A comparison of detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende, and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages in marine sediments off East Antarctica: implications for the geology of subglacial terrains and provenance studies

Pierce, E.L.^{a,f} (epierce@ldeo.columbia.edu)
 Hemming, S.R.^{a,b} (sidney@ldeo.columbia.edu)
 Williams, T.^b (trevor@ldeo.columbia.edu)
 van de Flierdt, T.^c (tina.vandeflierdt@imperial.ac.uk)
 Thomson, S.N.^d (thomson@email.arizona.edu)
 Reiners, P.W.^d (reiners@email.arizona.edu)
 Gehrels, G.E.^d (ggehrels@email.arizona.edu)
 Brachfeld, S.A.^e (brachfelds@mail.montclair.edu)
 Goldstein, S.L.^{a,b} (steveg@ldeo.columbia.edu)

^a Department of Earth and Environmental Sciences, Columbia University, 116th Street & Broadway, New York, NY 10027, USA

^b Lamont-Doherty Earth Observatory of Columbia University, Route 9W, Palisades, NY, 10964, USA

^c Department of Earth Science and Engineering, Imperial College London, South Kensington Campus, London, SW7 2AZ, UK

^d Department of Geosciences, University of Arizona, Tucson, AZ, 85721, USA

^e Department of Earth and Environmental Studies, Montclair State University, 1 Normal Ave, Montclair, NJ, 07043, USA

^f present address Department of Geosciences, Wellesley College, 106 Central Street, Wellesley, MA, 02481, USA. Tel: 781-283-3899

Abstract

U-Pb ages of detrital zircon grains have provided an extraordinary tool for sedimentary provenance work, given that they are ubiquitous, resistant to damage and weathering, and that the U-Pb age records the crystallization age of the mineral. Although not as widely used, $^{40}\text{Ar}/^{39}\text{Ar}$ dating of detrital hornblende and biotite grains can also serve as powerful sedimentary provenance tools, particularly in situations where chemical weathering is minor (e.g., Antarctica). Certain natural biases exist among these mineral chronometers (e.g., abundance in different rock types, durability during abrasion, resistance to dissolution) that determine the extent to which they are found in sedimentary deposits. Additionally, the $^{40}\text{Ar}/^{39}\text{Ar}$ systems in hornblende and biotite have lower closure temperatures for thermally activated diffusion ($\sim 500^\circ\text{C}$ and $\sim 300^\circ\text{C}$, respectively). Thus, for areas that have experienced a polymetamorphic history, such as East Antarctica, combining these approaches can provide added detail to provenance studies.

In this study we provide a comparison of the detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite age populations from 28 glacial-diamict and glacial-marine sediment core samples located around East Antarctica (55°W to 163°E). We present 3,370 new detrital age measurements of U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende, and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite, in conjunction with previously published data from some of the same core sites, as well as 78 U-Pb zircon ages

measured on dispersed zircons from five ice-rafted debris (IRD) layers recovered at ODP Site 1165. Our data indicate that detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages faithfully document the onshore geology of source areas within East Antarctica, as expressed in their respective age populations. In addition, a number of previously unknown age populations are recorded by the combined thermochronometers. Assuming an East Antarctic provenance, this approach helps to identify otherwise hidden geologic provinces. Previously unrecognized age populations include Archean $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages in Dronning Maud Land; 1200-1300 Ma $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages in the Weddell Sea; ~1560 Ma population of U-Pb zircons from the Wilkes Land margin; and Grenvillian (1000-1200 Ma) U-Pb zircon ages from the Adélie / George V Land margin.

Keywords: thermochronology, geochronology, ice-rafted debris, glacial diamict, detrital zircon

1. Introduction

The U-Pb system in detrital zircons is a widely used and powerful tool for conducting sedimentary provenance studies (e.g., Gaudette et al. 1981; Andersen, 2005; Gehrels et al. 2011a; Gehrels 2012, see Fedo et al. (2003) for a discussion of detrital U-Pb zircon studies). $^{40}\text{Ar}/^{39}\text{Ar}$ ages measured in detrital hornblende and biotite are less exploited as a sedimentary provenance tool, but they are increasingly being used for studies of ice rafted debris (IRD) around Antarctica and other regions characterized by tidewater glaciers (e.g., Gwiazda et al. 1996; Hemming et al. 1998; Hemming et al. 2000; Hemming and Hajdas 2003; Peck et al. 2007; Roy et al. 2007b; Williams et al. 2010; Pierce et al. 2011; Downing et al. 2013; Knutz et al. 2013). In this study, we compare U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages measured on detrital mineral grains from glacially-derived marine sediment samples taken from 28 marine sediment cores located around East Antarctica (Figs.1, 2).

The first objective is to provide a direct comparison of detrital zircon U-Pb, hornblende $^{40}\text{Ar}/^{39}\text{Ar}$ and biotite $^{40}\text{Ar}/^{39}\text{Ar}$ age populations. Given the natural biases that exist for each system (see Section 2), we are interested in which of the minerals are present, which age populations are present, if the age populations are present across all mineral systems, and how

these ages relate to one another from a thermochronology point of view. The findings have broad implications for evaluating each of these chronometers as a provenance tracer around East Antarctica, and they will particularly benefit the study IRD. The provenance of IRD provides key information on the ice sheet and ocean circulation dynamics that transport the mineral grains from their source to the ocean floor: flowing ice erodes and incorporates debris, and when the ice streams reach the ocean, they calve off icebergs that are carried by ocean currents, melting as they travel, and causing the entrained debris to sink and be deposited on the ocean floor.

The second objective of this study is to use this information to increase our understanding of East Antarctica's geology. Today more than 98% of East Antarctica is covered by the thick East Antarctic ice sheet, and relatively little outcrop is available for direct geologic study (Fig. 2). Despite these challenges, the general geological history of East Antarctica is known reasonably well. The bulk of East Antarctica was formed during the Precambrian; it comprises a number of Archean cratons, surrounded by orogenic belts and accreted terranes of Proterozoic and younger ages (e.g., Tingey 1991; Boger 2011). The amalgamation of the continents to form the supercontinent Rodinia at ~1100 Ma led to widespread occurrence of terranes with approximately Grenvillian (900-1300 Ma) ages. Though the Grenville orogeny itself is defined by Mesoproterozoic collisional activity along the Laurentian margin (e.g., Rivers, 1997), Fitzsimons (2000) compiled available U-Pb zircon outcrop data from East Antarctica and previous contiguous margins (see Fitzsimons (2000) for full description of data used), and defined three distinct Grenville-aged (or Grenvillian) zones in East Antarctica: Dronning Maud Land (1030-1090 Ma), Prydz Bay or Rayner Province (900-990 Ma), and Wilkes Land (1130-1330 Ma). In this paper we follow suit and refer to age populations within the bounds of 900 to 1330 Ma as Grenvillian or Grenville-aged. The timing of the subsequent break-up of Rodinia

remains controversial (as does the existence of Rodinia itself), with different studies arguing for different ranges of ages that span ages from 520 to 1000 Ma, and for either continuous or multiphase rifting (Goodge et al., 2002; Cordani et al., 2003; Meert and Torsvik, 2003; Veevers, 2004).

A re-assembly of the continents occurred after rifting, with East Gondwana (India, Australia, and East Antarctica) colliding with West Gondwana (South America and Africa) to form Gondwanaland. During this time of continental amalgamation, two temporally close orogenies, the Pan-African and the Ross-Beardmore, affected the East Antarctic Craton (EAC).

The Pan-African orogeny (500-650 Ma) was the result of the Gondwana blocks colliding to form Gondwana, while the Ross orogeny (~480-590 Ma) was the result of subduction between Gondwana and what would become the Pacific plate (Tingey, 1991; Goodge, 2007; Boger, 2011). During these partly contemporaneous orogenies, the continued attachment of East Antarctica, India and Australia meant that parts of the craton - specifically Wilkes Land and part of Adélie Land - were buffered from the intense tectonothermal activity associated with these orogenies. The evidence for this buffering is the lack of a high-temperature overprint signatures in the ages of in-situ and detrital zircons and hornblendes; these parts of East Antarctica still maintain Grenvillian and Paleoproterozoic ages based on $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and U-Pb zircon dates (Tingey, 1991; Anderson, 1999; Peucat et al., 1999; Fitzsimons, 2000; Di Vincenzo et al., 2007; Roy et al., 2007b; Pierce et al., 2011). This geologic history has left East Antarctica with dominant, characteristic high temperature age populations of ~3.0 Ga (cratons), 900-1300 Ma (Grenvillian) and 400-600 Ma (Pan-African/Ross orogenies) (Fig. 1). Examining the populations of U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ ages in glacial-marine sediments deposited around East Antarctica will

allow us to augment these broad interpretations with additional details on the thermochronology and hence geology of the unexplored parts of East Antarctica covered by the vast ice sheet.

2. Zircon, hornblende and biotite in provenance studies

There are some fundamental differences between the ages reflected by U-Pb measured in zircon and $^{40}\text{Ar}/^{39}\text{Ar}$ measurements in hornblende and biotite. Some of the basic advantages to using U-Pb zircon ages as a provenance tracer of terrestrial deposits, e.g., sandstones, do not hold true for provenance studies of marine sediments recovered in polar regions, and vice-versa. Here we provide a brief description of these generally known differences, in order to highlight why the U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite age populations found in a sediment sample may not always provide the same view of provenance.

2.1 Occurrence of zircon, hornblende and biotite in different rock types

Zircon, hornblende and biotite occur in varying amounts in different rock types, a fact that should be taken into account when considering provenance tools. Zircon (ZrSiO_4) is an accessory mineral found in trace amounts in most types of igneous and metamorphic rocks, is most common in felsic crystalline rocks (e.g., granitoids) and orthogneisses, and is highly concentrated in mature sandstones (Table 1). Hornblende (general formula $\text{Ca}_2\text{Mg}_4(\text{Al}, \text{Fe}^{3+})(\text{Al}, \text{Si})_8\text{O}_{22}(\text{OH})_2$), a member of the amphibole group, is a major-rock forming mineral found in high concentrations in intermediate igneous rocks, e.g., diorite, as well as medium- to high-grade metamorphic rocks (e.g., amphibolite facies), especially in mafic/ultramafic protoliths. Hornblende does not usually occur as a major mineral in the sedimentary rock record because it is weathered relatively easily, and is usually incorporated into

the clasts in clastic sedimentary rocks, e.g., conglomerates. Biotite ($\text{K}(\text{Mg,Fe})_3(\text{AlSi}_3\text{O}_{10})(\text{OH}_2)$, a mica, is a major rock-forming mineral found in high concentrations in felsic-intermediate igneous rocks, e.g., granitoids and diorite, and low- to medium-grade metamorphic rocks, e.g., hornfels, phyllite and schist. Biotite also is not a major detrital mineral in the sedimentary rock record, though it tends to be more abundant than hornblende (Deer et al., 1992).

2.2 Weathering

In terms of relative susceptibility to chemical and physical weathering, zircon is most resistant, then biotite, then hornblende (Goldich, 1938; Kowalewski and Rimstidt, 2003). Zircon is one of the most refractory minerals, and is common in both modern and ancient sedimentary environments. It is highly resistant to both chemical and physical weathering during erosional processes and subsequent burial, primarily due to its crystal structure with tightly bonded SiO_4 tetrahedra (Thoulet, 1913; Boswell, 1923; Goldich, 1938; Pettijohn, 1941; Morton, 1984; Bateman and Catt, 1985; Morton, 1991). Zircon not only survives sedimentary transport well, but also can survive through multiple cycles of burial, orogenesis, and erosion. Indeed, Kowalewski and Rimstidt (2003) have zircon ranked as the most durable detrital mineral. A zircon population in the sedimentary environment can record several tectonic events, which makes the interpretation of detrital zircon populations for provenance studies often challenging. For example, samples may contain recycled zircons that were transported from an original location of formation to a secondary location, and then eroded more recently from the secondary location, but with a provenance signal indicating the original location. As has been discussed before, (e.g., Thomas, 2011), the fact that zircon survives through many sedimentary cycles is an advantage, because a zircon population can record several tectonic events. However, it is also a

challenge when interpreting detrital zircon populations for provenance studies, because samples may contain recycled zircons.

While both biotite and hornblende may also be found in modern and ancient sedimentary deposits, their susceptibility to weathering makes the occurrence of un-weathered/un-altered grains unusual, particularly in modern environments with high chemical weathering rates, or in ancient sediments. Both hornblende and biotite are ferromagnesian silicates, and as such are susceptible to chemical weathering via oxidation. Hornblende is, however, slightly more susceptible to weathering than biotite, as discussed by Goldich (1938), and as explained by their relative placement on Bowen's reaction series (Bowen, 1922). Hornblende forms at a higher temperature than biotite, its bonds are not as strong as those of biotite, and thus it breaks down more readily. Biotite can generally survive transport for long distances in modern sedimentary systems, as its elastic nature protects it from abrasion (Kowalewski and Rimstidt, 2003; Hodges et al., 2005). However, biotite is very susceptible to chemical dissolution. Hornblende and biotite typically survive through only one sedimentary cycle and thus the application of $^{40}\text{Ar}/^{39}\text{Ar}$ ages in these minerals to provenance studies is more straightforward.

2.3 Geochronology and thermochronology

Typically, zircon core ages represent the age of crystallization, and are rarely if ever reset during successive tectonothermal events (e.g, Mezger and Krogstad, 1997), but rims can often grow around the original crystal during successive orogenies or later magma crystallization (Silver and Deutsch, 1963; Bickford et al., 1981). Lead loss, by various means (see Mezger and Krogstad, 1997), can lead to discordant U-Pb ages. Conversely, zircons with high U

concentrations can turn metamict, which can result in preferential destruction of this type of zircon.

In contrast to the retention of their initial crystallization ages that characterize zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ ages measured in hornblende reflect the time since the hornblende grain most recently formed or cooled below $\sim 500^\circ\text{C}$ (McDougall and Harrison, 1999). As a result, the $^{40}\text{Ar}/^{39}\text{Ar}$ age of hornblende records the last major tectonothermal event experienced by its host rock. Similarly, the $^{40}\text{Ar}/^{39}\text{Ar}$ ages measured in biotite reflect the time since the biotite grain formed or cooled below $\sim 300^\circ\text{C}$, and thus it is more likely than hornblende to record minor tectonothermal events (Reiners et al., 2005b).

2.4 Transport mechanisms

The transport mechanisms and depositional environments of sediments needs to be considered when conducting sedimentary provenance studies. Below is a summary of studies that apply the detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages to provenance studies in glacial and non-glacial environments. See Table 2 for a list of non-glacial terrestrial provenance studies (A) and glacial-marine and terrestrial provenance studies (B) that apply these methods, and which summarize the studies mentioned in sections 2.4.1 and 2.4.2.

2.4.1 Terrestrial sediment provenance studies in non-glacial environments

Previous detrital U-Pb zircon provenance studies are too numerous to mention here as a comprehensive list, attesting to the strength of this tool from its earliest uses (e.g., Ledent et al., 1964; Tatsumoto and Patterson, 1964; Gaudette et al., 1981) to more recent studies (e.g., Gehrels et al. 2011a; Gehrels 2012); see Fedo et al. (2003) for a discussion of detrital U-Pb zircon

studies). Typically, these studies are based on sediments that were eroded, transported and deposited by wind or water; transport mechanisms that ultimately sort sediments, which, paired with the resilient nature of zircon, serves to concentrate zircons.

As discussed above, biotite and hornblende are not as resilient as zircon, and so the $^{40}\text{Ar}/^{39}\text{Ar}$ ages of biotite and hornblende have not been exploited as a provenance tool as much as detrital zircon U-Pb (Table 2A). Where they have been applied to terrestrial studies, the results on $^{40}\text{Ar}/^{39}\text{Ar}$ ages of detrital biotite have been variably successful. Renne et al. (1990) applied detrital $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages to constrain the provenance of the Eocene Montgomery Creek Formation in northern California, however biotite grains were found to contain vermiculite as interlayer laminations and rinds, which lowered the integrated age of the biotite grains; accordingly, the $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages were not used as a tracer of provenance in this study. Cohen et al. (1995) successfully applied the $^{40}\text{Ar}/^{39}\text{Ar}$ ages of detrital hornblende and step-heated biotite grains in volcanoclastic Jurassic sandstones in southern Alaska, in order to determine the provenance of the Seymour Canal Formation. In this case, weathering was a minor factor and grains were selected based upon their physical appearance of little to no alteration. The authors were able to conclude that the biotite grains were sourced from the volcanic arc of the Gravina Belt. Aalto et al. (1998) applied the $^{40}\text{Ar}/^{39}\text{Ar}$ ages of detrital biotite to determine the provenance of Eocene-Miocene Hoh assemblage sandstones in northern California. These authors found that the detrital $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages they measured did not yield meaningful ages, as the ages were widely scattered, no plateau ages were reached during incremental step-heating of the grains, and radiogenic argon was $< 20\%$ in most samples, all indicating chemical alteration of the grains. Thus, in terrestrial provenance, weathering of the mineral grains can degrade or destroy the

$^{40}\text{Ar}/^{39}\text{Ar}$ signal, but reliable ages and provenance can be determined on grains where weathering/alteration/dissolution is minor.

2.4.2. Terrestrial and marine sediment provenance studies in glacial environments

Some of the basic advantages of detrital zircon U-Pb ages and disadvantages of hornblende and biotite $^{40}\text{Ar}/^{39}\text{Ar}$ ages as provenance tracers of terrestrial deposits do not apply to provenance studies of terrestrial and marine sediments recovered from the polar regions. In polar regions, and especially in East Antarctica, the dominant style of weathering is mechanical, and the majority of sedimentary provenance studies aim to determine the sources of IRD. Unlike wind and water, glacial transport does not sort sediment. In glacial-fluvial settings, however, material comminuted by ice and subsequently entrained in water may undergo some hydraulic sorting. This process will most affect biotite grains, and concentrate them in the finer sediment fractions (Nesbitt and Young, 1996). In ice-dominated transport systems, the lack of fluvial hydraulic sorting paired with the low amount of chemical weathering means that there should be no significant preferential concentration of zircon relative to hornblende relative to biotite, such that these minerals should more closely approximate the proportions in the source lithologies that were eroded.

In IRD and other glaciogenic sediment used for provenance studies, the $^{40}\text{Ar}/^{39}\text{Ar}$ age of detrital biotite is emerging as promising provenance tool. As a potassium-bearing mineral, biotite in the 63-150 μm fraction, in addition to the $>150 \mu\text{m}$ fraction, contains measurable amounts of argon, increasing the number of potential grains in a given sample that can be used for thermochronology. In the North Atlantic, Hemming et al. (2002) measured the $^{40}\text{Ar}/^{39}\text{Ar}$ ages of a small number of ice-rafted biotite grains, which indicated a provenance of the IRD similar to

the mid-Norwegian provenance indicated by the ice-rafted $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages presented in the same study. Van de Flierdt et al. (2008) applied the $^{40}\text{Ar}/^{39}\text{Ar}$ ages of detrital biotite from fluvial and glacial-marine sediments recovered at ODP Site 1166 in Prydz Bay, East Antarctica, to investigate the origin of the Gamburtsev Subglacial Mountains, and showed that these mountains could not be of a young volcanic origin. Pierce et al. (2011) found that the $^{40}\text{Ar}/^{39}\text{Ar}$ ages of ice-rafted biotite grains can be applied as a tracer of IRD provenance around the Wilkes and Adélie Land margins of East Antarctica; $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages used to characterize source areas reflected what is known through outcrop studies, and a comparison of ice-rafted $^{40}\text{Ar}/^{39}\text{Ar}$ biotite and $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages (Williams et al., 2010) at ODP Site 1165 demonstrated that the $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages indicated the same provenance sectors as the previously published $^{40}\text{Ar}/^{39}\text{Ar}$ biotite hornblende ages (Williams et al., 2010). Around East Antarctica, Pierce et al. (2011) found that there were a large numbers of grains that showed no signs of chemical alteration and gave robust ages. Palmer et al. (2012) successfully applied $^{40}\text{Ar}/^{39}\text{Ar}$ dating of biotite to glacial tills and cobbles in the Transantarctic Mountains in order to study the subglacial geology of this area.

In IRD and other glaciogenic sediment provenance studies, the $^{40}\text{Ar}/^{39}\text{Ar}$ of detrital hornblende has also been demonstrated as a reliable provenance tool (Table 2A). Studies in the North Atlantic (Gwiazda et al., 1996; Hemming et al., 1998; Hemming et al., 2000; Hemming et al., 2002; Hemming and Hajdas, 2003; Peck et al., 2007; Downing et al., 2013; Knutz et al., 2013) and in the circum-Antarctic (Roy et al., 2007b; van de Flierdt et al., 2008; Williams et al., 2010; Pierce et al., 2011; Tochilin et al., 2012) have successfully applied the $^{40}\text{Ar}/^{39}\text{Ar}$ tool. In glacial till samples, this method has been successfully applied both in Antarctica and North America. Roy et al. (2007a) used detrital $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages from mid-continent till

samples to constrain Laurentide ice sheet extent during the past ~2.0 Ma. They showed that a consistent source of till deposited during ice sheet advances over the past ~ 2 Myr was the northwestern Keewatin sector of the Laurentide ice sheet, indicating the sustained presence of an ice dome in that area. Palmer et al. (2012) successfully applied $^{40}\text{Ar}/^{39}\text{Ar}$ dating to hornblende in glacial till deposits from the Transantarctic Mountains with the goal of studying subglacial geology, Tochilin et al. (2012) presented detrital hornblende $^{40}\text{Ar}/^{39}\text{Ar}$ ages from Oligocene to recent glacial sediments in the Prydz Bay sector of East Antarctica to look at long term tectonic and erosion history in the Lambert Graben region of East Antarctica. Combined with other thermochronometers (see Section 7), they were able to infer that erosion rates slowed from a relative high in the Oligocene (following East Antarctic ice-sheet initiation), to relatively low rates from the late Miocene onwards.

In glaciogenic sediment provenance studies using the U-Pb zircon method, most work has been restricted to terrestrial samples, though increasingly studies are using glacial-marine samples (Table 2A). Van de Flierdt et al. (2008), Tochilin et al. (2012), and Palmer et al. (2012), in the studies discussed above, also measured detrital U-Pb zircon ages. (Goodge et al., 2010) measured U-Pb ages on zircons from Neogene and Quaternary till clasts deposited in the central Transantarctic mountains, and, based on Grenvillian U-Pb zircon ages, provided evidence for the extension of Grenville-aged crust into East Antarctica along the Ross-Sea margin. Goodge and Fanning (2010) measured U-Pb ages on detrital zircons from glacial-marine sediments (dispersed and from clasts) from western Wilkes Land; while age populations were dominated by a Ross signature, many older age populations show both the importance of this approach to identifying the age of un-exposed basement rocks, as well as the presence of older (Neoproterozoic, Mesoproterozoic and Archean) terranes within the interior of East Antarctica adjacent to western

Wilkes Land. In a review of U-Pb zircon ages and various geochemical proxies from around East Antarctica, Veevers and Saeed (2011) measured detrital U-Pb zircon ages from sediments offshore of East Antarctica (glacial diamict and turbidites, respectively), which offered valuable insights to the obscured subglacial geology of East Antarctica's interior. These authors argue that the East Antarctic craton is dominated by igneous and metamorphic ages of ~500-700, 900-1300, 1400-1700, 1900-2100, 2200-2300, 2600-2800, and 3150-3350 Ma.

Recent work in the North Atlantic (Small et al., 2013) applied U-Pb measurements on ice-rafted zircons to determine the provenance of IRD during the last deglacial period. Though the number of zircons was small, the authors inferred provenance with the additional pairing of U-Pb ages on ice-rafted rutile, and concluded that the IRD was sourced from the Laurentia, as opposed to Scotland, which is closer to the core site, indicating rapid distribution of IRD during the Older Dryas Cold Reversal. To our knowledge no studies have attempted to use U-Pb ages of ice-rafted zircons to determine the provenance of IRD in the Southern Ocean. Detrital U-Pb zircon provenance studies have also been applied to pre-Cenozoic glacial deposits. For example, Avigad et al. (2007) determined the provenance of Cryogenian diamictites from northern Ethiopia using this method while Gehrels et al. (2011b) determined Carboniferous-Permian diamictite provenance from the Tibet-Himalayan orogeny.

Another important consideration for determining the provenance of IRD is sample size. Detrital zircon studies are most often applied to determining the provenance of sandstones and conglomerates, and general practice is to take large samples in order to obtain sufficient zircons; Gehrels et al. (2006) advocate taking 4.5 to 18 kilogram samples for detrital U-Pb zircon provenance studies, depending on the maturity of the sandstone. It is important to note that for a terrestrial setting, sample size is generally not restricted by the availability of the material.

Sample sizes taken from marine sediment cores for the purpose of studying IRD, however, are typically 10-20 cubic centimeters, a size dictated by sedimentation rates in the open ocean (and thus the depositional age range of the interval sampled) and the fact that the diameter of a sediment core is typically ~6 centimeters. Furthermore, the bulk of pelagic marine sediments is typically in the <63 μm fraction, in which case major rock forming minerals are more likely to provide abundant grains for analysis.

3. Approach and sampling sites

There are essentially two provenance components to this study. The first is making the connection between the samples taken from the core sites to known outcrops on-land; the provenance of these samples should be more localized to the ice-sheet drainage that delivers material to the core site, as subglacial till or by local ice-rafting (Fig. 2). The second is to investigate changes through time in the provenance of ice-rafted grains from an open-ocean core site, located ~ 400 km away from the coast (ODP Site 1165, see Fig. 2). The provenance of the ice-rafted material delivered to such a site has the potential to reflect sourcing from both local and distant sources, depending on past climatic conditions (e.g., sea-surface temperatures controlling the rate of melting of the icebergs, ocean currents, wind, and ice-sheet behavior).

For this study, we compare U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende, and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages from 28 marine sediment core sites (Figs. 1, 2). Table 3 contains a full description of core site locations, water depth, sample type, and sampling depth. Samples from twenty-seven of the core sites were analyzed using each of the mineral systems, with the goal of studying subglacial geology and refining the characterization of potential IRD sources. Multiple layers were analyzed in several cores in order to increase the number of analyses for each mineral system.

Samples from 26 of the core sites were provided by Florida State University's Antarctic Marine Geology Research Facility (FSU AMGRF), and consist of piston or jumbo piston core samples, while samples from the remaining two core sites are from the Ocean Drilling Program. For the 26 piston or jumbo piston cores from the FSU AMGRF, we specifically targeted layers that had previously been identified as glacial diamict, or the sandy/gravel rich layers near the bottom of the piston cores, which are more likely to be till (perhaps representing LGM deposition), and thus be sourced from the proximal rock substrate (see Pierce et al., 2011) (see Table 3 for description of samples). The Ocean Drilling Program provided the samples for one proximal site (ODP Site 1166) as well as the down-core samples from ODP Site 1165; from ODP Site 1165 we measured the U-Pb zircon ages from five IRD-rich samples (spanning 3.5 to 19 Ma in depositional age) that had already been analyzed for $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende (Williams et al., 2010) and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite (Pierce et al., 2011), in order to compare the inferred provenance based on the different thermochronometers. Depositional ages for the IRD-rich samples from ODP Site 1165 are discussed in Williams et al. (2010), but are primarily based on microfossil data.

4. U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ analyses

Bulk till and glacial-marine sediment samples (~20 cc) were dried, weighed, disaggregated in deionized water, and washed through 63 μm sieves with deionized water. Subsequent sieving of dry samples was performed at 150 μm and 1 mm. Size fractions >63 μm (63-150 μm and 150 μm to 1 mm) were passed under a hand magnet and then passed through a Frantz magnetic separator at 0.8 Amps with a side-slope of 20° and a front slope of 20°.

Hornblende and biotite grains were hand-picked from the magnetic 150 μm to 1mm fraction and co-irradiated with the McClure Mountain hornblende (Mmhb) monitor standard

either at the Cd-lined in-core facility (CLICIT) at the Oregon State reactor, or (also with Cd shielding) at the U.S. Geological Survey (USGS) TRIGA reactor in Denver, CO. $^{40}\text{Ar}/^{39}\text{Ar}$ ages were obtained using single-step CO_2 laser fusion at the Lamont-Doherty Earth Observatory (LDEO) argon geochronology lab (AGES: Argon Geochronology for the Earth Sciences). Calculated values include corrections for backgrounds based on frequent measurements of the blank, and for mass discrimination based on measurements of atmospheric argon. Corrections are made for nuclear interferences using values reported in Renne et al. (1998) for the OSU irradiations and in Dalrymple et al. (1981) for the USGS irradiations. J values used to correct for neutron flux were calculated using a value of 525 Ma and decay constants from Steiger and Jäger (1977) for the co-irradiated Mmhb-1 hornblende standard (Samson and Alexander, 1987).

The $>150\mu\text{m}$ non-magnetic fraction was sieved at $250\mu\text{m}$, and combined with the $63\text{--}150\mu\text{m}$ non-magnetic fraction. The total $63\text{--}250\mu\text{m}$ non-magnetic fraction was then passed through density separations in order to concentrate the zircons in the sample. The first density separation was performed with LST (lithium heteropolytungstates) at a density of 2.85 g/cc . The fraction $>2.85\text{ g/cc}$ was subsequently put through a density separation using MEI (Methylene Iodide) at a density of 3.3 g/cc . Zircons were handpicked from the $>3.3\text{ g/cc}$ fraction using a light microscope with polarizing lens capabilities. Zircon morphologies include both euhedral and rounded grain shapes, likely because they were recycled through one or more sedimentary cycles. Zircon grains were placed on double-sided tape mounted to glass slides. The grains were therefore not polished or imaged, so we can not speak to the complexity of an individual grain; the point in this approach was to facilitate later analyses on U-Pb dated zircons, e.g., fission track and U-Th (He) dating.

U-Pb zircon analyses were performed at the University of Arizona's LaserChron facility, using laser ablation MC-ICP-MS. Corrections for instrumental bias were applied based on the measurement of a Sri Lankan zircon standard that was measured throughout the analytical session. The full procedure for this lab is reported on their website (<https://sites.google.com/a/laserchron.org/laserchron/home/>) and in Gehrels et al. (2006) and in (Gehrels et al., 2008).

5. Results of the U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ analyses

5.1 Results from shelf diamicts and core-top IRD (Cores 1-15, 17-28)

A total of 1,915 U-Pb detrital zircons ages, 1,169 $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages, and 275 $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages were measured for this study, adding to 683 $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages, 494 $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages, and 232 U-Pb detrital zircon ages from previous studies (van de Flierdt et al., 2008; Williams et al., 2010; Pierce et al., 2011) for a total of 2,147 U-Pb detrital zircon ages, 1,863 $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages, and 769 $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages (see Table 3). Twenty of the 27 piston jumbo core samples have measurements made on all three of the mineral systems, while in six samples we did not find any zircons, and in three samples we did not find any biotite (see Appendix A for U-Pb zircon data listed by sample location, Appendix B for $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende data listed by sample location, Appendix C for biotite data listed by sample location, Appendix D for data grouped by geographic sector, and appendix E for stacked histograms of each system (U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende, $^{40}\text{Ar}/^{39}\text{Ar}$ biotite) by individual core site).

Fig. 3 A-D shows stacked histograms of each system (U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende, $^{40}\text{Ar}/^{39}\text{Ar}$ biotite) by geographic sector (A) Dronning Maud Land (DML), (B) Prydz Bay (PB),

(C) Wilkes Land (WL) and (D) Adélie / George V / northern Victoria Land (AL / GVL / NVL). ISOPLOT/EX (Ludwig, 2003) was used for determining the peak ages in the detrital data sets. For comparison, we have included a histogram of on-land U-Pb zircon ages from each sector, taken from compilations in Veevers (2012) and Veevers and Saeed (2011).

5.1.1 Weddell and Dronning Maud Land sector (Cores 1-14, 60° W to 15°E)

Detrital zircon U-Pb ages from the core sites in the Dronning Maud Land (DML) sector show dominant populations of 500-600 Ma (peak age 520 Ma) and 1000-1200 Ma (peak ages ~1068 and ~1104), with additional small populations at ~108 Ma, ~180 Ma, ~760 Ma, ~1796 Ma ~2588 Ma and ~2736 Ma. $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages show dominant populations of 440-540 Ma (peak age ~494 Ma), 960-1100 Ma (peak age ~1056 Ma), with smaller populations of ~92 Ma, ~174 Ma, ~1236 Ma, ~2890 Ma and ~3080 Ma. $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages show dominant populations of 400-500 Ma (peak age ~451 Ma) and 900-1100 Ma (peak ages ~976 Ma and ~1011 Ma), with smaller populations of ~211 Ma and ~2550 Ma, ~2602 Ma and ~2644 Ma (Fig. 3A).

5.1.2 Prydz Bay sector (Cores 15, 17-19, 60°E to 80°E)

Detrital zircon U-Pb ages from cores in the Prydz Bay (PB) sector show dominant populations of 500-600 Ma (peak age 540 Ma) and 840-1040 Ma (peak age 932 Ma), with a continuum of zircon ages between these two peaks and a smaller population of 680 to 720 Ma (peak age ~698 Ma), and minor populations of ~2064 Ma and ~2766 Ma. $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages show dominant populations of 480-540 Ma (peak age ~500 Ma) and a minor population of

580-640 Ma (peak age ~628 Ma). $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages show a dominant population of 480-540 Ma (peak age ~500 Ma) (Fig. 3B).

5.1.3 Wilkes Land sector (Cores 20-22, 90°E to 135°E)

Detrital zircon U-Pb ages from cores in the Wilkes Land (WL) sector show dominant populations of 1100-1200 Ma (peak ~1150 Ma) and 1480-1620 Ma (peak age ~1562 Ma). $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages show a dominant population of 1100-1200 Ma (peak age ~1152 Ma), and a small population 1440 to 1500 Ma (peak age ~1494 Ma). $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages show a dominant population of 1080-1160 Ma (peak age ~1120 Ma) and a small population of 400-500 Ma (peak age ~440) (Fig. 3C).

5.1.4 Adélie Land / George V Land / northern Victoria Land (Cores 23-28, 140°E to 165°E)

Detrital zircon U-Pb ages from all cores in the Adélie/George V/northern Victoria Land (AL / GVL / NVL) sector show dominant populations of 480-620 Ma (peak ages ~502 and 579 Ma) and 380-400 Ma (peak age ~389 Ma), with small populations of ~1057 Ma, ~1235 Ma, ~1610 Ma, ~1723 Ma, ~1795 Ma, ~2455 Ma and ~2717 Ma. $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages show dominant populations of 480 to 520 Ma (peak age ~ 493 Ma) and 0-20 Ma (peak age ~ 3 Ma), with small populations of ~1480 Ma, 1608 Ma and 1715 Ma. $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages show dominant populations of 340-440 Ma (peak age ~369 Ma) and 460-540 Ma (peak age ~ 494 Ma), with small populations of ~105 and ~1626 Ma (Fig. 3D).

5.2 ODP Site 1165 – downcore results (Core 16)

Sixty-seven zircons were found in five layers previously studied from ODP Site 1165. for $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages (167 grains; Williams et al., 2010) and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages (145 grains; (Pierce et al., 2011)). Figure 4 shows stacked histograms of each mineral type for each of the IRD layers.

Three of the five layers yielded few U-Pb zircon analyses ($n = 3$ to 13), and a mix of ~ 500 Ma and 1000-1200 Ma grains (3.0 Ma, first 4.65 Ma, and 19.0 Ma; Fig. 4). The remaining two layers both contain more robust ~ 500 -600 Myr and 1100-1200 Myr age populations, with the latter being more prominent in the layer deposited 4.65 Ma, while the 7.0 Ma layer contains roughly equal proportions of both populations.

6. Discussion and comparison of thermochronometers

6.1. Relationship between detrital ages and on-land geology

While our new detrital age populations are in general agreement with major known tectonothermal events on land, the results also reveal age populations that have not previously been reported from on-shore studies. These ‘unexpected’ age populations reflect either a bias in the types of measurements made from on-land samples (e.g., U-Pb zircon ages dominate the on-land record) or the presence of ice-covered terranes that are not accessible for direct study today, and will be discussed below in more detail. We will discuss our new data by geographic sector, starting with a comparison to known source rock ages (from old to young) (Figs. 5A, 5B and 5C) (see Appendix F for a table of on-land ages and references to published geological studies) and followed by new and interesting age populations that have not previously been described.

6.1.1 Dronning Maud Land Sector (Cores 1-14, 60° W to 15°E)

6.1.1.1 Results consistent with onshore outcrop data

Archean ages

Overall, Archean zircons (n=30) are scattered in the 2500-3700 Ma range, with minor populations of ~2588 Ma and ~2736 Ma. Marschall et al. (2010) measured U-Pb ages in zircons recovered from the Annandagstoppane granite, which outcrops in the Grunehoga Craton, and determined the crystallization age of the granite to be 3067 ± 8 Ma, with evidence of inherited zircon ages ranging from 3175 ± 8 to 3433 ± 7 Ma. The low abundance of zircon in this granite, in addition to the lack of sorting during ice transport, is likely why there is no distinct population of U-Pb ages in the zircons measured in these cores. The spread of ages between 3100 Ma and 3700 Ma, however, is consistent with the inherited U-Pb zircon ages measured in the Annandagstoppane granite by Marschall et al. (2010), and with ages of tectono-magmatic events measured in the Kaapvaal craton, thus lending support to the conclusion of Marschall et al. (2010) that the Grunehogna craton was an extension of Africa's Kaapvaal craton.

Grenvillian activity

Based on previous data, Fitzsimons (2000) divided Grenvillian U-Pb zircon ages in the DML area into those older than 1100 Ma, reflecting igneous crystallization of orthogneiss and metavolcanic precursors, and those 1030-1090 Ma, reflecting high-grade Grenville-aged tectonism. Grenville-aged populations appear in each of the mineral systems, with peak ages of ~1068 Ma ~1104 Ma (U-Pb zircon), ~1056 Ma ($^{40}\text{Ar}/^{39}\text{Ar}$ hornblende) and ~1011 Ma and ~976 Ma ($^{40}\text{Ar}/^{39}\text{Ar}$ biotite).

The range of Grenvillian ages we have measured is consistent with Fitzsimons' (2000) survey, as well as with measured on-land ages that fall in the 1030 – 1090 Ma range (Harris et

al., 1995; Jacobs et al., 1996; Jacobs et al., 2003a; Jacobs et al., 2003b; Jacobs et al., 2003c; Board et al., 2005; Bisnath et al., 2006; Jacobs et al., 2008) and the greater than 1100 Ma range (Arndt et al., 1991; Harris et al., 1995; Gose et al., 1997; Jackson, 1999; Board et al., 2005; Bisnath et al., 2006; Flowerdew et al., 2012). Both the ~ 1104 Ma and 1068 Ma detrital zircon U-Pb peaks are consistent with U-Pb zircon ages of 1104 ± 8 and 1070 Ma measured by Bisnath et al. (2006) in Gjelsvikfjella (~3°W). The Grenvillian ages found in Core 1 (Western Weddell Sea, Fig. 5A-C) likely reflect sourcing from the Haag Nunatak area, which has been shown to contain Grenvillian ages ~1000-1180 Ma Rb-Sr whole rock ages (Millar and Pankhurst, 1987), and 991-1031 K-Ar hornblende and biotite ages (Clarkson and Brook, 1977).

Pan-African/Ross orogeny

The ~ 500 Ma populations found in each of the detrital thermochronometers from this area likely reflect a mix of Pan-African and Ross signatures from the bedrock source. Reconstructions of Gondwana (e.g., Harley and Kelly (2007); Kleinschmidt (2007); Fig. 1), project the Ross orogen all the way from northern Victoria Land through to Coats Land, in addition to having Pan-African rocks potentially projected from Enderby Land along a continuation of the Lützow-Holm Belt (to the Coats Land area as well (see Fig. 1). Given the close temporal overlap between these orogenies, we may not be able to use detrital mineral grain age populations to tease apart the two orogenies. However, based on the reconstructions mentioned above, we tentatively assign the ~500 Ma grain in cores 1-3 as having a 'Ross' orogen source, while the ~500 Ma grains in cores 5 -14 are assigned a 'Pan-African' source. Additionally, there is an older tail age in the Pan-African ages, and less so than in the Ross consistent with the findings of Pierce et al. (2011).

Pan-African/Ross populations appear in each of the thermochronometric ages, with peak ages of ~ 520 Ma, ~ 494 Ma, and ~451 Ma for detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite, respectively, and are consistent with Pan-African ages measured on-land in zircons (Mikhalsky et al., 1997; Harris, 1999; Zeh et al., 1999; Jacobs et al., 2003a; Jacobs et al., 2003b; Jacobs et al., 2003c; Paulsson and Austrheim, 2003; Curtis et al., 2004; Board et al., 2005; Bisnath et al., 2006; Flowerdew et al., 2012), with only a few $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende (Jacobs et al., 1995; Jacobs et al., 1996; Jacobs et al., 1997; Board et al., 2005) and one $^{40}\text{Ar}/^{39}\text{Ar}$ biotite age (Board et al., 2005) falling in this range.

The pattern that emerges from the age distribution in the thermochronometers in this area reflects Ross and Pan-African overprinting of Grenville-aged rocks in some areas but not others. Core 4, which consists purely of Grenvillian age populations in each of the thermochronometers, is located adjacent to the Bertrab-Littlewood-Moltke nunataks (see Fig. 5), which have U-Pb zircon ages of 1000-1100 Ma (Gose et al., 1997; Storey et al., 2004), and which did not undergo any metamorphism during the Pan-African/Ross orogenies. To the east of Core 4, Cores 5 and 6 contain bimodal populations of Pan-African/Ross and Grenvillian ages in each of the chronometers. To the east of Core 6, and of the cores that contain all thermochronometers, Cores 7, 8, 11, 12 and 14 contain Grenvillian and Pan-African U-Pb age populations, while the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite age populations are dominated by Pan-African ages, with few to no Grenvillian ages (Fig. 5, Table 4); this finding argues for significant resetting during the Pan-African orogeny in locations onshore of these core sites. These results are consistent with the interpretation of Jacobs and Thomas (2004), who show that Coats Land was unaffected by Pan-African overprinting due to lateral escape tectonics.

Jurassic rifting and younger ages

Grains less than 200 Ma in age are present in the detrital zircon U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite populations, though as a very small percentage (Fig. 3A, 5A-C). Zircons and hornblendes both contain populations of ~180 and ~100 Ma, while the biotite ages are more scattered from 160 to 211 Ma. The small population of ~100 Ma and younger ages are consistent with measured on-land ages south of the Ronne-Filchner Ice Shelf (Gose et al., 1997; Vaughan and Storey, 2000; Flowerdew et al., 2012), and are characteristic of the Antarctic Peninsula and West Antarctica (indeed, these ages are predominantly found in the cores located closest to the Antarctic Peninsula (Roy et al., 2007)).

The small age peak at ~180 Ma and ~174 Ma in the detrital zircon U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages, respectively, are from cores located off the coast of Coats Land; these likely reflect sourcing from the Dufek-Ferrar-Karoo volcanic rocks. U-Pb zircon dates of ~183 Ma have been measured in the Sonora Bluffs and surrounding area (Minor and Muakas, 1997; Flowerdew et al., 2012), while slightly younger $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages of 179 Ma and 175 Ma have been measured in the same areas (Fig. 5A-C). Hornblendes with these ages are additionally found farther along the coast to the east (Cores 7-9), and reflect sourcing from the extension of the Karoo flood basalts in the Vestfjella region, which have whole rock K-Ar ages of 160-230 Ma (Furnes and Mitchell, 1978; Furnes et al., 1987; Peters et al., 1991), and a plagioclase K-Ar age of 180 Ma (Peters et al., 1991). $^{40}\text{Ar}/^{39}\text{Ar}$ ages measured on the lavas in adjacent Kirwanveggan have an age of 183 ± 1 Ma (Duncan et al., 1997), consistent with ages further to the south in Coats Land, while $^{40}\text{Ar}/^{39}\text{Ar}$ ages from the Ferrar dolerite in Transantarctic Mountains yield an age of ~176 Ma (Flemming et al., 1995).

6.1.1.2 Novel and previously un-described age populations

Archean $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages

Archean grains comprise a small population of the total analyses made on cores off the coast of Dronning Maud Land. The majority (76%) of the Archean grains found in the cores off the coast of DML are either hornblende or biotite, and are from core sites 10-12, located directly offshore of the Archean Grunehoga craton (Fig. 5B,C). The Grunehoga craton is a continuation of South Africa's Kalahari craton in East Antarctica (e.g., Marschall et al. (2010), see Fig. 1), and, though only exposed in a few nunataks, has been interpreted to extend from $\sim 2^\circ$ to 15°W , along $\sim 72^\circ\text{S}$ based on geophysical surveying (Jacobs et al., 1996).

Archean hornblendes ($n = 71$) form a broad population of ~ 2800 - 3200 Ma. The older ages in this population are consistent with the U-Pb zircon age of 3067 ± 8 Ma obtained by Marschall et al. (2010) for the crystallization age of the Annandagstoppane granite. However, no hornblende is reported in the petrographic descriptions of the Annandagstoppane granite (Barton et al., 1987). We therefore suggest that additional hornblende-rich Archean basement lithologies may be obscured by ice in the Dronning Maud Land sector. This proposition is supported by the occurrence of a ~ 2900 Ma $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende population, which cannot be tied to known ages measured in outcrops.

Archean biotite grains contain a population of ~ 2602 to 2644 Ma, indicating the Grunehoga craton as a source, and indeed the Annandagstoppane granite contains accessory ($<5\%$) amounts of biotite (Barton et al., 1987). These younger $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages may reflect cooling following a tectonothermal event at 2800 Ma (Barton et al., 1987). However, Barton et al. (1987) also report on an ~ 1200 Ma event (intrusion of the Annandagstoppane gabbro), which reset the Rb-Sr biotite ages in the Annandagstoppane granite. It may be that with these biotite

grains, we are tapping a previously unstudied part of the Grunehoga craton, containing biotites that were either undisturbed or only partially disturbed during Grenvillian or Pan-African metamorphism. The relatively small range of ages of this population leads us to favor a lack of post-Archean disturbance of the source.

~1200-1300 Ma $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages

Core 1, in the western Weddell Sea, contains a significant 1200-1300 Ma population in the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages, which are significantly older than the detrital U-Pb zircon ages from this sector. While there are no reported 1200-1300 Ma $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages from outcrops in DML, these grains are likely sourced from the ice-covered continuation of the Natal Metamorphic Province (South Africa), which is this area of East Antarctica's conjugate margin in South Africa. The Quaha Formation specifically, has U-Pb zircon ages between 1235 ± 9 and 1207 ± 10 Ma (Thomas et al., 1999).

Grenvillian $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages

While there are no reported Grenvillian $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages from outcrops in DML, Grenvillian (~991-1031) K-Ar dates for hornblende and biotite from the Haag Nunatak (West Antarctica) have been reported (Clarkson and Brook, 1977). The presence of Grenvillian-aged detrital $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende populations in the marine sediment samples (primarily cores 1, 4, 5 and 6; see Fig. 5B) indicates that hornblendes with this age are indeed present in DML. Similarly, only one Grenvillian $^{40}\text{Ar}/^{39}\text{Ar}$ biotite age (974 Ma; Jacobs et al. (1995)) is reported from outcrops in DML, though these ages are found in many of the core sites offshore DML (Fig. 5 A-C). The presence of Grenvillian ages likely reflects sourcing from areas that were not

overprinted by Pan-African activity, as a result of escape tectonics (Jacobs and Thomas, 2004), but which are currently obscured by the ice sheet.

6.1.2 Prydz Bay (Cores 15, 17-19, 60°E to 80°E)

6.1.2.1 Results consistent with onshore outcrop data

Grenvillian activity

The ~932 Ma detrital zircon U-Pb ages agree well with Grenvillian ages of 900-990 Ma attributed to this area by Fitzsimmons (2000), as well as additional on-land studies (Kinny et al., 1993; Boger et al., 2000; Carson et al., 2000; Liu et al., 2007).

~ 700 Ma event?

The presence of small ~698 Ma and ~628 Ma populations in the detrital zircons, and hornblendes, respectively, may reflect a possible ~ 700 Ma metamorphic event (and subsequent cooling) recorded in the Prince Charles Mountains (Tong et al., 2002).

Pan-African orogeny

The dominant detrital zircon U-Pb (~540 Ma) and $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite (~500) age populations are consistent with the pervasive Pan-African (500-650 Ma) overprinting found in outcrops in the area (Stüwe and Oliver, 1989; Zhao et al., 1992; Fitzsimmons et al., 1997; Zhao et al., 1997; Tong et al., 1998; Tong et al., 2002; Meert, 2003; Veevers, 2003; Veevers, 2004; Liu et al., 2006; Liu et al., 2007; Wang et al., 2007; Veevers and Saeed, 2011; Veevers, 2012), as well as in Eocene fluvial sediments from ODP Site 1166 (van de Flierdt et al., 2008) and early Oligocene through Pliocene glacial-marine sediments from ODP Site 739 (Tochilin et

al., 2012). Onshore $^{40}\text{Ar}/^{39}\text{Ar}$ dates only show ages consistent with Pan-African over-printing, and complete resetting, of hornblende and biotite during the Pan-African orogeny, with no Grenville-aged hornblende or biotite ages reported (Tong, 2004; Phillips et al., 2007; Wilson et al., 2007).

6.1.2.2 Novel and previously un-described age populations

Overall, detrital age populations from the Prydz Bay sector are in general agreement with onshore ages, and no unexpected populations were discovered. As the Prydz Bay area is one of the best-exposed terrains within East Antarctica, this finding lends additional support to the value of using detrital mineral grain ages in marine sediments to infer onshore (and sub-ice) geology.

6.1.3 Wilkes Land (Cores 20-22, 90°E to 135°E)

6.1.3.1 Results consistent with onshore outcrop data

The Wilkes Land coastline has very few accessible outcrops ((Tingey, 1991; Anderson, 1999); Figs. 2, 5 A-C), with onshore thermochronologic measurements coming only from the Denman Glacier/Bunger Hills (Black et al., 1992; Fitzsimons, 2000), and the Windmill Islands (Post et al., 1996; Post, 2000; Möller et al., 2002; Fitzsimons, 2003) (Figs. 2, 5 A-C). Detrital $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages from this sector are dominated by Grenvillian ages (1152 Ma and 1120 Ma peak ages, respectively), while the detrital zircon U-Pb ages show two peaks at ~1150 Ma and ~1562 Ma (discussed above, section 6.1.3.1). The Grenvillian ages agree well with reports from Fitzsimons (2000) and Sheraton et al. (1992; 1993), which conclude that high-grade metamorphism affected the Wilkes Land sector from 1130-1200 Ma. Given the dearth of outcrops along this part of East Antarctica, more studies utilizing this approach and sampling

proximal glacial-marine sediments would surely yield further important clues about the geology along this margin. The small 400-500 Ma population seen in the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages comes from Core 20, located offshore of the boundary between Wilkes Land and the Pan-African overprinting seen in the Prydz Bay region, and so reflects this boundary location and is not seen in the other cores from this sector.

6.1.3.2. Novel and previously un-described age populations

~1562 Ma population of U-Pb zircons

Our detrital U-Pb zircon results from cores 21 and 22 show that half of the zircon population falls in the 1500-1600 Ma range, with a peak age of ~1562 Ma. There are no outcrops directly onshore from these core locations. However, just to the west of Wilkes Land, outcrops in the Bunger Hills area (~100°E) consist of granulite-facies metamorphic rocks. The emplacement of granodioritic orthogneisses in the Bunger Hills areas is dated at 1521 ± 29 Ma (Thomas Island) and ~1700 Ma (southwest Bunger Hills) by U-Pb zircon ages (Sheraton et al., 1992, 1993). Additionally, Fitzsimons (2003) reported on a 1500-1600 Ma population of inherited U-Pb zircon ages from a psammitic gneiss in the Windmill Island area. The presence of ~1562 Ma U-Pb zircon ages from cores 21 and 22 could require an extension of the granodioritic orthogneiss, or associated units, over 1000 km to the east. However, without a better spatial coverage of detrital U-Pb zircon analyses from marine sediment cores, this is entirely speculative. Veevers and Saeed (2011) measured detrital U-Pb zircon ages from Miocene-Oligocene samples recovered at DSDP Site 269 (Fig. 5), off the coast of East Antarctica near the boundary between Wilkes and Adélie Land, and just to the west of Core 21; their analyses revealed two minor peaks at ~1166 Ma and ~1570 Ma. These two age peaks are consistent with our U-Pb zircon

ages. Veevers and Saeed (2011) attribute these to ‘ice covered gaps’ in the data available from outcrops.

Additionally, the ~1560 Ma population in the U-Pb zircon ages could represent continuation of the south Australian Kararan orogen (1570 to 1540 Ma) into East Antarctica. Boger (2011) discusses the likely continuation of accreted domains (Nawa and Musgrave) under the East Antarctic ice sheet, between 115° to 140°E, and our sampling sites which contain this age population are located at ~127°E and ~133°E.

~1494 Ma population of $^{40}\text{Ar}/^{39}\text{Ar}$ hornblendes

There is a small $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende peak at ~ 1494 Ma (mostly found in core 21), which could be associated with cooling following the older ~ 1560 Ma event recorded by the U-Pb zircon ages. Indeed, the granodioritic gneiss does contain hornblende. While this would require the hornblende to have withstood resetting during the metamorphism associated with Grenvillian activity in this sector (see 6.1.3.2), this may be possible if they were sourced from far inside the East Antarctic craton, Alternatively, these grains could represent incomplete resetting during Grenvillian activity. Further work with these samples, such as $^{40}\text{Ar}/^{39}\text{Ar}$ step-heating experiments would help to test this.

6.1.4 Adélie Land / George V Land / northern Victoria Land (Cores 23-28, 140°E to 165°E)

6.1.4.1. Results consistent with onshore outcrop data

Two high-grade thermal events occurred in the Adélie craton ~1700 and ~2500 Ma (Peucat et al., 1999; Di Vincenzo et al., 2007; Ménot et al., 2007). Notably, there are no Grenvillian or Ross ages from outcrops in Adélie Land, making it one of the few areas in East

Antarctica where the Archean craton is preserved in nearly pristine condition, while northern Victoria Land, Oates Land and George V Land to the east of the Mertz shear zone are dominated by Ross orogen (550-480 Ma) ages (Black and Sheraton, 1990; Tingey, 1991; Tessensohn and Henjes-Kunst, 2005; Di Vincenzo et al., 2007; Tribuzio et al., 2008) (Fig. 5 A-C).

Archean and Proterozoic terranes

Detrital zircon U-Pb ages from the Adélie / George V / northern Victoria Land sector show age populations of ~2455 to ~2717 Ma, consistent with onshore ages (Oliver and Fanning, 1997; Peucat et al., 1999; Fitzsimons, 2003; Ménot et al., 2007; Duclaux et al., 2008; Veevers and Saeed, 2011) and offshore ages from marine sediments (Goodge and Fanning, 2010).

There is a broad 1600-1800 Ma population in the U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages. Detrital zircon U-Pb ages within this range show small peaks at ~1795 Ma, ~1723 Ma, and ~1610 Ma, which are also consistent with onshore ages in Adélie Land. Ménot et al. (2007) reported U-Pb zircon ages of ~1600 Ma in western Adélie Land, while Peucat et al. (1999) obtained U-Pb ages of 2800 Ma, 2600 Ma and 1730-1760 Ma on zircons from the Pointe Géologie Archipelago. Peucat et al. (2002) measured U-Pb ages of ~1600 Ma on zircons from clasts collected out of moraines exposed in Adélie Land, which they interpreted to have been connected to the Gawler Range volcanics and Hiltuba Suite granites of the Gawler craton in Australia; the Gawler Range volcanics and Hiltuba Suite granites have U-Pb zircon ages of 1580-1600 Ma (Fanning et al., 1988; Creaser and Fanning, 1993; Fanning et al., 2007).

$^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages show peaks at ~1608 Ma and 1715 Ma, and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages show a peak at ~1626 Ma. These ages are consistent with $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende (~1700) and biotite outcrop ages from George V Land (Fig. 5 A-C; DiVincenzo et al. (2007)). An additional

but small ~ 1480 Ma peak in the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages has previously been attributed to the Mertz shear zone area (Pierce et al., 2011), as these ages are from a core site (Core 22) directly off the coast from this feature. The shear zone is dated at ~1500 Ma via $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages (DiVincenzo et al., 2007), and Pierce et al. (2011) concluded that because the shear zone extends far inland (Ferraccioli et al., 2009), it is likely that interior rocks were affected by this event. This means that $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages from the interior could have been reset, thus explaining the ~1480 peak in the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages.

Ross orogeny

Core 23, located at the western edge of Adélie Land is characterized by >1400 Ma $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages, which is consistent with the proximal on-land geology, yet both the detrital zircon U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite populations contain a population of grains with Ross orogen ages in addition to the >1400 Ma population. Pierce et al. (2011) reported hornblende and biotite $^{40}\text{Ar}/^{39}\text{Ar}$ ages from this core, and attributed the ~500 Ma biotite population to possible low-temperature re-setting in western Adélie Land. The presence of Ross-aged detrital zircons implies that this population is the result of ice-rafting from east of the Mertz shear zone, or alternatively that bedrock affected by the Ross orogen is more extensive than previously thought. We consider the latter explanation highly unlikely, given the distance between Core 23 and outcrops affected by the Ross orogen, as well as the absence of known Ross overprinting west of the Mertz shear zone.

Bowers terrane

Detrital zircon U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages show populations of ~ 389 Ma and ~ 369 Ma, respectively; this age population is notably absent from the hornblende grains. These ages most likely reflect sourcing from the Bowers Range, which has K-Ar dates of this age (Adams, 2006). The absence of hornblende grains in this age range is likely a lithological bias, in that source rocks do not contain appreciable amounts of hornblende.

McMurdo volcanics

$^{40}\text{Ar}/^{39}\text{Ar}$ hornblende grains from cores off the coast of NVL contain a population of young grains, with a peak age of 2.3 Ma; these ages were not found in either the detrital zircon U-Pb or $^{40}\text{Ar}/^{39}\text{Ar}$ biotite age populations. A likely source for these young grains is the McMurdo Group volcanic rocks found off the coast of Victoria Land in the western (East Antarctic side) Ross Sea. Armstrong (1978) measured K-Ar ages on 91 samples of volcanic rocks from the Transantarctic Mountains and Ross Sea islands, finding that the majority of the samples are 0.003 to 4.0 Ma, with only a few between 13.0 and 18.0 Ma. Cooper et al. (2007) dated volcanism associated with White Island at $\sim 5 - 7$ Ma, while Rilling et al. (2007) dated volcanism associated with the Terror Rift at $< \sim 4$ Ma (See Kyle (2013) for a review of the McMurdo Volcanic Group).

6.1.4.2 Novel and previously un-described age populations

Grenvillian ages

There is a small spread of 1000-1200 Ma Grenvillian ages in the Adélie / George V/ northern Victoria Land sector samples; there are small peaks of ~ 1057 and 1235 Ma in the U-Pb zircon data, though no apparent peaks in the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende or biotite data. While no

Grenvillian ages have been reported from outcrops in the AL / GVL / NVL sector, Goodge and Fanning (2010) also found a small number of Grenvillian detrital U-Pb zircon ages from marine sediment samples in this area, consistent with our finding. Goodge and Fanning (2010) proposed that the presence of these ages are the result of either Grenvillian-aged basement extending to this part of the craton under the ice sheet, or the result of zircon recycling into sedimentary rocks present in the area. Given the presence of Grenvillian $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages, however, it is more likely that there is in fact Grenvillian-aged basement under the ice sheet in this part of Antarctica, as hornblende and biotite grains would not have survived multiple sedimentary cycles.

Precursor to Ross orogeny?

Detrital zircon U-Pb ages from Adélie / George V / northern Victoria Land show two peaks, ~579 Ma and ~502 Ma. While the younger ~502 Ma age peak is consistent with typical Ross orogen ages in this area of 490-544 Ma (e.g., Veevers (2012)), the ~579 Ma peak is significantly older. Goodge and Fanning (2010), found an older age population of ~580 Ma in cores east of the Mertz shear zone, consistent with our findings. These authors attribute the older ages to the likelihood that Ross orogeny magmatism began earlier than that recorded in the limited outcrops in the area. Several other studies also find evidence for Ross magmatism as early as 580-590 Ma (Goodge et al., 2004; Goodge et al., 2010; Goodge et al., 2012), indicating that this is an orogeny-wide phenomenon. $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages have a single peak at ~493 Ma and ~494 Ma, respectively; these ages are consistent with Ross orogen ages found in on-land sites to the east of the Mertz shear zone (Fig. 5 A-C; (Adams, 2006; Di Vincenzo et al., 2007; Goodge, 2007)).

6.2 Comparison of thermochronometers by sector

In this section we summarize some of the broad observations that can be made about thermochronology and potential provenance signals based on each of the individual mineral systems (Fig. 6).

First, in each of the sectors the data overall show the logical sequence of progressively younger ages when comparing the detrital U-Pb zircon to $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende to $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages, respectively, as would be expected based upon the relative closure temperatures of each system. (e.g., Fig. 3A).

Second, Pan-African, Ross and Grenvillian ages are pervasive around East Antarctica. However, the peak ages of these events are variable, depending upon the area analyzed and the chronometer used, allowing for the potential to still differentiate between broad areas affected by these events. For example, while Grenvillian ages in each of the mineral systems are generally consistent (allowing for cooling following the event, as discussed above), the oldest peak Grenvillian ages are found in Wilkes Land (~1200-1100 Ma), followed by Dronning Maud Land (~1100-1000 Ma), and Prydz Bay (~1000-900 Ma) (see also Fitzsimons (2000)). In contrast, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages of Pan-African and Ross overprinting around East Antarctica generally show more overlap between the different sectors, but peak ages within these populations still show subtle variations (e.g., slightly older ages in the Prydz Bay area as compared to the Dronning Maud and George V Land locations) that may be applied to differentiate source terranes.

Third, each individual geographic sector described here carries a unique thermochronological fingerprint. Our detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$

biotite ages for the Dronning Maud Land area present the first onshore/offshore comparison of
 its kind and an attempt to characterize the provenance signal. Overall, Dronning Maud Land is
 characterized by Grenvillian ages (1000-1100 Ma) and Pan-African/Ross ages in each of the
 thermochronometers. Archean $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages are associated with the
 Grunhogna craton ($\sim 2^\circ\text{W}$ to 15°W), and stand out as unique provenance indicator in this sector
 (Fig. 6). The peak ages for each of the chronometers associated with both tectonometamorphic
 events generally shows a younging trend from U-Pb to $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende to $^{40}\text{Ar}/^{39}\text{Ar}$ biotite,
 as is to be expected given the different closure temperatures. Additionally, there appears to be a
 division in the $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages, in which Coats Land ($\sim 20^\circ\text{W}$ to 30°W) is dominated by
 Grenvillian $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages (reflecting the lack of Pan-African overprinting in this area
 (Jacobs and Thomas, 2004)), while areas to the east of Coats Land are mostly in the 400-600 Ma
 range, with the exception of the area around the Grunhogna craton.

The Prydz Bay sector shows complete resetting of lower temperature
 thermochronometers during the Pan-African orogeny, as shown by the lack of Grenvillian aged
 $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages. On the other hand, the Wilkes Land sector is the only one
 of the four geographic sectors that is not characterized by Pan-African/Ross ages (i.e. in core
 sites proximal to the continent). U-Pb zircon ages offer a unique ~ 1562 Ma population to aid in
 provenance work, while all chronometers have peak ages in the 1100-1200 Ma range, easily
 distinguishable from Grenvillian ages in different sectors (Fig. 6).

The sector is the most diverse. This sector is dominated by Ross ages (480-590 Ma), but
 also reveals significant proportions of grains with ages > 1400 Ma (restricted to Adélie Land),
 and younger ages (389 and 369 Ma peak ages in the detrital zircon U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite
 data, respectively), and 2.3 Ma in the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages from cores located off of the

George V/Northern Victoria Land. U-Pb zircon ages in this sector contain a hint that the Ross orogeny in East Antarctica may extend as far back as 579 Ma.

Fourth, the potential power in using U-Pb zircon ages in addition to the $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronometers is that it adds another level of characterization. Given the resilient nature of the U-Pb system in zircon, and zircon itself, additional age populations, not present in the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages of the source areas, are present, and can then be paired with these lower-temperature ages to better constrain potential source areas. Overall, the U-Pb zircon and $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages that we have measured and discussed in this study faithfully reflect known neighboring on-land ages, and combined they offer ways to identify source areas of East Antarctica. An additional benefit of the detrital zircons is the potential for triple or double dating with fission track and/or (U-Th)/He (e.g., (Cox et al., 2010; Tochilin et al., 2012; Thomson et al., 2013).

6.3 Ice-rafted zircons from ODP Site 1165

IRD provenance data can be interpreted to reflect changes in the Antarctic ice sheet through time, if ice and iceberg transport in the past differed from the present day. For example, Williams et al. (2010) studied the IRD from five sediment layers at ODP Site 1165 for $^{40}\text{Ar}/^{39}\text{Ar}$ ages of ice-rafted hornblendes. They provided evidence for massive iceberg armadas originating from Adélie Land and Wilkes Land during the Pliocene. Subsequent work by Pierce et al. (2011) showed the viability of $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages as a tracer of IRD from the same layers in ODP Site 1165.

Here we test the application of U-Pb zircon ages for determining the provenance of IRD. To our knowledge, this is the first study that attempts to use U-Pb zircon ages for this purpose in

the Southern Ocean. We hence conducted our pilot study on exactly the same five samples from ODP Site 1165 analyzed by Williams et al. (2010) and Pierce et al. (2011), the depositional ages of which span ~19 to 3 Ma. Based on Williams et al. (2010) and Pierce et al. (2011), each of the five IRD layers contains a local, Prydz Bay provenance signature (~ 500 Ma) (Fig. 4). While the ~500 Ma age dominates the 19Ma old IRD layer, the IRD samples deposited 7.0 and 3.0 Ma also contain grains with a Wilkes Land signature (~1100-1220 Ma) (Fig. 4), indicating sourcing of massive iceberg armadas from the Wilkes Land region to ODP Site 1165, a minimum distance of 1000 km to the east. The $^{40}\text{Ar}/^{39}\text{Ar}$ ages of hornblendes from the IRD layer from 4.65 Ma (100 cm) contains an additional age population of 1500-1600 Ma, reflecting potential sourcing from the Adélie Land margin, approximately 3000 km to the east.

6.3.1 Comparison of zircon, hornblende and biotite provenance (ODP Site 1165)

Zircons are relatively rare in Site 1165 sediments (n= 3 to 31 with an average of 15; Figs. 4 and 5A) compared to hornblende (n= 23 to 41 with an average of 33; Figs. 4 and 5B) and biotite grains (n= 28 to 41 with an average of 36; Figs. 4 and 5C), and all zircons that were found were analyzed. Despite the small number of analyses some interesting insights to the application of U-Pb zircons as a provenance tool for IRD are revealed by comparing the provenance of IRD deposited at ODP Site 1165 as determined by U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite.

6.3.1.1 Local Prydz Bay signature

Based on the characterization of source areas through our detrital U-Pb data from the shelf diamict and core-top IRD samples, and onshore data, we would expect the local Prydz Bay

signature for the U-Pb zircons to include a 500-600 Ma population, potentially a small ~700 Ma population, and a Grenvillian population dominated by 900-1000 Ma ages (Figs. 3B and 5A; see also (Roy et al., 2007b; van de Flierdt et al., 2008; Tochilin et al., 2012)).

Each of the depositional layers (where populations exist) have in common grains in the 400-600 Ma range (Fig. 4), consistent with IRD sourced from the local Prydz Bay region, with U-Pb zircon ages slightly older than $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages, which are slightly older than $^{40}\text{Ar}/^{39}\text{Ar}$ biotite, as would be expected by the low closure temperatures of $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende (~500°C) and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite (~300°C) systems in comparison to U-Pb zircon (>900°C). This is in agreement with what is observed in the proximal sediment core samples discussed in section 6.2, and previous work (Roy et al., 2007b; van de Flierdt et al., 2008; Tochilin et al., 2012)).

Overall, the inferred source based on each of the provenance tools is consistent with regards to a local Prydz Bay source.

What is surprising, though, is that we do not observe a population of zircons with a U-Pb ages between 900-1000 Ma in any of the samples, which is the second-most dominant age population for this sector, based on both onshore studies and the detrital samples from this and previous work (Fig. 5A).

6.3.1.2 Wilkes Land signature

Layers deposited at 3.0 Ma and 7.0 Ma show a second population of grains with ages 1100-1300 Ma, reflecting, for each chronometer, a Wilkes Land provenance. As seen with the 400-600 Ma populations, there is a progressive younging of the peaks from U-Pb zircon to $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende to $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages. This Wilkes Land signature should also contain detrital U-Pb zircon age populations of ~ 1560 Ma due to the abundance of these ages in IRD

offshore Wilkes Land (Figs. 3C and 5A), and yet this population is absent. In both samples, it may be that our proximal core sites used for comparison with onshore data are tapping a larger area than the ice streams that produced the iceberg armadas inferred in the late Miocene and Pliocene by Williams et al. (2010).

6.3.1.3 Potential Adélie Land signature?

The only IRD layer in which the different approaches appear to provide contradictory provenance information is the 4.65 Ma layer sampled in ODP Site 1165, Core 6H, Section 1 at 100-102 cm depth (Fig. 4, third sample from the top; note this is different from the 4.65 Ma depositional layer sampled in ODP Site 1165, Core 6H, Section 1 at 70-72 cm depth plotted above). Both U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende data contain the expected local 400-600 Ma population, but the detrital zircon U-Pb ages show a second population of 1100-1200 Ma, while the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages show a second population of 1500-1600 Ma. In comparing the zircon and hornblende age populations from the 4.65 Ma (100 cm) layer, we see that 10% and 34% of the hornblende grains fall in the 1000-1200 Ma and 1400-1600 Ma range, respectively (n total is 41). Conversely, 52% and 4% of the zircon ages fall in the 1000-1200 Ma and 1400-1600 Ma populations (n total is 21). The source characterization based upon U-Pb zircon ages would imply that the 1100-1200 Ma zircon population is sourced from Wilkes Land, while the source characterization based upon the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages, as shown by Williams et al. (2010), was interpreted as sourcing from Adélie Land. One possible explanation for this discrepancy is the potential for a lithologic bias in material eroded by ice streams along the Wilkes and Adélie Land margins that was subsequently deposited at ODP Site 1165. For example, it could be that zircon-rich, hornblende-poor material was sourced from Wilkes Land, while hornblende-rich,

zircon-poor material was sourced from Adélie Land. A second explanation is that the zircons are in fact sourced from Adélie Land, and in agreement with the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende data. While Adélie Land and George V Land west of the Mertz shear zone contain a dominant $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende age population of 1400-1700 Ma (Cores 23-25), the U-Pb zircon ages from this area have small population of 1000-1200 Ma (~10%) and an even smaller 1400-1600 Ma (4%) population. Thus, zircons sourced from this area would not be expected to contain abundant grains in the 1400-1600 Ma population relative to the 1000-1200 Ma population. This particular sample highlights the importance of using multiple provenance tracers.

7. Other multichronometer approaches

In this study we have discussed applying the combination of detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages in order to 1) constrain more fully East Antarctica's subglacial geology, and 2) apply this information to determine the provenance of ice-rafted zircon grains deposited at ODP Site 1165 in the Neogene. This work highlights the value in applying multiple chronometers to better understand East Antarctica's obscured geology as well as its ice sheet history. Here we provide a brief overview of other studies that use multiple chronometers within and across multiple minerals to constrain East Antarctica's subglacial geology, in the hope these approaches will continue to be used to examine broad questions about East Antarctica's geology, landscape evolution and ice sheet history. As discussed in section 2, the advantage to multiple chronometers is that different chronometers retain their ages at different temperatures (U-Pb in zircon (crystallization age), $^{40}\text{Ar}/^{39}\text{Ar}$ in hornblende (~500°C), U-Pb in apatite (~500°C), $^{40}\text{Ar}/^{39}\text{Ar}$ in muscovite (~400°C) $^{40}\text{Ar}/^{39}\text{Ar}$ in biotite (~350°C), fission track in zircon (~250°C), (U-Th)/He in zircon (~180°C), fission track in

apatite ($\sim 100^{\circ}\text{C}$), (U-Th)/He in apatite ($\sim 70^{\circ}\text{C}$) (Reiners et al., 2005b)). By combining one or more, a more complete interpretation of the geological and erosion history of an area can be obtained.

Addressing the origin of the subglacial Gamburtsev Mountains in East Antarctica, van de Flierdt et al. (2008) examined Eocene fluvial-deltaic sediments recovered from ODP Site 1166 (Prydz Bay). Based upon pre-glacial drainage reconstructions, van de Flierdt et al. (2008) argued that there would have been significant erosion and sediment delivery to this core site via transportation by rivers from the Gamburtsev Mountains through the Lambert Graben. van de Flierdt et al. (2008) measured detrital $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende, biotite and muscovite ages along with U-Pb zircon ages, and all chronometers showed distinct ~ 500 Ma populations. Paired with analyses of neodymium isotopes in bulk sediments, these authors concluded that there was no evidence for recent volcanic activity, and hence rejected the hypothesis that the Gamburtsev Mountains have a young, volcanic origin.

Palmer et al. (2012) also took a multichronometer approach, measuring detrital U-Pb zircon and $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and mica ages from tills collected from the Byrd Glacier area of the Transantarctic Mountains, where the locally exposed bedrock consists of the Beacon Supergroup. The goal of this study was to use tills (dispersed grains and clasts) sourced from within the East Antarctic craton to further constrain the subglacial geology of a portion of East Antarctica. Detrital U-Pb zircon ages were measured from the coarse sand fraction of the till, while $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and mica ages were measured on both detrital grains and grains from individual till clasts. Each of the chronometers showed Pan-African and/or Ross age populations, with the detrital U-Pb zircon ages containing additional Grenvillian (950-1270 Ma) and Late Archean (~ 2700 Ma) populations, and the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages a Grenvillian (1150-150

Ma) population. Palmer et al. (2010) highlight two key aspects of this approach, in that 1) the presence of detrital hornblende and micas indicates sourcing from primary bedrock, as these minerals are unlikely to be sourced from the local Beacon Supergroup strata, and 2) that by pairing geochronological measurements from dispersed grains with those from clasts, an evaluation may be made of how representative ages from a single clast are.

Studies based upon detrital zircons and apatites have the additional benefit of the potential for triple or double dating individual grains with a combination of U-Pb, fission track and/or (U-Th)/He ages, e.g., (Reiners et al., 2005a). Through the double or triple dating of these grains, individual thermal, and thus uplift and erosional histories of the source rocks, can be determined, as well as provenance. Cox et al. (2010), also investigating the subglacial Gamburtsev Mountains, double dated detrital apatite grains (recovered from Eocene fluvial-deltatic sediments at ODP Site 1166 in Prydz Bay) using (U-Th)/He and apatite fission track dating, and concluded that grains sourced from the Gamburtsevs experienced extremely low erosion rates (0.01 to 0.02 km/Myr for at least the past 250 Myr). Tochilin et al. (2012) applied $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages, triple dating of apatites (U-Pb, fission track and (U-Th)/He) and double dating of zircons (U-Pb and fission track) to detrital grains from Oligocene to Quaternary aged glacial diamicts recovered at ODP Site 739 (Prydz Bay), to look at long term tectonic and erosion history in the Lambert Graben region of East Antarctica. Using this combination of methods they were able to infer relatively higher erosion rates in the Oligocene, after the initiation of widespread East Antarctic glaciation, followed by slower rates from the late Miocene onwards. Thomson et al. (2013) triple dated apatite using U-Pb, fission track and (U-Th)/He ages and measured zircon fission track ages in detrital sediments (glacial moraines and offshore glacial sediments) in the Lambert Graben/Prydz Bay area in order to look at long-term

(late Cretaceous through Quaternary) erosion rates and constrain subglacial landscape evolution. These authors found that the local overdeepened fjord topography beneath the Lambert Glacier, inferred by aerogeophysical surveys, was created in the past 34 Ma, after major ice sheet expansion on East Antarctica.

While each of the aforementioned studies was based upon single or multi-dating of individual grains, a clear objective for future work would be to apply the same approach(es) to grains within individual cobbles or clasts. Just as double and triple dating of apatites and zircons allows for reconstructing that grain's individual history, multiple chronometers across different minerals would allow for even more age measurements that are guaranteed to have been sourced from the same area and have the same history, as the grains are all from the same clast. This approach would be especially useful for provenance studies, as we could identify multiple ages within a single clast for both a more specific source area identification and for better elucidating the source region's thermal time-temperature history.

8. Conclusions

In this paper we have performed a comparison of detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende, and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages from 27 marine sediment cores, adding a total of 3,284 new analyses to a growing data set of detrital thermochronologic ages from glacial-marine sediments around East Antarctica. Included in this is the first analysis of ice-rafted U-Pb zircon ages from a down-core record of IRD in ODP Site 1165 located offshore Prydz Bay. Our results lead us to reach the following conclusions:

1035 **1.** Detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages match well with the ages
 1036 of outcrops nearby on Antarctica, indicating that detrital ages can also faithfully represent the
 1037 ages of ice-covered areas. Major populations present in our samples include Archean ages
 1038 reflecting the Grunehogna and Terre Adélie cratons, Paleoproterozoic ages (~1500-1700 Ma)
 1039 reflecting thermal events in Wilkes and Adélie Land, Grenvillian (1330-900 Ma), Pan-African
 1040 (600-450 Ma) and Ross (590-480 Ma) ages reflecting three major orogenies in East Antarctica's
 1041 history, an ~380 Ma population reflecting volcanic activity in the Bowers Terrane of northern
 1042 Victoria Land, a ~180 Ma population of grains reflecting Ferrar-Karoo magmatism associated
 1043 with Jurassic rifting and separation of Gondwanaland, and a 0-20 Ma population reflecting the
 1044 McMurdo volcanics in the Ross Sea.

1045
 1046 **2.** Our results reveal age populations from the detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and
 1047 $^{40}\text{Ar}/^{39}\text{Ar}$ biotite measurements which have not been reported from on-shore studies, reflecting
 1048 the presence of ice-covered terranes that are not accessible for direct study, or were unsampled
 1049 (U-Pb zircon ages dominate the on-land record). The previously unrecorded age populations
 1050 found in this study (Archean $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and biotite ages in Dronning Maud Land;
 1051 early (?) Grenvillian $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages (1200-1300) in the Weddell Sea; ~1560 Ma
 1052 population of U-Pb zircons from the Wilkes Land margin; Grenvillian (1000-1200 Ma) U-Pb
 1053 zircon ages from the Adélie / George V Land margin; and an older, potentially Ross orogen
 1054 related population of ~580 Ma from the Adélie / George V Land margin) illustrate both the
 1055 importance and potential for future studies of this kind as a means of learning more about East
 1056 Antarctica's geology.

1057

3. Zircon, hornblende and biotite grains were found in variable amounts, as expected, in each of the core samples, reflecting differences in the lithologies of the bedrock eroded by the ice sheet. U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages populations were found to not always be consistent between each of the individual samples. In some cases, this can be attributed to lithological bias, while in many it is more likely the result of resetting of the $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite systems.

4. As has been shown with previous work (Roy et al., 2007b; Williams et al., 2010; Pierce et al., 2011), East Antarctica can be broadly divided by the lower-temperature chronometers into source areas with distinctive ages: northern Victoria Land west to the Mertz Glacier in George V Land, Adélie Land, Wilkes Land, and Prydz Bay each have a unique signature. Dronning Maud Land as a whole is a mix of Grenvillian and Pan-African/Ross-orogen ages, however within this sector divisions can be made to determine source areas.

5. U-Pb zircon measurements made on ice-rafted deposits from ODP Site 1165 highlight both the potential and disadvantage for using this approach to trace the provenance of IRD from deep-sea core sites, with the disadvantage being low abundance of zircons in each of the IRD layers

6. The results of this comparative approach are promising, and we recommend that further application of this combined approach is likely to improve our understanding of East Antarctic geology, particularly in areas that are ice-covered. While the cores in this study were chosen so as to characterize major crustal elements of East Antarctica, more detailed work in specific study areas (e.g., Wilkes Land margin, which only has a few outcrops), combined with other types of

zircon analyses, e.g., zircon grain morphology, fission track and (U-Th)/He, and/or other mineral grain thermochronometers, will undoubtedly prove more insights to East Antarctica's geologic history.

Acknowledgements

Research was partially supported by NSF grant ANT-0538580 to Hemming, Goldstein and van de Flierdt, ANT 09-44489 to Williams, Hemming and van de Flierdt, ANT 08-38722 and ANT 08-38729 to Reiners, Thomson and Gehrels (U of AZ) and Hemming (LDEO) and NSF grant EAR 10-32156 which provided support to the Arizona Laserchron center. We thank E. Dahlhauser, E. Steponaitis, S. Cox, G. Mesko, E. Palmer and M. Reitz for assistance in sample processing at LDEO; G. Ali, D. Giesler, M. Pecha and the AZ Laserchron center for assistance with zircon analyses; and the FSU Antarctic Marine Geology Research Facility and the Integrated Ocean Drilling Program for core samples. Special thanks to the 'ANTARCTICHRON' workshop (University of Arizona in June 2011), during which many of the U-Pb zircon analyses were made. The authors would like to thank John Goodge and one anonymous reviewer for careful and constructive reviews.

References

- Aalto, K.R., Sharp, W.D., Renne, P.R., 1998. $^{40}\text{Ar}/^{39}\text{Ar}$ dating of detrital micas from Oligocene-Pleistocene sandstones of the Olympic Peninsula, Klamath Mountains, and northern California Coast Ranges: Provenance and palaeodrainage patterns. *Canadian Journal of Earth Science* 35, 735-745.
- Adams, C.J., 2006. Style of Uplift of Paleozoic Terranes in Northern Victoria Land, Antarctica: Evidence from K-Ar Age Patterns, in: Futterer D.K., D., D., Kleinschmidt, G., Miller, H., Tessensohn, F. (Ed.), *Antarctica: Contributions to global earth sciences*. Springer-Verlag, Berlin Heidelberg, New York, NY, pp. 205-214.
- Andersen, T., 2005. Detrital Zircons as tracers of sedimentary provenance: limiting conditions from statistics and numerical simulation. *Chemical Geology* 216, 249-270.
- Anderson, J.B., 1999. *Antarctic Marine Geology*, Cambridge.

- 1110 Armstrong, R.L., 1978. K-Ar dating: Late Cenozoic McMurdo Volcanic Group and dry valley
1111 glacial history, Victoria Land, Antarctica. *N.Z. Journal of Geology and Geophysics* 21,
1112 685-698.
- 1113 Arndt, N.T., Todt, W., Chauvel, C., Tapfer, M., Weber, K., 1991. U-Pb zircon age and Nd
1114 isotopic composition of granitoids, charnockites and supracrustal rocks from
1115 Heimefrontfjella, Antarctica. *Geologische Rundschau* 80, 759-777.
- 1116 Avigad, D., Stern, R.J., Beyth, M., Miller, N., McWilliams, M.O., 2007. Detrital zircon U-Pb
1117 geochronology of Cryogenian diamictites and Lower Paleozoic sandstone in Ethiopia
1118 (Tigrai): Age constraints on Neoproterozoic glaciation and crustal evolution of the
1119 southern Arabian-Nubian Shield. *Precambrian Research* 154, 88-106.
- 1120 Barton, J.M., Klemm, R., Allsopp, H.L., Auret, S.H., Copperthwaite, Y.E., 1987. The geology
1121 and geochronology of the Annandagstoppane granite, Western Dronning Maud Land,
1122 Antarctica. *Contributions to Mineralogy and Petrology* 97, 488-496.
- 1123 Bateman, R.M., Catt, J.A., 1985. Modification of heavy mineral assemblages in English
1124 coversands by acid pedochemical weathering. *Catena* 12, 1-21.
- 1125 Bickford, M.E., Chase, R.B., Nelson, B.K., Shuster, R.D., Arruda, E.C., 1981. U-Pb studies of
1126 zircon cores and overgrowths, and monazite: Implications for age and petrogenesis of the
1127 northeastern Idaho batholith. *Journal of Geology* 89, 433-457.
- 1128 Bisnath, A., Frimmel, H.E., Armstrong, R.A., Board, W.S., 2006. Tectono-thermal evolution of
1129 the Maud Belt: New SHRIMP U-Pb zircon data from Gjelsvikfjella, Dronning Maud
1130 Land, East Antarctica. *Precambrian Research* 150, 95-121.
- 1131 Black, L.P., Sheraton, J.W., 1990. The influence of Precambrian source components on the U-Pb
1132 zircon age of a Palaeozoic granite from northern Victoria Land, Antarctica. *Precambrian
1133 Research* 46, 275-293.
- 1134 Black, L.P., Sheraton, J.W., Tingey, R.J., McCulloch, M.T., 1992. New U-Pb zircon ages from
1135 the Denman Glacier area, East Antarctica, and their significance for Gondwana
1136 reconstruction. *Antarctic Science* 4, 447-460.
- 1137 Board, W.S., Frimmel, H.E., Armstrong, R.A., 2005. Pan-African tectonism in the Western
1138 Maud Belt: P-T-t path for high-grade gneisses in H.U. Sverdrupfjella, East Antarctica.
1139 *Journal of Petrology* 46, 671-699.
- 1140 Boger, S.D., 2011. Antarctica - Before and after Gondwana. *Gondwana Research* 19, 335-371.
- 1141 Boger, S.D., Carson, C.J., Wilson, C.L.J., Fanning, C.M., 2000. Neoproterozoic deformation in
1142 the Radok Lake region of the northern Prince Charles Mountains, East Antarctica;
1143 evidence for a single protracted orogenic event. *Precambrian Research* 104, 1-24.
- 1144 Boswell, P.G.H., 1923. Some aspects of the petrology of sedimentary rocks. *Proceedings of the
1145 Liverpool Geological Society* 13, 231-303.
- 1146 Bowen, N.L., 1922. The Reaction Principle in Petrogenesis. *Journal of Geology* 30, 178-198.
- 1147 Carson, C.J., Boger, S.D., Fanning, C.M., C.J.L., W., Thost, D.E., 2000. SHRIMP U-Pb
1148 geochronology from Mount Kirby, northern Prince Charles Mountains, East Antarctica.
1149 *Antarctic Science* 12, 429-442.
- 1150 Clarkson, P.D., Brook, M., 1977. Age and position of the Ellsworth Mountains crustal fragment,
1151 Antarctica. *Nature* 265, 615-616.
- 1152 Cohen, H.A., Hall, C.M., Lundberg, N., 1995. $^{40}\text{Ar}/^{39}\text{Ar}$ dating of detrital grains constrains the
1153 provenance and stratigraphy of the Gravina belt, Southeastern Alaska. *Journal of
1154 Geology* 103, 327-337.
- 1155 Collins, A.S., Pisarevsky, S.A., 2005. Amalgamating eastern Gondwana: The evolution of the

- 1156 Circum-India Orogens. *Earth Science Reviews* 71, 229-270.
- 1157 Cooper, A.F., Adam, L.J., Coulter, R.F., Eby, G.N., McIntosh, W.C., 2007. Geology,
1158 geochronology and geochemistry of a basanitic volcano, White Island, Ross Sea,
1159 Antarctica. *Journal of Volcanology and Geothermal Research* 165, 182-216.
- 1160 Cordani, U.G., D'Agrella-Filho, M.S., Brito-Neves, B.B., Trindade, I.F., 2003. Tearing up
1161 Rodinia: the Neoproterozoic paleogeography of South American cratonic fragments.
1162 *Terra Nova* 15, 350-359.
- 1163 Cox, S.E., Thomson, S.N., Reiners, P.W., Hemming, S.R., van de Fleirdt, T., 2010. Extremely
1164 low long-term erosion rates around the Gamburtsev Mountains in interior East
1165 Antarctica. *Geophysical Research Letters* 37, 5.
- 1166 Creaser, R.A., Fanning, C.M., 1993. A U-Pb zircon study of the Mesoproterozoic Charleston
1167 Granite, Gawler craton, South Australia. *Australian Journal of Earth Sciences* 40, 519.
- 1168 Curtis, M.L., Millar, I.L., Storey, B.C., Fanning, C.M., 2004. Structural and geochronological
1169 constraints of early Ross orogenic deformation in the Pensacola Mountains, Antarctica.
1170 *Geological Society of America Bulletin* 116, 619-636.
- 1171 Dalrymple, G.B., Alexander Jr., E.C., Lanphere, M.A., Kraker, G.P., 1981. Irradiation of
1172 samples for $^{40}\text{Ar}/^{39}\text{Ar}$ dating using the Geological Survey TRIGA Reactor. *Geological*
1173 *Society Professional Paper* 1176.
- 1174 Deer, W.A., Howie, R.A., Zussman, J., 1992. An Introduction to rock-forming minerals. 2nd
1175 Edition. Longman Scientific and Technical, Essex, England.
- 1176 Di Vincenzo, G.D., Talarico, F., Kleinschmidt, G., 2007. An $^{40}\text{Ar}/^{39}\text{Ar}$ investigation of the
1177 Mertz Glacier area (George V Land, Antarctica): Implications for the Ross Orogen-East
1178 Antarctic Craton relationship and Gondwana reconstructions. *Precambrian Research* 152,
1179 93-118.
- 1180 Downing, G.E., Hemming, S.R., Jost, A., Roy, M., 2013. $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende provenance
1181 clues about Heinrich event 3 (H3), *Advances in $^{40}\text{Ar}/^{39}\text{Ar}$ Dating: from Archaeology to*
1182 *Planetary Sciences.*, Geological Society of London, Special Papers.
- 1183 Duclaux, G., Rolland, Y., Ruffet, G., Ménot, R.-P., Guillot, S., Peucat, J.-J., Fanning, M., Rey,
1184 P., Pêcher, A., 2008. Superimposed Neoproterozoic and Paleoproterozoic tectonics in the
1185 Terre Adélie Craton (East Antarctica): Evidence from Th-U-Pb ages on monazite and
1186 $^{40}\text{Ar}/^{39}\text{Ar}$ ages. *Precambrian Research* 167, 316-338.
- 1187 Duncan, R.A., Hooper, P.R., Rehacek, J., Marsh, J.S., Duncan, A.R., 1997. The timing and
1188 duration of the Karoo igneous event, southern Gondwana. *Journal of Geophysical*
1189 *Research* 101, 18127-18138.
- 1190 Fanning, C.M., Flint, R.B., Parker, A.J., Ludwig, K.R., Blissett, A.H., 1988. Refined Proterozoic
1191 evolution of the Gawler craton, South Australia, through U-Pb zircon geochronology.
1192 *Precambrian Research* 40/41, 363-386.
- 1193 Fanning, C.M., Reid, A.J., Teale, G.S., 2007. A geochronological framework for the Gawler
1194 Craton, South Australia. *South Australia. Geological Survey Bulletin* 55.
- 1195 Fedo, C.M., Sircombe, K.N., Rainbird, R.H., 2003. Detrital zircon analysis of the sedimentary
1196 record, in: Hanchar, J.M., Hoskin, P.W.O. (Eds.), *Reviews in Mineralogy and*
1197 *Geochemistry* pp. 277-303.
- 1198 Ferraccioli, F., Armadillo, E., Jordan, T., Bozzo, E., Corr, H., 2009. Aeromagnetic exploration
1199 over the East Antarctic Ice Sheet: A new view of the Wilkes Subglacial Basin.
1200 *Tectonophysics* 478, 62-77.
- 1201 Fitzsimons, I.C.W., 2000. Grenville-age basement provinces in East Antarctica: Evidence for

- 1202 three separate collisional origins. *Geology* 28, 879-882.
- 1203 Fitzsimons, I.C.W., 2003. Proterozoic basement provinces of southern and southwestern
1204 Australia, and their correlation with Antarctica. *Geological Society of L, Special*
1205 *Publications* 206, 93-130.
- 1206 Fitzsimons, I.C.W., Kinny, P.D., Harley, S.L., 1997. Two stages of zircon and monazite growth
1207 in anatectic leucogneiss: SHRIMP constraints on the duration and intensity of Pan-
1208 African metamorphism in Prydz Bay, East Antarctica. *Terra Nova* 9, 47-51.
- 1209 Flemming, T.H., Foland, K.A., Elliot, D.H., 1995. Isotopic and chemical constraints on the
1210 crustal evolution and source signature of Ferrar magmas, north Victoria Land, Antarctica.
1211 *Contributions to Mineralogy and Petrology* 121, 217-236.
- 1212 Flowerdew, M.J., Tyrrell, S., Riley, T.R., Whitehouse, M.J., Mulvaney, R., Leat, P.T.,
1213 Marschall, H.R., 2012. Distinguishing East and West Antarctic sediment sources using
1214 the Pb isotope composition of detrital K-feldspar. *Chemical Geology* 292-293.
- 1215 Furnes, H., Mitchell, J.G., 1978. Age relationships of Mesozoic basalt lava and dykes in
1216 Vestfjella Dronning Maud Land, Antarctica. *Nor. Polarinst. Skr.* 169, 45-68.
- 1217 Furnes, H., Vad, E., Austrheim, H., Mitchell, J.G., Garman, L.B., 1987. Geochemistry of
1218 basalt lavas from Vestfjella and adjacent areas, Dronning Maud Land, Antarctica. *Lithos*,
1219 337-356.
- 1220 Gaudette, H.E., Vitrac-Michard, A., Allègre, C.J., 1981. North American Precambrian history
1221 recorded in a single sample: high-resolution U-Pb systematics of the Potsdam Sandstone
1222 detrital zircons, New York State. *Earth and Planetary Science Letters* 52, 248-260.
- 1223 Gehrels, G., 2012. Detrital Zircon U-Pb Geochronology: Current Methods and New
1224 Opportunities, in *Tectonics of Sedimentary Basins: Recent Advances*, in: Busby, C.,
1225 Azor, A. (Eds.), *Tectonics of Sedimentary Basins: Recent Advances*. Wiley-Blackwell
1226 Publishing, pp. 47-62.
- 1227 Gehrels, G., Valencia, V., Pullen, A., 2006. Detrital zircon geochronology by laser-ablation
1228 multicollector ICPMS at the Arizona LaserChron Center, in: Olszewski, T. (Ed.),
1229 *Geochronology: Emerging opportunities*, Paleontological Society Short Course, October
1230 21, 2006, Philadelphia, PA. *Paleontological Society Papers*, Volume 12. The
1231 Paleontological Society.
- 1232 Gehrels, G.E., Blakey, R., Karlstrom, K.E., Timmons, J.M., Dickinson, B., Pecha, M., 2011a.
1233 Detrital zircon U-Pb geochronology of Paleozoic strata in the Grand Canyon, Arizona.
1234 *Lithosphere* 3.
- 1235 Gehrels, G.E., Kapp, P., DeCelles, P., Pullen, A., Blakey, R., Weislogel, A., Ding, L., Guynn, J.,
1236 Martin, A., McQuarrie, N., Yin, A., 2011b. Detrital zircon geochronology of pre-Tertiary
1237 strata in the Tibetan-Himalayan orogen. *Tectonics* 30.
- 1238 Gehrels, G.E., Valencia, V.A., Ruiz, J., 2008. Enhanced precision, accuracy, efficiency, and
1239 spatial resolution of U-Pb ages by laser ablation-multicollector-inductively coupled
1240 plasma-mass spectrometry. *Geochemistry, Geophysics, Geosystems* 9.
- 1241 Goldich, S.S., 1938. A study in rock weathering. *Journal of Geology* 46, 17-58.
- 1242 Goodge, J.W., 2007. Metamorphism in the Ross orogen and its bearing on Gondwana margin
1243 tectonics, in: Cloos, M., Carlson, W.D., Gilbert, M.C., Liou, J.G., Sorensen, S.S. (Eds.),
1244 *Convergent Margin Terranes and Associated Regions: A Tribute to W.G. Ernst*, *Geol.*
1245 *Soc. Amer. Special Paper* pp. 185-203.
- 1246 Goodge, J.W., Fanning, C.M., 2010. Composition and age of the East Antarctic Shield in eastern

- 1247 Wilkes Land determined by proxy from Oligocene-Pleistocene glaciomarine sediment
1248 and Beacon Supergroup sandstones, Antarctica. Geological Society of America Bulletin.
1249 Goodge, J.W., Fanning, C.M., Brecke, D.M., Licht, K.J., Palmer, E.F., 2010. Continuation of the
1250 Laurentian Grenville Province across the Ross Sea Margin of East Antarctica. Journal of
1251 Geology 118, 601-619.
- 1252 Goodge, J.W., Fanning, C.M., Norman, M.D., Bennett, V.C., 2012. Temporal, Isotopic and
1253 Spatial Relations of Early Paleozoic Gondwana-Margin Arc Magmatism, Central
1254 Transantarctic Mountains, Antarctica. Journal of Petrology 0, 1-39.
- 1255 Goodge, J.W., Myrow, P., Williams, I.S., Bowring, S., 2002. Age and provenance of the
1256 Beardmore Group, Antarctica: Constraints on Rodinia supercontinent breakup. Journal
1257 of Geology 110, 393-406.
- 1258 Goodge, J.W., Williams, I.S., Myrow, P., 2004. Provenance of Neoproterozoic and lower
1259 Paleozoic siliciclastic rocks of the central Ross orogen, Antarctica: Detrital record of rift-,
1260 passive- and active-margin sedimentation. Geological Society of America Bulletin 116,
1261 1253-1279.
- 1262 Gose, W.A., Helper, M.A., Connelly, J.N., Hutson, F.E., Dalziel, I.W.D., 1997. Paleomagnetic
1263 data and U-Pb isotopic age determinations from Coats Land, Antarctica: implications for
1264 late Proterozoic plate reconstructions. Geophysical Research 101, 7889-7902.
- 1265 Gwiazda, R.H., Hemming, S.R., Broecker, W.S., Onstot, T., Mueller, C., 1996. Evidence from
1266 $^{40}\text{Ar}/^{39}\text{Ar}$ ages for a Churchill Province source of ice-rafted amphiboles in Heinrich layer
1267 2. Journal of Glaciology 42, 440-446.
- 1268 Harley, S.L., Kelly, N.M., 2007. Ancient Antarctica: the Archaean of the East Antarctic shield,
1269 in: van Kranendonk, M.J., Smithies, R.H., Bennett, V.C. (Eds.), Developments in
1270 Precambrian Geology. Elsevier.
- 1271 Harris, P.D., 1999. The geological evolution of Neumayerskarvet in the Northern Kirwanveggen,
1272 Western Dronning Maud Land, Antarctica. . Rand Afrikaans University, Johannesburg, p.
1273 249.
- 1274 Harris, P.D., Moyes, A.B., Fanning, C.M., Armstrong, R.A., 1995. Zircon ion microprobe results
1275 from the Maudheim high-grade gneiss terrane, western Dronning Maud Land,
1276 Antarctica., in: Barton, J.M.J., Copperthwaite, Y.E. (Eds.), Centennial Geocongress.
1277 Geological Society of South Africa, Johannesburg, pp. 240-243.
- 1278 Hemming, S.R., Bond, G.C., Broecker, W.S., Sharp, W.D., Klas-Mendelson, M., 2000. Evidence
1279 from $^{40}\text{Ar}/^{39}\text{Ar}$ Ages of Individual Hornblende Grains for Varying Laurentide Sources of
1280 Iceberg Discharges 22,000 to 10,500 yr B.P. Quaternary Research 54, 372-373.
- 1281 Hemming, S.R., Broecker, W.S., Sharp, W.D., Bond, G.C., Gwiazda, J.F., 1998. Provenance of
1282 the Heinrich layers in core V28-82, northeastern Atlantic: ^{40}Ar - ^{39}Ar ages of ice-rafted
1283 hornblende, Pb isotopes in feldspar grains, and Nd-Sr-Pb isotopes in the fine sediment
1284 fraction. Earth and Planetary Science Letters 164, 317-333.
- 1285 Hemming, S.R., Hajdas, I., 2003. Ice-rafted detritus evidence from $^{40}\text{Ar}/^{39}\text{Ar}$ ages of individual
1286 hornblende grains for evolution of the eastern margin of the Laurentide ice sheet since 43
1287 ^{14}Cky . Quaternary International 99, 29-43.
- 1288 Hemming, S.R., Vorren, T.O., Kleman, J., 2002. Provinciality of ice rafting in the North
1289 Atlantic: application of $^{40}\text{Ar}/^{39}\text{Ar}$ dating of individual ice rafted hornblende grains.
1290 Quaternary International 95-96, 75-85.
- 1291 Hodges, K.V., Ruhl, K.W., Wobus, C.W., Pringle, M.S., 2005. $^{40}\text{Ar}/^{39}\text{Ar}$ Thermochronology of
1292 Detrital Minerals. Reviews in Mineralogy and Geochemistry 58, 239-257.

- 1293 Jackson, C., 1999. Characterization of Mesoproterozoic to Palaeozoic Crustal Evolution of
1294 Western Dronning Maud Land. Study 3: Deformational History and Thermochronology
1295 of the Central Kirwanveggen. Pretoria: Department of Environmental Affairs and
1296 Tourism, 80.
- 1297 Jacobs, J., Ahrendt, H., Kreutzer, H., Weber, K., 1995. K-Ar, ^{40}Ar - ^{39}Ar and apatite fission-
1298 track evidence for Neoproterozoic and Mesozoic basement rejuvenation events in the
1299 Heimefrontfjella and Mannefallknausane (East Antarctica). *Precambrian Research* 75,
1300 251-262.
- 1301 Jacobs, J., Bauer, W., Fanning, C.M., 27–53., 2003a. Late Neoproterozoic/Early Palaeozoic
1302 events in central Dronning Maud Land (East Antarctica) and significance for the southern
1303 extension of the EAO into East Antarctic. *Precambrian Research* 126, 27-53.
- 1304 Jacobs, J., Bauer, W., Spaeth, G., Thomas, R.J., Weber, K., 1996. Lithology and structure of the
1305 Grenville-aged (1.1 Ga) basement of Heimefrontfjella (East Antarctica). . *Geol.*
1306 *Rundschau* 85, 800-821.
- 1307 Jacobs, J., Bingen, B., Thomas, R.J., Bauer, W., Wingate, M.T.D., Feitio, P., 2008. Early
1308 Palaeozoic orogenic collapse and voluminous late-tectonic magmatism in Dronning
1309 Maud Land and mozambique: inishgts into the partially delaminated orogenic root of the
1310 East African-Antarctic Orogen? Geological Society, London, Special Publications 308,
1311 69-90.
- 1312 Jacobs, J., Falter, M., Weber, K., Jebberger, E.K., 1997. Evidence for the structural evolution of
1313 the Heimefront Shear Zone (Western Dronning Maud Land), East Antarctica., in: Rico,
1314 C.A. (Ed.), *The Antarctic Region: Geological Evolution and Processes*. Terra Antarctica
1315 Publication, Siena, pp. 37-44.
- 1316 Jacobs, J., Fanning, C.M., Bauer, W., 2003b. Timing of Grenville-age vs. Pan-African medium-
1317 to high grade metamorphism in western Dronning Maud Land (East Antarctica) and
1318 significance for correlations in Rodinia and Gondwana. *Precambrian Research* 125, 1-20.
- 1319 Jacobs, J., Klemm, R., Fanning, C.M., Bauer, W., Columbo, F., 2003c. Extensional collapse of
1320 the Late Neoproterozoic/Early Palaeozoic East African/Antarctic Orogen in central
1321 Dronning Maud Land., in: Yoshida, M., Windley, B.F., Dasgupta, S. (Eds.), *Proterozoic*
1322 *East Gondwana: Supercontinent Assembly and Breakup*. Geological Society, London.
- 1323 Jacobs, J., Thomas, R.J., 2004. Himalayan-type indenter-escape tectonics model for the southern
1324 part of the late Neoproterozoic-early Paleozoic East Africa-Antarctic orogen. *Geology*
1325 32, 721-724.
- 1326 Kinny, P.D., Black, L.P., Sheraton, J.W., 1993. Zircon ages and the distribution of Archaean and
1327 Proterozoic rocks in the Rauer Islands. *Antarctic Science* 5, 193-206.
- 1328 Kleinschmidt, G., 2007. Geological evolution and structure of Antarctica, in: Riffenburgh, B.
1329 (Ed.), *Encyclopedia of the Antarctic*, Routledge, New York/London, pp. 430-437.
- 1330 Knutz, P.C., Storey, M., Kuihpers, A., 2013. Greenland iceberg emissions constrained by
1331 $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages: Implications for ocean-climate variability during last
1332 deglaciation. *Earth and Planetary Science Letters* 375, 441-449.
- 1333 Kowalewski, M., Rimstidt, J.D., 2003. Average lifetime and age spectra of detrital grains:
1334 Toward a unifying theory of sedimentary particles. *Journal of Geology* 111, 427-439.
- 1335 Kyle, P.R., 2013. A. McMurdo Volcanic Group Western Ross Embayment, in: LeMasurier,
1336 W.E., Thomson, J.W., Baker, P.E., Kyle, P.R., Rowley, P.D., Smellie, J.L., Verwoerd,
1337 W.J. (Eds.), *Volcanoes of the Antarctic Plate and Southern Oceans*. American
1338 Geophysical Union, Washington, D.C.

- 1339 Ledent, D., Patterson, C., Tilton, G.R., 1964. Ages of zircon and feldspar concentrates from
1340 North American beach and river sands. *Journal of Geology* 72, 112-122.
- 1341 Liu, X., Jahn, B., Zhao, Y., Li, M., Li, H., Liu, X., 2006. Late Pan-African granitoids from the
1342 Grove Mountains, East Antarctica: Age, origin and tectonic implications. *Precambrian*
1343 *Research* 145, 131-154.
- 1344 Liu, X., Zhao, Y., Zhao, G., Jian, P., Xu, G., 2007. Petrology and geochronology of granulites
1345 from the McKaskle Hills, Eastern Amery Ice Shelf, Antarctica, and implications for the
1346 evolution of the Prydz Belt. *Journal of Petrology* 48, 1443-1470.
- 1347 Ludwig, K.R., 2003. User's Manual for Isoplot/Ex Version 3.00. A Geochronological Toolkit for
1348 Microsoft Excel. Berkeley Geochronology Center Special Publication 4, 72.
- 1349 Marschall, H.R., Hawkesworth, C.J., Storey, C.D., Dhuime, B., Leat, P.T., Meyer, H.-P., Tamm-
1350 Buckle, S., 2010. The Annandagstoppane Granite, East Antarctica: Evidence for
1351 Archaean Intracrustal Recycling in the Kaapvaal-Grunehogna Craton from Zircon O and
1352 Hf Isotopes. *Journal of Petrology* 51, 2277-2901.
- 1353 McDougall, I., Harrison, T.M., 1999. Geochronology and Thermochronology by the $^{40}\text{Ar}/^{39}\text{Ar}$
1354 Method. Oxford University Press, New York.
- 1355 Meert, J.G., 2003. A synopsis of events related to the assembly of eastern Gondwana.
1356 *Tectonophysics* 362, 1-40.
- 1357 Meert, J.G., Torsvik, T.H., 2003. The making and unmaking of a supercontinent: Rodinia
1358 Revisited. *Tectonophysics* 375, 261-288.
- 1359 Ménot, R.P., Duclaux, G., Peucat, J.J., Rolland, Y., Guillot, S., Fanning, M., Bascou, J., Gapais,
1360 D., Pêcher, A., 2007. Geology of the Terre Adélie Craton (135-146° E). Antarctica: A
1361 keystone in a changing world online proceedings of the 10th ISAES: U.S. Geological
1362 Survey Open-File Report 2007-1047 Extended abstract 048, 3 p.
- 1363 Mezger, K., Krogstad, E.J., 1997. Interpretation of discordant U-Pb zircon ages: An evaluation.
1364 *Journal of Metamorphic Geology* 15, 127-140.
- 1365 Mikhalsky, E.V., Beliatsky, B.V., Savva, E.V., Wetzell, H.U., Federov, L.V., Weiser, T., Hahne,
1366 K., 1997. Reconnaissance geochronologic data on polymetamorphic and igneous rocks of
1367 the Humboldt Mountains, central Queen Maud Land, East Antarctica., in: Ricci, C.A.
1368 (Ed.), *The Antarctic Region: Geological Evolution and Processes*. Terra Antarctica
1369 Publication, Siena, pp. 45-54.
- 1370 Millar, I.L., Pankhurst, R.J., 1987. Rb-Sr geochronology of the region between the Antarctic
1371 Peninsula and the Transantarctic Mountains: Haag Nunataks and Mesozoic granitoids.,
1372 in: McKenzie, G.D. (Ed.), *Gondwana Six: Structure, Tectonics and Geophysics:*
1373 *Geophysical Monograph* 40. American Geophysical Union, pp. 151-160.
- 1374 Minor, D.R., Muakas, S.B., 1997. Zircon U-Pb and hornblende ^{40}Ar - ^{39}Ar ages for the Dufek
1375 layered mafic intrusion, Antarctica: Implications for the age of the Ferrar large igneous
1376 province. *Geochemica et Cosmochimica Acta* 61, 2497-2504.
- 1377 Möller, A., Post, N.J., Hensen, B.J., 2002. Crustal residence history and garnet Sm-Nd ages of
1378 high-grade metamorphic rocks from the Windmill Islands area, East Antarctica.
1379 *International Journal of Earth Science* 91, 993-1004.
- 1380 Morton, A.C., 1984. Stability of detrital heavy minerals in Tertiary sandstones from the North
1381 Sea Basin. *Clay Minerals* 19, 287-308.
- 1382 Morton, A.C., 1991. Geochemical studies of detrital heavy minerals and their application to

- 1383 provenance studies, in: Morton, A.C., Todd, S.P., Haughton, P.D.W. (Eds.),
 1384 Developments in Sedimentary Provenance Studies. Geological Society of London Special
 1385 Publications, London, pp. 31-45.
- 1386 Nesbitt, H.W., Young, G.M., 1996. Petrogenesis of sediments in the absence of chemical
 1387 weathering: effects of abrasion and sorting on bulk composition and mineralogy.
 1388 Sedimentology 43, 341-358.
- 1389 Nesse, W.D., 2000. Introduction to Mineralogy. Oxford University Press, New York.
- 1390 Oliver, R.L., Fanning, C.M., 1997. Australia and Antarctica. Precise correlation of
 1391 Palaeoproterozoic terrains, in: Riccia, C.A. (Ed.), Antarctic Region: Geological evolution
 1392 and processes. . Terra Antarctica Publishers, Siena, pp. 163-172.
- 1393 Palmer, E.F., Licht, K.J., Swope, R.J., Hemming, S.R., 2012. Nunatak moraines as repository of
 1394 what lies beneath the East Antarctic Ice sheet. GSA Special Papers 487, 97-104.
- 1395 Paulsson, O., Austrheim, H., 2003. A geochronological and geochemical study of rocks from
 1396 Gjelsvikfjella, Dronning Maud Land, Antarctica—implications for Mesoproterozoic
 1397 correlations and assembly of Gondwana. . Precambrian Research 125, 113-138.
- 1398 Peck, V.L., Hall, I.R., Zahn, R., Grousset, F., Hemming, S.R., Scourse, J.D., 2007. The
 1399 relationship of Heinrich events and their European precursors over the past 60 ka BP: a
 1400 multi-proxy ice-rafted debris provenance study in the North East Atlantic. Quaternary
 1401 Science Reviews 26, 862-875.
- 1402 Peters, M., Haverkamp, B., Emmermann, R., Kohen, H., Weber, K., 1991. Palaeomagnetism, K–
 1403 Ar dating and geodynamic setting of igneous rocks in western and central
 1404 Neuschwabenland, Antarctica., in: Thomson, M.R.A., Crame, J.A., Thomson, J.W.
 1405 (Eds.), Geological Evolution of Antarctica. Cambridge University Press, pp. 549-555.
- 1406 Pettijohn, F.J., 1941. Persistence of Heavy Minerals and Geologic Age. Journal of Geology 49,
 1407 610-625.
- 1408 Peucat, J.J., Capdevila, R., Fanning, C.M., Ménot, R.-P., Pécora, L., Testut, L., 2002. 1.60 Ga
 1409 felsic volcanic blocks in the moraines of the Terre Adélie craton, Antarctica:
 1410 Comparisons with the Gawler Range volcanics South Australia. Australian Journal of
 1411 Earth Sciences 49, 831-845.
- 1412 Peucat, J.J., Ménot, R.P., Monnier, O., Fanning, C.M., 1999. The Terre Adélie basement in the
 1413 East-Antarctica Shield: geological and isotopic evidence for a major 1.7 Ga thermal
 1414 event; comparison with the Gawler Craton in South Australia. Precambrian Research 94,
 1415 205-224.
- 1416 Phillips, G., Wilson, C.J.L., Phillips., D., Szczepanski, S.K., 2007. Thermochronological
 1417 ($^{40}\text{Ar}/^{39}\text{Ar}$) evidence of Early Paleozoic basin inversion within the southern Prince
 1418 Charles Mountains, East Antarctica: implications for East Gondwana. Journal of the
 1419 Geological Society of London 164, 771-784.
- 1420 Pierce, E.L., Williams, T., van de Flierdt, T., Hemming, S.R., Steven, S.L., Brachfeld, S.A.,
 1421 2011. Characterizing the sediment provenance of East Antarctica's weak underbelly: the
 1422 Wilkes and Aurora sub-glacial basins. Paleoceanography 26, PA4217.
- 1423 Poldervaart, A., 1955. Zircon in rocks, 1: sedimentary rocks. American Journal of Science 253,
 1424 433-463.
- 1425 Poldervaart, A., 1956. Zircon in rocks. 2. Igneous rocks. American Journal of Science 254.
- 1426 Post, N.J., 2000. Unravelling Gondwana fragments; an integrated structural, isotopic and
 1427 petrographic investigation of the Windmill Islands, Antarctica. University of New South
 1428 Wales.

- 1429 Post, N.J., Hensen, B.J., Kinny, P.D., 1996. Two metamorphic episodes during a 1340-1180 Ma
1430 convergent tectonic event in the Windmill Islands, East Antarctica, in: Ricci, C.A. (Ed.),
1431 The Antarctic region; geological evolution and processes; proceedings of the VII ISAES,
1432 pp. 157-161.
- 1433 Reiners, P.W., Campbell, I.H., Nicolescu, S., Allen, C.M., Hourigan, J.K., Garver, J.I.,
1434 Mattinson, J.M., Cowan, E.S., 2005a. (U-Th)/(He-Pb) Double Dating of Detrital Zircons.
1435 American Journal of Science 305, 259-311.
- 1436 Reiners, P.W., Ehlers, T.A., Zeitler, P.K., 2005b. Past, present, and future of thermochronology.
1437 Reviews in Mineralogy and Geochemistry 58, 1-18.
- 1438 Renne, P.R., Becker, T.A., Swapp, S.M., 1990. $^{40}\text{Ar}/^{39}\text{Ar}$ laser-probe dating of detrital micas
1439 from the Montgomery Creek Formation, northern California: Clues to provenance,
1440 tectonics and weathering processes. *Geology* 18, 563-566.
- 1441 Renne, P.R., Swisher, C.C., Deino, A.L., Karner, D.B., Owens, T.L., DePaolo, D.J., 1998.
1442 Intercalibration of standards, absolute ages and uncertainties in $^{40}\text{Ar}/^{39}\text{Ar}$ dating.
1443 *Chemical Geology* 145, 117-152.
- 1444 Rilling, S.E., Mukasa, S.B., Wilson, T.J., Lawver, L.A., 2007. ^{40}Ar - ^{39}Ar Age constraints on
1445 volcanism and tectonism in the Terror Rift of the Ross Sea, Santa Barbara, CA, p. 4.
- 1446 Rivers, T., 1997. Lithotectonic elements of the Grenville Province: review and tectonic
1447 implications. *Precambrian Research* 86, 117-154.
- 1448 Roy, M., Clark, P.U., Duncan, A.R., Hemming, S.R., 2007a. Insights into the late Cenozoic
1449 configuration of the Laurentide Ice Sheet from $^{40}\text{Ar}/^{39}\text{Ar}$ dating of glacially transported
1450 minerals in midcontinent tills. *Geochemistry, Geophysics, Geosystems* 8.
- 1451 Roy, M., van de Flierdt, T., Hemming, S.R., Goldstein, S.L., 2007b. $^{40}\text{Ar}/^{39}\text{Ar}$ ages of
1452 Hornblende Grains and Bulk Sm/Nd Isotopes of Circum-Antarctic Glacio-marine
1453 Sediments: Implications for Sediment Provenance in the Southern Ocean. *Chemical*
1454 *Geology* 244, 507-519.
- 1455 Samson, S.D., Alexander, E.C., 1987. Calibration of the interlaboratory $^{40}\text{Ar}/^{39}\text{Ar}$ dating
1456 standard, MMhb-1. *Chemical Geology* 66.
- 1457 Sheraton, J.W., Black, L.P., Tindle, A.G., 1992. Sheraton, J.W., Black, L.P. and Tindle, A.G.,
1458 1992, Petrogenesis of plutonic rocks in a Proterozoic granulite-facies terrane – the
1459 Bungar Hills, East Antarctica: *Chemical Geology*. *Chemical Geology* 97, 163-198.
- 1460 Sheraton, J.W., Tingey, R.J., Black, L.P., Oliver, R.L., 1993. Geology of the Bungar Hills area,
1461 Antarctica: implications for Gondwana correlations. *Antarctic Science* 5, 85-102.
- 1462 Silver, L.T., Deutsch, S., 1963. Uranium-lead isotopic variations in zircons: A case study.
1463 *Journal of Geology* 71.
- 1464 Small, D., Parrish, R.R., Austin, W.E.N., Cawood, P.A., Rinterknecht, V., 2013. Provenance of
1465 North Atlantic ice-rafted debris during the last deglaciation- A new application of U-Pb
1466 rutile and zircon geochronology. *Geology* 41, 155-158.
- 1467 Steiger, R.H., Jäger, E., 1977. Subcommittee on Geochronology: Convention on the use of
1468 decay constants in geo- and cosmochronology. *Earth and Planetary Science Letters* 36,
1469 359-362.
- 1470 Storey, B.C., Pankhurst, R.J., Johnson, A.C., 2004. The Grenville Province within Antarctica: a
1471 test of the SWEAT hypothesis. *Journal of the Geological Society* 151, 1-4.
- 1472 Stüwe, K., Oliver, R., 1989. Geological History of Adélie Land and King George V Land,
1473 Antarctica: Evidence for a Polycyclic Metamorphic Evolution. *Precambrian Research* 43,
1474 317-334.

- 1475 Tatsumoto, M., Patterson, C., 1964. Age studies of zircon and feldspar concentrates from the
1476 Franconia Sandstone. *Journal of Geology* 2, 232-242.
- 1477 Tessensohn, F., Henjes-Kunst, F., 2005. Northern Victoria Land terranes, Antarctica: far
1478 travelled or local products? *Geological Society of London Special Publications* 246, 275-
1479 291.
- 1480 Thomas, R.J., Cornell, D.H., Armstrong, R.A., 1999. Provenance age and metamorphic history
1481 of the Quha Formation, Natal Metamorphic Province: a U-Th-Pb zircon SHRIMP study.
1482 *South African Journal of Geology* 102, 83-88.
- 1483 Thomas, W.A., 2011. Detrital-zircon geochronology and sedimentary provenance. *Lithosphere* 3,
1484 304-208.
- 1485 Thomson, S.N., Reiners, P.W., Hemming, S.R., Gehrels, G., 2013. The contribution of glacial
1486 erosion to shaping the hidden landscape of East Antarctica. *Nature Geoscience* 6, 203-
1487 207.
- 1488 Thoulet, J., 1913. Notes de lithologies sous-marine. *Annual Ins. Océanographie* 5.
- 1489 Tingey, J.R., 1991. The regional geology of Archean and Proterozoic rocks in Antarctica, in:
1490 Tingey, J.R. (Ed.), *The Geology of Antarctica*. Clarendon Press, Oxford, pp. 1-73.
- 1491 Tochilin, C.J., Reiners, P.W., Thomson, S.N., Gehrels, G., Hemming, S.R., Pierce, E.L., 2012.
1492 Erosional history of the Prydz Bay sector of East Antarctica from detrital apatite and
1493 zircon geo- and thermochronology multidating. *Geochemistry, Geophysics, Geosystems*
1494 13, 21.
- 1495 Tong, L., 2004. Metamorphism of granulite facies metapelites. University of Melbourne.
- 1496 Tong, L., Liu, X., Zhang, L., Chen, H., 1998. The ^{40}Ar - ^{39}Ar ages of hornblendes in Grt-Pl-
1497 bearing amphibolite from the Larsemann Hills, East Antarctica and their geological
1498 implications. *Chinese Journal of Polar Science* 9, 79-91.
- 1499 Tong, L., Wilson, C.J.L., Liu, X., 2002. A high-grade event of ~1100 Ma preserved within the
1500 ~500 Ma mobile belt of the Larsemann Hills, East Antarctica: further evidence from
1501 $^{40}\text{Ar}/^{39}\text{Ar}$ dating. *Terra Antarctica* 9, 73-86.
- 1502 Tribuzio, R., Tiepolo, M., Fiameni, S., 2008. A mafic-ultramafic cumulate sequence derived
1503 from boninite-type melts (Niagara Icefalls, northern Victoria Land, Antarctica).
1504 *Contributions to Mineralogy and Petrology* 155, 619-633.
- 1505 van de Flierdt, T., Hemming, S.R., Goldstein, S.L., Gehrels, G.E., Cox, S.E., 2008. Evidence
1506 against a young volcanic origin of the Gamburtsev Subglacial Mountains, Antarctica.
1507 *Geophysical Research Letters* 35, 1-6.
- 1508 Vaughan, A.P.M., Storey, B.C., 2000. The eastern Palmer Land shear zone: a new terrane
1509 accretion model for the Mesozoic development of the Antarctic Peninsula. *Geological*
1510 *Society of London* 157, 1243-1256.
- 1511 Veevers, J.J., 2003. Pan-African is Pan-Gondwanaland: Oblique convergence drives rotation
1512 during 650–500 Ma assembly. *Geology* 31, 501-504.
- 1513 Veevers, J.J., 2004. Gondwanaland from 650-500 Ma assembly through 320 Ma merger in
1514 Pangea to 185-100 Ma breakup: supercontinental tectonics via stratigraphy and
1515 radiometric dating. *Earth Science Reviews* 68, 1-132.
- 1516 Veevers, J.J., 2012. Reconstructions before rifting and drifting reveal the geological connections
1517 between Antarctica and its conjugates in Gondwanaland. *Earth-Science Reviews* 111,
1518 249-318.
- 1519 Veevers, J.J., Saeed, A., 2011. Age and composition of Antarctic bedrock reflected by detrital

- zircons, erratics, and recycled microfossils in the Prydz Bay–Wilkes Land–Ross Sea–Marie Byrd Land sector (70°–240°E). *Gondwana Research* 20, 710-738.
- Wang, Y., Liu, D., Chung, S.-L., Tong, L., Ren, L., 2007. Shrimp zircon age constraints from the Larsemann Hills region, Prydz Bay, for a late Mesoproterozoic to Early Neoproterozoic tectono-thermal event in East Antarctica. *American Journal of Science* 308.
- Williams, T., van de Flierdt, T., Chung, E., Roy, M., Hemming, S.R., Goldstein, S.L., 2010. Evidence for iceberg armadas from East Antarctica in the Southern Ocean during the late Miocene and early Pliocene. *Earth and Planetary Science Letters* 290, 351-361.
- Wilson, C.J.L., Quinn, C., Tong, L., Phillips, D., 2007. Early Palaeozoic intracratonic shears and post-tectonic cooling in the Rauer Group, Prydz Bay, East Antarctica constrained by $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronology. *Antarctic Science* 19, 339-353.
- Zeh, A., Millar, I.L., Kroner, U., Görz, I., 1999. The structural and metamorphic evolution of the Northern Haskard Highlands, Shackleton Range, Antarctica. *Terra Antarctica* 6, 249-268.
- Zhao, Y., Liu, X.H., Wang, S.C., Song, B., 1997. Syn- and post-tectonic cooling and exhumation in the Larsemann Hills, East Antarctica. *Episodes* 20, 122-127.
- Zhao, Y., Song, B., Wang, Y., Ren, L., Li, J., Chen, T., 1992. Geochronology of the late granite in the Larsemann Hills, East Antarctica., in: Kaminuma, K., Shiraishi, K. (Eds.), *Recent Progress in Antarctic Earth Science*. Terra Scientific Publishing, Tokyo.

Figure Captions

Fig. 1. East Antarctic crustal provinces and approximate core sites. Map modified from Harley and Kelly (2007); Grenvillian age ranges are as defined by Fitzsimons (2000). BH – Bunger Hills, DG – Denman Glacier, EG – Eastern Ghats, GC- Grunehogna Craton, GVL – George V Land, LHN- Lützow-Holm Belt, NVL – northern Victoria Land, P – Province, PB - Prydz Bay, R- Ruker Terrane, SL- Sri Lanka.

Fig. 2. Location map of East Antarctica showing outcrops, simplified geology, ocean currents and cores sites. Geology from Collins & Pisarevsky (2005).

Fig. 3. Histograms (20 Myr bins) and probability plots of detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages by geographic sector compared to a histogram (20 myr bin) and probability plot of on-land ages taken from the compilation of Veevers (2012) and (Veevers and Saeed, 2011). The color scale used here is the same as that used in Figs. 4 and 5 A-C, and corresponds to 100 Ma increments of time. A) DML – Dronning Maud Land B) PB – Prydz Bay C) WL – Wilkes Land and D) AL / GVL / NVL – Adélie Land, George V Land and northern Victoria Land.

Fig. 4. Stacked histograms (20 Myr bins) showing the U-Pb zircon (this study), $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende (Williams et al., 2010) and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite (Pierce et al., 2011) ages from the IRD recovered from ODP Site 1165 record. The depositional age of each layer is in the top left corner of each set of histograms. The color scale used here is the same as that used in Figs. 3 and 5 A-C, and corresponds to 100 Ma increments of time.

Fig. 5. Maps of East Antarctica with pie charts showing the distribution of thermochronologic ages by site location and mineral type, the down-core ODP Site 1165 record of IRD, and known onshore ages (see appendix F for onshore thermochronologic age references). The color scale used here is the same as that used in Figs. 3 and 4, and corresponds to 100 Ma increments of time. **A)** Pie charts displaying U-Pb zircon results **B)** Pie charts displaying $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende results **C)** Pie charts displaying $^{40}\text{Ar}/^{39}\text{Ar}$ biotite results. GC – Grunehogna Craton, G-Gjelsvifjella, H – Haag Nunatak, HU- H.U. Sverdrupfjella, K – Kirwanveggan.

Fig. 6. Summary figure of U-Pb zircon (red), $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende (green) and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite (blue) ages. Thick pink line around map of Antarctica shows geographic coverage of each sector (Dronning Maud Land, Prydz Bay, Wilkes Land, Adélie / George V / northern Victoria Land). Vertical axis shows age bins, horizontal axis shows the percentage of ages, across the entire population of a given mineral in that sector, that fall within the corresponding age bin.

Table Captions

Table 1: Relative concentrations of zircon, hornblende and biotite in major lithologies (Poldervaart, 1955; Poldervaart, 1956; Deer et al., 1992; Nesse, 2000; Reiners et al., 2005b).

Table 2: Provenance studies using detrital zircon U-Pb ages, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende or $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages grouped by terrestrial non-glacial depositional environments (**A**) and terrestrial or marine glacial environments (**B**). Studies list in Table B were successful in part due to abundant grains with minor to little alteration.

Table 3: Samples and analyses made for this study. Columns headings from left to right: ID number assigned to cores for this study; Name of the core from which the sample was taken; Location of core in degrees latitude; Location of core in degrees longitude; Type of sample (SRL – sand rich layer; IRD – Ice rafted debris); Depth of sample in the core; Water depth of drill site; Geographical sector assigned to core based on relative position of the core to East Antarctica; DML - Dronning Maud Land; PB - Prydz Bay; WL- Wilkes Land; Al - Adélie Land; GVL - George V Land; NVL - northern Victoria Land, Study in which U-Pb zircon data was collected, Number of zircon grains measured for U-Pb from sample, Study in which $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende data was collected, Number of hornblende grains measured for $^{40}\text{Ar}/^{39}\text{Ar}$ from sample, Study in which $^{40}\text{Ar}/^{39}\text{Ar}$ biotite data was collected, Number of biotite grains measured for $^{40}\text{Ar}/^{39}\text{Ar}$ from sample, nm – not measured, vdf et al. (2008) – van de Flierdt et al. (2008).

List of Appendices

- A. U-Pb zircon data by core site
- B. $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende by core site
- C. $^{40}\text{Ar}/^{39}\text{Ar}$ biotite data by core site
- D. U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite data grouped by sector

- 1612 E. Histograms of U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite data by core site
- 1613 F. List of references for onshore ages used in Fig. 5

ODP Site 1165

- U-Pb Zircon
- Ar-Ar Hornblende
- Ar-Ar Biotite

Table 1. Relative concentrations of zircon, hornblende and biotite in major lithologies

ZIRCON	<i>High</i>	<i>Medium</i>	<i>Low to none</i>
Igneous	Felsic crystalline (granite, granodiorite, tonalite)	Rhyolite, ignimbrite	Gabbro, basalt, ultramafic
Metamorphic	Orthogneiss	Pargneiss, metarhyolite, metasandstone, phyllite	Marble, eclogite, schist
Sedimentary	Arkose	Conglomerate, quartz-arenite, litharenite	Claystone, dolomite, carbonate rocks
HORNBLENDE	<i>High</i>	<i>Medium</i>	<i>Low to none</i>
Igneous	Intermediate rocks; granodiorite, diorite	Granite, gabbro	Ultramafic,
Metamorphic	Medium to high-grade; mafic/ultramafic protolith	medium grade	Marble, carbonate protolith
Sedimentary	None	None	Clastics
BIOTITE	<i>High</i>	<i>Medium</i>	<i>Low to none</i>
Igneous	Felsic rocks; granite, rhyolite	Intermediate and mafic rocks, diorite, andesite	ultramafic
Metamorphic	Low to intermediate grade; hornfels, phyllites, schists and gneisses	High grade; migmatites	Mafic protolith
Sedimentary	None	None	Clastics, immature sediments

Table 2A. Provenance Studies of terrestrial non-glacial sediments using U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages.

$^{40}\text{Ar}/^{39}\text{Ar}$ Biotite Study	Material	Location	Purpose of Study	Results	Why?
Aalto et al., 1998	Eocene-Miocene Hoh Assemblage sandstones	Hoh Assemblage, Northern California	Determining the provenance of Eocene-Miocene Hoh assemblage sandstones	Unsuccessful	Biotites: Ages widely scattered, incrementally heated grains did not form plateaus, radiogenic Ar < 20%
Cohen et al., 1995	Late Jurassic-mid Cretaceous Volcaniclastic sandstones	Gravina Belt, southeastern Alaska	Determining provenance of the Seymour Canal Formation	Successful	Samples were chosen based upon degree of weathering (picked those with least degree of weathering); grains were hand-picked with a binocular microscope and any visibly altered grains were rejected. Both approaches gave meaningful results; weathering and alteration of grains was minor
Renee et al., 1990	Montgomery Creek Sandstones	Montgomery Creek Formation, northern California	Provenance of the Eocene Montgomery Creek Formation	Unsuccessful	Biotite ages were widely scattered; determined to contain increasing amounts of vermiculite as interlayer laminations and as rinds on the grain which increased with depth; this lowers the integrated Ar/Ar age of the biotite grains.
$^{40}\text{Ar}/^{39}\text{Ar}$ Hornblende Study	Material	Location		Results	Why?
Cohen et al., 1995	Late Jurassic-mid Cretaceous Volcaniclastic sandstones	Gravina Belt, southeastern Alaska	Determining provenance of the Seymour Canal Formation	Successful	Samples were chosen based upon degree of weathering (picked those with least degree of weathering); grains were hand-picked with a binocular microscope and any visibly altered grains were rejected. Both approaches gave meaningful results; weathering and alteration of grains was minor
U-Pb Zircon Study	Material	Location	Purpose of Study	Results	Why?

See reviews in Gehrels (2012), Gehrels et al. (2011); Fedo et al. (2003)

Table 2B. Provenance Studies of glacial sediments (till, ice-rafted detritus) using U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages.

$^{40}\text{Ar}/^{39}\text{Ar}$ Biotite			
Study	Sample Type	Location	Purpose of Study
Hemming et al., 2002	Glacial Marine/Trough Mouth Fans	North Atlantic	tracing IRD provenance during Heinrich Events
van de Flierdt et al., 2008	Glacial Marine and Fluvial sediments	East Antarctica, Prydz Bay, ODP Site 1166A	Investigating the origin of the subglacial Gamburtsev Mountains
Pierce et al., 2011	Glacial-Marine Sediments; ice-rafted detritus and diamict	East Antarctica; ODP Site 1165	Characterizing geology and IRD source areas around in East Antarctica
Palmer et al., 2012	Glacial Till	Transantarctic Mountains	Characterizing subglacial geology
$^{40}\text{Ar}/^{39}\text{Ar}$ Hornblende			
Study	Sample Type	Location	Purpose of Study
Gwiazda et al., 1996	Glacial-Marine Sediments; ice-rafted detritus	North Atlantic	Tracing IRD provenance during Heinrich Events
Hemming et al., 1998	Glacial-Marine Sediments; ice-rafted detritus	N.E. Atlantic (V28-82)	Tracing IRD provenance during Heinrich Events
Hemming et al., 2000	Glacial-Marine Sediments; ice-rafted detritus	North Atlantic (EW9303-GGC31)	Tracing IRD provenance 22 to 10.5 ka BP
Hemming et al., 2002	Glacial Marine/Trough Mouth Fans	North Atlantic	Tracing IRD provenance during Heinrich Events
Hemming and Hajdas, 2003	Glacial-Marine Sediments; ice-rafted detritus	North Atlantic (V23-14)	Tracing IRD provenance over the past 43 14C kyr
Roy et al., 2007a	Glacial-Marine Sediments; ice-rafted detritus	Antarctica; multiple sites	Characterizing geology around Antarctica
Roy et al., 2007b	Glacial Till	North Central USA	Tracing provenance of tills over the past ~2.0 Ma
Peck et al., 2007	Glacial-Marine Sediments; ice-rafted detritus	North Atlantic (MD01-2461)	Tracing IRD provenance during Heinrich Events
van de Flierdt et al., 2008	Glacial Marine and Fluvial sediments	East Antarctica, Prydz Bay, ODP Site 1166A	Investigating the origin of the subglacial Gamburtsev Mountains
Williams et al., 2010	Glacial-Marine Sediments; ice-rafted detritus	East Antarctica ODP Site 1165	Tracing IRD provenance during Heinrich-like events
Pierce et al., 2011	Glacial-Marine Sediments; ice-rafted detritus and diamict	East Antarctica; multiple sites	Characterizing IRD source areas around in East Antarctica
Palmer et al., 2012	Glacial Till	Transantarctic Mountains	Characterizing subglacial geology
Tochilin et al., 2012	Glacial Marine Sediments; diamictite	East Antarctica, ODP Site 739	Determining Early Oligocene through Quaternary erosion rates in East Antarctica
Downing et al., 2013	Glacial-Marine Sediments; ice-rafted detritus	North Atlantic	Tracing IRD provenance during Heinrich Events
Knutz et al., 2013	Glacial-Marine Sediments; ice-rafted detritus	North Atlantic/Greenland	Tracing IRD provenance during the last glacial-interglacial transition
U-Pb Zircon			
Study	Sample Type	Location	Purpose of Study?
Avigad et al., 2007	Glacial Diamictite	Ethiopia, Negash Syncline	Determining provenance and chronology of Cryogenian diamictites
van de Flierdt et al., 2008	Glacial Marine and Fluvial sediments	East Antarctica, Prydz Bay, ODP Site 1166A	Investigating the origin of the subglacial Gamburtsev Mountains
Goode and Fanning., 2010	Glacial-Marine Sediments	East Antarctica, Adélie Land Margin	Characterizing subglacial geology
Goode et al., 2010	Glacial Till	Transantarctic Mountains	Characterizing subglacial geology
Gehrels et al., 2011	Glacial Diamictite	Tibetan Himalayas	Constraining paleogeography and tectonic history of Mesoproterozoic through Mesozoic Tibet-Himalaya region
Veevers and Saeed, 2011	Glacial-Marine Sediments; turbidites	East Antarctica, DSDP Sites 268, 269, 273 and 274	Comparison of onland and detrital U-Pb zircon ages to improve understanding of East Antarctic geology
Palmer et al., 2012	Glacial Till	Transantarctic Mountains	Characterizing subglacial geology
Tochilin et al., 2012	Glacial Diamictite	East Antarctica, ODP Site 739	Determining Early Oligocene through Quaternary erosion rates in East Antarctica
Small et al., 2013	Glacial-Marine Sediments; ice-rafted detritus	North Atlantic, Site MD95-2007	Determining IRD provenance during the Younger and Older Dryas events and testing viability of U-Pb zircon and U-Pb rutile as IRD tracers

Table 3. Samples and analyses for this study

Site ID	Site Name	Latitude (°)	Longitude (°)	Sample Type	Sampling Depth	Water Depth (m)	Sector	Studies associated with mineral analyses	n	Studies associated with mineral analyses	n	Studies associated with mineral analyses	n
								Zircon		Hornblende		Biotite	
1	IWSOE 68-11	-74.017	-54.75	SRL	11-18 cm	459	DML	This Study	0	This Study	67	This Study	11
2	IWSOE 68 G8	-76.833	-40.917	SRL	10-17 cm	400	DML	This Study	0	This Study	6	This Study	0
3	IWSOE 70 2-22-1	-77.533	-37.967	SRL	22-27 cm	1054	DML	This Study	104	This Study	71	This Study	0
4	IWSOE 69 G17	-76.883	-32.833	SRL	158-162 cm	341	DML	This Study	15	This Study	96	This Study	13
5	IWSOE69 G21	-72.8	-29.367	SRL	79-82 cm	3964	DML	This Study	60	This Study	55	This Study	9
6	IWSOE 68 13	-75.45	-26.55	SRL	8-14 cm	507	DML	This Study	42	This Study	46	This Study	17
7	IWSOE 70 03-11-03	-73.983	-23.65	SRL	228-230cm	260	DML	This Study	102	This Study	20	This Study	4
8	IO 1578-27	-72.408	-19.418	SRL	735.5-737	3274	DML	This Study	20	This Study	39	This Study	19
9	IO 1578-28	-72.19	-15.305	SRL	235.5-237	58	DML	This Study	77	This Study	23	This Study	8
10	IWSOE 70 3-17-2	-71.167	-12.367	SRL	55-59 cm	418	DML	This Study	53	This Study	97	This Study	27
11	IO 1578-16	-70.612	-10.063	SRL	128-130 cm	366	DML	This Study	77	This Study	29	This Study	22
12	IWSOE 70 3-18-1	-70.3	-6.807	SRL	31-33 cm	713	DML	this stud	46	This Study	46	This Study	27
13	IO 1277-41	-69.998	-5.077	SRL	1161-1173 cm	1173	DML	This Study	0	This Study	23	This Study	0
14	IO 1277-23	-67.897	14.58	SRL	887-889; 889-891	924	DML	This Study	123	This Study	57	This Study	29
15	NBP01-01 JPC40	-67.176	65.737	diamict	2370 cm	750	PB	This Study	100	this study	13	this study	25
16	ODP Site 1165B	-64.371	67.219	IRD	(see below)	3537	PB	This Study	78	Williams et al. (2010)	167	Pierce et al. (2011)	145
17	NBP01-01 JPC34	-68.251	72.730	diamict	70, 292, 345	754	PB	This Study	258	this study	318	this study	50
18	ODP Site 1166A	-67.696	74.787	diamict and fluvial	60, 80, 100 cm	475	PB	vdF et al. (2008)	232	vdF et al. (2008)	160	vdF et al. (2008)	16
19	NBP01-01 JPC25	-68.752	76.703	diamict	1305, 1405 cm	848	PB	This study	126	this study	37	this study	14
20	ELT49-30	-59.005	95.23	SRL	1698-1702 cm	4276	WL	This Study	0	Pierce et al. (2011)	34	Pierce et al. (2011)	30
	ELT49-30 A			SRL	1276-1280 cm	4276		This Study	0	this study	nm	this study	nm
21	ELT37-16	-63.97	127.447	SRL	231-235 cm	3840	WL	This Study	0	Pierce et al. (2011)	63	Pierce et al. (2011)	57
	ELT37-16 A			SRL	228-233 cm	3840		This Study	143	this study	38	this study	nm
22	ELT37-13	-64.672	132.977	SRL	113-120 cm	1333	WL	This Study	33	Pierce et al. (2011)	47	Pierce et al. (2011)	29
	ELT37-13 A			SRL	112-117 cm	1333		This Study	126	this study	44	this study	nm
23	ELT37-09	-65.552	141.095	SRL	140-144 cm	1308	AL	This Study	10	Pierce et al. (2011)	45	Pierce et al. (2011)	28
	ELT37-09 A			SRL	137-139 cm	1308		This Study	34	this study	16	Pierce et al. (2011)	59
24	NBP 01-01JPC11	-66.563	143.052	diamict	2305-2310 cm	870	AL	This Study	10	Pierce et al. (2011)	15	Pierce et al. (2011)	14
	NBP 01-01JPC11			diamict	2370-2375 cm	870		This Study	8	Pierce et al. (2011)	41	Pierce et al. (2011)	15
25	DF79-47	-66.667	148.733	SRL	563-567 cm	476	GVL	This Study	17	Pierce et al. (2011)	46	Pierce et al. (2011)	10
	DF79-47 A			SRL	568.5-576 cm	476		This Study	87	this study	18	this study	nm
26	DF80-34	-69.917	162.83	SRL	222-226 cm	805	NVL	This Study	17	Pierce et al. (2011)	36	Pierce et al. (2011)	33
	DF80-34 A			SRL	213-222 cm	805		This Study	71	this study	10	this study	nm
27	DF80-35	-70.017	166.417	SRL	269-273 cm	490	NVL	This Study	0	Pierce et al. (2011)	21	Pierce et al. (2011)	23
	DF80-35 A			SRL	264-269 cm	490		This Study	0	this study	11	this study	nm
28	DF80-20	-69.783	163.683	SRL	160-164 cm	475	NVL	This Study	0	Pierce et al. (2011)	8	Pierce et al. (2011)	35
	DF80-20 A			SRL	152-160 cm	475		This Study	0	this study	nm	this study	nm
Downcore Record ODP Site 1165B:													
		-64.371	67.219				PB						
16	ODP Site 1165	3.5 Ma		IRD	1165B-4H-6 (80)			This Study	10	Williams et al. (2010)	40	Pierce et al. (2011)	41
16	ODP Site 1165	4.65 Ma		IRD	1165B-6H-1 (70)			This Study	3	Williams et al. (2010)	32	Pierce et al. (2011)	28
16	ODP Site 1165	7 Ma		IRD	1165B-10H-2 (35)			This Study	31	Williams et al. (2010)	31	Pierce et al. (2011)	39
16	ODP Site 1165	19 Ma		IRD	1165C-10R-3 (120)			This Study	13	Williams et al. (2010)	23	Pierce et al. (2011)	37
16	ODP Site 1165	4.65 Ma		IRD	1165B 6H-1 100/102			This Study	21	Williams et al. (2010)	41	Pierce et al. (2011)	-

Appendix A. U-Pb (zircon) geochronological analyses by Laser-Ablation Multicollector ICP Mass Spectrometry																					
Core ID	Analysis	U (ppm)	Th 204Pb	Isotope ratios								error cont.	206Pb* 238U*	Apparent ages (Ma)				Best age (Ma)	Conc (%)		
				206Pb/238U	±	207Pb/235U	±	206Pb/235U	±	206Pb/238U	±			207Pb/235U	±	206Pb/238U	±				
3	IWSOE 70-2-22-1-67	797	4990	2.3	20.433	4.2	0.11674	4.4	0.01730	1.3	0.29	110.6	1.4	112.1	4.7	144.9	98.6	110.6	1.4	NA	2.2, 2.1
3	IWSOE 70-2-22-1-28	168	1042	1.6	18.151	17.8	0.13345	18.5	0.01757	5.2	0.28	112.3	5.8	127.2	22.2	415.9	400.5	112.3	5.8	NA	
3	IWSOE 70-2-22-1-42	851	6310	2.1	21.262	3.1	0.11853	3.3	0.01828	1.0	0.31	116.8	1.2	113.7	3.5	50.9	74.3	116.8	1.2	NA	
3	IWSOE 70-2-22-1-22	725	5456	2.0	19.492	5.5	0.13042	5.6	0.01844	1.0	0.18	117.8	1.2	124.5	6.6	254.5	127.4	117.8	1.2	NA	
3	IWSOE 70-2-22-1-87	2155	504	7.3	9.849	8.3	0.30320	8.8	0.02149	2.8	0.32	127.7	4.4	229.4	24.8	1656.1	154.8	127.7	4.8	NA	
3	IWSOE 70-2-22-1-45	570	8140	1.9	20.186	8.2	0.18672	8.3	0.02735	1.1	0.13	173.9	1.9	173.8	13.3	172.3	192.7	173.9	1.9	NA	
3	IWSOE 70-2-22-1-34	208	2668	1.1	20.582	14.3	0.18838	14.3	0.02812	1.0	0.07	178.8	1.8	175.2	23.0	127.9	336.9	178.8	1.8	NA	
3	IWSOE 70-2-22-1-10	32157	1182	0.4	19.291	1.6	0.31681	3.9	0.04433	3.5	0.91	279.6	9.6	279.4	9.4	278.2	37.5	279.6	9.6	NA	
3	IWSOE 70-2-22-1-17	834	8998	7.7	15.785	4.7	0.66657	6.5	0.07631	4.5	0.69	474.1	20.4	518.6	26.3	720.1	99.4	474.1	20.4	NA	
3	IWSOE 70-2-22-1-16	210	1558	1.8	17.663	3.3	0.62334	3.7	0.07085	1.7	0.45	495.3	7.9	491.9	14.4	476.5	73.1	495.3	7.9	NA	
3	IWSOE 70-2-22-1-77	337	14686	3.1	17.141	3.0	0.64885	3.1	0.08066	1.0	0.32	500.1	4.8	507.8	12.5	542.5	64.6	500.1	4.8	NA	
3	IWSOE 70-2-22-1-23	127	2944	1.5	14.606	6.1	0.76303	6.2	0.08083	1.0	0.16	501.1	4.8	575.8	27.2	882.7	126.4	501.1	4.8	NA	
3	IWSOE 70-2-22-1-37	201	5796	2.2	16.682	3.2	0.67999	3.4	0.08227	1.0	0.30	509.7	4.9	526.8	13.9	601.5	69.9	509.7	4.9	NA	
3	IWSOE 70-2-22-1-61	351	17498	9.6	17.623	2.6	0.68037	2.6	0.08696	1.0	0.46	1046.7	9.2	1240.0	12.5	881.6	57.8	1240.0	12.5	NA	
3	IWSOE 70-2-22-1-25	293	21220	5.0	15.563	7.3	0.75431	14.6	0.08514	12.7	0.87	526.8	64.1	570.7	63.9	750.0	154.0	526.8	64.1	NA	
3	IWSOE 70-2-22-1-12	781	22308	6.9	16.905	2.6	0.70473	3.0	0.08641	1.4	0.46	534.2	7.0	541.6	12.5	572.7	57.5	534.2	7.0	NA	
3	IWSOE 70-2-22-1-2	294	11468	5.1	17.493	3.5	0.68247	5.5	0.08659	4.2	0.77	535.3	21.6	528.3	22.5	497.9	76.5	535.3	21.6	NA	
3	IWSOE 70-2-22-1-9	424	121580	5.5	17.488	3.9	0.68433	4.3	0.08680	1.7	0.41	536.6	9.0	529.4	17.5	498.6	85.5	536.6	9.0	NA	
3	IWSOE 70-2-22-1-27	820	14048	9.6	17.623	2.6	0.68037	2.6	0.08696	1.0	0.36	537.5	5.2	527.0	11.5	481.6	57.8	537.5	5.2	NA	
3	IWSOE 70-2-22-1-48	820	34520	13.8	17.168	3.1	0.70060	5.8	0.08723	4.9	0.85	539.2	25.5	539.2	24.4	539.1	68.1	539.2	25.5	NA	
3	IWSOE 70-2-22-1-32	231	8596	1.5	16.508	3.5	0.73111	4.3	0.08753	2.5	0.58	540.9	12.9	557.2	18.4	624.3	75.8	540.9	12.9	NA	
3	IWSOE 70-2-22-1-50	244	7582	4.5	16.915	4.4	0.71688	4.5	0.08794	1.0	0.22	543.4	5.2	548.8	18.9	571.5	94.7	543.4	5.2	NA	
3	IWSOE 70-2-22-1-15	428	13568	2.9	16.561	3.0	0.73862	3.0	0.08812	1.0	0.31	548.0	5.9	561.6	13.8	617.2	65.7	548.0	5.9	NA	
3	IWSOE 70-2-22-1-58	628	31546	15.7	17.281	3.4	0.70841	5.2	0.08879	4.0	0.76	548.4	20.8	543.8	21.8	524.7	73.7	548.4	20.8	NA	
3	IWSOE 70-2-22-1-8	435	11886	4.8	16.696	2.5	0.73650	3.3	0.08918	2.2	0.67	550.7	11.8	560.4	14.4	599.8	53.6	550.7	11.8	NA	
3	IWSOE 70-2-22-1-24	305	10570	1.1	17.528	3.9	0.70360	4.1	0.08945	1.2	0.30	552.3	6.6	540.9	17.2	493.5	86.1	552.3	6.6	NA	
3	IWSOE 70-2-22-1-54	68	3080	6.9	16.858	4.8	0.73838	4.9	0.09028	1.0	0.20	557.2	5.3	561.5	21.3	578.8	104.9	557.2	5.3	NA	
3	IWSOE 70-2-22-1-77B	224	10048	3.5	15.848	5.4	0.81882	7.2	0.09152	4.8	0.67	564.5	12.8	605.7	32.9	762.9	113.3	605.7	32.9	NA	
3	IWSOE 70-2-22-1-4	392	9064	21.7	16.585	5.3	0.76221	6.2	0.09168	3.3	0.53	565.5	17.6	575.3	27.2	614.1	113.8	565.5	17.6	NA	
3	IWSOE 70-2-22-1-13	665	22432	4.4	16.664	2.6	0.77048	2.7	0.09312	1.0	0.36	574.0	5.5	580.0	12.1	603.9	55.4	574.0	5.5	NA	
3	IWSOE 70-2-22-1-43	120	5086	0.3	16.578	2.9	0.77948	3.5	0.09372	1.9	0.55	577.5	10.6	585.5	15.5	615.1	62.9	577.5	10.6	NA	
3	IWSOE 70-2-22-1-14	241	12526	2.6	14.702	3.7	0.92979	10.6	0.09914	10.0	0.94	609.4	57.9	667.5	52.0	869.1	76.7	609.4	57.9	70.1	
3	IWSOE 70-2-22-1-78	90	4250	2.6	16.618	3.8	0.84401	4.1	0.10173	1.6	0.39	624.5	9.5	621.4	19.1	609.9	81.9	624.5	9.5	102.4	
3	IWSOE 70-2-22-1-86	220	9134	3.7	15.722	4.4	0.89274	5.1	0.10212	2.5	0.50	626.8	15.2	647.8	24.3	721.7	93.4	626.8	15.2	86.8	
3	IWSOE 70-2-22-1-57	175	1904	4.6	16.217	3.5	1.11197	3.7	0.10659	1.3	0.36	652.9	8.3	759.1	19.9	1086.0	69.7	652.9	8.3	60.1	
3	IWSOE 70-2-22-1-52	172	6610	1.8	15.879	4.5	0.92569	4.7	0.10661	1.3	0.28	653.0	8.2	665.4	22.9	707.4	95.9	653.0	8.2	92.3	
3	IWSOE 70-2-22-1-61	639	24788	1.8	15.848	5.4	0.92829	5.5	0.10670	1.9	0.60	653.5	11.8	666.7	15.5	711.6	54.9	653.5	11.8	91.8	
3	IWSOE 70-2-22-1-5	386	16796	3.5	16.410	2.6	0.90135	2.8	0.10728	1.0	0.35	656.9	6.2	652.4	13.6	637.0	56.9	656.9	6.2	103.1	
3	IWSOE 70-2-22-1-38	49	2852	3.3	13.438	7.3	1.26264	13.3	0.12306	11.1	0.83	748.2	78.4	829.1	75.5	1052.7	148.1	748.2	78.4	71.1	
3	IWSOE 70-2-22-1-62	137	6980	2.8	14.698	5.2	1.16437	5.3	0.12412	1.0	0.19	754.2	7.1	784.0	29.2	869.7	108.7	754.2	7.1	86.7	
3	IWSOE 70-2-22-1-16	522	314	3.2	14.927	4.7	1.15017	8.3	0.12452	6.9	0.37	756.4	49.0	777.3	45.2	837.9	78.8	756.4	49.0	90.3	
3	IWSOE 70-2-22-1-71	87	5222	10.0	14.108	6.2	1.34394	13.0	0.13752	11.4	0.88	830.6	88.8	864.9	75.7	953.9	127.2	830.6	88.8	87.1	
3	IWSOE 70-2-22-1-59	629	20002	4.8	13.466	6.1	1.76029	6.1	0.17192	1.0	0.16	1022.7	9.5	1031.0	39.7	1048.5	122.1	1048.5	39.7	97.5	
3	IWSOE 70-2-22-1-65	464	34462	3.3	13.465	3.6	1.57968	4.1	0.15427	2.1	0.51	924.8	18.2	962.2	25.7	1048.7	71.6	1048.7	25.7	71.6	
3	IWSOE 70-2-22-1-84	297	18610	2.3	13.387	2.3	1.80854	2.6	0.17559	1.4	0.52	1042.8	13.1	1048.6	17.2	1060.5	45.3	1060.5	45.3	98.3	
3	IWSOE 70-2-22-1-9	880	28958	1.1	15.101	1.9	1.85532	1.9	0.17632	1.0	0.27	1046.7	38.4	1103.3	38.4	1103.3	38.4	1103.3	38.4	94.8	1.8, 1.1
3	IWSOE 70-2-22-1-35	312	23772	2.9	12.802	2.5	2.13662	3.3	0.19839	2.2	0.66	1166.7	23.3	1160.7	22.9	1149.7	49.5	1149.7	22.9	101.5	
3	IWSOE 70-2-22-1-44	118	7348	2.1	12.493	1.7	1.99346	2.6	0.18062	2.0	0.75	1070.4	19.6	1113.3	17.8	1198.1	34.1	1198.1	34.1	89.3	
3	IWSOE 70-2-22-1-49	257	11582	3.2	12.313	3.6	2.15294	3.9	0.19226	1.5	0.38	1133.6	15.2	1166.0	26.8	1226.6	70.3	1226.6	70.3	92.4	
3	IWSOE 70-2-22-1-14	235	94132	3.7	12.017	3.3	2.01877	8.6	0.21154	7.4	0.86	1250.6	70.2	121212							

5	IWSOE 69 G21 26	186	45558	26.5	16.645	3.7	0.70741	7.3	0.08540	6.3	0.86	528.3	32.0	543.2	30.7	606.3	79.6	528.3	32.0	NA
286	94224	67	14.445	6.8	0.85059	21.0	0.08911	19.9	0.95	550.3	105.0	625.0	98.4	905.5	140.4	550.3	105.0	NA	NA	
5	IWSOE 69 G21 25	15	17959	5.9	1.729	0.7	0.7628	1.7	0.0840	1.1	0.60	3.1	560.3	7.5	194.2	24.1	532.0	7.1	NA	NA
5	IWSOE 69 G21 24	211	20473	4.2	16.816	3.1	0.76511	4.4	0.09331	3.0	0.69	575.1	16.7	577.0	19.2	584.3	68.4	575.1	16.7	NA
225	15598	3.7	17.086	2.3	0.77075	3.2	0.09551	2.2	0.70	588.1	12.4	580.2	13.9	549.5	49.4	588.1	12.4	NA	NA	
5	IWSOE 69 G21 27	1065	90701	15.9	15.793	2.5	0.84268	10.1	0.09652	9.8	0.97	594.0	55.4	620.6	46.9	718.9	54.1	594.0	55.4	NA
297	132098	17.5	16.529	1.4	0.85087	3.2	0.10200	2.9	0.90	626.1	17.1	625.1	15.0	621.5	30.5	626.1	17.1	100.8	NA	
5	IWSOE 69 G21 122	291	26274	2.9	16.458	0.5	0.88096	2.2	0.10515	2.1	0.98	644.5	12.9	641.5	10.3	630.9	10.4	644.5	12.9	102.2
5	IWSOE 69 G21 87	258	19519	6.9	16.366	1.1	0.90530	4.0	0.10746	3.8	0.96	658.0	24.0	654.6	19.2	642.9	23.3	658.0	24.0	102.3
5	IWSOE 69 G21 7	236	22417	3.5	16.246	1.3	0.91581	3.4	0.10791	3.1	0.92	660.6	19.7	660.1	16.5	658.5	28.3	660.6	19.7	100.3
5	IWSOE 69 G21 23	160	39536	2.8	15.008	3.0	1.01397	8.9	0.11037	8.4	0.94	674.9	53.8	710.9	45.5	826.2	61.9	674.9	53.8	81.7
5	IWSOE 69 G21 86	317	43421	1.4	12.123	0.9	0.98242	1.6	0.11488	1.3	0.83	701.0	8.1	692.8	7.8	674.9	18.8	701.0	8.5	103.9
5	IWSOE 69 G21 46	351	155196	3.4	13.595	0.7	1.67720	2.3	0.16537	2.2	0.96	986.5	19.8	999.9	14.4	1029.4	13.6	1029.4	13.6	95.8
5	IWSOE 69 G21 54	715	217049	7.3	13.591	0.6	1.62465	2.3	0.16015	2.2	0.96	957.6	19.2	979.8	14.2	1029.9	13.1	1029.9	13.1	93.0
5	IWSOE 69 G21 11	363	182928	1.6	13.585	0.7	1.68238	1.9	0.16576	1.7	0.92	988.7	15.9	1001.9	12.1	1030.8	15.1	1030.8	15.1	95.9
5	IWSOE 69 G21 13	240	189749	3.2	13.476	0.7	1.79496	1.1	0.17544	0.8	0.72	1042.0	7.3	1043.6	6.9	1047.1	14.8	1047.1	14.8	99.5
5	IWSOE 69 G21 8	399	42892	3.3	13.435	0.5	1.80877	0.4	0.17628	1.3	0.91	1046.4	12.8	1048.6	9.3	1053.2	10.5	1053.2	9.5	99.4
5	IWSOE 69 G21 81	392	448446	2.4	13.330	0.8	1.95942	2.1	0.18943	1.9	0.91	1118.3	19.3	1101.7	13.8	1069.1	16.9	1069.1	16.9	104.6
5	IWSOE 69 G21 35	28	39863	2.0	13.312	4.4	1.74418	5.3	0.16839	3.0	0.56	1003.2	27.8	1025.0	34.2	1071.8	88.0	1071.8	88.0	93.6
5	IWSOE 69 G21 121	217	101877	1.9	13.291	1.2	1.88873	3.6	0.18207	3.4	0.95	1078.2	33.7	1077.1	23.8	1074.9	23.2	1074.9	23.2	100.3
5	IWSOE 69 G21 36	272	87122	18.4	13.269	0.9	1.85445	2.3	0.17951	2.1	0.91	1064.4	20.7	1068.9	15.3	1078.2	19.0	1078.2	19.0	98.7
5	IWSOE 69 G21 117	230	56838	2.8	13.265	6.6	1.85243	8.1	0.17821	4.8	0.58	1057.2	46.5	1064.3	53.8	1078.9	132.8	1078.9	132.8	98.0
5	IWSOE 69 G21 59	134	37104	2.0	13.258	1.9	1.95623	2.5	0.18811	1.7	0.67	1111.1	17.3	1106.6	16.9	1079.8	37.3	1079.8	37.3	102.9
5	IWSOE 69 G21 83	283	128422	1.9	13.248	0.4	1.98166	3.0	0.19040	3.0	0.99	1123.6	30.9	1093.3	20.4	1081.4	7.8	1081.4	7.8	103.9
5	IWSOE 69 G21 48	177	93116	1.8	13.221	1.0	1.85628	4.7	0.17799	4.6	0.98	1056.0	45.0	1065.7	31.2	1085.5	20.2	1085.5	20.2	97.3
5	IWSOE 69 G21 7	125	78811	1.3	13.218	4.1	1.90521	1.2	0.19264	1.2	0.94	1081.4	7.3	1082.6	25.9	1086.0	25.9	1086.0	25.9	99.4
5	IWSOE 69 G21 4	79	38802	1.4	13.217	2.0	1.93213	2.4	0.18522	1.4	0.57	1095.4	13.7	1092.3	16.1	1086.0	39.9	1086.0	39.9	100.9
5	IWSOE 69 G21 96	454	30669	5.6	13.217	3.1	1.84985	5.5	0.17733	4.5	0.83	1052.4	44.2	1063.4	36.1	1086.1	61.2	1086.1	61.2	96.9
5	IWSOE 69 G21 45	67	46097	3.7	13.216	3.3	1.90985	4.5	0.18307	3.0	0.67	1083.7	30.3	1084.5	30.1	1086.2	67.1	1086.2	67.1	99.8
5	IWSOE 69 G21 106	274	83830	2.6	13.181	1.3	1.94924	2.1	0.18975	2.1	0.84	1120.0	21.1	1091.6	26.1	1091.6	26.1	1091.6	26.1	98.4
5	IWSOE 69 G21 33	242	178105	1.7	13.179	0.9	1.88910	4.1	0.18057	4.0	0.98	1070.1	39.9	1077.3	27.4	1086.2	17.0	1091.8	17.0	98.0
5	IWSOE 69 G21 10	729	181258	12.3	13.144	0.2	1.92890	2.4	0.18389	2.4	0.99	1088.2	23.6	1091.2	15.8	1097.1	4.8	1097.1	4.8	99.2
5	IWSOE 69 G21 106	492	69659	2.6	13.134	0.4	1.96718	0.8	0.18739	0.7	0.85	1107.2	6.7	1104.3	5.2	1098.7	8.2	1098.7	8.2	100.8
5	IWSOE 69 G21 95	263	61670	5.7	13.118	1.3	1.76388	4.0	0.16782	3.8	0.95	1000.1	34.8	1032.3	25.7	1101.1	25.7	1101.1	25.7	90.8
5	IWSOE 69 G21 94	488	1864	1.6	13.117	1.8	1.87234	1.8	0.18234	1.8	0.92	1121.4	31.7	1102.7	12.0	1109.5	31.7	1102.7	12.0	98.4
5	IWSOE 69 G21 47	430	56680	3.5	13.104	0.4	1.94771	0.9	0.18511	0.8	0.90	1094.8	8.0	1097.7	5.9	1103.3	7.5	1103.3	7.5	99.2
5	IWSOE 69 G21 44	522	168596	15.5	13.091	2.1	1.86727	12.5	0.17729	12.4	0.99	1052.1	119.9	1069.6	83.1	1105.3	42.4	1105.3	42.4	95.2
5	IWSOE 69 G21 120	801	146093	8.7	13.081	0.4	1.81659	9.2	0.17234	9.2	1.00	1025.0	87.2	1051.5	60.4	1106.9	7.4	1106.9	7.4	92.6
5	IWSOE 69 G21 104	271	23599	3.4	13.069	1.5	2.00707	1.0	0.19013	1.0	0.83	1121.1	10.1	1091.9	10.8	1109.6	10.8	1109.6	10.8	91.1
5	IWSOE 69 G21 68	266	234152	3.3	13.042	0.7	1.93713	1.2	0.18323	1.0	0.84	1084.6	10.4	1094.0	8.3	1112.8	13.6	1112.8	13.6	97.5
5	IWSOE 69 G21 16	289	252922	7.8	12.964	1.3	1.99239	2.8	0.18734	2.5	0.88	1106.9	25.3	1112.9	19.0	1124.7	26.5	1124.7	26.5	98.4
5	IWSOE 69 G21 90	87	29692	6.8	12.946	1.9	1.22279	3.1	0.19931	2.5	0.80	1171.6	26.5	1156.2	21.4	1127.5	37.3	1127.5	37.3	103.9
5	IWSOE 69 G21 67	596	33045	3.9	12.930	0.8	1.84433	7.2	0.17296	7.2	0.99	1028.4	68.3	1061.4	47.7	1129.9	16.7	1129.9	16.7	91.0
5	IWSOE 69 G21 111	198	193291	2.3	12.923	0.3	1.91320	2.9	0.19235	2.9	0.99	1160.1	20.0	1151.5	6.8	1129.9	20.0	1151.5	6.8	102.6
5	IWSOE 69 G21 18	455	70756	21.9	12.838	0.6	2.03072	3.4	0.18907	3.4	0.98	1116.4	34.4	1125.9	23.2	1144.2	12.3	1144.2	12.3	97.6
5	IWSOE 69 G21 115	374	12660	8.6	12.634	1.0	2.12171	1.8	0.20266	1.5	0.83	1189.6	16.6	1184.8	12.9	1176.0	20.3	1176.0	20.3	101.2
5	IWSOE 69 G21 62	93	18248	2.7	12.375	8.1	2.17331	10.2	0.19506	6.1	0.60	1148.7	63.8	1172.5	70.8	1216.8	160.5	1216.8	160.5	94.4
5	IWSOE 69 G21 29	60	83396	1.6	5.303	0.5	1.83203	4.7	0.53149	4.7	0.99	2747.7	104.9	2737.5	44.7	2729.9	8.7	2729.9	8.7	100.7
6	IWSOE 68 13-8-1 81	163	426	1.6	24.851	21.7	0.14709	21.7	0.02651	1.0	0.05	168.7	1.7	139.3	28.3	-335.6	563.3	168.7	1.7	NA 2.3, 2.3
357	1148	2.0	21.132	7.0	0.18607	7.1	0.02852	1.0	0.14	181.3	1.8	173.3	11.3	65.5	167.8	181.3	1.8	NA	NA	
6	IWSOE 68 13-8-1 52	269	88	1.4	21.306	7.2	0.18723	7.3	0.02893	1.4	0.19	183.9	2.5	174.3	11.7	45.9	172.3	183.9	2.5	NA
469	1126	16.6	15.820	3.9	0.66360	3.9	0.07638	1.0	0.25	474.5	4.9	517.8	40.0	525.4	82.4	517.8	40.0	525.4	82.4	NA
6	IWSOE 68 13-8-1 12	141	740	2.8	19.098	10.8	0.59364	10.8	0.08222	1.0	0.09	509.4	4.9	473.2	40.9	301.3	246.0	509.4	4.9	NA
6	IWSOE 68 13-8-1 27	1089	10856	4.2	16.746	3.7	0.69982	4.3	0.08500	2.1	0.51	525.9	11.0	530.7	18.0	593.2	80.5	525.9	11.0	NA
6	IWSOE 68 13-8-1 102	165	1414	3.4	18.487	8.7	0.63628	9.0	0.08531	2.6	0.29	527.8	13.2	500.8	35.7	374.8	195.1	527.8	13.2	NA
6	IWSOE 68 13-8-1 106	190	278	6.7	18.428	5.5	0.65664	5.7	0.08452	2.4	0.44	494.2	51.2	510.6	12.4	444.4	512.5	510.6	12.4	NA
6	IWSOE 68 13-8-1 6	215	3194	12.8	17.366	3.6	0.70948	3.8	0.08936	1.0	0.25	551.8	5.3	544.4	15.9	513.9	80.1	551.8	5.3	NA
6	IWSOE 68 13-8-1 15	598	7868	3.9	16.955	2.6	0.74242	3.0	0.09129	1.6	0.51	563.2	8.4	563.8	13.1	566.4	56.6	563.2	8.4	NA
6	IWSOE 68 13-8-1 103	191	1334	7.1	17.515	3.9	0.72412	4.0	0.09199	1.0	0.25	567.3	5.5	553.1	17.2	495.1	86.1	567.3	5.5	NA
6	IWSOE 68 13-8-1 64	452	1516	12.1	15.216	3.7	0.85772	3.8	0.09465	1.0	0.26	583.0	5.6							

7	ISWSE 70-3-11-3-107	87	20827	18	17.497	6.1	0.70945	6.8	0.09029	2.9	0.43	555.7	15.6	544.4	28.6	497.5	135.2	555.7	15.6	6	NA
7	ISWSE 70-3-11-3-127	180	37374	25	17.016	2.0	0.73164	2.6	0.0903	1.6	0.62	557.3	87	557.2	112	558.6	445	557.3	87	NA	NA
7	ISWSE 70-3-11-3-22	377	47184	20	17.183	1.5	0.73104	3.9	0.09110	3.6	0.92	562.1	19.4	557.2	16.8	577.2	33.3	562.1	19.4	NA	NA
7	ISWSE 70-3-11-3-128	859	24112	120	16.928	0.6	0.74239	1.3	0.09114	1.1	0.89	562.3	61.1	563.8	5.5	569.9	127	562.3	61.1	NA	NA
7	ISWSE 70-3-11-3-38	888	25103	8	16.903	0.2	0.79133	0.7	0.09133	0.7	0.91	562.3	44	581.2	15.8	582.3	62.2	562.3	44	NA	NA
7	ISWSE 70-3-11-3-75	325	12210	10.8	16.690	2.9	0.75836	0.9	0.09180	2.1	0.59	566.6	11.3	571.3	15.5	600.6	61	566.6	11.3	NA	NA
7	ISWSE 70-3-11-3-75	788	239473	2.6	16.161	1.3	0.78771	7.9	0.09233	7.8	0.99	569.3	42.4	589.9	35.3	669.8	28.4	569.3	42.4	NA	NA
7	ISWSE 70-3-11-3-74	128	26819	0.5	16.867	2.4	0.75634	2.7	0.09252	1.1	0.41	570.4	6.1	571.9	11.7	577.7	53.1	570.4	6.1	NA	NA
7	ISWSE 70-3-11-3-69	1019	34553	25	16.380	0.6	0.78221	2.3	0.09293	2.2	0.97	572.8	12.3	586.7	10.4	604.1	13.1	572.8	12.3	NA	NA
7	ISWSE 70-3-11-3-96	1729	35133	11	17.066	0.7	0.79133	0.7	0.09293	0.7	1.07	572.8	12.3	586.7	10.4	604.1	13.1	572.8	12.3	NA	NA
7	ISWSE 70-3-11-3-90	544	145812	18	17.126	0.9	0.74966	1.9	0.09312	1.7	0.88	573.9	3.9	568.0	8.4	544.5	20.3	573.9	3.9	NA	NA
7	ISWSE 70-3-11-3-101	535	21184	0.8	16.803	1.0	0.78003	3.6	0.09536	3.4	0.96	585.4	19.2	585.5	15.9	586.6	20.8	585.4	19.2	NA	NA
7	ISWSE 70-3-11-3-72	411	34250	5.4	16.495	0.9	0.79646	1.2	0.09528	2.0	0.91	586.7	11.0	594.8	8.7	626.0	19.2	586.7	11.0	NA	NA
7	ISWSE 70-3-11-3-72	158	34250	5.4	16.495	0.9	0.79646	1.2	0.09528	2.0	0.91	586.7	11.0	594.8	8.7	626.0	19.2	586.7	11.0	NA	NA
7	ISWSE 70-3-11-3-102	833	265914	16.0	16.789	0.4	0.79611	0.6	0.09694	0.5	0.77	596.5	2.8	594.6	2.9	587.7	8.9	596.5	2.8	NA	NA
7	ISWSE 70-3-11-3-99	138	114540	3.4	16.726	1.1	0.83209	4.4	0.10094	4.3	0.97	591.9	25.2	614.8	20.3	595.9	23.7	591.9	25.2	104.0	NA
7	ISWSE 70-3-11-3-63	251	80388	3.4	16.353	1.5	0.85395	1.8	0.10128	1.0	0.57	621.9	6.0	626.8	8.4	646.4	31.6	621.9	6.0	96.5	NA
7	ISWSE 70-3-11-3-96	790	10719	19	16.064	1.7	0.85395	1.8	0.10128	1.0	0.57	621.9	6.0	626.8	8.4	646.4	31.6	621.9	6.0	96.5	NA
7	ISWSE 70-3-11-3-113	477	59544	18	16.078	0.8	0.91369	10.8	0.10655	10.5	1.00	652.7	65.3	659.0	51.2	680.8	17.0	652.7	65.3	95.9	NA
7	ISWSE 70-3-11-3-33	657	31869	3.9	16.126	1.5	0.93250	8.8	0.10965	8.7	0.99	667.3	54.9	669.0	43.1	674.5	31.7	667.3	54.9	98.9	NA
7	ISWSE 70-3-11-3-131	731	60303	4.3	16.186	1.4	0.93585	10.8	0.10986	10.7	0.99	671.9	68.3	670.7	53.1	666.9	30.7	671.9	68.3	100.1	NA
7	ISWSE 70-3-11-3-138	131	36336	1.0	15.870	2.4	1.02168	4.5	0.12059	3.9	0.88	716.7	6.8	714.8	23.3	708.0	9.0	716.7	6.8	103.8	NA
7	ISWSE 70-3-11-3-45	127	150245	2.4	14.079	0.7	1.02168	4.5	0.12059	3.9	0.88	716.7	6.8	714.8	23.3	708.0	9.0	716.7	6.8	103.8	NA
7	ISWSE 70-3-11-3-66	178	4612	3.8	14.833	1.4	1.10660	2.1	0.11905	1.6	0.75	725.1	10.7	756.5	11.2	850.9	29.0	725.1	10.7	85.2	NA
7	ISWSE 70-3-11-3-100	243	59849	2.5	14.813	1.2	1.14192	3.2	0.12268	3.0	0.93	746.0	20.8	773.4	17.2	835.3	24.7	746.0	20.8	87.4	NA
7	ISWSE 70-3-11-3-99	245	31628	2.7	14.400	2.3	1.17592	18.8	0.12302	18.7	0.99	747.9	131.7	790.3	103.6	912.0	46.8	747.9	131.7	82.0	NA
7	ISWSE 70-3-11-3-91	251	31628	2.7	14.400	2.3	1.17592	18.8	0.12302	18.7	0.99	747.9	131.7	790.3	103.6	912.0	46.8	747.9	131.7	82.0	NA
7	ISWSE 70-3-11-3-41	251	77001	3.0	14.965	1.7	1.20182	6.3	0.14044	6.1	0.96	790.4	25.2	801.4	35.1	832.3	36.1	790.4	25.2	95.0	NA
7	ISWSE 70-3-11-3-54	165	30763	3.2	14.323	1.9	1.37336	7.6	0.14256	7.4	0.97	859.1	59.8	877.2	44.9	923.1	38.8	859.1	59.8	93.1	NA
7	ISWSE 70-3-11-3-58	41	19274	4.5	14.204	2.9	1.48188	15.8	0.15265	12.7	0.81	915.8	108.8	923.0	95.8	940.2	190.6	940.2	190.6	97.4	NA
7	ISWSE 70-3-11-3-73	494	14258	8.4	14.588	0.9	1.51732	6.2	0.16134	6.2	0.95	917.3	67.4	916.7	67.4	916.7	67.4	917.3	67.4	90.8	NA
7	ISWSE 70-3-11-3-78	117	81579	1.5	13.867	1.7	1.42976	4.7	0.14379	4.4	0.94	866.1	35.9	901.4	28.3	989.2	33.8	866.1	35.9	98.9	NA
7	ISWSE 70-3-11-3-6	1029	16151	5.2	13.716	0.7	1.34106	3.0	0.13341	2.9	0.97	807.3	12.8	863.7	17.3	1011.3	14.4	1011.3	14.4	79.8	NA
7	ISWSE 70-3-11-3-64	153	109892	1.8	13.649	0.9	1.56454	1.5	0.15488	1.2	0.78	929.8	10.3	956.2	9.2	1021.2	18.3	1021.2	18.3	90.9	NA
7	ISWSE 70-3-11-3-21	106	13063	1.7	13.944	0.9	1.56454	1.5	0.15488	1.2	0.78	929.8	10.3	956.2	9.2	1021.2	18.3	1021.2	18.3	90.9	NA
7	ISWSE 70-3-11-3-49	281	59847	3.3	13.467	0.8	1.89827	2.2	0.18541	2.0	0.94	1096.5	20.1	1080.5	14.4	1048.5	15.3	1048.5	15.3	104.6	NA
7	ISWSE 70-3-11-3-8	294	51345	2.7	13.192	0.7	1.79743	13.0	0.17197	12.9	1.00	1023.0	122.4	1045.4	84.8	1089.9	14.8	1089.9	14.8	93.9	NA
7	ISWSE 70-3-11-3-25	368	136992	2.8	13.049	0.9	2.06125	4.6	0.19508	4.5	0.98	1148.9	47.1	1136.0	31.3	1111.6	18.6	1111.6	18.6	103.4	NA
7	ISWSE 70-3-11-3-60	386	146562	4.2	12.976	0.7	1.86199	5.8	0.19666	5.3	0.97	1148.9	47.1	1136.0	31.3	1111.6	18.6	1111.6	18.6	103.4	NA
7	ISWSE 70-3-11-3-75	58	28	2.9	12.862	3.5	2.01292	2.2	0.21491	2.2	0.54	1199.9	29.9	1122.9	29.9	1140.4	69.0	1140.4	69.0	97.7	NA
7	ISWSE 70-3-11-3-15	158	135803	4.6	12.767	1.7	2.13782	6.2	0.19895	5.9	0.96	1164.3	62.9	1161.1	42.2	1155.2	34.3	1155.2	34.3	100.8	NA
7	ISWSE 70-3-11-3-98	488	12644	3.3	12.719	5.6	1.78998	6.0	0.16512	2.1	0.35	985.2	19.5	1041.8	39.2	1162.6	111.5	1162.6	111.5	84.7	NA
7	ISWSE 70-3-11-3-51	353	104610	10.8	12.554	0.4	2.24664	1.8	0.20566	1.7	0.97	1199.7	18.8	1195.7	12.4	1188.5	8.3	1188.5	8.3	101.9	NA
7	ISWSE 70-3-11-3-62	386	12644	3.3	12.719	5.6	1.78998	6.0	0.16512	2.1	0.35	985.2	19.5	1041.8	39.2	1162.6	111.5	1162.6	111.5	84.7	NA
7	ISWSE 70-3-11-3-61	212	83974	1.6	11.244	2.4	2.95145	0.9	0.23770	0.6	0.65	1374.7	7.4	1385.6	6.9	1402.3	13.3	1402.3	13.3	98.0	NA
7	ISWSE 70-3-11-3-86	77	74693	1.0	10.921	0.8	3.20197	1.1	0.25386	0.8	0.72	1458.4	10.7	1458.4	8.8	1458.5	15.0	1458.5	15.0	100.0	NA
7	ISWSE 70-3-11-3-26	452	91562	1.8	9.877	0.5	3.84352	1.4	0.27534	1.3	0.93	1567.8	18.8	1601.1	17.1	1647.0	9.7	1647.0	9.7	95.2	NA
7	ISWSE 70-3-11-3-64	86	34353	0.6	9.828	0.9	4.08289	0.6	0.28592	0.6	0.94	1444.7	20.3	1444.7	20.3	1444.7	20.3	1444.7	20.3	90.8	NA
7	ISWSE 70-3-11-3-104	259	228759	1.0	9.594	1.2	4.14387	1.5	0.28835	0.9	0.60	1633.3	13.2	1663.0	12.4	1707.0	22.2	1707.0	22.2	96.0	NA
7	ISWSE 70-3-11-3-2	220	16523	1.4	9.416	0.7	4.29265	3.8	0.29316	3.8	0.98	1657.3	54.9	1692.0	31.5	1735.1	12.9	1735.1	12.9	95.5	NA
7	ISWSE 70-3-11-3-77	297	3145	0.5	9.182	1.3	3.25739	4.0	0.21692	3.8	0.96	1265.6	43.8	1470.9	30.8	1781.3	19.6	1781.3	19.6	71.0	NA
7	ISWSE 70-3-11-3-21	372	3145	0.5	9.182	1.3	3.25739	4.0	0.21692	3.8	0.96	1265.6	43.8	1470.9	30.8	1781.3	19.6	1781.3	19.6	71.0	NA
7	ISWSE 70-3-11-3-52	194	258895	1.7	9.124	0.3	4.88965	1.0	0.32356	1.0	0.96	1807.1	15.3	1800.5	8.5	1792.8	4.9	1792.8	4.9	100.8	NA
7	ISWSE 70-3-11-3-125	479	3051	1.7	8.298	3.8	5.07384	7.6	0.30537	6.6	0.86	1717.9	99.2	1831.7	64.8	1963.7	68.7	1963.7	68.7	87.5	NA
7	ISWSE 70-3-11-3-44	199	165900	1.1	6.200	1.2	8.46090	1.4	0.38048	14.4	1.00	2078.5	255.7	2281.7	131.8	2461.9	19.9	2461.9	19.9	84.2	NA
7	ISWSE 70-3-11-3-115	134	367411	1.5	5.675	0.3	12.62990	1.9	0.51986	1.9	0.99	2698.6	42.4	2652.5	18.3	2617.4	4.5	2617.4	4.5	103.1	NA
8	IO 1578-27-1	104	76429	3.0	13.354	1.2	1.83625	2.3	0.17768	1.9	0.84	1055.2	18.5	1058.5	14.8	1065.4	24.5	1065.4	24.5	99.0	1.4, 1.4
8	IO 1578-27-2	229																			

9	IO 1578-28 79	224	141132	9.7	13.972	1.9	1.23069	7.8	0.12471	7.5	0.97	757.6	53.8	814.7	43.5	973.7	39.2	757.6	53.8	77.8
9	IO 1578-28 100	221	9077	7.8	13.729	5.8	1.29039	9.9	0.12849	8.0	0.81	779.2	58.5	841.5	56.6	1009.4	118.6	779.2	58.5	77.2
9	IO 1578-28 84	1140	258575	13.5	13.943	2.3	1.33074	7.4	0.13450	7.2	0.93	834.9	7.2	918.0	51.8	913.5	53.0	81.5	81.5	81.5
9	IO 1578-28 69	106	84263	1.8	13.763	2.6	1.57114	8.5	0.15683	8.1	0.95	939.1	70.5	958.9	52.7	1004.5	52.9	1004.5	52.9	93.5
9	IO 1578-28 104	169	49585	3.3	13.744	1.6	1.68559	3.8	0.16803	3.4	0.91	1001.2	31.9	1003.1	24.1	1007.2	31.9	1007.2	31.9	99.4
9	IO 1578-28 74	390	39940	2.6	13.706	1.2	1.47680	5.5	0.14680	5.4	0.98	883.0	44.5	920.9	33.5	1012.9	24.6	1012.9	24.6	87.2
9	IO 1578-28 99	116	65533	2.8	13.679	3.5	1.68533	19.7	0.16720	19.4	0.98	996.7	179.1	1003.0	126.2	1016.8	70.0	1016.8	70.0	98.0
9	IO 1578-28 61	298	72074	3.9	13.425	0.8	1.79630	1.4	0.17490	1.2	0.81	1039.1	11.4	1044.1	9.3	1054.7	16.2	1054.7	16.2	98.5
9	IO 1578-28 68	255	106882	2.8	13.392	1.2	1.79862	6.3	0.17470	6.2	0.98	1037.9	59.6	1045.0	41.3	1059.7	24.5	1059.7	24.5	98.0
9	IO 1578-28 27	367	39702	3.3	13.235	1.4	1.85513	5.7	0.17807	5.6	0.97	1056.4	54.3	1065.3	37.9	1083.4	27.9	1083.4	27.9	97.5
9	IO 1578-28 88	248	51962	2.2	13.048	0.8	1.95419	1.4	0.18494	1.1	0.81	1093.9	11.5	1099.9	9.5	1111.8	16.5	1111.8	16.5	98.4
9	IO 1578-28 72	238	74517	1.1	13.936	0.8	1.81512	4.7	0.17029	4.7	0.98	1013.7	43.9	1020.9	31.1	1129.1	16.6	1129.1	16.6	89.8
9	IO 1578-28 90	292	88384	1.6	12.827	0.7	2.07437	2.7	0.19298	2.6	0.97	1137.5	27.5	1140.4	18.7	1145.9	13.9	1145.9	13.9	99.3
9	IO 1578-28 48	795	525288	5.3	12.742	0.5	2.11550	1.1	0.19550	1.0	0.91	1151.1	10.8	1153.9	7.8	1159.1	9.3	1159.1	9.3	99.3
9	IO 1578-28 62	68	556	0.4	12.463	2.0	2.03420	2.4	0.18388	1.3	0.53	1088.1	12.6	1127.0	16.0	1202.8	39.3	1202.8	39.3	90.5
9	IO 1578-28 63	114	23084	2.4	12.365	2.9	2.11017	5.2	0.18923	4.3	0.83	1117.2	44.5	1152.1	35.8	1218.4	56.4	1218.4	56.4	91.7
9	IO 1578-28 73	64	116636	0.8	6.074	0.6	1.01894	1.6	0.44660	1.5	0.93	2389.0	29.6	2451.6	14.7	2503.9	9.7	2503.9	9.7	NA
10	IO 1578-28 31-72 64	71	1552	0.9	16.244	12.7	0.40981	12.9	0.04828	2.5	0.19	304.0	7.4	348.7	38.1	658.9	272.6	304.0	7.4	NA 2.7, 1.6
10	IO 1578-28 31-72 85	173	4370	1.0	16.757	5.8	0.61084	7.3	0.07424	4.4	0.61	461.6	19.6	484.1	28.0	591.9	125.6	461.6	19.6	NA
10	IO 1578-28 31-72 1	190	5422	13.9	17.577	2.0	0.62336	3.8	0.07947	3.7	0.85	492.9	15.1	492.0	14.7	487.3	44.1	492.9	15.1	NA
10	IO 1578-28 31-72 28	150	520	1.4	18.039	4.5	0.62603	4.7	0.08190	1.2	0.25	507.5	5.7	493.6	18.2	429.8	100.5	507.5	5.7	NA
10	IO 1578-28 31-72 130	112	4522	1.3	18.034	6.7	0.62981	6.8	0.08238	1.5	0.22	510.3	7.4	496.0	26.8	430.5	148.6	510.3	7.4	NA
10	IO 1578-28 31-72 72	741	21004	0.9	14.539	6.6	0.73822	10.0	0.08265	7.4	0.75	511.9	36.6	587.7	44.5	892.1	136.9	511.9	36.6	NA
10	IO 1578-28 31-72 40	52	2072	1.7	17.423	10.3	0.65836	10.3	0.08319	1.0	0.10	515.2	5.0	513.6	41.5	506.7	226.0	515.2	5.0	NA
10	IO 1578-28 31-72 90	154	5156	5.3	17.550	2.2	0.65687	4.0	0.08351	1.1	0.29	517.6	11.4	517.6	11.4	517.6	11.4	517.6	11.4	NA
10	IO 1578-28 31-72 65	623	19272	3.9	17.088	1.9	0.67702	2.2	0.08391	1.0	0.46	519.4	5.0	525.0	8.9	549.2	42.3	519.4	5.0	NA
10	IO 1578-28 31-72 16	158	672	2.4	14.202	10.3	0.81584	10.4	0.08403	1.6	0.15	520.1	7.9	605.7	47.5	940.4	211.4	520.1	7.9	NA
10	IO 1578-28 31-72 32	71	2950	##	16.998	9.1	0.68250	9.4	0.08414	2.6	0.27	520.8	13.0	528.3	38.9	560.8	198.1	520.8	13.0	NA
10	IO 1578-28 31-72 119	354	12490	8.2	17.096	3.2	0.68838	3.4	0.08538	1.0	0.30	529.0	5.1	531.8	13.9	548.2	70.2	529.0	5.1	NA
10	IO 1578-28 31-72 75	302	10032	4.9	17.055	2.2	0.69045	2.4	0.08540	1.0	0.42	528.3	5.1	533.1	9.9	553.5	47.2	528.3	5.1	NA
10	IO 1578-28 31-72 159	299	17544	3.0	17.263	1.7	0.68743	2.5	0.08607	1.8	0.74	532.3	9.3	531.3	10.3	526.9	37.0	532.3	9.3	NA
10	IO 1578-28 31-72 135	144	582	8.8	12.350	6.6	0.96220	7.3	0.08188	3.2	0.44	532.9	16.4	684.4	36.5	1220.8	129.6	532.9	16.4	NA
10	IO 1578-28 31-72 8	134	4452	4.7	16.806	5.9	0.71864	8.0	0.08759	5.4	0.68	541.3	28.1	549.9	34.0	585.5	127.8	541.3	28.1	NA
10	IO 1578-28 31-72 87	785	11086	6.1	16.847	9.9	0.72450	10.1	0.08852	1.2	0.21	540.8	11.4	552.3	12.2	580.4	114.8	540.8	11.4	NA
10	IO 1578-28 31-72 47	36	838	1.8	14.372	15.6	0.80556	15.6	0.08866	1.4	0.99	547.6	7.1	625.0	73.1	916.0	322.4	547.6	7.1	NA
10	IO 1578-28 31-72 56	321	14532	4.9	17.132	2.1	0.71586	4.1	0.08895	3.5	0.86	549.3	18.5	548.2	17.4	543.7	46.2	549.3	18.5	NA
10	IO 1578-28 31-72 70	229	7892	5.8	16.180	4.9	0.74250	5.4	0.08968	2.1	0.39	553.6	11.1	576.4	23.6	667.4	105.8	553.6	11.1	NA
10	IO 1578-28 31-72 126	355	14236	6.3	16.598	4.3	0.78389	3.8	0.09138	3.8	0.67	554.5	20.4	587.7	25.8	718.3	91.6	554.5	20.4	NA
10	IO 1578-28 31-72 73	183	9298	2.4	16.451	5.3	0.76285	5.6	0.09102	2.1	0.36	561.6	11.0	575.7	24.8	631.6	113.2	561.6	11.0	NA
10	IO 1578-28 31-72 54	172	5022	0.7	17.196	3.9	0.73750	4.0	0.09198	1.0	0.25	567.2	5.4	560.9	17.4	535.6	85.4	567.2	5.4	NA
10	IO 1578-28 31-72 8	64	240	0.2	15.432	5.3	0.82419	5.4	0.09224	1.2	0.22	568.8	6.5	610.4	24.9	767.9	117.1	568.8	6.5	NA
10	IO 1578-28 31-72 78	377	1554	16.9	15.302	2.8	0.84233	3.0	0.09336	1.2	0.41	575.4	6.8	619.8	14.1	785.7	58.2	575.4	6.8	NA
10	IO 1578-28 31-72 118	665	27204	19.8	15.463	9.9	0.84613	1.1	0.09456	1.2	0.32	576.4	9.2	590.7	22.2	630.2	106.2	576.4	9.2	NA
10	IO 1578-28 31-72 109	243	13664	1.9	16.313	4.7	0.80274	5.4	0.09498	2.7	0.51	584.9	15.3	598.4	24.4	649.8	99.9	584.9	15.3	NA
10	IO 1578-28 31-72 96	343	23684	5.9	16.221	3.2	0.80758	3.6	0.09501	1.8	0.49	585.1	10.0	601.1	16.5	661.9	67.8	585.1	10.0	NA
10	IO 1578-28 31-72 14	241	12292	7.3	16.795	3.9	0.81755	4.5	0.09522	2.3	0.50	586.4	12.6	586.5	20.2	587.0	85.6	586.4	12.6	NA
10	IO 1578-28 31-72 104	154	9524	3.4	17.024	2.1	0.80913	2.4	0.09613	1.4	0.56	591.5	10.4	591.7	14.1	585.1	59.5	591.5	10.4	NA
10	IO 1578-28 31-72 132	517	17268	3.9	16.488	2.8	0.85138	3.8	0.10181	2.5	0.66	625.0	14.8	625.4	17.5	626.9	60.9	625.0	14.8	99.7
10	IO 1578-28 31-72 6	366	17674	9.9	13.862	3.1	1.33998	8.9	0.13471	8.4	0.94	814.7	64.1	863.2	52.0	989.9	63.5	814.7	64.1	82.3
10	IO 1578-28 31-72 77	278	19524	1.6	13.922	3.1	1.40576	9.7	0.14194	4.9	0.85	855.6	38.9	891.4	34.0	981.1	62.4	855.6	38.9	87.2
10	IO 1578-28 31-72 26	198	16230	3.7	13.662	3.1	1.72399	3.6	0.17082	1.8	0.51	1016.6	17.2	1017.5	23.0	1019.4	62.4	1019.4	62.4	99.7
10	IO 1578-28 31-72 106	886	29457	16.3	16.875	3.6	1.06785	5.5	0.17278	5.5	0.77	1065.8	35.6	1069.5	25.7	1072.8	72.5	1072.8	72.5	98.9
10	IO 1578-28 31-72 99	735	5426	7.3	13.217	2.9	1.52904	3.9	0.14657	2.6	0.67	881.7	21.3	942.1	23.8	1086.1	57.7	1086.1	57.7	81.2
10	IO 1578-28 31-72 11	253	23588	6.5	13.113	3.5	1.98136	3.7	0.18844	1.2	0.33	1112.9	12.6	1109.2	25.0	1101.9	101.9	1101.9	101.9	101.0
10	IO 1578-28 31-72 117	659	25824	2.1	5.620	7.7	9.50906	10.2	0.38757	6.8	0.66	2111.5	121.6	2388.4	94.2	2633.8	127.8	2633.8	127.8	80.2
10	IO 1578-28 31-72 103	129	6232	0.7	5.150	3.9	12.31502	4.4	0.45341	3.4	0.53	2319.4	4.8	2319.4	4.8	2319.4	4.8	2319.4	4.8	NA
10	IO 1578-28 31-72 98	315	38700	3.3	5.062	4.6	11.29807	6.6	0.41475	4.7	0.71	2236.6	88.5	2548.0	61.4	2806.2	75.6	2806.2	75.6	79.7
10	IO 1578-28 31-72 38	447	67150	6.7	4.874	12.5	13.79654	14.1	0.48767	6.6	0.47	2560.6	139.3	2735.8	134.2	2867.9	203.5	2867.9	203.5	89.3
10	IO 1578-28 31-72 38	234	23316	2.2	4.189	4.3	14.57976	6.0	0.44295	4.3	0.71	2363.8	84.5</							

11	IO 1578-16 130-132 12	470	103788	1.9	13.329	0.6	1.82895	4.3	0.17681	4.2	0.99	1049.5	40.9	1055.9	28.0	1069.2	11.8	1069.2	11.8	98.2
11	IO 1578-16 130-132 35	229	95788	3.0	13.238	0.8	1.83978	1.8	0.17664	1.5	0.88	1048.6	14.9	1059.8	11.5	1082.9	16.6	1082.9	16.6	96.8
11	IO 1578-16 130-132 22	445	19007	2.2	13.192	0.5	1.90059	2.6	0.18170	2.6	0.98	1076.3	25.8	1081.3	17.6	1091.5	9.1	1091.5	9.1	98.1
11	IO 1578-16 130-132 11	222	44330	2.5	13.181	1.0	1.89011	8.8	0.18070	8.7	0.99	1070.8	85.8	1077.6	58.2	1091.5	20.6	1091.5	20.6	98.1
11	IO 1578-16 130-132 4	139	41740	0.7	12.912	3.1	2.08028	5.3	0.19482	4.2	0.80	1147.4	44.6	1142.3	36.2	1132.6	62.4	1132.6	62.4	101.3
11	IO 1578-16 130-132 64	175	38234	1.2	12.809	1.5	2.06334	5.1	0.19168	4.9	0.96	1130.5	51.0	1136.7	35.2	1148.7	29.9	1148.7	29.9	98.4
11	IO 1578-16 130-132 43	306	2603	0.0	12.555	3.9	1.70324	8.1	0.15509	7.1	0.87	929.4	61.1	1009.7	51.8	1188.4	78.0	1188.4	78.0	78.2
11	IO 1578-16 130-132 63	283	22684	0.4	12.510	4.8	1.72914	18.6	0.15781	17.9	0.97	944.6	157.7	1023.2	120.4	1195.4	95.6	1195.4	95.6	79.0
11	IO 1578-16 130-132 16	220	28269	4.7	9.282	0.4	4.63500	3.5	0.31203	3.5	0.99	1750.7	53.7	1755.6	29.5	1761.4	8.2	1761.4	8.2	99.4
11	IO 1578-16 130-132 21	166	14330	0.8	8.723	0.4	5.30690	2.1	0.33573	2.1	0.98	1866.1	33.9	1870.0	18.3	1874.3	7.8	1874.3	7.8	99.6
11	IO 1578-16 130-132 46	416	108071	2.1	7.844	4.2	5.90426	10.4	0.33590	9.5	0.91	1866.9	154.2	1961.9	90.6	2063.6	74.8	2063.6	74.8	90.5
12	IO 1578-70 3-18-01 22	270	26969	1.6	19.699	7.2	0.31606	7.6	0.04515	2.3	0.30	284.7	6.4	278.9	18.5	230.2	167.4	284.7	6.4	NA
12	IO 1578-70 3-18-01 23	963	107836	5.0	17.257	1.0	0.65612	2.7	0.08212	2.5	0.93	508.8	12.5	512.2	11.0	527.8	22.3	508.8	12.5	NA
12	IO 1578-70 3-18-01 62	69	8757	2.0	16.436	10.5	0.69330	10.7	0.08265	1.8	0.16	511.9	8.6	534.8	44.4	633.6	227.0	511.9	8.6	NA
12	IO 1578-70 3-18-01 40	498	87759	1.1	17.060	1.8	0.67071	3.4	0.08299	2.9	0.86	513.9	14.4	521.1	13.8	552.9	38.3	513.9	14.4	NA
12	IO 1578-70 3-18-01 57	366	114059	2.7	17.172	3.5	0.66886	2.0	0.08301	1.3	0.64	514.1	3.2	520.0	20.0	546.3	33.3	514.1	3.2	NA
12	IO 1578-70 3-18-01 19	197	32611	1.9	17.533	1.6	0.65564	2.2	0.08337	1.5	0.70	516.2	7.6	511.9	8.8	492.9	34.8	516.2	7.6	NA
12	IO 1578-70 3-18-01 21	270	45242	1.5	17.080	2.1	0.67708	3.1	0.08388	2.3	0.73	519.2	11.3	525.0	12.7	505.3	45.8	519.2	11.3	NA
12	IO 1578-70 3-18-01 76	299	43576	2.4	17.710	1.7	0.65320	2.1	0.08390	1.2	0.58	519.4	6.1	510.4	8.4	470.8	37.9	519.4	6.1	NA
12	IO 1578-70 3-18-01 61	217	45053	3.7	17.526	1.8	0.66797	3.8	0.08491	3.1	0.88	525.4	16.8	519.5	15.3	493.7	39.5	525.4	16.8	NA
12	IO 1578-70 3-18-01 14	122	9260	1.9	17.225	3.5	0.68006	4.2	0.08496	2.2	0.53	525.7	11.1	526.8	17.1	531.8	77.7	525.7	11.1	NA
12	IO 1578-70 3-18-01 9	336	61073	3.8	17.412	2.9	0.67718	7.1	0.08552	6.5	0.91	529.0	33.1	525.1	29.3	508.2	63.7	529.0	33.1	NA
12	IO 1578-70 3-18-01 51	523	44512	3.2	17.260	1.3	0.68602	3.7	0.08588	3.5	0.94	531.1	17.9	530.4	15.5	527.4	28.4	531.1	17.9	NA
12	IO 1578-70 3-18-01 67	351	4703	2.2	16.902	3.8	0.70439	4.5	0.08635	2.5	0.55	533.9	12.6	541.4	18.9	573.2	82.2	533.9	12.6	NA
12	IO 1578-70 3-18-01 50	452	18415	2.9	16.922	1.6	0.69021	2.5	0.08650	1.2	0.68	535.4	7.6	537.2	19.4	538.4	35.4	535.4	7.6	NA
12	IO 1578-70 3-18-01 24	109	44046	4.7	16.901	3.1	0.71853	11.8	0.08807	11.4	0.96	544.1	59.3	549.8	50.0	573.3	67.4	544.1	59.3	NA
12	IO 1578-70 3-18-01 11	74	17870	1.1	16.099	8.6	0.75470	16.7	0.08812	14.3	0.86	544.4	74.8	570.9	73.0	678.1	183.1	544.4	74.8	NA
12	IO 1578-70 3-18-01 28	50	13728	2.5	17.197	7.2	0.71821	7.4	0.08958	1.9	0.25	553.0	10.0	549.6	31.6	535.5	157.8	553.0	10.0	NA
12	IO 1578-70 3-18-01 33	248	94908	4.3	16.977	2.3	0.74529	3.0	0.09129	2.0	0.67	554.9	3.0	565.5	49.5	566.5	50.0	554.9	3.0	NA
12	IO 1578-70 3-18-01 18	639	120262	14.1	17.158	0.6	0.74282	1.6	0.09244	1.4	0.92	570.0	70.9	546.1	6.8	540.3	13.8	570.0	70.9	NA
12	IO 1578-70 3-18-01 48	151	57087	99.0	16.382	2.9	0.77965	5.4	0.09263	4.6	0.85	571.1	25.3	585.3	24.2	640.7	61.5	571.1	25.3	NA
12	IO 1578-70 3-18-01 36	175	58703	3.7	16.686	1.9	0.76722	2.2	0.09285	1.0	0.45	572.3	5.4	578.2	9.6	601.1	42.2	572.3	5.4	NA
12	IO 1578-70 3-18-01 26	60	23632	1.8	16.897	4.6	0.79417	5.2	0.09732	2.4	0.45	598.7	13.5	593.5	23.3	573.9	100.7	598.7	13.5	NA
12	IO 1578-70 3-18-01 13	74	22113	68.7	16.732	1.1	0.80296	1.1	0.09806	1.1	0.85	602.1	61.9	602.9	61.9	629.4	41.0	602.9	61.9	104.9
12	IO 1578-70 3-18-01 39	205	21480	3.0	16.597	6.0	0.82154	6.6	0.09889	2.8	0.42	607.9	16.2	608.9	30.5	612.7	130.4	607.9	16.2	99.2
12	IO 1578-70 3-18-01 44	149	40857	2.9	16.626	4.1	0.82332	4.6	0.09928	2.0	0.44	610.2	11.8	609.9	21.2	608.8	89.7	610.2	11.8	100.2
12	IO 1578-70 3-18-01 56	818	260767	18.4	16.577	0.3	0.83418	3.8	0.10029	3.8	1.00	616.2	22.4	615.9	17.7	615.3	6.8	616.1	22.4	100.1
12	IO 1578-70 3-18-01 90	32	95382	3.2	16.412	6.2	0.85701	8.3	0.10208	3.6	0.67	626.6	33.8	628.8	39.1	636.8	132.5	626.6	33.8	98.4
12	IO 1578-70 3-18-01 20	124	30424	2.2	16.426	3.2	0.85793	3.6	0.10221	1.6	0.45	627.3	9.8	629.0	16.9	635.0	69.3	627.3	9.8	98.8
12	IO 1578-70 3-18-01 49	361	82484	2.3	16.580	1.2	0.86004	2.4	0.10342	2.1	0.88	634.4	12.7	630.1	11.3	614.8	24.9	634.4	12.7	103.2
12	IO 1578-70 3-18-01 32	419	130305	9.1	16.552	0.9	0.86629	2.0	0.10400	1.7	0.88	637.8	10.6	633.5	9.3	618.4	19.9	637.8	10.6	103.1
12	IO 1578-70 3-18-01 12	443	89950	1.5	16.479	0.8	0.87697	1.1	0.10481	0.8	0.69	642.5	4.7	639.3	5.3	628.1	17.4	642.5	4.7	102.3
12	IO 1578-70 3-18-01 34	118	123478	2.4	16.512	7.7	0.88929	2.6	0.10511	2.6	0.90	650.1	22.3	644.2	19.4	623.6	37.6	650.1	22.3	104.2
12	IO 1578-70 3-18-01 58	136	39690	32.6	16.246	2.3	0.90660	2.7	0.10683	1.4	0.51	654.3	8.4	655.3	12.9	658.6	49.1	654.3	8.4	99.4
12	IO 1578-70 3-18-01 3	118	37889	1.0	16.424	1.2	0.90389	3.4	0.10767	3.2	0.94	659.2	20.0	653.8	16.4	635.3	26.0	659.2	20.0	103.8
12	IO 1578-70 3-18-01 74	132	35445	0.9	16.098	1.7	0.93091	2.0	0.10869	1.1	0.54	665.1	6.7	668.1	9.7	678.2	35.9	665.1	6.7	98.1
12	IO 1578-70 3-18-01 35	35	9536	1.5	15.932	8.7	0.95388	10.0	0.10988	10.0	0.67	665.1	65.1	681.2	49.5	734.5	185.5	665.1	65.1	98.1
12	IO 1578-70 3-18-01 43	491	154740	3.4	15.809	0.6	0.97005	4.1	0.11122	4.1	0.99	679.8	26.5	688.5	20.7	716.9	12.7	679.8	26.5	94.8
12	IO 1578-70 3-18-01 73	105	10830	3.9	14.317	2.8	1.45156	5.2	0.15073	4.4	0.85	905.1	37.2	910.5	31.3	923.8	57.1	923.8	31.3	98.0
12	IO 1578-70 3-18-01 15	325	48375	5.0	14.169	0.6	1.33885	5.5	0.13759	5.4	0.99	831.0	42.2	862.7	31.7	945.2	12.6	945.2	12.6	87.9
12	IO 1578-70 3-18-01 35	483	170897	5.1	13.861	1.2	1.57335	3.7	0.15817	3.5	0.98	946.6	30.7	959.8	23.0	989.9	25.4	989.9	25.4	95.6
12	IO 1578-70 3-18-01 24	649	45724	2.4	13.640	2.2	1.48073	11.6	0.14649	11.4	0.98	881.2	32.9	922.5	70.5	1022.6	44.7	1022.6	44.7	94.0
12	IO 1578-70 3-18-01 68	118	15054	1.9	13.635	1.8	1.62672	4.6	0.16086	4.2	0.92	961.6	37.8	980.6	28.8	1023.4	35.7	1023.4	35.7	94.0
12	IO 1578-70 3-18-01 10	182	45445	2.3	13.359	1.0	1.92692	5.1	0.18670	5.0	0.98	1103.5	50.8	1090.5	34.2	1064.6	20.9	1064.6	20.9	103.6
12	IO 1578-70 3-18-01 45	344	166310	5.6	13.345	3.5	1.64707	7.9	0.19542	7.0	0.89	953.5	62.1	1084.4	49.6	1066.7	71.3	1066.7	71.3	89.4
12	IO 1578-70 3-18-01 66	66	23959	2.4	13.620	3.1	2.04048	3.2	0.21132	3.2	0.72	1134.2	11.5	1142.3	61.4	1112.9	61.4	1142.3	61.4	94.4
12	IO 1578-70 3-18-01 70	5	502	0.4	3.947	3.3	21.83020	5.0	0.62486	3.7	0.75	3129.2	91.8	3176.2	48.3	3206.0	52.4	3206.0	52.4	97.6
14	IO1277-23 889-891 24	69	166	2.3	9.438	71.7	0.89009	204.3	0.06093	191.3										

14	101277-23 889-891	53	376	88104	3.0	14.131	11.0	1.06429	47.4	0.10907	46.1	0.97	667.4	292.4	735.9	253.2	950.7	225.9	667.4	292.4	70.2
14	101277-23 889-891	31	5	40	7.8	4.422	40.7	3.40158	54.9	0.10909	36.8	0.67	667.5	233.6	1504.8	459.8	NA	NA	667.5	233.6	#VALUE!
14	101277-23 889-891	8	1252	11425	8.0	14.394	8.1	1.09226	25.8	0.10985	24.5	0.95	671.9	135.3	730.0	135.3	912.8	167.5	713.9	156.5	73.6
14	101277-23 889-891	17	221	126789	12.4	16.110	0.7	0.95780	1.1	0.11191	0.9	0.77	683.8	5.5	682.2	5.5	676.6	15.2	683.8	5.5	101.1
14	101277-23 889-891	48	369	256727	9.8	15.546	1.8	1.00951	6.5	0.11382	6.3	0.96	694.9	41.4	708.6	33.3	752.3	37.0	694.9	41.4	92.4
14	101277-23 889-891	86	265	78764	3.0	16.364	1.1	0.97146	3.5	0.11530	3.3	0.95	703.4	22.3	689.2	17.6	643.1	23.1	703.4	22.3	109.4
14	101277-23 889-891	115	3591	82428	13.8	17.315	0.2	0.95636	5.2	0.12010	5.2	1.00	731.1	36.1	681.4	26.0	520.4	4.2	731.1	36.1	140.5
14	101277-23 889-891	38	191	116432	2.0	14.972	3.7	1.12664	15.8	0.12158	15.0	0.97	739.6	104.7	762.8	72.3	831.2	76.3	739.6	104.7	89.0
14	101277-23 889-891	2	242	69442	8.6	13.613	2.8	1.27045	15.9	0.12543	15.6	0.98	761.8	112.2	832.6	90.4	1026.6	57.6	761.8	112.2	74.2
14	101277-23 889-891	15	153	46772	10.0	14.471	3.3	1.20794	7.0	0.12678	6.1	0.88	769.5	44.4	804.2	38.6	901.8	67.8	769.5	44.4	85.3
14	101277-23 889-891	82	151	73961	1.7	14.037	3.1	1.29043	7.0	0.13138	6.3	0.90	795.7	47.3	841.5	40.2	964.3	63.2	795.7	47.3	82.5
14	101277-23 889-891	126	10	38	8.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#VALUE!
14	101277-23 889-891	110	140	68409	3.3	14.438	1.6	1.43912	2.3	0.15070	1.6	0.71	904.9	13.8	905.4	13.8	906.5	33.4	906.5	33.4	99.8
14	101277-23 889-891	59	212	163591	2.3	14.303	1.1	1.45265	2.7	0.15069	2.5	0.92	904.8	21.0	911.0	16.3	925.9	22.2	925.9	22.2	97.7
14	101277-23 889-891	96	217	134378	10.8	13.864	2.7	1.44832	9.9	0.14563	9.5	0.96	876.4	78.1	909.2	59.5	989.6	54.8	989.6	54.8	88.6
14	101277-23 889-891	47	121	49049	3.3	13.832	1.2	1.66128	8.5	0.16666	8.4	0.99	993.7	77.1	993.9	53.7	994.3	24.5	994.3	24.5	99.9
14	101277-23 889-891	70	336	54776	2.2	13.732	2.0	1.61388	12.1	0.16070	11.9	0.99	960.7	106.6	975.5	76.0	1099.1	39.7	1009.7	38.7	95.2
14	101277-23 889-891	39	90	93766	2.7	13.667	1.7	1.64654	2.8	0.16321	2.2	0.78	974.6	19.5	988.2	17.5	1018.6	35.4	1018.6	35.4	95.7
14	101277-23 889-891	5	203	101240	0.7	13.632	0.9	1.62293	2.5	0.16046	2.3	0.94	959.3	20.8	979.1	15.6	1023.8	17.3	1023.8	17.3	93.7
14	101277-23 889-891	107	526	129029	4.0	13.584	0.5	1.82702	2.1	0.17999	2.0	0.97	1066.9	19.9	1055.2	13.7	1031.0	10.7	1031.0	10.7	103.5
14	101277-23 889-891	35	193	143762	4.7	13.505	0.8	1.98875	3.0	0.15729	2.9	0.97	941.7	25.6	969.7	18.8	1031.7	15.4	1033.7	15.4	91.1
14	101277-23 889-891	8	230	34316	2.4	13.555	1.7	1.56999	6.0	0.15434	5.8	0.96	925.3	49.6	958.4	37.2	1035.3	34.0	1035.3	34.0	89.4
14	101277-23 889-891	29	752	31050	7.9	13.551	0.6	1.34282	26.9	0.13197	26.9	1.00	799.1	202.0	864.5	157.7	1035.8	11.7	1035.8	11.7	77.1
14	101277-23 889-891	19	395	206107	1.6	13.544	0.3	1.68534	2.0	0.16555	1.9	0.98	987.6	17.6	1003.0	12.4	1036.9	7.0	1036.9	7.0	95.2
14	101277-23 889-891	73	122	76377	2.3	13.506	2.5	1.87808	4.2	0.18397	3.4	0.81	1088.6	34.3	1073.4	28.1	1042.5	50.5	1042.5	50.5	104.5
14	101277-23 889-891	20	410	82615	3.0	13.496	2.4	1.63864	12.0	0.16404	12.0	0.98	959.0	106.9	985.2	72.3	1044.0	48.8	1044.0	48.8	91.0
14	101277-23 889-891	92	127	89658	3.1	13.490	2.1	1.77746	4.2	0.17390	3.6	0.87	1033.6	34.5	1037.3	27.1	1045.0	41.7	1045.0	41.7	98.9
14	101277-23 889-891	14	190	100514	8.0	13.488	1.9	1.68370	6.5	0.16471	6.2	0.96	982.9	56.7	1002.4	41.3	1045.3	37.5	1045.3	37.5	94.0
14	101277-23 889-891	55	153	132932	3.2	13.421	0.7	1.82394	1.2	0.17753	0.9	0.79	1053.5	9.2	1054.1	7.8	1055.3	14.7	1055.3	14.7	99.8
14	101277-23 889-891	24	690	419455	8.5	13.418	0.4	1.90928	3.1	0.18580	3.1	0.99	1098.6	31.1	1098.6	20.4	1055.8	7.4	1055.8	7.4	93.4
14	101277-23 889-891	61	97	69027	2.0	13.246	2.5	1.59458	21.0	0.15319	20.8	0.99	918.8	178.4	968.1	131.6	1081.6	50.2	1081.6	50.2	85.5
14	101277-23 889-891	23	313	248148	1.4	13.017	0.7	2.11982	2.6	0.20013	2.5	0.96	1176.0	26.7	1155.7	17.9	1116.6	14.7	1116.6	14.7	105.3
14	101277-23 889-891	88	516	308773	1.7	12.986	0.7	1.97968	3.0	0.18645	2.9	0.97	1102.1	29.5	1108.6	20.2	1121.4	14.0	1121.4	14.0	98.3
14	101277-23 889-891	37	195	59518	1.8	12.966	1.5	1.81043	5.9	0.17025	5.8	0.97	1013.5	54.0	1049.2	38.9	1124.4	30.1	1124.4	30.1	90.1
14	101277-23 889-891	18	224	12510	2.0	12.834	1.1	1.99128	1.9	0.18535	1.5	0.79	1096.1	15.3	1115.2	12.6	1144.7	22.6	1144.7	22.6	95.8
14	101277-23 889-891	4	17	154	10.0	12.200	34.0	1.13457	35.0	0.10039	8.2	0.23	616.7	48.1	769.9	191.0	1244.7	686.1	1244.7	686.1	49.5
14	101277-23 889-891	89	131	107006	2.2	11.728	0.8	2.82812	1.5	0.24055	1.2	0.82	1389.5	15.2	1363.0	11.1	1321.7	16.3	1321.7	16.3	105.1
14	101277-23 889-891	90	16	90	1.2	9.963	35.1	1.16583	35.8	0.08424	7.1	0.20	521.4	35.4	784.7	198.2	1630.9	674.5	1630.9	674.5	NA
14	101277-23 889-891	74	60	115	2.4	9.902	68.7	2.12564	73.1	0.08529	21.1	0.24	555.3	37.3	824.6	438.8	1642.4	1491.9	1642.4	1491.9	NA
14	101277-23 889-891	114	22	68	0.9	9.271	56.7	1.01181	57.5	0.06803	9.6	0.17	424.3	39.4	709.8	302.4	1763.6	1143.3	1763.6	1143.3	NA
14	101277-23 889-891	20	30	67	0.1	8.772	4.9	1.31494	5.2	0.08366	1.5	0.30	517.9	7.7	852.3	29.9	1864.1	89.3	1864.1	89.3	NA
14	101277-23 889-891	71	8	71	2.4	8.555	26.0	1.39674	30.0	0.08667	15.3	0.51	535.8	78.6	887.6	180.4	1909.1	475.6	1909.1	475.6	NA
14	101277-23 889-891	100	54	43555	1.1	8.264	11.7	5.52760	15.9	0.33130	10.7	0.67	1844.7	171.5	1904.9	137.4	1971.1	210.2	1971.1	210.2	93.6
14	101277-23 889-891	19	285	18732	1.5	8.060	2.2	5.70428	4.3	0.33346	3.7	0.86	1855.1	59.4	1932.0	37.1	2015.5	39.1	2015.5	39.1	92.0
15	NBP01-01 JPC40-2370	8	226	29408	2.4	2.4	0	1.49218	8.4	0.16173	4.1	0.49	966.4	36.9	927.2	50.8	835.2	151.7	835.2	151.7	115.7
15	NBP01-01 JPC40-2370	24	209	27368	0.5	0.5	0	0.97493	3.2	0.11398	2.5	0.80	695.8	16.8	691.0	16.0	675.3	41.1	695.8	16.8	103.0
15	NBP01-01 JPC40-2370	47	51	1311	100.78	4.6	0	1.15119	100.78	4.6	0	0.91	954.2	5.1	943.1	17.4	911.4	44.7	911.4	44.7	107.0
15	NBP01-01 JPC40-2370	83	499	77209	1.9	1.9	0	1.67260	3.1	0.16631	2.7	0.88	991.7	25.1	998.2	19.6	1012.3	29.2	1012.3	29.2	98.8
15	NBP01-01 JPC40-2370	41	976	19178	3.1	0	0	2.06233	12.4	0.18918	6.7	0.54	1116.9	69.2	1136.4	85.2	1173.7	207.2	1173.7	207.2	95.2
15	NBP01-01 JPC40-2370	77	670	31782	3.2	0	0	1.46438	4.2	0.15489	2.5	0.60	928.3	21.9	915.8	25.3	885.9	68.9	885.9	68.9	104.8
15	NBP01-01 JPC40-2370	97	2031	1517	13.2	0	0	1.09525	4.9	0.11570	1.6	0.34	705.8	11.0	751.1	25.8	888.4	94.6	705.8	11.0	79.4
15	NBP01-01 JPC40-2370	76	12	105	0.4	0	0	1.95306	22.2	0.14307	2.9	0.27	862.6	47.2	1029.5	150.2	1605.5	403.6	1605.5	403.6	92.2
15	NBP01-01 JPC40-2370	30	868	502	0.5	0.5	0	1.50040	6.6	0.13098	2.9	0.45	793.5	21.9	936.5	40.1	1271.0	114.9	793.5	21.9	62.4
15	NBP01-01 JPC40-2370	10	209	15538	0.5	0	0	1.78940	4.1	0.17889	2.8	0.68	1060.9	26.9	1041.6	26.5	1001.3	60.6	1001.3	60.6	106.0
15	NBP01-01 JPC40-2370	2	287	20120	0.7	0	0	1.69303	5.2	0.16840	1.6	0.30	1003.3	14.6	1005.9	33.1	1011.6	100.2	1011.6	100.2	99.2
15	NBP01-01 JPC40-2370	80	1085	570	0.5	0	0	1.63024	10.3	0.10363	1.7	0.53	955.7	10.3	1036.3	58.7	1386.6	165.8	1386.6	165.8	82.7
15	NBP01-01 JPC40-2370	1	543	47703	2.4	0	0	1.57342	8.0	0.16215											

15	NBP01-01	JP40-2370	57	295	46433	1.3			1.76917	3.9	0.17030	2.9	0.74	1013.8	26.9	1034.2	25.3	1077.7	52.8	1077.7	52.8	94.1	
15	NBP01-01	JP40-2370	45	2375	4026	0.0			1.16162	3.2	0.12900	2.9	0.92	782.2	21.6	782.7	17.4	784.3	25.7	782.2	51.6	99.7	
15	NBP01-01	JP40-2370	7	271	2010	0.7			1.12617	2.1	0.12617	2.1	0.92	815.1	15.7	812.6	16.0	810.0	18.9	815.1	15.7	100.4	
15	NBP01-01	JP40-2370	99	129	12208	0.8			1.13062	5.2	0.12816	2.0	0.39	777.4	14.9	768.1	28.0	741.1	101.2	777.4	14.9	104.9	
15	NBP01-01	JP40-2370	89	352	31701	0.6			1.65814	9.7	0.15431	3.4	0.35	925.1	29.2	992.7	61.8	1145.2	182.0	1145.2	182.0	80.8	
15	NBP01-01	JP40-2370	95	2275	5133	0.0			1.37701	1.6	0.14373	1.1	0.71	865.7	9.0	879.2	9.2	91.3	22.5	865.7	9.0	94.8	
15	NBP01-01	JP40-2370	15	624	18957	6.7			2.14293	11.3	0.19344	10.6	0.93	1140.0	110.3	1162.8	78.5	1205.4	80.7	1205.4	80.7	94.6	
16	116S6	6H1	100-102	1	365	75668	4.6	17.027	1.7	0.74112	2.2	0.09152	1.5	0.66	564.5	8.0	563.1	9.7	557.1	36.8	564.5	8.0	NA
16	116S6	6H1	100-102	2	182	169423	0.5	12.551	1.0	2.09343	2.1	0.19056	1.8	0.88	1124.4	18.6	1146.7	14.2	1189.0	19.7	1189.0	19.7	94.6
16	116S6	6H1	100-102	4	375	92375	1.1	12.566	8.5	2.00193	10.8	0.18246	6.6	0.62	1080.6	66.0	1116.2	73.0	1186.5	167.7	1186.5	167.7	91.1
16	116S6	6H1	100-102	5	324	172570	2.3	5.682	3.3	8.94258	8.8	0.36853	8.5	0.97	2022.5	147.2	222.2	80.5	2615.4	37.8	2615.4	37.8	77.3
16	116S6	6H1	100-102	9	28	15175	0.4	12.825	3.0	1.95202	4.0	0.81517	3.3	0.73	1075.5	32.5	1099.1	30.1	1146.2	60.4	1146.2	60.4	93.8
16	116S6	6H1	100-102	12	1816	175204	59.3	13.675	1.6	1.52613	7.1	0.15137	6.9	0.97	908.6	58.6	940.9	43.6	1017.4	33.0	1017.4	33.0	89.3
16	116S6	6H1	100-102	13	1297	123346	0.0	11.423	8.0	2.39994	17.2	0.19882	15.2	0.88	1169.0	162.5	1242.6	123.8	1372.5	154.8	1372.5	154.8	85.2
16	116S6	6H1	100-102	14	109	58106	0.6	12.485	1.2	2.35058	2.6	0.21284	2.4	0.89	1243.9	26.7	1227.7	18.9	1199.4	23.8	1199.4	23.8	103.7
16	116S6	6H1	100-102	15	170	14231	0.6	17.028	3.2	0.71237	5.1	0.08836	3.0	0.79	545.8	20.8	546.7	29.7	550.6	70.6	545.8	20.8	NA
16	116S6	6H1	100-102	17	260	178984	0.9	12.846	1.7	1.96764	3.3	0.18331	2.9	0.86	1085.1	28.5	1104.5	22.2	1143.0	33.2	1143.0	33.2	94.9
16	116S6	6H1	100-102	18	877	27956	7.3	14.574	3.3	1.27215	19.5	0.13447	19.2	0.99	813.3	146.9	833.3	111.3	887.2	68.1	813.3	146.9	91.7
16	116S6	6H1	100-102	19	296	383291	1.5	12.563	0.4	2.14009	0.9	0.19500	0.8	0.92	1148.4	8.7	1161.9	6.2	1187.1	7.0	1187.1	7.0	96.7
16	116S6	6H1	100-102	21	328	154244	1.5	12.923	0.6	2.04434	1.7	0.19161	1.6	0.86	1130.1	10.9	1130.4	8.3	1131.1	12.2	1131.1	12.2	99.9
16	116S6	6H1	100-102	22	170	130798	1.1	12.598	1.0	2.27182	2.8	0.20758	2.6	0.94	1215.9	29.2	1203.6	19.9	1181.6	19.6	1181.6	19.6	102.9
16	116S6	6H1	100-102	23	190	163359	0.9	12.583	1.1	2.18883	3.9	0.19975	3.8	0.96	1174.0	40.6	1177.5	27.5	1184.0	22.5	1184.0	22.5	99.2
16	116S6	6H1	100-102	26	508	140837	7.8	17.151	0.7	0.69005	3.6	0.08584	3.5	0.98	530.9	18.0	532.8	14.9	541.3	15.3	530.9	18.0	NA
16	116S6	6H1	100-102	27	2793	641519	16.9	5.513	1.2	1.03634	6.4	0.41440	6.2	0.98	2235.0	117.8	2460.8	58.9	2665.5	20.5	2665.5	20.5	83.9
16	116S6	6H1	100-102	32	546	371106	3.6	16.822	0.7	0.69744	1.8	0.08566	1.8	0.98	529.4	9.2	537.3	13.1	542.9	9.3	529.4	9.2	91.3
16	116S6	6H1	100-102	33	544	250238	4.1	17.102	1.0	0.74141	1.6	0.09196	1.2	0.77	567.1	6.5	563.2	6.7	547.5	21.5	567.1	6.5	NA
16	116S6	6H1	100-102	34	123	74898	0.7	12.553	1.4	2.25471	2.3	0.20528	1.8	0.79	1203.6	19.7	1198.3	16.0	1188.6	27.5	1188.6	27.5	101.3
16	116S6	6H1	100-102	35	248	26811	2.4	15.198	2.5	0.95990	9.3	0.10570	9.0	0.96	647.8	55.3	682.8	46.3	800.0	51.6	647.8	55.3	81.0
16	116S6	4H-6 (80)	1	254	27888	1.0	15.782	3.2	0.95778	4.5	0.10963	3.2	0.77	670.6	23.0	672.1	22.4	720.0	67.7	670.6	23.0	93.1	
16	116S6	4H-6 (80)	10	722	54877	3.1	12.890	0.3	1.78701	5.0	0.16706	5.0	1.00	995.9	46.4	1040.7	32.8	1136.2	5.3	1136.2	5.3	87.7	
16	116S6	4H-6 (80)	12	502	101496	2.2	11.392	1.4	2.59296	4.2	0.21423	4.0	0.94	1251.3	45.4	1298.7	31.1	1377.7	27.4	1377.7	27.4	90.8	
16	116S6	4H-6 (80)	14	359	16862	1.3	12.400	0.7	2.23231	2.4	0.20076	2.3	0.96	1179.4	25.3	1191.2	17.1	1212.8	13.1	1212.8	13.1	97.2	
16	116S6	4H-6 (80)	16	254	41351	2.0	16.783	1.7	0.75493	3.2	0.09189	2.7	0.83	566.7	14.6	571.1	13.8	588.5	36.1	566.7	14.6	NA	
16	116S6	4H-6 (80)	17	358	51673	1.6	12.418	0.2	2.08051	2.4	0.19259	2.2	0.94	1234.2	33.6	1142.4	16.6	1115.7	23.7	1115.7	23.7	98.2	
16	116S6	4H-6 (80)	4	423	68124	2.4	14.679	0.9	1.28778	3.3	0.13710	3.2	0.96	828.2	24.9	840.3	19.1	872.4	19.2	828.2	24.9	94.9	
16	116S6	4H-6 (80)	5	179	17370	1.9	12.604	1.0	2.13306	3.8	0.19500	3.7	0.96	1148.4	38.7	1159.6	26.4	1180.6	20.6	1180.6	20.6	97.3	
16	116S6	4H-6 (80)	6	98	169959	4.0	4.636	0.9	1.76896	4.9	0.59480	4.9	0.98	3008.8	116.7	2973.0	47.5	2948.8	14.6	2948.8	14.6	102.0	
16	116S6	4H-6 (80)	7	150	71960	1.7	12.518	2.3	2.35827	2.9	0.20571	2.8	0.83	1205.9	29.9	1201.7	20.7	1194.2	25.7	1194.2	25.7	101.0	
16	116S6	6H-1 (70)	3	73	21233	0.9	13.104	1.2	1.95222	3.2	0.18554	3.0	0.93	1097.1	30.2	1099.2	21.6	1103.3	23.1	1103.3	23.1	99.4	
16	116S6	6H-1 (70)	4	77	1446	3.1	15.358	6.9	0.72785	7.3	0.08107	2.3	0.31	502.5	11.0	555.3	31.3	778.0	146.2	502.5	11.0	NA	
16	116S6	6H-1 (70)	6	546	18411	1.4	17.253	1.4	0.66401	1.9	0.08309	1.3	0.70	514.5	6.5	517.1	7.7	528.3	29.7	514.5	6.5	NA	
16	116S6	10H-2 (35)	1	798	2661	1.3	12.203	1.6	0.05850	4.3	0.18218	4.2	0.94	1078.9	42.1	1135.1	30.8	1244.3	30.4	1244.3	30.4	86.7	
16	116S6	10H-2 (35)	10	339	549785	2.8	12.116	0.7	0.12429	14.5	0.32629	14.5	0.92	1209.7	17.4	1202.9	13.9	1319.5	15.5	1319.5	15.5	86.6	
16	116S6	10H-2 (35)	11	190	134550	1.0	12.771	1.6	0.05662	3.8	0.19049	3.4	0.90	1124.0	35.0	1134.5	25.6	1154.5	32.0	1154.5	32.0	97.4	
16	116S6	10H-2 (35)	14	239	345020	1.1	12.649	0.6	2.16773	3.4	0.19886	3.4	0.99	1169.2	36.3	1170.8	23.9	1173.6	11.5	1173.6	11.5	99.6	
16	116S6	10H-2 (35)	16	394	181811	1.3	12.630	0.4	2.11617	3.3	0.19384	3.2	0.99	1142.1	33.8	1154.1	22.4	1176.6	7.0	1176.6	7.0	97.1	
16	116S6	10H-2 (35)	17	146	32101	3.7	10.417	0.7	0.05013	5.0	0.34040	5.0	0.93	1190.1	50.0	1200.1	38.9	1435.0	68.1	1435.0	68.1	90.9	
16	116S6	10H-2 (35)	22	197	165048	0.6	9.440	2.1	4.26143	4.1	0.29175	3.5	0.86	1650.3	51.1	1685.9	33.8	1730.6	39.1	1730.6	39.1	95.4	
16	116S6	10H-2 (35)	24	110	178655	0.8	12.644	1.1	2.13476	3.5	0.19576	3.3	0.95	1152.5	35.0	1160.1	24.2	1174.4	22.2	1174.4	22.2	98.1	
16	116S6	10H-2 (35)	25	293	18880	0.9	12.301	1.2	2.34614	2.2	0.20932	1.8	0.83	1225.2	20.4	1226.4	15.7	1228.5	24.1	1228.5	24.1	99.7	
16	116S6	10H-2 (35)	26	244	11533	2.9	11.764	1.0	2.68821	2.2	0.22935	1.9	0.89	1331.1	23.3	1325.2	16.1	1315.7	19.5	1315.7	19.5	101.2	
16	116S6	10H-2 (35)	27	363	97039	3.1	0.66612	0.9	0.66612	0.9	0.66612	0.9	0.66	524.0	8.7	514.1	4.8	518.5	8.5	518.5	8.5	95.5	
16	116S6	10H-2 (35)	3	106	32019	0.6	17.434	2.9	0.61541	3.4	0.08364	1.7	0.52	517.8	8.7	515.5	13.6	505.4	63.4	517.8	8.7	NA	
16	116S6	10H-2 (35)	30	327	34070	2.0	12.430	0.4	2.28154	1.0	0.20568	1.0	0.92	1205.8	10.5	1206.6	7.4	1208.1	8.2	1208.1	8.2	99.8	
16	116S6	10H-2 (35)	33	647	158295	2.8	12.671	0.4	2.20554	2.2	0.20296	2.1	0.98	1191.2	23.0	1183.8	15.1	1170.2	8.4	1170.2	8.4	101.8	
16	116S6																						

17	NBP01-01	JP034-292	67	694	29845	7.5	1.843	5.3	0.17257	4.6	0.86446	1026.2	43.24	1061.0	34.7	1133.3	52.8	1026.2	43.2	1026.2	43.2	103.4	
17	NBP01-01	JP034-292	68	691	56014	0.9	2.256	3.2	0.20672	1.4	0.45167	1211.3	15.88	1198.7	22.4	1175.8	56.2	1175.8	56.2	1175.8	56.2	101.9	
17	NBP01-01	JP034-292	69	326	21231	0.5	1.455	2.9	0.11674	0.7	0.59027	924.0	14.38	911.9	17.4	882.7	52.7	924.0	14.3	924.0	14.3	98.5	
17	NBP01-01	JP034-292	72	592	19467	0.9	1.857	5.5	0.18307	3.5	0.63008	1083.7	34.49	1066.1	36.2	1030.2	86.2	1083.7	34.5	1083.7	34.5	98.4	
17	NBP01-01	JP034-292	73	1185	13536	6.3	0.766	6.4	0.09604	5.2	0.81702	591.2	29.42	577.3	28.1	522.9	80.6	591.2	29.4	577.3	28.1	NA	
17	NBP01-01	JP034-292	74	166	842	0.5	0.715	5.5	0.08795	3.0	0.54936	543.4	15.88	547.7	23.5	565.6	101.0	543.4	15.9	547.7	23.5	NA	
17	NBP01-01	JP034-292	75	164	3520	0.8	0.704	5.1	0.08527	1.6	0.31339	527.5	8.10	541.0	21.4	598.0	105.0	527.5	8.1	541.0	21.4	NA	
17	NBP01-01	JP034-292	76	80	263	1.0	0.217	3.7	0.11674	0.7	0.47058	700.1	10.06	808.3	18.0	1119.2	56.7	700.1	10.1	808.3	18.0	115.5	
17	NBP01-01	JP034-292	78	1192	3779	4.3	1.136	8.8	0.11009	7.7	0.87082	673.3	49.23	770.8	47.8	1064.9	87.5	673.3	49.2	770.8	47.8	114.5	
17	NBP01-01	JP034-292	79	537	12291	2.1	2.747	7.8	0.23346	4.9	0.63249	1352.6	60.05	1341.1	58.0	1322.9	116.9	1322.9	116.9	1322.9	116.9	101.4	
17	NBP01-01	JP034-292	80	216	13350	0.9	1.605	7.5	0.16160	4.3	0.57525	965.6	38.61	972.0	46.9	986.5	124.7	965.6	38.6	965.6	38.6	100.7	
17	NBP01-01	JP034-292	82	286	531	1.9	0.802	8.1	0.09083	3.8	0.46953	560.4	20.34	598.1	36.4	743.4	150.9	560.4	20.3	598.1	36.5	NA	
17	NBP01-01	JP034-292	83	235	14755	0.7	1.565	5.2	0.16379	3.7	0.70026	977.8	33.23	956.6	32.4	908.0	76.9	977.8	33.2	977.8	33.2	97.7	
17	NBP01-01	JP034-292	84	224	951	3.8	0.831	2.5	0.09188	1.7	0.68597	566.6	9.28	614.2	11.5	793.6	38.1	566.6	9.3	614.2	11.5	108.4	
17	NBP01-01	JP034-292	85	90	7664	0.4	1.546	3.6	0.15980	2.5	0.69580	955.7	22.41	948.8	22.4	933.0	53.5	955.7	22.4	955.7	22.4	99.3	
17	NBP01-01	JP034-292	86	299	12204	2.4	0.671	6.7	0.07974	5.4	0.81261	494.6	25.87	521.4	27.3	641.0	83.8	494.6	25.9	521.4	27.3	NA	
17	NBP01-01	JP034-292	87	475	10791	3.1	1.629	10.4	0.15022	3.4	0.78534	557.2	29.30	981.5	27.5	1128.2	180.8	957.2	29.3	917.2	29.3	107.0	
17	NBP01-01	JP034-292	88	86	1147	13.8	0.854	5.8	0.09443	3.7	0.64732	581.7	20.77	627.1	27.0	794.3	92.2	581.7	20.8	627.1	20.7	107.8	
17	NBP01-01	JP034-292	89	464	15603	0.9	1.780	11.3	0.18295	8.2	0.72184	1083.1	81.27	1038.3	73.5	945.1	160.3	1083.1	81.3	1083.1	81.3	95.9	
17	NBP01-01	JP034-292	91	487	10660	1.4	1.704	4.3	0.17192	3.0	0.70688	1022.7	28.83	1009.9	27.6	982.1	62.1	1022.7	28.8	1022.7	28.8	98.7	
17	NBP01-01	JP034-292	92	136	14501	1.9	2.424	5.8	0.20797	2.8	0.48695	1191.2	30.77	1249.8	41.8	1352.0	98.0	1352.0	98.0	1352.0	98.0	92.4	
17	NBP01-01	JP034-292	93	149	11660	0.7	1.580	5.1	0.16057	2.0	0.39542	960.0	18.01	962.3	31.8	967.7	95.8	960.0	18.0	960.0	18.0	100.2	
17	NBP01-01	JP034-292	94	1168	12158	8.9	1.748	6.6	0.17383	6.3	0.95718	1033.2	60.01	1026.5	42.4	1012.2	38.5	1033.2	60.0	1033.2	60.0	99.4	
17	NBP01-01	JP034-292	95	1194	32594	2.7	1.770	1.8	0.16673	1.0	0.55843	994.1	9.21	1034.4	11.6	1120.5	29.6	994.1	9.2	994.1	9.2	104.1	
17	NBP01-01	JP034-292	97	162	4889	0.6	1.722	15.6	0.15562	4.3	0.47705	932.1	37.51	1016.8	100.5	1203.3	296.9	924.4	37.5	932.4	37.5	109.1	
17	NBP01-01	JP034-292	99	879	61027	0.5	1.367	4.7	0.16474	3.8	0.83551	94.4	24.56	257.1	36.6	924.4	51.8	971.4	24.6	971.4	24.6	98.5	
17	NBP01-01	JP034-292	100	116	8194	2.3	1.415	5.3	0.14444	1.8	0.34376	869.7	14.78	895.3	31.5	959.1	101.5	869.7	14.8	895.3	31.5	102.9	
17	NBP01-01	JP034-345	1	962	4042	1.9	0.755	10.1	0.08219	8.7	0.86651	509.2	42.83	571.4	44.1	827.3	105.2	402.2	42.8	571.4	44.1	NA	
17	NBP01-01	JP034-345	2	820	28652	1.5	0.089	10.4	0.29620	10.2	0.98486	1672.4	150.69	1834.3	88.3	2023.3	31.9	2023.3	31.9	2023.3	31.9	90.7	
17	NBP01-01	JP034-345	3	128	6196	0.9	1.721	1.9	0.08219	3.2	0.61546	225.1	36.31	113.5	36.1	924.4	51.8	971.4	24.6	971.4	24.6	98.5	
17	NBP01-01	JP034-345	7	118	17047	1.6	1.020	4.7	0.49521	3.9	0.82653	2593.2	82.46	2681.1	44.1	2748.1	43.2	2748.1	43.2	2748.1	43.2	97.6	
17	NBP01-01	JP034-345	8	287	13172	1.3	1.337	3.3	0.14288	2.1	0.63520	860.9	16.98	861.8	19.3	864.0	53.1	860.9	17.0	861.8	19.3	100.1	
17	NBP01-01	JP034-345	9	250	12486	1.2	1.442	2.1	0.14877	1.6	0.77206	894.1	13.24	906.5	12.3	937.0	26.8	894.1	13.2	894.1	13.2	101.4	
17	NBP01-01	JP034-345	10	42	261	10.3	1.059	4.6	0.09349	2.9	0.70496	576.1	17.85	733.3	24.0	1248.9	63.8	576.1	17.9	733.3	24.0	127.3	
17	NBP01-01	JP034-345	11	114	124	4.5	0.962	7.9	0.14288	3.8	0.36688	539.9	28.98	950.2	40.6	2026.8	124.0	2026.8	124.0	2026.8	124.0	47.1	
17	NBP01-01	JP034-345	13	235	27177	0.8	8.061	3.4	0.39629	4.9	0.85269	2151.9	53.48	2237.8	31.0	2317.4	30.7	2317.4	30.7	2317.4	30.7	96.6	
17	NBP01-01	JP034-345	15	30	243	0.7	1.339	5.3	0.11036	4.7	0.89864	674.9	30.40	862.9	30.7	1382.7	44.5	674.9	30.4	862.9	30.7	127.9	
17	NBP01-01	JP034-345	16	181	28053	1.2	5.878	5.0	0.34037	4.6	0.91520	1888.4	75.49	1957.9	43.7	2032.2	35.9	2032.2	35.9	2032.2	35.9	96.3	
17	NBP01-01	JP034-345	17	458	12154	5.9	0.832	4.3	0.10117	2.8	0.66159	621.2	16.80	614.5	19.8	589.8	69.7	621.2	16.8	614.5	19.8	98.9	
17	NBP01-01	JP034-345	18	252	8237	1.2	0.663	2.6	0.08341	1.7	0.66030	516.5	8.39	516.4	10.4	516.4	42.2	516.5	8.4	516.4	10.4	NA	
17	NBP01-01	JP034-345	19	154	925	0.6	0.758	4.4	0.09222	3.5	0.78957	568.7	18.85	573.0	19.2	590.3	58.4	568.7	18.8	573.0	19.2	NA	
17	NBP01-01	JP034-345	20	132	363	2.5	0.790	3.4	0.08324	2.6	0.77916	515.4	12.96	591.3	15.1	894.4	43.4	515.4	13.0	591.3	15.1	NA	
17	NBP01-01	JP034-345	22	35	215	2.4	2.561	7.7	0.18344	6.5	0.89033	1085.8	60.99	1289.5	56.0	1647.0	74.8	1647.0	74.8	1647.0	74.8	78.3	
17	NBP01-01	JP034-345	23	96	1616	0.5	0.922	2.4	0.11036	5.2	0.92228	50.3	97.2	28.3	28.3	97.2	28.3	97.2	28.3	97.2	28.3	98.8	
17	NBP01-01	JP034-345	24	141	382	1.4	1.266	6.3	0.11990	5.1	0.82317	730.0	35.53	830.4	35.5	1109.5	71.0	730.0	35.5	830.4	35.5	113.8	
17	NBP01-01	JP034-345	25	50	246	1.7	1.268	6.1	0.11357	3.3	0.54222	693.4	21.79	831.6	34.7	1221.4	101.0	693.4	21.8	831.6	34.7	119.9	
17	NBP01-01	JP034-345	27	599	12784	15.0	1.271	9.1	0.13773	6.3	0.69217	831.7	49.11	832.9	51.1	856.2	136.8	831.7	49.1	832.9	51.1	100.1	
17	NBP01-01	JP034-345	28	621	6124	1.3	1.411	61.7	0.11357	8.1	0.75207	21.2	46.9	132.1	20.5	955.3	19.7	621.2	1.3	612.4	1.3	87.7	
17	NBP01-01	JP034-345	29	474	44635	29	0.3	11.006	4.3	0.46773	3.8	0.87563	2473.6	77.48	2523.6	40.1	2364.1	34.8	2564.1	34.8	2564.1	34.8	98.4
17	NBP01-01	JP034-345	30	412	3734	1.5	1.111	9.1	0.11725	8.8	0.96979	714.7	59.46	758.5	48.5	889.6	45.7	714.7	59.5	758.5	48.5	106.1	
17	NBP01-01	JP034-345	34	1064	127244	6.4	12.850	4.6	0.50923	4.0	0.86437	2653.4	86.75	2668.7	43.5	2680.4	38.4	2680.4	38.4	2680.4	38.4	99.6	
17	NBP01-01	JP034-345	35	366	27460	8.8	7.666	5.0	0.33959	3.1	0.62990	1884.7	51.29	2192.7	44.8	2494.6	65.2	2494.6	65.2	2494.6	65.2	87.9	
17	NBP01-01	JP034-345	36	105	19504	0.4	1.598	4.4	0.11036	2.0	0.61546	281.4	4.41	2840.2	46.2	2856.4	36.0	2856.4	36.0	2856.4	36.0	99.4	
17	NBP01-01	JP034-345	37	179	32602	1.0	19.533	3.9	0.96869	3.0	0.78184	3017.3	73.13	3068.5	37.5	3102.2	38.6	3102.2	38.6	3102.2	38.6	98.9	
17	NBP01-01	JP034-345	40	407	149	1.9	1.303	20.3	0.09281	8.2	0.40357	1021.4	64.80	847.1	117.0	1657.8	346.7	1657.8	346.7	847.1	117.0	51.1	
17	NBP01-01																						

17	NBP01-01	JKPC34-70	32	96	24504	1.5				2.80765	14.9	0.23507	10.3	0.69	1361.0	126.7	1357.6	112.1	1352.1	208.0	1352.1	208.0	100.7
17	NBP01-01	JKPC34-70	80	1473	55782	1.7				2.72562	21.8	0.20207	5.9	0.27	1186.4	64.4	1335.5	163.7	1583.1	397.6	1583.1	397.6	74.9
17	NBP01-01	JKPC34-70	82	103	17639	2.2				6.1533	3.6	0.36389	3.1	0.64	1998.5	43.3	1389.5	31.0	1998.5	48.7	1998.5	48.7	100.1
17	NBP01-01	JKPC34-70	47	485	20301	1.4				1.55932	4.8	0.15738	3.2	0.66	942.2	27.8	954.2	29.6	981.9	73.1	981.9	73.1	96.0
17	NBP01-01	JKPC34-70	22	356	3307	0.6				9.51403	3.0	0.43266	2.5	0.84	2317.7	49.1	2388.9	27.5	2450.2	27.3	2450.2	27.3	94.6
17	NBP01-01	JKPC34-70	86	32	23206	0.6				2.39206	4.5	0.12490	3.8	0.86	758.7	27.4	1240.2	32.0	2213.6	40.2	2213.6	40.2	34.3
17	NBP01-01	JKPC34-70	82	103	17639	2.2				2.08189	5.4	0.14865	1.6	0.30	893.4	13.5	1142.9	37.2	1653.1	95.8	1653.1	95.8	54.0
17	NBP01-01	JKPC34-70	25	345	11086	0.4				17.06282	24.2	0.58540	34.0	0.99	2970.7	572.4	2938.4	236.7	2916.3	56.9	2916.3	56.9	101.9
17	NBP01-01	JKPC34-70	48	208	22434	0.4				0.75533	2.3	0.09014	1.0	0.43	556.4	5.3	571.3	10.1	631.3	45.1	556.4	5.3	NA
17	NBP01-01	JKPC34-70	36	14	190	0.6				3.25991	4.8	0.14302	3.2	0.68	861.7	26.2	1471.5	37.1	2510.8	58.9	861.7	26.2	34.3
17	NBP01-01	JKPC34-70	38	164	21060	0.4				0.76070	3.1	0.08893	1.0	0.32	549.2	5.3	574.4	13.5	675.5	62.4	549.2	5.3	NA
17	NBP01-01	JKPC34-70	35	1898	14875	1.6				0.85665	8.3	0.09830	3.5	0.91	604.4	43.3	628.3	38.9	715.1	73.9	604.4	43.5	84.5
17	NBP01-01	JKPC34-70	53	56	187	0.9				2.39782	4.9	0.09626	3.5	0.72	592.4	20.0	1241.9	35.1	2659.0	56.4	592.4	20.0	NA
17	NBP01-01	JKPC34-70	7	122	6856	0.4				1.58913	4.7	0.15341	3.2	0.67	920.0	27.1	966.0	29.6	1072.0	71.2	1072.0	71.2	85.8
17	NBP01-01	JKPC34-70	43	28	133	0.3				3.64138	7.7	0.09733	6.7	0.88	598.8	38.5	1558.6	61.0	3313.8	57.1	598.8	38.5	NA
17	NBP01-01	JKPC34-70	90	124	67076	6.2				21.48445	3.6	0.52776	3.4	0.96	2732.0	76.0	3160.7	34.5	3445.5	15.5	3445.5	15.5	79.3
17	NBP01-01	JKPC34-70	45	20	251	0.5				4.75381	8.4	0.18879	3.5	0.90	1144.8	76.8	1778.5	70.2	2680.1	60.9	2680.1	60.9	41.6
17	NBP01-01	JKPC34-70	63	12	152	1.1				7.11458	6.1	0.20515	4.3	0.71	1202.9	47.5	2125.9	54.3	3194.4	68.0	3194.4	68.0	37.7
17	NBP01-01	JKPC34-70	61	539	42081	1.6				1.70495	4.6	0.16859	2.1	0.45	1004.3	19.3	1010.4	29.3	1023.6	82.6	1023.6	82.6	98.1
17	NBP01-01	JKPC34-70	11	51	222	2.0				1.71966	5.2	0.10122	4.6	0.87	621.5	27.0	1015.9	33.7	2003.4	45.9	621.5	27.0	31.0
17	NBP01-01	JKPC34-70	9	922	191692	5.9				12.07320	14.4	0.48175	11.1	0.77	2534.9	232.6	2610.1	135.8	2669.0	152.4	2669.0	152.4	95.0
17	NBP01-01	JKPC34-70	13	1196	13501	12.2				0.86764	10.1	0.10348	8.7	0.86	634.8	52.5	634.3	47.7	632.4	111.5	634.8	52.5	100.4
17	NBP01-01	JKPC34-70	16	63	365	0.5				1.34161	5.6	0.08374	3.3	0.59	518.4	16.4	863.9	32.8	1898.5	82.0	518.4	16.4	NA
17	NBP01-01	JKPC34-70	29	2474	204015	4.3				0.73312	4.4	0.09219	2.1	0.48	568.5	11.4	558.4	19.0	517.4	85.4	568.5	11.4	NA
17	NBP01-01	JKPC34-70	20	34	219	0.6				2.08555	6.9	0.09523	2.9	0.57	586.4	22.0	1144.1	47.4	2443.3	96.1	586.4	22.0	NA
17	NBP01-01	JKPC34-70	54	54	5	0.2				5.14228	5.6	0.09228	4.1	0.75	551.2	21.6	865.2	32.6	1785.3	69.5	551.2	21.6	NA
17	NBP01-01	JKPC34-70	12	298	1697	11.9				0.75243	3.7	0.08007	1.1	0.28	496.6	5.0	569.6	16.2	873.1	73.8	496.6	5.0	NA
17	NBP01-01	JKPC34-70	65	189	582	0.9				1.11789	3.1	0.08410	1.6	0.52	520.6	8.2	762.0	16.7	1555.6	49.9	520.6	8.2	NA
17	NBP01-01	JKPC34-70	1	426	81538	1.1				1.48118	7.0	0.15428	6.9	0.99	924.9	59.8	922.7	42.7	917.5	24.3	917.5	24.3	100.8
17	NBP01-01	JKPC34-70	33	86	780	2.2				1.71190	4.7	0.09852	3.5	0.75	605.7	20.3	787.5	25.6	1344.3	59.7	605.7	20.3	45.1
17	NBP01-01	JKPC34-70	76	160	738	0.6				1.01204	5.1	0.08393	3.7	0.49	519.6	15.6	709.9	25.9	1370.4	77.0	519.6	15.6	NA
17	NBP01-01	JKPC34-70	17	1156	106070	6.2				5.58048	2.2	0.32189	1.4	0.63	1798.9	21.8	1913.1	19.1	2039.2	30.6	2039.2	30.6	88.2
17	NBP01-01	JKPC34-70	30	92	661	7.9				0.91583	4.9	0.07672	1.8	0.38	476.5	8.4	660.2	23.6	1351.1	87.0	476.5	8.4	NA
17	NBP01-01	JKPC34-70	21	7	81	0.2				8.63434	9.4	0.16001	8.1	0.88	956.8	78.8	2300.2	85.3	3876.3	1903.4	956.8	78.8	24.7
17	NBP01-01	JKPC34-70	8	2	2	0.2				1.72639	10.6	0.30289	10.6	0.82	1265.4	130.4	2975.5	102.3	0.0	195.5	170.5	0.0	#DIV/0!
17	NBP01-01	JKPC34-70	83	368	60813	0.9				11.44998	9.0	0.42351	7.1	0.79	2276.4	136.4	2560.5	83.8	2793.8	89.3	2793.8	89.3	81.5
17	NBP01-01	JKPC34-70	70	344	49408	3.3				5.55705	11.2	0.32960	10.5	0.93	1836.4	167.5	1909.5	96.8	1989.7	71.3	1989.7	71.3	92.3
17	NBP01-01	JKPC34-70	26	428	37700	3.2				0.71471	4.5	0.08826	2.4	0.54	545.2	12.6	547.5	18.9	557.2	81.6	545.2	12.6	NA
17	NBP01-01	JKPC34-70	19	111	10244	1.3				1.06487	14.9	0.11102	13.0	0.95	678.7	83.7	736.2	78.9	915.5	149.6	678.7	83.7	74.1
17	NBP01-01	JKPC34-70	8	112	1423	0.9				0.80995	5.5	0.08686	1.6	0.30	536.9	8.5	602.4	25.1	857.2	109.5	536.9	8.5	NA
17	NBP01-01	JKPC34-70	42	841	86341	8.2				0.84494	11.5	0.10354	11.1	0.96	635.1	67.1	621.9	53.6	573.9	67.7	635.1	67.7	110.7
17	NBP01-01	JKPC34-70	37	616	3969	0.3				0.68281	5.5	0.08010	3.2	0.50	496.7	15.5	528.5	26.8	668.0	120.0	496.7	15.5	NA
17	NBP01-01	JKPC34-70	89	6	78	0.2				6.47030	9.9	0.13475	5.8	0.88	814.9	44.1	2041.9	86.9	3699.3	122.2	814.9	44.1	22.0
17	NBP01-01	JKPC34-70	21	291	38327	1.2				0.59127	14.2	0.07940	11.3	0.89	492.5	37.2	472.0	53.6	192.4	492.3	472.0	53.6	NA
17	NBP01-01	JKPC34-70	72	128	31993	0.5				1.88704	2.6	0.18033	2.1	0.79	1068.8	20.2	1076.5	17.3	1092.3	32.3	1092.3	32.3	97.8
17	NBP01-01	JKPC34-70	84	1721	10295	6.6				0.76109	9.7	0.08563	8.0	0.82	529.7	40.7	574.6	42.8	756.8	117.1	529.7	40.7	NA
17	NBP01-01	JKPC34-70	74	648	18539	0.7				7.89894	6.4	0.39359	6.1	0.95	2139.4	111.6	2219.6	58.0	2294.3	33.8	2294.3	33.8	93.2
17	NBP01-01	JKPC34-70	91	142	11488	2.8				1.01128	2.8	0.16124	1.4	0.96	512.1	2.9	1616.0	97.4	976.5	51.0	976.5	51.0	NA
17	NBP01-01	JKPC34-70	14	3500	4449	0.0				0.59360	2.8	0.07592	2.4	0.84	471.7	10.8	473.2	10.7	480.2	33.8	471.7	10.8	NA
17	NBP01-01	JKPC34-70	23	407	39579	1.2				1.71581	2.4	0.16396	1.8	0.75	978.7	16.6	1014.5	15.7	1092.4	32.5	1092.4	32.5	89.6
17	NBP01-01	JKPC34-70	88	18	106	0.4				2.89549	8.4	0.08625	7.0	0.84	533.3	36.0	1380.7	63.1	3142.9	71.6	533.3	36.0	NA
17	NBP01-01	JKPC34-70	24	85	12088	1.0				2.37683	5.7	0.20636	4.3	0.76	1209.4	47.9	1235.7	40.7	1281.8	71.7	1281.8	71.7	94.4
17	NBP01-01	JKPC34-70	62	62	52	0.2				0.85424	6.9	0.08064	3.2	0.64	892.4	29.7	680.2	34.2	1334.3	104.5	499.8	34.2	NA
17	NBP01-01	JKPC34-70	60	122	14579	1.3				1.38926	7.5	0.14340	3.7	0.49	863.8	29.8	884.4	44.3	936.1	133.9	863.8	44.3	92.3
17	NBP01-01	JKPC34-70	25	70	732	1.6				0.79421	6.7	0.07012	4.6	0.69	436.9	19.4	593.6	30.0	1248.9	95.0	436.9	19.4	NA
17	NBP01-01	JKPC34-70	55	98	1328	0.2				0.67393	6.2	0.07428	2.9	0.47	461.9	12.8	523.1	25.2	799.9	114.3	461.9	12.8	NA
17	NBP01-01	JKPC34-70	15	62	829	0.6				0.50216	5.5	0.07771	3.5	0.63	717.1	25.5	613.2	25.5	1131.4	84.7	482.4	25.5	NA
17	NBP01-01	JKPC34-70	69	20	259	4.5				1.56865	7.7	0.09142	4.5	0.58	563.9	24.2	957.9	47.9	2020.9	111.7	563.9	24.2	NA
17																							

19	NBP01-01	JPC25-1305-37	487	8740	5.0	0.782	3.1	0.09168	2.2	0.69755	565.5	11.75	586.9	13.9	670.5	47.7	565.5	11.7	586.9	13.9	NA
19	NBP01-01	JPC25-1305-38	647	11852	10.9	1.503	3.5	0.14909	2.9	0.81673	895.9	24.14	931.4	21.6	1016.6	41.3	895.9	24.1	895.9	24.1	104.0
19	NBP01-01	JPC25-1305-39	208	6369	9.1	1.361	9.3	0.13379	5.7	0.61254	750.4	40.30	794.4	54.4	1196.3	145.0	750.4	40.3	872.4	54.4	113.3
19	NBP01-01	JPC25-1305-40	315	5473	2.0	1.526	4.3	0.16013	1.7	0.39730	957.5	15.33	941.0	26.6	902.8	82.1	957.5	15.3	957.5	15.3	98.3
19	NBP01-01	JPC25-1305-42	1469	28981	95.6	1.163	8.6	0.13281	4.8	0.56111	803.8	36.53	783.4	47.1	725.5	151.4	803.8	36.5	783.4	47.1	97.5
19	NBP01-01	JPC25-1305-44	719	61374	30.0	1.288	8.6	0.13925	7.7	0.89548	840.4	60.72	840.4	49.2	840.3	79.8	840.4	60.7	840.4	49.2	100.0
19	NBP01-01	JPC25-1305-45	357	20672	6.1	1.346	3.7	0.14360	2.7	0.73279	865.0	22.23	865.8	21.8	867.8	52.9	865.0	22.2	865.8	21.8	100.1
19	NBP01-01	JPC25-1305-46	938	10659	7.5	1.223	4.8	0.09103	2.6	0.35204	561.6	16.14	523.3	20.3	514.0	87.3	561.6	16.1	523.3	20.3	NA
19	NBP01-01	JPC25-1305-47	507	43432	11.7	1.103	4.6	0.12138	1.4	0.29705	738.5	9.51	754.6	24.4	802.8	91.8	738.5	9.5	754.6	24.4	102.2
19	NBP01-01	JPC25-1305-48	546	2838	3.4	1.473	9.6	0.15691	8.1	0.84864	939.6	70.89	919.4	57.8	871.3	104.8	939.6	70.9	939.6	70.9	97.9
19	NBP01-01	JPC25-1305-49	497	11660	5.1	0.709	2.6	0.08726	1.1	0.42146	539.3	5.68	543.9	11.0	562.9	51.4	539.3	5.7	543.9	11.0	NA
19	NBP01-01	JPC25-1305-50	394	440	0.9	1.734	10.8	0.09547	2.7	0.20177	587.8	12.29	558.9	46.8	442.7	216.8	587.8	12.3	558.9	46.6	NA
19	NBP01-01	JPC25-1305-51	179	3319	2.6	0.800	6.1	0.09522	2.0	0.32552	586.3	11.12	596.8	27.5	637.0	124.1	586.3	11.1	596.8	27.5	NA
19	NBP01-01	JPC25-1305-52	667	24104	10.5	0.942	7.1	0.11217	6.1	0.86117	685.3	39.68	674.0	34.9	636.5	77.5	685.3	39.7	674.0	34.9	98.4
19	NBP01-01	JPC25-1305-53	104	2345	0.5	0.773	3.6	0.09111	2.3	0.65984	562.1	12.62	581.6	15.7	658.7	57.3	562.1	12.6	581.6	15.7	NA
19	NBP01-01	JPC25-1305-54	363	35163	4.1	0.719	3.6	0.08710	1.6	0.43931	538.3	8.06	550.3	15.1	599.9	69.1	538.3	8.1	550.3	15.1	NA
19	NBP01-01	JPC25-1305-55	835	33911	24.9	1.056	5.3	0.12071	4.4	0.82356	734.6	39.50	718.8	27.8	723.2	63.9	734.6	30.6	731.8	27.8	99.6
19	NBP01-01	JPC25-1305-56	482	15045	2.4	0.740	2.4	0.08988	1.1	0.46431	554.8	5.89	562.3	10.3	592.4	45.8	554.8	5.9	562.3	10.3	NA
19	NBP01-01	JPC25-1305-57	217	14486	0.9	1.488	2.3	0.15361	1.6	0.67707	921.2	13.34	925.5	13.9	935.9	34.7	921.2	13.3	921.2	13.3	100.5
19	NBP01-01	JPC25-1305-58	482	15115	11.8	0.747	2.6	0.09193	1.5	0.58195	566.9	8.20	566.5	11.3	564.7	46.0	566.9	8.2	566.5	11.3	NA
19	NBP01-01	JPC25-1305-59	1369	16911	17.9	1.044	6.1	0.12368	3.0	0.49092	751.1	21.36	726.1	31.8	647.7	114.8	751.7	21.4	726.1	31.8	96.6
19	NBP01-01	JPC25-1305-60	2074	72413	13.7	0.762	2.3	0.09362	1.0	0.44008	576.9	5.52	575.3	10.0	569.0	44.4	576.9	5.5	575.3	10.0	NA
19	NBP01-01	JPC25-1305-61	784	14504	16.0	1.143	8.7	0.12609	7.7	0.87607	765.5	55.31	773.8	47.4	797.9	88.4	765.5	55.3	773.8	47.4	101.1
19	NBP01-01	JPC25-1305-62	596	37576	9.1	1.584	4.9	0.15569	3.5	0.72511	932.8	30.75	963.8	30.4	1035.2	67.9	932.8	30.7	932.8	30.7	103.3
19	NBP01-01	JPC25-1305-64	369	12024	8.3	0.801	6.4	0.09446	5.1	0.79607	581.9	28.15	597.5	28.7	657.4	82.5	581.9	28.1	597.5	28.7	NA
19	NBP01-01	JPC25-1305-65	638	21912	7.1	1.023	9.1	0.11111	5.9	0.65397	679.2	28.24	679.1	44.9	671.8	146.8	679.2	38.2	679.1	44.9	100.0
19	NBP01-01	JPC25-1305-66	288	5481	6.0	1.181	8.2	0.13045	7.8	0.94872	790.4	57.69	791.7	45.0	795.1	54.2	790.4	57.7	791.7	54.2	100.2
19	NBP01-01	JPC25-1305-67	602	5955	5.3	0.738	2.7	0.09159	1.1	0.39630	564.9	5.69	561.2	11.4	546.1	53.2	564.9	5.7	561.2	11.4	NA
19	NBP01-01	JPC25-1305-68	159	5991	3.4	0.934	4.3	0.11021	3.2	0.75729	674.0	20.73	669.5	21.0	654.7	59.9	674.0	20.7	669.5	21.0	99.3
19	NBP01-01	JPC25-1305-69	405	5203	16.1	1.587	8.0	0.16688	6.1	0.76343	984.9	35.49	964.9	50.9	897.3	107.0	994.9	50.9	994.9	107.0	99.6
19	NBP01-01	JPC25-1305-70	671	26546	29.6	0.944	10.8	0.11167	10.1	0.93288	682.4	65.32	674.9	53.4	649.9	83.6	682.4	65.3	674.9	53.4	98.9
19	NBP01-01	JPC25-1305-72	728	22935	31.2	0.688	3.5	0.08709	2.8	0.79853	538.3	14.30	531.3	14.3	501.4	46.0	538.3	14.3	531.3	14.3	NA
19	NBP01-01	JPC25-1305-73	627	10831	6.3	1.194	5.1	0.13443	3.3	0.65352	813.1	25.34	797.8	28.1	755.5	81.1	813.1	25.3	797.8	28.1	98.1
19	NBP01-01	JPC25-1305-74	391	15117	4.5	1.002	6.8	0.11018	2.3	0.34195	673.8	14.78	704.8	34.3	805.1	133.0	673.8	14.8	704.8	34.3	104.6
19	NBP01-01	JPC25-1305-75	42	48961	9.9	1.422	11.1	0.14278	6.7	0.70237	836.5	62.91	824.0	82.2	1798.5	134.4	836.5	62.9	824.0	82.2	100.8
19	NBP01-01	JPC25-1305-76	355	10505	19.1	0.695	3.3	0.08580	1.3	0.40534	530.6	6.81	535.7	13.7	557.2	68.8	530.6	6.8	535.7	13.7	NA
19	NBP01-01	JPC25-1305-77	645	38896	30.4	0.747	2.4	0.09155	1.0	0.40838	564.7	5.41	566.5	10.6	573.7	48.6	564.7	5.4	566.5	10.6	NA
19	NBP01-01	JPC25-1305-78	565	79230	12.5	8.494	4.6	0.37945	3.0	0.65495	2073.7	52.87	2285.3	41.4	2480.3	58.0	2480.3	58.0	2480.3	58.0	92.1
19	NBP01-01	JPC25-1305-79	467	11537	9.5	0.770	7.4	0.09563	6.8	0.93563	588.9	35.52	592.3	32.6	557.1	58.7	588.9	35.5	592.3	32.6	99.6
19	NBP01-01	JPC25-1305-80	830	43084	14.5	1.170	4.7	0.12820	4.5	0.95373	777.6	32.62	786.8	25.6	812.9	29.4	777.6	32.6	786.8	25.6	101.2
19	NBP01-01	JPC25-1305-82	518	21173	18.3	1.005	4.8	0.11499	3.1	0.65307	701.6	20.62	706.6	24.2	722.3	76.3	701.6	20.6	706.6	24.2	100.7
19	NBP01-01	JPC25-1305-83	222	12621	0.7	1.060	7.0	0.12068	6.3	0.89395	734.5	43.66	734.0	36.8	732.4	66.8	734.5	43.7	734.0	36.8	99.9
19	NBP01-01	JPC25-1305-84	546	24216	10.0	0.961	3.6	0.10759	2.0	0.56956	658.7	12.68	683.9	17.7	767.8	61.6	658.7	17.7	683.9	17.7	103.8
19	NBP01-01	JPC25-1305-85	143	7554	1.1	1.242	1.1	0.14278	6.7	0.70237	836.5	62.91	824.0	82.2	1798.5	134.4	836.5	62.9	824.0	82.2	100.8
19	NBP01-01	JPC25-1305-86	713	19549	34.5	0.970	7.7	0.11378	4.7	0.61749	694.7	31.18	688.3	38.3	667.3	129.2	694.7	31.2	688.3	38.3	99.1
19	NBP01-01	JPC25-1305-87	99	5057	2.0	1.556	6.0	0.15532	2.1	0.35732	930.7	18.45	953.0	36.8	1004.7	113.0	930.7	18.4	930.7	18.4	102.4
19	NBP01-01	JPC25-1305-88	472	15515	10.1	0.985	10.0	0.11394	7.8	0.78860	695.6	51.23	695.50	50.2	697.0	132.7	695.6	51.2	695.5	50.2	100.1
19	NBP01-01	JPC25-1305-89	128	3651	0.7	1.232	9.5	0.08713	1.9	0.39879	540.3	9.86	540.3	17.4	484.849	49.9	540.3	9.8	540.3	9.8	99.6
19	NBP01-01	JPC25-1305-90	1576	7237	27.0	0.715	5.4	0.09028	4.9	0.89115	557.2	25.89	547.8	23.0	509.0	54.3	557.2	25.9	547.8	23.0	NA
19	NBP01-01	JPC25-1305-91	335	21666	2.0	1.436	2.9	0.14892	1.0	0.34199	894.9	8.36	904.0	17.5	926.4	56.4	894.9	8.4	894.9	8.4	101.0
19	NBP01-01	JPC25-1305-92	854	470	30.7	0.550	8.5	0.07589	3.9	0.46264	471.6	17.86	445.0	30.6	310.2	171.6	471.6	17.9	445.0	30.6	NA
19	NBP01-01	JPC25-1305-93	111	3206	1.4	1.384	2.9	0.14685	2.3	0.79840	883.3	18.90	882.2	16.9	879.6	35.7	883.3	16.9	882.2	16.9	99.9
19	NBP01-01	JPC25-1305-94	132	47362	1.7	1.396	9.2	0.12394	8.9	0.91789	808.6	62.87	793.6	63.8	767.3	181.4	808.6	62.9	793.6	63.8	98.6
19	NBP01-01	JPC25-1305-95	1117	36673	9.4	0.732	1.5	0.08977	1.2	0.75421	554.2	6.11	557.8	6.5	572.9	21.8	554.2	6.1	557.8	6.5	NA
19	NBP01-01	JPC25-1305-96	399	17690	13.1	1.491	8.1	0.15181	6.5	0.79598	911.1	54.99	926.9	49.5	964.7	100.6	911.1	55.0	911.1	55.0	101.7
19	NBP01-01	JPC25-1305-97	658	24041	39.7	1.035	4.8	0.11783	1.3	0.25877	718.1	85.92	721.3	25.0	731.2	99.2	718.1	8.5	721.3	25.0	NA
19	NBP01-01	JPC25-1305-98	36	120	0.1																

21	ELT37-16-A-76	144	60064	0.7	12.980	1.1	2.03118	5.6	0.19121	5.4	0.98	1127.9	56.4	1126.0	37.9	1122.3	22.5	1122.3	22.5	100.5
21	ELT37-16-A-91	129	74255	1.2	12.913	1.6	2.02977	4.2	0.19009	3.9	0.93	1121.9	40.6	1125.5	28.8	1132.6	30.9	1132.6	30.9	99.0
21	ELT37-16-A-77	70	45976	2.5	12.976	2.5	2.15288	3.2	0.20126	2.4	0.97	1180.9	21.9	1166.0	22.3	1138.4	49.7	1138.4	49.7	103.7
21	ELT37-16-A-96	583	246550	2.8	12.865	0.5	2.05874	3.7	0.19209	3.7	0.99	1132.7	38.4	1135.2	25.5	1140.0	9.3	1140.0	9.3	99.4
21	ELT37-16-A-77	248	120708	1.1	12.852	0.8	2.05857	1.3	0.19188	1.1	0.81	1131.5	11.2	1135.1	9.0	1142.1	15.3	1142.1	15.3	99.1
21	ELT37-16-A-81	294	202881	1.1	12.816	0.5	2.02927	1.1	0.20535	1.0	0.91	1204.0	11.0	1184.0	9.7	1147.6	9.0	1147.6	9.0	104.9
21	ELT37-16-A-80	616	54855	18.2	12.801	0.9	2.05274	4.4	0.19058	4.3	0.98	1124.5	44.2	1133.2	29.9	1149.9	17.7	1149.9	17.7	97.8
21	ELT37-16-A-80	158	27620	0.9	12.795	1.0	2.14188	2.5	0.19871	3.4	0.96	1168.5	56.2	1162.4	24.5	1151.2	20.4	1151.2	20.4	101.5
21	ELT37-16-A-64	429	12064	1.8	12.778	0.6	2.17601	2.6	0.20166	2.5	0.97	1184.2	26.9	1173.4	17.9	1153.5	12.6	1153.5	12.6	102.7
21	ELT37-16-A-14	164	3130	1.0	12.744	2.1	2.03694	2.4	0.18827	1.1	0.47	1112.0	11.4	1127.9	16.3	1158.8	42.0	1158.8	42.0	96.0
21	ELT37-16-A-32	150	84796	0.7	12.742	0.9	2.09288	5.0	0.19341	4.9	0.98	1139.8	51.4	1146.5	34.4	1159.1	18.7	1159.1	18.7	98.8
21	ELT37-16-A-26	187	216031	1.1	12.735	1.5	2.15242	2.0	0.19880	1.4	0.69	1168.5	15.1	1165.5	14.1	1160.1	29.0	1160.1	29.0	100.8
21	ELT37-16-A-62	268	100254	0.9	12.725	0.9	2.18993	2.7	0.20211	2.6	0.95	1186.6	28.2	1177.8	19.2	1161.7	17.4	1161.7	17.4	102.1
21	ELT37-16-A-6	49	18607	0.9	12.697	2.5	2.01360	2.7	0.18543	1.0	0.37	1096.6	10.1	1120.1	18.4	1166.1	49.8	1166.1	49.8	94.0
21	ELT37-16-A-20	212	123530	1.9	12.666	0.8	2.12713	2.2	0.19540	2.0	0.92	1150.6	21.1	1157.7	15.0	1170.9	16.8	1170.9	16.8	98.3
21	ELT37-16-A-54	152	79189	1.4	12.658	1.7	2.19253	2.7	0.20128	2.0	0.76	1182.2	22.1	1178.7	18.7	1172.3	34.5	1172.3	34.5	100.8
21	ELT37-16-A-15	205	100813	0.6	12.648	0.1	2.24653	4.5	0.20508	4.4	0.97	1207.9	48.3	1195.7	31.7	1173.7	21.2	1173.7	21.2	102.9
21	ELT37-16-A-9	186	78160	1.5	12.643	1.0	2.16843	1.8	0.19884	1.5	0.84	1169.1	16.4	1171.0	12.7	1174.5	19.4	1174.5	19.4	99.5
21	ELT37-16-A-52	426	3159	0.8	12.607	1.7	1.84578	3.5	0.16877	3.0	0.88	1005.3	28.3	1061.9	22.8	1180.2	32.7	1180.2	32.7	85.2
21	ELT37-16-A-44	296	23637	0.7	12.607	1.3	2.18862	4.7	0.20011	4.5	0.96	1175.9	48.9	1177.4	33.0	1180.2	26.0	1180.2	26.0	99.6
21	ELT37-16-A-86	257	14294	1.4	12.551	4.2	2.20952	9.8	0.19792	8.9	0.90	1164.1	94.4	1184.1	68.7	1220.7	83.0	1220.7	83.0	95.4
21	ELT37-16-A-22	59	497	12.6	12.033	10.3	2.30122	10.6	0.20082	2.4	0.23	1179.7	26.3	1212.7	75.0	1271.8	201.3	1271.8	201.3	92.8
21	ELT37-16-A-11	92	40751	8.8	11.934	6.0	2.44059	17.5	0.21125	16.4	0.94	1235.5	185.0	1254.6	126.8	1287.7	117.2	1287.7	117.2	95.9
21	ELT37-16-A-56	82	1699	12.7	11.731	7.6	2.62874	12.2	0.22365	9.5	0.78	1301.1	112.5	1308.7	89.8	1321.2	146.6	1321.2	146.6	98.5
21	ELT37-16-A-42	72	2717	8.0	11.718	7.7	2.70491	16.2	0.22989	14.2	0.88	1333.9	171.7	1329.8	120.5	1323.2	148.6	1323.2	148.6	100.8
21	ELT37-16-A-92	38	44747	3.1	11.546	8.0	2.53138	11.6	0.21197	8.4	0.72	1239.3	85.1	1281.1	85.0	1351.9	116.2	1351.9	116.2	95.2
21	ELT37-16-A-47	159	20678	1.6	11.452	6.9	2.62555	25.7	0.21806	24.8	0.96	1271.6	286.2	1307.8	191.5	1367.6	133.8	1367.6	133.8	93.0
21	ELT37-16-A-94	168	6738	2.4	11.294	4.3	2.79961	6.6	0.22932	4.9	0.75	1330.9	59.4	1355.4	49.3	1394.3	83.4	1394.3	83.4	95.5
21	ELT37-16-A-46	149	27906	2.0	11.159	0.9	2.89448	2.6	0.23425	2.5	0.93	1356.7	30.2	1380.5	19.9	1417.3	18.0	1417.3	18.0	95.7
21	ELT37-16-A-34	66	33541	2.2	11.135	6.1	2.89424	13.9	0.23464	12.5	0.90	1429.3	59.2	1380.4	105.1	1422.1	116.2	1422.1	116.2	93.0
21	ELT37-16-A-93	416	140675	3.1	11.077	3.4	2.74663	4.8	0.22066	3.4	0.70	1285.4	39.3	1341.2	35.9	1431.4	65.8	1431.4	65.8	89.8
21	ELT37-16-A-95	310	147743	2.8	10.983	3.1	3.18297	10.5	0.25355	10.0	0.95	1456.8	130.4	1453.0	81.1	1447.6	59.2	1447.6	59.2	100.6
21	ELT37-16-A-72	166	117928	1.5	10.874	1.1	3.03997	3.4	0.23975	3.2	0.95	1385.4	40.4	1417.7	26.1	1466.0	20.7	1466.0	20.7	94.5
21	ELT37-16-A-97	234	32264	0.8	10.808	3.8	2.77896	8.4	0.21784	7.5	0.89	1270.4	86.9	1340.9	63.0	1478.1	71.5	1478.1	71.5	92.0
21	ELT37-16-A-67	131	45187	0.8	10.437	2.5	3.41817	2.8	0.26092	2.8	0.90	1491.2	43.6	1499.2	25.8	1490.9	9.3	1490.9	9.3	109.1
21	ELT37-16-A-35	185	18914	2.6	10.682	1.2	3.08485	5.6	0.23898	5.5	0.98	1314.4	68.4	1428.9	43.2	1500.4	23.2	1500.4	23.2	92.1
21	ELT37-16-A-25	525	307447	2.5	10.640	0.4	3.29120	3.1	0.25398	3.1	0.99	1459.0	40.6	1479.0	24.4	1507.8	7.5	1507.8	7.5	96.8
21	ELT37-16-A-33	268	160605	1.9	10.628	0.8	3.45779	6.0	0.26553	6.0	0.99	1523.2	80.9	1517.6	47.5	1509.9	15.9	1509.9	15.9	100.9
21	ELT37-16-A-7	72	42283	1.2	10.618	1.1	3.28359	2.1	0.25268	2.1	0.94	1452.3	23.9	1477.2	16.4	1513.1	21.5	1513.1	21.5	96.0
21	ELT37-16-A-18	1351	17642	2.6	10.590	0.6	3.94043	46.4	0.22585	46.4	1.00	1312.7	552.8	1392.4	367.0	1516.6	121.1	1516.6	121.1	86.6
21	ELT37-16-A-23	125	18545	2.2	10.572	0.8	3.51327	2.0	0.26937	1.8	0.92	1537.6	24.7	1530.2	15.6	1520.0	14.9	1520.0	14.9	101.2
21	ELT37-16-A-88	323	24042	2.7	10.540	0.7	3.51652	7.3	0.26881	7.3	1.00	1534.7	99.1	1530.9	57.7	1525.7	17.2	1525.7	17.2	100.6
21	ELT37-16-A-65	1008	37264	25.6	10.471	1.4	3.23371	6.0	0.24558	5.8	0.97	1415.7	74.0	1465.3	46.5	1537.9	26.6	1537.9	26.6	92.0
21	ELT37-16-A-21	76	49202	0.8	10.432	4.7	3.24381	3.7	0.26100	3.5	0.94	1581.2	32.5	1582.0	19.7	1544.1	19.7	1544.1	19.7	104.3
21	ELT37-16-A-30	420	4393	0.8	10.436	1.3	3.22940	6.9	0.24444	6.8	0.98	1409.7	85.6	1464.2	53.3	1544.2	23.7	1544.2	23.7	91.3
21	ELT37-16-A-78	285	6591	3.1	10.435	1.3	3.17187	6.1	0.24004	5.9	0.98	1386.9	73.8	1450.3	46.7	1544.5	23.8	1544.5	23.8	89.8
21	ELT37-16-A-58	357	31082	1.2	10.432	0.5	3.59297	3.0	0.27184	3.0	0.99	1550.1	41.4	1548.0	24.1	1545.0	8.5	1545.0	8.5	100.3
21	ELT37-16-A-5	162	33065	1.5	10.305	1.5	3.14270	2.5	0.27420	2.4	0.97	1568.3	41.0	1546.1	10.4	1546.1	10.4	1546.1	10.4	99.7
21	ELT37-16-A-37	834	15186	8.4	10.421	1.7	3.57467	3.5	0.27017	3.0	0.87	1541.7	41.5	1543.9	27.7	1547.0	32.7	1547.0	32.7	99.7
21	ELT37-16-A-7	67	5123	1.9	10.413	1.5	3.42785	3.2	0.26228	2.8	0.89	1501.5	37.8	1521.1	25.1	1548.4	27.7	1548.4	27.7	97.0
21	ELT37-16-A-45	180	46710	2.4	10.393	3.0	3.46462	4.3	0.26114	3.0	0.71	1495.7	40.6	1519.2	33.7	1552.1	56.4	1552.1	56.4	96.4
21	ELT37-16-A-24	480	116255	0.8	10.342	0.2	3.71557	2.0	0.27871	2.0	1.00	1584.8	28.3	1574.7	16.2	1561.2	3.7	1561.2	3.7	103.5
21	ELT37-16-A-8	429	4413	2.9	10.315	2.6	3.88992	7.0	0.25344	6.5	0.91	1458.9	85.4	1501.8	35.5	1566.1	26.6	1566.1	26.6	96.0
21	ELT37-16-A-57	598	14573	2.4	10.310	3.7	3.80327	12.0	0.28438	11.4	0.95	1613.4	163.4	1593.4	97.1	1567.1	70.3	1567.1	70.3	103.0
21	ELT37-16-A-1	305	2342	1.0	10.300	3.4	3.42992	4.0	0.25623	4.2	0.96	1470.5	29.5	1511.3	31.8	1568.9	62.9	1568.9	62.9	93.7
21	ELT37-16-A-71	404	46214	1.4	10.280	1.8	3.78040	4.8	0.28186	4.5	0.93	1600.7	63.3	1588.6	38.6	1572.5	30.0	1572.5	30.0	101.8
21	ELT37-16-A-94	195	72887	0.9	10.276	1.1	3.83539	2.1	0.28358	2.0	0.97	1611.4	49.0	1585.8	29.9	1573.4	27.0	1573.4	27.0	99.4
21	ELT37-16-A-4	167	35954	2.4	10.260	2.3	3.34854	9.2	0.24917	8.8	0.97	1434.2	113.8	1492.5	71.7	1576.2	43.9	1576.2	43.9	91.0
21	ELT37-16-A-19	428	107287	2.2	10.189	0.2	3.93													

22	ELT3713-20	538	35916	3.7	12.894	1.6	2.05177	2.1	0.19187	1.4	0.65	1131.5	14.0	1132.9	14.1	1135.5	31.1	1135.5	31.1	99.6
22	ELT3713-26	545	12736	1.8	12.884	1.7	1.98115	2.0	0.18513	1.0	0.51	1094.9	10.1	1109.1	13.3	1137.0	33.8	1137.0	33.8	96.3
22	ELT3713-27	3	118	14442	3.5	12.122	3.5	2.1	0.19360	1.0	0.39	1151.5	13.5	1152.6	24.9	1174.7	68.8	1174.7	68.8	97.1
22	ELT3713-4	324	22956	1.9	12.616	2.0	2.10005	2.3	0.19216	1.0	0.44	1133.1	10.4	1148.8	15.7	1178.7	40.5	1178.7	40.5	96.1
22	ELT3713-34	181	8636	1.1	12.578	2.8	2.10548	3.1	0.19208	1.4	0.46	1132.6	15.0	1150.6	21.5	1184.6	54.7	1184.6	54.7	95.6
22	ELT3713-1	284	7422	1.8	12.451	4.5	1.97898	4.6	0.17870	1.2	0.27	1059.9	12.0	1108.4	31.2	1204.8	87.9	1204.8	87.9	88.0
22	ELT3713-30	1100	61934	13.2	12.125	5.5	1.99004	9.9	0.17500	8.2	0.83	1039.6	78.8	1121.1	66.8	1256.8	107.0	1256.8	107.0	87.8
22	ELT3713-19	149	7894	1.4	12.092	3.1	1.99832	3.5	0.17525	1.6	0.45	1049.0	25.5	1114.9	23.6	1262.1	60.9	1262.1	60.9	82.5
22	ELT3713-14	92	3968	2.1	11.161	5.2	2.96546	6.0	0.24005	2.9	0.49	1387.0	36.3	1398.8	45.3	1416.9	99.5	1416.9	99.5	97.9
22	ELT3713-29	1092	53838	18.6	10.593	3.5	3.42552	3.8	0.26296	1.3	0.35	1504.9	17.6	1509.6	29.5	1516.1	66.4	1516.1	66.4	99.3
22	ELT3713-9	208	10046	6.0	10.575	4.3	2.57838	6.1	0.19775	4.3	0.70	1163.2	45.4	1294.5	44.5	1519.4	81.6	1519.4	81.6	76.6
22	ELT3713-18	54	4918	1.0	12.548	2.4	3.46696	2.6	0.26522	1.0	0.39	1516.5	13.5	1597.9	20.3	1534.2	44.7	1534.2	44.7	95.9
22	ELT3713-3	176	13506	2.2	10.522	5.2	3.65912	5.3	0.27924	1.0	0.19	1587.5	14.5	1562.5	42.5	1528.8	98.4	1528.8	98.4	103.8
22	ELT3713-17	235	9162	1.9	10.469	2.1	3.57050	2.3	0.27110	1.0	0.45	1546.4	14.2	1543.0	18.3	1538.4	38.8	1538.4	38.8	100.5
22	ELT3713-28	159	10506	1.4	10.418	3.9	3.45352	4.1	0.26095	1.0	0.25	1494.7	13.3	1516.7	32.1	1547.5	74.2	1547.5	74.2	96.6
22	ELT3713-8	177	13356	1.8	10.369	2.9	3.94064	3.9	0.26627	2.7	0.69	1521.8	37.0	1536.3	31.3	1556.4	53.5	1556.4	53.5	97.8
22	ELT3713-21	141	12578	2.5	10.236	1.9	3.72242	3.3	0.28005	1.7	0.81	1591.6	38.1	1586.9	26.7	1580.6	36.3	1580.6	36.3	100.7
22	ELT3713-19	220	15046	1.5	10.222	2.5	3.67337	2.6	0.27234	1.0	0.38	1552.6	13.8	1565.6	21.1	1583.1	45.8	1583.1	45.8	98.1
22	ELT3713-22	227	15196	2.1	10.202	2.7	3.78055	2.9	0.27972	1.0	0.34	1590.0	14.1	1588.6	23.4	1586.8	51.2	1586.8	51.2	100.2
22	ELT3713-13	1481	14850	10.1	10.088	3.4	3.92540	5.1	0.28720	3.9	0.75	1627.5	55.4	1618.9	41.5	1607.8	63.0	1607.8	63.0	101.2
22	ELT3713-11	115	8648	0.9	10.072	3.5	3.81175	5.3	0.27844	4.4	0.75	1583.5	56.0	1595.2	42.6	1610.8	64.8	1610.8	64.8	98.3
22	ELT3713-10	105	3428	2.0	9.926	6.6	3.85642	7.6	0.27763	3.7	0.49	1579.4	52.4	1604.6	61.4	1637.8	123.1	1637.8	123.1	96.4
22	ELT3713-24	41	254	0.4	9.923	2.9	3.42676	3.2	0.24662	1.3	0.42	1421.0	17.0	1510.6	24.9	1638.4	53.3	1638.4	53.3	86.7
22	ELT3713-15	326	39430	1.2	9.832	1.8	4.19112	2.0	0.29888	1.0	0.50	1685.7	15.0	1672.3	16.7	1655.4	32.8	1655.4	32.8	101.8
22	ELT3713-33	988	5866	0.8	9.738	2.9	3.39294	6.4	0.23726	5.7	0.89	1372.4	69.8	1494.9	49.8	1673.2	54.1	1673.2	54.1	82.0
22	ELT3713-23	62	7612	1.3	9.513	30.1	3.25488	30.2	0.25488	2.0	0.96	1463.6	25.5	1514.9	24.2	1613.5	56.6	1613.5	56.6	82.9
22	ELT3713-12	277	2758	1.4	8.959	7.2	3.47964	9.9	0.22610	6.8	0.69	1314.0	81.1	1522.6	78.2	1825.9	130.2	1825.9	130.2	72.0
22	ELT3713-27	178	1202	1.1	6.417	34.6	5.84929	34.9	0.27222	4.5	0.13	1552.1	62.0	1953.7	312.4	2411.0	609.1	2411.0	609.1	64.4
22	ELT3713-A-78	241	71028	1.7	16.825	1.2	0.76132	1.8	0.09390	1.4	0.76	572.7	7.6	574.8	7.9	583.0	25.4	572.7	7.6	NA
22	ELT3713-A-37	423	20391	1.7	10.612	1.1	0.77927	2.8	0.09394	2.6	0.92	578.8	14.5	585.3	12.6	591.7	23.4	585.3	12.6	98.9
22	ELT3713-A-26	289	224903	2.8	12.948	0.6	2.03589	0.9	0.19118	0.7	0.78	1127.8	7.4	1127.6	6.2	1127.2	11.4	1127.2	11.4	100.1
22	ELT3713-A-47	310	15187	1.3	12.932	1.3	2.07522	4.4	0.19464	4.2	0.95	1146.5	43.9	1140.7	30.0	1129.6	26.4	1129.6	26.4	101.5
22	ELT3713-A-17	562	257756	1.5	12.919	0.6	2.03391	1.9	0.19057	1.8	0.95	1124.5	18.6	1126.9	13.0	1131.7	12.2	1131.7	12.2	99.4
22	ELT3713-A-38	192	17016	1.9	12.882	0.7	2.04750	9.0	0.19130	9.0	1.00	1128.4	92.7	1131.5	61.4	1137.4	14.4	1137.4	14.4	99.2
22	ELT3713-A-53	221	200229	1.5	12.812	0.3	2.07895	1.4	0.19419	1.5	0.97	1144.1	18.4	1142.9	15.6	1137.8	18.4	1137.8	18.4	109.6
22	ELT3713-A-32	720	277355	1.9	12.864	0.3	2.01823	2.4	0.18830	2.4	0.99	1112.2	24.1	1121.7	16.2	1140.1	6.0	1140.1	6.0	97.6
22	ELT3713-A-35	270	194016	0.9	12.841	0.9	2.00677	1.7	0.18690	1.4	0.84	1104.6	14.2	1117.8	11.3	1143.6	18.0	1143.6	18.0	96.6
22	ELT3713-A-5	130	115824	0.9	12.798	1.1	2.19192	2.0	0.20346	1.7	0.84	1193.9	18.7	1178.5	14.3	1150.3	22.2	1150.3	22.2	103.8
22	ELT3713-A-20	405	20117	3.2	12.789	1.5	2.27730	12.1	0.19095	12.1	0.99	1397.7	124.2	1163.4	82.8	1151.8	29.6	1151.8	29.6	101.6
22	ELT3713-A-57	212	5805	0.8	12.783	1.9	2.07762	5.2	0.19262	4.8	0.93	1135.5	50.5	1141.4	35.6	1152.7	37.1	1152.7	37.1	98.5
22	ELT3713-A-14	267	83655	3.9	12.777	0.9	2.12804	3.6	0.19720	3.5	0.97	1160.3	37.4	1158.0	25.0	1153.6	17.0	1153.6	17.0	100.6
22	ELT3713-A-92	454	7315	0.4	12.748	0.5	2.06897	6.0	0.19128	6.0	1.00	1128.3	62.3	1138.6	41.3	1158.2	10.4	1158.2	10.4	97.4
22	ELT3713-A-43	652	20217	0.9	12.739	1.4	2.11280	1.6	0.19513	0.8	0.50	1149.1	8.3	1152.7	10.9	1159.6	27.2	1159.6	27.2	99.2
22	ELT3713-A-71	114	89172	1.3	12.714	4.2	2.09787	4.2	0.20619	4.2	0.96	1190.7	26.2	1181.5	26.2	1163.5	26.2	1163.5	26.2	102.8
22	ELT3713-A-2	224	8464	1.0	12.420	1.9	2.23582	9.3	0.20140	9.1	0.98	1182.9	98.2	1192.3	65.3	1209.6	38.3	1209.6	38.3	97.8
22	ELT3713-A-63	333	35643	1.0	12.356	4.4	2.08796	8.4	0.18711	7.2	0.85	1105.7	73.2	1144.9	58.0	1219.8	86.6	1219.8	86.6	90.6
22	ELT3713-A-86	310	3880	2.1	12.225	5.2	2.29356	7.9	0.20336	6.0	0.75	1193.4	65.2	1210.3	56.3	1240.7	102.7	1240.7	102.7	96.2
22	ELT3713-A-90	405	205716	4.1	12.012	4.1	2.49176	6.0	0.21315	6.0	0.72	1256.2	64.2	1442.5	79.1	1442.5	79.1	1442.5	79.1	107.8
22	ELT3713-A-96	1477	86071	12.0	12.016	0.6	3.20356	4.2	0.25678	4.1	0.99	1473.4	54.1	1480.2	32.4	1494.3	12.1	1494.3	12.1	98.6
22	ELT3713-A-31	122	29956	1.6	10.704	0.7	3.32643	1.5	0.25824	1.3	0.87	1480.8	17.1	1487.3	11.6	1496.5	14.1	1496.5	14.1	99.0
22	ELT3713-A-28	641	9138	2.8	10.665	4.1	3.13137	10.5	0.24081	9.7	0.92	1390.9	121.6	1435.9	81.2	1503.3	77.1	1503.3	77.1	92.5
22	ELT3713-A-20	103	172476	0.9	10.665	8.8	3.42646	2.4	0.26504	2.3	0.94	1515.6	30.7	1510.5	19.0	1503.4	15.6	1503.4	15.6	100.6
22	ELT3713-A-16	326	18849	1.6	10.644	0.4	3.70705	3.5	0.26019	3.5	0.99	1490.8	62.5	1497.5	25.5	1507.0	3.3	1507.0	3.3	101.6
22	ELT3713-A-26	190	71245	1.6	10.611	1.1	3.52428	1.4	0.27123	0.8	0.61	1547.0	11.4	1532.7	10.8	1512.9	20.4	1512.9	20.4	102.3
22	ELT3713-A-46	206	244758	1.9	10.572	0.8	3.65745	2.6	0.28045	2.5	0.96	1593.6	35.2	1562.1	20.9	1519.8	14.2	1519.8	14.2	104.9
22	ELT3713-A-9	79	55246	1.7	10.552	1.5	3.62202	3.1	0.27719	2.7	0.86	1577.2	37.2	1554.9	45.5	1523.5	29.1	1523.5	29.1	103.5
22	ELT3713-A-13	97	177030	1.2	10.541	1.4	3.64114	1.4	0.27708	1.4	0.97	1576.7	14.5	1534.7	22.6	1541.1	2.6	1541.1	2.6	105.6
22	ELT3713-A-70	883	80729	7.8	10.462	1.1	3.46687	13.0	0.26307	12.9	1.00	1505.5	173.8	1519.7	102.8	1539.5	21.4	1539.5	21.4	97.8
22	ELT3713-A-51	62	28221	1.3	10.442	0.8	3.53976	4.4	0.26806	4.3	0.98	1531.0	58.9	1536.1	34.8	1543.3	14.7	1543.3	14.7	99.2

24	JPCL1-2305-19	1067	33016	3.8	17.210	0.9	0.67204	3.9	0.97	519.3	19.1	522.0	16.1	533.8	20.4	519.3	19.1	NA
24	JPCL1-2370-2375-1	664	134906	4.3	9.349	0.3	4.52103	5.6	0.30656	5.6	1.00	1723.8	84.8	1734.8	46.7	1748.2	5.7	98.6
24	JPCL1-2370-2375-10	457	34112	3.8	0.1966	3.8	0.1966	3.8	0.41242	2.5	0.67	2226.0	11	2357.7	34.4	2473.7	47.3	90.35
24	JPCL1-2370-2375-11	1886	31245	4.5	7.155	3.6	6.11139	24.2	0.31713	23.9	0.99	1775.7	371.9	1991.9	214.4	2224.3	62.9	79.8
24	JPCL1-2370-2375-12	266	194997	2.2	6.309	0.2	10.27250	1.5	0.47005	1.5	0.99	2483.8	30.0	2459.6	13.6	2439.7	2.8	101.8
24	JPCL1-2370-2375-16	22	321	0.5	9.055	17.1	4.57334	18.5	0.30035	7.0	0.38	1693.0	104.4	1744.4	155.2	1806.6	313.3	93.7
24	JPCL1-2370-2375-18	304	92335	0.8	9.230	0.9	4.57261	4.5	0.30609	4.4	0.98	1721.4	66.2	1744.3	37.2	1771.8	15.9	1771.8
24	JPCL1-2370-2375-19	270	11155	0.6	4.481	1.0	8.72941	6.4	0.38920	6.4	0.99	2119.1	114.7	2269.1	58.3	2394.0	16.8	85.8
24	JPCL1-2370-2375-22	544	11429	0.8	9.536	0.2	4.18873	6.5	0.28969	6.5	1.00	1640.0	93.6	1671.8	53.1	1712.0	3.6	95.8
24	JPCL1-2305-1	1229	15881	2.6	9.934	5.7	0.45610	5.2	0.90799	2422.3	104.65	2428.6	52.7	2433.9	40.5	2433.9	40.5	99.8
24	JPCL1-2305-2	2734	11149	0.2	9.208	5.6	0.41567	4.6	0.82301	2240.8	86.68	2358.9	51.0	2462.6	53.4	2462.6	53.4	95.8
24	JPCL1-2305-3	940	4815	3.0	10.313	4.9	0.58456	4.0	0.81867	2967.3	95.36	2952.4	47.2	2942.2	45.3	2942.2	45.3	100.3
24	JPCL1-2305-4	865	6796	0.8	10.558	8.6	0.47960	7.2	0.83568	2525.5	149.89	2485.0	79.8	2452.0	79.8	2452.0	79.8	101.3
25	DF79-47-A-3	166	20671	1.5	19.309	5.2	0.30190	5.6	0.04228	1.9	0.35	266.9	5.1	267.9	13.2	276.2	120.3	266.9
25	DF79-47-A-65	171	69802	1.4	18.464	2.9	0.43477	4.2	0.05822	3.1	0.73	364.8	10.9	366.6	13.0	377.7	65.3	364.8
25	DF79-47-A-46	705	100428	2.8	18.956	1.0	0.46883	0.6	0.06306	4.8	0.97	394.2	14.7	390.2	29.9	396.7	22.2	394.2
25	DF79-47-A-66	375	45891	19.3	15.727	4.6	0.69198	12.0	0.07893	11.1	0.92	489.7	52.2	534.0	49.8	727.9	97.7	489.7
25	DF79-47-A-90	266	18762	2.8	17.356	3.8	0.68021	4.5	0.08562	2.3	0.52	529.6	11.7	526.9	18.3	515.2	83.9	529.6
25	DF79-47-A-10	300	63387	3.0	17.309	1.6	0.68801	3.4	0.08637	2.0	0.88	534.0	15.3	531.6	14.1	521.2	35.9	534.0
25	DF79-47-A-48	453	33745	3.5	17.108	0.7	0.7134	3.8	0.08727	3.7	0.98	539.4	19.1	540.8	15.8	546.8	15.7	539.4
25	DF79-47-A-82	334	133089	2.4	17.239	1.5	0.69965	3.3	0.08748	3.0	0.90	540.6	15.3	538.6	13.8	530.0	32.2	540.6
25	DF79-47-A-45	657	135622	14.2	16.441	3.1	0.73500	12.0	0.08764	11.6	0.97	541.6	60.1	559.5	51.5	633.0	65.9	541.6
25	DF79-47-A-52	223	54111	1.4	17.047	1.6	0.71817	2.2	0.08879	1.5	0.69	548.4	7.9	549.6	9.2	554.6	3.4	548.4
25	DF79-47-A-97	479	53401	8.1	15.967	2.6	0.78328	13.3	0.09071	12.0	0.98	559.7	69.7	587.4	59.2	695.6	54.9	559.7
25	DF79-47-A-30	899	161308	2.6	17.213	0.6	0.72983	2.4	0.09083	2.4	0.97	560.4	12.8	572.6	10.5	520.6	13.2	560.4
25	DF79-47-A-21	47	5488	0.8	15.596	14.4	0.80636	17.0	0.09121	9.1	0.53	562.7	49.1	600.4	77.4	745.5	305.9	562.7
25	DF79-47-A-59	356	17716	2.5	16.976	1.9	0.74133	3.5	0.09127	3.0	0.85	563.1	15.9	563.2	15.1	563.7	40.3	563.1
25	DF79-47-A-84	116	23220	0.9	16.978	4.9	0.74515	5.5	0.09126	2.3	0.43	565.9	12.7	565.4	23.7	563.4	107.6	565.9
25	DF79-47-A-19	493	96201	1.7	17.020	4.0	0.75347	3.4	0.09187	3.1	0.81	566.8	17.2	570.2	22.1	534.6	87.4	566.8
25	DF79-47-A-69	314	124450	1.6	16.484	1.3	0.77396	2.8	0.09253	2.5	0.88	570.5	13.4	582.0	12.3	627.3	280.0	570.5
25	DF79-47-A-41	287	3726	2.4	16.612	2.3	0.77013	3.5	0.09278	2.7	0.76	572.0	14.7	579.8	15.6	610.7	49.5	572.0
25	DF79-47-A-37	162	57633	1.7	17.029	4.4	0.75600	7.1	0.09337	5.6	0.79	575.4	30.9	571.7	31.1	556.9	95.1	575.4
25	DF79-47-A-23	746	9220	60.5	16.163	5.4	0.79741	10.8	0.09347	9.4	0.87	576.1	51.8	595.4	48.8	669.7	115.6	576.1
25	DF79-47-A-76	305	32943	0.8	16.912	3.6	0.76246	3.8	0.09382	5.4	0.87	576.8	18.8	575.4	4.4	571.9	37.8	576.8
25	DF79-47-A-72	153	40867	2.0	16.729	3.0	0.77113	5.5	0.09356	4.7	0.84	576.6	25.8	580.4	24.5	595.5	64.9	576.6
25	DF79-47-A-104	36	6838	0.5	17.098	8.8	0.75602	9.9	0.09375	4.6	0.47	577.7	25.6	571.7	43.5	548.0	192.3	577.7
25	DF79-47-A-4	418	175811	6.4	16.900	1.2	0.76626	2.1	0.09392	1.7	0.81	578.7	9.4	577.6	9.2	573.4	26.6	578.7
25	DF79-47-A-19	80	9600	1.7	17.020	4.0	0.75347	3.4	0.09401	3.1	0.61	579.2	17.2	570.2	22.1	534.6	87.4	579.2
25	DF79-47-A-61	198	67252	1.7	16.716	2.5	0.77678	3.1	0.09417	1.8	0.60	580.2	10.2	583.6	13.6	597.2	53.1	580.2
25	DF79-47-A-43	101	21840	0.8	16.960	4.2	0.76678	4.5	0.09432	1.4	0.31	581.0	7.8	577.9	19.6	565.7	92.1	581.0
25	DF79-47-A-98	901	233463	3.7	16.857	0.6	0.77895	2.4	0.09523	2.4	0.97	586.4	13.3	584.9	10.8	578.9	12.8	586.4
25	DF79-47-A-76	377	132954	6.6	16.930	1.0	0.77957	2.1	0.09572	1.8	0.87	589.3	10.2	585.2	9.3	569.6	22.0	589.3
25	DF79-47-A-40	15	3024	1.5	30.24	1.5	0.68130	3.0	0.09581	3.0	0.97	590.4	14.0	587.2	128.8	571.7	171.8	590.4
25	DF79-47-A-54	279	47239	5.2	16.703	1.5	0.79596	7.9	0.09643	7.8	0.98	593.4	44.2	594.5	35.8	598.8	33.3	593.4
25	DF79-47-A-83	212	27084	1.0	16.782	1.6	0.80130	3.0	0.09753	2.5	0.84	599.9	14.5	597.6	13.6	588.6	35.2	599.9
25	DF79-47-A-81	650	188176	42.3	16.727	0.7	0.80923	3.1	0.09817	3.0	0.97	603.7	17.2	602.0	13.9	595.8	15.0	603.7
25	DF79-47-A-68	176	7431	12.1	16.440	2.7	0.82463	2.4	0.09826	2.4	0.97	604.6	10.4	610.6	47.2	610.6	13.2	604.6
25	DF79-47-A-86	225	61565	2.5	16.444	1.8	0.87130	2.0	0.10391	0.9	0.44	637.3	5.4	636.3	9.5	632.6	38.8	637.3
25	DF79-47-A-39	514	76109	1.0	14.550	1.5	1.28469	4.0	0.13557	3.7	0.92	819.6	28.3	838.9	22.8	890.5	31.9	890.5
25	DF79-47-A-100	119	29129	1.9	14.465	5.0	1.50537	16.3	0.15793	15.5	0.95	945.3	136.4	932.6	99.7	902.6	102.9	902.6
25	DF79-47-A-35	168	27328	2.0	14.198	0.9	1.57378	2.0	0.16205	1.8	0.90	968.2	15.9	959.9	12.2	941.1	18.0	941.1
25	DF79-47-A-11	188	23565	1.8	14.059	2.7	1.65550	5.8	0.16550	5.5	0.80	979.2	23.0	979.2	23.0	967.3	25.5	979.2
25	DF79-47-A-44	70	6699	2.3	13.565	5.3	1.66150	5.8	0.16347	2.3	0.40	976.0	21.0	993.9	36.5	1033.7	105.3	976.0
25	DF79-47-A-14	263	130927	19.3	13.468	0.7	1.82777	4.0	0.17853	4.0	0.99	1058.9	38.8	1055.5	26.4	1048.4	13.3	1048.4
25	DF79-47-A-26	465	32528	13.9	13.430	8.2	0.97597	14.5	0.09506	12.0	0.83	585.4	67.0	691.5	72.9	1054.0	165.3	1054.0
25	DF79-47-A-12	207	85916	2.2	12.120	2.7	1.66417	1.6	0.6994	1.5	0.91	1540.5	20.3	1550.0	14.0	1584.2	12.1	1540.5
25	DF79-47-A-53	556	108802	4.8	12.824	3.3	1.78542	12.3	0.16606	11.9	0.96	990.4	108.8	1040.2	80.3	1146.3	65.8	1146.3
25	DF79-47-A-47	120	44064	2.3	12.667	3.3	2.10650	13.9	0.19352	13.5	0.97	1140.4	141.3	1150.9	96.0	1170.8	64.8	1170.8
25	DF79-47-A-80	101	39326	3.2	12.597	2.0	2.24981	3.0	0.20966	2.3	0.75	1227.0	25.3	1210.7	21.5	1181.7	40.0	1181.7
25	DF79-47-A-78	95	35308	1.1	12.413	1.6	2.40106	2.7	0.21616	2.1	0.78	1261.3	23.8	1242.9	19.0	1210.8	32.4	1210.8
25	DF79-47-A-19	95	52475	1.9	12.267	2.6	2.80807	3.8	0.20886	3.8	0.71	1490.6	29.9	1490.6	26.6	1254.0	30.4	1490.6
25	DF79-47-A-55	456	52288	4.2	11.104	0.7	2.58564	6.2	0.20823	4.0	0.65	1219.4	44.3	1296.6	45.1	1426.8	89.6	1426.8
25	DF79-47-A-70	138	74607	2.1	10.941	0.9	3.24762	3.1	0.25769	3.0	0.96	1478.0	39.7	1468.6	24.4	1455.0	17.7	1455.0
25	DF79-47-A-13	222	44453	1.6	10.818	1.9	3.32268	3.1	0.26609	2.5	0.80	1493.4	33.1	1486.4	24.2	1476.4	35.3	1476.4
25	DF79-47-A-2	201	238826	1.2	10.818	1.6	3.32268	3.1	0.26609	2.5	0.80	1493.4	33.1	1486.4	24.2	1476.4	35.	

26	DF80-34-A-94	520	30159	4.6	17.805	4.6	0.50629	5.1	0.06538	2.3	0.45	408.3	9.2	416.0	17.5	458.9	101.6	408.3	9.2	NA
26	DF80-34-A-6	1159	535268	2.1	18.367	0.9	0.51003	2.8	0.06794	2.7	0.95	423.7	10.9	418.5	9.6	389.5	19.8	423.7	10.9	NA
26	DF80-34-A-61	766	965	6.7	16.512	1.4	0.61653	3.5	0.07383	3.2	0.91	459.2	14.0	487.7	13.5	623.7	30.8	459.2	14.0	NA
26	DF80-34-A-9	1191	176405	2.4	17.510	0.8	0.58209	5.6	0.07392	5.6	0.99	459.8	24.7	465.8	21.0	495.7	17.6	459.8	24.7	NA
26	DF80-34-A-42	481	159120	3.2	17.433	1.3	0.60521	2.0	0.07652	1.5	0.74	475.3	6.7	480.5	7.6	505.5	29.4	475.3	6.7	NA
26	DF80-34-A-2	434	62884	1.8	17.700	2.0	0.59624	8.5	0.07654	8.3	0.97	475.4	38.0	474.8	32.4	471.9	44.9	475.4	38.0	NA
26	DF80-34-A-38	587	3551	2.7	16.768	6.2	0.63453	11.3	0.07717	9.5	0.84	479.2	43.7	498.9	44.7	590.4	135.0	479.2	43.7	NA
26	DF80-34-A-78	902	347061	6.5	17.173	1.2	0.63152	4.6	0.07866	4.4	0.96	488.1	20.6	497.0	17.9	538.4	27.2	488.1	20.6	NA
26	DF80-34-A-59	1303	10621	1.7	17.119	2.4	0.63912	3.0	0.07935	1.9	0.62	492.2	8.8	501.8	12.0	545.4	51.9	492.2	8.8	NA
26	DF80-34-A-91	260	43454	1.3	17.585	1.2	0.62492	3.1	0.07970	2.9	0.92	494.3	13.7	492.9	12.2	486.4	27.0	494.3	13.7	NA
26	DF80-34-A-26	451	119044	1.4	17.430	1.8	0.63222	3.2	0.07992	2.7	0.83	495.7	12.8	497.5	12.7	505.9	39.3	495.7	12.8	NA
26	DF80-34-A-32	257	46170	1.9	17.624	2.4	0.62960	4.8	0.08048	4.1	0.86	499.0	19.6	495.8	18.6	481.4	53.9	499.0	19.6	NA
26	DF80-34-A-40	267	5694	3.3	17.184	3.0	0.64847	3.7	0.08082	2.1	0.57	501.0	10.2	507.5	14.7	537.1	65.7	501.0	10.2	NA
26	DF80-34-A-95	205	44008	3.0	17.718	2.6	0.63654	3.0	0.08180	1.6	0.52	506.8	7.7	500.2	12.0	469.7	57.4	506.8	7.7	NA
26	DF80-34-A-97	426	74074	1.5	17.317	1.5	0.65130	4.6	0.08180	4.3	0.94	506.9	21.2	509.3	18.5	520.1	33.8	506.9	21.2	NA
26	DF80-34-A-82	345	70733	2.1	17.533	1.2	0.64771	4.4	0.08236	4.3	0.96	510.2	20.9	507.1	17.7	492.9	26.5	510.2	20.9	NA
26	DF80-34-A-54	201	55674	1.5	17.216	2.9	0.67630	3.4	0.08444	3.7	0.51	522.6	8.7	524.5	13.7	533.1	63.0	522.6	8.7	NA
26	DF80-34-A-35	254	64782	5.4	17.276	2.9	0.67424	9.3	0.08448	8.9	0.95	522.8	44.6	523.3	38.2	525.3	62.9	522.8	44.6	NA
26	DF80-34-A-37	230	73614	2.0	16.795	2.2	0.69385	2.4	0.08452	0.9	0.39	523.0	4.7	535.1	9.9	587.0	47.5	523.0	4.7	NA
26	DF80-34-A-28	42	9295	1.5	18.135	15.2	0.64960	15.7	0.08491	3.6	0.23	525.4	18.3	505.8	62.5	418.0	342.1	525.4	18.3	NA
26	DF80-34-A-80	798	8706	16.9	15.352	5.3	0.76173	9.1	0.08498	7.4	0.82	525.8	37.5	575.0	40.0	774.6	111.1	525.8	37.5	NA
26	DF80-34-A-56	508	139400	9.7	17.267	0.8	0.68073	4.1	0.08525	4.0	0.98	527.4	20.4	527.2	16.9	526.6	18.2	527.4	20.4	NA
26	DF80-34-A-90	221	53433	3.8	17.333	3.8	0.69025	4.0	0.08677	1.1	0.28	536.4	5.7	533.0	16.4	518.1	83.3	536.4	5.7	NA
26	DF80-34-A-44	320	55882	3.1	17.308	1.9	0.69463	4.9	0.08720	4.5	0.92	538.9	23.3	536.0	20.4	521.3	41.7	538.9	23.3	NA
26	DF80-34-A-98	298	117820	5.4	15.345	5.6	0.78439	17.8	0.08730	17.0	0.98	539.5	88.1	588.0	80.1	779.8	118.1	539.5	88.1	NA
26	DF80-34-A-34	366	62482	1.6	17.573	4.0	0.68674	12.5	0.08753	11.8	0.95	540.9	61.3	530.8	51.5	487.8	87.5	540.9	61.3	NA
26	DF80-34-A-39	336	58534	2.6	17.278	2.0	0.70727	3.3	0.08863	2.6	0.80	547.4	13.7	543.1	13.8	525.1	43.2	547.4	13.7	NA
26	DF80-34-A-22	452	23288	2.1	16.883	2.0	0.74229	4.9	0.09089	4.5	0.92	560.8	24.2	563.7	21.3	575.6	43.0	560.8	24.2	NA
26	DF80-34-A-27	622	57931	2.2	17.183	1.0	0.73082	4.3	0.09108	4.2	0.97	561.9	22.5	557.0	18.4	537.2	21.7	561.9	22.5	NA
26	DF80-34-A-71	1056	131274	6.0	16.909	0.7	0.74417	1.7	0.09126	1.6	0.91	563.0	8.5	564.8	7.5	572.3	15.5	563.0	8.5	NA
26	DF80-34-A-88	209	44065	1.1	16.809	2.5	0.74986	4.2	0.09141	3.4	0.81	563.9	18.2	568.1	18.2	585.2	53.5	563.9	18.2	NA
26	DF80-34-A-68	106	32186	0.8	17.284	5.4	0.73954	6.4	0.09271	3.4	0.53	571.5	18.5	562.1	27.5	524.3	118.5	571.5	18.5	NA
26	DF80-34-A-58A	234	31697	2.8	16.428	2.1	0.77980	6.4	0.09291	6.0	0.94	572.7	32.8	585.4	28.3	634.7	45.7	572.7	32.8	NA
26	DF80-34-A-69	1068	224258	10.4	16.891	0.3	0.75870	1.7	0.09294	1.7	0.99	572.9	9.5	573.3	7.6	574.7	5.8	572.9	9.5	NA
26	DF80-34-A-65	385	155136	1.7	16.881	1.3	0.76571	1.9	0.09375	1.4	0.74	577.6	7.9	577.3	8.6	575.9	28.6	577.6	7.9	NA
26	DF80-34-A-64	474	76712	5.6	15.352	2.5	0.84534	14.0	0.09412	13.8	0.98	579.9	76.6	622.1	65.4	778.8	51.5	579.9	76.6	NA
26	DF80-34-A-53	295	51272	1.2	16.679	1.6	0.78151	2.6	0.09454	2.1	0.80	582.3	11.6	586.3	11.6	601.9	33.9	582.3	11.6	NA
26	DF80-34-A-47	254	67023	1.6	17.017	2.5	0.77649	4.5	0.09583	3.7	0.83	589.9	21.0	583.5	20.0	558.5	54.8	589.9	21.0	NA
26	DF80-34-A-29	853	6883	7.2	15.265	1.4	0.86893	3.0	0.09620	2.6	0.88	592.1	14.7	635.0	14.0	790.7	29.9	592.1	14.7	NA
26	DF80-34-A-3	216	83737	2.6	16.498	1.6	0.81318	5.3	0.09730	5.1	0.95	598.6	29.1	604.2	24.3	625.5	34.8	598.6	29.1	NA
26	DF80-34-A-31	70	19410	2.5	13.969	3.8	1.60873	8.7	0.16298	7.8	0.90	973.3	70.8	973.6	54.4	974.3	76.6	974.3	76.6	99.9
26	DF80-34-A-15	490	236208	1.4	13.505	0.8	1.66777	9.6	0.16335	9.6	1.00	975.4	87.0	996.3	61.3	1042.7	15.6	1042.7	15.6	93.5
26	DF80-34-A-19	143	72173	2.8	13.481	1.7	1.89284	2.6	0.18504	2.0	0.78	1094.5	20.1	1078.5	17.5	1046.4	34.5	1046.4	34.5	104.6
26	DF80-34-A-81	276	81987	4.7	13.367	3.2	1.74079	15.3	0.16876	15.2	0.98	1095.3	141.1	1023.8	100.2	1063.5	63.8	1063.5	63.8	94.5
26	DF80-34-A-84	536	68106	2.9	12.903	0.9	1.95661	8.2	0.18310	8.1	0.99	1083.9	81.0	1100.7	54.9	1134.2	18.0	1134.2	18.0	95.6
26	DF80-34-A-79	669	113066	2.4	12.881	0.7	2.03036	4.6	0.18968	4.6	0.99	1119.6	47.1	1125.7	31.6	1137.5	14.3	1137.5	14.3	98.4
26	DF80-34-A-66	318	64117	6.0	12.597	8.8	2.05708	11.2	0.18793	7.0	0.62	1110.2	70.9	1134.7	77.0	1181.8	175.1	1181.8	175.1	93.9
26	DF80-34-A-67	598	278751	11.1	12.459	0.5	2.2567	4.5	0.20111	4.5	0.99	1181.3	48.1	1189.2	31.5	1203.5	10.3	1203.5	10.3	98.2
26	DF80-34-A-72	591	40272	0.9	12.269	0.5	2.42705	3.2	0.21996	3.1	0.98	1281.7	36.2	1263.9	22.8	1233.8	10.7	1233.8	10.7	103.9
26	DF80-34-A-12	149	84911	2.5	11.711	5.4	2.40580	6.1	0.20433	2.9	0.48	1198.6	32.2	1244.3	43.9	1324.4	104.0	1324.4	104.0	90.5
26	DF80-34-A-11	185	154253	1.9	9.160	0.4	4.69507	2.2	0.31193	2.2	0.98	1750.2	33.3	1766.4	18.6	1785.5	8.0	1785.5	8.0	98.0
26	DF80-34-A-16	439	330345	4.7	9.070	1.4	4.53059	4.5	0.29802	4.3	0.95	1681.5	63.0	1736.6	37.3	1803.7	25.8	1803.7	25.8	93.2
26	DF8034-2	695	4598	4.0	16.714	14.5	0.58670	15.9	0.07112	6.5	0.41	442.9	27.7	468.8	59.7	597.4	315.7	442.9	27.7	NA
26	DF8034-3	518	12672	2.5	11.174	3.6	3.11941	3.7	0.25280	1.0	0.27	1452.9	13.0	1437.5	28.6	1414.8	68.6	1414.8	68.6	102.7
26	DF8034-4	91	670	2.2	18.277	7.2	0.63606	7.7	0.08431	2.9	0.37	521.8	14.3	499.9	30.5	400.5	160.9	521.8	14.3	NA
26	DF8034-5	799	6758	14.0	11.057	7.1	1.88558	15.3	0.15145	13.6	0.89	909.1	115.1	1077.1	102.0	1434.8	135.5	1434.8	135.5	63.4
26	DF8034-6	79	266	2.1	13.594	22.6	0.79781	24.4	0.07866	9.1	0.38	488.1	43.0	595.6	110.2	1029.4	462.2	488.1	43.0	NA
26	DF8034-7	123	5510	1.8	5.396	3.1	12.96497	3.5	0.50738	1.7	0.48	2645.4	36.5	2677.1	33.0	2701.1	50.8	2701.1	50.8	97.9
26	DF8034-8	369	1954	12.4	18.127	8.8	0.61676	8.8	0.08108	1.0	0.11	502.6	4.8	487.8	34.2	419.0	196.0	502.6	4.8	NA
26	DF8034-9	484	2448	2.3	17.828	7.2	0.41106	7.2	0.05703	1.0	0.14	357.5	3.5	371.0	22.5	456.0	159.4	357.5	3.5	NA
26	DF8034-10	318	4006	3.0	14.561	3.8	1.36828	4.2	0.14											

Appendix B. $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende data. $^{40}\text{Ar}/^{39}\text{Ar}$ analyses were performed at L-DEO's AGES lab.

See Table 2 for which study each sample is from

Core ID	Sample Name	Run ID Number	Ca/K	Cl/K	Mol ^{39}Ar	% $^{40}\text{Ar}^*$	Age	Internal Error	$\pm$ Age	Size Fraction	n	Study
1	IWSOE 68-11	12647-36	0.16515	0.0039	0.11	83.7	51.80	1.07	1.18	>150	67	<i>this study</i>
1	IWSOE 68-11	12647-04	1.6624	0.04062	0.116	36.6	89.00	2.18	2.34	>150		
1	IWSOE 68-11	12647-34	10.73163	0.05211	0.031	99.5	109.61	3.40	3.57	>150		
1	IWSOE 68-11	12647-32	20.10268	0.00463	0.018	78	113.89	5.97	6.07	>150		
1	IWSOE 68-11	12647-48	2.85654	-0.00938	0.046	86.2	135.68	2.52	2.84	>150		
1	IWSOE 68-11	12647-65	21.11144	-0.02153	0.009	67.6	174.75	12.86	12.97	>150		
1	IWSOE 68-11	12647-50	25.20956	0.22683	0.01	90.6	181.87	10.52	10.67	>150		
1	IWSOE 68-11	12647-20	1.61773	-0.16641	0.006	27.6	343.97	34.56	34.72	>150		
1	IWSOE 68-11	12647-11	0.05656	-0.38715	0.004	54.3	364.21	47.17	47.30	>150		
1	IWSOE 68-11	12647-37	24.87592	0.10847	0.009	95.3	672.39	12.06	13.72	>150		
1	IWSOE 68-11	12647-57	36.58748	0.03187	0.007	93.7	977.78	17.12	19.58	>150		
1	IWSOE 68-11	12647-28	6.1483	0.02383	0.118	99.1	978.93	2.84	9.92	>150		
1	IWSOE 68-11	12647-09	14.30418	0.11503	0.069	81.7	990.66	4.45	10.60	>150		
1	IWSOE 68-11	12647-70	6.35591	-0.01859	0.015	97.9	993.12	8.57	12.90	>150		
1	IWSOE 68-11	12647-08	12.90936	0.1405	0.146	87.1	993.75	3.27	10.19	>150		
1	IWSOE 68-11	12647-47	10.02358	0.02682	0.026	98.4	1001.63	6.06	11.46	>150		
1	IWSOE 68-11	12647-30	15.44037	0.1034	0.012	99.8	1013.53	11.59	15.21	>150		
1	IWSOE 68-11	12647-27	9.23468	0.01462	0.08	96.9	1019.41	3.43	10.48	>150		
1	IWSOE 68-11	12647-79	4.97364	0.15599	0.011	96.7	1024.65	12.25	15.78	>150		
1	IWSOE 68-11	12647-13	5.89838	0.01215	0.121	100.2	1029.93	2.69	10.36	>150		
1	IWSOE 68-11	12647-58	16.16855	-0.06613	0.009	94.1	1034.34	14.96	18.02	>150		
1	IWSOE 68-11	12647-38	69.58627	0.23692	0.004	90.4	1035.00	34.50	35.94	>150		
1	IWSOE 68-11	12647-40	12.00619	0.05929	0.031	99.7	1037.92	5.31	11.39	>150		
1	IWSOE 68-11	12647-29	25.09569	0.00497	0.013	92.3	1040.54	10.52	14.59	>150		
1	IWSOE 68-11	12647-84	27.12519	0.0906	0.004	61.8	1046.54	26.59	28.47	>150		
1	IWSOE 68-11	12647-78	30.34233	0.37314	0.003	92.6	1049.42	38.31	39.65	>150		
1	IWSOE 68-11	12647-55	7.57517	0.04157	0.042	99.1	1060.18	4.70	11.32	>150		
1	IWSOE 68-11	12647-53	16.85866	0.01813	0.013	99.2	1062.23	10.53	14.74	>150		
1	IWSOE 68-11	12647-46	11.79768	-0.01711	0.022	97.7	1064.30	6.14	12.02	>150		
1	IWSOE 68-11	12647-68	10.97152	0.0193	0.013	99	1076.43	10.27	14.65	>150		
1	IWSOE 68-11	12647-60	9.10964	0.05162	0.005	90.5	1078.15	27.15	29.10	>150		
1	IWSOE 68-11	12647-69	1.01744	0.06347	0.007	100.6	1079.63	13.75	17.29	>150		
1	IWSOE 68-11	12647-31	17.06273	0.01471	0.029	95.5	1087.97	6.02	12.16	>150		
1	IWSOE 68-11	12647-16	8.16393	0.01518	0.118	102.6	1088.29	3.38	11.10	>150		
1	IWSOE 68-11	12647-62	0.32059	0.03101	0.029	100.4	1089.12	5.47	11.91	>150		
1	IWSOE 68-11	12647-42	30.30344	0.07153	0.007	80.2	1091.09	18.46	21.28	>150		
1	IWSOE 68-11	12647-74	13.48353	0.02689	0.011	99.3	1096.65	10.77	15.15	>150		
1	IWSOE 68-11	12647-54	31.61401	0.13598	0.015	96.1	1105.07	9.64	14.42	>150		
1	IWSOE 68-11	12647-18	8.36025	-0.02394	0.058	103.6	1113.16	5.00	11.91	>150		
1	IWSOE 68-11	12647-56	9.64379	0.00634	0.085	98.4	1114.63	3.44	11.36	>150		

1	IWSOE 68-11	12647-23	9.91952	0.00397	0.023	99.3	1119.87	6.14	12.49	>150
1	IWSOE 68-11	12647-39	26.43813	0.02107	0.012	97.7	1123.54	11.96	16.19	>150
1	IWSOE 68-11	12647-17	8.49591	0.01098	0.179	100.4	1128.21	2.55	11.25	>150
1	IWSOE 68-11	12647-33	8.37599	-0.00472	0.03	96.5	1128.79	6.62	12.81	>150
1	IWSOE 68-11	12647-14	25.66186	-0.04961	0.02	88.7	1135.72	10.63	15.32	>150
1	IWSOE 68-11	12647-59	6.78029	0.00175	0.012	94.3	1136.60	12.89	16.97	>150
1	IWSOE 68-11	12647-67	7.90798	0.0376	0.036	98.4	1150.23	6.01	12.68	>150
1	IWSOE 68-11	12647-51	52.9438	0.09856	0.005	88.2	1155.94	24.20	26.68	>150
1	IWSOE 68-11	12647-76	44.49258	0.12855	0.003	91.4	1170.32	36.61	38.33	>150
1	IWSOE 68-11	12647-64	9.58717	-0.04535	0.012	100.3	1170.71	11.11	15.90	>150
1	IWSOE 68-11	12647-19	8.40245	-0.02471	0.055	103.2	1170.86	4.55	12.25	>150
1	IWSOE 68-11	12647-75	17.39199	-0.09797	0.009	95.2	1185.52	14.11	18.21	>150
1	IWSOE 68-11	12647-35	17.45126	0.03424	0.015	93.1	1186.71	10.44	15.55	>150
1	IWSOE 68-11	12647-26	18.05256	0.04454	0.032	98.8	1205.53	5.53	12.95	>150
1	IWSOE 68-11	12647-77	11.14394	0.10103	0.017	99.3	1211.83	7.92	14.19	>150
1	IWSOE 68-11	12647-15	6.07386	-0.04647	0.059	105.4	1213.06	4.86	12.74	>150
1	IWSOE 68-11	12647-52	18.72133	0.07946	0.014	96.7	1218.08	11.16	16.26	>150
1	IWSOE 68-11	12647-66	20.15955	0.05026	0.012	99.2	1221.73	13.08	17.66	>150
1	IWSOE 68-11	12647-24	11.14801	-0.00838	0.028	96.6	1225.71	7.19	13.91	>150
1	IWSOE 68-11	12647-44	12.41115	0.00744	0.009	100.7	1226.16	15.33	19.41	>150
1	IWSOE 68-11	12647-41	27.21596	0.0963	0.014	99.1	1229.66	9.30	15.14	>150
1	IWSOE 68-11	12647-25	13.56242	0.05925	0.028	99.8	1241.55	6.05	13.49	>150
1	IWSOE 68-11	12647-71	15.03851	0.22408	0.006	101.4	1251.07	21.24	24.47	>150
1	IWSOE 68-11	12647-12	13.87901	0.02741	0.068	99.2	1253.15	4.15	12.86	>150
1	IWSOE 68-11	12647-43	24.74571	0.02354	0.01	96.8	1283.44	13.19	18.15	>150
1	IWSOE 68-11	12647-21	7.43308	0.01975	0.052	95.9	1378.72	5.19	14.36	>150
1	IWSOE 68-11	12647-85	21.12219	0.03345	0.004	97.5	1486.77	30.42	33.67	>150
2	IWSOE68 G8	12638-07	12.78382	0.02456	0.003	2.7	176.35	68.20	68.22	>150
2	IWSOE68 G8	12638-08	16.58322	0.11478	0.002	10.1	346.74	61.25	61.34	>150
2	IWSOE68 G8	12638-01	8.19739	0.01127	0.311	92.2	481.92	1.28	4.85	>150
2	IWSOE68 G8	12638-15	7.72143	-0.01671	0.023	96.2	489.50	5.90	7.58	>150
2	IWSOE68 G8	12638-02	18.19448	0.00741	0.046	78.8	490.24	3.53	5.93	>150
2	IWSOE68 G8	12638-04	15.13614	-0.03931	0.005	76.8	893.69	21.54	23.22	>150
3	IWSOE70 2-22-1	12636-107	39.30669	0.17588	0.002	9.6	17.72	67.07	67.07	>150
3	IWSOE70 2-22-1	12636-108	27.23109	0.02192	0.009	31.2	167.46	12.94	13.05	>150
3	IWSOE70 2-22-1	12636-20	11.53312	0.12621	0.041	98.1	189.15	3.31	3.82	>150
3	IWSOE70 2-22-1	12636-62	0.45077	-0.00256	0.038	25.6	197.05	5.92	6.24	>150
3	IWSOE70 2-22-1	12636-105	22.5179	-0.00911	0.008	92.3	202.48	13.27	13.42	>150
3	IWSOE70 2-22-1	12636-71	22.61232	0.09223	0.008	93.8	346.39	11.90	12.39	>150
3	IWSOE70 2-22-1	12636-84	1.80642	0.09548	0.009	81.6	439.82	11.85	12.64	>150
3	IWSOE70 2-22-1	12636-61	15.71271	0.02306	0.011	82.7	446.79	11.35	12.20	>150
3	IWSOE70 2-22-1	12636-35	38.49951	0.06172	0.002	76.2	451.84	52.57	52.76	>150
3	IWSOE70 2-22-1	12636-101	38.01362	0.16464	0.006	86.3	463.23	18.05	18.63	>150

6 this study

71 this study

3	IWSOE70 2-22-1	12636-65	31.90551	0.11334	0.011	84	469.50	10.13	11.16	>150
3	IWSOE70 2-22-1	12636-10	14.75702	0.00463	0.039	95	471.05	3.60	5.93	>150
3	IWSOE70 2-22-1	12636-33	6.28759	0.04761	0.035	90.7	472.15	3.93	6.14	>150
3	IWSOE70 2-22-1	12636-79	56.06088	-0.08504	0.002	86.5	475.93	50.49	50.72	>150
3	IWSOE70 2-22-1	12636-17	10.4131	0.02048	0.025	92.1	477.00	5.41	7.21	>150
3	IWSOE70 2-22-1	12636-44	18.84053	-0.01439	0.008	97.4	478.69	14.93	15.68	>150
3	IWSOE70 2-22-1	12636-36	9.16906	0.05919	0.025	91	481.45	5.71	7.47	>150
3	IWSOE70 2-22-1	12636-14	14.07925	0.06436	0.019	94.4	481.90	6.71	8.26	>150
3	IWSOE70 2-22-1	12636-21	15.70387	-0.09236	0.002	84.2	483.30	55.37	55.58	>150
3	IWSOE70 2-22-1	12636-32	13.99554	0.06894	0.033	93	485.92	4.17	6.40	>150
3	IWSOE70 2-22-1	12636-51	12.65108	-0.02777	0.017	96.1	486.93	7.04	8.56	>150
3	IWSOE70 2-22-1	12636-04	7.44489	0.01214	0.112	99.1	488.55	1.69	5.17	>150
3	IWSOE70 2-22-1	12636-12	5.70676	0.01656	0.138	98.6	489.43	1.66	5.17	>150
3	IWSOE70 2-22-1	12636-26	5.76859	0.01176	0.112	99.6	489.71	1.83	5.23	>150
3	IWSOE70 2-22-1	12636-30	32.48421	-0.07282	0.003	46.5	490.39	38.69	39.00	>150
3	IWSOE70 2-22-1	12636-24	6.19174	0.03795	0.059	98.3	491.60	2.69	5.60	>150
3	IWSOE70 2-22-1	12636-60	8.32979	-0.0015	0.036	97.7	492.28	3.75	6.19	>150
3	IWSOE70 2-22-1	12636-88	8.77888	0.12316	0.011	96.9	492.46	10.15	11.29	>150
3	IWSOE70 2-22-1	12636-29	6.74698	0.01764	0.053	99.2	493.12	2.87	5.71	>150
3	IWSOE70 2-22-1	12636-43	11.80684	0.09815	0.005	100.1	493.28	24.04	24.54	>150
3	IWSOE70 2-22-1	12636-53	5.50905	0.05126	0.021	98.3	498.30	6.55	8.23	>150
3	IWSOE70 2-22-1	12636-42	7.71981	0.00572	0.034	98.9	498.40	4.09	6.45	>150
3	IWSOE70 2-22-1	12636-76	4.6195	0.06744	0.022	103.4	498.96	4.81	6.93	>150
3	IWSOE70 2-22-1	12636-81	17.88226	-0.02238	0.013	96.6	499.71	7.48	9.00	>150
3	IWSOE70 2-22-1	12636-54	4.68595	0.02572	0.028	80.8	501.09	5.52	7.45	>150
3	IWSOE70 2-22-1	12636-07	7.89781	0.09112	0.031	96.8	501.56	4.47	6.72	>150
3	IWSOE70 2-22-1	12636-49	11.74892	-0.10269	0.011	97.5	503.13	11.25	12.33	>150
3	IWSOE70 2-22-1	12636-48	6.24855	-0.01395	0.05	99.5	507.26	3.28	6.04	>150
3	IWSOE70 2-22-1	12636-01	18.83789	0.02527	0.077	98.2	508.12	2.40	5.62	>150
3	IWSOE70 2-22-1	12636-95	9.2981	0.0461	0.026	99.7	508.17	4.50	6.78	>150
3	IWSOE70 2-22-1	12636-47	6.39316	-0.01814	0.046	71.8	509.55	3.75	6.33	>150
3	IWSOE70 2-22-1	12636-25	8.8683	0.04947	0.02	88.3	509.93	6.38	8.17	>150
3	IWSOE70 2-22-1	12636-28	5.5406	0.02665	0.051	98.4	510.23	3.03	5.93	>150
3	IWSOE70 2-22-1	12636-18	19.31936	0.08615	0.015	98.4	512.57	8.96	10.33	>150
3	IWSOE70 2-22-1	12636-41	8.88848	0.02671	0.018	78.4	513.67	7.60	9.17	>150
3	IWSOE70 2-22-1	12636-52	14.68258	0.0881	0.019	103.5	516.06	6.68	8.44	>150
3	IWSOE70 2-22-1	12636-77	65.61571	0.28412	0.004	96.9	519.19	21.71	22.32	>150
3	IWSOE70 2-22-1	12636-15	6.65581	0.00986	0.039	98.4	525.00	3.82	6.49	>150
3	IWSOE70 2-22-1	12636-68	9.03142	0.03852	0.018	98.6	525.35	7.13	8.86	>150
3	IWSOE70 2-22-1	12636-82	4.52309	0.01336	0.122	98.5	528.48	1.75	5.57	>150
3	IWSOE70 2-22-1	12636-23	5.66283	0.02115	0.046	100.6	529.41	3.17	6.17	>150
3	IWSOE70 2-22-1	12636-73	4.6297	0.07499	0.012	94.4	530.75	8.87	10.33	>150
3	IWSOE70 2-22-1	12636-31	6.75273	0.03096	0.064	96.5	535.83	2.55	5.93	>150
3	IWSOE70 2-22-1	12636-27	7.80894	0.0262	0.049	99.6	539.90	3.50	6.44	>150
3	IWSOE70 2-22-1	12636-70	7.13587	-0.02088	0.026	103.1	552.35	4.69	7.25	>150

3	IWSOE70 2-22-1	12636-46	7.20223	-0.02464	0.046	99.6	554.25	3.36	6.48	>150
3	IWSOE70 2-22-1	12636-05	7.19555	0.11032	0.034	96	561.52	4.49	7.19	>150
3	IWSOE70 2-22-1	12636-45	6.57333	0.01726	0.018	89.9	567.69	7.91	9.74	>150
3	IWSOE70 2-22-1	12636-11	14.07921	0.06555	0.025	92.3	587.86	5.87	8.31	>150
3	IWSOE70 2-22-1	12636-13	9.26903	0.00165	0.041	98.5	590.69	3.89	7.07	>150
3	IWSOE70 2-22-1	12636-72	21.57406	0.01082	0.015	72.5	638.67	7.55	9.89	>150
3	IWSOE70 2-22-1	12636-67	8.50984	0.03997	0.027	96.7	696.41	5.21	8.70	>150
3	IWSOE70 2-22-1	12636-38	9.96117	0.02336	0.022	92.5	698.66	6.69	9.67	>150
3	IWSOE70 2-22-1	12636-63	13.67332	0.02693	0.052	97.4	825.58	3.63	9.02	>150
3	IWSOE70 2-22-1	12636-69	29.54472	0.01559	0.005	87.9	932.35	21.44	23.38	>150
3	IWSOE70 2-22-1	12636-40	7.50937	0.0387	0.015	97.8	1041.29	9.18	13.88	>150
3	IWSOE70 2-22-1	12636-58	29.55405	-0.0185	0.007	91.6	1082.89	18.65	21.57	>150
3	IWSOE70 2-22-1	12636-64	14.16618	-0.02455	0.014	93.9	1113.02	9.80	14.83	>150
3	IWSOE70 2-22-1	12636-59	30.48578	-0.08447	0.007	96.4	1203.54	19.15	22.61	>150
3	IWSOE70 2-22-1	12636-02	19.12208	0.01045	0.016	95.2	1225.77	8.66	15.01	>150
3	IWSOE70 2-22-1	12636-06	27.9012	0.00159	0.026	97.8	1268.19	7.44	14.71	>150
4	IWSOE69 G17	12640-56	7.95832	-0.0335	0.014	96.7	517.98	12.38	13.36	>150
4	IWSOE69 G17	12640-66	47.5923	0.16018	0.004	76.7	666.56	28.30	29.03	>150
4	IWSOE69 G17	12640-30	29.89203	-0.05284	0.009	80	773.94	13.32	15.29	>150
4	IWSOE69 G17	12640-85	74.20188	0.10692	0.002	70.4	773.97	44.05	44.68	>150
4	IWSOE69 G17	12640-21	39.84649	-0.00412	0.006	73.7	851.36	18.97	20.69	>150
4	IWSOE69 G17	12640-23	9.16229	0.00343	0.025	88.4	881.91	5.77	10.33	>150
4	IWSOE69 G17	12640-86	98.24375	0.36813	0.004	85.2	900.84	30.57	31.80	>150
4	IWSOE69 G17	12640-63	59.44829	0.01066	0.008	95.9	909.46	16.16	18.42	>150
4	IWSOE69 G17	12640-11	1.41423	0.01595	0.046	96	940.90	4.42	10.15	>150
4	IWSOE69 G17	12640-91	40.22646	0.06297	0.007	88.3	971.02	17.02	19.46	>150
4	IWSOE69 G17	12640-36	13.68263	0.00802	0.09	96.9	973.58	3.18	9.97	>150
4	IWSOE69 G17	12640-03	16.05604	0.05106	0.015	67.2	977.32	9.59	13.49	>150
4	IWSOE69 G17	12640-06	49.0649	0.03978	0.014	77	979.49	10.14	13.91	>150
4	IWSOE69 G17	12640-61	41.2256	0.40883	0.008	94.1	983.55	17.33	19.79	>150
4	IWSOE69 G17	12640-101	21.80114	-0.01322	0.019	95.1	995.16	6.65	11.73	>150
4	IWSOE69 G17	12640-33	25.56528	-0.017	0.018	81.3	995.34	8.69	13.00	>150
4	IWSOE69 G17	12640-92	30.92992	0.01346	0.01	91.4	995.39	12.56	15.85	>150
4	IWSOE69 G17	12640-64	46.51051	0.10864	0.007	71.9	997.76	20.19	22.39	>150
4	IWSOE69 G17	12640-24	30.67076	-0.03494	0.006	82	1001.98	21.40	23.51	>150
4	IWSOE69 G17	12640-90	74.13462	0.3817	0.004	82.5	1003.70	30.34	31.86	>150
4	IWSOE69 G17	12640-01	5.65967	0.0278	0.028	92.6	1006.33	6.13	11.54	>150
4	IWSOE69 G17	12640-96	17.17793	-0.03401	0.012	69.6	1008.96	11.66	15.23	>150
4	IWSOE69 G17	12640-05	29.00639	0.06093	0.012	93.6	1009.62	11.15	14.85	>150
4	IWSOE69 G17	12640-35	23.14757	0.00087	0.209	97.8	1010.51	2.41	10.11	>150
4	IWSOE69 G17	12640-81	63.53403	0.06528	0.011	97	1010.86	12.45	15.86	>150
4	IWSOE69 G17	12640-32	30.50195	-0.00145	0.01	84.1	1011.74	13.69	16.85	>150
4	IWSOE69 G17	12640-09	12.66935	0.04998	0.026	89.6	1016.49	6.83	12.00	>150
4	IWSOE69 G17	12640-27	17.17562	0.0919	0.014	93.1	1017.06	9.48	13.69	>150

96 this study

4	IWSOE69 G17	12640-49	14.51211	-0.01935	0.021	78.1	1017.74	10.69	14.56	>150
4	IWSOE69 G17	12640-40	16.39559	-0.03627	0.037	92.9	1018.57	6.86	12.04	>150
4	IWSOE69 G17	12640-39	22.55728	-0.02572	0.031	89.8	1022.49	8.07	12.79	>150
4	IWSOE69 G17	12640-02	22.40502	0.12308	0.01	54.1	1025.52	13.92	17.12	>150
4	IWSOE69 G17	12640-99	12.996	-0.05788	0.012	95.6	1027.16	10.98	14.84	>150
4	IWSOE69 G17	12640-07	9.9037	0.01231	0.041	97.7	1031.78	4.41	10.95	>150
4	IWSOE69 G17	12640-106	39.38743	-0.03415	0.007	94.3	1033.29	18.09	20.68	>150
4	IWSOE69 G17	12640-28	8.94246	0.01301	0.055	97.7	1033.91	4.42	10.97	>150
4	IWSOE69 G17	12640-08	14.32547	-0.00056	0.04	87.4	1034.51	5.78	11.59	>150
4	IWSOE69 G17	12640-103	7.98651	-0.0083	0.016	99.4	1036.72	8.76	13.35	>150
4	IWSOE69 G17	12640-37	38.80655	0.00664	0.022	64.6	1036.97	10.66	14.67	>150
4	IWSOE69 G17	12640-70	20.57857	-0.00264	0.021	94.2	1038.77	7.69	12.68	>150
4	IWSOE69 G17	12640-54	17.5613	-0.12844	0.017	97.8	1039.72	10.39	14.49	>150
4	IWSOE69 G17	12640-16	13.98665	0.03453	0.038	97.5	1039.81	5.31	11.41	>150
4	IWSOE69 G17	12640-62	56.0766	0.20512	0.007	91.9	1041.60	20.28	22.67	>150
4	IWSOE69 G17	12640-94	14.28485	0.11652	0.009	97.8	1043.02	15.22	18.28	>150
4	IWSOE69 G17	12640-93	39.92469	0.29828	0.004	79.3	1043.08	29.04	30.76	>150
4	IWSOE69 G17	12640-68	26.93031	-0.03382	0.007	99.5	1048.24	17.05	19.86	>150
4	IWSOE69 G17	12640-20	8.6225	-0.01036	0.056	98.8	1048.55	4.27	11.04	>150
4	IWSOE69 G17	12640-87	11.50704	-0.05974	0.011	89.1	1052.26	12.97	16.52	>150
4	IWSOE69 G17	12640-60	7.79843	0.01447	0.026	98.2	1052.61	5.88	11.79	>150
4	IWSOE69 G17	12640-69	16.97467	0.03245	0.031	83.5	1054.36	6.55	12.16	>150
4	IWSOE69 G17	12640-100	65.13783	0.26262	0.005	85	1058.77	21.19	23.55	>150
4	IWSOE69 G17	12640-18	11.2091	0.00998	0.016	98.5	1058.93	8.68	13.46	>150
4	IWSOE69 G17	12640-89	17.38638	-0.00289	0.016	95.1	1059.15	8.94	13.63	>150
4	IWSOE69 G17	12640-53	24.44691	-0.03865	0.021	98.1	1059.96	9.26	13.85	>150
4	IWSOE69 G17	12640-22	18.83823	0.01174	0.011	101.3	1061.38	11.94	15.78	>150
4	IWSOE69 G17	12640-71	12.24233	0.00457	0.026	97.8	1063.15	5.95	11.91	>150
4	IWSOE69 G17	12640-25	26.72256	0.0826	0.016	84.5	1063.43	10.43	14.68	>150
4	IWSOE69 G17	12640-51	24.99747	-0.10791	0.017	86.6	1064.04	11.49	15.45	>150
4	IWSOE69 G17	12640-67	75.85093	-0.04177	0.004	92.5	1065.28	32.43	34.04	>150
4	IWSOE69 G17	12640-97	3.44466	0.02212	0.016	101	1066.72	8.35	13.31	>150
4	IWSOE69 G17	12640-34	16.31457	0.24443	0.008	92	1067.38	16.29	19.31	>150
4	IWSOE69 G17	12640-58	11.03087	0.02783	0.021	102.8	1067.82	9.01	13.74	>150
4	IWSOE69 G17	12640-38	14.93673	-0.0121	0.089	90.2	1072.92	4.09	11.19	>150
4	IWSOE69 G17	12640-12	28.7278	0.08531	0.01	82.1	1072.92	11.92	15.83	>150
4	IWSOE69 G17	12640-107	18.46756	0.03282	0.012	98.8	1074.75	11.63	15.63	>150
4	IWSOE69 G17	12640-76	42.13013	-0.02907	0.009	97.3	1074.84	13.31	16.91	>150
4	IWSOE69 G17	12640-82	46.19625	-0.22291	0.005	93.4	1074.98	21.49	23.90	>150
4	IWSOE69 G17	12640-73	13.62623	0.0067	0.016	97.6	1075.93	8.70	13.60	>150
4	IWSOE69 G17	12640-14	25.96746	0.2139	0.009	19	1081.32	32.51	34.16	>150
4	IWSOE69 G17	12640-41	16.43519	-0.00548	0.037	96	1081.87	5.53	11.87	>150
4	IWSOE69 G17	12640-72	18.45945	0.02374	0.03	93.7	1090.28	5.96	12.15	>150
4	IWSOE69 G17	12640-77	18.67316	0.00283	0.014	97.7	1092.30	9.79	14.44	>150
4	IWSOE69 G17	12640-98	16.25694	-0.10771	0.008	98.8	1100.90	15.18	18.57	>150

4	IWSOE69 G17	12640-10	19.78015	0.1077	0.014	97.7	1101.66	10.80	15.20	>150
4	IWSOE69 G17	12640-95	21.15998	0.01679	0.014	94.9	1106.17	10.52	15.03	>150
4	IWSOE69 G17	12640-105	39.67323	0.12652	0.007	83.9	1106.17	17.63	20.65	>150
4	IWSOE69 G17	12640-43	14.19392	-0.01577	0.046	97.9	1113.47	6.05	12.39	>150
4	IWSOE69 G17	12640-84	24.32086	-0.00248	0.01	94.7	1114.95	12.83	16.79	>150
4	IWSOE69 G17	12640-19	20.1631	0.04346	0.006	89	1115.35	19.39	22.21	>150
4	IWSOE69 G17	12640-55	11.10002	-0.00312	0.024	100.7	1125.97	8.12	13.62	>150
4	IWSOE69 G17	12640-57	14.00946	-0.03707	0.026	99	1128.58	9.13	14.26	>150
4	IWSOE69 G17	12640-75	19.74701	-0.01251	0.015	94.1	1138.24	9.21	14.39	>150
4	IWSOE69 G17	12640-42	17.79435	0.06693	0.023	51.2	1151.90	11.47	16.02	>150
4	IWSOE69 G17	12640-102	31.22497	0.13237	0.007	99.5	1154.58	15.72	19.31	>150
4	IWSOE69 G17	12640-46	21.65298	0.09223	0.035	94.6	1166.22	6.37	13.00	>150
4	IWSOE69 G17	12640-79	51.93014	0.10003	0.007	103.5	1171.16	20.38	23.34	>150
4	IWSOE69 G17	12640-04	14.4102	0.16287	0.009	81	1172.32	14.69	18.58	>150
4	IWSOE69 G17	12640-59	11.32504	0.03381	0.023	101.6	1181.03	8.05	14.01	>150
4	IWSOE69 G17	12640-29	31.0548	0.01376	0.011	92.6	1194.31	14.39	18.49	>150
4	IWSOE69 G17	12640-74	39.30733	0.16077	0.006	103.4	1205.48	22.37	25.25	>150
4	IWSOE69 G17	12640-50	28.66374	0.1628	0.012	22.5	1244.86	29.68	32.05	>150
4	IWSOE69 G17	12640-15	23.96988	0.24584	0.006	93.9	1267.03	20.03	23.51	>150
4	IWSOE69 G17	12640-52	55.65813	-0.08911	0.011	78.3	1278.21	15.98	20.23	>150
4	IWSOE69 G17	12640-48	20.72658	-0.09616	0.02	105.8	1318.78	10.82	16.77	>150
4	IWSOE69 G17	12640-44	13.1608	-0.17906	0.004	98.7	1591.07	37.57	40.62	>150
4	IWSOE69 G17	12640-47	68.23874	-0.20618	0.008	98.1	1700.07	24.32	29.40	>150
5	IWSOE69 G21 hb	14305-04	6.21838	0.08721	0.002	6.4	131.86	17.87	18.06	> 150
5	IWSOE69 G21 hb	14305-10	7.92066	0.1181	0.015	91.9	180.19	1.19	3.80	> 150
5	IWSOE69 G21 hb	14305-06	70.32126	0.00803	0.003	49.3	197.61	5.62	6.87	> 150
5	IWSOE69 G21 hb	14305-12	26.39133	-0.10046	0.001	19.9	202.88	13.95	14.53	> 150
5	IWSOE69 G21 hb	14305-20	54.28485	0.00628	0.005	40.3	243.60	4.76	6.81	> 150
5	IWSOE69 G21 hb	13488-01	166.48495	-0.03515	0.0990	67.1	288.36	5.81	6.48	> 150
5	IWSOE69 G21 hb	13488-24	4.61724	0.01698	0.016	97.2	379.59	1.72	4.17	> 150
5	IWSOE69 G21 hb	13488-15	15.27365	0.01364	0.003	39.8	441.01	9.48	10.46	> 150
5	IWSOE69 G21 hb	13488-30	19.64712	0.00397	0.02	96.6	467.94	1.74	4.99	> 150
5	IWSOE69 G21 hb	14305-07	6.86481	0.03213	0.009	98.5	474.36	2.66	9.85	> 150
5	IWSOE69 G21 hb	13488-26	17.57166	-0.02383	0.012	87.4	481.82	2.57	5.46	> 150
5	IWSOE69 G21 hb	14305-18	16.50699	0.04046	0.004	95.3	486.69	4.37	10.67	> 150
5	IWSOE69 G21 hb	13488-18	9.45271	0.00027	0.053	96.2	489.69	2.18	5.36	> 150
5	IWSOE69 G21 hb	13488-29	8.01727	0.00675	0.039	97.7	496.19	1.32	5.13	> 150
5	IWSOE69 G21 hb	14305-17	8.74372	0.00878	0.02	99.5	497.58	2.05	10.16	> 150
5	IWSOE69 G21 hb	14305-19	17.24244	0.04703	0.009	95	502.14	2.78	10.42	> 150
5	IWSOE69 G21 hb	13488-19	6.99676	0.00194	0.01	91.8	502.80	3.10	5.90	> 150
5	IWSOE69 G21 hb	13488-14	7.1258	0.01364	0.012	64.1	507.75	3.65	6.26	> 150
5	IWSOE69 G21 hb	14305-03	10.80734	0.02082	0.011	97.3	514.07	2.35	10.55	> 150
5	IWSOE69 G21 hb	14305-02	6.90262	0.02051	0.012	97.5	517.70	2.19	10.58	> 150
5	IWSOE69 G21 hb	14305-16	16.37783	0.0076	0.016	98.9	518.55	2.23	10.61	> 150

55 This study

5	IWSOE69 G21 hb	13488-17	16.04776	0.0012	0.078	98.2	521.57	0.98	5.31	> 150
5	IWSOE69 G21 hb	13488-02	5.83686	0.00534	0.7170	100	523.32	3.63	6.37	> 150
5	IWSOE69 G21 hb	13488-09	8.04288	0.02048	0.0940	98.1	616.20	5.97	8.58	> 150
5	IWSOE69 G21 hb	14305-15	14.12617	0.01617	0.02	71.3	723.03	3.68	14.92	> 150
5	IWSOE69 G21 hb	13488-21	0.05551	0.00427	0.242	99.9	941.18	2.00	9.62	> 150
5	IWSOE69 G21 hb	13488-23	7.60695	0.02455	0.012	98.3	953.28	3.68	10.22	> 150
5	IWSOE69 G21 hb	13488-25	6.37778	0.22025	0.011	94.8	964.65	7.86	12.44	> 150
5	IWSOE69 G21 hb	14305-01	11.33491	0.06681	0.006	98.5	971.31	5.45	20.18	> 150
5	IWSOE69 G21 hb	13488-27	7.9829	0.04982	0.006	98.7	976.35	7.90	12.56	> 150
5	IWSOE69 G21 hb	13488-22	10.46756	0.06712	0.008	97.6	979.39	4.93	10.96	> 150
5	IWSOE69 G21 hb	14305-13	4.73318	0.0222	0.023	98.4	979.78	2.95	19.82	> 150
5	IWSOE69 G21 hb	13488-05	6.5409	0.13339	0.3410	100.5	991.75	6.60	11.91	> 150
5	IWSOE69 G21 hb	13488-03	7.36788	0.05255	0.5580	99.7	992.65	5.79	11.49	> 150
5	IWSOE69 G21 hb	13488-06	7.56462	0.01419	0.4300	100.3	994.78	5.62	11.42	> 150
5	IWSOE69 G21 hb	13488-10	19.9136	-0.00642	0.1740	99.8	1000.71	5.99	11.66	> 150
5	IWSOE69 G21 hb	13488-20	11.70044	0.02561	0.006	97.6	1002.71	10.40	14.44	> 150
5	IWSOE69 G21 hb	13488-07	25.31501	0.02021	0.0310	98.7	1010.72	9.16	13.64	> 150
5	IWSOE69 G21 hb	13488-28	5.17224	0.02757	0.006	97.4	1028.72	5.55	11.69	> 150
5	IWSOE69 G21 hb	14305-08	8.32876	0.02341	0.01	99.7	1035.98	4.20	21.14	> 150
5	IWSOE69 G21 hb	13488-08	8.34628	0.00548	0.1400	100.4	1049.86	6.18	12.18	> 150
5	IWSOE69 G21 hb	13488-04	8.98092	0.02401	0.5890	99.5	1058.78	5.96	12.15	> 150
5	IWSOE69 G21 hb	14305-11	21.98824	0.09702	0.004	97	1064.87	8.92	23.09	> 150
5	IWSOE69 G21 hb	14305-09	6.39447	0.07658	0.039	97.2	1086.51	2.50	21.87	> 150
5	IWSOE69 G21 hb	14305-21	12.21178	0.01703	0.013	96.3	493.01	2.39	10.15	> 150
5	IWSOE69 G21 hb	14305-22	13.68026	0.03812	0.01	97.8	479.54	2.69	9.96	> 150
5	IWSOE69 G21 hb	14305-24	5.80064	0.05167	0.11	99.7	1150.07	2.10	23.10	> 150
5	IWSOE69 G21 hb	14305-27	4.61851	0.01282	0.13	83.5	171.48	0.60	3.48	> 150
5	IWSOE69 G21 hb	14305-28	5.62354	0.02379	0.018	85.9	316.73	1.60	6.53	> 150
5	IWSOE69 G21 hb	14305-31	8.29819	0.02885	0.016	99.6	520.22	2.11	10.62	> 150
5	IWSOE69 G21 hb	14305-32	10.83577	0.04478	0.006	95.7	929.95	6.43	19.68	> 150
5	IWSOE69 G21 hb	14305-34	9.50278	0.07065	0.006	99.4	980.73	5.69	20.42	> 150
5	IWSOE69 G21 hb	14305-35	12.77679	0.05834	0.03	99	1064.65	2.66	21.46	> 150
5	IWSOE69 G21 hb	14305-36	18.84649	0.00531	0.036	98.5	508.35	1.43	10.27	> 150
5	IWSOE69 G21 hb	14305-37	19.55541	0.05752	0.01	98.5	820.22	3.86	16.85	> 150
6	IWSOE68-13	12639-12	14.50491	0.71929	0.002	5.4	73.06	86.11	86.12	>150
6	IWSOE68-13	12639-29	13.73652	0.05986	0.033	93.7	495.89	4.47	6.57	>150
6	IWSOE68-13	12639-16	9.41328	0.04557	0.027	87.2	498.39	5.24	7.13	>150
6	IWSOE68-13	12639-26	12.09173	0.07986	0.029	92.5	499.40	4.46	6.59	>150
6	IWSOE68-13	12639-19	8.7111	-0.00482	0.051	90.5	505.72	3.52	6.05	>150
6	IWSOE68-13	12639-06	5.00745	0.03182	0.151	94.2	505.77	1.57	5.16	>150
6	IWSOE68-13	12639-38	9.25896	0.0164	0.033	102.5	509.29	4.58	6.74	>150
6	IWSOE68-13	12639-44	10.66923	0.00366	0.028	93.3	512.89	5.14	7.16	>150
6	IWSOE68-13	12639-39	9.07824	0.00709	0.044	91.8	516.65	3.57	6.16	>150
6	IWSOE68-13	12639-07	7.62283	0.01193	0.12	96.8	518.15	1.89	5.38	>150

46 this study

6	IWSOE68-13	12639-37	11.48835	-0.03672	0.031	97	518.24	4.60	6.82	>150
6	IWSOE68-13	12639-09	6.22443	0.01627	0.082	95.1	520.06	2.50	5.64	>150
6	IWSOE68-13	12639-48	5.49229	0.01997	0.087	97.5	524.12	2.18	5.54	>150
6	IWSOE68-13	12639-33	8.54058	0.00536	0.089	93.5	526.33	2.34	5.62	>150
6	IWSOE68-13	12639-18	10.09023	0.01362	0.041	90	531.49	3.70	6.35	>150
6	IWSOE68-13	12639-32	11.06783	0.00357	0.036	84.1	555.96	4.69	7.15	>150
6	IWSOE68-13	12639-45	26.10428	0.00289	0.011	99	558.81	11.57	12.78	>150
6	IWSOE68-13	12639-23	21.67617	0.07175	0.022	70.3	596.92	6.82	8.95	>150
6	IWSOE68-13	12639-08	15.31759	-0.00263	0.035	86.3	598.12	4.70	7.47	>150
6	IWSOE68-13	12639-28	34.56262	-0.15682	0.01	74.9	599.27	13.64	14.83	>150
6	IWSOE68-13	12639-24	13.86009	0.03763	0.025	93.1	724.71	6.32	9.46	>150
6	IWSOE68-13	12639-31	14.02769	-0.17121	0.003	38.4	727.75	36.98	37.65	>150
6	IWSOE68-13	12639-20	3.11265	0.24475	0.003	61.6	757.83	36.84	37.57	>150
6	IWSOE68-13	12639-50	20.94222	0.02541	0.027	94.6	773.39	5.96	9.59	>150
6	IWSOE68-13	12639-10	26.98964	0.00723	0.016	89.2	920.95	8.40	12.27	>150
6	IWSOE68-13	12639-01	5.10688	0.03729	0.127	95	989.82	2.69	9.98	>150
6	IWSOE68-13	12639-34	17.48125	-0.00883	0.056	97	993.62	4.21	10.53	>150
6	IWSOE68-13	12639-49	5.71695	0.03644	0.07	99.3	994.27	3.65	10.32	>150
6	IWSOE68-13	12639-47	6.49513	-0.01387	0.028	95.4	995.34	6.38	11.58	>150
6	IWSOE68-13	12639-17	5.59977	0.04305	0.135	96.3	998.48	2.75	10.08	>150
6	IWSOE68-13	12639-14	6.61472	0.00026	0.044	94.8	1024.78	5.13	11.20	>150
6	IWSOE68-13	12639-42	3.98963	0.20006	0.026	99.4	1026.38	6.63	11.97	>150
6	IWSOE68-13	12639-22	18.13691	0.03787	0.021	96.2	1028.16	7.33	12.39	>150
6	IWSOE68-13	12639-40	8.08848	0.01241	0.035	47	1034.12	9.94	14.13	>150
6	IWSOE68-13	12639-43	12.13439	0.01517	0.019	96.4	1039.49	8.40	13.13	>150
6	IWSOE68-13	12639-21	12.35436	0.00989	0.053	97.2	1042.65	4.01	10.89	>150
6	IWSOE68-13	12639-13	5.92242	0.01457	0.098	98.9	1045.38	3.09	10.61	>150
6	IWSOE68-13	12639-27	5.08968	0.00862	0.101	98.3	1047.35	2.96	10.59	>150
6	IWSOE68-13	12639-30	16.44524	-0.01393	0.038	97.1	1048.54	4.69	11.21	>150
6	IWSOE68-13	12639-11	6.22684	0.023	0.116	98.6	1049.06	2.83	10.57	>150
6	IWSOE68-13	12639-41	12.34959	-0.0125	0.037	96	1049.26	4.97	11.34	>150
6	IWSOE68-13	12639-04	11.05718	0.0417	0.057	97.8	1055.29	4.02	11.01	>150
6	IWSOE68-13	12639-25	7.98774	0.029	0.062	98.4	1056.49	3.87	10.97	>150
6	IWSOE68-13	12639-46	13.1685	-0.00381	0.037	96.8	1063.18	5.24	11.58	>150
6	IWSOE68-13	12639-15	9.39589	0.02835	0.025	96.2	1066.64	6.89	12.44	>150
6	IWSOE68-13	12639-05	5.78877	0.02905	0.233	98.3	1090.30	2.27	10.83	>150
7	IWSOE70 03-11-03 228-230 hb	13487-10	1.87641	0.00988	0.1100	81.1	191.00	2.87	3.44	> 150
7	IWSOE70 03-11-03 228-230 hb	13487-03	8.1779	0.01887	0.2040	97.5	517.27	4.63	6.94	> 150
7	IWSOE70 03-11-03 228-230 hb	13487-11	6.74431	0.0191	0.034	47.1	478.90	4.56	6.61	> 150
7	IWSOE70 03-11-03 228-230 hb	13487-12	0.00281	-0.00311	0.137	56.8	169.68	1.21	2.08	> 150
7	IWSOE70 03-11-03 228-230 hb	13487-15	12.51342	-0.02128	0.001	62.1	603.23	26.59	27.27	> 150
7	IWSOE70 03-11-03 228-230 hb	13487-16	12.00471	0.10356	0.009	82.2	185.45	2.33	2.98	> 150
7	IWSOE70 03-11-03 228-230 hb	13487-19	0.07538	0.00628	0.022	61.8	225.85	1.95	2.99	> 150
7	IWSOE70 03-11-03 228-230 hb	13487-20	7.55271	0.0273	0.008	88.7	465.51	5.26	7.03	> 150

20 This study

7	IWSOE70 03-11-03 228-230 hb	13487-23	5.2887	-0.12254	0.002	3.7	275.83	54.31	54.38	> 150
7	IWSOE70 03-11-03 228-230 hb	13487-25	1.13373	-0.01932	0.011	84.9	279.31	2.00	3.44	> 150
7	IWSOE70 03-11-03 228-230 hb	13487-26	0.0886	-0.00394	0.044	85.6	174.21	1.05	2.04	> 150
7	IWSOE70 03-11-03 228-230 hb	14315-01	27.0393	0.02552	0.005	27.6	168.54	5.20	6.20	> 150
7	IWSOE70 03-11-03 228-230 hb	14315-20	2.46016	0.04256	0.004	42.1	180.40	4.89	6.08	> 150
7	IWSOE70 03-11-03 228-230 hb	14315-02	7.96163	0.06128	0.007	90.7	463.76	3.28	9.84	> 150
7	IWSOE70 03-11-03 228-230 hb	14315-06	8.40473	0.1057	0.029	98.1	472.94	1.47	9.57	> 150
7	IWSOE70 03-11-03 228-230 hb	14315-19	7.88112	0.098	0.013	98.7	507.22	2.64	10.48	> 150
7	IWSOE70 03-11-03 228-230 hb	14315-10	6.19473	0.02001	0.102	99.1	509.50	1.13	10.25	> 150
7	IWSOE70 03-11-03 228-230 hb	14315-08	66.55449	0.03783	0.006	87.4	740.61	5.26	15.72	> 150
7	IWSOE70 03-11-03 228-230 hb	14315-14	12.464	0.09385	0.011	99	947.52	4.18	19.41	> 150
7	IWSOE70 03-11-03 228-230 hb	14315-11	6.54334	0.08684	0.009	99.6	1029.94	4.30	21.04	> 150
8	IO 1578-27 hb	14309-10	38.47017	-0.02101	0.008	7.9	12.58	2.39	2.40	> 150
8	IO 1578-27 hb	14309-11	7.3159	-0.01457	0.004	18	90.95	5.28	5.59	> 150
8	IO 1578-27 hb	14309-01	0.94616	0.01596	0.011	81.2	152.56	1.40	3.36	> 150
8	IO 1578-27 hb	14309-06	2.84515	0.01455	0.029	81.3	156.89	0.88	3.26	> 150
8	IO 1578-27 hb	14309-18	2.40321	0.00525	0.038	93.5	183.82	0.72	3.75	> 150
8	IO 1578-27 hb	13497-18	12.03868	-0.10764	0.018	6.3	224.15	22.39	22.50	> 150
8	IO 1578-27 hb	14309-19	2.54933	0.01997	0.019	82.2	232.06	1.31	4.82	> 150
8	IO 1578-27 hb	13497-11	5.06318	-0.00089	0.006	68.5	273.10	3.73	4.62	> 150
8	IO 1578-27 hb	14309-13	3.28882	0.02234	0.014	85.9	301.93	1.77	6.29	> 150
8	IO 1578-27 hb	13497-15	15.49401	-0.02792	0.003	56.5	316.58	9.23	9.76	> 150
8	IO 1578-27 hb	14309-15	6.4635	0.03015	0.007	90.1	324.17	2.62	6.99	> 150
8	IO 1578-27 hb	14309-02	6.83793	-0.0035	0.004	79.3	367.39	4.64	8.69	> 150
8	IO 1578-27 hb	14309-08	6.10245	0.03404	0.006	91.9	379.62	3.37	8.31	> 150
8	IO 1578-27 hb	14309-04	8.89293	0.01534	0.098	99	442.01	0.98	8.89	> 150
8	IO 1578-27 hb	13497-19	7.83319	0.00065	0.025	46.5	446.54	4.11	6.07	> 150
8	IO 1578-27 hb	14309-17	16.64544	0.03215	0.014	96.5	458.87	2.06	9.41	> 150
8	IO 1578-27 hb	13497-23	6.97294	0.00202	0.051	98.2	462.93	1.17	4.78	> 150
8	IO 1578-27 hb	13497-26	6.85592	0.00949	0.047	97.4	467.48	2.15	5.14	> 150
8	IO 1578-27 hb	13497-17	8.00996	-0.02005	0.012	71.5	476.38	3.00	5.63	> 150
8	IO 1578-27 hb	13497-12	7.42753	0.02155	0.013	86.2	477.41	2.60	5.43	> 150
8	IO 1578-27 hb	13497-01	5.45704	0.00895	0.9370	100.2	477.60	3.29	5.80	> 150
8	IO 1578-27 hb	13497-13	6.98223	0.02611	0.01	95.2	478.14	4.17	6.34	> 150
8	IO 1578-27 hb	13497-09	7.94273	-0.00241	0.5420	101.2	481.50	3.46	5.93	> 150
8	IO 1578-27 hb	13497-20	7.88963	0.01966	0.038	91.3	487.73	1.53	5.11	> 150
8	IO 1578-27 hb	13497-08	5.95585	0.00307	0.9190	100.2	487.87	3.35	5.92	> 150
8	IO 1578-27 hb	13497-02	5.13503	-0.0009	0.3580	100.9	490.89	3.70	6.15	> 150
8	IO 1578-27 hb	13497-03	14.37649	-0.00561	0.4800	100.3	494.35	3.61	6.12	> 150
8	IO 1578-27 hb	13497-04	12.4476	0.00621	0.3200	98	496.28	3.61	6.14	> 150
8	IO 1578-27 hb	13497-25	5.6447	0.01165	0.073	99.7	496.82	0.97	5.06	> 150
8	IO 1578-27 hb	13497-22	18.87558	0.02325	0.017	94.2	504.55	3.31	6.03	> 150
8	IO 1578-27 hb	13497-10	7.40708	0.01732	0.5070	100.8	504.74	3.68	6.25	> 150
8	IO 1578-27 hb	13497-06	19.89118	0.01278	0.2180	98.8	507.62	4.71	6.93	> 150

62 This study

8	IO 1578-27 hb	13497-14	9.30702	0.02307	0.047	98.6	519.38	1.35	5.37	> 150
8	IO 1578-27 hb	13497-05	6.61025	-0.00056	0.3520	98.5	566.40	4.64	7.32	> 150
8	IO 1578-27 hb	13497-16	29.97828	0.03719	0.012	53	602.32	4.96	7.80	> 150
8	IO 1578-27 hb	13497-21	6.59915	0.00815	0.024	98.1	876.87	2.49	9.12	> 150
8	IO 1578-27 hb	14309-03	51.8272	0.01192	0.013	92.2	897.06	3.43	18.27	> 150
8	IO 1578-27 hb	13497-07	10.78694	0.00098	0.4040	100.2	1005.98	6.83	12.16	> 150
8	IO 1578-27 hb	14309-14	0.42319	0.00961	0.194	99.8	1064.56	1.65	21.36	> 150
9	IO 1578-28 hb	14307-01	1.59616	0.01373	0.021	56.8	46.63	0.82	1.24	> 150
9	IO 1578-28 hb	14307-32	3.22229	0.00406	0.017	58.7	66.42	1.09	1.72	> 150
9	IO 1578-28 hb	14307-17	0.26756	0.00819	0.063	83.7	66.44	0.33	1.37	> 150
9	IO 1578-28 hb	14307-16	0.03466	0.01463	0.031	81.2	71.21	0.52	1.51	> 150
9	IO 1578-28 hb	14307-33	1.18113	0.00578	0.015	79.3	81.89	1.02	1.93	> 150
9	IO 1578-28 hb	14307-14	1.37136	0.00421	0.015	68.1	93.38	1.10	2.17	> 150
9	IO 1578-28 hb	14307-11	3.07701	0.01971	0.016	78.6	145.26	1.14	3.12	> 150
9	IO 1578-28 hb	14307-25	9.64448	0.00949	0.027	83.5	153.69	0.81	3.18	> 150
9	IO 1578-28 hb	14307-19	1.66774	0.00933	0.041	81.2	157.48	0.78	3.25	> 150
9	IO 1578-28 hb	14307-31	17.61837	-0.01335	0.003	64.2	170.67	4.70	5.81	> 150
9	IO 1578-28 hb	13496-07	35.88044	-0.15845	0.0150	87.5	206.98	6.93	7.23	> 150
9	IO 1578-28 hb	13496-06	3.03925	-0.00564	0.1930	96	213.09	1.94	2.88	> 150
9	IO 1578-28 hb	14307-10	31.06395	-0.00385	0.001	50.9	227.86	12.32	13.14	> 150
9	IO 1578-28 hb	14307-02	95.97125	-0.0529	0.003	9.8	260.76	17.47	18.23	> 150
9	IO 1578-28 hb	13496-09	13.13681	-0.00371	0.0320	102.7	471.79	7.90	9.20	> 150
9	IO 1578-28 hb	13496-08	10.28869	-0.03645	0.0440	101.9	479.73	4.37	6.49	> 150
9	IO 1578-28 hb	13496-10	11.41443	0.04107	0.0330	101.9	537.43	5.63	7.78	> 150
9	IO 1578-28 hb	14307-18	21.14312	0.04075	0.004	64.5	543.93	5.88	12.37	> 150
9	IO 1578-28 hb	13496-04	19.05196	0.01704	0.0440	94.7	730.21	11.59	13.70	> 150
9	IO 1578-28 hb	13496-02	22.81218	0.0198	0.1050	100.3	1985.07	10.07	22.26	> 150
9	IO 1578-28 hb	13496-01	9.43246	-0.00873	0.2460	100.1	3156.85	14.85	34.89	> 150
9	IO 1578-28 hb	13496-03	14.8702	0.02043	0.0270	100.3	3320.82	19.41	38.47	> 150
9	IO 1578-28 hb	13496-05	14.66382	0.00201	0.0270	100.6	3681.81	19.08	41.47	> 150
10	IWSOE17 3-17-2	12646-21	8.69657	0.18073	0.023	5	33.22	8.92	8.92	>150
10	IWSOE17 3-17-2	12646-108	0.25119	-0.00675	0.079	80.5	57.23	1.58	1.67	>150
10	IWSOE17 3-17-2	12646-54	0.21866	-0.01044	0.112	64.8	60.90	1.56	1.66	>150
10	IWSOE17 3-17-2	12646-74	0.34118	-0.00993	0.033	37	63.43	3.34	3.39	>150
10	IWSOE17 3-17-2	12646-95	2.07302	-0.02989	0.025	57.3	69.77	4.21	4.26	>150
10	IWSOE17 3-17-2	12646-83	0.80397	-0.01843	0.03	95.8	87.34	3.57	3.66	>150
10	IWSOE17 3-17-2	12646-109	2.35525	0.02515	0.018	57.6	93.38	6.23	6.30	>150
10	IWSOE17 3-17-2	12646-03	0.34125	0.00551	0.433	78	125.71	0.58	1.35	>150
10	IWSOE17 3-17-2	12646-100	0.78369	-0.02062	0.036	83	131.20	2.94	3.20	>150
10	IWSOE17 3-17-2	12646-86	9.2428	0.0177	0.044	86.8	238.42	2.72	3.57	>150
10	IWSOE17 3-17-2	12646-38	20.94609	0.05585	0.021	54.5	286.42	7.04	7.57	>150
10	IWSOE17 3-17-2	12646-22	10.74745	0.05632	0.059	60.7	336.67	3.51	4.79	>150
10	IWSOE17 3-17-2	12646-13	10.42929	0.04171	0.034	65.7	353.73	4.14	5.38	>150
10	IWSOE17 3-17-2	12646-27	8.91872	0.00475	0.013	79	362.06	9.61	10.23	>150

97 this study

10	IWSOE17 3-17-2	12646-37	9.55325	0.06935	0.033	77.4	385.98	4.41	5.79	>150
10	IWSOE17 3-17-2	12646-15	7.19242	0.03827	0.073	76	397.48	2.42	4.55	>150
10	IWSOE17 3-17-2	12646-46	11.35495	0.01863	0.013	76.4	402.82	9.91	10.65	>150
10	IWSOE17 3-17-2	12646-34	6.97405	0.01427	0.09	95.2	408.10	2.16	4.51	>150
10	IWSOE17 3-17-2	12646-18	7.36474	0.04743	0.076	81	414.32	2.52	4.75	>150
10	IWSOE17 3-17-2	12646-76	22.92227	0.01442	0.005	85.3	431.15	19.07	19.53	>150
10	IWSOE17 3-17-2	12646-64	28.17433	0.11702	0.008	50.6	431.17	13.46	14.10	>150
10	IWSOE17 3-17-2	12646-28	14.25604	0.01246	0.024	77.1	435.45	5.51	6.94	>150
10	IWSOE17 3-17-2	12646-12	7.40454	0.00477	0.097	86.2	443.43	2.06	4.77	>150
10	IWSOE17 3-17-2	12646-99	9.54993	-0.04276	0.02	92.9	443.46	5.42	6.93	>150
10	IWSOE17 3-17-2	12646-89	70.89383	0.1483	0.005	92.6	451.25	18.79	19.30	>150
10	IWSOE17 3-17-2	12646-33	31.52875	0.07883	0.01	89.5	452.34	12.00	12.78	>150
10	IWSOE17 3-17-2	12646-91	14.8868	0.05045	0.025	88.5	453.28	4.45	6.26	>150
10	IWSOE17 3-17-2	12646-19	9.05472	0.04455	0.12	86.2	456.11	2.24	4.96	>150
10	IWSOE17 3-17-2	12646-73	22.30393	-0.02212	0.01	90.2	462.90	10.20	11.15	>150
10	IWSOE17 3-17-2	12646-26	5.92112	0.01526	0.04	90.8	466.20	3.90	5.97	>150
10	IWSOE17 3-17-2	12646-106	9.09114	0.00278	0.031	82.4	468.81	4.17	6.18	>150
10	IWSOE17 3-17-2	12646-04	14.48516	0.04469	0.114	73.5	469.11	2.52	5.20	>150
10	IWSOE17 3-17-2	12646-93	16.21497	0.10589	0.014	92.6	474.88	8.23	9.44	>150
10	IWSOE17 3-17-2	12646-10	12.18628	0.01221	0.079	90.5	475.49	2.31	5.16	>150
10	IWSOE17 3-17-2	12646-71	12.8298	0.03185	0.02	98.5	478.87	5.14	6.93	>150
10	IWSOE17 3-17-2	12646-101	6.3789	0.03578	0.025	94.7	480.89	4.70	6.63	>150
10	IWSOE17 3-17-2	12646-16	8.22526	0.01625	0.13	76.4	480.89	2.33	5.22	>150
10	IWSOE17 3-17-2	12646-68	13.48116	0.06141	0.012	98.9	485.08	8.25	9.50	>150
10	IWSOE17 3-17-2	12646-11	8.28662	-0.0038	0.058	84.8	486.53	2.95	5.57	>150
10	IWSOE17 3-17-2	12646-85	8.70874	0.04479	0.03	98.9	487.44	3.76	6.05	>150
10	IWSOE17 3-17-2	12646-97	7.93482	-0.00525	0.034	95	487.71	3.81	6.08	>150
10	IWSOE17 3-17-2	12646-79	16.82904	0.05628	0.015	94.2	491.44	6.83	8.33	>150
10	IWSOE17 3-17-2	12646-103	3.96029	0.01635	0.026	93.9	492.08	4.47	6.54	>150
10	IWSOE17 3-17-2	12646-81	11.59189	-0.01458	0.026	93.2	492.36	4.45	6.53	>150
10	IWSOE17 3-17-2	12646-09	12.56337	0.00874	0.09	94.6	493.04	1.87	5.14	>150
10	IWSOE17 3-17-2	12646-58	6.80111	0.02355	0.034	91	494.79	4.73	6.74	>150
10	IWSOE17 3-17-2	12646-75	10.41289	0.00899	0.007	87.4	495.29	13.17	14.02	>150
10	IWSOE17 3-17-2	12646-41	7.24536	0.00558	0.051	96.1	495.38	3.13	5.74	>150
10	IWSOE17 3-17-2	12646-59	7.25701	0.00063	0.028	97.8	495.92	5.00	6.95	>150
10	IWSOE17 3-17-2	12646-84	11.99428	0.00022	0.012	98.1	496.61	9.01	10.22	>150
10	IWSOE17 3-17-2	12646-102	7.58949	0.00135	0.028	96.2	497.86	4.64	6.70	>150
10	IWSOE17 3-17-2	12646-30	5.74377	0.01532	0.134	99.3	499.25	1.69	5.13	>150
10	IWSOE17 3-17-2	12646-50	6.78341	-0.02109	0.074	102.3	500.68	2.37	5.41	>150
10	IWSOE17 3-17-2	12646-48	15.23288	-0.02592	0.021	93.6	502.52	6.99	8.53	>150
10	IWSOE17 3-17-2	12646-107	8.97318	0.04415	0.019	94.1	505.15	5.94	7.71	>150
10	IWSOE17 3-17-2	12646-55	7.18217	-0.02264	0.028	94.5	505.58	5.38	7.28	>150
10	IWSOE17 3-17-2	12646-96	17.34302	-0.03442	0.012	59.3	506.21	8.89	10.16	>150
10	IWSOE17 3-17-2	12646-92	12.94097	0.07231	0.026	96.3	508.09	4.49	6.67	>150
10	IWSOE17 3-17-2	12646-77	16.25139	0.11832	0.011	89	508.42	10.40	11.51	>150

10	IWSOE17 3-17-2	12646-53	24.89907	-0.01696	0.02	76.3	519.46	7.79	9.28	>150
10	IWSOE17 3-17-2	12646-67	7.98272	0.05273	0.019	102	520.57	6.15	7.96	>150
10	IWSOE17 3-17-2	12646-32	11.40371	0.0344	0.024	94.5	521.15	5.38	7.38	>150
10	IWSOE17 3-17-2	12646-49	6.9149	-0.01457	0.037	102.7	523.03	4.19	6.59	>150
10	IWSOE17 3-17-2	12646-94	10.45521	0.05607	0.021	98.7	523.92	5.77	7.69	>150
10	IWSOE17 3-17-2	12646-39	5.2874	0.02865	0.091	100.2	531.38	2.24	5.63	>150
10	IWSOE17 3-17-2	12646-51	11.47148	0.02487	0.052	98.1	534.69	3.46	6.24	>150
10	IWSOE17 3-17-2	12646-69	17.68225	0.04495	0.013	95.6	535.46	7.55	9.17	>150
10	IWSOE17 3-17-2	12646-112	11.58469	0.04657	0.015	100.7	537.68	7.25	8.94	>150
10	IWSOE17 3-17-2	12646-65	13.53327	0.08324	0.013	103.7	593.25	8.27	10.08	>150
10	IWSOE17 3-17-2	12646-29	24.95807	0.05022	0.008	78.6	680.94	14.77	16.19	>150
10	IWSOE17 3-17-2	12646-01	12.96659	0.02899	0.573	91.4	768.32	1.86	7.69	>150
10	IWSOE17 3-17-2	12646-14	13.60938	0.07512	0.027	60.2	1005.27	7.97	12.61	>150
10	IWSOE17 3-17-2	12646-05	3.43057	0.0124	0.466	98.3	1683.94	2.82	16.60	>150
10	IWSOE17 3-17-2	12646-105	14.20442	-0.09499	0.007	68.5	2535.93	26.76	36.37	>150
10	IWSOE17 3-17-2	12646-35	13.15637	0.02231	0.066	97.6	2634.81	6.78	26.47	>150
10	IWSOE17 3-17-2	12646-72	9.282	-0.00839	0.006	96	2843.52	30.90	41.44	>150
10	IWSOE17 3-17-2	12646-63	14.01502	0.06704	0.015	99.2	2874.80	14.61	31.51	>150
10	IWSOE17 3-17-2	12646-25	24.50695	-0.02291	0.011	91.8	2905.22	21.62	35.54	>150
10	IWSOE17 3-17-2	12646-40	11.49484	-0.00892	0.026	99.7	2927.88	11.08	30.52	>150
10	IWSOE17 3-17-2	12646-20	19.33978	0.09267	0.033	93.5	2971.54	12.12	31.30	>150
10	IWSOE17 3-17-2	12646-88	45.00235	-0.02912	0.006	96.8	3000.00	27.15	39.82	>150
10	IWSOE17 3-17-2	12646-47	23.67351	0.08962	0.015	98.2	3050.93	16.92	34.12	>150
10	IWSOE17 3-17-2	12646-62	28.89779	0.04059	0.01	99.3	3062.66	14.03	32.89	>150
10	IWSOE17 3-17-2	12646-36	16.41719	0.04176	0.032	97.4	3069.37	11.48	31.94	>150
10	IWSOE17 3-17-2	12646-52	14.56829	-0.00891	0.026	99	3071.21	12.56	32.36	>150
10	IWSOE17 3-17-2	12646-56	7.63689	0.0272	0.022	99.7	3102.91	12.05	32.45	>150
10	IWSOE17 3-17-2	12646-06	13.30082	0.05456	0.07	97.2	3103.85	7.96	31.18	>150
10	IWSOE17 3-17-2	12646-110	9.19293	0.0064	0.021	99.9	3105.47	14.87	33.62	>150
10	IWSOE17 3-17-2	12646-08	10.19373	0.00394	0.065	99.2	3114.34	7.53	31.17	>150
10	IWSOE17 3-17-2	12646-98	14.80391	-0.02276	0.006	99.8	3121.72	27.89	41.19	>150
10	IWSOE17 3-17-2	12646-70	0.0287	0.04698	0.006	97.7	3141.83	29.50	42.44	>150
10	IWSOE17 3-17-2	12646-23	17.60166	0.00043	0.052	99.6	3144.12	8.03	31.57	>150
10	IWSOE17 3-17-2	12646-90	12.72852	0.00728	0.032	99.3	3146.63	9.94	32.14	>150
10	IWSOE17 3-17-2	12646-24	10.59003	0.03403	0.02	97.5	3156.13	13.86	33.64	>150
10	IWSOE17 3-17-2	12646-87	30.7862	0.07554	0.008	97.8	3175.13	25.69	40.13	>150
10	IWSOE17 3-17-2	12646-60	8.21047	0.05582	0.013	98.9	3207.18	18.35	36.15	>150
10	IWSOE17 3-17-2	12646-80	19.04388	0.0174	0.008	99.7	3322.22	19.42	37.66	>150
11	IO 1578-16 128-130 hb	13486-03	6.66277	0.00506	0.1980	98.6	463.30	3.37	5.73	> 150
11	IO 1578-16 128-130 hb	13486-10	6.2505	0.01707	0.3880	69.1	506.41	8.81	10.16	> 150
11	IO 1578-16 128-130 hb	13486-02	27.92274	0.02524	0.1040	99.4	1008.36	6.57	12.03	> 150
11	IO 1578-16 128-130 hb	13486-06	7.16145	0.03138	0.0740	97.6	1263.06	8.71	15.34	> 150
11	IO 1578-16 128-130 hb	13486-01	38.25245	-0.03997	0.0470	99.2	2889.84	14.80	32.47	> 150
11	IO 1578-16 128-130 hb	13486-08	25.98871	-0.01313	0.0610	100	2891.62	14.16	32.20	> 150

11	IO 1578-16 128-130 hb	13486-07	12.31178	-0.00756	0.3760	100	2907.14	14.42	32.45	> 150
11	IO 1578-16 128-130 hb	13486-09	11.00036	-0.01438	0.1350	100.1	3064.95	12.50	33.10	> 150
11	IO 1578-16 128-130 hb	13486-05	53.66905	-0.07184	0.0220	100.3	3091.28	22.42	38.19	> 150
11	IO 1578-16 128-130 hb	13486-04	39.0579	0.22214	0.0390	100	3126.60	15.52	34.90	> 150
11	IO 1578-16 128-130 hb	13486-11	29.53609	-0.0164	0.004	97.8	2733.60	17.38	32.40	> 150
11	IO 1578-16 128-130 hb	13486-12	14.39568	-0.05248	0.004	97.8	2820.81	14.94	31.92	> 150
11	IO 1578-16 128-130 hb	13486-13	8.38851	-0.01877	0.009	97.6	2678.22	7.64	27.85	> 150
11	IO 1578-16 128-130 hb	13486-14	7.33502	-0.00697	0.005	72.5	415.83	4.07	5.82	> 150
11	IO 1578-16 128-130 hb	13486-15	7.05269	0.00709	0.01	79.1	453.97	4.81	6.61	> 150
11	IO 1578-16 128-130 hb	13486-16	36.62013	0.04289	0.002	97	2894.20	22.05	36.39	> 150
11	IO 1578-16 128-130 hb	13486-18	6.32384	0.0177	0.013	88	409.01	3.43	5.34	> 150
11	IO 1578-16 128-130 hb	13486-19	27.93818	0.1264	0.002	97.6	2679.78	18.75	32.70	> 150
11	IO 1578-16 128-130 hb	13486-21	14.99804	0.00845	0.02	94.7	2815.30	6.44	28.88	> 150
11	IO 1578-16 128-130 hb	13486-22	6.63448	0.03478	0.008	99.2	470.65	5.16	6.98	> 150
11	IO 1578-16 128-130 hb	13486-23	44.01046	0.00437	0.005	89.3	463.87	3.88	6.05	> 150
11	IO 1578-16 128-130 hb	13486-24	17.22341	-0.01402	0.002	99.9	515.89	7.68	9.25	> 150
11	IO 1578-16 128-130 hb	13486-25	12.4036	0.16027	0.003	92.5	463.62	6.18	7.73	> 150
11	IO 1578-16 128-130 hb	14313-07	1.97873	0.01163	0.041	75.3	117.94	0.71	2.46	> 150
11	IO 1578-16 128-130 hb	14313-03	1.61606	0.01064	0.027	94.1	260.51	1.05	5.32	> 150
11	IO 1578-16 128-130 hb	14313-06	4.83123	0.01606	0.019	93	339.90	1.46	6.95	> 150
11	IO 1578-16 128-130 hb	14313-08	3.04416	-0.02486	0.001	77.9	757.69	23.16	27.68	> 150
11	IO 1578-16 128-130 hb	14313-19	9.31442	0.0321	0.056	99.7	1511.65	3.11	30.39	> 150
11	IO 1578-16 128-130 hb	14313-13	13.60741	0.08247	0.003	100	2869.84	14.73	59.26	> 150
12	IWSOE70 3-18-01 hb	14302-01	0.03359	0.01592	0.035	79.5	91.28	0.55	1.91	> 150
12	IWSOE70 3-18-01 hb	14302-07	5.06065	0.00824	0.122	89.7	166.85	0.47	3.37	> 150
12	IWSOE70 3-18-01 hb	13494-24	12.99555	-0.1157	0.003	90.3	421.05	6.70	5.21	> 150
12	IWSOE70 3-18-01 hb	13494-23	15.79698	-0.01053	0.009	85	441.42	6.48	4.74	> 150
12	IWSOE70 3-18-01 hb	14302-12	4.44192	0.03279	0.002	79.6	468.78	7.05	11.73	> 150
12	IWSOE70 3-18-01 hb	13494-16	9.41223	0.02253	0.004	96	472.75	6.30	4.16	> 150
12	IWSOE70 3-18-01 hb	14302-15	12.38248	0.01407	0.021	99.6	479.60	1.71	9.74	> 150
12	IWSOE70 3-18-01 hb	13494-19	5.15133	0.06516	0.007	97.3	484.54	7.23	5.37	> 150
12	IWSOE70 3-18-01 hb	14302-23	6.18576	0.02413	0.008	99.5	491.94	2.82	10.23	> 150
12	IWSOE70 3-18-01 hb	13494-11	9.51955	0.04058	0.007	95.6	515.28	6.37	3.74	> 150
12	IWSOE70 3-18-01 hb	14302-02	39.72592	0.01259	0.002	98.6	568.36	9.58	14.86	> 150
12	IWSOE70 3-18-01 hb	14302-29	8.34423	0.04946	0.008	98.9	705.87	3.89	14.64	> 150
12	IWSOE70 3-18-01 hb	14302-14	7.28263	0.0863	0.004	96.3	735.00	5.95	15.86	> 150
12	IWSOE70 3-18-01 hb	14302-09	8.54836	0.10241	0.002	98.5	1128.51	11.59	25.37	> 150
12	IWSOE70 3-18-01 hb	14302-17	18.56729	0.08838	0.003	90.4	1633.96	14.12	35.60	> 150
12	IWSOE70 3-18-01 hb	14302-28	2.64411	0.00404	0.152	99.5	2530.67	3.13	50.71	> 150
12	IWSOE70 3-18-01 hb	13494-05	53.42878	-0.0714	0.0400	98.4	2531.93	15.22	29.54	> 150
12	IWSOE70 3-18-01 hb	14302-10	42.20518	0.19169	0.001	98.9	2687.99	26.44	59.91	> 150
12	IWSOE70 3-18-01 hb	14302-30	16.99648	0.0458	0.008	99.4	2800.66	9.21	56.77	> 150
12	IWSOE70 3-18-01 hb	14302-25	20.18207	0.02431	0.01	99.7	2831.41	8.21	57.22	> 150
12	IWSOE70 3-18-01 hb	13494-03	34.62787	-0.02636	0.0260	99.1	2840.60	36.22	46.03	> 150

46 This study

12	IWSOE70 3-18-01 hb	13494-12	13.2678	0.00101	0.007	99.6	2875.58	29.65	7.21	> 150
12	IWSOE70 3-18-01 hb	13494-25	8.75752	-0.00286	0.015	99.7	2879.55	31.95	13.84	> 150
12	IWSOE70 3-18-01 hb	13494-09	33.86819	-0.08427	0.0160	100.1	2885.45	26.78	39.37	> 150
12	IWSOE70 3-18-01 hb	13494-01	116.47505	-0.11954	0.0290	99.8	2885.89	16.24	33.11	> 150
12	IWSOE70 3-18-01 hb	13494-20	27.96719	0.08129	0.003	99.6	2924.37	33.05	15.41	> 150
12	IWSOE70 3-18-01 hb	13494-10	18.27182	-0.01695	0.0500	100.6	2930.68	25.94	39.14	> 150
12	IWSOE70 3-18-01 hb	13494-04	20.7313	0.00663	0.0520	99.7	2935.77	14.27	32.64	> 150
12	IWSOE70 3-18-01 hb	13494-21	50.65492	-0.03606	0.005	99.9	2937.02	31.20	10.53	> 150
12	IWSOE70 3-18-01 hb	14302-24	13.48138	0.03485	0.011	99.9	2961.45	6.76	59.61	> 150
12	IWSOE70 3-18-01 hb	13494-22	28.57615	-0.05218	0.003	99.6	2966.74	53.17	44.13	> 150
12	IWSOE70 3-18-01 hb	13494-13	14.27971	-0.01266	0.009	99.8	2997.20	30.93	7.64	> 150
12	IWSOE70 3-18-01 hb	14302-32	17.91175	0.0198	0.009	99.9	3003.92	8.74	60.71	> 150
12	IWSOE70 3-18-01 hb	14302-31	12.45933	0.01891	0.012	99.9	3006.79	7.36	60.58	> 150
12	IWSOE70 3-18-01 hb	14302-21	19.87313	0.02229	0.005	96.4	3013.04	11.98	61.44	> 150
12	IWSOE70 3-18-01 hb	13494-06	11.03117	-0.03363	0.0420	100.3	3018.45	24.39	38.80	> 150
12	IWSOE70 3-18-01 hb	13494-18	20.409	0.00196	0.005	99.7	3025.21	41.09	27.80	> 150
12	IWSOE70 3-18-01 hb	13494-07	43.13273	-0.04618	0.0350	100.5	3025.71	17.37	34.89	> 150
12	IWSOE70 3-18-01 hb	13494-02	23.13029	-0.04014	0.0640	100.4	3037.85	14.50	33.66	> 150
12	IWSOE70 3-18-01 hb	14302-13	12.76379	0.04409	0.008	99.9	3054.23	8.47	61.67	> 150
12	IWSOE70 3-18-01 hb	14302-16	15.55191	0.02797	0.01	99.6	3057.95	7.77	61.65	> 150
12	IWSOE70 3-18-01 hb	14302-19	12.1063	0.03284	0.012	99.7	3065.17	7.44	61.75	> 150
12	IWSOE70 3-18-01 hb	13494-17	39.83445	-0.03567	0.011	99.5	3068.07	31.46	6.96	> 150
12	IWSOE70 3-18-01 hb	13494-15	21.37897	-0.02394	0.015	99.7	3205.14	32.74	6.66	> 150
12	IWSOE70 3-18-01 hb	13494-08	104.0027	-0.10207	0.0140	99.9	3380.24	29.01	44.55	> 150
12	IWSOE70 3-18-01 hb	14302-03	16.51788	0.00656	0.017	99.5	3527.88	6.45	70.85	> 150
13	IO 1277-41 1161-1173 hb	13485-01	12.81199	0.01574	0.4050	94.2	397.33	3.45	5.26	> 150
13	IO 1277-41 1161-1173 hb	13485-12	13.80363	0.01681	0.003	68.7	426.40	5.72	7.14	> 150
13	IO 1277-41 1161-1173 hb	13485-13	19.73125	0.01007	0.006	87.6	461.82	3.78	5.97	> 150
13	IO 1277-41 1161-1173 hb	13485-20	6.69201	0.00268	0.009	95.3	467.83	5.65	7.34	> 150
13	IO 1277-41 1161-1173 hb	13485-08	15.48815	0.01364	0.0540	99.2	467.90	4.36	6.40	> 150
13	IO 1277-41 1161-1173 hb	13485-16	14.68595	-0.12511	0.002	95.9	468.86	7.40	8.76	> 150
13	IO 1277-41 1161-1173 hb	13485-24	7.71033	-0.00224	0.01	97.7	469.36	2.28	5.22	> 150
13	IO 1277-41 1161-1173 hb	13485-19	18.0058	-0.00423	0.002	93.3	471.63	5.13	6.97	> 150
13	IO 1277-41 1161-1173 hb	13485-07	14.82677	0.01908	0.1160	98.8	476.31	3.61	5.98	> 150
13	IO 1277-41 1161-1173 hb	13485-21	6.62203	0.01985	0.007	97.3	481.94	3.03	5.69	> 150
13	IO 1277-41 1161-1173 hb	13485-09	8.22645	0.04548	0.0430	93.7	482.38	6.86	8.38	> 150
13	IO 1277-41 1161-1173 hb	13485-02	5.46203	0.00584	0.5730	100.6	485.99	3.04	5.73	> 150
13	IO 1277-41 1161-1173 hb	13485-10	6.2784	0.0477	0.1340	99.6	487.12	3.51	6.00	> 150
13	IO 1277-41 1161-1173 hb	13485-04	9.64241	0.00075	0.3860	99.8	494.62	3.65	6.15	> 150
13	IO 1277-41 1161-1173 hb	13485-17	14.62916	-0.06463	0.002	98.9	495.46	6.05	7.82	> 150
13	IO 1277-41 1161-1173 hb	13485-05	8.22123	0.0259	0.1770	100.9	502.56	3.43	6.08	> 150
13	IO 1277-41 1161-1173 hb	13485-03	19.4859	0.01491	0.1560	92.6	535.50	5.92	7.98	> 150
13	IO 1277-41 1161-1173 hb	13485-25	9.09377	0.04449	0.004	96.2	572.96	4.34	7.19	> 150
13	IO 1277-41 1161-1173 hb	13485-15	12.64448	-0.00453	0.01	96.1	594.39	2.91	6.62	> 150

23 This study

13	IO 1277-41 1161-1173 hb	13485-23	10.64638	0.25076	0.003	97.1	701.71	10.33	12.49	> 150
13	IO 1277-41 1161-1173 hb	13485-18	31.47467	0.37213	0.007	78	1203.69	10.67	16.08	> 150
13	IO 1277-41 1161-1173 hb	13485-14	76.93679	-0.00552	0.002	95.8	1349.12	11.54	17.75	> 150
13	IO 1277-41 1161-1173 hb	13485-06	34.61651	0.3184	0.0340	97.1	1507.18	12.28	19.44	> 150
14	IO 1277-23 hb	13489-15	0.06304	-0.00055	0.25	97.3	26.50	0.10	0.28	> 150
14	IO 1277-23 hb	13489-17	9.42029	-0.00099	0.009	90.5	377.66	2.47	4.51	> 150
14	IO 1277-23 hb	13484-11	6.33939	0.03762	0.006	96.6	419.03	2.92	5.11	> 150
14	IO 1277-23 hb	13489-20	7.79258	0.04496	0.007	97.3	431.69	2.56	5.02	> 150
14	IO 1277-23 hb	13489-24	7.50119	0.01693	0.007	92.9	442.82	4.58	6.37	> 150
14	IO 1277-23 hb	13489-13	11.79129	0.01931	0.005	94.7	446.15	3.52	5.68	> 150
14	IO 1277-23 hb	13489-16	2.00219	0.02221	0.04	98.3	448.56	1.23	4.65	> 150
14	IO 1277-23 hb	13484-03	7.08187	0.02023	0.009	98.2	450.91	2.39	5.10	> 150
14	IO 1277-23 hb	14311-05	8.45622	0.03288	0.009	98.8	451.28	2.30	9.31	> 150
14	IO 1277-23 hb	13489-23	9.76972	-0.0901	0.002	76.7	453.22	8.40	9.55	> 150
14	IO 1277-23 hb	13484-14	9.62421	0.04827	0.013	96.8	456.26	2.01	4.99	> 150
14	IO 1277-23 hb	13489-04	11.38321	0.02038	0.0510	97.9	456.37	5.91	7.47	> 150
14	IO 1277-23 hb	13489-22	10.45427	-0.04985	0.003	87.1	458.95	5.56	7.21	> 150
14	IO 1277-23 hb	13484-06	13.94758	0.0019	0.008	97.7	460.97	2.32	5.16	> 150
14	IO 1277-23 hb	14311-02	8.09937	0.03066	0.008	99	462.33	2.71	9.63	> 150
14	IO 1277-23 hb	13484-08	7.29446	-0.01284	0.008	97.4	463.90	2.44	5.24	> 150
14	IO 1277-23 hb	13484-09	6.46488	0.02845	0.021	98.9	464.52	1.73	4.96	> 150
14	IO 1277-23 hb	13489-19	9.37051	0.02832	0.005	94.2	464.61	3.87	6.05	> 150
14	IO 1277-23 hb	13489-21	14.20458	-0.01364	0.002	91.1	466.36	5.82	7.46	> 150
14	IO 1277-23 hb	14311-03	5.59946	0.10768	0.006	99.5	469.63	3.24	9.94	> 150
14	IO 1277-23 hb	14311-12	7.44193	0.05756	0.009	98.7	471.60	2.75	9.82	> 150
14	IO 1277-23 hb	13489-11	7.86525	0.0387	0.016	97.8	473.89	1.89	5.10	> 150
14	IO 1277-23 hb	13489-06	12.81817	0.01408	0.0560	98.5	474.67	6.75	8.25	> 150
14	IO 1277-23 hb	13489-10	11.20571	-0.0158	0.0360	86	474.84	6.14	7.77	> 150
14	IO 1277-23 hb	13484-02	8.28581	0.03475	0.004	98.6	477.07	4.62	6.64	> 150
14	IO 1277-23 hb	13484-07	7.58454	0.01514	0.024	98.8	477.21	2.76	5.51	> 150
14	IO 1277-23 hb	14311-16	10.00073	0.11579	0.005	98.3	479.17	3.75	10.29	> 150
14	IO 1277-23 hb	14311-15	8.85272	0.01439	0.049	99.6	483.14	1.28	9.75	> 150
14	IO 1277-23 hb	13484-12	11.03924	0.02747	0.007	95.4	483.35	2.54	5.46	> 150
14	IO 1277-23 hb	14311-08	7.81392	0.02903	0.011	99.2	487.77	2.44	10.06	> 150
14	IO 1277-23 hb	13489-25	9.22133	-0.04123	0.002	92.2	488.65	5.43	7.31	> 150
14	IO 1277-23 hb	14311-18	11.22869	0.04633	0.021	99.7	489.10	1.69	9.93	> 150
14	IO 1277-23 hb	13489-02	8.10457	0.1294	0.3890	99.5	489.68	3.78	6.18	> 150
14	IO 1277-23 hb	13489-03	7.64759	-0.00325	0.2520	98.4	490.44	3.54	6.05	> 150
14	IO 1277-23 hb	13489-01	6.14786	0.03675	0.2800	100.1	491.10	3.61	6.10	> 150
14	IO 1277-23 hb	14311-21	8.19392	0.0287	0.048	99.6	493.24	1.18	9.93	> 150
14	IO 1277-23 hb	13489-14	7.84054	0.0283	0.009	91.2	497.63	4.50	6.71	> 150
14	IO 1277-23 hb	13489-07	13.19032	-0.00063	0.0670	102.9	503.27	3.72	6.26	> 150
14	IO 1277-23 hb	13489-08	7.9233	0.01783	0.0760	99.6	504.03	3.98	6.42	> 150
14	IO 1277-23 hb	13489-09	8.90984	0.0228	0.0500	100.3	504.59	6.68	8.37	> 150

57 This study

14	IO 1277-23 hb	13489-05	5.97688	0.01519	0.0670	100	507.89	4.01	6.47	> 150	
14	IO 1277-23 hb	14311-17	8.9731	0.14297	0.005	98.4	510.70	3.84	10.91	> 150	
14	IO 1277-23 hb	13484-10	6.5685	-0.01967	0.011	97.6	510.96	2.27	5.59	> 150	
14	IO 1277-23 hb	14311-06	8.21526	0.04311	0.012	99.8	515.00	2.42	10.58	> 150	
14	IO 1277-23 hb	14311-11	7.18308	0.04673	0.007	99	515.99	3.41	10.87	> 150	
14	IO 1277-23 hb	14311-20	15.12356	0.05415	0.004	100.1	516.67	4.13	11.13	> 150	
14	IO 1277-23 hb	13484-04	16.57621	-0.0094	0.004	95.7	518.59	8.19	9.69	> 150	
14	IO 1277-23 hb	14311-22	9.89206	0.06855	0.007	98.5	520.75	3.53	11.00	> 150	
14	IO 1277-23 hb	14311-10	18.0653	0.03588	0.005	97.2	521.86	3.88	11.14	> 150	
14	IO 1277-23 hb	13484-01	6.02839	0.09318	0.022	98.8	522.86	1.80	5.53	> 150	
14	IO 1277-23 hb	13484-15	7.96576	0.02271	0.012	96.2	547.49	4.60	7.15	> 150	
14	IO 1277-23 hb	14311-13	10.48214	0.04081	0.006	97.3	561.87	3.90	11.90	> 150	
14	IO 1277-23 hb	14311-09	10.61328	0.08721	0.005	99.1	563.86	4.20	12.03	> 150	
14	IO 1277-23 hb	14311-19	18.77767	0.02566	0.006	100.2	600.69	4.52	12.84	> 150	
14	IO 1277-23 hb	14311-14	31.44609	0.0618	0.014	83	646.25	3.07	13.28	> 150	
14	IO 1277-23 hb	13484-05	9.8415	0.02116	0.018	99.1	1117.86	3.22	11.63	> 150	
14	IO 1277-23 hb	13484-13	29.99626	0.00962	0.003	94.1	1240.19	10.33	16.14	> 150	
15	JPC40 2245-2250	12514-09	3.00087	-0.01033	0.001	6.2	185.38	97.74	97.76	>150	13 this study
15	JPC40 2245-2250	12514-01	4.8377	0.05872	1.203	98.4	507.87	0.49	5.10	>150	
15	JPC40 2280-2285	12522-18	2.27635	0.02931	0.014	81.8	528.17	5.49	7.62	>150	
15	JPC40 2245-2250	12514-02	1.23291	0.00016	0.107	95.3	540.58	1.72	5.67	>150	
15	JPC40 2245-2250	12514-15	1.80647	-0.34444	0.001	24.7	660.15	64.46	64.80	>150	
15	JPC40 2245-2250	12514-14	12.82094	-0.0629	0.007	80.8	821.59	12.66	15.09	>150	
15	JPC40 2370-2375	12521-06	1.35292	0.02007	0.018	87.8	918.87	7.11	11.62	>150	
15	JPC40 2370-2375	12521-09	34.25551	0.09577	0.001	18.2	1560.99	65.43	67.27	>150	
15	JPC40 2245-2250	12514-17	9.08256	0.13147	0.002	73	1595.05	54.83	57.10	>150	
15	JPC40 2245-2250	12514-18	1.50207	-0.22843	0.001	78.1	2078.09	106.98	108.98	>150	
15	JPC40 2245-2250	12514-08	20.16246	-0.00431	0.002	87	3082.73	47.48	56.61	>150	
15	JPC40 2280-2285	12522-05	1.55514	0.14188	0.001	91	3745.77	138.61	143.58	>150	
15	JPC40 2245-2250	12514-06	2.46359	0.01397	0.002	71.8	4658.10	66.37	81.08	>150	
17	JPC34 292-297	12655-170	40.98532	0.13926	0.026	40.1	40.12	6.71	6.72	>150	318 this study
17	JPC34 292-297	12655-83E	41.36656	0.13018	0.025	25.6	151.37	8.41	8.54	>150	
17	JPC34 345-350	12667-44	36.92753	0.05586	0.015	16.4	155.78	13.39	13.48	>150	
17	JPC34 292-297	12655-82A	21.13859	0.05296	0.041	9	187.50	6.50	6.76	>150	
17	JPC34 292-297	12655-123	86.02873	0.03721	0.007	8.8	248.28	23.94	24.07	>150	
17	JPC34 292-297	12518-16	1.33089	-0.137	0.003	10.3	264.23	22.28	22.44	>150	
17	JPC34 292-297	12655-82F	31.45148	0.05014	0.047	55.5	289.72	4.17	5.08	>150	
17	JPC34 292-297	12655-88	5.82479	0.00361	0.638	90.8	329.23	0.56	3.34	>150	
17	JPC34 292-297	12655-104	16.58543	0.03237	0.188	79.2	395.80	1.25	4.15	>150	
17	JPC34 292-297	12655-83C	15.41803	0.05102	0.148	81	399.69	1.67	4.33	>150	
17	JPC34 345-350	12667-47	25.32083	0.03139	0.072	78.1	404.26	2.69	4.86	>150	
17	JPC34 345-350	12667-51	31.01758	0.02904	0.082	77.4	405.91	2.58	4.81	>150	
17	JPC34 292-297	12655-92	9.76599	0.04397	0.143	81.7	410.07	1.57	4.39	>150	

17	JPC34 292-297	12655-22	54.18542	-0.01372	0.063	85.8	414.10	2.79	4.99	>150
17	JPC34 292-297	12655-100	13.51384	0.03659	0.243	86.5	418.56	1.06	4.32	>150
17	JPC34 292-297	12655-83D	16.14974	0.04086	0.149	84.4	421.24	1.65	4.52	>150
17	JPC34 292-297	12655-110	17.21149	0.02166	0.077	84.4	424.32	2.70	5.03	>150
17	JPC34 292-297	12655-99	15.99896	0.01035	0.3	79.3	427.97	0.95	4.38	>150
17	JPC34 292-297	12667-50	35.06907	0.01801	0.132	80.4	429.90	1.90	4.70	>150
17	JPC34 292-297	12655-96	23.79751	0.02439	0.115	81.6	448.08	1.83	4.84	>150
17	JPC34 292-297	12655-62	14.64266	0.0216	0.156	89.4	450.74	1.60	4.78	>150
17	JPC34 345-350	12667-18	29.37316	0.02079	0.071	77.3	455.26	3.27	5.61	>150
17	JPC34 345-350	12667-63	8.63479	0.01889	0.259	91.4	457.50	1.24	4.74	>150
17	JPC34 292-297	12655-15	31.12735	-0.01223	0.06	91.9	460.18	3.31	5.67	>150
17	JPC34 345-350	12667-52	10.80562	0.00674	0.201	88.4	460.79	1.45	4.83	>150
17	JPC34 292-297	12655-108	16.55666	0.02474	0.098	89.1	461.16	2.33	5.17	>150
17	JPC34 345-350	12667-39	20.12983	-0.00145	0.103	94.2	463.59	1.94	5.03	>150
17	JPC34 292-297	12655-174	6.78998	0.00365	0.386	96.4	463.59	0.94	4.73	>150
17	JPC34 292-297	12655-130	51.59678	-0.00455	0.072	92.5	466.37	3.09	5.59	>150
17	JPC34 345-350	12667-58	20.07374	0.02521	0.196	93	466.76	1.51	4.90	>150
17	JPC34 292-297	12655-77	12.43729	0.01335	0.184	93.6	466.80	1.35	4.86	>150
17	JPC34 345-350	12667-69	7.79291	0.01765	0.403	94.4	466.94	0.90	4.76	>150
17	JPC34 292-297	12655-27	13.96787	0.03035	0.147	97.7	467.73	1.62	4.95	>150
17	JPC34 345-350	12667-68	14.89687	0.05012	0.317	92.5	468.54	1.13	4.82	>150
17	JPC34 345-350	12667-42	13.67377	0.00852	0.118	91	468.91	1.83	5.03	>150
17	JPC34 292-297	12655-34	44.65732	0.00185	0.041	94.9	469.06	3.32	5.75	>150
17	JPC34 292-297	12655-23	7.72514	0.01564	0.323	99	469.87	0.97	4.80	>150
17	JPC34 292-297	12655-138	6.31001	0.02036	0.313	96.8	470.87	1.08	4.83	>150
17	JPC34 292-297	12655-07	17.67784	0.00581	0.138	94.7	471.29	1.58	4.97	>150
17	JPC34 345-350	12667-43	15.74754	0.01237	0.233	94.9	471.36	1.37	4.91	>150
17	JPC34 292-297	12655-89	10.15844	0.03492	0.142	65	471.90	1.79	5.05	>150
17	JPC34 345-350	12667-46	7.55707	0.00813	0.356	95.5	472.42	0.95	4.82	>150
17	JPC34 292-297	12655-93	15.19841	0.01242	0.344	92.2	472.72	0.94	4.82	>150
17	JPC34 345-350	12667-64	9.47704	0.01306	0.273	92.2	472.74	1.18	4.87	>150
17	JPC34 292-297	12655-01	37.41948	-0.00457	0.197	94.5	473.91	1.12	4.87	>150
17	JPC34 292-297	12655-71	15.18359	0.00293	0.081	96.6	474.16	3.11	5.67	>150
17	JPC34 292-297	12655-82D	7.85398	0.02538	0.852	96.3	475.32	0.61	4.79	>150
17	JPC34 345-350	12667-02	6.69217	0.0193	0.323	96.9	475.79	1.17	4.90	>150
17	JPC34 345-350	12667-65	14.34453	0.00963	0.345	91.4	475.82	1.02	4.87	>150
17	JPC34 292-297	12655-171	10.72737	0.01741	0.136	97.2	476.06	1.91	5.13	>150
17	JPC34 345-350	12667-57	10.62974	0.01023	0.245	96.5	476.32	1.25	4.92	>150
17	JPC34 292-297	12655-141	11.14808	0.01667	0.483	99	476.36	0.91	4.85	>150
17	JPC34 292-297	12655-139	14.88672	0.01726	0.306	97	476.47	1.18	4.91	>150
17	JPC34 292-297	12655-76	10.43756	-0.00203	0.334	96.9	476.74	1.00	4.87	>150
17	JPC34 292-297	12518-07	18.454	0.0045	0.082	97.7	477.07	1.90	5.14	>150
17	JPC34 292-297	12655-39	25.94417	0.00592	0.051	93.6	477.10	3.08	5.68	>150
17	JPC34 292-297	12655-105	9.59804	0.01575	0.11	88.7	477.15	2.00	5.17	>150
17	JPC34 292-297	12655-59	12.11776	0.03086	0.131	97.2	477.79	1.78	5.10	>150

17	JPC34 292-297	12655-133	8.15964	0.00164	0.184	95.9	477.82	1.26	4.94	>150
17	JPC34 292-297	12655-75	13.09311	0.00566	0.128	55.7	478.23	2.14	5.24	>150
17	JPC34 345-350	12667-67	12.72392	0.01228	0.541	95.3	478.33	0.81	4.85	>150
17	JPC34 345-350	12667-66	6.8649	0.009	0.41	94.6	478.91	0.90	4.87	>150
17	JPC34 292-297	12655-11	8.52688	0.00653	0.39	99.5	479.43	0.83	4.87	>150
17	JPC34 292-297	12655-127	6.00665	0.0127	0.21	97.5	479.76	1.19	4.94	>150
17	JPC34 292-297	12655-147	5.44445	0.0073	0.467	98.4	480.34	0.90	4.89	>150
17	JPC34 292-297	12655-06	9.47867	0.01275	0.314	97.3	481.67	0.99	4.92	>150
17	JPC34 292-297	12655-82C	6.88993	0.02166	3.353	98.9	481.80	0.69	4.87	>150
17	JPC34 292-297	12655-69	15.32398	0.00736	0.196	98.7	482.46	1.54	5.06	>150
17	JPC34 345-350	12667-16	15.2165	0.02245	0.394	97.9	482.55	1.00	4.93	>150
17	JPC34 345-350	12667-49	10.68617	0.0306	0.271	93.3	482.86	1.30	5.00	>150
17	JPC34 292-297	12655-150	11.35445	0.0169	0.194	99.6	483.10	1.33	5.01	>150
17	JPC34 345-350	12667-61	21.4465	0.01704	0.25	92.3	483.12	1.33	5.01	>150
17	JPC34 292-297	12655-83B	10.08081	0.02237	4.162	99	484.01	0.70	4.89	>150
17	JPC34 292-297	12655-164	10.09732	0.01652	0.763	99.4	484.05	0.67	4.89	>150
17	JPC34 345-350	12667-36	9.19982	0.01196	0.359	98.1	484.78	0.85	4.92	>150
17	JPC34 292-297	12655-51	10.16843	0.00662	0.231	94.7	484.97	1.20	5.00	>150
17	JPC34 292-297	12655-114	20.05022	0.00468	0.183	98.4	485.02	1.30	5.02	>150
17	JPC34 292-297	12655-74	7.78096	0.00434	0.79	95.5	485.13	0.64	4.89	>150
17	JPC34 292-297	12655-33	8.25051	0.00882	0.219	98.7	485.15	1.09	4.97	>150
17	JPC34 345-350	12667-04	14.63022	0.0211	0.437	90.9	485.74	0.85	4.93	>150
17	JPC34 292-297	12655-35	13.5318	0.0028	0.128	98.2	485.97	1.72	5.16	>150
17	JPC34 345-350	12519-25	7.57252	0.02365	0.344	98	486.23	0.86	4.94	>150
17	JPC34 292-297	12655-49	35.61156	0.00314	0.127	93.3	486.51	1.92	5.23	>150
17	JPC34 292-297	12655-08	7.13817	0.01634	0.388	99.6	486.62	0.84	4.94	>150
17	JPC34 292-297	12655-37	6.76642	0.00383	0.351	99.3	486.70	0.89	4.95	>150
17	JPC34 292-297	12655-29	10.11976	-0.00034	0.179	99.3	487.18	1.20	5.02	>150
17	JPC34 70-75	12513-19	6.80802	0.007	0.1	94.8	487.31	1.54	5.11	>150
17	JPC34 292-297	12655-82B	6.98965	0.02342	2.107	98.6	487.52	0.46	4.90	>150
17	JPC34 292-297	12655-44	6.86041	0.01384	0.276	99.6	487.80	1.14	5.01	>150
17	JPC34 292-297	12655-36	15.66633	0.01155	0.155	96.8	487.88	1.34	5.06	>150
17	JPC34 292-297	12655-83	6.48481	0.00373	0.344	97.3	488.52	0.96	4.98	>150
17	JPC34 292-297	12655-159	8.96101	0.00781	0.122	99.7	488.54	1.86	5.23	>150
17	JPC34 345-350	12667-32	7.69696	0.00475	0.291	99.1	488.95	1.14	5.02	>150
17	JPC34 345-350	12667-01	8.72515	0.00923	1.836	97.9	489.05	0.47	4.91	>150
17	JPC34 345-350	12667-29	10.57484	0.01053	0.204	96.5	489.19	1.45	5.10	>150
17	JPC34 292-297	12655-120	8.7523	0.02202	0.325	70.1	489.38	1.09	5.01	>150
17	JPC34 292-297	12655-85	7.63769	0.01148	0.986	96.9	489.56	0.59	4.93	>150
17	JPC34 292-297	12655-63	6.82062	0.05796	0.2	99.2	489.77	1.43	5.10	>150
17	JPC34 345-350	12667-59	6.91709	0.00247	0.497	97.1	489.93	0.91	4.98	>150
17	JPC34 345-350	12667-41	10.6315	0.00323	0.433	97.4	490.01	0.81	4.97	>150
17	JPC34 292-297	12655-109	13.76201	0.01467	0.195	87.9	490.13	1.62	5.16	>150
17	JPC34 292-297	12655-143	9.13932	0.01413	0.612	99.5	490.19	0.74	4.96	>150
17	JPC34 345-350	12667-21	9.17817	0.00691	0.562	99.4	490.94	0.79	4.97	>150

17	JPC34 292-297	12655-13	11.8749	-0.00489	0.15	98.2	491.07	1.54	5.15	>150
17	JPC34 345-350	12667-33	6.89802	-0.01064	0.113	89.9	491.27	2.18	5.38	>150
17	JPC34 292-297	12655-144	9.45266	0.00457	0.235	98.9	491.99	1.29	5.09	>150
17	JPC34 292-297	12655-156	10.81146	0.00443	0.158	94.8	492.01	1.63	5.18	>150
17	JPC34 70-75	12513-23	6.6867	0.03526	0.147	97.7	492.17	1.21	5.07	>150
17	JPC34 345-350	12667-38	10.49897	0.01129	0.581	98.9	492.31	0.80	4.99	>150
17	JPC34 292-297	12655-60	10.66719	0.00077	0.065	62.1	492.37	3.34	5.95	>150
17	JPC34 292-297	12655-46	7.06503	0.00178	0.376	99.4	492.52	0.91	5.01	>150
17	JPC34 292-297	12655-68	14.6307	0.00572	0.254	98.5	492.83	1.12	5.05	>150
17	JPC34 292-297	12655-172	5.77824	-0.00094	0.218	99.6	492.85	1.31	5.10	>150
17	JPC34 292-297	12655-10	8.66955	0.00232	0.334	99.4	492.87	0.96	5.02	>150
17	JPC34 292-297	12655-149	24.33881	-0.00477	0.059	98.7	492.90	3.44	6.01	>150
17	JPC34 345-350	12667-15	19.63619	0.00651	0.167	94.6	493.01	1.55	5.17	>150
17	JPC34 345-350	12667-17	7.61632	0.01176	1.409	98	493.10	0.53	4.96	>150
17	JPC34 292-297	12655-61	8.66746	0.00027	1.39	96.8	493.20	0.55	4.96	>150
17	JPC34 292-297	12655-128	7.07015	0.0052	0.225	99.2	493.86	1.25	5.09	>150
17	JPC34 345-350	12667-22	7.09409	0.00916	0.491	97.8	494.00	0.80	5.00	>150
17	JPC34 292-297	12655-24	9.45224	0.04272	0.255	100.4	494.27	1.07	5.06	>150
17	JPC34 292-297	12655-65	7.36451	0.00201	0.253	98.4	494.49	1.43	5.15	>150
17	JPC34 292-297	12655-135	21.08686	-0.00637	0.158	99	494.58	1.57	5.19	>150
17	JPC34 345-350	12519-24	7.09407	0.01325	0.208	96.5	494.74	1.32	5.12	>150
17	JPC34 345-350	12667-25	23.55394	0.01852	0.121	96.4	494.91	2.12	5.38	>150
17	JPC34 292-297	12655-47	10.92884	0.00258	0.526	99.3	494.96	0.71	5.00	>150
17	JPC34 292-297	12655-72	9.31689	0.00609	0.224	94.3	495.12	1.59	5.20	>150
17	JPC34 292-297	12655-82	7.09261	-0.00045	0.579	95.1	495.60	0.83	5.03	>150
17	JPC34 292-297	12655-12	7.4155	-0.00409	0.416	99.8	495.72	0.89	5.04	>150
17	JPC34 292-297	12518-17	7.4063	0.02318	0.121	94.7	495.87	1.53	5.19	>150
17	JPC34 345-350	12519-29	10.86341	0.01949	0.405	98.3	495.94	0.87	5.04	>150
17	JPC34 292-297	12655-18	6.43753	0.01873	0.219	99.6	495.98	1.33	5.13	>150
17	JPC34 345-350	12519-36	19.10821	0.00519	0.06	95.6	496.61	2.27	5.46	>150
17	JPC34 345-350	12667-09	13.38101	0.00481	0.174	97.6	497.14	1.79	5.28	>150
17	JPC34 292-297	12655-153	8.9289	0.00947	0.333	99.1	497.27	1.00	5.07	>150
17	JPC34 345-350	12519-27	6.08791	0.03317	0.843	98.8	497.31	0.60	5.01	>150
17	JPC34 70-75	12513-08	22.89205	0.00479	0.091	97.9	497.65	1.51	5.20	>150
17	JPC34 292-297	12655-14	9.09228	0.0143	0.492	97.8	497.79	0.73	5.03	>150
17	JPC34 292-297	12655-161	19.51754	-0.00363	0.23	97.5	497.80	1.14	5.11	>150
17	JPC34 292-297	12655-80	6.6575	0.02971	0.134	100	498.45	1.75	5.28	>150
17	JPC34 70-75	12513-03	12.68563	0.01332	0.272	97.9	498.55	0.79	5.05	>150
17	JPC34 292-297	12518-02	9.4781	0.00677	0.215	99.2	498.60	1.06	5.10	>150
17	JPC34 345-350	12667-10	7.78002	0.01437	0.268	101.4	498.71	1.24	5.14	>150
17	JPC34 292-297	12655-55	7.27834	0.00635	0.232	99.6	498.77	1.27	5.15	>150
17	JPC34 292-297	12518-12	6.67974	0.00208	0.206	98.9	499.39	1.08	5.11	>150
17	JPC34 292-297	12518-11	11.30117	0.00297	0.146	99	499.48	1.56	5.23	>150
17	JPC34 292-297	12655-50	10.67506	0.01667	0.153	94.7	500.00	1.79	5.31	>150
17	JPC34 345-350	12667-55	6.82379	0.00566	0.243	98.7	500.31	1.34	5.18	>150

17	JPC34 70-75	12513-16	7.78408	0.01357	0.151	97.3	500.37	1.23	5.15	>150
17	JPC34 345-350	12667-12	8.13434	0.00458	0.457	98.6	501.15	0.97	5.10	>150
17	JPC34 70-75	12513-12	9.40749	0.01074	0.122	98.5	501.60	1.57	5.26	>150
17	JPC34 292-297	12655-41	7.33882	0.00805	0.248	97.7	501.80	1.17	5.15	>150
17	JPC34 292-297	12655-52	20.0332	-0.00559	0.064	102.5	501.85	3.24	5.97	>150
17	JPC34 292-297	12655-40	10.43466	0.00913	0.197	98.8	501.92	1.30	5.18	>150
17	JPC34 70-75	12513-14	9.63345	0.00465	0.143	98.7	501.99	1.51	5.24	>150
17	JPC34 292-297	12655-112	5.70361	0.01492	0.375	94	501.99	1.04	5.13	>150
17	JPC34 345-350	12667-20	9.26989	0.0049	0.59	98.4	502.14	0.86	5.09	>150
17	JPC34 345-350	12519-28	8.81162	0.02687	0.447	97.6	502.15	0.71	5.07	>150
17	JPC34 292-297	12655-87	9.15649	0.01055	0.885	97.2	502.27	0.65	5.06	>150
17	JPC34 70-75	12513-09	7.76531	0.0078	0.425	98.9	502.45	0.70	5.07	>150
17	JPC34 345-350	12667-53	7.80752	0.00537	0.246	97.6	502.52	1.24	5.17	>150
17	JPC34 345-350	12519-34	25.49118	0.06213	0.08	93.5	502.52	1.90	5.37	>150
17	JPC34 292-297	12655-17	9.34294	0.00055	0.525	97.2	502.90	0.87	5.10	>150
17	JPC34 345-350	12667-11	6.12518	0.00906	0.4	101.1	502.90	1.11	5.15	>150
17	JPC34 345-350	12519-16	11.45637	0.01985	0.134	97.3	503.44	1.55	5.27	>150
17	JPC34 70-75	12513-01	7.93159	0.00918	0.812	97.1	503.56	0.86	5.11	>150
17	JPC34 292-297	12655-70	7.13336	-0.00052	0.407	90.9	503.88	1.00	5.14	>150
17	JPC34 292-297	12518-14	13.24214	0.01116	0.122	99.4	504.14	1.43	5.24	>150
17	JPC34 345-350	12519-19	14.39218	0.00218	0.64	97.2	504.84	0.71	5.10	>150
17	JPC34 345-350	12519-18	12.54104	0.00653	0.305	97.7	504.85	0.89	5.13	>150
17	JPC34 70-75	12513-07	10.40048	0.01617	0.276	97.1	505.05	0.94	5.14	>150
17	JPC34 292-297	12655-16	6.3427	0.01458	0.284	100.1	505.06	1.03	5.15	>150
17	JPC34 345-350	12667-23	30.99139	0.00702	0.096	85.6	505.37	2.41	5.60	>150
17	JPC34 70-75	12513-21	6.29222	0.00707	0.135	97.2	505.57	1.22	5.20	>150
17	JPC34 292-297	12655-53	13.93135	0.00991	0.071	101.8	506.04	2.95	5.86	>150
17	JPC34 292-297	12655-30	8.56965	0.00219	0.531	93	507.22	0.80	5.13	>150
17	JPC34 345-350	12519-15	8.81611	0.02657	0.14	94.4	507.82	1.62	5.33	>150
17	JPC34 292-297	12655-125	7.81528	0.01248	0.259	99	508.32	1.27	5.24	>150
17	JPC34 70-75	12513-24	7.17274	0.0235	0.157	98	508.49	1.31	5.25	>150
17	JPC34 292-297	12655-42	12.69125	0.00897	0.248	98.7	508.66	1.30	5.25	>150
17	JPC34 292-297	12655-126	10.32889	0.03017	0.264	97.7	508.72	1.13	5.21	>150
17	JPC34 292-297	12655-116	10.48228	0.02283	0.144	95.2	509.00	1.54	5.32	>150
17	JPC34 345-350	12667-07	26.94659	-0.00712	0.175	78.6	509.01	1.80	5.40	>150
17	JPC34 70-75	12513-15	12.18811	0.00566	0.105	96.3	509.34	1.61	5.34	>150
17	JPC34 292-297	12518-21	8.25345	0.00852	0.122	97.1	509.61	1.49	5.31	>150
17	JPC34 292-297	12655-151	6.01831	0.00903	0.256	97.8	509.80	1.29	5.26	>150
17	JPC34 70-75	12513-20	7.93215	0.01802	0.159	97.4	509.81	1.14	5.22	>150
17	JPC34 292-297	12655-165	14.08511	0.01383	0.11	91.2	509.81	2.14	5.53	>150
17	JPC34 292-297	12518-18	15.67302	-0.00165	0.009	55	510.59	7.90	9.40	>150
17	JPC34 292-297	12655-107	12.12559	0.00795	0.142	89.2	511.65	1.78	5.42	>150
17	JPC34 70-75	12513-13	9.28405	0.0069	0.262	99.1	514.03	0.95	5.23	>150
17	JPC34 345-350	12519-05	8.26262	0.00979	0.441	98.2	514.31	0.71	5.19	>150
17	JPC34 292-297	12655-119	11.37273	0.01764	0.46	97.4	514.35	0.94	5.23	>150

17	JPC34 292-297	12655-148	9.65189	0.00485	0.232	99.7	515.47	1.31	5.32	>150
17	JPC34 292-297	12655-78	10.62705	0.01731	0.338	98.2	515.98	1.05	5.27	>150
17	JPC34 292-297	12655-91	7.3239	0.03261	0.325	89.2	516.19	0.88	5.24	>150
17	JPC34 292-297	12655-154	7.93574	0.01145	0.213	96.6	517.37	1.30	5.33	>150
17	JPC34 292-297	12655-21	6.40542	0.04224	0.568	99.1	517.67	0.80	5.24	>150
17	JPC34 345-350	12519-37	7.17299	0.00229	0.584	98.2	517.70	0.65	5.22	>150
17	JPC34 70-75	12513-04	43.7564	-0.00272	0.067	91.8	520.60	1.89	5.54	>150
17	JPC34 292-297	12655-169	6.68301	0.00624	0.213	99	520.90	1.38	5.39	>150
17	JPC34 292-297	12655-146	7.8984	0.04085	0.139	98.8	521.03	1.94	5.56	>150
17	JPC34 292-297	12655-136	7.46391	0.02109	0.235	95.5	521.17	1.45	5.41	>150
17	JPC34 345-350	12667-19	11.33219	0.00165	0.253	99.6	522.19	1.26	5.37	>150
17	JPC34 292-297	12655-160	6.67934	0.00849	0.813	98.5	522.30	0.75	5.28	>150
17	JPC34 292-297	12655-140	11.28115	0.01743	0.18	98.2	522.38	1.52	5.44	>150
17	JPC34 345-350	12519-04	5.92053	0.02095	0.27	87.4	523.36	0.97	5.32	>150
17	JPC34 345-350	12519-35	8.24521	0.02224	0.176	98.5	523.43	1.33	5.40	>150
17	JPC34 292-297	12655-57	5.05136	0.03765	0.683	98.2	523.91	0.71	5.29	>150
17	JPC34 292-297	12655-38	6.8718	0.00267	0.254	99	523.94	1.15	5.36	>150
17	JPC34 292-297	12655-117	8.46776	0.01439	0.134	73.2	523.98	2.01	5.61	>150
17	JPC34 292-297	12655-131	18.72044	0.01175	0.133	97	524.90	1.78	5.54	>150
17	JPC34 292-297	12655-28	9.21969	0.00697	0.158	98.8	525.42	1.79	5.55	>150
17	JPC34 292-297	12655-101	9.35607	0.01672	0.426	89.8	525.46	0.92	5.34	>150
17	JPC34 70-75	12513-18	11.65583	0.02493	0.089	94	525.62	1.69	5.52	>150
17	JPC34 345-350	12519-26	12.01859	0.00446	0.154	98.9	526.15	1.36	5.43	>150
17	JPC34 292-297	12655-132	10.53897	0.0067	0.308	99.2	526.47	1.15	5.39	>150
17	JPC34 345-350	12667-45	16.22517	0.00693	0.124	89	527.56	1.84	5.59	>150
17	JPC34 292-297	12655-66	10.49894	0.03118	0.084	98.1	527.94	2.68	5.92	>150
17	JPC34 292-297	12655-102	9.19303	0.02291	0.392	91.3	529.31	0.99	5.38	>150
17	JPC34 70-75	12513-10	18.99822	0.01996	0.174	98.3	529.49	1.01	5.39	>150
17	JPC34 345-350	12519-21	15.88034	0.00349	0.73	96.3	531.06	0.64	5.35	>150
17	JPC34 345-350	12667-62	12.15472	0.01397	0.247	91.9	532.94	1.27	5.48	>150
17	JPC34 292-297	12655-158	20.43191	0.00425	0.182	78.8	533.60	1.67	5.59	>150
17	JPC34 345-350	12667-35	11.54381	0.01143	0.179	97.6	534.82	1.78	5.64	>150
17	JPC34 292-297	12655-05	9.35557	0.01021	0.838	99	537.59	0.71	5.42	>150
17	JPC34 292-297	12655-124	6.26832	0.01382	0.597	98.2	539.32	0.83	5.46	>150
17	JPC34 292-297	12655-64	17.52485	0.03153	0.068	91.6	540.68	3.26	6.31	>150
17	JPC34 292-297	12655-152	7.40967	0.00865	0.186	99.7	542.68	1.70	5.69	>150
17	JPC34 292-297	12655-113	20.85338	0.03649	0.079	80.9	545.45	3.06	6.26	>150
17	JPC34 292-297	12655-134	9.47982	0.00361	0.215	99	546.68	1.32	5.62	>150
17	JPC34 292-297	12655-94	9.20021	0.00504	0.375	90	546.75	0.97	5.55	>150
17	JPC34 345-350	12667-05	19.15199	0.00122	0.252	97.9	547.83	1.36	5.64	>150
17	JPC34 292-297	12655-79	17.75584	-0.00057	0.156	97.9	550.78	1.87	5.82	>150
17	JPC34 292-297	12655-115	15.06294	0.01163	0.147	89.2	552.38	1.55	5.74	>150
17	JPC34 292-297	12655-25	10.94859	0.00464	0.577	99.3	553.00	0.85	5.60	>150
17	JPC34 292-297	12518-04	8.07638	0.00614	0.366	94.9	554.36	0.88	5.61	>150
17	JPC34 292-297	12655-31	28.04361	0.01864	0.058	94.9	558.44	3.11	6.39	>150

17	JPC34 292-297	12655-26	22.7679	0.02371	0.122	97.2	560.53	2.08	5.98	>150
17	JPC34 70-75	12513-22	10.44023	0.01924	0.098	93.6	562.58	1.77	5.90	>150
17	JPC34 292-297	12655-168	15.69097	0.01803	0.148	98.4	564.33	1.67	5.88	>150
17	JPC34 345-350	12519-08	7.76724	0.00598	0.21	98.7	565.88	1.06	5.76	>150
17	JPC34 292-297	12655-137	19.46943	0.00481	0.25	98.2	572.37	1.40	5.89	>150
17	JPC34 292-297	12655-43	22.18139	0.03522	0.089	93.7	572.48	2.35	6.19	>150
17	JPC34 292-297	12655-162	6.24186	0.00333	0.248	99.6	574.17	1.32	5.89	>150
17	JPC34 345-350	12667-13	27.89179	0.01831	0.06	92.9	574.89	3.60	6.78	>150
17	JPC34 70-75	12513-11	8.05367	0.0224	0.204	96.7	579.65	1.08	5.90	>150
17	JPC34 345-350	12667-08	6.19015	0.00193	0.443	100.3	582.79	1.09	5.93	>150
17	JPC34 292-297	12518-03	33.90511	0.00589	0.082	89.1	583.32	2.22	6.24	>150
17	JPC34 70-75	12513-25	6.04101	0.02071	0.21	96.8	587.42	1.19	5.99	>150
17	JPC34 292-297	12655-129	8.27981	0.01033	0.135	94.5	592.16	2.03	6.26	>150
17	JPC34 292-297	12655-67	56.36651	0.0207	0.049	75.4	593.04	4.36	7.36	>150
17	JPC34 292-297	12655-166	10.93377	0.0346	0.568	95.9	595.99	0.90	6.03	>150
17	JPC34 70-75	12513-02	13.69264	0.00917	0.383	97	597.12	1.09	6.07	>150
17	JPC34 292-297	12655-163	3.45382	0.01964	0.111	99.9	600.68	2.15	6.38	>150
17	JPC34 292-297	12655-84	44.36353	0.0302	0.058	67.5	602.12	3.70	7.07	>150
17	JPC34 292-297	12655-48	30.5079	0.01554	0.14	93.3	605.06	2.02	6.38	>150
17	JPC34 292-297	12655-56	13.14181	0.01771	0.37	97.9	605.94	1.06	6.15	>150
17	JPC34 70-75	12513-05	6.95752	0.02347	0.273	97.3	609.33	1.17	6.20	>150
17	JPC34 292-297	12655-90	9.80311	0.00714	0.469	95.4	613.43	1.15	6.24	>150
17	JPC34 292-297	12655-167	12.34461	0.0123	0.189	97.5	614.29	1.53	6.33	>150
17	JPC34 292-297	12655-121	19.55521	0.00179	0.19	94.5	616.75	1.63	6.38	>150
17	JPC34 345-350	12667-14	16.89355	0.0168	0.141	98.8	617.05	2.08	6.51	>150
17	JPC34 292-297	12655-145	8.69538	0.02548	0.17	96.4	617.64	1.59	6.38	>150
17	JPC34 292-297	12655-106	14.54323	0.0521	0.277	98.3	620.44	1.22	6.32	>150
17	JPC34 292-297	12655-04	9.20616	0.01316	1.015	98.6	622.48	0.70	6.26	>150
17	JPC34 292-297	12655-95	34.77212	0.08401	0.063	78	624.04	3.68	7.24	>150
17	JPC34 345-350	12667-40	7.85383	0.01099	0.648	98.9	625.62	0.77	6.30	>150
17	JPC34 292-297	12518-08	7.87791	0.04011	0.536	94.8	628.26	0.91	6.35	>150
17	JPC34 292-297	12655-157	10.70614	0.01557	0.216	97	628.32	1.48	6.46	>150
17	JPC34 292-297	12655-20	4.77532	0.00792	0.498	99.7	629.79	1.00	6.38	>150
17	JPC34 292-297	12655-111	29.88584	0.02212	0.073	84.4	632.49	3.25	7.11	>150
17	JPC34 345-350	12667-54	24.38614	0.03099	0.101	97.5	663.23	2.59	7.12	>150
17	JPC34 292-297	12655-02	16.70526	0.01215	0.612	97.1	670.54	0.77	6.75	>150
17	JPC34 345-350	12519-23	17.5248	0.01821	0.156	97.9	674.15	1.74	6.96	>150
17	JPC34 345-350	12519-30	9.98001	0.02784	0.281	97.5	698.61	1.33	7.11	>150
17	JPC34 345-350	12519-22	7.34601	0.00687	1.275	99.5	700.58	0.68	7.04	>150
17	JPC34 292-297	12655-09	16.92574	0.01842	0.156	94.6	712.51	1.88	7.37	>150
17	JPC34 292-297	12655-03	28.19796	-0.00264	0.192	95	714.89	1.79	7.37	>150
17	JPC34 70-75	12513-06	32.29201	0.0024	0.042	90.6	720.07	3.22	7.89	>150
17	JPC34 292-297	12655-173	10.54293	0.00314	0.085	100.1	725.13	3.20	7.93	>150
17	JPC34 345-350	12519-32	9.50552	0.08871	0.066	97.5	734.11	2.85	7.88	>150
17	JPC34 345-350	12519-02	8.96059	0.00204	0.543	96.7	740.01	0.96	7.46	>150

17	JPC34 292-297	12655-155	36.33029	0.0144	0.069	89.4	745.38	3.67	8.31	>150
17	JPC34 292-297	12655-142	15.88196	-0.00337	0.122	93.9	762.92	2.68	8.09	>150
17	JPC34 345-350	12667-56	15.40139	0.03918	0.218	96.1	770.37	1.73	7.90	>150
17	JPC34 292-297	12518-09	15.91886	0.00557	0.118	99.9	775.54	2.07	8.03	>150
17	JPC34 345-350	12667-24	15.68365	0.02557	0.139	97.1	843.66	2.49	8.80	>150
17	JPC34 345-350	12519-03	5.46619	0.09064	1.726	97.3	849.93	0.87	8.54	>150
17	JPC34 292-297	12655-103	10.8699	0.02133	0.884	97.1	862.15	1.07	8.69	>150
17	JPC34 345-350	12519-14	11.35943	0.01503	0.291	96.8	878.50	1.58	8.93	>150
17	JPC34 292-297	12518-19	87.91534	0.01033	0.016	65.8	882.20	6.62	11.03	>150
17	JPC34 292-297	12655-54	13.17486	0.02526	0.094	100.6	889.37	3.51	9.56	>150
17	JPC34 292-297	12655-58	16.00951	0.2108	0.1	97.9	892.93	3.31	9.52	>150
17	JPC34 292-297	12655-81	8.8533	0.01954	0.34	99.5	902.06	1.54	9.15	>150
17	JPC34 345-350	12667-60	15.28248	0.01373	0.244	95.6	913.96	1.84	9.32	>150
17	JPC34 292-297	12655-45	10.28644	0.01175	0.245	99	923.30	1.69	9.39	>150
17	JPC34 292-297	12655-73	21.78829	0.0219	0.326	96.6	982.25	1.70	9.97	>150
17	JPC34 345-350	12519-20	17.88742	0.13591	0.236	93.4	998.14	1.99	10.18	>150
17	JPC34 292-297	12655-19	9.20621	0.02129	0.282	99.5	1025.63	1.79	10.41	>150
17	JPC34 345-350	12667-30	5.97978	0.06259	0.308	99.4	1056.73	1.73	10.71	>150
17	JPC34 345-350	12667-31	12.49821	0.01924	0.073	98.6	1072.12	4.63	11.68	>150
17	JPC34 292-297	12655-86	13.72607	0.00457	0.144	97.9	1108.09	2.83	11.44	>150
17	JPC34 292-297	12655-32	9.88897	0.02377	0.325	99.4	1123.53	1.68	11.36	>150
17	JPC34 345-350	12519-13	15.96565	0.02517	0.015	83.8	1243.50	10.68	16.39	>150
17	JPC34 345-350	12667-27	15.22734	-0.00174	0.039	60.4	1250.04	7.66	14.66	>150
17	JPC34 345-350	12519-06	26.06237	-0.00012	0.155	98.2	1266.49	2.38	12.89	>150
17	JPC34 292-297	12518-05	24.89455	0.02413	0.069	97.4	1274.91	4.06	13.38	>150
17	JPC34 345-350	12519-10	14.47709	0.01568	0.006	68.6	1300.94	16.25	20.81	>150
17	JPC34 345-350	12667-37	42.78261	0.00195	0.204	94.8	1323.77	2.39	13.45	>150
17	JPC34 345-350	12667-26	17.45192	0.01164	0.095	98.2	1338.62	4.24	14.04	>150
17	JPC34 345-350	12667-34	14.99141	0.03939	0.156	89.3	1396.06	3.32	14.35	>150
17	JPC34 292-297	12655-97	13.38144	0.02284	0.49	93.3	1446.70	1.94	14.60	>150
17	JPC34 292-297	12655-83A	18.36526	0.05164	0.085	94	1472.84	5.00	15.55	>150
17	JPC34 345-350	12667-48	14.51322	0.02203	0.103	92.7	1672.24	4.72	17.38	>150
17	JPC34 345-350	12667-28	7.60622	0.1235	0.376	99.7	2164.01	2.93	21.84	>150
17	JPC34 292-297	12655-122	60.11529	0.58063	0.001	47.5	2190.54	206.20	207.36	>150
17	JPC34 292-297	12655-118	11.8716	0.05436	0.274	99.3	2205.08	3.43	22.32	>150
18	1166A 22-1W 60-62	12632-47	20.93883	0.14324	0.047	80.4	414.99	4.68	6.26	>150
18	1166A 26-1W 100-102	12616-36	70.67025	-0.04056	0.014	82.2	418.71	6.12	7.42	>150
18	1166A 22-1W 60-62	12632-23	10.16526	0.0088	0.057	78.1	419.59	3.06	5.19	>150
18	1166A 26-1W 100-102	12616-63	155.83828	0.06798	0.005	110.7	421.05	13.70	14.34	>150
18	1166A 22-1W 60-62	12632-51	10.05317	-0.17137	0.006	75.2	421.86	30.29	30.58	>150
18	1166A 22-1W 60-62	12632-97	10.27789	0.02549	0.021	85.1	436.69	6.61	7.92	>150
18	1166A 24-1W 80/82	12511-08	12.08875	0.01033	0.042	37	449.58	3.15	5.49	>150
18	1166A 22-1W 60-62	12632-26	11.70621	0.01962	0.084	89.9	458.02	2.61	5.27	>150
18	1166A 22-1W 60-62	12632-05	13.52238	0.01251	0.197	93.8	460.98	0.98	4.71	>150

160 van de Flierdt et al. (2008)

18	1166A 22-1W 60-62	12632-29	7.03792	0.03711	0.079	92.2	465.33	2.53	5.30	>150
18	1166A 22-1W 60-62	12632-15	10.2343	0.01359	0.115	94.4	469.93	2.23	5.20	>150
18	1166A 26-1W 100-102	12616-16	33.66285	0.22049	0.124	97.8	471.83	1.51	4.95	>150
18	1166A 22-1W 60-62	12632-45	11.11223	0.00696	0.087	52	472.15	3.08	5.64	>150
18	1166A 26-1W 100/102	12509-21	34.46027	-0.00648	0.016	94.2	473.08	15.28	16.00	>150
18	1166A 26-1W 100/102	12509-26	37.11935	0.01002	0.005	94.5	473.14	43.63	43.89	>150
18	1166A 22-1W 60-62	12632-74	7.99815	0.03963	0.082	95.1	474.16	2.85	5.53	>150
18	1166A 22-1W 60-62	12632-52	7.95573	-0.00046	0.127	96.1	476.15	1.90	5.13	>150
18	1166A 24-1W 80/82	12511-05	6.14739	0.0459	0.115	38.6	477.05	2.15	5.23	>150
18	1166A 22-1W 60-62	12632-96	6.03137	0.02383	0.093	92.1	477.58	2.08	5.21	>150
18	1166A 26-1W 100-102	12616-18	7.76282	0.00525	0.136	98.8	478.41	1.51	5.02	>150
18	1166A 26-1W 100/102	12509-16	7.78853	0.01519	0.028	98	478.78	8.79	10.01	>150
18	1166A 26-1W 100-102	12616-46	26.32412	0.00772	0.061	99.7	478.85	2.32	5.32	>150
18	1166A 26-1W 100-102	12616-03	40.10561	0.0022	0.15	93.6	479.57	1.26	4.96	>150
18	1166A 26-1W 100-102	12616-34	12.14441	0.01645	0.081	99.1	481.57	1.60	5.07	>150
18	1166A 22-1W 60-62	12632-38	11.13086	0.02125	0.062	96.8	482.25	3.41	5.91	>150
18	1166A 26-1W 100-102	12616-01	39.51866	0.00214	0.234	98.2	482.82	0.96	4.92	>150
18	1166A 22-1W 60-62	12632-92	14.97852	0.12325	0.005	78.7	483.09	23.15	23.65	>150
18	1166A 22-1W 60-62	12632-12	15.31045	0.02703	0.155	96.8	483.43	1.74	5.14	>150
18	1166A 22-1W 60-62	12632-62	15.39999	0.00941	0.05	98.2	484.48	4.43	6.57	>150
18	1166A 22-1W 60-62	12632-93	8.91186	0.00154	0.041	97.7	485.08	4.03	6.31	>150
18	1166A 22-1W 60-62	12632-63	6.15531	0.06997	0.177	94.4	485.83	1.68	5.14	>150
18	1166A 22-1W 60-62	12632-80	5.48903	0.13098	0.068	99.3	486.28	2.94	5.68	>150
18	1166A 24-1W 80/82	12511-04	10.29639	0.00679	0.029	80.7	486.73	3.15	5.80	>150
18	1166A 22-1W 60-62	12632-31	8.16644	0.02756	0.132	97	486.91	1.76	5.18	>150
18	1166A 26-1W 100-102	12616-08	19.54352	-0.00018	0.13	99.4	486.98	1.29	5.04	>150
18	1166A 26-1W 100-102	12616-19	20.50496	-0.00034	0.095	98.2	487.17	1.64	5.14	>150
18	1166A 22-1W 60-62	12632-41	6.66947	0.03261	0.185	97.9	487.22	1.58	5.12	>150
18	1166A 26-1W 100-102	12616-64	28.15236	-0.01023	0.016	108.8	487.41	5.81	7.59	>150
18	1166A 22-1W 60-62	12632-56	6.04707	0.01162	0.151	97.4	487.88	1.80	5.20	>150
18	1166A 22-1W 60-62	12632-85	20.80948	0.02988	0.021	89.9	488.01	8.27	9.61	>150
18	1166A 24-1W 80/82	12511-07	8.26693	0.00793	0.063	91.4	488.58	2.01	5.28	>150
18	1166A 22-1W 60-62	12632-27	17.14577	-0.001	0.069	91.5	489.51	2.86	5.67	>150
18	1166A 26-1W 100-102	12616-14	26.47186	0.00697	0.148	89.7	489.84	1.34	5.08	>150
18	1166A 26-1W 100/102	12509-18	8.92116	0.00952	0.05	97.7	490.21	4.97	6.98	>150
18	1166A 22-1W 60-62	12632-18	8.43764	0.02317	0.121	97.6	491.02	2.19	5.38	>150
18	1166A 22-1W 60-62	12632-03	7.55478	0.02314	0.609	98.4	491.57	0.72	4.97	>150
18	1166A 22-1W 60-62	12632-32	6.33298	0.03215	0.046	89.7	491.83	4.34	6.56	>150
18	1166A 22-1W 60-62	12632-69	23.01124	0.0217	0.04	93.9	492.34	5.14	7.12	>150
18	1166A 26-1W 100-102	12616-23	7.31845	0.01321	0.385	100.1	492.89	0.73	4.98	>150
18	1166A 22-1W 60-62	12632-16	10.59718	0.01613	0.226	100.1	493.21	1.42	5.13	>150
18	1166A 22-1W 60-62	12632-20	8.73056	0.00652	0.081	102.5	493.90	2.85	5.70	>150
18	1166A 26-1W 100-102	12616-32	24.67687	-0.00076	0.035	98.1	494.27	3.16	5.87	>150
18	1166A 22-1W 60-62	12632-73	18.78544	0.03768	0.055	81.4	494.59	3.77	6.22	>150
18	1166A 26-1W 100-102	12616-50	14.0463	0.01871	0.074	100.7	495.10	2.65	5.61	>150

18	1166A 22-1W 60-62	12632-57	6.14009	0.00173	0.258	100.1	495.31	1.06	5.06	>150
18	1166A 22-1W 60-62	12632-11	8.03768	0.01579	0.248	98.3	495.69	1.27	5.12	>150
18	1166A 26-1W 100-102	12616-47	13.73384	0.01041	0.04	94.5	495.77	2.95	5.77	>150
18	1166A 22-1W 60-62	12632-25	17.83163	0.09623	0.172	96.4	496.09	1.55	5.20	>150
18	1166A 22-1W 60-62	12632-44	5.26855	-0.00977	0.105	95.5	496.31	2.07	5.38	>150
18	1166A 22-1W 60-62	12632-58	7.23901	0.02891	0.065	99.1	496.34	3.24	5.93	>150
18	1166A 22-1W 60-62	12632-24	6.72858	0.03663	0.143	98.2	496.37	1.89	5.31	>150
18	1166A 26-1W 100-102	12616-24	5.70131	0.0094	0.552	99.9	497.19	0.76	5.03	>150
18	1166A 26-1W 100-102	12616-59	7.58977	0.00801	0.167	101.5	497.43	1.36	5.16	>150
18	1166A 22-1W 60-62	12632-55	9.15071	0.01409	0.098	97.6	498.09	2.51	5.58	>150
18	1166A 22-1W 60-62	12632-36	11.52058	0.00753	0.129	99.7	498.10	1.86	5.32	>150
18	1166A 22-1W 60-62	12632-64	8.28164	0.01497	0.164	96.9	498.21	1.67	5.25	>150
18	1166A 22-1W 60-62	12632-39	6.15877	0.01083	0.147	100.3	498.24	1.72	5.27	>150
18	1166A 22-1W 60-62	12632-43	6.99691	0.01841	0.079	100.6	498.61	2.71	5.68	>150
18	1166A 22-1W 60-62	12632-30	8.159	0.01682	0.097	99.5	498.77	2.20	5.45	>150
18	1166A 26-1W 100-102	12616-54	7.40701	0.02598	0.216	99.8	499.38	1.33	5.17	>150
18	1166A 26-1W 100/102	12509-24	7.02097	0.0066	0.024	98.5	499.46	10.16	11.33	>150
18	1166A 22-1W 60-62	12632-75	5.83218	0.03267	0.07	100.3	499.46	3.08	5.87	>150
18	1166A 26-1W 100-102	12616-31	12.50776	0.0414	0.116	98.5	500.12	1.54	5.23	>150
18	1166A 26-1W 100/102	12509-14	11.77152	0.02647	0.036	69.6	500.17	6.99	8.59	>150
18	1166A 22-1W 60-62	12632-60	7.12423	0.01386	0.062	100.8	500.59	3.29	5.99	>150
18	1166A 24-1W 80/82	12511-12	6.76063	0.03605	0.092	97.6	500.81	1.74	5.30	>150
18	1166A 26-1W 100-102	12616-57	10.24499	-0.00122	0.085	102	503.08	2.11	5.46	>150
18	1166A 24-1W 80/82	12511-02	40.8728	0.02524	0.017	78.2	503.83	4.43	6.71	>150
18	1166A 26-1W 100-102	12616-15	10.24691	0.035	0.264	99.3	503.90	1.03	5.14	>150
18	1166A 26-1W 100-102	12616-11	8.32788	0.00835	0.768	99.8	504.21	0.62	5.08	>150
18	1166A 26-1W 100-102	12616-53	10.09623	0.00949	0.095	100.2	504.45	1.62	5.30	>150
18	1166A 22-1W 60-62	12632-82	6.52256	0.02024	0.059	101.9	504.52	3.43	6.10	>150
18	1166A 26-1W 100-102	12616-49	5.27352	0.14271	0.084	99.1	504.64	1.91	5.39	>150
18	1166A 26-1W 100-102	12616-07	26.22647	0.01631	0.148	98.9	504.78	1.35	5.23	>150
18	1166A 26-1W 100-102	12616-38	9.83384	0.01853	0.262	100.6	505.26	1.14	5.18	>150
18	1166A 22-1W 60-62	12632-67	63.2445	0.06927	0.009	99.4	505.93	20.35	20.97	>150
18	1166A 22-1W 60-62	12632-17	19.64255	0.02113	0.078	98.5	506.83	3.13	5.95	>150
18	1166A 22-1W 60-62	12632-22	18.5502	0.00228	0.282	74.1	506.86	1.25	5.22	>150
18	1166A 26-1W 100-102	12616-27	11.40957	0.0044	0.143	101.5	507.67	1.41	5.27	>150
18	1166A 22-1W 60-62	12632-76	6.6305	-0.0035	0.051	101.6	507.67	3.86	6.38	>150
18	1166A 26-1W 100-102	12616-29	7.84804	0.01943	0.105	100.1	507.85	1.76	5.37	>150
18	1166A 22-1W 60-62	12632-08	33.00938	0.01317	0.092	97.7	507.92	2.69	5.75	>150
18	1166A 26-1W 100-102	12616-52	7.46985	0.00368	0.123	99.7	508.29	1.53	5.31	>150
18	1166A 26-1W 100-102	12616-10	14.02761	0.00727	0.392	99.6	508.65	0.69	5.13	>150
18	1166A 26-1W 100-102	12616-56	7.80243	0.01262	0.168	101.2	508.76	1.67	5.35	>150
18	1166A 22-1W 60-62	12632-50	9.00951	0.01119	0.088	104.1	508.86	2.51	5.67	>150
18	1166A 22-1W 60-62	12632-19	16.44695	-0.00365	0.027	102	509.27	7.17	8.80	>150
18	1166A 22-1W 60-62	12632-34	10.21552	0.00914	0.096	102	509.54	2.32	5.60	>150
18	1166A 22-1W 60-62	12632-21	8.62465	0.03585	0.105	101.5	509.74	2.27	5.58	>150

18	1166A 26-1W 100-102	12616-62	10.78431	0.00694	0.052	85.6	510.54	2.88	5.86	>150
18	1166A 26-1W 100/102	12509-25	6.88002	0.02525	0.042	99	511.37	5.95	7.84	>150
18	1166A 26-1W 100-102	12616-28	28.62996	-0.00606	0.057	98	511.71	2.68	5.78	>150
18	1166A 26-1W 100-102	12616-58	7.28802	0.00865	0.072	101.8	513.30	2.49	5.70	>150
18	1166A 26-1W 100-102	12616-55	23.78207	0.01522	0.032	100.3	515.49	3.20	6.07	>150
18	1166A 22-1W 60-62	12632-72	8.42846	-0.01048	0.073	103.9	515.86	3.18	6.06	>150
18	1166A 26-1W 100-102	12616-35	7.99385	0.01555	0.159	99.1	516.27	1.26	5.31	>150
18	1166A 22-1W 60-62	12632-83	7.04451	0.00393	0.044	103	516.78	4.55	6.89	>150
18	1166A 22-1W 60-62	12632-71	3.91712	-0.01449	0.03	44.7	516.87	7.17	8.84	>150
18	1166A 26-1W 100-102	12616-40	6.06833	0.02503	0.105	100.9	520.26	7.31	8.98	>150
18	1166A 26-1W 100-102	12616-61	19.79164	0.01403	0.102	100.9	520.45	2.24	5.67	>150
18	1166A 22-1W 60-62	12632-66	10.90861	-0.02386	0.052	105.3	520.81	4.16	6.66	>150
18	1166A 22-1W 60-62	12632-88	5.51286	-0.00322	0.037	95.2	521.20	5.14	7.32	>150
18	1166A 22-1W 60-62	12632-14	9.21139	0.05254	0.155	97.3	521.76	1.71	5.49	>150
18	1166A 26-1W 100-102	12616-26	27.8543	0.03359	0.059	99.8	522.69	2.52	5.80	>150
18	1166A 22-1W 60-62	12632-89	4.89258	-0.00819	0.042	104.5	525.44	4.61	6.99	>150
18	1166A 22-1W 60-62	12632-02	6.73806	0.01761	0.185	98.1	526.37	1.56	5.49	>150
18	1166A 22-1W 60-62	12632-10	11.43014	0.00226	0.197	99.6	527.08	1.56	5.50	>150
18	1166A 22-1W 60-62	12632-77	12.69206	0.00821	0.047	98.9	529.10	4.45	6.91	>150
18	1166A 22-1W 60-62	12632-42	12.43903	0.03852	0.037	95	531.66	5.35	7.54	>150
18	1166A 22-1W 60-62	12632-59	13.08704	-0.00848	0.023	101.7	531.94	8.13	9.71	>150
18	1166A 26-1W 100-102	12616-65	45.8021	0.00603	0.022	107.7	533.76	4.60	7.05	>150
18	1166A 26-1W 100/102	12509-01	9.52983	0.04058	0.213	98.7	536.20	1.59	5.59	>150
18	1166A 26-1W 100-102	12616-66	6.51258	0.08448	0.093	98.6	538.76	2.04	5.76	>150
18	1166A 22-1W 60-62	12632-13	33.21293	-0.01252	0.145	95.6	538.79	1.75	5.67	>150
18	1166A 26-1W 100-102	12616-44	22.63848	0.03074	0.025	104	545.59	3.82	6.66	>150
18	1166A 26-1W 100-102	12616-06	15.45567	0.00538	0.312	98.6	549.74	0.90	5.57	>150
18	1166A 26-1W 100-102	12616-69	12.9929	0.25636	0.023	103.3	550.17	4.58	7.16	>150
18	1166A 26-1W 100-102	12616-67	35.67319	0.02663	0.022	96.1	553.05	4.76	7.30	>150
18	1166A 26-1W 100-102	12616-42	7.0958	0.01923	0.075	101	570.20	5.73	8.08	>150
18	1166A 22-1W 60-62	12632-49	6.81118	0.00273	0.031	109.2	574.63	6.38	8.58	>150
18	1166A 26-1W 100-102	12616-37	19.07842	0.00267	0.136	101.2	578.20	1.69	6.03	>150
18	1166A 26-1W 100-102	12616-60	10.27215	0.0085	0.071	100.9	581.78	2.24	6.24	>150
18	1166A 26-1W 100-102	12616-41	13.9189	0.00725	0.048	101	589.45	3.48	6.84	>150
18	1166A 22-1W 60-62	12632-40	5.9424	-0.00156	0.104	98.9	589.62	2.44	6.38	>150
18	1166A 26-1W 100-102	12616-30	14.83493	0.01023	0.089	100.3	593.56	2.13	6.31	>150
18	1166A 26-1W 100-102	12616-13	9.68201	0.01216	0.153	97.4	594.87	1.36	6.10	>150
18	1166A 22-1W 60-62	12632-87	5.25106	-0.03019	0.018	108.7	600.08	9.90	11.58	>150
18	1166A 22-1W 60-62	12632-90	12.98693	-0.13193	0.016	107.5	603.80	10.06	11.74	>150
18	1166A 22-1W 60-62	12632-94	29.66447	0.09091	0.017	95.5	609.35	7.73	9.84	>150
18	1166A 26-1W 100-102	12616-22	10.89628	0.01399	0.437	100	620.75	0.85	6.27	>150
18	1166A 26-1W 100-102	12616-12	8.33718	0.0085	0.385	98.6	638.65	1.01	6.47	>150
18	1166A 26-1W 100-102	12616-02	11.09812	0.03317	0.328	98.9	640.05	0.95	6.47	>150
18	1166A 22-1W 60-62	12632-61	14.63501	0.02416	0.139	98.4	646.13	1.99	6.76	>150
18	1166A 22-1W 60-62	12632-68	19.17016	-0.4331	0.004	128.7	660.60	39.74	40.28	>150

18	1166A 26-1W 100-102	12616-25	15.58075	0.01567	0.071	101.2	669.52	2.36	7.10	>150
18	1166A 26-1W 100-102	12616-20	53.89476	0.00974	0.056	56.8	675.71	3.54	7.63	>150
18	1166A 26-1W 100-102	12616-04	22.68193	0.01028	0.183	98.8	681.21	1.29	6.93	>150
18	1166A 26-1W 100-102	12616-43	9.63211	0.00327	0.043	101.4	689.00	4.11	8.02	>150
18	1166A 22-1W 60-62	12632-33	9.47459	0.02655	0.111	100.4	691.14	2.26	7.27	>150
18	1166A 22-1W 60-62	12632-37	6.9842	0.01006	0.114	97	698.97	2.62	7.46	>150
18	1166A 22-1W 60-62	12632-09	25.54957	0.01579	0.088	97.3	741.77	3.13	8.05	>150
18	1166A 22-1W 60-62	12632-04	18.36443	0.03261	0.024	91.5	742.55	8.45	11.25	>150
18	1166A 26-1W 100-102	12616-05	5.64032	0.02825	1.267	99.9	799.31	1.63	8.16	>150
18	1166A 22-1W 60-62	12632-86	5.2646	0.00829	0.052	98.6	828.29	4.67	9.51	>150
18	1166A 22-1W 60-62	12632-65	28.38068	-0.00722	0.031	102.4	832.29	6.67	10.66	>150
18	1166A 22-1W 60-62	12632-01	9.83735	0.00667	0.573	99.4	1349.72	1.65	13.60	>150
18	1166A 22-1W 60-62	12632-46	14.6079	0.02241	0.071	98	1526.67	5.91	16.37	>150
18	1166A 26-1W 100-102	12616-39	11.47308	0.02703	0.089	88.9	1887.97	4.86	19.50	>150
18	1166A 22-1W 60-62	12632-06	10.44868	0.02069	0.16	99.1	2411.93	4.28	24.50	>150
18	1166A 22-1W 60-62	12632-79	31.58804	1.17987	0.002	82.3	3189.22	103.30	108.11	>150
19	JPC 25 1305-1310	12512-07	14.77681	0.02259	0.103	76.6	489.64	1.78	5.21	>150
19	JPC 25 1503-1510	12517-08	7.31953	0.03092	0.158	85.5	495.84	1.39	5.15	>150
19	JPC 25 1503-1510	12517-25	5.06334	0.03735	0.16	94.9	496.04	1.46	5.17	>150
19	JPC 25 1405-1410	12516-18	4.02798	0.19115	0.206	98.6	498.70	1.00	5.09	>150
19	JPC 25 1305-1310	12512-10	4.88079	0.21607	0.17	99.4	499.01	1.38	5.18	>150
19	JPC 25 1503-1510	12517-26	4.14195	0.10207	0.253	98.6	499.70	0.96	5.09	>150
19	JPC 25 1405-1410	12516-10	4.61438	0.17478	0.242	98	499.91	1.08	5.11	>150
19	JPC 25 1405-1410	12516-05	5.56355	0.11315	0.677	98.7	500.38	0.58	5.04	>150
19	JPC 25 1305-1310	12512-18	7.8648	0.00178	0.187	98.1	501.34	1.19	5.15	>150
19	JPC 25 1305-1310	12512-13	10.16808	0.01525	0.15	94.9	502.04	1.30	5.19	>150
19	JPC 25 1503-1510	12517-12	6.73703	0.04521	0.184	97.9	502.58	1.11	5.15	>150
19	JPC 25 1305-1310	12512-03	12.00415	0.01103	0.111	93.7	502.88	1.36	5.21	>150
19	JPC 25 1405-1410	12516-06	9.07004	0.0102	0.363	98.8	503.32	0.81	5.10	>150
19	JPC 25 1503-1510	12517-09	5.08206	0.18041	0.24	94.5	503.33	0.90	5.11	>150
19	JPC 25 1503-1510	12517-17	4.76103	0.22624	0.156	97.3	504.31	1.20	5.18	>150
19	JPC 25 1503-1510	12517-11	5.25778	0.17236	0.263	98.5	504.35	1.16	5.17	>150
19	JPC 25 1305-1310	12512-16	5.98912	0.15658	0.137	98.7	504.61	1.35	5.22	>150
19	JPC 25 1305-1310	12512-05	8.52227	0.23167	0.199	97.3	505.47	1.18	5.19	>150
19	JPC 25 1405-1410	12516-03	8.05151	0.03213	0.512	99.2	508.36	0.63	5.12	>150
19	JPC 25 1503-1510	12517-05	5.04279	0.01659	0.527	97.5	511.67	0.65	5.16	>150
19	JPC 25 1305-1310	12512-19	4.81821	0.15666	0.312	99	517.29	0.81	5.24	>150
19	JPC 25 1503-1510	12517-14	2.53858	0.00201	0.618	97.7	521.94	0.61	5.25	>150
19	JPC 25 1405-1410	12516-02	7.2289	0.19275	0.393	99	531.85	0.84	5.38	>150
19	JPC 25 1503-1510	12517-01	5.86954	0.05448	2.369	99.1	538.00	0.49	5.40	>150
19	JPC 25 1305-1310	12512-25	8.16886	-0.00133	0.211	96.9	542.30	1.26	5.57	>150
19	JPC 25 1503-1510	12517-02	4.42202	0.17419	3.348	98.7	543.62	0.65	5.47	>150
19	JPC 25 1405-1410	12516-04	9.0013	0.01397	0.192	96.5	551.48	1.26	5.66	>150
19	JPC 25 1405-1410	12516-08	26.40082	0.22856	0.065	94.5	554.77	2.12	5.94	>150

37 this study

19	JPC 25 1305-1310	12512-09	8.13559	0.02191	0.185	98.1	582.69	1.31	5.97	>150
19	JPC 25 1405-1410	12516-21	7.43926	0.00784	0.13	91.9	606.80	1.73	6.31	>150
19	JPC 25 1305-1310	12512-27	8.87405	0.14163	0.17	94.2	616.80	1.40	6.33	>150
19	JPC 25 1503-1510	12517-13	8.71757	0.0327	0.025	84.1	1423.21	6.94	15.83	>150
19	JPC 25 1503-1510	12517-23	1.87653	-0.06446	0.001	32.7	1815.50	109.12	110.62	>150
19	JPC 25 1503-1510	12517-24	41.6869	0.02099	0.002	33.2	1863.95	79.90	82.04	>150
19	JPC 25 1305-1310	12512-17	1.04443	-0.25811	0.001	72.7	2767.23	147.59	150.16	>150
19	JPC 25 1405-1410	12516-07	1.57366	-0.26586	0.001	55.5	3015.56	128.14	131.64	>150
19	JPC 25 1305-1310	12512-12	1.22739	0.68347	0.001	90.9	4144.39	171.93	176.86	>150
20	ELT49-30 hb	12673-22	8.17817	-0.00747	0.122	98.7	661.15	2.37	7.02	> 150
20	ELT49-30 hb	12673-26	20.22232	-0.02419	0.029	97.3	1135.28	7.21	13.45	> 150
20	ELT49-30 hb	12673-19	6.49868	-0.00009	0.159	99.2	1150.81	3.00	11.89	> 150
20	ELT49-30 hb	12673-23	6.15927	-0.00243	0.164	99.2	1155.78	2.83	11.90	> 150
20	ELT49-30 hb	12673-25	7.94718	0.00198	0.113	95.8	1164.09	3.31	12.10	> 150
20	ELT49-30 hb	12673-20	6.04748	0.0077	0.571	99.5	1172.68	2.30	11.95	> 150
20	ELT49-30 hb	12673-18	6.80707	0.02547	0.375	99	1364.59	2.66	13.90	> 150
20	ELT49-30 hb	12673-21	6.30127	-0.0089	0.048	97.9	1477.64	6.83	16.28	> 150
20	ELT49-30 hb	12673-02	6.59551	0.01079	0.392	99.1	1164.88	4.39	12.45	>150
20	ELT49-30 hb	12673-03	5.1076	0.05835	2.302	1.2	3.49	5.20	5.20	>150
20	ELT49-30 hb	12673-06	10.97325	0.02388	0.563	99.3	1203.83	4.76	12.95	>150
20	ELT49-30 hb	12673-07	5.57445	0.02019	0.435	96.1	1163.85	4.70	12.55	>150
20	ELT49-30 hb	12673-08	6.35349	-0.00045	0.602	78.7	582.21	4.77	7.53	>150
20	ELT49-30 hb	12673-09	16.0711	0.01649	0.487	98.8	1113.89	4.14	11.89	>150
20	ELT49-30 hb	12673-10	6.98301	0.00532	0.341	85.7	671.18	4.34	7.99	>150
20	ELT49-30 hb	12673-13	9.35143	0.02165	0.834	92.5	1242.90	6.40	13.98	>150
20	ELT49-30 hb	12673-14	5.14668	-0.00115	0.209	99.4	798.07	3.22	8.61	>150
20	ELT49-30 hb	12673-15	7.04795	-0.00584	0.07	98.6	1152.40	4.34	12.31	>150
20	ELT49-30 hb	12932-18	3.75189	0.00886	0.01	5.4	23.52	5.89	5.90	> 150
20	ELT49-30 hb	12932-11	7.20778	0.01187	0.083	90	1135.87	3.64	11.93	> 150
20	ELT49-30 hb	12932-10	7.22154	0.01193	0.07	99.4	1138.62	3.25	11.84	> 150
20	ELT49-30 hb	12932-09	7.26258	0.013	0.231	99.4	1164.48	2.55	11.92	> 150
20	ELT49-30 hb	12932-08	6.39021	0.00772	0.115	99.2	1172.05	2.71	12.03	> 150
20	ELT49-30 hb	12932-22	6.42643	0.00548	0.09	99.1	1172.70	3.09	12.13	> 150
20	ELT49-30 hb	12932-13	7.46358	0.01648	0.248	96.6	1180.25	2.69	12.10	> 150
20	ELT49-30 hb	12932-17	6.92773	0.01582	0.017	97.4	1189.16	6.59	13.60	> 150
20	ELT49-30 hb	13187-02A	12.55072	-0.01178	0.09	98.1	1169.11	12.39	17.03	> 150
20	ELT49-30 hb	13187-03A	5.8936	0.01523	0.128	97.9	1133.51	11.90	16.43	> 150
20	ELT49-30 hb	13187-04A	15.02749	-0.04135	0.053	101.4	1190.81	13.10	17.71	> 150
20	ELT49-30 hb	13187-05A	4.86782	0.04463	0.099	99.4	1162.95	12.15	16.82	> 150
20	ELT49-30 hb	13187-06A	6.87292	-0.01099	0.091	98.9	1147.23	12.34	16.85	> 150
20	ELT49-30 hb	13187-07A	3.83124	0.01209	0.063	97.6	1157.32	13.41	17.71	> 150
20	ELT49-30 hb	13187-08A	5.01837	-0.00791	0.071	99.6	1265.49	13.01	18.15	> 150
20	ELT49-30 hb	13187-09A	3.53255	0.01527	0.117	98.3	1190.66	12.22	17.06	> 150

34 *Pierce et al. (2011)*

21	ELT37-16 hb	12680-01	3.17171	0.00165	1.28	99.7	1250.07	2.78	12.81	> 150	63	<i>Pierce et al. (2011)</i>
21	ELT37-16 hb	12680-02	11.44255	0.00421	0.411	99.4	1632.84	3.75	16.75	> 150	38	<i>this study</i>
21	ELT37-16 hb	12680-03	7.54908	0.00233	0.166	98.8	1302.18	3.56	13.50	> 150		
21	ELT37-16 hb	12680-04	21.44905	-0.0202	0.044	98.2	1194.11	6.31	13.51	> 150		
21	ELT37-16 hb	12680-06	65.38187	0.03673	0.042	96.8	2017.55	8.55	21.91	> 150		
21	ELT37-16 hb	12680-07	23.43376	0.00792	0.087	99.2	2309.63	6.32	23.94	> 150		
21	ELT37-16 hb	12680-08	21.38554	0.04417	0.02	95.3	1143.85	10.03	15.21	> 150		
21	ELT37-16 hb	12680-09	23.30239	0.03658	0.035	98.1	1497.16	8.69	17.31	> 150		
21	ELT37-16 hb	12680-10	18.72199	0.01827	0.08	99.5	1171.64	4.50	12.55	> 150		
21	ELT37-16 hb	12680-11	10.36479	0.00141	0.138	99.2	1197.80	3.35	12.44	> 150		
21	ELT37-16 hb	12680-12	13.53421	0.00171	0.131	99.2	1152.30	3.70	12.10	> 150		
21	ELT37-16 hb	12680-13	18.29366	0.00664	0.028	98.5	1250.00	9.41	15.64	> 150		
21	ELT37-16 hb	12680-14	16.37397	-0.00089	0.051	99.5	1496.50	6.12	16.17	> 150		
21	ELT37-16 hb	12680-15	9.96974	0.00496	0.193	98.3	1481.72	4.16	15.39	> 150		
21	ELT37-16 hb	12680-16	10.46987	-0.01706	0.117	99.7	1149.73	3.27	11.95	> 150		
21	ELT37-16 hb	12680-22	7.47265	0.00057	0.33	98.2	1155.49	2.86	11.90	> 150		
21	ELT37-16 hb	12680-24	6.78632	0.00453	0.351	99	1195.63	2.66	12.25	> 150		
21	ELT37-16 hb	12680-18	16.30465	0.03666	0.022	91.7	1330.53	7.71	15.38	> 150		
21	ELT37-16 hb	12680-21	7.28225	0.00436	0.503	99	1489.89	2.63	15.13	> 150		
21	ELT37-16 hb	12680-17	16.276	0.00607	0.25	99.1	1549.89	3.27	15.84	> 150		
21	ELT37-16 hb	12680-23	23.38785	0.02168	0.118	98.1	2330.49	4.99	23.83	> 150		
21	ELT37-16 hb	12980-16	2.48009	0.01677	0.14	49.9	354.21	3.87	5.24	> 150		
21	ELT37-16 hb	12980-24	12.81148	0.01338	0.046	87.6	1128.40	5.16	12.41	> 150		
21	ELT37-16 hb	12980-31	11.09251	0.00128	0.222	97.6	1131.54	2.85	11.67	> 150		
21	ELT37-16 hb	12980-06	9.0119	0.00407	0.587	98.5	1131.66	2.68	11.63	> 150		
21	ELT37-16 hb	12980-17	11.68396	0.00281	0.636	94.5	1132.31	2.85	11.68	> 150		
21	ELT37-16 hb	12980-34	7.63834	0.00959	0.26	98.2	1136.43	3.03	11.76	> 150		
21	ELT37-16 hb	12980-41	8.26589	0.0049	0.116	99.4	1141.05	3.29	11.87	> 150		
21	ELT37-16 hb	12980-25	6.89157	0.00327	0.389	99.2	1144.09	2.44	11.70	> 150		
21	ELT37-16 hb	12980-23	27.58413	0.00616	0.064	94.7	1145.53	3.87	12.09	> 150		
21	ELT37-16 hb	12980-15	10.56146	0.00346	0.181	98.2	1147.65	3.24	11.92	> 150		
21	ELT37-16 hb	12980-21	7.41926	0.01218	0.428	98.9	1156.84	2.74	11.89	> 150		
21	ELT37-16 hb	12980-14	12.98396	0.00234	0.176	98.8	1158.13	2.86	11.93	> 150		
21	ELT37-16 hb	12980-22	16.64825	0.01027	0.065	92.8	1160.66	4.06	12.30	> 150		
21	ELT37-16 hb	12980-01	22.5215	0.00035	0.216	98.2	1162.95	2.79	11.96	> 150		
21	ELT37-16 hb	12980-37	8.16526	0.00618	0.082	97.9	1164.69	3.30	12.10	> 150		
21	ELT37-16 hb	12980-08	7.47336	0.00264	2.722	99.3	1167.60	3.02	12.06	> 150		
21	ELT37-16 hb	12980-40	8.4108	0.00375	0.174	98.8	1167.65	3.40	12.16	> 150		
21	ELT37-16 hb	12980-42	5.87249	0.00775	0.499	96.7	1169.02	2.92	12.05	> 150		
21	ELT37-16 hb	12980-32	17.95697	0.01917	0.058	95.6	1174.08	4.45	12.56	> 150		
21	ELT37-16 hb	12980-36	5.24229	0.0085	0.458	98.9	1176.90	2.66	12.07	> 150		
21	ELT37-16 hb	12980-12	11.21189	0.00305	0.45	98.5	1199.60	2.63	12.28	> 150		
21	ELT37-16 hb	12980-30	7.3083	0.0076	0.225	96.9	1215.96	3.16	12.56	> 150		
21	ELT37-16 hb	12980-28	7.54955	0.00708	0.171	94.1	1273.31	3.44	13.19	> 150		
21	ELT37-16 hb	12980-02	25.34668	-0.01483	0.03	78.2	1351.98	6.61	15.05	> 150		

21	ELT37-16 hb	12980-09	35.53666	0.01381	0.174	97.3	1405.44	3.54	14.49	> 150
21	ELT37-16 hb	12980-19	40.67461	0.01279	0.112	96.7	1433.47	3.83	14.84	> 150
21	ELT37-16 hb	12980-18	9.02436	0.00831	0.346	99.4	1456.67	3.25	14.93	> 150
21	ELT37-16 hb	12980-11	16.6597	0.00555	0.212	92.9	1463.81	4.04	15.19	> 150
21	ELT37-16 hb	12980-35	28.48244	0.00329	0.056	96.6	1479.88	5.19	15.68	> 150
21	ELT37-16 hb	12980-04	19.58876	0.01614	0.078	83.9	1519.52	5.18	16.06	> 150
21	ELT37-16 hb	12980-13	25.0238	0.02902	0.038	92.1	1528.19	6.05	16.44	> 150
21	ELT37-16 hb	12980-10	10.1525	0.01218	0.046	99.1	1528.79	4.67	15.99	> 150
21	ELT37-16 hb	12980-05	32.69251	0.00081	0.276	87	1634.40	4.47	16.95	> 150
21	ELT37-16 hb	12980-07	28.2396	0.01027	0.053	88.7	1705.84	5.88	18.04	> 150
21	ELT37-16 hb	12980-26	14.11781	0.0053	0.664	93.1	1709.72	4.22	17.61	> 150
21	ELT37-16 hb	12980-27	35.17421	0.0042	0.102	95.5	1711.30	4.65	17.73	> 150
21	ELT37-16 hb	12980-29	11.40088	0.00924	0.2	99.1	1765.31	3.42	17.98	> 150
21	ELT37-16 hb	12980-03	48.05452	-0.00219	0.045	86.9	1777.05	6.84	19.04	> 150
21	ELT37-16 hb	12980-33	13.38322	0.00773	0.252	99	1881.16	3.82	19.20	> 150
21	ELT37-16 hb	12980-38	15.26778	-0.00288	0.121	97.8	1941.65	4.54	19.94	> 150
21	ELT37-16 hb	12980-39	27.5257	0.01323	0.049	98.6	1967.55	6.13	20.61	> 150
21	ELT37-16 hb	12980-20	45.47058	0.00682	0.118	93.7	2421.16	5.32	24.79	> 150
21	ELT37-16-A hb	14633-12A	8.74943	0.02006	0.082	99.1	1114.94	1.89	11.31	> 150
21	ELT37-16-A hb	14633-07A	7.47561	0.03886	0.014	99.3	1134.05	3.87	11.98	> 150
21	ELT37-16-A hb	14633-36A	13.35409	0.03182	0.022	98.7	1136.08	3.19	11.80	> 150
21	ELT37-16-A hb	14633-02A	12.92542	0.02173	0.029	98.6	1140.21	3.06	11.81	> 150
21	ELT37-16-A hb	14633-13A	8.35168	0.028	0.025	99.4	1141.29	3.18	11.85	> 150
21	ELT37-16-A hb	14633-37A	7.93887	0.01593	0.032	96.3	1142.67	2.93	11.80	> 150
21	ELT37-16-A hb	14633-09A	15.87113	0.06518	0.005	95.6	1148.37	6.33	13.11	> 150
21	ELT37-16-A hb	14633-39A	12.13171	0.03115	0.014	96.7	1149.30	3.93	12.15	> 150
21	ELT37-16-A hb	14633-31A	13.34392	0.03954	0.011	92	1159.79	5.33	12.76	> 150
21	ELT37-16-A hb	14633-28A	31.54577	0.14045	0.004	96.1	1164.79	8.03	14.15	> 150
21	ELT37-16-A hb	14633-16A	12.43666	0.02997	0.023	98.9	1172.67	3.83	12.34	> 150
21	ELT37-16-A hb	14633-20A	9.78354	0.02001	0.033	97.9	1174.08	2.89	12.09	> 150
21	ELT37-16-A hb	14633-35A	5.42863	0.02093	0.039	99.5	1181.19	2.59	12.09	> 150
21	ELT37-16-A hb	14633-05A	6.76416	0.01954	0.014	98	1184.34	4.41	12.64	> 150
21	ELT37-16-A hb	14633-18A	8.76465	0.0144	0.077	98.8	1185.99	2.43	12.11	> 150
21	ELT37-16-A hb	14633-15A	12.64179	0.01135	0.053	97.5	1196.78	2.36	12.20	> 150
21	ELT37-16-A hb	14633-10A	7.95573	0.02097	0.028	88.1	1198.39	3.62	12.52	> 150
21	ELT37-16-A hb	14633-29A	9.97214	0.03034	0.038	98.7	1200.63	3.01	12.38	> 150
21	ELT37-16-A hb	14633-32A	7.38611	0.01465	0.031	99.3	1203.90	3.01	12.41	> 150
21	ELT37-16-A hb	14633-14A	22.31645	0.02788	0.014	98.1	1211.60	4.40	12.89	> 150
21	ELT37-16-A hb	14633-17A	9.09527	0.0145	0.057	98.6	1219.77	2.41	12.43	> 150
21	ELT37-16-A hb	14633-27A	23.35834	0.05338	0.015	99.2	1224.28	4.47	13.03	> 150
21	ELT37-16-A hb	14633-34A	7.62721	0.01702	0.039	96.5	1246.76	3.28	12.89	> 150
21	ELT37-16-A hb	14633-22A	19.82641	0.03892	0.014	92.8	1290.41	5.20	13.91	> 150
21	ELT37-16-A hb	14633-26A	19.05231	0.03313	0.013	98.2	1377.52	4.78	14.58	> 150
21	ELT37-16-A hb	14633-08A	13.78761	0.0471	0.01	96.4	1404.74	5.70	15.16	> 150
21	ELT37-16-A hb	14633-11A	7.90514	0.03661	0.015	99.5	1408.32	4.81	14.88	> 150

21	ELT37-16-A hb	14633-03A	8.12501	0.01329	0.044	99.3	1424.27	2.93	14.54	> 150
21	ELT37-16-A hb	14633-30A	11.00603	0.01627	0.015	99.1	1441.57	4.54	15.11	> 150
21	ELT37-16-A hb	14633-24A	11.48331	0.03546	0.017	96.2	1463.05	5.03	15.47	> 150
21	ELT37-16-A hb	14633-01A	11.22771	0.01108	0.021	95.8	1478.40	4.07	15.33	> 150
21	ELT37-16-A hb	14633-06A	11.94952	0.03992	0.012	98.9	1480.46	5.62	15.84	> 150
21	ELT37-16-A hb	14633-25A	12.86762	0.01993	0.033	99.6	1512.70	3.22	15.47	> 150
21	ELT37-16-A hb	14633-21A	19.8416	0.02082	0.038	97.2	1571.96	3.88	16.19	> 150
21	ELT37-16-A hb	14633-19A	11.37128	0.03886	0.018	99	1599.73	4.73	16.68	> 150
21	ELT37-16-A hb	14633-04A	21.91512	0.0344	0.01	97.7	1608.50	7.07	17.57	> 150
21	ELT37-16-A hb	14633-23A	8.87323	0.04018	0.018	98.6	1623.86	4.83	16.94	> 150
21	ELT37-16-A hb	14633-38A	40.08205	0.07784	0.003	97.2	1909.37	13.93	23.64	> 150
22	ELT37-13 hb	12979-05	9.76933	0.00931	0.187	99.5	1121.27	2.77	11.55	> 150
22	ELT37-13 hb	12979-04	12.97786	0.00414	0.176	99.3	1128.57	2.60	11.58	> 150
22	ELT37-13 hb	12979-02	5.41983	0.00322	3.264	99.8	1139.19	2.86	11.74	> 150
22	ELT37-13 hb	12979-06	13.56411	-0.00181	0.1	99.1	1179.44	3.00	12.17	> 150
22	ELT37-13 hb	12979-01	9.73409	0.01426	0.777	96.9	1257.95	2.72	12.87	> 150
22	ELT37-13 hb	12679-01	12.89935	0.00386	0.266	99	1114.88	3.03	11.55	> 150
22	ELT37-13 hb	12679-03	7.88209	0.00944	0.302	98.4	1205.27	2.99	12.42	> 150
22	ELT37-13 hb	12679-05	6.22964	0.00819	0.273	99.7	1128.56	2.97	11.67	> 150
22	ELT37-13 hb	12679-06	13.99852	0.00232	0.252	99.3	1447.51	3.65	14.93	> 150
22	ELT37-13 hb	12679-07	9.51268	0.00768	0.089	99.4	1363.31	4.46	14.34	> 150
22	ELT37-13 hb	12679-08	57.05087	0.12589	0.004	79.7	2055.67	39.84	44.83	> 150
22	ELT37-13 hb	12679-09	24.51428	-0.00126	0.246	92.9	1225.68	3.92	12.87	> 150
22	ELT37-13 hb	12679-11	8.36614	0.00112	0.757	99.7	1125.53	2.54	11.54	> 150
22	ELT37-13 hb	12679-12	5.23601	0.01991	0.005	75.1	1293.45	41.29	43.27	> 150
22	ELT37-13 hb	12679-13	11.34937	-0.01701	0.049	97.3	1216.49	6.48	13.79	> 150
22	ELT37-13 hb	12679-14	6.35363	0.00332	0.134	99.7	1127.20	3.56	11.82	> 150
22	ELT37-13 hb	12679-15	28.40905	-0.01991	0.04	97.7	1386.57	7.14	15.59	> 150
22	ELT37-13 hb	12679-18	1.86986	0.01586	0.078	95.6	538.86	2.51	5.94	> 150
22	ELT37-13 hb	12679-22	2.3292	-0.01879	0.01	94.3	1089.91	15.96	19.32	> 150
22	ELT37-13 hb	12679-23	12.24865	-0.00425	0.099	93.7	1110.61	3.99	11.80	> 150
22	ELT37-13 hb	12679-19	9.72061	-0.00327	0.174	97.5	1117.64	2.99	11.57	> 150
22	ELT37-13 hb	12679-16	6.94007	0.00339	0.167	98.7	1120.72	3.09	11.63	> 150
22	ELT37-13 hb	12679-28	10.79683	0.02475	0.064	97.3	1123.22	4.35	12.05	> 150
22	ELT37-13 hb	12679-25	6.46002	0.01184	0.043	98.1	1131.44	5.89	12.76	> 150
22	ELT37-13 hb	12679-20	11.49504	0.02549	0.067	97.8	1132.86	4.70	12.26	> 150
22	ELT37-13 hb	12679-29	9.39301	0.00329	0.318	97	1136.59	2.70	11.68	> 150
22	ELT37-13 hb	12679-17	8.8582	0.00523	0.506	98.7	1137.47	2.43	11.63	> 150
22	ELT37-13 hb	12679-30	10.79568	0.00104	0.125	97	1138.27	3.41	11.88	> 150
22	ELT37-13 hb	12679-27	18.06721	0.01886	0.043	96.5	1162.46	5.44	12.83	> 150
22	ELT37-13 hb	12679-24	7.20951	-0.00042	0.127	95.7	1181.73	3.51	12.33	> 150
22	ELT37-13 hb	12679-26	41.25096	0.00777	0.054	98.9	2013.32	7.51	21.49	> 150
22	ELT37-13 hb	12979-24	14.50738	0.00258	0.135	96.9	1080.87	2.99	11.22	> 150
22	ELT37-13 hb	12979-33	15.07214	0.00427	0.258	97.6	1101.66	2.84	11.38	> 150

47 *Pierce et al. (2011)*
44 *this study*

22	ELT37-13 hb	12979-28	18.77428	0.00296	0.03	96.2	1110.77	4.38	11.94	> 150
22	ELT37-13 hb	12979-34	7.61102	0.00986	0.254	85.7	1162.06	3.76	12.21	> 150
22	ELT37-13 hb	12979-29	7.81791	0.00548	0.46	98.8	1172.56	2.46	11.98	> 150
22	ELT37-13 hb	12979-25	8.02304	-0.00925	0.031	98.5	1175.81	4.78	12.69	> 150
22	ELT37-13 hb	12979-32	38.23289	-0.03684	0.009	77.4	1193.63	11.79	16.78	> 150
22	ELT37-13 hb	12979-26	8.97237	0.00801	0.045	96.3	1198.64	4.66	12.86	> 150
22	ELT37-13 hb	12979-35	10.06447	0.00949	0.081	92.1	1199.20	3.51	12.49	> 150
22	ELT37-13 hb	12979-30	17.86613	0.00615	0.095	97.4	1215.28	3.61	12.68	> 150
22	ELT37-13 hb	12979-27	19.34789	0.00775	0.068	80.3	1255.46	5.20	13.59	> 150
22	ELT37-13 hb	12979-37	14.54053	0.00046	0.025	85.8	1257.53	5.72	13.82	> 150
22	ELT37-13 hb	12979-31	37.91826	0.01815	0.027	96.8	1283.92	6.26	14.28	> 150
22	ELT37-13 hb	12979-23	13.88472	0.01894	0.047	59.3	1288.17	8.96	15.69	> 150
22	ELT37-13 hb	12979-36	36.54656	0.02633	0.019	46.1	1684.36	16.45	23.54	> 150
22	ELT37-13 hb	12979-22	9.45756	0.02063	0.907	97.8	1815.36	3.55	18.50	> 150
22	ELT37-13-A hb	14635-01A	21.61467	0.03604	0.016	99	1321.77	4.26	13.89	> 150
22	ELT37-13-A hb	14635-02A	29.05038	0.05556	0.004	95.6	1198.93	7.07	13.92	> 150
22	ELT37-13-A hb	14635-03A	19.57467	0.02315	0.016	97.9	1559.73	4.92	16.35	> 150
22	ELT37-13-A hb	14635-04A	8.26113	0.00919	0.052	99.7	1116.69	2.31	11.40	> 150
22	ELT37-13-A hb	14635-05A	8.70724	0.01967	0.049	98.8	1160.99	2.48	11.87	> 150
22	ELT37-13-A hb	14635-06A	8.94654	-0.00726	0.032	64.1	1143.01	5.09	12.51	> 150
22	ELT37-13-A hb	14635-07A	5.35031	0.02275	0.018	64.8	418.11	2.61	4.93	> 150
22	ELT37-13-A hb	14635-08A	19.23831	0.0585	0.009	96.5	1174.07	5.08	12.79	> 150
22	ELT37-13-A hb	14635-09A	11.2319	0.0382	0.017	95.1	1253.57	3.88	13.12	> 150
22	ELT37-13-A hb	14635-10A	9.77093	0.02052	0.024	91.7	1062.59	3.50	11.19	> 150
22	ELT37-13-A hb	14635-11A	25.58979	0.05216	0.012	94.5	2752.20	8.41	28.78	> 150
22	ELT37-13-A hb	14635-12A	7.314	0.01019	0.03	87.8	1151.77	3.29	11.98	> 150
22	ELT37-13-A hb	14635-13A	10.99084	0.02036	0.013	55.3	952.89	6.60	11.59	> 150
22	ELT37-13-A hb	14635-14A	13.34129	0.04284	0.006	79.5	954.39	6.14	11.35	> 150
22	ELT37-13-A hb	14635-15A	9.26767	0.03492	0.02	96.7	1170.33	3.39	12.18	> 150
22	ELT37-13-A hb	14635-16A	5.13153	0.02921	0.052	94.4	1345.95	2.83	13.75	> 150
22	ELT37-13-A hb	14635-42A	6.06964	0.03302	0.015	98.5	1110.72	4.11	11.84	> 150
22	ELT37-13-A hb	14635-24A	6.30172	0.02161	0.051	99.8	1107.00	2.31	11.31	> 150
22	ELT37-13-A hb	14635-41A	6.9145	0.03259	0.02	99.7	1116.08	3.22	11.62	> 150
22	ELT37-13-A hb	14635-25A	7.84314	0.02109	0.033	97.2	1059.18	2.79	10.95	> 150
22	ELT37-13-A hb	14635-32A	8.10111	0.01875	0.035	99.3	1142.17	2.80	11.76	> 150
22	ELT37-13-A hb	14635-30A	8.10829	0.00921	0.073	99.9	1284.20	2.42	13.07	> 150
22	ELT37-13-A hb	14635-18A	8.10881	0.01702	0.049	99.2	1150.40	2.64	11.80	> 150
22	ELT37-13-A hb	14635-34A	8.93639	0.04848	0.009	94.2	1128.27	5.93	12.75	> 150
22	ELT37-13-A hb	14635-31A	9.19454	0.02412	0.018	99.2	1144.21	3.87	12.08	> 150
22	ELT37-13-A hb	14635-17A	9.76338	0.02239	0.018	99.5	1152.68	3.53	12.06	> 150
22	ELT37-13-A hb	14635-27A	9.82766	0.02722	0.007	98.5	1064.73	5.27	11.88	> 150
22	ELT37-13-A hb	14635-35A	10.13632	0.03367	0.011	99.5	1107.84	5.04	12.17	> 150
22	ELT37-13-A hb	14635-40A	10.4365	0.0281	0.01	95.1	1085.39	4.69	11.82	> 150
22	ELT37-13-A hb	14635-36A	10.46518	0.02039	0.028	97.8	1118.47	2.83	11.54	> 150
22	ELT37-13-A hb	14635-29A	10.64755	0.02127	0.03	99.5	1120.20	3.00	11.60	> 150

22	ELT37-13-A hb	14635-37A	10.99886	0.04456	0.008	98.9	1494.71	6.23	16.19	> 150
22	ELT37-13-A hb	14635-21A	11.5775	0.01018	0.057	98.6	1252.39	2.32	12.74	> 150
22	ELT37-13-A hb	14635-39A	13.6381	0.03723	0.018	96.2	1204.24	4.37	12.81	> 150
22	ELT37-13-A hb	14635-20A	15.15384	0.06665	0.006	97.3	1351.01	6.64	15.05	> 150
22	ELT37-13-A hb	14635-43A	15.55919	0.02273	0.015	98	1131.44	4.14	12.05	> 150
22	ELT37-13-A hb	14635-23A	16.1927	0.03556	0.017	98.4	1116.00	3.54	11.71	> 150
22	ELT37-13-A hb	14635-33A	17.1385	0.01236	0.046	96.5	1010.27	2.54	10.42	> 150
22	ELT37-13-A hb	14635-22A	18.03369	0.01528	0.055	98.5	1376.48	2.93	14.07	> 150
22	ELT37-13-A hb	14635-19A	19.01623	0.02518	0.032	98.5	1302.40	3.15	13.40	> 150
22	ELT37-13-A hb	14635-28A	21.52774	0.04342	0.005	99.1	1449.42	8.83	16.97	> 150
22	ELT37-13-A hb	14635-26A	27.04318	0.03925	0.02	99.5	1432.81	3.58	14.77	> 150
22	ELT37-13-A hb	14635-45A	55.18661	0.07317	0.004	70.9	1146.33	8.87	14.49	> 150
23	ELT37-09 hb	12674-03	7.33485	0.01013	0.605	99.9	1715.69	6.60	18.38	>150
23	ELT37-09 hb	12674-04	5.77156	0.00455	0.267	94.4	1429.27	6.09	15.53	>150
23	ELT37-09 hb	12674-05	2.23335	0.00177	0.273	97.1	1287.67	4.85	13.76	>150
23	ELT37-09 hb	12674-07	8.83598	0.01678	0.213	99.4	1609.36	5.57	17.03	>150
23	ELT37-09 hb	12674-09	17.96544	0.05361	0.048	100	1660.62	8.27	18.55	>150
23	ELT37-09 hb	12674-10	32.73616	0.05953	0.082	98.5	1874.23	6.07	19.70	>150
23	ELT37-09 hb	12674-12	9.25045	0.0063	0.273	99.5	1547.56	5.26	16.34	>150
23	ELT37-09 hb	12674-15	11.3095	0.01995	0.338	72.2	98.82	1.22	1.57	>150
23	ELT37-09 hb	12978-16	6.99763	0.0674	0.103	52.5	4.25	0.35	0.36	> 150
23	ELT37-09 hb	12978-04	9.25228	0.01717	0.078	36.7	127.65	2.25	2.59	> 150
23	ELT37-09 hb	12978-12	15.08758	0.01268	0.034	50.4	132.07	1.91	2.32	> 150
23	ELT37-09 hb	12978-08	22.81568	0.19692	0.027	30.7	301.62	6.49	7.16	> 150
23	ELT37-09 hb	12978-15	12.27431	0.0313	0.034	61.9	894.37	6.21	10.89	> 150
23	ELT37-09 hb	12978-01	10.72956	0.02691	0.029	98.1	1448.51	5.14	15.37	> 150
23	ELT37-09 hb	12978-22	10.98124	0.00939	0.052	95	1495.99	4.45	15.61	> 150
23	ELT37-09 hb	12978-11	16.19903	-0.00731	0.029	92.3	1583.04	6.36	17.06	> 150
23	ELT37-09 hb	12978-17	28.99154	0.01266	0.161	98.7	1681.20	3.33	17.14	> 150
23	ELT37-09 hb	12978-10	7.51069	0.09332	0.049	94.7	1690.03	4.55	17.50	> 150
23	ELT37-09 hb	12978-18	51.14565	-0.00654	0.026	98.2	1748.56	7.80	19.15	> 150
23	ELT37-09 hb	12978-23	12.41936	0.04783	0.027	92.5	1755.44	7.68	19.16	> 150
23	ELT37-09 hb	12978-19	6.3361	0.02429	0.067	98.1	1768.87	4.49	18.25	> 150
23	ELT37-09 hb	12978-07	9.20599	0.03506	0.16	98.8	1785.31	3.58	18.21	> 150
23	ELT37-09 hb	12978-03	43.39233	0.04073	0.036	95.1	1841.73	6.55	19.55	> 150
23	ELT37-09 hb	12978-06	4.32943	0.2495	0.002	62.7	4063.12	50.82	65.06	> 150
23	ELT37-09 hb	13184-01A	12.85272	0.03557	0.387	95.1	115.51	1.86	2.19	> 150
23	ELT37-09 hb	13184-02A	5.23818	0.04189	0.28	97.3	539.00	6.54	8.47	> 150
23	ELT37-09 hb	13184-03A	11.00415	0.09016	0.091	73.9	128.60	5.08	5.24	> 150
23	ELT37-09 hb	13184-04A	13.30093	0.04127	0.207	98.4	1659.30	14.15	21.81	> 150
23	ELT37-09 hb	13184-06A	5.5894	0.26071	0.027	78.1	1531.21	28.58	32.42	> 150
23	ELT37-09 hb	13184-08A	12.87927	0.03868	0.209	99.5	1693.48	13.68	21.77	> 150
23	ELT37-09 hb	13184-09A	11.61379	0.06003	0.099	98.1	1789.98	15.27	23.53	> 150
23	ELT37-09 hb	13184-10A	1.03142	-0.10265	0.023	92.6	1651.45	22.86	28.20	> 150

45 *Pierce et al. (2011)*
16 *this study*

23	ELT37-09 hb	13184-11A	7.22988	0.00636	0.108	98.3	1707.68	15.37	22.97	> 150
23	ELT37-09 hb	13184-12A	7.61725	-0.01503	0.075	97.8	1785.69	17.32	24.88	> 150
23	ELT37-09 hb	13184-13A	9.85743	-0.15889	0.025	100.6	1778.57	15.96	23.90	> 150
23	ELT37-09 hb	13184-14A	7.00821	-0.08373	0.045	99.7	1794.48	18.16	25.53	> 150
23	ELT37-09 hb	13184-15A	9.03718	0.13751	0.035	99.4	1676.81	15.29	22.69	> 150
23	ELT37-09 hb	13184-17A	13.79903	-0.06219	0.031	96.8	1687.60	16.94	23.91	> 150
23	ELT37-09 hb	13184-18A	6.78487	0.12474	0.038	101	1783.25	17.78	25.18	> 150
23	ELT37-09 hb	13184-19A	8.57142	0.05666	0.101	99.2	1894.38	16.37	25.04	> 150
23	ELT37-09 hb	13184-20A	8.29247	0.00917	0.051	96.3	1592.35	17.73	23.83	> 150
23	ELT37-09 hb	13184-21A	6.35906	0.01968	0.173	97.9	493.27	6.20	7.92	> 150
23	ELT37-09 hb	13184-22A	19.66375	-0.01066	0.045	98.6	1712.31	18.17	24.97	> 150
23	ELT37-09 hb	13184-23A	3.32213	-0.0331	0.044	97.1	1761.06	16.47	24.11	> 150
23	ELT37-09 hb	13184-25A	7.77236	0.27625	0.028	97.4	1595.23	16.68	23.08	> 150
23	ELT37-09-A hb	14632-16A	11.57938	-0.03476	0.001	90.4	482.65	10.63	11.67	> 150
23	ELT37-09-A hb	14632-14A	5.57924	0.02185	0.026	98.7	537.29	1.85	5.68	> 150
23	ELT37-09-A hb	14632-03A	12.64701	0.04908	0.009	99	1477.50	5.94	15.93	> 150
23	ELT37-09-A hb	14632-11A	31.22426	0.0225	0.027	98.4	1506.14	3.80	15.53	> 150
23	ELT37-09-A hb	14632-07A	9.96759	0.06075	0.034	97.2	1536.30	3.34	15.72	> 150
23	ELT37-09-A hb	14632-10A	14.28686	0.06474	0.05	97.3	1611.67	3.11	16.41	> 150
23	ELT37-09-A hb	14632-09A	15.07738	0.03165	0.013	99.1	1651.82	5.24	17.33	> 150
23	ELT37-09-A hb	14632-02A	9.85821	0.03893	0.036	98.4	1695.06	3.37	17.28	> 150
23	ELT37-09-A hb	14632-06A	14.46498	0.05251	0.014	99.1	1697.05	5.50	17.84	> 150
23	ELT37-09-A hb	14632-08A	40.75765	0.08663	0.004	95.6	2214.30	12.58	25.47	> 150
23	ELT37-09-A hb	14632-17A	4.07745	0.02212	0.047	77.8	219.20	1.02	2.42	> 150
23	ELT37-09-A hb	14632-24A	5.55542	0.01013	0.012	87.2	355.93	1.93	4.05	> 150
23	ELT37-09-A hb	14632-23A	6.20628	0.03277	0.013	76.8	530.98	2.90	6.05	> 150
23	ELT37-09-A hb	14632-22A	10.88672	0.08345	0.008	88.4	1262.30	5.47	13.76	> 150
23	ELT37-09-A hb	14632-20A	10.36772	0.03129	0.016	74.7	1265.39	5.45	13.78	> 150
23	ELT37-09-A hb	14632-18A	8.54574	0.06483	0.012	91.8	1346.88	4.62	14.24	> 150
24	JPC11 2305-2310 hb	12507-04	0.0078	0.0003	4.196	99.8	1611.75	3.72	16.54	> 150
24	JPC11 2305-2310 hb	12507-05	22.32632	0.00947	0.188	98.3	1668.36	3.33	17.01	> 150
24	JPC11 2305-2310 hb	12507-06	33.77635	0.00584	0.046	97.6	1650.51	6.70	17.81	> 150
24	JPC11 2305-2310 hb	12507-07	20.12419	0.00874	0.084	97.2	1729.90	5.55	18.17	> 150
24	JPC11 2305-2310 hb	12507-08	7.27876	0.00465	0.231	98.6	1704.86	2.96	17.30	> 150
24	JPC11 2305-2310 hb	12507-09	57.91119	0.06279	0.014	92	2212.65	12.90	25.61	> 150
24	JPC11 2305-2310 hb	12507-10	0.65296	0.04869	0.002	77.8	1506.80	35.56	38.62	> 150
24	JPC11 2305-2310 hb	12507-11	0.1759	-0.00017	0.63	99.3	1431.76	2.02	14.46	> 150
24	JPC11 2305-2310 hb	12507-12	0.59148	0.00244	0.172	83.2	1613.05	3.84	16.58	> 150
24	JPC11 2305-2310 hb	12507-13	0.66761	0.00098	0.418	93.7	1091.91	1.70	11.05	> 150
24	JPC11 2305-2310 hb	12507-14	30.50721	0.00838	0.051	96.5	1729.59	5.74	18.22	> 150
24	JPC11 2305-2310 hb	12507-15	11.93941	0.01859	0.126	97.4	1546.05	3.76	15.91	> 150
24	JPC11 2305-2310 hb	12507-16	36.24223	0.01438	0.029	93.6	1726.78	7.92	19.00	> 150
24	JPC11 2305-2310 hb	12507-17	14.07825	0.0045	0.095	99.2	1756.08	5.25	18.33	> 150
24	JPC11 2305-2310 hb	12507-18	7.85514	0.00682	0.078	97.8	1420.01	4.76	14.98	> 150

24	JPC11 2370-2375 hb	12635-01	26.70138	0.00972	0.591	94.5	1757.43	2.42	17.74	> 150
24	JPC11 2370-2375 hb	12635-02	17.22664	0.01241	0.436	96.2	1696.20	2.27	17.11	> 150
24	JPC11 2370-2375 hb	12635-03	53.70243	0.01856	0.151	90.1	3248.97	5.13	32.89	> 150
24	JPC11 2370-2375 hb	12635-04	6.78385	0.00613	1.23	94.3	1158.37	1.84	11.73	> 150
24	JPC11 2370-2375 hb	12635-05	6.94557	0.00458	0.686	98.7	1579.50	2.15	15.94	> 150
24	JPC11 2370-2375 hb	12635-06	33.79887	-0.00126	0.278	97.9	1929.63	3.25	19.57	> 150
24	JPC11 2370-2375 hb	12635-07	35.81388	0.00531	0.118	96.4	1708.95	3.82	17.51	> 150
24	JPC11 2370-2375 hb	12635-08	24.52023	0.00077	0.158	96.5	2002.07	4.45	20.51	> 150
24	JPC11 2370-2375 hb	12635-09	29.245	0.00201	0.183	95.8	1687.44	3.12	17.16	> 150
24	JPC11 2370-2375 hb	12635-10	19.68589	0.00559	0.246	95.7	1754.11	2.77	17.76	> 150
24	JPC11 2370-2375 hb	12635-11	31.57426	0.00733	0.151	96.6	1752.28	3.64	17.90	> 150
24	JPC11 2370-2375 hb	12635-12	0.51514	-0.00023	3.222	99.6	1613.82	2.86	16.39	> 150
24	JPC11 2370-2375 hb	12635-13	11.96913	0.02178	0.261	97.3	1743.42	2.88	17.67	> 150
24	JPC11 2370-2375 hb	12635-14	31.4551	0.01022	0.074	91.1	1829.16	5.56	19.12	> 150
24	JPC11 2370-2375 hb	12635-15	56.88529	0.02096	0.046	92.1	2282.94	8.20	24.26	> 150
24	JPC11 2370-2375 hb	12635-16	15.69341	0.01807	0.145	96.4	1895.70	4.05	19.38	> 150
24	JPC11 2370-2375 hb	12635-17	22.70609	0.02273	0.069	93.2	1651.09	4.55	17.13	> 150
24	JPC11 2370-2375 hb	12635-18	9.97799	0.01978	0.372	98.8	1578.70	2.45	15.98	> 150
24	JPC11 2370-2375 hb	12635-19	14.958	0.01835	0.166	95.7	1665.35	3.17	16.95	> 150
24	JPC11 2370-2375 hb	12635-20	12.43042	0.00786	0.145	97.5	1821.41	4.29	18.71	> 150
24	JPC11 2370-2375 hb	12635-21	22.59055	0.00869	0.217	97.3	1943.71	3.30	19.71	> 150
24	JPC11 2370-2375 hb	12635-22	13.35981	0.01121	0.254	97.4	1754.90	2.95	17.80	> 150
24	JPC11 2370-2375 hb	12635-23	2.14067	0.00044	0.61	97.3	1433.78	1.90	14.46	> 150
24	JPC11 2370-2375 hb	12635-24	0.35033	0.00051	1.32	99.5	1566.18	2.34	15.84	> 150
24	JPC11 2370-2375 hb	12635-25	64.47626	-0.00448	0.027	94	2888.19	14.12	32.15	> 150
24	JPC11 2370-2375 hb	12635-26	63.15348	-0.01328	0.042	96.1	2463.99	10.10	26.63	> 150
24	JPC11 2370-2375 hb	12635-27	20.67141	0.00186	0.256	96.7	1667.74	2.85	16.92	> 150
24	JPC11 2370-2375 hb	12635-28	19.35601	0.02118	0.143	95.4	1568.37	3.80	16.14	> 150
24	JPC11 2370-2375 hb	12635-29	48.21788	0.01108	0.039	96.6	2078.62	9.30	22.77	> 150
24	JPC11 2370-2375 hb	12635-30	0.54833	-0.00022	3.099	99.4	1477.08	2.72	15.02	> 150
24	JPC11 2370-2375 hb	12635-31	29.99707	-0.00135	0.172	95.1	1602.77	3.56	16.42	> 150
24	JPC11 2370-2375 hb	12635-32	12.56434	0.01097	0.231	98.3	1542.40	2.80	15.68	> 150
24	JPC11 2370-2375 hb	12635-33	13.40714	0.00366	0.259	96.6	1689.76	2.76	17.12	> 150
24	JPC11 2370-2375 hb	12635-34	18.91264	0.00687	0.195	97.6	1676.27	3.19	17.06	> 150
24	JPC11 2370-2375 hb	12635-35	28.09366	0.02987	0.042	93.9	2541.76	9.23	27.04	> 150
24	JPC11 2370-2375 hb	12635-36	24.33676	-0.01162	0.08	96.7	1712.19	5.54	18.00	> 150
24	JPC11 2370-2375 hb	12635-37	36.83839	-0.01923	0.072	96.2	2285.84	5.76	23.57	> 150
24	JPC11 2370-2375 hb	12635-38	14.96535	0.00951	0.201	98	1819.36	3.37	18.50	> 150
24	JPC11 2370-2375 hb	12635-39	34.11192	-0.01609	0.04	94.7	1784.25	6.73	19.07	> 150
24	JPC11 2370-2375 hb	12635-40	22.83852	-0.00735	0.116	97.4	2454.30	4.89	25.02	> 150
24	JPC11 2370-2375 hb	12635-41	16.06268	0.00814	0.067	96.8	1458.82	5.12	15.46	> 150
25	DF79-47 hb	12685-05	2.37059	0.01687	0.122	38	180.01	3.56	3.99	> 150
25	DF79-47 hb	12685-14	4.70811	-0.22949	0.001	34.4	431.69	66.38	66.52	> 150
25	DF79-47 hb	12685-15	6.2587	-0.00347	0.056	50.4	494.82	6.11	7.86	> 150

46 *Pierce et al. (2011)*
18 *this study*

25	DF79-47 hb	12685-02	9.54973	0.00617	0.05	95.6	514.84	3.31	6.12	> 150
25	DF79-47 hb	12685-04	4.47714	0.00486	0.15	84.6	517.76	2.44	5.72	> 150
25	DF79-47 hb	12685-10	7.5997	-0.20608	0.003	86.6	599.15	35.33	35.83	> 150
25	DF79-47 hb	12685-09	12.6577	-0.00277	0.05	85.2	613.47	3.76	7.19	> 150
25	DF79-47 hb	12685-13	8.40591	0.0116	0.049	71.3	1041.39	7.05	12.58	> 150
25	DF79-47 hb	12685-01	7.79916	0.01699	0.145	98.4	1474.84	3.85	15.24	> 150
25	DF79-47 hb	12685-21	10.15418	0.01739	0.022	8.1	4.97	4.76	4.76	> 150
25	DF79-47 hb	12685-22	66.89985	0.21874	0.003	9.9	247.33	47.36	47.42	> 150
25	DF79-47 hb	12685-16	7.68478	0.0062	0.064	94.9	490.53	2.74	5.62	> 150
25	DF79-47 hb	12685-18	5.60775	0.03088	0.008	55.5	1520.61	22.74	27.35	> 150
25	DF79-47 hb	12685-26	7.0264	0.02002	0.029	98	1649.56	8.44	18.53	> 150
25	DF79-47 hb	12977-23	0.98964	0.00916	0.05	90.4	485.65	2.35	5.40	> 150
25	DF79-47 hb	12977-17	0.03839	0.00271	0.142	96.6	557.22	1.56	5.79	> 150
25	DF79-47 hb	12977-07	7.01002	0.00451	0.283	94.9	1089.09	2.61	11.20	> 150
25	DF79-47 hb	12977-16	7.78879	0.00331	0.143	99.3	1129.54	2.65	11.60	> 150
25	DF79-47 hb	12977-22	7.28079	0.01717	0.056	97.9	1231.46	3.80	12.89	> 150
25	DF79-47 hb	12977-09	7.97982	0.00244	0.098	99	1426.46	3.85	14.77	> 150
25	DF79-47 hb	12977-14	8.75023	0.01878	0.07	99.5	1435.37	3.63	14.80	> 150
25	DF79-47 hb	12977-11	8.86541	0.02355	0.033	98.3	1460.30	5.74	15.69	> 150
25	DF79-47 hb	12977-18	8.67059	0.00769	0.076	94.6	1476.42	4.28	15.37	> 150
25	DF79-47 hb	12977-12	11.00843	0.01091	0.029	96.2	1555.43	5.62	16.54	> 150
25	DF79-47 hb	12977-02	6.59405	0.04518	5.173	99.7	1741.76	4.68	18.04	> 150
25	DF79-47 hb	12977-03	25.3946	0.00984	0.037	99.9	1881.66	6.63	19.95	> 150
25	DF79-47 hb	12977-01	4.55152	0.14329	0.003	82.7	3299.22	34.73	47.90	> 150
25	DF79-47 hb	13185-01A	16.99535	-0.04916	0.059	94.6	529.71	8.47	9.99	> 150
25	DF79-47 hb	13185-02A	26.32185	-0.15503	0.023	92.3	1430.01	18.15	23.11	> 150
25	DF79-47 hb	13185-03A	4.94522	0.02011	0.136	99.3	1191.49	11.86	16.81	> 150
25	DF79-47 hb	13185-04A	7.07881	0.02905	0.187	95.2	505.74	6.77	8.45	> 150
25	DF79-47 hb	13185-06A	6.29252	-0.0043	0.113	100	477.10	5.79	7.50	> 150
25	DF79-47 hb	13185-07A	9.29667	-0.02644	0.062	95.2	556.63	8.38	10.06	> 150
25	DF79-47 hb	13185-08A	5.99902	-0.03114	0.101	92.7	492.11	7.87	9.28	> 150
25	DF79-47 hb	13185-09A	4.29808	-0.04074	0.137	97.6	500.63	6.50	8.20	> 150
25	DF79-47 hb	13185-10A	15.47538	-0.02376	0.077	99.8	1530.10	14.58	21.13	> 150
25	DF79-47 hb	13185-12A	77.98733	-0.30772	0.02	104.5	1708.85	21.67	27.60	> 150
25	DF79-47 hb	13185-13A	7.02658	0.00032	0.106	94	511.54	7.62	9.18	> 150
25	DF79-47 hb	13185-14A	7.01443	0.08374	0.121	98.1	1700.70	14.83	22.56	> 150
25	DF79-47 hb	13185-16A	6.72283	0.0232	0.052	97.6	1378.56	13.94	19.61	> 150
25	DF79-47 hb	13185-17A	5.72914	-0.00319	0.163	99.1	1682.18	14.06	21.93	> 150
25	DF79-47 hb	13185-19A	9.88904	0.03419	0.047	94.4	517.35	8.95	10.34	> 150
25	DF79-47 hb	13185-20A	16.16265	-0.03808	0.048	92.5	518.58	9.13	10.50	> 150
25	DF79-47 hb	13185-21A	4.5758	-0.12897	0.053	101.2	1469.94	12.44	19.26	> 150
25	DF79-47 hb	13185-22A	6.15686	0.01124	0.152	91.1	423.21	6.78	7.99	> 150
25	DF79-47 hb	13185-23A	8.36834	0.00017	0.13	98.2	1988.63	17.03	26.18	> 150
25	DF79-47-A hb	14639-02A	3.10711	0.01579	0.032	84.3	410.35	1.50	4.37	> 150
25	DF79-47-A hb	14639-19A	11.60403	0.02705	0.015	66.2	474.62	3.05	5.64	> 150

25	DF79-47-A hb	14639-14A	17.80367	0.03091	0.008	94.1	481.41	3.23	5.80	> 150
25	DF79-47-A hb	14639-08A	7.80422	0.01012	0.033	97.9	492.57	1.49	5.15	> 150
25	DF79-47-A hb	14639-06A	5.82833	0.05099	0.016	96.4	510.28	1.90	5.44	> 150
25	DF79-47-A hb	14639-27A	18.44528	0.02169	0.004	89.8	605.44	4.72	7.68	> 150
25	DF79-47-A hb	14639-10A	10.63643	0.03586	0.014	97.3	1029.77	3.61	10.91	> 150
25	DF79-47-A hb	14639-11A	5.52934	0.01823	0.036	96.6	1077.43	2.61	11.09	> 150
25	DF79-47-A hb	14639-21A	29.01855	0.03211	0.008	96.7	1080.00	5.41	12.08	> 150
25	DF79-47-A hb	14639-26A	10.49382	0.06182	0.005	90.1	1170.27	6.96	13.61	> 150
25	DF79-47-A hb	14639-17A	7.93548	0.04321	0.01	98.3	1181.31	5.10	12.87	> 150
25	DF79-47-A hb	14639-01A	11.31932	0.11743	0.002	91.3	1265.22	13.37	18.40	> 150
25	DF79-47-A hb	14639-23A	20.89857	0.20984	0.006	93	1270.94	6.17	14.13	> 150
25	DF79-47-A hb	14639-16A	8.60576	0.06192	0.009	97	1370.10	6.01	14.96	> 150
25	DF79-47-A hb	14639-18A	8.59429	0.0853	0.007	98.7	1442.74	7.04	16.05	> 150
25	DF79-47-A hb	14639-25A	8.03788	0.04805	0.014	98	1455.73	5.87	15.70	> 150
25	DF79-47-A hb	14639-07A	7.04039	0.04482	0.016	98.4	1574.13	4.52	16.38	> 150
25	DF79-47-A hb	14639-20A	5.6782	0.08422	0.023	95.4	1705.61	4.52	17.65	> 150
26	DF80-34 hb	12691-09	5.27409	0.01901	0.123	2.7	0.79	1.01	1.01	> 150
26	DF80-34 hb	12691-14	7.63484	0.01068	0.193	5.4	6.28	1.78	1.78	> 150
26	DF80-34 hb	12691-11	7.39049	-0.01169	0.014	5.6	8.75	7.71	7.71	> 150
26	DF80-34 hb	12691-13	5.75784	0.02763	0.088	45.3	8.89	1.25	1.26	> 150
26	DF80-34 hb	12691-07	8.57737	-0.00076	0.066	4.3	10.69	4.06	4.06	> 150
26	DF80-34 hb	12691-05	3.20515	0.00144	0.002	0.1	12.02	164.97	164.97	> 150
26	DF80-34 hb	12691-02	42.12188	-0.07207	0.014	32.8	57.63	7.32	7.34	> 150
26	DF80-34 hb	12691-06	22.24842	-0.12419	0.005	2.8	205.65	103.32	103.34	> 150
26	DF80-34 hb	12691-04	1.52704	0.02669	0.003	38.3	817.50	43.53	44.29	> 150
26	DF80-34 hb	12691-01	8.15435	0.02906	0.096	92.1	1141.44	5.63	12.73	> 150
26	DF80-34 hb	12691-08	8.89858	0.00134	0.128	96.2	1159.74	4.86	12.57	> 150
26	DF80-34 hb	12691-22	4.56073	0.01848	0.667	9.3	2.92	0.21	0.21	> 150
26	DF80-34 hb	12691-16	8.66996	0.00471	0.6	26.2	3.75	0.26	0.27	> 150
26	DF80-34 hb	12691-17	2.6199	0.01184	0.609	8.7	9.40	0.91	0.92	> 150
26	DF80-34 hb	12691-18	7.22599	0.00678	0.059	93.4	497.37	3.02	5.82	> 150
26	DF80-34 hb	12691-23	7.62276	0.0168	0.038	77.4	499.14	2.97	5.81	> 150
26	DF80-34 hb	12923-30	14.06459	0.00649	0.006	34.4	83.48	5.52	5.59	> 150
26	DF80-34 hb	12923-25	17.16385	0.02666	0.016	18.1	125.18	5.60	5.74	> 150
26	DF80-34 hb	12923-12	9.09137	0.01322	0.035	89.2	416.98	2.07	4.65	> 150
26	DF80-34 hb	12923-16	11.16042	0.02308	0.019	91.7	478.95	3.30	5.82	> 150
26	DF80-34 hb	12923-10	32.58829	0.02237	0.013	93	482.47	3.65	6.05	> 150
26	DF80-34 hb	12923-14	8.3821	0.03515	0.039	94	483.71	2.24	5.33	> 150
26	DF80-34 hb	12923-23	8.76369	-0.00213	0.022	92.7	489.74	2.85	5.67	> 150
26	DF80-34 hb	12923-07	70.02775	0.00342	0.019	501	491.64	3.99	6.33	> 150
26	DF80-34 hb	12923-28	25.76539	0.04864	0.013	81.9	492.43	4.37	6.58	> 150
26	DF80-34 hb	12923-26	17.08506	0.01008	0.092	91.2	502.77	1.77	5.33	> 150
26	DF80-34 hb	12923-27	9.58465	0.01833	0.045	92	528.24	2.42	5.81	> 150
26	DF80-34 hb	12923-24	13.99904	0.13357	0.001	13	628.91	43.84	44.29	> 150

36 *Pierce et al. (2011)*

26	DF80-34 hb	12923-20	6.75473	0.05353	0.002	16.6	914.75	39.94	40.98	> 150
26	DF80-34 hb	12923-13	8.70245	0.02108	0.075	97.1	1179.68	3.23	12.23	> 150
26	DF80-34 hb	13186-02A	15.18334	0.00073	0.045	100.8	1901.25	14.79	24.09	> 150
26	DF80-34 hb	13186-03A	9.09946	0.03828	0.171	92.5	501.30	7.55	9.06	> 150
26	DF80-34 hb	13186-04A	9.43369	-0.01149	0.214	99.4	541.80	6.35	8.35	> 150
26	DF80-34 hb	13186-06A	3.31287	0.07895	0.047	83.4	495.14	11.65	12.66	> 150
26	DF80-34 hb	13186-09A	18.02137	0.03191	0.02	101.8	447.92	13.82	14.53	> 150
26	DF80-34 hb	13186-10A	12.28013	0.03566	0.042	105.6	439.83	8.53	9.60	> 150
26	DF80-34-A hb	14640-14A	11.12583	0.02468	0.04	52	34.56	0.54	0.64	> 150
26	DF80-34-A hb	14640-16A	5.30582	0.0218	0.026	30.5	48.79	1.29	1.38	> 150
26	DF80-34-A hb	14640-17A	6.52413	0.00855	0.033	58.9	84.99	0.88	1.22	> 150
26	DF80-34-A hb	14640-10A	6.82997	0.00177	0.002	69	87.68	4.79	4.87	> 150
26	DF80-34-A hb	14640-13A	15.56459	0.02506	0.01	85.5	204.56	1.62	2.61	> 150
26	DF80-34-A hb	14640-08A	1.6348	0.028	0.017	53.9	285.38	2.85	4.03	> 150
26	DF80-34-A hb	14640-11A	9.56959	0.04073	0.023	99.2	472.42	1.68	5.01	> 150
26	DF80-34-A hb	14640-01A	9.31821	0.03181	0.054	96.2	490.93	1.42	5.11	> 150
26	DF80-34-A hb	14640-18A	3.36313	0.03776	0.013	99.6	2310.67	8.32	24.56	> 150
26	DF80-34-A hb	14640-09A	46.99964	0.05008	0.01	99.6	2594.96	7.75	27.08	> 150
27	DF80-35 hb	12690-02	3.02673	0.01617	0.109	0.4	3.03	11.28	11.28	> 150
27	DF80-35 hb	12690-03	9.57969	0.00182	0.083	20.1	5.71	1.45	1.45	> 150
27	DF80-35 hb	12690-05	4.42151	0.0158	0.319	15.3	16.08	1.45	1.46	> 150
27	DF80-35 hb	12690-01	48.81312	0.02183	0.2	26.3	23.15	1.22	1.24	> 150
27	DF80-35 hb	12690-07	3.30523	0.00801	6.417	42.9	9.63	0.08	0.13	> 150
27	DF80-35 hb	12690-09	5.59235	0.01844	0.579	1.3	0.77	0.35	0.35	> 150
27	DF80-35 hb	12690-16	7.49857	0.0241	0.108	4.3	2.69	0.76	0.76	> 150
27	DF80-35 hb	12690-15	10.10302	0.00588	0.445	12.6	4.10	0.25	0.25	> 150
27	DF80-35 hb	12690-14	3.06318	0.02173	0.92	1.5	6.78	2.03	2.03	> 150
27	DF80-35 hb	12690-08	3.33203	0.00529	0.097	9.4	11.44	1.03	1.04	> 150
27	DF80-35 hb	12690-19	1.57053	0.01704	0.709	85.1	98.78	0.39	1.06	> 150
27	DF80-35 hb	12922-06	7.46521	0.00815	0.07	12.1	6.80	0.69	0.69	> 150
27	DF80-35 hb	12922-07	7.44774	0.01847	0.016	18.2	8.37	1.97	1.97	> 150
27	DF80-35 hb	12922-12	10.81235	-0.00027	0.02	13.7	10.13	1.82	1.82	> 150
27	DF80-35 hb	12922-18	10.0335	0.01517	0.158	47.6	10.38	0.25	0.27	> 150
27	DF80-35 hb	12922-14	1.44238	0.00571	0.003	18.7	83.57	12.21	12.23	> 150
27	DF80-35 hb	12922-10	3.08324	0.00691	0.083	68.1	330.55	2.18	3.96	> 150
27	DF80-35 hb	12922-08	6.07094	0.19473	0.002	29.8	333.58	18.30	18.60	> 150
27	DF80-35 hb	12922-15	6.82018	0.03076	0.028	95.7	476.50	2.40	5.34	> 150
27	DF80-35 hb	12922-17	16.69373	0.03804	0.013	35.1	477.86	8.90	10.10	> 150
27	DF80-35 hb	12922-09	6.86422	0.03355	0.027	78.6	485.42	3.09	5.75	> 150
27	DF80-35-A hb	14642-01A	5.76287	0.02026	0.068	26.2	18.40	0.47	0.51	> 150
27	DF80-35-A hb	14642-09A	6.93335	0.02	0.012	37.2	28.46	1.08	1.11	> 150
27	DF80-35-A hb	14642-12A	7.07841	0.02667	0.077	28.2	9.10	0.26	0.28	> 150
27	DF80-35-A hb	14642-13A	4.05952	0.02807	0.112	3.7	2.49	0.48	0.48	> 150
27	DF80-35-A hb	14642-15A	5.84072	0.02215	0.159	3.8	3.08	0.55	0.55	> 150

21 *Pierce et al. (2011)*
11 *this study*

27	DF80-35-A hb	14642-26A	1.85191	0.01086	0.016	73.9	155.76	1.23	1.98	> 150
27	DF80-35-A hb	14642-23A	2.3691	0.01802	0.064	71.4	111.83	0.62	1.28	> 150
27	DF80-35-A hb	14642-25A	3.04818	0.02436	0.042	29.1	15.06	0.51	0.53	> 150
27	DF80-35-A hb	14642-16A	4.3096	0.01769	0.06	2.2	0.78	0.39	0.39	> 150
27	DF80-35-A hb	14642-18A	4.35134	0.02781	0.148	15.9	5.34	0.26	0.27	> 150
27	DF80-35-A hb	14642-20A	5.32605	0.02073	0.071	8.5	2.25	0.30	0.30	> 150
28	DF80-20 hb	12686-11	9.25028	-0.14469	0.01	10	31.00	13.91	13.92	> 150
28	DF80-20 hb	12686-08	13.68731	0.09943	0.036	56.9	126.15	4.61	4.78	> 150
28	DF80-20 hb	12686-14	5.45543	-0.05761	0.009	31.3	243.96	15.50	15.69	> 150
28	DF80-20 hb	12686-04	18.01687	0.00466	0.091	97.1	476.95	2.33	5.31	> 150
28	DF80-20 hb	12686-13	14.61673	-0.07042	0.019	71.3	504.20	7.36	8.92	> 150
28	DF80-20 hb	12686-16	13.10768	0.02205	0.042	72.2	372.94	4.31	5.70	> 150
28	DF80-20 hb	12686-19	25.01592	-0.05136	0.016	78.1	362.89	6.95	7.84	> 150
28	DF80-20 hb	12686-22	23.52487	0.04813	0.052	92.2	363.12	2.93	4.67	> 150

8 *Pierce et al. (2011)*

40Ar/39Ar biotite data. 40Ar/39Ar analyses were performed at L-DEO's AGES lab.

See Table 2 for which study each sample is from

Core ID	Sample Name	Run ID Number	Ca/K	Cl/K	Mol 39Ar	%40Ar*	Age	Internal Error	± Age	Size Fraction	n	Study
1	IWSOE68-11	14644-01A	0.03237	0.00528	0.018	94.5	190.53	0.90	2.11	> 150	11	<i>This study</i>
1	IWSOE68-11	14644-02A	0.14233	0.0234	0.005	97.3	977.35	5.38	11.16	> 150		
1	IWSOE68-11	14644-03A	0.00629	0.01514	0.029	99.6	1010.29	2.53	10.41	> 150		
1	IWSOE68-11	14644-04A	0.04287	0.00666	0.3	99.3	347.72	0.68	3.54	> 150		
1	IWSOE68-11	14644-06A	0.05198	0.02581	0.012	96.4	914.61	3.86	9.93	> 150		
1	IWSOE68-11	14644-07A	0.07402	0.02255	0.039	99.4	1040.81	2.47	10.70	> 150		
1	IWSOE68-11	14644-08A	0.17528	0.0086	0.013	54.7	114.39	1.50	1.89	> 150		
1	IWSOE68-11	14644-09A	0.08305	0.03211	0.014	99.7	1110.68	3.92	11.78	> 150		
1	IWSOE68-11	14644-10A	0.1087	0.03181	0.023	98.3	615.74	1.98	6.47	> 150		
1	IWSOE68-11	14644-11A	0.39126	0.08533	0.005	46.2	196.20	3.65	4.15	> 150		
1	IWSOE68-11	14644-12A	0.01342	0.01367	0.041	99	969.19	2.41	9.99	> 150		
2	IWSOE 68 G8	no biotites										
3	IWSOE 70 2-22-1	no biotites										
4	IWSOE 69 G17 bio	14647-04A	0.15994	0.04311	0.003	84.7	585.06	6.84	9.00	> 150	13	<i>This study</i>
4	IWSOE 69 G17 bio	14647-01A	0.06945	0.02946	0.02	97.4	977.76	3.23	10.30	> 150		
4	IWSOE 69 G17 bio	14647-11A	0.20436	0.07502	0.005	97	1003.31	6.38	11.89	> 150		
4	IWSOE 69 G17 bio	14647-10A	0.08626	0.0397	0.014	99.4	1018.15	3.81	10.87	> 150		
4	IWSOE 69 G17 bio	14647-03A	0.13739	0.04697	0.008	99.3	1025.81	4.52	11.21	> 150		
4	IWSOE 69 G17 bio	14647-08A	0.02298	0.01232	0.074	100	1030.45	2.12	10.52	> 150		
4	IWSOE 69 G17 bio	14647-14A	0.1297	0.0259	0.01	99.3	1032.24	4.27	11.17	> 150		
4	IWSOE 69 G17 bio	14647-12A	0.14051	0.06493	0.006	99.8	1037.40	5.03	11.53	> 150		
4	IWSOE 69 G17 bio	14647-13A	0.10788	0.06017	0.005	99.5	1038.12	5.97	11.98	> 150		
4	IWSOE 69 G17 bio	14647-09A	0.06147	0.029	0.017	99.8	1060.29	3.93	11.31	> 150		
4	IWSOE 69 G17 bio	14647-07A	0.08085	0.03728	0.006	99.7	1061.27	5.01	11.73	> 150		
4	IWSOE 69 G17 bio	14647-15A	0.16202	0.0203	0.011	99.6	1063.58	4.61	11.59	> 150		
4	IWSOE 69 G17 bio	14647-05A	0.26615	0.04686	0.006	99.5	1064.51	5.86	12.15	> 150		
5	IWSOE69 G21 bio	14306-10	0.01963	0.01496	0.042	96.4	160.80	3.27	0.57	> 150	9	<i>This study</i>
5	IWSOE69 G21 bio	14306-04	0.03594	0.01614	0.091	99.7	544.32	10.94	1.11	> 150		
5	IWSOE69 G21 bio	14306-03	0.24926	0.00411	0.207	99.3	587.17	11.78	0.96	> 150		
5	IWSOE69 G21 bio	14306-01	0.03461	0.01323	0.071	99.6	928.85	18.67	1.81	> 150		
5	IWSOE69 G21 bio	14306-08	0.04168	0.00536	0.251	99.9	938.98	18.83	1.36	> 150		
5	IWSOE69 G21 bio	14306-05	0.25879	0.01217	0.065	99.8	947.31	19.04	1.87	> 150		
5	IWSOE69 G21 bio	14306-09	0.0123	0.01202	0.046	99.7	957.18	19.26	2.11	> 150		
5	IWSOE69 G21 bio	14306-02	0.16761	0.03228	0.021	95.6	975.03	19.73	3.03	> 150		
5	IWSOE69 G21 bio	14306-07	0.04053	0.02231	0.016	99.4	998.74	20.25	3.32	> 150		
6	IWSOE68-13	14645-14A	0.37655	0.08911	0.001	49.6	250.59	14.34	14.55	> 150		

6	IWSOE68-13	14645-09A	0.02149	0.04647	0.008	97.9	467.14	2.96	5.53	> 150	17	<i>This study</i>
6	IWSOE68-13	14645-19A	8.09897	0.06062	0.004	86.4	479.99	4.47	6.56	> 150		
6	IWSOE68-13	14645-05A	0.07873	0.02522	0.019	92.4	886.25	3.27	9.45	> 150		
6	IWSOE68-13	14645-07A	0.31831	0.01705	0.035	98	942.66	2.35	9.72	> 150		
6	IWSOE68-13	14645-11A	0.63143	0.02759	0.024	98.7	964.63	2.87	10.07	> 150		
6	IWSOE68-13	14645-12A	0.01169	0.012	0.082	99.2	966.69	1.79	9.83	> 150		
6	IWSOE68-13	14645-10A	0.01696	0.02016	0.031	98.1	967.73	2.75	10.06	> 150		
6	IWSOE68-13	14645-02A	0.02383	0.0241	0.03	99.6	968.25	2.57	10.02	> 150		
6	IWSOE68-13	14645-03A	0.07091	0.06124	0.008	94.7	973.76	4.85	10.88	> 150		
6	IWSOE68-13	14645-08A	0.03293	0.04364	0.018	99.1	978.91	3.12	10.27	> 150		
6	IWSOE68-13	14645-16A	0.02842	0.0144	0.053	96.6	979.92	2.18	10.04	> 150		
6	IWSOE68-13	14645-17A	0.0251	0.02788	0.026	99.8	1006.37	2.94	10.49	> 150		
6	IWSOE68-13	14645-04A	0.26348	0.01368	0.067	99.2	1009.59	2.05	10.30	> 150		
6	IWSOE68-13	14645-15A	0.02609	0.01488	0.046	99.7	1015.22	2.54	10.47	> 150		
6	IWSOE68-13	14645-18A	0.03429	0.02168	0.025	98.6	1021.84	3.12	10.68	> 150		
6	IWSOE68-13	14645-06A	0.0469	0.01777	0.036	98.6	1031.45	2.49	10.61	> 150		
7	IWSOE70 03-11-03 228-230 bio	14316-04	0.03661	0.07245	0.002	91.9	352.11	10.80	8.19	> 150	4	<i>This study</i>
7	IWSOE70 03-11-03 228-230 bio	14316-06	0.354	0.01338	0.063	92.3	479.26	9.68	1.35	> 150		
7	IWSOE70 03-11-03 228-230 bio	14316-01	0.03314	0.00636	0.139	99.7	484.24	9.73	0.93	> 150		
7	IWSOE70 03-11-03 228-230 bio	14316-03	0.01246	0.01469	0.053	99.8	1009.97	20.32	2.20	> 150		
8	IO 1578-27 bio	14310-01	0.02369	0.00793	0.035	57.3	153.74	3.33	1.27	> 150	19	<i>This study</i>
8	IO 1578-27 bio	14310-09	0.0233	0.01159	0.044	93.9	211.26	4.28	0.68	> 150		
8	IO 1578-27 bio	14310-04	0.05301	-0.02889	0.059	19.4	250.95	8.84	7.28	> 150		
8	IO 1578-27 bio	14310-15	0.00951	-0.09074	0.078	12	310.23	16.29	15.07	> 150		
8	IO 1578-27 bio	14310-03	0.00693	0.00685	0.12	97.5	386.09	7.77	0.82	> 150		
8	IO 1578-27 bio	14310-08	0.01575	0.00927	0.046	99.9	413.33	8.35	1.16	> 150		
8	IO 1578-27 bio	14310-19	0.00779	0.04546	0.016	99.3	422.07	8.67	1.98	> 150		
8	IO 1578-27 bio	14310-21	0.07053	0.01963	0.025	98.2	428.29	8.70	1.50	> 150		
8	IO 1578-27 bio	14310-05	0.19341	0.00777	0.096	98.6	429.39	8.64	0.98	> 150		
8	IO 1578-27 bio	14310-14	0.00423	0.01039	0.14	92.3	434.61	8.76	1.06	> 150		
8	IO 1578-27 bio	14310-18	0.00754	0.00378	0.204	99.8	441.13	8.86	0.83	> 150		
8	IO 1578-27 bio	14310-25	0.01371	0.01501	0.033	99.6	450.03	9.11	1.39	> 150		
8	IO 1578-27 bio	14310-11	0.00764	0.01484	0.063	98.8	452.25	9.11	1.08	> 150		
8	IO 1578-27 bio	14310-12	0.00794	0.01188	0.083	99.4	458.33	9.23	1.10	> 150		
8	IO 1578-27 bio	14310-24	0.00414	0.01804	0.027	81.9	470.70	9.60	1.90	> 150		
8	IO 1578-27 bio	14310-20	0.00791	0.02239	0.027	99.5	472.50	9.58	1.54	> 150		
8	IO 1578-27 bio	14310-07	0.00831	0.01125	0.107	99.5	475.33	9.56	0.97	> 150		
8	IO 1578-27 bio	14310-06	0.00686	0.00421	0.134	99.3	502.19	10.10	1.02	> 150		
8	IO 1578-27 bio	14310-16	0.00698	0.0081	0.079	99.7	566.81	11.41	1.27	> 150		
9	IO 1578-28 bio	14308-03	0.22586	0.01394	0.046	78.4	155.96	3.21	0.75	> 150	8	<i>This study</i>
9	IO 1578-28 bio	14308-05	2.73923	0.11284	0.002	22.1	204.39	9.84	8.95	> 150		
9	IO 1578-28 bio	14308-01	1.06155	0.00796	0.037	80	219.86	4.53	1.07	> 150		
9	IO 1578-28 bio	14308-02	0.14462	0.03001	0.005	74.6	235.67	5.53	2.89	> 150		
9	IO 1578-28 bio	14308-09	0.02853	0.02378	0.021	99.7	487.02	9.89	1.72	> 150		

9	IO 1578-28 bio	14308-07	0.0295	0.0088	0.035	97.5	494.21	9.99	1.48	> 150
9	IO 1578-28 bio	14308-04	0.01646	0.02192	0.036	98.7	1179.47	23.76	2.83	> 150
9	IO 1578-28 bio	14308-08	0.07114	0.01489	0.039	98.9	1951.90	39.23	3.90	> 150
10	IWSOE70 3/17/2	14646-01A	0.00619	0.00783	0.225	100	1249.25	1.87	12.63	> 150
10	IWSOE70 3/17/2	14646-02A	0.10191	0.01478	0.037	99.9	2755.06	4.54	27.92	> 150
10	IWSOE70 3/17/2	14646-03A	0.01888	0.01864	0.086	99.9	480.41	1.14	4.94	> 150
10	IWSOE70 3/17/2	14646-04A	0.10224	0.03463	0.019	99.9	2891.78	6.78	29.70	> 150
10	IWSOE70 3/17/2	14646-05A	0.14367	0.01506	0.055	99.9	2772.88	3.99	28.01	> 150
10	IWSOE 70 3/17/2 bio	14646-24A	0.09701	0.05523	0.01	95.4	393.51	2.27	4.54	> 150
10	IWSOE 70 3/17/2 bio	14646-10A	-0.08851	0.0017	0.007	95.8	412.70	2.81	4.99	> 150
10	IWSOE 70 3/17/2 bio	14646-07A	0.09301	0.04443	0.009	93.4	427.71	2.51	4.96	> 150
10	IWSOE 70 3/17/2 bio	14646-15A	0.13695	0.0146	0.002	95.1	432.98	5.80	7.24	> 150
10	IWSOE 70 3/17/2 bio	14646-11A	0.01043	0.02675	0.035	99.4	447.49	1.36	4.68	> 150
10	IWSOE 70 3/17/2 bio	14646-26A	0.08481	0.03548	0.009	97.3	450.66	2.44	5.12	> 150
10	IWSOE 70 3/17/2 bio	14646-18A	0.12118	0.04906	0.012	96.3	453.13	2.07	4.98	> 150
10	IWSOE 70 3/17/2 bio	14646-22A	0.18044	0.03823	0.012	97.1	464.01	1.94	5.03	> 150
10	IWSOE 70 3/17/2 bio	14646-13A	0.00325	0.00979	0.015	98.9	468.05	1.96	5.07	> 150
10	IWSOE 70 3/17/2 bio	14646-17A	0.01741	0.01108	0.076	99.7	469.23	1.09	4.82	> 150
10	IWSOE 70 3/17/2 bio	14646-21A	0.06899	0.02628	0.019	98.5	513.20	1.95	5.49	> 150
10	IWSOE 70 3/17/2 bio	14646-27A	0.0383	0.01332	0.013	99.1	515.87	2.12	5.58	> 150
10	IWSOE 70 3/17/2 bio	14646-12A	0.0506	0.02434	0.021	79.2	727.20	3.25	7.96	> 150
10	IWSOE 70 3/17/2 bio	14646-14A	0.12702	0.0306	0.008	76.1	895.97	5.20	10.36	> 150
10	IWSOE 70 3/17/2 bio	14646-23A	0.05805	0.01497	0.146	99.9	1151.92	2.20	11.73	> 150
10	IWSOE 70 3/17/2 bio	14646-09A	0.04517	-0.04995	0.001	93.2	1505.37	33.84	37.04	> 150
10	IWSOE 70 3/17/2 bio	14646-16A	0.04147	0.02836	0.014	99.9	1927.79	6.23	20.26	> 150
10	IWSOE 70 3/17/2 bio	14646-06A	0.13988	0.02401	0.018	99.4	2306.89	6.11	23.86	> 150
10	IWSOE 70 3/17/2 bio	14646-08A	0.24984	0.02968	0.019	96.9	2397.32	5.96	24.70	> 150
10	IWSOE 70 3/17/2 bio	14646-19A	0.2127	0.00586	0.199	100	2556.16	3.60	25.81	> 150
10	IWSOE 70 3/17/2 bio	14646-20A	0.1441	0.07994	0.004	99.5	2663.99	14.46	30.31	> 150
10	IWSOE 70 3/17/2 bio	14646-25A	0.25517	0.00569	0.405	99.9	2697.52	3.84	27.25	> 150
11	IO 1578-16 128-130 bio	14314-24	0.13402	0.06138	0.005	84.9	61.75	3.03	2.76	> 150
11	IO 1578-16 128-130 bio	14314-07	0.07785	0.03491	0.02	96.9	405.38	8.25	1.55	> 150
11	IO 1578-16 128-130 bio	14314-06	0.00715	0.01053	0.045	98.8	421.11	8.50	1.16	> 150
11	IO 1578-16 128-130 bio	14314-17	0.00963	0.02119	0.009	95.4	422.06	8.85	2.65	> 150
11	IO 1578-16 128-130 bio	14314-04	0.00572	0.01917	0.034	99.6	440.79	8.92	1.33	> 150
11	IO 1578-16 128-130 bio	14314-19	0.01594	0.01289	0.035	100	444.72	8.99	1.28	> 150
11	IO 1578-16 128-130 bio	14314-15	0.04899	0.01203	0.029	99.7	447.85	9.07	1.40	> 150
11	IO 1578-16 128-130 bio	14314-14	0.02893	0.01036	0.055	92.7	449.71	9.08	1.25	> 150
11	IO 1578-16 128-130 bio	14314-23	0.00394	0.02047	0.02	99.9	453.83	9.25	1.76	> 150
11	IO 1578-16 128-130 bio	14314-13	0.05419	0.02235	0.025	99.5	458.22	9.29	1.50	> 150
11	IO 1578-16 128-130 bio	14314-02	0.01898	0.01467	0.03	98.9	460.17	9.33	1.55	> 150
11	IO 1578-16 128-130 bio	14314-08	0.02231	0.02024	0.021	99.7	461.61	9.38	1.63	> 150
11	IO 1578-16 128-130 bio	14314-12	0.009	0.01912	0.019	98.8	463.28	9.48	2.00	> 150
11	IO 1578-16 128-130 bio	14314-21	0.15384	0.02793	0.017	96.4	464.42	9.49	1.95	> 150

27 This study

22 This study

11	IO 1578-16 128-130 bio	14314-05	0.00651	0.00751	0.06	99.3	464.98	9.38	1.23	> 150
11	IO 1578-16 128-130 bio	14314-01	0.01216	0.0268	0.013	99.5	467.77	9.62	2.23	> 150
11	IO 1578-16 128-130 bio	14314-11	0.00918	0.01307	0.028	99.7	470.10	9.53	1.57	> 150
11	IO 1578-16 128-130 bio	14314-22	0.04692	0.03416	0.01	97.7	478.57	9.87	2.41	> 150
11	IO 1578-16 128-130 bio	14314-10	0.00472	0.01527	0.13	99.7	502.45	10.10	1.02	> 150
11	IO 1578-16 128-130 bio	14314-09	0.04036	0.0227	0.02	99.4	535.80	10.91	2.05	> 150
11	IO 1578-16 128-130 bio	14314-20	0.06287	0.00888	0.072	99.3	1822.48	36.58	3.14	> 150
11	IO 1578-16 130-132 bio	14317-01	0.0071	0.01315	0.064	99.5	487.57	9.83	1.21	> 150

12	IWSOE70 3-18-01 bio	14303-04	0.00128	0.01445	0.05	100	450.92	9.08	1.08	> 150
12	IWSOE70 3-18-01 bio	14303-09	0.00755	0.01904	0.04	99.8	452.41	9.14	1.28	> 150
12	IWSOE70 3-18-01 bio	14303-13	2.78302	0.03141	0.018	98.1	486.17	9.93	2.02	> 150
12	IWSOE70 3-18-01 bio	14303-20	0.01151	0.01643	0.026	99.5	524.27	10.63	1.74	> 150
12	IWSOE70 3-18-01 bio	14303-27	0.07723	0.02596	0.009	97.8	593.05	12.27	3.14	> 150
12	IWSOE70 3-18-01 bio	14303-03	0.01344	0.04258	0.007	81.3	761.55	15.94	4.70	> 150
12	IWSOE70 3-18-01 bio	14303-05	0.43188	0.09904	0.004	70.7	1033.51	22.52	8.93	> 150
12	IWSOE70 3-18-01 bio	14303-11	0.06499	0.03643	0.018	99.1	1070.08	21.63	3.12	> 150
12	IWSOE70 3-18-01 bio	14303-18	0.00587	0.01204	0.118	99.8	1119.71	22.47	1.86	> 150
12	IWSOE70 3-18-01 bio	14303-30	0.10544	0.15588	0.001	90.4	1220.28	33.59	23.08	> 150
12	IWSOE70 3-18-01 bio	14303-19	0.02825	0.01028	0.02	99.5	2513.53	50.60	5.78	> 150
12	IWSOE70 3-18-01 bio	14303-21	0.02029	0.00326	0.627	100	2545.66	51.04	3.63	> 150
12	IWSOE70 3-18-01 bio	14303-12	0.01554	0.01856	0.018	99.9	2550.23	51.34	5.89	> 150
12	IWSOE70 3-18-01 bio	14303-10	0.0442	0.01227	0.04	99.9	2599.11	52.16	4.28	> 150
12	IWSOE70 3-18-01 bio	14303-08	0.00829	0.01181	0.046	99.8	2601.31	52.17	3.89	> 150
12	IWSOE70 3-18-01 bio	14303-17	0.13125	0.01069	0.038	100	2617.48	52.54	4.42	> 150
12	IWSOE70 3-18-01 bio	14303-26	0.06351	0.01123	0.026	99.7	2631.71	52.87	5.03	> 150
12	IWSOE70 3-18-01 bio	14303-01	0.00484	0.00389	0.122	100	2642.48	52.94	3.17	> 150
12	IWSOE70 3-18-01 bio	14303-24	0.28952	0.05378	0.01	99.8	2653.42	53.62	7.67	> 150
12	IWSOE70 3-18-01 bio	14303-02	0.05354	0.01304	0.03	99.8	2655.73	53.35	4.99	> 150
12	IWSOE70 3-18-01 bio	14303-28	0.00957	0.02241	0.022	100	2677.50	53.83	5.47	> 150
12	IWSOE70 3-18-01 bio	14303-31	0.01084	0.02798	0.019	99.9	2682.16	54.05	6.62	> 150
12	IWSOE70 3-18-01 bio	14303-07	0.00083	0.00667	0.074	100	2707.64	54.29	3.86	> 150
12	IWSOE70 3-18-01 bio	14303-14	0.02308	0.01239	0.058	100	2714.68	54.43	3.78	> 150
12	IWSOE70 3-18-01 bio	14303-06	0.00991	0.01339	0.023	100	2729.96	54.94	6.10	> 150
12	IWSOE70 3-18-01 bio	14303-23	0.02738	0.0157	0.035	99.8	2806.35	56.34	4.89	> 150
12	IWSOE70 3-18-01 bio	14303-15	0.03908	0.01448	0.027	100	2828.55	56.80	5.04	> 150

13 IO 1277-41 no biotites

14	IO 1277-23 887-889 bio	14312-30	0.03559	0.00963	0.045	95.4	257.66	5.23	0.90	> 150
14	IO 1277-23 887-889 bio	14312-24	0.01684	0.01854	0.039	97.3	264.10	5.35	0.84	> 150
14	IO 1277-23 887-889 bio	14312-23	0.03215	0.01421	0.036	97.1	329.59	6.67	1.05	> 150
14	IO 1277-23 887-889 bio	14312-21	0.01467	0.00934	0.047	98.9	395.96	7.99	1.08	> 150
14	IO 1277-23 887-889 bio	14312-02	0.0149	0.00952	0.04	97.5	403.06	8.16	1.25	> 150
14	IO 1277-23 887-889 bio	14312-19	0.11518	0.01955	0.012	98.1	414.86	8.56	2.12	> 150
14	IO 1277-23 887-889 bio	14312-28	0.05646	0.01882	0.044	99.2	415.84	8.39	1.11	> 150

27 *This study*

29 *This study*

14	IO 1277-23 887-889 bio	14312-01	0.02742	0.01085	0.063	99.7	420.77	8.47	1.00	> 150
14	IO 1277-23 887-889 bio	14312-10	0.00736	0.01219	0.038	97	420.99	8.51	1.26	> 150
14	IO 1277-23 887-889 bio	14312-17	0.00514	0.00825	0.111	99.7	422.86	8.51	0.96	> 150
14	IO 1277-23 887-889 bio	14312-14	0.04342	0.00751	0.048	99.4	423.29	8.55	1.17	> 150
14	IO 1277-23 887-889 bio	14312-22	0.0113	0.02364	0.015	99.3	429.06	8.80	1.96	> 150
14	IO 1277-23 887-889 bio	14312-27	0.0394	0.01817	0.051	99.8	430.35	8.67	1.03	> 150
14	IO 1277-23 887-889 bio	14312-25	0.00907	0.01683	0.041	99.1	431.30	8.71	1.19	> 150
14	IO 1277-23 887-889 bio	14312-26	0.05916	0.01236	0.056	99.1	439.35	8.85	1.06	> 150
14	IO 1277-23 887-889 bio	14312-04	0.01285	0.02404	0.029	99	444.44	9.02	1.50	> 150
14	IO 1277-23 887-889 bio	14312-06	0.00255	0.01156	0.069	99.9	446.31	8.99	1.03	> 150
14	IO 1277-23 887-889 bio	14312-29	0.01497	0.01435	0.027	99.2	446.57	9.08	1.63	> 150
14	IO 1277-23 887-889 bio	14312-16	0.00796	0.01614	0.025	99.8	449.93	9.15	1.65	> 150
14	IO 1277-23 887-889 bio	14312-15	0.01596	0.01314	0.033	99.6	451.84	9.14	1.38	> 150
14	IO 1277-23 887-889 bio	14312-18	0.00149	0.02294	0.031	99.8	452.61	9.15	1.33	> 150
14	IO 1277-23 887-889 bio	14312-13	0.0091	0.01447	0.026	100	455.43	9.24	1.57	> 150
14	IO 1277-23 887-889 bio	14312-05	0.01885	0.00446	0.034	99.6	457.21	9.24	1.34	> 150
14	IO 1277-23 887-889 bio	14312-11	0.00966	0.01499	0.046	99.7	457.31	9.23	1.22	> 150
14	IO 1277-23 887-889 bio	14312-12	0.01124	0.01218	0.044	98	470.14	9.50	1.38	> 150
14	IO 1277-23 887-889 bio	14312-03	0.04249	0.00758	0.052	99.5	492.07	9.92	1.21	> 150
14	IO 1277-23 887-889 bio	14312-09	0.00387	0.01252	0.371	99.7	494.44	9.93	0.86	> 150
14	IO 1277-23 887-889 bio	14312-07	0.00653	0.01111	0.046	99.7	554.87	11.18	1.34	> 150
14	IO 1277-23 887-889 bio	14312-20	0.02253	0.00966	0.072	98.9	720.75	14.50	1.60	> 150
15	JPC 40 2240 bio	14653-07A	0.05903	0.00535	1.105	99.2	449.51	0.93	4.59	> 150
15	JPC 40 2245 bio	14652-10A	0.01057	0.00717	0.157	94.8	497.05	1.24	5.12	> 150
15	JPC 40 2240 bio	14653-02A	0.01079	0.01461	0.143	99.5	503.08	1.06	5.14	> 150
15	JPC 40 2245 bio	14652-04A	0.00689	0.00844	0.358	99.5	503.87	1.06	5.15	> 150
15	JPC 40 2370 bio	14654-01A	0.17873	0.02039	0.155	99.4	504.47	1.17	5.18	> 150
15	JPC 40 2240 bio	14653-05A	0.03769	0.00733	0.358	99.7	510.54	1.07	5.22	> 150
15	JPC 40 2240 bio	14653-08A	0.0037	0.03805	0.73	99.7	519.73	1.08	5.31	> 150
15	JPC 40 2240 bio	14653-01A	0.14411	0.0062	0.183	98.8	520.28	1.10	5.32	> 150
15	JPC 40 2370 bio	14654-09A	0.01121	0.00908	0.179	99	525.56	1.19	5.39	> 150
15	JPC 40 2245 bio	14652-11A	0.012	0.00788	0.167	99	527.20	1.17	5.40	> 150
15	JPC 40 2245 bio	14652-02A	0.0077	0.00812	0.144	98.8	528.48	1.18	5.42	> 150
15	JPC 40 2245 bio	14652-08A	0.15406	0.01271	0.087	94.9	528.49	1.38	5.46	> 150
15	JPC 40 2245 bio	14652-03A	0.01297	0.01292	0.185	99	530.66	1.16	5.43	> 150
15	JPC 40 2370 bio	14654-08A	0.59466	0.00797	0.223	99.8	538.17	1.15	5.50	> 150
15	JPC 40 2370 bio	14654-10A	0.0599	0.00982	0.319	99.5	548.47	1.11	5.60	> 150
15	JPC 40 2245 bio	14652-01A	0.22143	0.00937	0.133	98.6	553.77	1.17	5.66	> 150
15	JPC 40 2240 bio	14653-09A	0.01191	0.0096	0.194	99.4	560.72	1.20	5.73	> 150
15	JPC 40 2370 bio	14654-04A	0.06666	0.01565	0.046	97.8	564.52	1.98	5.98	> 150
15	JPC 40 2370 bio	14654-05A	0.01204	0.00734	0.131	99.2	582.53	1.41	5.99	> 150
15	JPC 40 2370 bio	14654-11A	0.03983	0.01385	0.119	99.4	583.81	1.26	5.97	> 150
15	JPC 40 2370 bio	14654-07A	0.20377	0.01084	0.325	97.8	617.44	1.38	6.33	> 150
15	JPC 40 2245 bio	14652-09A	0.12264	0.00739	0.164	99.5	670.50	1.36	6.84	> 150
15	JPC 40 2370 bio	14654-03A	0.26895	0.00896	0.193	99.9	784.04	1.50	7.98	> 150

15	JPC 40 2370 bio	14654-06A	0.01486	0.01048	0.215	99.8	1093.08	1.97	11.11	> 150
15	JPC 40 2370 bio	14654-02A	0.01937	0.00507	0.225	99.7	1492.78	2.54	15.14	> 150
16	ELP-01 bio	13548-01	0.00086	-0.00003	0.691	99.5	507.43	3.82	6.35	> 150
16	ELP-01 bio	13548-02	-0.01341	-0.00039	0.385	99.4	1404.56	9.13	16.75	> 150
16	ELP-01 bio	13548-03	0.10925	0.00212	2.915	98.6	1072.45	8.27	13.54	> 150
16	ELP-01 bio	13548-04	0.00104	0.00033	3.249	99.8	1140.02	7.36	13.57	> 150
16	ELP-01 bio	13548-05	0.00413	0.00201	0.612	98.6	523.69	4.09	6.65	> 150
16	ELP-01 bio	13548-06	0.00293	0.01147	4.336	99.3	481.52	4.03	6.28	> 150
16	ELP-01 bio	13548-07	8.0996	0.03579	0.115	98	939.97	7.23	11.86	> 150
16	ELP-01 bio	13548-08	0.00167	0.0028	1.982	99.8	466.86	3.60	5.90	> 150
16	ELP-01 bio	13548-09	0.00266	0.01164	1.417	99.9	1659.91	10.54	19.66	> 150
16	ELP-01 bio	13548-10	0.02249	0.00555	0.972	98.3	722.00	5.69	9.19	> 150
16	ELP-01 bio	13548-11	-0.00793	0.00981	0.303	99.2	1110.88	8.65	14.08	> 150
16	ELP-01 bio	13548-12	0.00401	0.0035	0.602	98.4	1009.93	7.02	12.30	> 150
16	ELP-01 bio	13548-13	-0.0021	-0.01121	0.079	99.8	1156.17	8.18	14.17	> 150
16	ELP-01 bio	13548-14	0.01242	-0.00567	0.323	99.5	1058.82	7.05	12.72	> 150
16	ELP-01 bio	13548-15	1.35936	0.00457	1.315	95.3	798.25	6.68	10.41	> 150
16	ELP-01 bio	13548-16	0.00986	0.00399	0.892	99.5	447.27	2.19	4.98	> 150
16	ELP-01 bio	13548-17	0.01871	0.00469	1.076	64	224.86	3.63	4.27	> 150
16	ELP-01 bio	13548-18	0.00873	0.00452	0.401	99.4	997.12	4.35	10.88	> 150
16	ELP-01 bio	13548-19	0.00102	0.0102	0.438	99.4	568.87	3.22	6.54	> 150
16	ELP-01 bio	13548-20	0.04174	0.00276	3.493	99.3	454.85	2.70	5.29	> 150
16	ELP-01 bio	13548-21	0.04196	0.00618	1.336	99.1	506.50	2.73	5.75	> 150
16	ELP-01 bio	13548-22	-0.00127	0.00524	0.77	99.9	1130.45	4.72	12.25	> 150
16	ELP-01 bio	13548-23	0.00133	0.00219	0.449	99	475.73	3.00	5.62	> 150
16	ELP-01 bio	13548-24	0.01142	0.00526	0.204	99.4	1147.07	5.32	12.64	> 150
16	ELP-01 bio	13548-25	-0.00687	0.01097	0.952	99.6	503.33	2.47	5.61	> 150
16	ELP-01 bio	13548-26	-0.01343	0.00608	0.481	99.5	510.70	3.01	5.93	> 150
16	ELP-01 bio	13548-27	0.00243	0.00783	0.72	99.5	1144.37	5.10	12.53	> 150
16	ELP-01 bio	13548-28	-0.05043	0.01002	0.088	89.3	483.94	3.87	6.20	> 150
16	ELP-01 bio	13548-29	-0.00461	0.01168	0.358	99.8	1119.95	4.76	12.17	> 150
16	ELP-01 bio	13548-31	0.00989	0.00505	0.675	83.3	343.52	3.02	4.57	> 150
16	ELP-01 bio	13548-32	-0.01971	-0.00057	0.43	99.6	1100.16	5.91	12.49	> 150
16	ELP-01 bio	13548-33	0.01485	0.00384	0.759	98.1	444.15	2.33	5.02	> 150
16	ELP-01 bio	13548-34	-0.05278	0.00796	0.082	98.3	499.95	3.36	6.03	> 150
16	ELP-01 bio	13548-35	-0.15758	0.04274	0.03	100.2	503.45	7.29	8.86	> 150
16	ELP-01 bio	13548-36	0.00767	0.00334	1.67	98.1	944.34	5.29	10.82	> 150
16	ELP-01 bio	13548-37	-0.0484	0.02062	0.122	97.6	535.07	3.27	6.27	> 150
16	ELP-01 bio	13548-38	0.02875	-0.01284	0.054	97.7	1093.03	7.39	13.19	> 150
16	ELP-01 bio	13548-39	0.06853	0.00887	0.228	56.8	220.64	4.56	5.07	> 150
16	ELP-01 bio	13548-40	0.01417	0.00414	0.169	98.7	645.95	3.59	7.39	> 150
16	ELP-01 bio	13548-41	-0.01407	0.0064	0.475	99.8	1176.76	6.07	13.24	> 150
16	ELP-01 bio	13548-42	-0.02039	0.01221	0.286	99.7	1141.40	5.04	12.48	> 150
16	ELP-02 bio	13551-01	0.00287	0.00407	2.209	96.7	515.07	4.36	6.75	> 150
16	ELP-02 bio	13551-02	0.00349	0.00412	1.971	99.4	774.58	6.01	9.81	> 150

145 *Pierce et al. (2011)*

16	ELP-02 bio	13551-03	-0.0118	0.00431	0.358	98.7	509.64	3.99	6.47	> 150
16	ELP-02 bio	13551-04	-0.01112	0.00776	0.606	99.7	915.38	6.20	11.05	> 150
16	ELP-02 bio	13551-05	0.04628	0.00103	0.825	97.9	908.72	6.78	11.34	> 150
16	ELP-02 bio	13551-06	0.02234	0.01522	0.115	99.2	508.25	5.11	7.21	> 150
16	ELP-02 bio	13551-07	0.08201	0.00893	1.403	99.7	1217.39	8.37	14.77	> 150
16	ELP-02 bio	13551-08	0.10319	0.00383	1.182	98.6	911.62	6.57	11.24	> 150
16	ELP-02 bio	13551-09	0.0235	0.00385	0.734	98.5	482.90	4.05	6.30	> 150
16	ELP-02 bio	13551-10	0.05517	0.00226	0.374	99.6	1508.11	9.97	18.08	> 150
16	ELP-02 bio	13551-11	0.08023	0.00492	1.225	99.5	1273.00	8.19	15.14	> 150
16	ELP-02 bio	13551-12	0.07386	0.00445	0.136	93.2	286.27	3.22	4.31	> 150
16	ELP-02 bio	13551-13	0.01007	0.00197	0.315	84.8	568.12	6.98	9.00	> 150
16	ELP-02 bio	13551-14	0.01367	0.00382	0.43	99	1098.27	7.32	13.20	> 150
16	ELP-02 bio	13551-15	0.0072	0.01089	3.869	99.8	1313.26	9.69	16.32	> 150
16	ELP-02 bio	13551-16	-0.0127	0.00789	0.766	99.7	963.08	4.98	10.84	> 150
16	ELP-02 bio	13551-17	-0.00269	0.00408	0.347	99.3	939.48	4.27	10.32	> 150
16	ELP-02 bio	13551-18	0.05821	0.00176	0.685	99.2	513.42	3.01	5.95	> 150
16	ELP-02 bio	13551-19	0.00229	0.00689	1.553	98.1	656.73	3.47	7.43	> 150
16	ELP-02 bio	13551-20	0.02915	0.01087	0.62	95.2	486.57	3.06	5.75	> 150
16	ELP-02 bio	13551-21	0.32719	0.00107	0.22	91.4	1256.76	7.03	14.40	> 150
16	ELP-02 bio	13551-22	0.90027	0.02056	0.092	31.3	159.05	8.11	8.27	> 150
16	ELP-02 bio	13551-23	-0.01485	0.00868	0.709	99.8	878.47	4.62	9.93	> 150
16	ELP-02 bio	13551-24	0.19459	0.00825	0.103	69.2	683.86	8.64	11.02	> 150
16	ELP-02 bio	13551-25	-0.02315	0.00602	0.273	98.6	531.12	2.91	6.06	> 150
16	ELP-02 bio	13551-26	0.01576	0.01103	0.626	94.7	431.31	2.77	5.12	> 150
16	ELP-02 bio	13551-27	0.02383	0.00392	0.432	99.1	1059.35	5.77	12.06	> 150
16	ELP-02 bio	13551-28	-0.01071	0.00883	0.224	99	493.29	3.55	6.08	> 150
16	ELP-06 bio	13560-01	0.03579	0.00014	0.272	24.5	278.80	21.43	21.61	> 150
16	ELP-06 bio	13560-02	0.00975	0.0043	0.266	95.1	524.26	4.11	6.66	> 150
16	ELP-06 bio	13560-03	-0.00176	0.00175	0.72	99.4	1109.64	5.74	12.49	> 150
16	ELP-06 bio	13560-04	0.00223	0.00442	1.794	99.5	505.61	2.85	5.81	> 150
16	ELP-06 bio	13560-05	0.01338	0.01786	1.732	99.2	519.14	2.95	5.97	> 150
16	ELP-06 bio	13560-06	0.00046	0.00538	0.646	99.7	3285.22	13.67	35.58	> 150
16	ELP-06 bio	13560-07	0.01186	0.00451	1.172	99.2	1067.11	5.72	12.11	> 150
16	ELP-06 bio	13560-08	0.00433	0.00201	2.027	99.6	1145.89	5.65	12.78	> 150
16	ELP-06 bio	13560-09	0.52025	-0.00264	0.546	90.5	918.08	7.28	11.72	> 150
16	ELP-06 bio	13560-10	-0.0031	0.00481	0.371	99.9	1150.61	6.60	13.26	> 150
16	ELP-06 bio	13560-11	-0.02697	0.00946	0.294	98.9	493.52	3.52	6.06	> 150
16	ELP-06 bio	13560-12	0.01416	0.00083	0.39	95.2	499.80	3.40	6.05	> 150
16	ELP-06 bio	13560-13	-0.00335	0.01853	0.493	92.7	487.09	3.63	6.07	> 150
16	ELP-06 bio	13560-14	-0.00127	0.00226	1.083	99.7	1041.83	5.85	11.95	> 150
16	ELP-06 bio	13560-15	0.01073	0.01023	0.323	99.8	487.96	3.37	5.93	> 150
16	ELP-06 bio	13560-16	0.01635	0.00197	3.29	99.9	1147.82	6.86	13.37	> 150
16	ELP-06 bio	13560-17	0.05165	0.00248	2.084	80.3	426.66	4.42	6.15	> 150
16	ELP-06 bio	13560-18	-0.0076	0.00752	0.373	98.2	502.99	3.36	6.05	> 150
16	ELP-06 bio	13560-19	0.03065	0.00044	0.807	89.9	497.14	3.76	6.23	> 150
16	ELP-06 bio	13560-20	-0.00029	0.01169	1.659	99.6	500.10	2.81	5.74	> 150

16	ELP-06 bio	13560-21	-0.00611	0.01142	0.487	97.6	516.54	3.01	5.98	> 150
16	ELP-06 bio	13560-22	0.05987	0.00538	0.377	69.8	239.60	3.61	4.33	> 150
16	ELP-06 bio	13560-23	0.00452	0.00822	0.524	99.3	493.84	2.70	5.63	> 150
16	ELP-06 bio	13560-24	0.00388	0.00798	0.276	48.9	66.60	2.14	2.24	> 150
16	ELP-06 bio	13560-25	-0.0095	0.00014	0.322	97.7	498.27	2.99	5.81	> 150
16	ELP-06 bio	13560-26	0.02175	0.00968	2.543	99	518.59	3.00	5.99	> 150
16	ELP-06 bio	13560-27	0.0009	-0.01101	0.203	24.8	199.06	13.21	13.36	> 150
16	ELP-06 bio	13560-28	0.00449	0.00392	0.618	99.7	836.70	4.55	9.53	> 150
16	ELP-06 bio	13560-29	-0.11361	-0.00093	0.074	99.1	528.20	3.30	6.23	> 150
16	ELP-06 bio	13560-30	-0.01041	0.01398	0.33	93	509.93	3.69	6.30	> 150
16	ELP-06 bio	13560-31	0.01164	0.00208	1.426	99.6	775.77	3.80	8.64	> 150
16	ELP-06 bio	13560-33	-0.00704	-0.00016	0.535	99	1082.27	5.78	12.27	> 150
16	ELP-06 bio	13560-34	-0.00592	0.00911	0.621	99.3	764.52	3.68	8.48	> 150
16	ELP-06 bio	13560-35	-0.00169	0.00374	4.04	99.9	894.95	5.28	10.39	> 150
16	ELP-06 bio	13560-36	0.01968	0.01191	1.251	97.7	596.63	3.31	6.82	> 150
16	ELP-06 bio	13560-37	0.01224	-0.00004	0.772	90	479.10	3.61	6.00	> 150
16	ELP-06 bio	13560-38	-0.04828	0.01207	0.085	93.6	464.34	3.66	5.91	> 150
16	ELP-06 bio	13560-40	-0.00572	0.00938	0.326	98.4	501.91	2.66	5.68	> 150
16	ELP-06 bio	13560-41	0.02196	0.00518	0.542	99.8	1147.75	4.83	12.45	> 150
16	ELP-09 bio	13568-01	-0.01652	0.00225	0.221	99.9	1217.29	2.63	12.45	> 150
16	ELP-09 bio	13568-02	0.00354	-0.00403	0.232	99.5	1199.20	2.62	12.27	> 150
16	ELP-09 bio	13568-03	0.04906	-0.00244	0.448	99.8	1354.18	2.66	13.80	> 150
16	ELP-09 bio	13568-04	0.30181	0.00354	4.572	99.7	525.95	2.22	5.71	> 150
16	ELP-09 bio	13568-05	0.0088	-0.00017	0.137	99.7	1222.83	7.43	14.31	> 150
16	ELP-09 bio	13568-07	-0.00255	0.00434	2.336	99.2	599.14	2.10	6.35	> 150
16	ELP-09 bio	13568-08	0.01109	-0.00126	0.353	98.4	573.59	1.18	5.86	> 150
16	ELP-09 bio	13568-10	0.00487	0.00749	0.477	100.2	518.54	0.92	5.27	> 150
16	ELP-09 bio	13568-11	0.00367	0.00651	0.252	100.3	527.70	1.28	5.43	> 150
16	ELP-09 bio	13568-12	0.00471	0.00615	0.704	99.7	516.71	0.82	5.23	> 150
16	ELP-09 bio	13568-13	-0.00846	0.00746	0.835	99.7	513.97	0.73	5.19	> 150
16	ELP-09 bio	13568-14	0.00597	0.00647	0.677	99.9	518.57	1.66	5.45	> 150
16	ELP-09 bio	13568-15	0.08958	0.00607	1.709	99.7	561.51	1.24	5.75	> 150
16	ELP-09 bio	13568-16	-0.0163	0.01024	0.12	97.1	519.13	2.03	5.58	> 150
16	ELP-09 bio	13568-17	-0.05456	0.01474	0.166	100	528.46	1.79	5.58	> 150
16	ELP-09 bio	13568-18	-0.00778	0.00587	1.517	99.9	532.23	1.36	5.49	> 150
16	ELP-09 bio	13568-20	0.00413	0.01332	0.799	99.9	532.27	0.90	5.40	> 150
16	ELP-09 bio	13568-21	-0.0032	0.00741	0.879	99.6	519.12	0.79	5.25	> 150
16	ELP-09 bio	13568-22	-0.01333	0.03717	0.217	99.8	533.86	2.48	5.89	> 150
16	ELP-09 bio	13568-23	0.00325	0.00325	1.078	99.5	525.90	1.51	5.47	> 150
16	ELP-09 bio	13568-24	1.7496	0.00067	0.287	98.2	573.71	2.18	6.14	> 150
16	ELP-09 bio	13568-25	-0.03147	0.00544	0.236	99	528.01	1.37	5.46	> 150
16	ELP-09 bio	13568-26	-0.00009	0.01054	0.882	99.2	527.41	1.47	5.48	> 150
16	ELP-09 bio	13568-27	5.14894	0.08931	0.307	99.2	582.27	1.15	5.94	> 150
16	ELP-09 bio	13568-28	-0.01798	0.00685	0.33	99.6	521.87	1.14	5.34	> 150
16	ELP-09 bio	13568-29	-0.01345	0.00507	0.353	99.7	516.99	2.27	5.65	> 150
16	ELP-09 bio	13568-30	0.00708	0.00486	0.391	99.6	513.39	1.82	5.45	> 150

16	ELP-09 bio	13568-31	-0.01153	-0.00331	0.18	99.2	520.40	2.30	5.69	> 150
16	ELP-09 bio	13568-32	0.00287	0.02875	0.131	100.7	520.09	2.95	5.98	> 150
16	ELP-09 bio	13568-33	-0.00823	0.00428	0.389	99.7	1182.67	3.21	12.25	> 150
16	ELP-09 bio	13568-34	-0.01202	0.00281	0.443	97.2	522.18	1.04	5.32	> 150
16	ELP-09 bio	13568-35	-0.07805	-0.31715	0.002	56.4	580.68	37.19	37.65	> 150
16	ELP-09 bio	13568-36	-0.01713	0.00678	0.322	99.9	530.27	0.98	5.39	> 150
16	ELP-09 bio	13568-37	-0.03893	0.00697	0.306	98	523.43	0.96	5.32	> 150
16	ELP-09 bio	13568-38	-0.14468	0.01073	0.05	102	535.14	3.32	6.30	> 150
16	ELP-09 bio	13568-39	-0.11783	-0.0009	0.083	100.5	518.35	3.81	6.44	> 150
16	ELP-09 bio	13568-40	-0.52835	0.00516	0.019	102.7	515.50	11.16	12.29	> 150

17	JPC 34 345.5 bio	14648-01A	0.02305	0.01279	0.067	99	503.20	1.17	5.17	> 150
17	JPC 34 345.5 bio	14648-02A	0.05128	0.00522	0.095	57.6	383.51	2.28	4.46	> 150
17	JPC 34 345.5 bio	14648-03A	0.05282	0.00408	0.527	99.4	479.25	0.81	4.86	> 150
17	JPC 34 345.5 bio	14648-04A	0.00419	0.00448	0.357	99.6	506.74	0.91	5.15	> 150
17	JPC 34 345.5 bio	14648-05A	0.0158	0.00876	0.081	98.5	488.96	1.09	5.01	> 150
17	JPC 34 345.5 bio	14648-06A	0.0168	0.0502	0.058	99.7	525.96	1.19	5.39	> 150
17	JPC 34 345.5 bio	14648-07A	0.0252	0.0152	0.059	98.8	457.22	1.07	4.70	> 150
17	JPC 34 345.5 bio	14648-08A	0.00429	0.00845	0.17	98.5	490.09	0.90	4.98	> 150
17	JPC 34 345.5 bio	14648-09A	0.01519	0.00976	0.141	99.6	499.73	0.94	5.08	> 150
17	JPC 34 345.5 bio	14648-10A	0.01922	0.01746	0.05	97.8	473.08	1.22	4.89	> 150
17	JPC 34 345.5 bio	14648-11A	0.0293	0.00705	0.152	97.2	482.02	0.91	4.90	> 150
17	JPC 34 345.5 bio	14648-12A	0.02538	0.01058	0.342	81.8	480.58	1.36	4.99	> 150
17	JPC 34 345.5 bio	14648-13A	0.02734	0.00888	0.094	87.7	399.41	1.04	4.13	> 150
17	JPC 34 345.5 bio	14648-14A	0.01915	0.0189	0.067	99.9	797.05	1.61	8.13	> 150
17	JPC 34 345.5 bio	14648-15A	0.23556	0.00818	0.164	99.9	485.61	0.85	4.93	> 150
17	JPC 34 345.5 bio	14648-16A	0.02082	0.0091	0.108	99.6	489.53	0.93	4.98	> 150
17	JPC 34 345.5 bio	14648-17A	0.00858	0.01151	0.092	99.4	510.81	1.07	5.22	> 150
17	JPC 34 345.5 bio	14648-18A	0.01639	0.01445	0.035	93.5	485.58	1.53	5.09	> 150
17	JPC 34 345.5 bio	14648-19A	0.01603	0.01594	0.066	99.7	482.31	1.03	4.93	> 150
17	JPC 34 345.5 bio	14648-20A	0.02615	0.007	0.154	99	434.80	0.80	4.42	> 150
17	JPC 34 345.5 bio	14648-21A	0.04615	0.00879	0.099	97.5	406.79	0.88	4.16	> 150
17	JPC 34 345.5 bio	14648-22A	0.00836	0.00466	0.2	94.1	492.44	1.24	5.08	> 150
17	JPC 34 345.5 bio	14648-23A	0.03108	0.01074	0.056	98.1	487.41	1.57	5.12	> 150
17	JPC 34 345.5 bio	14648-24A	0.03093	0.00596	0.18	96.8	497.59	1.14	5.11	> 150
17	JPC 34 292 bio	14649-20A	0.01544	0.0011	0.158	45.6	204.99	2.07	2.92	> 150
17	JPC 34 292 bio	14649-21A	0.01495	0.00548	0.276	98.9	492.11	1.09	5.04	> 150
17	JPC 34 292 bio	14649-22A	0.00684	0.00686	0.165	99.3	474.85	1.09	4.87	> 150
17	JPC 34 292 bio	14649-23A	0.01189	0.0139	0.086	96.9	476.79	1.27	4.93	> 150
17	JPC 34 292 bio	14649-24A	0.03204	0.00894	0.154	99.3	484.69	1.05	4.96	> 150
17	JPC 34 292 bio	14649-25A	0.01446	0.00897	0.154	89.8	498.98	1.45	5.20	> 150
17	JPC 34 292 bio	14649-26A	0.03997	0.00685	0.144	94.2	478.46	1.20	4.93	> 150
17	JPC34 292 bio	14649-01A	0.02415	0.01178	0.068	97.9	483.15	1.56	5.08	> 150
17	JPC34 292 bio	14649-02A	0.03582	0.0047	0.147	79.3	451.62	2.38	5.10	> 150
17	JPC34 292 bio	14649-03A	0.03902	0.01202	0.059	96.8	519.52	1.72	5.47	> 150
17	JPC34 292 bio	14649-04A	0.00681	0.00877	0.109	93.5	461.89	1.60	4.89	> 150

50

This study

17	JPC34 292 bio	14649-05A	0.01423	0.01214	0.074	79.5	417.19	2.28	4.75	> 150
17	JPC34 292 bio	14649-06A	0.02021	0.01141	0.05	82	451.45	2.33	5.08	> 150
17	JPC34 292 bio	14649-07A	0.03709	0.01215	0.083	92.7	438.77	1.59	4.67	> 150
17	JPC34 292 bio	14649-08A	0.02456	0.0065	0.152	87.7	453.40	1.84	4.89	> 150
17	JPC34 292 bio	14649-09A	0.02637	0.01757	0.056	98.1	568.51	1.73	5.94	> 150
17	JPC34 292 bio	14649-10A	0.00833	0.01127	0.449	98.9	500.72	1.36	5.19	> 150
17	JPC34 292 bio	14649-11A	0.05262	0.02817	0.022	98.2	490.69	1.97	5.29	> 150
17	JPC34 292 bio	14649-12A	0.02361	0.01455	0.08	95.9	489.37	1.59	5.15	> 150
17	JPC34 292 bio	14649-13A	0.03093	0.01737	0.047	98.8	498.67	1.75	5.28	> 150
17	JPC34 292 bio	14649-14A	0.01815	0.01093	0.082	99.6	485.86	1.40	5.06	> 150
17	JPC34 292 bio	14649-15A	0.01956	0.01317	0.112	97.5	475.17	1.47	4.97	> 150
17	JPC34 292 bio	14649-16A	0.02841	0.00025	0.081	58	361.86	3.69	5.17	> 150
17	JPC34 292 bio	14649-17A	0.02766	0.01705	0.04	94.7	487.78	1.86	5.22	> 150
17	JPC34 292 bio	14649-18A	0.01959	0.01316	0.073	99.5	560.24	1.61	5.83	> 150
17	JPC34 292 bio	14649-19A	0.04353	0.00743	0.144	98.5	453.78	1.32	4.73	> 150

18	ODP188 1166A 26-1W 100-102 cm	12604-01	0.4			17	216		33	16	<i>This study</i>
18	ODP188 1166A 26-1W 100-102 cm	12604-02	0			88	400		1		
18	ODP188 1166A 26-1W 100-102 cm	12604-03	0			91	342		1		
18	ODP188 1166A 26-1W 100-102 cm	12604-04	0			99	501		1		
18	ODP188 1166A 26-1W 100-102 cm	12604-05	0.2			94	516		3		
18	ODP188 1166A 26-1W 100-102 cm	12604-06	0.1			97	617		2		
18	ODP188 1166A 26-1W 100-102 cm	12604-07	0.2			97	529		2		
18	ODP188 1166A 26-1W 100-102 cm	12604-08	0.9			86	528		6		
18	ODP188 1166A 26-1W 100-102 cm	12604-09	0.3			95	552		2		
18	ODP188 1166A 26-1W 100-102 cm	12604-10	0.2			51	314		8		
18	ODP188 1166A 26-1W 100-102 cm	12604-11	0.1			96	499		1		
18	ODP188 1166A 26-1W 100-102 cm	12604-12	0			97	580		2		
18	ODP188 1166A 26-1W 100-102 cm	12604-13	0.2			95	560		2		
18	ODP188 1166A 26-1W 100-102 cm	12604-14	0			97	500		3		
18	ODP188 1166A 26-1W 100-102 cm	12604-16	0			202	585		52		
18	ODP188 1166A 26-1W 100-102 cm	12604-17	0.4			83	553		6		

19	JPC 25 1305 bio	14651-08A	0.04029	0.03215	0.038	93.8	477.76	1.60	5.04	> 150	14	<i>This study</i>
19	JPC 25 1305 bio	14651-14A	0.12401	0.03946	0.013	83.4	481.80	2.61	5.48	> 150		
19	JPC 25 1305 bio	14651-12A	0.05736	0.02608	0.022	78.8	483.07	2.39	5.39	> 150		
19	JPC 25 1305 bio	14651-13A	0.13519	0.02507	0.017	78.2	487.67	2.65	5.55	> 150		
19	JPC 25 1305 bio	14651-05A	0.05908	0.02178	0.037	94.3	501.62	1.64	5.28	> 150		
19	JPC 25 1305 bio	14651-01A	0.04686	0.03988	0.04	98.3	502.53	1.39	5.21	> 150		
19	JPC 25 1305 bio	14651-03A	0.12078	0.0505	0.022	98.7	504.63	1.82	5.36	> 150		
19	JPC 25 1305 bio	14651-07A	0.0463	0.03857	0.024	91.6	506.94	2.04	5.46	> 150		
19	JPC 25 1305 bio	14651-06A	0.04606	0.02993	0.053	97.2	512.42	1.40	5.31	> 150		
19	JPC 25 1305 bio	14651-10A	0.11796	0.01993	0.025	99.4	526.11	1.73	5.54	> 150		
19	JPC 25 1305 bio	14651-04A	0.03053	0.024	0.036	98.9	539.25	1.71	5.66	> 150		
19	JPC 25 1305 bio	14651-11A	0.1746	0.02194	0.059	98	555.48	1.51	5.76	> 150		
19	JPC 25 1305 bio	14651-15A	0.11707	0.03477	0.009	94.4	576.45	2.84	6.43	> 150		

19	JPC 25 1305 bio	14651-02A	0.02112	0.00976	0.061	99.5	639.14	1.51	6.57	> 150	
20	ELT49-30 bio	12674-27	0.0191	0.00411	3.2	87.6	499.54	1.38	5.18	> 150	30 <i>Pierce et al. (2011)</i>
20	ELT49-30 bio	12674-29	0.00812	0.00719	1.637	98.2	510.41	1.29	5.27	> 150	
20	ELT49-30 bio	12674-28	0.01694	0.00451	1.677	94.2	854.75	2.03	8.79	> 150	
20	ELT49-30 bio	12674-31	0.1078	0.00026	2.784	98.8	1075.20	2.45	11.03	> 150	
20	ELT49-30 bio	12674-30	0.03331	-0.00068	1.427	99.6	1091.06	2.46	11.18	> 150	
20	ELT49-30 bio	12927-10	-0.0573	-0.01131	0.027	2	11.35	4.34	4.34	> 150	
20	ELT49-30 bio	12927-06	0.01065	0.0015	0.129	89.7	456.19	1.52	4.81	> 150	
20	ELT49-30 bio	12927-08	0.06087	0.0002	0.151	75.6	463.47	1.99	5.04	> 150	
20	ELT49-30 bio	12927-09	0.90698	0.01931	0.081	59.6	652.15	3.96	7.63	> 150	
20	ELT49-30 bio	12927-01	0.20779	0.0061	2.198	89.2	935.01	2.44	9.66	> 150	
20	ELT49-30 bio	12927-04	0.0014	0.0064	0.367	95.6	1085.08	2.25	11.08	> 150	
20	ELT49-30 bio	12927-02	0.0045	0.00142	2.803	96.9	1104.12	2.97	11.43	> 150	
20	ELT49-30 bio	12927-05	0.12393	0.00147	0.286	92.7	1111.97	2.58	11.41	> 150	
20	ELT49-30 Bio	13195-03A	0.2678	0.00404	0.644	97.5	480.13	7.30	8.73	> 150	
20	ELT49-30 Bio	13195-04A	0.57563	-0.00665	0.214	99.9	487.90	6.96	8.50	> 150	
20	ELT49-30 Bio	13195-05A	3.18496	0.03092	0.056	98.5	921.00	14.24	16.96	> 150	
20	ELT49-30 Bio	13195-06A	1.51149	0.07848	0.044	92.3	400.31	10.47	11.21	> 150	
20	ELT49-30 Bio	13195-07A	4.19708	0.00882	0.051	92.3	478.21	10.80	11.81	> 150	
20	ELT49-30 Bio	13195-08A	1.52924	0.01458	0.117	94.3	428.01	8.01	9.08	> 150	
20	ELT49-30 Bio	13195-09A	1.86067	0.03671	0.102	97.7	1065.65	14.75	18.20	> 150	
20	ELT49-30 bio 63-150	13469-10	-0.01363	0.00509	0.169	99.4	438.12	3.10	5.37	63-150	
20	ELT49-30 bio 63-150	13469-04	0.03295	0.00417	0.186	96	438.41	2.85	5.23	63-150	
20	ELT49-30 bio 63-150	13469-01	-0.19803	-0.00407	0.027	98.5	494.56	12.59	13.53	63-150	
20	ELT49-30 bio 63-150	13469-06	-0.10724	0.00632	0.071	86.3	855.80	8.22	11.87	63-150	
20	ELT49-30 bio 63-150	13469-03	4.23465	-0.1576	0.006	89.2	943.56	44.04	45.04	63-150	
20	ELT49-30 bio 63-150	13469-11	-0.03363	-0.0051	0.101	100.1	1083.44	3.93	11.52	63-150	
20	ELT49-30 bio 63-150	13469-07	-0.01664	-0.00336	0.014	100.1	1090.93	25.44	27.68	63-150	
20	ELT49-30 bio 63-150	13469-02	0.07033	0.01733	0.023	96.3	1138.72	19.30	22.40	63-150	
20	ELT49-30 bio 63-150	13469-05	-0.3537	0.01548	0.023	99.2	1195.70	20.73	23.93	63-150	
20	ELT49-30 bio 63-150	13469-09	-0.07478	-0.00133	0.092	100.2	1339.83	8.67	15.96	63-150	
21	ELT37-16 bio	12744-01	0.78351	-0.00007	2.901	99.1	1109.10	2.64	11.40	> 150	57 <i>Pierce et al. (2011)</i>
21	ELT37-16 bio	12744-02	0.19596	-0.00013	6.294	99.6	1115.09	3.09	11.57	> 150	
21	ELT37-16 bio	12744-03	0.00718	-0.00133	0.26	99.6	1137.77	2.37	11.62	> 150	
21	ELT37-16 bio	12744-04	0.00837	0.00057	2.255	99.8	1126.58	2.11	11.46	> 150	
21	ELT37-16 bio	12744-05	0.03913	0.00384	1.088	99.1	1117.68	2.60	11.48	> 150	
21	ELT37-16 bio	12744-06	0.06316	-0.00005	0.135	97.2	1126.77	3.56	11.82	> 150	
21	ELT37-16 bio	12744-07	0.04303	0.00514	0.512	98.6	1120.47	3.26	11.67	> 150	
21	ELT37-16 bio	12744-08	0.02158	0.00176	0.881	74.5	829.41	3.28	8.92	> 150	
21	ELT37-16 bio	12744-09	0.02949	0.00103	3.131	99.7	1146.70	2.34	11.70	> 150	
21	ELT37-16 bio	12744-10	0.03649	-0.00087	0.171	96.4	1119.21	3.16	11.63	> 150	
21	ELT37-16 bio	12744-11	0.03032	0.00238	2.05	99.7	1146.40	2.35	11.70	> 150	
21	ELT37-16 bio	12744-12	0.00762	0.00004	2.161	99.8	1141.36	2.28	11.64	> 150	
21	ELT37-16 bio	12744-13	0.01553	0.00143	0.326	99.4	1224.60	3.27	12.68	> 150	

21	ELT37-16 bio	12744-14	0.22075	0.00208	0.479	99.6	2156.93	3.82	21.90	> 150
21	ELT37-16 bio	12744-15	0.0366	0.00523	0.222	99.2	1144.79	2.68	11.76	> 150
21	ELT37-16 bio	12744-16	-0.013	0.00709	0.119	99.2	1106.67	3.32	11.55	> 150
21	ELT37-16 bio	12928-01	0.00991	0.00446	0.697	99	1094.77	1.88	11.11	> 150
21	ELT37-16 bio	12928-02	0.03699	0.00176	8.122	99.6	1144.80	3.42	11.95	> 150
21	ELT37-16 bio	12928-03	0.02334	0.00161	8.255	99.5	1167.45	3.57	12.21	> 150
21	ELT37-16 bio	12928-04	0.02066	0.00227	2.293	97.8	1107.49	2.56	11.37	> 150
21	ELT37-16 bio	12928-05	0.0019	0.00095	2.939	99.4	1123.87	2.85	11.59	> 150
21	ELT37-16 bio	12928-06	0.00294	0.00074	5.467	99.6	1102.29	4.02	11.73	> 150
21	ELT37-16 bio	12928-07	0.29245	0.00274	3.525	99.7	1490.83	3.68	15.35	> 150
21	ELT37-16 bio	12928-08	0.03367	0.00206	3.402	99.2	1141.51	2.93	11.79	> 150
21	ELT37-16 bio	12928-09	-0.1358	0.05578	0.004	57	1265.44	37.17	39.27	> 150
21	ELT37-16 bio	12928-10	0.01568	0.00235	2.992	98.9	1113.06	2.51	11.41	> 150
21	ELT37-16 bio	12928-11	0.01372	0.00064	0.05	47	1111.21	8.36	13.91	> 150
21	ELT37-16 bio	12928-12	48.9179	0.02073	0.083	89.3	1230.36	3.71	12.85	> 150
21	ELT37-16 bio	12928-13	0.00183	0.00193	11.52	99.8	1150.86	3.21	11.95	> 150
21	ELT37-16 bio	12928-14	0.18883	0.00087	10.913	99.8	1155.97	3.55	12.09	> 150
21	ELT37-16 bio	12928-27A	0.00646	0.00178	2.43931	99.66798	1115.91	11.41	15.96	> 150
21	ELT37-16 bio	12928-23A	0.01329	0.00414	1.21944	99.47380	1110.56	11.55	16.02	> 150
21	ELT37-16 bio	12928-24A	0.03889	0.00652	0.76394	98.81441	1161.58	12.11	16.78	> 150
21	ELT37-16 bio	12928-21A	0.06250	0.00345	4.08698	95.32834	1117.22	11.66	16.15	> 150
21	ELT37-16 bio	12928-22A	0.03447	0.00333	2.14866	97.36342	1304.94	13.34	18.66	> 150
21	ELT37-16 bio	12928-15A	0.42960	0.00648	0.15577	66.52241	1104.13	11.27	15.78	> 150
21	ELT37-16 bio	12928-16A	-0.00575	0.00151	0.45641	97.85219	1131.00	11.58	16.19	> 150
21	ELT37-16 bio	12928-29A	-0.02649	-0.00551	0.21533	93.96489	1261.66	12.88	18.03	> 150
21	ELT37-16 bio	12928-25A	-0.05943	-0.01322	0.26569	85.52506	1144.29	11.72	16.38	> 150
21	ELT37-16 bio	12928-18A	-0.38845	0.23639	0.78400	201.35899	1119.88	11.50	16.05	> 150
21	ELT37-16 bio	12928-31A	-0.59189	0.11312	0.01062	48.86034	987.44	10.15	14.16	> 150
21	ELT37-16 bio	12928-19A	0.17738	0.10509	0.12556	61.45938	1097.45	11.22	15.70	> 150
21	ELT37-16 bio	12928-17A	0.00133	0.00381	1.02270	99.23489	1130.20	11.50	16.12	> 150
21	ELT37-16 bio	12928-28A	0.16466	0.00527	0.13683	98.19529	1106.18	11.38	15.87	> 150
21	ELT37-16 bio	12928-26A	3.37668	0.01681	0.05430	97.55484	1074.88	11.23	15.55	> 150
21	ELT37-16 bio	12928-20A	20.88569	0.00899	0.12954	98.92938	1208.59	12.69	17.52	> 150
21	ELT37-16 bio 63-150	13459-05	0.10938	-0.09873	0.015	96	387.36	16.74	17.18	63-150
21	ELT37-16 bio 63-150	13459-06	-0.2063	-0.04991	0.018	93.9	938.30	18.76	20.97	63-150
21	ELT37-16 bio 63-150	13459-04	-0.10684	-0.01023	0.032	99	1039.19	14.60	17.92	63-150
21	ELT37-16 bio 63-150	13459-09	-0.13782	0.00673	0.073	100.1	1098.66	10.63	15.29	63-150
21	ELT37-16 bio 63-150	13459-01	-0.05007	-0.00496	0.057	100.3	1100.75	9.89	14.80	63-150
21	ELT37-16 bio 63-150	13459-03	-0.0369	-0.00419	0.136	100.2	1108.44	6.87	13.04	63-150
21	ELT37-16 bio 63-150	13459-02	0.00003	0.00588	0.136	100.3	1115.24	8.04	13.75	63-150
21	ELT37-16 bio 63-150	13459-10	0.18306	-0.00591	0.136	100.1	1123.05	7.53	13.52	63-150
21	ELT37-16 bio 63-150	13459-08	-0.08053	0.00029	0.115	99.9	1125.66	8.14	13.89	63-150
21	ELT37-16 bio 63-150	13459-11	-0.11938	-0.01516	0.072	100.2	1159.67	9.52	15.00	63-150
21	ELT37-16 bio 63-150	13459-07	-0.20122	-0.02043	0.046	100.6	1260.86	13.46	18.45	63-150

22 ELT37-13 bio 12743-01 0.03879 0.0005 3.204 99.8 1118.64 2.08 11.38 > 150 29 *Pierce et al. (2011)*

22	ELT37-13 bio	12743-02	0.01056	0.00281	0.644	99.7	1123.23	2.42	11.49	> 150
22	ELT37-13 bio	12743-03	0.01104	0.00099	0.976	99.7	1493.72	2.99	15.23	> 150
22	ELT37-13 bio	12743-04	0.01585	0.00115	0.876	98.6	1076.41	2.70	11.10	> 150
22	ELT37-13 bio	12743-05	0.0076	0.0004	1.184	99.3	1115.44	2.63	11.46	> 150
22	ELT37-13 bio	12743-06	-0.0111	0.00194	0.266	99.2	1126.72	2.67	11.58	> 150
22	ELT37-13 bio	12743-07	0.00756	0.00082	1.164	99.6	1128.97	2.36	11.53	> 150
22	ELT37-13 bio	12743-08	0.01184	-0.00005	5.553	99.7	1115.94	2.66	11.47	> 150
22	ELT37-13 bio	12743-09	0.05785	-0.00021	5.629	99.5	1139.43	2.47	11.66	> 150
22	ELT37-13 bio	12743-10	0.01957	0.00095	0.491	98.5	1119.73	2.53	11.48	> 150
22	ELT37-13 bio	12743-11	0.02869	-0.00175	0.187	98.9	1157.96	2.85	11.92	> 150
22	ELT37-13 bio	12743-12	0.0056	0.00003	1.709	99.8	1128.95	2.29	11.52	> 150
22	ELT37-13 bio	12743-13	0.03264	0.00366	0.217	89	1112.16	3.59	11.69	> 150
22	ELT37-13 bio	12743-14	0.01	0.00094	0.901	99.4	1121.64	2.33	11.46	> 150
22	ELT37-13 bio	12743-15	0.00394	0.00132	0.871	99.2	1121.45	2.83	11.56	> 150
22	ELT37-13 bio	12743-16	3.63879	-0.00011	0.432	97.5	1097.12	2.73	11.31	> 150
22	ELT37-13 bio	12743-17	0.02214	0.00103	0.38	99.2	1514.11	3.26	15.49	> 150
22	ELT37-13 bio 63-150	13470-07	0.0205	-0.01823	0.099	96.1	861.02	5.76	10.36	63-150
22	ELT37-13 bio 63-150	13470-09	0.00727	-0.01929	0.055	100.3	1087.61	6.29	12.56	63-150
22	ELT37-13 bio 63-150	13470-12	-0.0658	-0.00607	0.106	99.4	1091.56	4.12	11.67	63-150
22	ELT37-13 bio 63-150	13470-03	-0.02421	0.00296	0.155	99.9	1100.04	3.22	11.46	63-150
22	ELT37-13 bio 63-150	13470-06	-0.05397	-0.013	0.039	97.9	1101.33	15.07	18.67	63-150
22	ELT37-13 bio 63-150	13470-10	-0.06375	0.00089	0.065	100	1104.58	9.78	14.75	63-150
22	ELT37-13 bio 63-150	13470-01	-0.04538	-0.00798	0.068	97.9	1105.80	9.35	14.48	63-150
22	ELT37-13 bio 63-150	13470-02	-0.12526	-0.01857	0.052	100.1	1108.61	12.35	16.60	63-150
22	ELT37-13 bio 63-150	13470-08	-0.03341	0.00898	0.121	99.7	1111.74	7.67	13.51	63-150
22	ELT37-13 bio 63-150	13470-04	-0.0772	0.00113	0.09	100	1119.46	7.68	13.57	63-150
22	ELT37-13 bio 63-150	13470-05	-0.09897	0.01371	0.066	99.9	1121.06	8.88	14.30	63-150
22	ELT37-13 bio 63-150	13470-11	0.00695	-0.01869	0.056	100.3	1132.90	9.70	14.92	63-150
23	ELT37-09 A bio	13577-05	0.62766	0.00038	0.371	76	111.29	0.78	1.36	> 150
23	ELT37-09 A bio	13577-01	0.01798	0.00209	2.435	99.5	459.80	1.53	4.84	> 150
23	ELT37-09 A bio	13577-11	0.01207	0.00149	2.293	99.7	487.55	1.53	5.11	> 150
23	ELT37-09 A bio	13577-15	0.003	0.00755	0.644	99.6	489.99	1.82	5.23	> 150
23	ELT37-09 A bio	13577-10	0.00985	0.00244	0.603	99.1	490.03	1.58	5.15	> 150
23	ELT37-09 A bio	13577-02	0.00079	0.01853	1.005	99.5	495.06	0.65	4.99	> 150
23	ELT37-09 A bio	13577-04	0.11152	0.0008	0.706	99.9	499.77	0.80	5.06	> 150
23	ELT37-09 A bio	13577-12	0.00194	0.00514	0.472	98	1479.01	2.06	14.93	> 150
23	ELT37-09 A bio	13577-06	0.0352	-0.0059	0.379	72.1	1493.07	6.86	16.43	> 150
23	ELT37-09 A bio	13577-07	0.13469	-0.00064	0.732	99.3	1559.09	2.21	15.75	> 150
23	ELT37-09 A bio	13577-14	0.01444	0.00664	0.762	99.8	1590.40	5.24	16.75	> 150
23	ELT37-09 A bio	13577-09	0.0173	0.00401	0.87	99.7	1647.52	4.93	17.20	> 150
23	ELT37-09 A bio	13577-13	-0.00237	0.00173	1.831	99.9	1670.83	5.65	17.64	> 150
23	ELT37-09 A bio	13577-03	0.00553	0.00239	4.186	100	1698.71	7.59	18.61	> 150
23	ELT37-09 B bio	13578-06	0.0064	0.00058	3.085	99	481.45	1.66	5.09	> 150
23	ELT37-09 B bio	13578-03	0.00039	0.00309	2.538	99.5	491.55	1.64	5.18	> 150
23	ELT37-09 B bio	13578-08	-0.0051	-0.00135	0.415	99.8	493.08	1.86	5.27	> 150

23	ELT37-09 B bio	13578-15	0.14303	0.00297	3.384	99.7	493.11	1.94	5.30	> 150
23	ELT37-09 B bio	13578-09	-0.00514	0.00264	1.597	99.8	496.37	1.39	5.15	> 150
23	ELT37-09 B bio	13578-07	-0.0101	0.00352	0.445	99.7	500.73	1.03	5.11	> 150
23	ELT37-09 B bio	13578-12	-0.00043	0.00547	1.905	99.5	512.22	1.37	5.30	> 150
23	ELT37-09 B bio	13578-14	0.06627	0.00054	7.264	99.9	1628.08	10.78	19.52	> 150
23	ELT37-09 B bio	13578-11	-0.00036	0.00119	3.257	99.9	1668.48	7.26	18.19	> 150
23	ELT37-09 B bio	13578-02	0.1212	0.00376	6.915	99.8	1679.27	8.75	18.94	> 150
23	ELT37-09 B bio	13578-04	-0.00068	0.00185	2.315	99.8	1707.45	6.58	18.30	> 150
23	ELT37-09 B bio	13578-01	0.00004	0.00093	6.957	99.7	1734.03	9.02	19.55	> 150
23	ELT37-09 B bio	13578-10	0.0796	0.00227	3.799	99.8	1744.95	7.83	19.12	> 150
23	ELT37-09 B bio	13578-05	0.00028	-0.00272	0.212	99.9	1767.14	7.80	19.31	> 150
23	ELT37-09 bio	12742-01	0.61397	0.00556	1.581	23.3	53.63	1.46	1.55	> 150
23	ELT37-09 bio	12742-06	0.03209	0.00359	0.895	87.6	97.64	0.49	1.09	> 150
23	ELT37-09 bio	12742-13	0.0125	-0.00327	0.207	88.3	438.55	1.91	4.78	> 150
23	ELT37-09 bio	12742-09	0.00815	0.0092	0.137	82	457.01	2.43	5.17	> 150
23	ELT37-09 bio	12742-07	0.0737	0.00354	0.994	80.2	463.15	1.72	4.94	> 150
23	ELT37-09 bio	12742-12	0.00863	-0.00059	0.486	95.8	466.83	1.35	4.86	> 150
23	ELT37-09 bio	12742-04	0.0122	0.0135	0.782	98	492.55	1.23	5.08	> 150
23	ELT37-09 bio	12742-02	0.00138	0.01062	3.721	99.1	493.67	1.19	5.08	> 150
23	ELT37-09 bio	12742-08	0.11794	0.00094	4.695	98	494.76	1.18	5.09	> 150
23	ELT37-09 bio	12742-05	0.05914	0.00476	0.622	93.4	1393.71	3.13	14.28	> 150
23	ELT37-09 bio	12742-03	0.01303	0.00282	6.055	99.1	1554.62	3.71	15.98	> 150
23	ELT37-09 bio	12742-10	0.0505	0.00172	0.666	98.9	1575.93	2.93	16.03	> 150
23	ELT37-09 bio	12742-11	0.01059	0.00368	0.535	98.5	1604.52	3.31	16.38	> 150
23	ELT37-09 bio	12862-01	0.00371	0.002	1.24	98.3	1630.59	4.27	16.86	> 150
23	ELT37-09 bio	12862-02	0.00956	0.00411	0.877	96.9	1562.81	4.49	16.26	> 150
23	ELT37-09 bio	12862-03	0.01627	0.00436	1.909	94.5	459.54	1.96	5.00	> 150
23	ELT37-09 bio	12862-04	0.00423	0.00543	14.288	99	517.58	2.12	5.59	> 150
23	ELT37-09 bio	12862-05	0.00669	0.00375	2.765	95.3	481.12	1.74	5.12	> 150
23	ELT37-09 bio	12862-06	0.0423	0.01204	4.945	98.1	493.42	1.81	5.26	> 150
23	ELT37-09 bio	12862-07	0.00548	0.00356	0.864	90.7	489.41	2.38	5.44	> 150
23	ELT37-09 bio	12862-08	0.02137	0.00232	1.136	93.8	474.51	1.90	5.11	> 150
23	ELT37-09 bio	12862-09	0.00606	0.01182	4.794	99.7	1706.73	5.66	17.98	> 150
23	ELT37-09 bio	12862-10	0.00724	0.00217	2.135	96.4	485.08	1.65	5.12	> 150
23	ELT37-09 bio	12862-11	0.00883	0.00478	0.309	98.9	495.55	1.83	5.28	> 150
23	ELT37-09 bio	12862-12	0.003	0.00398	1.178	99.3	493.63	1.67	5.21	> 150
23	ELT37-09 bio	12862-13	0.1604	0.00136	5.647	99.1	399.55	1.33	4.21	> 150
23	ELT37-09 bio	12862-14	0.01683	0.01965	0.186	94.1	526.54	2.31	5.75	> 150
23	ELT37-09 bio	12862-15	0.01916	0.01067	1.789	97.8	328.27	1.18	3.49	> 150
23	ELT37-09 bio	12862-16	0.00123	0.0088	3.544	93.9	523.64	2.01	5.61	> 150
23	ELT37-09 bio	12862-17	0.00253	0.01242	0.837	96.1	504.53	1.99	5.42	> 150
23	ELT37-09 bio	12862-18	0.17598	0.00533	1.499	98.9	1666.70	4.91	17.38	> 150
23	ELT37-09 bio	12862-19	-0.0037	0.01227	0.326	95.4	512.56	1.90	5.47	> 150
23	ELT37-09 bio	12862-23	0.01161	0.00202	3.669	94.3	102.08	0.44	1.11	> 150
23	ELT37-09 bio	13192-01A	0.35185	0.01495	0.409	101.6	510.09	6.65	8.38	> 150
23	ELT37-09 bio	13192-02A	0.05144	0.00283	1.434	100.4	503.95	6.76	8.43	> 150

23	ELT37-09 bio	13192-03A	0.11267	0.00565	1.353	100.7	480.57	6.41	8.01	> 150
23	ELT37-09 bio	13192-04A	0.12603	-0.02221	0.266	103.2	479.72	6.08	7.75	> 150
23	ELT37-09 bio	13192-05A	-0.17184	-0.01029	0.174	104	526.71	6.52	8.38	> 150
23	ELT37-09 bio	13192-07A	1.01977	0.02026	0.116	100.2	512.89	7.62	9.19	> 150
23	ELT37-09 bio	13192-08A	0.3162	-0.01373	0.27	100.5	527.97	7.23	8.96	> 150
23	ELT37-09 bio	13192-10A	0.09734	0.0068	0.219	97.3	427.28	6.72	7.96	> 150
23	ELT37-09 bio	13192-11A	0.11974	-0.00204	1.068	99.8	493.31	6.82	8.42	> 150
23	ELT37-09 bio	13192-12A	1.03728	-0.01794	0.117	99.7	1204.77	14.99	19.23	> 150
23	ELT37-09 bio	13192-13A	0.09573	0.01496	0.979	100.5	531.87	7.10	8.87	> 150
23	ELT37-09 bio	13192-15A	6.09615	-0.0727	0.032	97.8	503.22	11.93	12.95	> 150
23	ELT37-09 bio	13192-16A	18.01166	0.13756	0.02	101.5	1595.01	19.60	25.27	> 150
23	ELT37-09 bio	13192-17A	0.04384	0.01561	0.428	101.4	505.16	6.65	8.35	> 150
23	ELT37-09 bio	13192-18A	0.02743	0.0268	0.648	100.5	497.00	6.72	8.36	> 150
23	ELT37-09 bio	13192-19A	1.0176	0.00253	0.136	93.9	229.49	4.92	5.43	> 150
23	ELT37-09 bio 63-150	13460-04	-0.01645	0.00799	0.064	95.9	475.27	6.15	7.77	63-150
23	ELT37-09 bio 63-150	13460-02	-0.02178	-0.07665	0.018	94.9	481.87	15.50	16.23	63-150
23	ELT37-09 bio 63-150	13460-01	0.03363	0.01959	0.057	94.8	501.05	7.29	8.84	63-150
23	ELT37-09 bio 63-150	13460-03	-0.07072	-0.01991	0.077	100.4	1113.04	8.47	13.99	63-150
23	ELT37-09 bio 63-150	13460-11	-0.09499	0.12157	0.011	100.7	1527.53	25.07	29.36	63-150
23	ELT37-09 bio 63-150	13460-08	-0.08241	0.02505	0.057	99.7	1560.71	12.98	20.30	63-150
23	ELT37-09 bio 63-150	13460-06	-0.11719	-0.01054	0.049	99.7	1567.05	16.00	22.40	63-150
23	ELT37-09 bio 63-150	13460-10	-0.05406	0.00487	0.108	100.1	1568.10	12.59	20.11	63-150
23	ELT37-09 bio 63-150	13460-09	-0.09124	-0.01119	0.044	98.9	1644.10	18.00	24.38	63-150
23	ELT37-09 bio 63-150	13460-07	-0.19651	-0.05173	0.025	97.8	1733.04	22.16	28.14	63-150
24	JPC11 2305-2310 bio	13575-01	-0.02704	-0.00185	0.236	99.9	1683.21	6.40	18.01	> 150
24	JPC11 2305-2310 bio	13575-02	0.04358	0.00363	1.222	99.5	1594.16	5.12	16.74	> 150
24	JPC11 2305-2310 bio	13575-03	0.01262	0.00114	1.229	99.9	1709.11	2.55	17.28	> 150
24	JPC11 2305-2310 bio	13575-04	-0.09654	0.01972	0.093	97.4	1655.07	5.00	17.29	> 150
24	JPC11 2305-2310 bio	13575-06	0.01107	-0.00099	0.45	99.8	1634.58	5.76	17.33	> 150
24	JPC11 2305-2310 bio	13575-07	-0.00065	0.00413	0.874	100	1656.97	5.24	17.38	> 150
24	JPC11 2305-2310 bio	13575-08	0.00827	0.00165	0.226	99.2	1618.98	3.00	16.47	> 150
24	JPC11 2305-2310 bio	13575-09	-0.00282	0.00237	1.912	99.9	1608.34	6.08	17.19	> 150
24	JPC11 2305-2310 bio	13575-10	0.03228	-0.00018	1.237	99.9	1624.18	3.66	16.65	> 150
24	JPC11 2305-2310 bio	13575-11	0.00031	0.00082	1.524	99.9	1686.12	2.52	17.05	> 150
24	JPC11 2305-2310 bio	13575-12	-0.00132	0.00803	0.711	99.9	1635.44	2.15	16.50	> 150
24	JPC11 2305-2310 bio	13575-13	0.00579	0.00119	0.266	99.7	1580.25	2.95	16.08	> 150
24	JPC11 2305-2310 bio	13575-14	0.0148	0.00071	0.486	99.9	1583.01	2.18	15.98	> 150
24	JPC11 2305-2310 bio	13575-15	0.27267	0.00502	6.489	99.8	1799.91	9.74	20.47	> 150
24	JPC11 2370-2375 bio	13574-01	-0.00093	-0.00258	0.407	99.7	1581.00	2.70	16.04	> 150
24	JPC11 2370-2375 bio	13574-03	0.43147	0.05247	0.016	83.5	1592.50	13.69	21.00	> 150
24	JPC11 2370-2375 bio	13574-15	-0.01546	0.00738	0.305	99.8	1594.74	3.43	16.31	> 150
24	JPC11 2370-2375 bio	13574-10	-0.00699	0.00444	0.39	99.9	1598.26	2.98	16.26	> 150
24	JPC11 2370-2375 bio	13574-04	0.01763	-0.00005	0.171	99.9	1602.40	3.73	16.45	> 150
24	JPC11 2370-2375 bio	13574-09	-0.00556	0.00878	0.276	99.9	1607.13	3.51	16.45	> 150
24	JPC11 2370-2375 bio	13574-08	0.00917	0.00372	0.279	99.9	1617.25	4.81	16.87	> 150

29 *Pierce et al. (2011)*

24	JPC11 2370-2375 bio	13574-06	0.01381	-0.00057	1.022	99.9	1618.66	5.45	17.08	> 150	10	<i>Pierce et al. (2011)</i>
24	JPC11 2370-2375 bio	13574-05	-0.02394	-0.0027	0.144	100	1619.78	4.79	16.89	> 150		
24	JPC11 2370-2375 bio	13574-02	-0.03149	0.00426	0.188	99.8	1624.88	3.14	16.55	> 150		
24	JPC11 2370-2375 bio	13574-12	-0.00595	0.00353	0.26	99.8	1635.41	3.56	16.74	> 150		
24	JPC11 2370-2375 bio	13574-14	0.01228	0.00628	0.816	99.9	1640.17	4.93	17.13	> 150		
24	JPC11 2370-2375 bio	13574-07	-0.00741	-0.00091	0.464	99.9	1659.98	5.12	17.37	> 150		
24	JPC11 2370-2375 bio	13574-11	0.01619	0.00368	0.773	99.7	1674.24	4.98	17.47	> 150		
24	JPC11 2370-2375 bio	13574-13	-0.00273	0.00835	0.298	99.2	1698.25	2.66	17.19	> 150		
25	DF79-47 bio 63-150	13463-08	-0.05594	0.02097	0.037	72.3	429.50	8.73	9.73	63-150	10	<i>Pierce et al. (2011)</i>
25	DF79-47 bio 63-150	13463-07	-0.11661	0.01615	0.032	90	436.90	9.86	10.78	63-150		
25	DF79-47 bio 63-150	13463-06	-0.0795	-0.03976	0.033	98.6	462.78	9.83	10.87	63-150		
25	DF79-47 bio 63-150	13463-10	0.01295	0.00709	0.116	100.2	488.27	4.57	6.69	63-150		
25	DF79-47 bio 63-150	13463-05	-0.27545	0.01802	0.028	82.3	492.83	11.40	12.42	63-150		
25	DF79-47 bio 63-150	13463-11	-0.0352	0.00581	0.027	98.7	495.08	11.58	12.59	63-150		
25	DF79-47 bio 63-150	13463-09	-0.19732	-0.05853	0.014	100.3	535.89	17.17	17.99	63-150		
25	DF79-47 bio 63-150	13463-02	-0.02851	0.02942	0.051	99.3	547.15	7.63	9.39	63-150		
25	DF79-47 bio 63-150	13463-01	0.75776	0.06774	0.02	98.6	712.11	16.22	17.72	63-150	33	<i>Pierce et al. (2011)</i>
25	DF79-47 bio 63-150	13463-03	-0.18376	0.04029	0.011	99.9	1385.58	24.76	28.37	63-150		
26	DF80-34 bio	12747-04	0.01568	0.00148	0.997	79.1	105.20	0.41	1.13	> 150		
26	DF80-34 bio	12747-11	0.04545	-0.00278	0.203	77.5	127.39	0.76	1.48	> 150		
26	DF80-34 bio	12747-15	-0.00291	0.00203	0.313	89.7	303.00	1.10	3.22	> 150		
26	DF80-34 bio	12747-08	0.02562	0.00191	0.969	98.2	376.73	0.87	3.87	> 150		
26	DF80-34 bio	12747-16	0.00396	0.00197	0.148	95	446.65	1.75	4.80	> 150		
26	DF80-34 bio	12747-10	0.03041	0.00033	1.156	99	473.08	0.94	4.82	> 150		
26	DF80-34 bio	12747-07	0.03605	0.00105	0.942	98	483.97	0.98	4.94	> 150	33	<i>Pierce et al. (2011)</i>
26	DF80-34 bio	12747-05	0.01834	0.00149	0.847	98.1	488.76	1.03	4.99	> 150		
26	DF80-34 bio	12747-17	-0.00309	0.00813	0.048	81	491.19	2.65	5.58	> 150		
26	DF80-34 bio	12747-02	0.02864	0.00014	1.554	98.2	497.64	0.89	5.06	> 150		
26	DF80-34 bio	12747-06	0.01838	0.00295	0.713	99.3	501.15	1.00	5.11	> 150		
26	DF80-34 bio	12747-03	0.00892	0.01229	0.707	96.2	521.42	1.19	5.35	> 150		
26	DF80-34 bio	12747-01	0.02569	0.00055	0.275	96.7	523.60	1.60	5.48	> 150		
26	DF80-34 bio	12747-13	0.01228	0.00148	0.754	98.1	561.69	1.22	5.75	> 150		
26	DF80-34 bio	12747-14	0.00873	0.00038	0.269	97.5	895.14	1.85	9.14	> 150	33	<i>Pierce et al. (2011)</i>
26	DF80-34 bio	12747-12	0.05921	0.00449	0.167	93.6	1126.86	3.01	11.66	> 150		
26	DF80-34 Bio	13194-01A	0.55561	0.00798	0.078	94.2	516.23	9.63	10.93	> 150		
26	DF80-34 Bio	13194-02A	-0.00284	0.00592	0.301	97.8	367.34	5.78	6.85	> 150		
26	DF80-34 Bio	13194-03A	-0.09566	-0.02616	0.048	86.9	489.12	12.34	13.28	> 150		
26	DF80-34 Bio	13194-04A	1.98383	0.03908	0.088	71.5	84.99	4.65	4.73	> 150		
26	DF80-34 Bio	13194-06A	12.42474	-0.14798	0.02	66.5	345.38	19.82	20.11	> 150		
26	DF80-34 Bio	13194-07A	4.28675	0.05706	0.046	92	477.01	10.51	11.54	> 150		
26	DF80-34 Bio	13194-08A	0.8706	-0.02724	0.127	98.6	983.84	13.01	16.31	> 150	33	<i>Pierce et al. (2011)</i>
26	DF80-34 bio 63-150	13465-05	0.02056	0.00807	0.048	98.7	369.83	5.44	6.57	63-150		
26	DF80-34 bio 63-150	13465-07	-0.02467	0.00439	0.058	96.8	389.56	5.39	6.65	63-150		
26	DF80-34 bio 63-150	13465-06	-0.02448	-0.00952	0.06	88.8	394.96	5.88	7.08	63-150		

26	DF80-34 bio 63-150	13465-01	-0.0043	0.01043	0.228	99.6	401.24	2.59	4.77	63-150
26	DF80-34 bio 63-150	13465-08	-0.66651	0.00339	0.011	105.8	428.89	23.51	23.90	63-150
26	DF80-34 bio 63-150	13465-04	-0.04155	0.00485	0.136	98.9	466.90	3.74	5.98	63-150
26	DF80-34 bio 63-150	13465-03	-0.16039	-0.02773	0.023	103.2	496.42	14.39	15.22	63-150
26	DF80-34 bio 63-150	13465-02	-0.13884	0.01224	0.027	98.8	510.72	11.97	13.01	63-150
26	DF80-34 bio 63-150	13465-11	0.03057	0.00711	0.055	90.3	527.16	7.52	9.18	63-150
26	DF80-34 bio 63-150	13465-10	-0.0305	0.01055	0.024	97.9	633.15	10.05	11.88	63-150

27	DF80-35 bio	12746-02	0.02073	0.00213	0.296	94	374.14	1.04	3.88	> 150
27	DF80-35 bio	12746-03	0.01921	0.00625	0.285	97.5	372.74	0.92	3.84	> 150
27	DF80-35 bio	12746-04	0.01787	0.00101	0.7	98.3	363.41	0.83	3.73	> 150
27	DF80-35 bio	12746-05	0.89522	0.00141	0.277	80.2	474.86	1.61	5.02	> 150
27	DF80-35 bio	12746-06	0.09196	-0.00061	0.203	91.2	374.94	1.23	3.95	> 150
27	DF80-35 bio	12746-07	0.03854	-0.00047	0.216	84.6	414.16	1.48	4.40	> 150
27	DF80-35 bio	12746-08	0.06551	-0.00057	0.087	88.3	352.13	1.58	3.86	> 150
27	DF80-35 bio	12746-09	0.0223	0.00622	0.356	83.6	355.18	1.20	3.75	> 150
27	DF80-35 bio	12746-10	0.04457	0.00725	0.087	87	362.41	1.97	4.13	> 150
27	DF80-35 bio	12746-11	0.14178	0.00382	0.268	94.1	356.48	1.16	3.75	> 150
27	DF80-35 bio	12746-12	0.01067	0.0043	0.132	81	375.11	1.71	4.12	> 150
27	DF80-35 bio	12746-13	0.00152	0.00657	0.072	89.1	380.48	1.99	4.29	> 150
27	DF80-35 bio 63-150	13468-09	-0.04147	-0.00941	0.059	98.8	310.44	5.48	6.30	63-150
27	DF80-35 bio 63-150	13468-10	0.00686	0.00039	0.037	90.7	348.52	7.89	8.62	63-150
27	DF80-35 bio 63-150	13468-01	-0.13959	-0.03687	0.028	101.1	361.24	8.79	9.50	63-150
27	DF80-35 bio 63-150	13468-03	0.03628	-0.03175	0.049	96.6	362.98	6.34	7.30	63-150
27	DF80-35 bio 63-150	13468-08	0.06789	-0.03439	0.008	94	371.12	31.67	31.88	63-150
27	DF80-35 bio 63-150	13468-02	-0.02335	0.02344	0.1	96	376.06	3.68	5.26	63-150
27	DF80-35 bio 63-150	13468-11	0.00995	0.00995	0.04	97.9	381.01	7.92	8.79	63-150
27	DF80-35 bio 63-150	13468-04	0.12259	-0.02227	0.039	88.7	385.70	7.88	8.78	63-150
27	DF80-35 bio 63-150	13468-07	-0.05939	-0.01053	0.023	87.3	394.80	12.08	12.71	63-150
27	DF80-35 bio 63-150	13468-05	-0.05792	-0.01416	0.025	91.4	407.21	12.02	12.69	63-150
27	DF80-35 bio 63-150	13468-06	-0.06813	0.02582	0.036	84.2	647.68	6.95	9.50	63-150

23 *Pierce et al. (2011)*

28	DF80-20 bio	12745-01	0.12716	0.0002	5.663	99.3	365.60	0.83	3.75	> 150
28	DF80-20 bio	12745-03	0.01529	0.00218	1.823	99.6	367.49	0.90	3.78	> 150
28	DF80-20 bio	12745-04	-0.00396	0.00072	0.442	96.9	373.81	1.16	3.91	> 150
28	DF80-20 bio	12745-05	0.10674	0.00313	0.705	99.1	481.18	1.17	4.95	> 150
28	DF80-20 bio	12745-06	-0.01116	0.00077	0.179	91.8	369.93	1.52	4.00	> 150
28	DF80-20 bio	12745-07	0.13353	0.00216	0.497	98.9	364.13	1.04	3.79	> 150
28	DF80-20 bio	12745-08	0.028	0.00303	3.33	98.6	484.77	1.13	4.98	> 150
28	DF80-20 bio	12745-10	0.01783	0.00506	0.249	97.2	365.50	1.33	3.89	> 150
28	DF80-20 bio	12745-11	0.00252	0.00246	0.778	98.1	367.67	0.83	3.77	> 150
28	DF80-20 bio	12745-12	0.11154	0.00552	0.096	81	370.11	1.95	4.18	> 150
28	DF80-20 bio	12745-13	0.18232	0.00191	0.425	79.2	335.96	1.15	3.55	> 150
28	DF80-20 bio	12745-14	0.01903	-0.0012	0.268	94.4	360.51	1.16	3.79	> 150
28	DF80-20 bio	12745-15	0.21791	0.0011	0.349	97.2	365.59	1.05	3.80	> 150
28	DF80-20 bio	12745-16	0.05227	0.00349	0.128	93.2	367.53	1.48	3.96	> 150

35 *Pierce et al. (2011)*

28	DF80-20 bio	12745-17	-0.00165	-0.00206	0.087	90.2	370.24	1.73	4.09	> 150
28	DF80-20 bio	12745-18	0.36028	0.01837	0.104	43.6	277.74	2.64	3.83	> 150
28	DF80-20 Bio	13193-01A	0.72396	0.01092	0.169	96.5	444.88	7.33	8.57	> 150
28	DF80-20 Bio	13193-02A	0.27769	0.00334	0.726	100.2	1144.21	13.20	17.47	> 150
28	DF80-20 Bio	13193-03A	0.07753	0.00055	4.713	99	412.01	6.16	7.41	> 150
28	DF80-20 Bio	13193-04A	0.10887	-0.00425	0.749	100.1	738.92	9.45	12.00	> 150
28	DF80-20 Bio	13193-05A	24.90623	0.51976	0.005	37.8	185.52	62.19	62.22	> 150
28	DF80-20 Bio	13193-06A	0.0401	-0.01163	0.489	99.8	1061.70	12.77	16.61	> 150
28	DF80-20 Bio	13193-07A	0.20474	0.00128	0.255	100.7	1058.20	12.42	16.31	> 150
28	DF80-20 Bio	13193-08A	0.68414	0.0176	0.148	99.7	361.98	5.72	6.77	> 150
28	DF80-20 Bio 63-150	13464-07	-0.04341	0.00273	0.104	100.5	363.21	3.12	4.79	63-150
28	DF80-20 Bio 63-150	13464-08	0.01315	-0.00203	0.086	99.2	368.80	3.33	4.97	63-150
28	DF80-20 Bio 63-150	13464-11	-0.05927	0.00642	0.075	97.7	370.39	4.58	5.89	63-150
28	DF80-20 Bio 63-150	13464-01	0.21493	0.00822	0.042	94	370.43	8.22	9.02	63-150
28	DF80-20 Bio 63-150	13464-05	-0.06679	0.00573	0.066	101.7	376.43	5.42	6.60	63-150
28	DF80-20 Bio 63-150	13464-03	-0.07409	0.00346	0.056	94.1	376.55	4.74	6.06	63-150
28	DF80-20 Bio 63-150	13464-09	-0.03871	0.00704	0.064	98.4	380.43	5.49	6.68	63-150
28	DF80-20 Bio 63-150	13464-10	0.04895	-0.00785	0.05	98.1	386.85	6.23	7.34	63-150
28	DF80-20 Bio 63-150	13464-02	0.15531	0.00044	0.027	85.5	429.77	11.07	11.87	63-150
28	DF80-20 Bio 63-150	13464-04	-0.06367	0.05084	0.009	80.3	472.63	29.75	30.12	63-150
28	DF80-20 Bio 63-150	13464-06	-0.05728	0.01483	0.083	96	493.56	5.04	7.06	63-150

Appendix D. Analyses grouped by geographic sector (as defined in Table 3).

Droning Maud Land (Cores 1-14)						Prydz Bay (Cores 15, 17-19)						Wilkes Land (Cores 20-22)						Adélie/George V/Northern Victoria Land (Cores 23-2)					
n= 742		n= 675		n= 186		n= 684		n= 528		n= 105		n= 302		n= 225		n= 116		n= 254		n= 267		n=	
U Pb Z	± (Ma)	ArAr Hb	± (Ma)	ArAr Bio	± (Ma)	U Pb Z	± (Ma)	ArAr Hb	± (Ma)	ArAr Bio	± (Ma)	U Pb Z	± (Ma)	ArAr Hb	± (Ma)	ArAr Bio	± (Ma)	U Pb Z	± (Ma)	ArAr Hb	± (Ma)	ArAr Bio	
98.9	16.7	26.50	0.28	257.66	0.90	350.9	27.3	185.38	97.76	503.20	5.17	111.2	4.5	661.15	7.02	1118.64	11.38	508.6	9.9	1715.69	18.38	429.50	
109.0	1.1	377.66	4.51	264.10	0.84	398.4	11.7	507.87	5.10	383.51	4.46	115.4	8.6	1135.28	13.45	1123.23	11.49	604.6	12.5	1429.27	15.53	436.90	
110.6	1.4	419.03	5.11	329.59	1.05	406.5	22.8	528.17	7.62	479.25	4.86	130.9	12.1	1150.81	11.89	1493.72	15.23	607.0	12.0	1287.67	13.76	462.78	
110.9	5.5	431.69	5.02	395.96	1.08	417.9	10.5	540.58	5.67	506.74	5.15	480.4	8.2	1155.78	11.90	1076.41	11.10	707.7	40.2	1609.36	17.03	488.27	
112.3	5.8	442.82	6.37	403.06	1.25	426.4	19.0	660.15	64.80	488.96	5.01	501.1	5.4	1164.09	12.10	1115.44	11.46	1604.5	62.9	1660.62	18.55	492.83	
116.8	1.2	446.15	5.68	414.86	2.12	444.3	27.3	821.59	15.09	525.96	5.39	557.2	19.7	1172.68	11.95	1126.72	11.58	1655.3	213.8	1874.23	19.70	495.08	
117.8	1.2	448.56	4.65	415.84	1.11	455.9	12.7	918.87	11.62	457.22	4.70	561.3	18.3	1364.59	13.90	1128.97	11.53	1770.7	83.7	1547.56	16.34	535.89	
168.7	1.7	450.91	5.10	420.77	1.00	463.8	8.3	1560.99	67.27	490.09	4.98	572.7	7.6	1477.64	16.28	1115.94	11.47	1969.5	162.7	98.82	1.57	547.15	
170.9	11.1	451.28	9.31	420.99	1.26	470.1	10.8	1595.05	57.10	499.73	5.08	578.8	14.5	1164.88	12.45	1139.43	11.66	2441.7	83.2	4.25	0.36	712.11	
173.7	4.8	453.22	9.55	422.86	0.96	471.6	17.9	2078.09	108.98	473.08	4.89	1095.1	46.3	3.49	5.20	1119.73	11.48	2521.0	123.0	127.65	2.59	1385.58	
173.9	1.9	456.26	4.99	423.29	1.17	472.7	15.9	3082.73	56.61	482.02	4.90	1095.8	43.4	1203.83	12.95	1157.96	11.92	55.0	3.0	132.07	2.32	365.60	
177.2	15.9	456.37	7.47	429.06	1.96	472.8	29.5	3745.77	143.58	480.58	4.99	1122.3	22.5	1163.85	12.55	1128.95	11.52	132.3	2.2	301.62	7.16	367.49	
178.5	5.2	458.95	7.21	430.35	1.03	482.1	29.9	4658.10	81.08	399.41	4.13	1127.2	11.4	582.21	7.53	1112.16	11.69	489.0	12.8	894.37	10.89	373.81	
178.8	1.8	460.97	5.16	431.30	1.19	482.8	20.2	40.12	6.72	797.05	8.13	1129.0	28.9	1113.89	11.89	1121.64	11.46	497.0	7.5	1448.51	15.37	481.18	
181.3	1.8	462.33	9.63	439.35	1.06	483.6	10.4	151.37	8.54	485.61	4.93	1129.1	4.4	671.18	7.99	1121.45	11.56	509.0	27.4	1495.99	15.61	369.93	
183.0	4.0	463.90	5.24	444.44	1.50	487.9	8.1	155.78	13.48	489.53	4.98	1129.6	26.4	1242.90	13.98	1097.12	11.31	514.0	4.9	1583.04	17.06	364.13	
183.9	2.5	464.52	4.96	446.31	1.03	487.9	16.0	187.50	6.76	510.81	5.22	1130.1	75.7	798.07	8.61	1514.11	15.49	532.2	18.1	1681.20	17.14	484.77	
189.2	2.6	464.61	6.05	446.57	1.63	491.7	5.0	248.28	24.07	485.58	5.09	1130.5	35.5	1152.40	12.31	861.02	10.36	549.0	15.8	1690.03	17.50	365.50	
198.3	11.9	466.36	7.46	449.93	1.65	494.4	15.9	264.23	22.44	482.31	4.93	1131.5	56.8	23.52	5.90	1087.61	12.56	554.8	13.8	1748.56	19.15	367.67	
202.8	2.4	469.63	9.94	451.84	1.38	494.6	25.9	289.72	5.08	434.80	4.42	1131.7	12.2	1135.87	11.93	1091.56	11.67	569.2	31.7	1755.44	19.16	370.11	
216.8	6.0	471.60	9.82	452.61	1.33	495.5	15.7	329.23	3.34	406.79	4.16	1132.2	20.7	1138.62	11.84	1100.04	11.46	577.8	5.0	1768.87	18.25	335.96	
216.8	6.0	473.89	5.10	455.43	1.57	496.2	14.1	395.80	4.15	483.15	5.08	1132.6	30.9	1164.48	11.92	1101.33	18.67	577.8	9.8	1785.31	18.21	360.51	
249.2	2.8	474.67	8.25	457.21	1.34	496.3	8.5	399.69	4.33	451.62	5.10	1133.0	12.0	1172.05	12.03	1104.58	14.75	587.5	6.0	1841.73	19.55	365.59	
258.4	2.5	474.84	7.77	457.31	1.22	502.8	9.2	404.26	4.86	519.52	5.47	1135.4	53.6	1172.70	12.13	1105.80	14.48	593.1	22.8	4063.12	65.06	367.53	
273.7	8.8	477.07	6.64	470.14	1.38	504.8	8.1	405.91	4.81	461.89	4.89	1135.5	31.1	1180.25	12.10	1108.61	16.60	594.2	14.5	1155.51	2.19	370.24	
279.6	9.6	477.21	5.51	492.07	1.21	506.0	9.2	410.07	4.39	417.19	4.75	1136.1	15.4	1189.16	13.60	1111.74	13.51	652.4	24.3	539.00	8.47	277.74	
284.7	6.4	479.17	10.29	494.44	0.86	508.1	14.7	414.10	4.99	451.45	5.08	1136.3	10.8	1169.11	17.03	1119.46	13.57	861.8	32.3	128.60	5.24	444.88	
304.0	7.4	483.14	9.75	554.87	1.34	509.2	42.8	418.56	4.32	438.77	4.67	1136.4	27.5	1133.51	16.43	1121.06	14.30	1088.6	22.4	1659.30	21.81	1144.21	
313.9	51.4	483.35	5.46	720.75	1.60	510.5	14.1	421.24	4.52	453.40	4.89	1136.7	10.5	1190.81	17.71	1132.90	14.92	1102.2	11.5	1531.21	32.42	412.01	
319.9	49.1	487.77	10.06	61.75	2.76	512.0	16.1	424.32	5.03	568.51	5.94	1137.0	33.8	1162.95	16.82	1109.10	11.40	1105.4	28.6	1693.48	21.77	738.92	
374.2	63.1	488.65	7.31	405.38	1.55	514.7	7.2	427.97	4.38	500.72	5.19	1137.4	14.4	1147.23	16.85	1115.09	11.57	1140.3	80.2	1789.98	23.53	185.52	
374.5	50.8	489.10	9.93	421.11	1.16	515.4	13.0	429.90	4.70	490.69	5.29	1137.7	18.4	1157.32	17.71	1137.77	11.62	1161.5	6.5	1651.45	28.20	1061.70	
381.3	711.0	489.68	6.18	422.06	2.65	516.5	8.4	448.08	4.84	489.37	5.15	1138.4	49.7	1265.49	18.15	1126.58	11.46	1173.3	103.8	1707.68	22.97	1058.20	
381.3	68.9	490.44	6.05	440.79	1.33	517.0	11.0	450.74	4.78	498.67	5.28	1140.0	9.3	1190.66	17.06	1117.68	11.48	1599.9	11.9	1785.69	24.88	361.98	
387.0	56.8	491.10	6.10	444.72	1.28	517.2	6.7	455.26	5.61	485.86	5.06	1140.1	6.0	1250.07	12.81	1126.77	11.82	1629.2	7.9	1778.57	23.90	363.21	
388.3	360.6	493.24	9.93	447.85	1.40	517.8	11.8	457.50	4.74	475.17	4.97	1141.4	13.3	1632.84	16.75	1120.47	11.67	1739.4	24.5	1794.48	25.53	368.80	
391.1	44.7	497.63	6.71	449.71	1.25	518.3	6.8	460.18	5.67	361.86	5.17	1142.1	15.3	1302.18	13.50	829.41	8.92	1793.1	5.7	1676.81	22.69	370.39	
397.9	42.5	503.27	6.26	453.83	1.76	519.2	10.5	460.79	4.83	487.78	5.22	1143.6	18.0	1194.11	13.51	1146.70	11.70	1900.7	7.5	1687.60	23.91	370.43	
400.3	262.0	504.03	6.42	458.22	1.50	520.3	7.1	461.16	5.17	560.24	5.83	1144.6	13.7	2017.55	21.91	1119.21	11.63	2373.8	3.1	1783.25	25.18	376.43	
419.8	100.0	504.59	8.37	460.17	1.55	520.4	13.1	463.59	5.03	453.78	4.73	1146.0	7.6	2309.63	23.94	1146.40	11.70	2442.1	36.5	1894.38	25.04	376.55	
423.7	196.1	507.89	6.47	461.61	1.63	520.9	12.0	463.59	4.73	497.05	5.12	1146.9	35.8	1143.85	15.21	1141.36	11.64	2455.0	2.9	1592.35	23.83	380.43	
426.0	4.2	510.70	1																				

461.6	19.6	521.86	11.14	535.80	2.05	523.7	10.7	469.06	5.75	449.51	4.59	1150.3	22.2	1149.73	11.95	1107.49	11.37	1748.2	5.7	1506.14	15.53	376.73
461.7	102.8	522.86	5.53	1822.48	3.14	524.1	11.9	469.87	4.80	503.08	5.14	1150.4	15.1	1155.49	11.90	1123.87	11.59	2473.7	47.3	1536.30	15.72	446.65
461.9	20.3	547.49	7.15	487.57	1.21	524.6	21.5	470.87	4.83	510.54	5.22	1150.6	34.0	1195.63	12.25	1102.29	11.73	2224.3	62.9	1611.67	16.41	473.08
464.8	68.0	561.87	11.90	153.74	1.27	524.8	23.7	471.29	4.97	519.73	5.31	1151.2	20.4	1330.53	15.38	1490.83	15.35	2439.7	2.8	1651.82	17.33	483.97
466.4	19.4	563.86	12.03	211.26	0.68	524.9	6.2	471.36	4.91	520.28	5.32	1151.7	14.5	1489.89	15.13	1141.51	11.79	1806.6	313.3	1695.06	17.28	488.76
467.3	82.0	600.69	12.84	250.95	7.28	525.5	16.9	471.90	5.05	560.72	5.73	1151.8	29.6	1549.89	15.84	1265.44	39.27	1771.8	15.9	1697.05	17.84	491.19
470.9	28.0	646.25	13.28	310.23	15.07	526.7	11.4	472.42	4.82	477.76	5.04	1152.7	37.1	2330.49	23.83	1113.06	11.41	2394.0	16.8	2214.30	25.47	497.64
470.9	87.7	1117.86	11.63	386.09	0.82	526.8	14.3	472.72	4.82	481.80	5.48	1153.5	12.6	354.21	5.24	1111.21	13.91	1712.0	3.6	219.20	2.42	501.15
471.4	137.3	1240.19	16.14	413.33	1.16	527.5	8.1	472.74	4.87	483.07	5.39	1153.6	17.0	1128.40	12.41	1230.36	12.85	1617.2	9.7	355.93	4.05	521.42
472.0	109.9	397.33	5.26	422.07	1.98	528.0	17.8	473.91	4.87	487.67	5.55	1154.7	21.4	1131.54	11.67	1150.86	11.95	1603.4	13.8	530.98	6.05	523.60
472.1	40.6	426.40	7.14	428.29	1.50	528.5	12.2	474.16	5.67	501.62	5.28	1156.5	41.2	1131.66	11.63	1155.97	12.09	445.4	15.4	1262.30	13.76	561.69
473.5	27.2	461.82	5.97	429.39	0.98	528.6	18.8	475.32	4.79	502.53	5.21	1156.6	16.5	1132.31	11.68	1115.91	15.96	2396.7	34.9	1265.39	13.78	895.14
474.1	20.4	467.83	7.34	434.61	1.06	528.9	18.5	475.79	4.90	504.63	5.36	1158.1	23.0	1136.43	11.76	1110.56	16.02	1774.4	14.1	1346.88	14.24	1126.86
474.5	4.6	467.90	6.40	441.13	0.83	529.0	5.1	475.82	4.87	506.94	5.46	1158.1	22.1	1141.05	11.87	1161.58	16.78	519.3	19.1	1611.75	16.54	516.23
474.6	8.1	468.86	8.76	450.03	1.39	529.2	8.5	476.06	5.13	512.42	5.31	1158.2	10.4	1144.09	11.70	1117.22	16.15	319.4	28.6	1668.36	17.01	367.34
475.4	28.2	469.36	5.22	452.25	1.08	529.3	16.1	476.32	4.92	526.11	5.54	1158.2	13.0	1145.53	12.09	1304.94	18.66	501.2	4.8	1650.51	17.81	489.12
477.2	44.6	471.63	6.97	458.33	1.10	529.4	7.4	476.36	4.85	539.25	5.66	1158.4	14.9	1147.65	11.92	1104.13	15.78	514.4	29.3	1729.90	18.17	84.99
478.9	54.4	476.31	5.98	470.70	1.90	529.6	17.5	476.47	4.91	555.48	5.76	1158.8	42.0	1156.84	11.89	1131.00	16.19	516.4	5.9	1704.86	17.30	345.38
479.3	86.5	481.94	5.69	472.50	1.54	530.0	18.9	476.74	4.87	576.45	6.43	1159.1	18.7	1158.13	11.93	1261.66	18.03	532.0	20.8	2212.65	25.61	477.01
479.9	8.7	482.38	8.38	475.33	0.97	530.6	6.8	477.07	5.14	639.14	6.57	1159.6	27.2	1160.66	12.30	1144.29	16.38	552.8	5.3	1506.80	38.62	983.84
480.4	44.4	485.99	5.73	502.19	1.02	530.7	11.0	477.10	5.68	216	33	1160.1	29.0	1162.95	11.96	1119.88	16.05	561.4	5.4	1431.76	14.46	369.83
481.0	5.9	487.12	6.00	566.81	1.27	530.9	32.4	477.15	5.17	400	1	1161.0	23.7	1164.69	12.10	987.44	14.16	574.2	5.5	1613.05	16.58	389.56
481.1	58.3	494.62	6.15	155.96	0.75	531.0	13.8	477.79	5.10	342	1	1161.7	17.4	1167.60	12.06	1097.45	15.70	597.7	5.7	1091.91	11.05	394.96
481.2	61.9	495.46	7.82	204.39	8.95	531.1	5.8	477.82	4.94	501	1	1162.6	70.4	1167.65	12.16	1130.20	16.12	599.2	5.7	1729.59	18.22	401.24
482.4	35.0	502.56	6.08	219.86	1.07	531.5	8.2	478.23	5.24	516	3	1162.9	13.6	1169.02	12.05	1106.18	15.87	610.7	5.8	1546.05	15.91	428.89
486.2	22.7	535.50	7.98	235.67	2.89	532.3	7.7	478.33	4.85	617	2	1163.5	26.2	1174.08	12.56	1074.88	15.55	628.5	6.0	1726.78	19.00	466.90
486.3	73.4	572.96	7.19	487.02	1.72	532.4	11.9	478.91	4.87	529	2	1165.0	32.9	1176.90	12.07	1208.59	17.52	804.3	8.9	1756.08	18.33	496.42
486.4	13.8	594.39	6.62	494.21	1.48	532.4	8.8	479.43	4.87	528	6	1166.0	96.1	1199.60	12.28	387.36	17.18	1135.9	61.4	1420.01	14.98	510.72
490.4	2.9	701.71	12.49	1179.47	2.83	532.5	6.5	479.76	4.94	552	2	1166.1	49.8	1215.96	12.56	938.30	20.97	1930.1	94.1	1757.43	17.74	527.16
492.3	71.6	1203.69	16.08	1951.90	3.90	533.3	25.0	480.34	4.89	314	8	1166.1	48.7	1273.31	13.19	1039.19	17.92	2361.0	58.2	1696.20	17.11	633.15
492.9	53.5	1349.12	17.75	160.80	0.57	533.9	12.1	481.67	4.92	499	1	1170.9	16.8	1351.98	15.05	1098.66	15.29	3305.4	25.1	3248.97	32.89	374.14
492.9	15.1	1507.18	19.44	544.32	1.11	534.1	7.0	481.80	4.87	580	2	1172.3	34.5	1405.44	14.49	1100.75	14.80	266.9	5.1	1158.37	11.73	372.74
494.2	8.2	463.30	5.73	587.17	0.96	534.2	6.5	482.46	5.06	560	2	1172.9	58.3	1433.47	14.84	1108.44	13.04	364.8	10.9	1579.50	15.94	363.41
494.2	8.2	506.41	10.16	928.85	1.81	535.2	14.8	482.55	4.93	500	3	1173.7	21.2	1456.67	14.93	1115.24	13.75	394.2	14.7	1929.63	19.57	474.86
494.9	11.6	1008.36	12.03	938.98	1.36	535.5	8.1	482.86	5.00	585	52	1173.8	76.9	1463.81	15.19	1123.05	13.52	489.7	52.2	1708.95	17.51	374.94
495.3	7.9	1263.06	15.34	947.31	1.87	535.6	10.5	483.10	5.01	553	6	1174.4	32.7	1479.88	15.68	1125.66	13.89	529.6	11.7	2002.07	20.51	414.16
496.7	18.6	2889.84	32.47	957.18	2.11	536.3	19.1	483.12	5.01	492.44	5.08	1174.5	19.4	1519.52	16.06	1159.67	15.00	534.0	15.3	1687.44	17.16	352.13
497.3	20.5	2891.62	32.20	975.03	3.03	536.5	5.5	484.01	4.89	487.41	5.12	1174.6	36.9	1528.19	16.44	1260.86	18.45	539.4	19.1	1754.11	17.76	355.18
497.4	26.7	2907.14	32.45	998.74	3.32	536.7	38.4	484.05	4.89	497.59	5.11	1174.6	53.4	1528.79	15.99	499.54	5.18	540.6	15.3	1752.28	17.90	362.41
497.8	14.6	3064.95	33.10	352.11	8.19	537.5	18.5	484.78	4.92	204.99	2.92	1174.7	68.8	1634.40	16.95	510.41	5.27	541.6	60.1	1613.82	16.39	356.48
497.9	23.1	3091.28	38.19	479.26	1.35	537.6	12.0	484.97	5.00	492.11	5.04	1176.9	50.9	1705.84	18.04	854.75	8.79	548.4	7.9	1743.42	17.67	375.11
498.1	6.4	3126.60	34.90	484.24	0.93	537.6	11.2	485.02	5.02	474.85	4.87	1176.9	10.0	1709.72	17.61	1075.20	11.03	559.7	69.7	1829.16	19.12	380.48
499.0	11.2	2733.60	32.40	1009.97	2.20	537.9	14.8	485.13	4.89	476.79	4.93	1178.6	26.9	1711.30	17.73	1091.06	11.18	560.4	12.8	2282.94	24.26	310.44
499.9	75.9	2820.81	31.92	450.92	1.08	538.3	14.3	485.15	4.97	484.69	4.96	1178.7	40.5	1765.31	17.98	11.35	4.34	562.7	49.1	1895.70	19.38	348.52
500.1	4.8	2678.22	27.85	452.41	1.28	538.3	8.1	485.74	4.93	498.98	5.20	1180.2	32.7	1777.05	19.04	456.19	4.81	563.1	15.9	1651.09	17.13	361.24
500.5	30.5	415.83	5.82	486.17	2.02	538.5	8.0	485.97	5.16	478.46	4.93	1180.2	26.0	1881.16	19.20	463.47	5.04	565.9	12.7	1578.70	15.98	362.98
500.7	75.0	453.97	6.61	524.27	1.74	538.6	8.7	486.23	4.94	504.47	5.18	1181.4	34.1	1941.65	19.94	652.15	7.63	566.6	18.1	1665.35	16.95	371.12
501.1	4.8	2894.20	36.39	593.05	3.14	538.7	19.4	486.51	5.23	1492.78	15.14	1184.6	54.7	1967.55	20.61	935.01	9.66	570.5	13.4	1821.41	18.71	376.06
501.6	14.6	409.01	5.34	761.55	4.70	538.9	8.5	486.62	4.94	784.04	7.98	1190.2	63.1	2421.16	24.79	1085.08	11.08	572.0	14.7	1943.71	19.71	381.01
501.9	10.0	2679.78	32.70	1033.51	8.93	539.0	40.8	486.70	4.95	564.52	5.98	1191.8	21.0	1114.94	11.31	1104.12	11.43	575.4	30.9	1754.90	17.80	385.70
503.9	9.7	2815.30	28.88	1070.08	3.12	539.3	5.7	487.18	5.02	582.53	5.99	1192.0	70.9	1134.05	11.98	1111.97	11.41	576.1	51.8	1433.78	14.46	394.80
504.1	6.9	470.65	6.98	1119.71	1.86	539.8	8.8	487.31	5.11	1093.08	11.11	1194.2	118.6	1136.08	11.80	480.13	8.73	576.3	18.8	1566.18	15.84	407.21
504.2	20.9																					

504.3	9.7	515.89	9.25	2513.53	5.78	542.1	9.4	487.80	5.01	538.17	5.50	1204.8	87.9	1141.29	11.85	921.00	16.96	577.7	25.6	2463.99	26.63	111.29
504.5	6.8	463.62	7.73	2545.66	3.63	542.9	5.2	487.88	5.06	525.56	5.39	1209.6	38.3	1142.67	11.80	400.31	11.21	578.7	9.4	1667.74	16.92	459.80
506.2	5.3	117.94	2.46	2550.23	5.89	543.3	15.6	488.52	4.98	548.47	5.60	1209.9	40.6	1148.37	13.11	478.21	11.81	579.2	17.2	1568.37	16.14	487.55
507.0	16.8	260.51	5.32	2599.11	4.28	543.4	15.9	488.54	5.23	583.81	5.97	1212.0	121.5	1149.30	12.15	428.01	9.08	580.2	10.2	2078.62	22.77	489.99
507.4	76.7	339.90	6.95	2601.31	3.89	544.7	9.5	488.95	5.02			1219.6	50.0	1159.79	12.76	1065.65	18.20	581.0	7.8	1477.08	15.02	490.03
507.5	5.7	757.69	27.68	2617.48	4.42	544.8	5.2	489.05	4.91			1219.8	86.6	1164.79	14.15	438.12	5.37	586.4	13.3	1602.77	16.42	495.06
508.6	103.0	1511.65	30.39	2631.71	5.03	545.7	10.9	489.19	5.10			1220.7	83.0	1172.67	12.34	438.41	5.23	589.3	10.2	1542.40	15.68	499.77
508.8	12.5	2869.84	59.26	2642.48	3.17	545.8	5.7	489.38	5.01			1221.7	120.0	1174.08	12.09	494.56	13.53	589.8	30.4	1689.76	17.12	1479.01
508.8	38.5	12.58	2.40	2653.42	7.67	547.0	38.4	489.56	4.93			1224.1	59.8	1181.19	12.09	855.80	11.87	593.4	44.2	1676.27	17.06	1493.07
509.3	5.0	90.95	5.59	2655.73	4.99	547.0	6.8	489.77	5.10			1239.6	141.8	1184.34	12.64	943.56	45.04	599.9	14.5	2541.76	27.04	1559.09
509.3	9.3	152.56	3.36	2677.50	5.47	547.1	12.3	489.93	4.98			1240.7	102.7	1185.99	12.11	1083.44	11.52	603.7	17.2	1712.19	18.00	1590.40
509.4	4.9	156.89	3.26	2682.16	6.62	547.2	26.6	490.01	4.97			1256.8	107.0	1196.78	12.20	1090.93	27.68	604.6	15.2	2285.84	23.57	1647.52
509.5	3.2	183.82	3.75	2707.64	3.86	547.3	6.1	490.13	5.16			1262.1	60.9	1198.39	12.52	1138.72	22.40	637.3	5.4	1819.36	18.50	1670.83
509.7	4.9	224.15	22.50	2714.68	3.78	548.3	27.4	490.19	4.96			1268.6	129.4	1200.63	12.38	1195.70	23.93	890.5	31.9	1784.25	19.07	1698.71
509.8	9.0	232.06	4.82	2729.96	6.10	548.7	9.0	490.94	4.97			1271.8	201.3	1203.90	12.41	1339.83	15.96	902.6	102.9	2454.30	25.02	481.45
510.1	43.4	273.10	4.62	2806.35	4.89	549.0	5.3	491.07	5.15			1273.4	155.3	1211.60	12.89			941.1	18.0	1458.82	15.46	491.55
510.2	22.0	301.93	6.29	2828.55	5.04	549.2	24.1	491.27	5.38			1282.8	118.5	1219.77	12.43			961.2	23.4	180.01	3.99	493.08
510.3	7.4	316.58	9.76	190.53	2.11	549.5	8.1	491.99	5.09			1287.7	117.2	1224.28	13.03			1033.7	106.5	431.69	66.52	493.11
510.4	22.4	324.17	6.99	977.35	11.16	550.0	11.0	492.01	5.18			1292.3	113.3	1246.76	12.89			1048.4	13.3	494.82	7.86	496.37
510.5	4.9	367.39	8.69	1010.29	10.41	551.5	14.0	492.17	5.07			1321.2	146.6	1290.41	13.91			1054.0	165.3	514.84	6.12	500.73
511.0	24.3	379.62	8.31	347.72	3.54	551.9	20.7	492.31	4.99			1323.2	148.6	1377.52	14.58			1122.5	33.1	517.76	5.72	512.22
511.3	6.9	442.01	8.89	914.61	9.93	552.2	19.9	492.37	5.95			1351.9	155.2	1404.74	15.16			1146.3	65.8	599.15	35.83	1628.08
511.4	10.4	446.54	6.07	1040.81	10.70	552.3	5.3	492.52	5.01			1367.6	133.8	1408.32	14.88			1170.8	64.8	613.47	7.19	1668.48
511.5	12.1	458.87	9.41	114.39	1.89	552.7	10.1	492.83	5.05			1394.3	83.4	1424.27	14.54			1181.7	40.0	1041.39	12.58	1679.27
511.5	7.8	462.93	4.78	1110.68	11.78	553.0	23.2	492.85	5.10			1401.7	78.2	1441.57	15.11			1210.8	32.4	1474.84	15.24	1707.45
511.9	8.6	467.48	5.14	615.74	6.47	553.2	6.3	492.87	5.02			1402.3	142.2	1463.05	15.47			1234.0	50.5	4.97	4.76	1734.03
511.9	36.6	476.38	5.63	196.20	4.15	553.5	32.1	492.90	6.01			1416.9	99.5	1478.40	15.33			1426.8	89.6	247.33	47.42	1744.95
512.6	7.7	477.41	5.43	969.19	9.99	554.2	6.1	493.01	5.17			1417.3	18.0	1480.46	15.84			1455.0	17.7	490.53	5.62	1767.14
512.8	13.1	477.60	5.80	250.59	14.55	554.8	5.9	493.10	4.96			1422.2	116.1	1512.70	15.47			1476.4	35.3	1520.61	27.35	53.63
513.7	18.2	478.14	6.34	467.14	5.53	555.7	16.1	493.20	4.96			1431.4	65.8	1571.96	16.19			1584.2	13.0	1649.56	18.53	97.64
513.9	14.4	481.50	5.93	479.99	6.56	555.8	15.0	493.86	5.09			1437.3	20.7	1599.73	16.68			1598.6	5.8	485.65	5.40	438.55
514.1	6.2	487.73	5.11	886.25	9.45	556.1	8.1	494.00	5.00			1442.5	79.1	1608.50	17.57			1610.5	10.1	557.22	5.79	457.01
514.6	22.4	487.87	5.92	942.66	9.72	556.2	5.3	494.27	5.06			1447.6	59.2	1623.86	16.94			1617.3	20.4	1089.09	11.20	463.15
515.2	5.0	490.89	6.15	964.63	10.07	556.7	11.5	494.49	5.15			1452.6	132.9	1909.37	23.64			1687.1	10.7	1129.54	11.60	466.83
515.7	23.1	494.35	6.12	966.69	9.83	557.2	25.9	494.58	5.19			1461.7	89.7	1121.27	11.55			1722.1	3.6	1231.46	12.89	492.55
515.8	22.4	496.28	6.14	967.73	10.06	557.8	30.3	494.74	5.12			1462.2	16.7	1128.57	11.58			2509.6	25.8	1426.46	14.77	493.67
516.1	7.0	496.82	5.06	968.25	10.02	558.4	8.4	494.91	5.38			1466.6	20.7	1139.19	11.74			2510.5	27.5	1435.37	14.80	494.76
516.2	7.6	504.55	6.03	973.76	10.88	559.0	10.8	494.96	5.00			1471.3	39.2	1179.44	12.17			2514.0	6.7	1460.30	15.69	1393.71
516.5	7.0	504.74	6.25	978.91	10.27	560.4	20.3	495.12	5.20			1478.1	71.5	1257.95	12.87			2712.1	9.6	1476.42	15.37	1554.62
517.0	35.7	507.62	6.93	979.92	10.04	561.0	9.0	495.60	5.03			1481.1	13.4	1114.88	11.55			2714.0	6.0	1555.43	16.54	1575.93
517.2	8.1	519.38	5.37	1006.37	10.49	561.6	14.1	495.72	5.04			1483.6	15.1	1205.27	12.42			3080.5	12.2	1741.76	18.04	1604.52
517.3	20.4	566.40	7.32	1009.59	10.30	562.1	12.6	495.87	5.19			1483.7	16.5	1128.56	11.67			3359.7	5.6	1881.66	19.95	1630.59
517.6	15.5	602.32	7.80	1015.22	10.47	562.2	20.4	495.94	5.04			1487.8	40.7	1447.51	14.93			479.3	9.0	3299.22	47.90	1562.81
518.1	5.0	876.87	9.12	1021.84	10.68	562.3	14.7	495.98	5.13			1490.4	9.0	1363.31	14.34			560.0	12.7	529.71	9.99	459.54
518.1	5.0	897.06	18.27	1031.45	10.61	562.3	24.5	496.61	5.46			1492.8	26.0	2055.67	44.83			1714.2	172.9	1430.01	23.11	517.58
518.2	9.7	1005.98	12.16	1249.25	12.63	562.7	9.2	497.14	5.28			1494.3	12.1	1225.68	12.87			284.3	3.7	1191.49	16.81	481.12
518.3	54.2	1064.56	21.36	2755.06	27.92	562.7	24.5	497.27	5.07			1495.6	4.4	1125.53	11.54			549.6	7.7	505.74	8.45	493.42
518.5	5.0	46.63	1.24	480.41	4.94	563.2	24.8	497.31	5.01			1496.5	14.1	1293.45	43.27			510.2	18.8	477.10	7.50	489.41
518.8	14.4	66.42	1.72	2891.78	29.70	563.5	23.8	497.65	5.20			1498.8	48.3	1216.49	13.79			1636.9	7.9	556.63	10.06	474.51
518.9	7.7	66.44	1.37	2772.88	28.01	564.1	12.5	497.79	5.03			1500.4	23.2	1127.20	11.82			528.4	47.8	492.11	9.28	1706.73
519.2	69.5	71.21	1.51	393.51	4.54	564.2	6.9	497.80	5.11			1503.3	77.1	1386.57	15.59			527.8	3.7	500.63	8.20	485.08
519.2	11.3	81.89	1.93	412.70	4.99	564.7	9.3	498.45	5.28			1503.4	15.6	538.86	5.94			1219.7	20.7	1530.10	21.13	495.55
519.3	41.5	93.38	2.17	427.71	4.96	564.7	5.4	498.55	5.05			1505.6	6.9	1089.91	19.32			1040.4	19.2	1708.85	27.60	493.63

519.4	6.1	145.26	3.12	432.98	7.24	564.9	5.7	498.60	5.10	1506.8	23.3	1110.61	11.80	1013.0	24.2	511.54	9.18	399.55
519.4	5.0	153.69	3.18	447.49	4.68	565.1	20.6	498.71	5.14	1506.9	84.3	1117.64	11.57	1118.4	17.2	1700.70	22.56	526.54
519.4	17.2	157.48	3.25	450.66	5.12	565.5	11.7	498.77	5.15	1507.0	8.3	1120.72	11.63	597.4	17.0	1378.56	19.61	328.27
520.1	24.0	170.67	5.81	453.13	4.98	566.6	9.3	499.39	5.11	1507.8	7.5	1123.22	12.05	3433.8	15.8	1682.18	21.93	523.64
520.1	7.9	206.98	7.23	464.01	5.03	566.9	13.7	499.48	5.23	1509.9	5.8	1131.44	12.76	586.5	7.2	517.35	10.34	504.53
520.2	103.0	213.09	2.88	468.05	5.07	566.9	8.2	500.00	5.31	1509.9	15.9	1132.86	12.26	526.8	30.5	518.58	10.50	1666.70
520.4	9.7	227.86	13.14	469.23	4.82	567.8	28.5	500.31	5.18	1510.3	8.7	1136.59	11.68	1596.6	90.4	1469.94	19.26	512.56
520.8	13.0	260.76	18.23	513.20	5.49	567.9	25.1	500.37	5.15	1510.8	47.2	1137.47	11.63	1227.7	11.8	423.21	7.99	102.08
521.1	12.4	471.79	9.20	515.87	5.58	568.7	18.8	501.15	5.10	1512.0	16.2	1138.27	11.88	1614.6	13.6	1988.63	26.18	510.09
521.7	6.8	479.73	6.49	727.20	7.96	568.8	19.3	501.60	5.26	1512.9	20.4	1162.46	12.83	515.7	52.7	410.35	4.37	503.95
521.8	11.5	537.43	7.78	895.97	10.36	570.0	8.4	501.80	5.15	1513.1	21.5	1181.73	12.33	618.6	18.0	474.62	5.64	480.57
522.5	9.5	543.93	12.37	1151.92	11.73	570.3	20.9	501.85	5.97	1516.1	66.4	2013.32	21.49	548.5	7.4	481.41	5.80	479.72
522.6	16.6	730.21	13.70	1505.37	37.04	570.3	13.3	501.92	5.18	1516.6	12.1	1080.87	11.22	186.4	3.2	492.57	5.15	526.71
523.0	4.8	1985.07	22.26	1927.79	20.26	570.4	12.8	501.99	5.24	1518.9	17.7	1101.66	11.38	357.5	3.5	510.28	5.44	512.89
524.3	19.8	3156.85	34.89	2306.89	23.86	571.8	6.7	501.99	5.13	1519.3	15.2	1110.77	11.94	442.9	27.7	605.44	7.68	527.97
524.9	11.6	3320.82	38.47	2397.32	24.70	571.9	17.9	502.14	5.09	1519.4	81.6	1162.06	12.21	484.2	5.8	1029.77	10.91	427.28
524.9	11.6	3681.81	41.47	2556.16	25.81	572.1	28.5	502.15	5.07	1519.8	14.2	1172.56	11.98	488.1	43.0	1077.43	11.09	493.31
525.1	7.5	131.86	18.06	2663.99	30.31	572.3	26.0	502.27	5.06	1520.0	14.9	1175.81	12.69	495.7	4.8	1080.00	12.08	1204.77
525.4	16.8	180.19	3.80	2697.52	27.25	573.9	12.0	502.45	5.07	1523.5	29.1	1193.63	16.78	498.3	4.8	1170.27	13.61	531.87
525.7	11.1	197.61	6.87	585.06	9.00	574.5	29.5	502.52	5.17	1524.2	44.7	1198.64	12.86	502.6	4.8	1181.31	12.87	503.22
525.7	5.3	202.88	14.53	977.76	10.30	575.5	14.2	502.52	5.37	1525.7	12.7	1199.20	12.49	521.8	14.3	1265.22	18.40	1595.01
525.7	7.5	243.60	6.81	1003.31	11.89	575.7	9.8	502.90	5.10	1526.4	48.6	1215.28	12.68	555.1	7.6	1270.94	14.13	505.16
525.8	14.8	288.36	6.48	1018.15	10.87	576.1	17.9	502.90	5.15	1526.5	59.7	1255.46	13.59	824.0	21.7	1370.10	14.96	497.00
525.9	11.0	379.59	4.17	1025.81	11.21	576.2	16.2	503.44	5.27	1526.6	5.8	1257.53	13.82	849.7	21.7	1442.74	16.05	229.49
526.0	66.6	441.01	10.46	1030.45	10.52	576.9	5.5	503.56	5.11	1527.2	13.7	1283.92	14.28	870.0	14.7	1455.73	15.70	475.27
526.5	7.0	467.94	4.99	1032.24	11.17	577.2	36.1	503.88	5.14	1528.8	98.4	1288.17	15.69	1032.1	58.5	1574.13	16.38	481.87
526.8	64.1	474.36	9.85	1037.40	11.53	579.6	14.6	504.14	5.24	1529.0	11.3	1684.36	23.54	1414.8	68.6	1705.61	17.65	501.05
526.8	20.9	481.82	5.46	1038.12	11.98	581.4	42.8	504.84	5.10	1532.1	21.5	1815.36	18.50	1434.8	135.5	0.79	1.01	1113.04
526.8	5.9	486.69	10.67	1060.29	11.31	581.7	20.8	504.85	5.13	1534.1	22.6	1321.77	13.89	2701.1	50.8	6.28	1.78	1527.53
527.1	16.2	489.69	5.36	1061.27	11.73	581.9	28.1	505.05	5.14	1534.6	13.0	1198.93	13.92	50.2	2.8	8.75	7.71	1560.71
527.8	13.2	496.19	5.13	1063.58	11.59	584.3	13.7	505.06	5.15	1535.1	12.8	1559.73	16.35	110.8	2.1	8.89	1.26	1567.05
528.0	5.1	497.58	10.16	1064.51	12.15	585.4	55.6	505.37	5.60	1535.2	20.7	1116.69	11.40	277.4	5.1	10.69	4.06	1568.10
528.3	32.0	502.14	10.42			586.0	14.8	505.57	5.20	1535.4	27.3	1160.99	11.87	364.4	18.4	12.02	164.97	1644.10
528.3	5.1	502.80	5.90			586.0	13.0	506.04	5.86	1537.9	26.6	1143.01	12.51	364.9	36.7	57.63	7.34	1733.04
528.4	4.6	507.75	6.26			586.3	11.1	507.22	5.13	1538.4	38.8	418.11	4.93	365.9	5.5	205.65	103.34	1683.21
528.4	7.5	514.07	10.55			586.7	14.5	507.82	5.33	1538.4	8.7	1174.07	12.79	371.5	6.0	817.50	44.29	1594.16
528.8	6.5	517.70	10.58			586.8	39.4	508.32	5.24	1539.5	21.4	1253.57	13.12	374.5	20.8	1141.44	12.73	1709.11
529.0	33.1	518.55	10.61			587.5	9.7	508.49	5.25	1540.8	11.0	1062.59	11.19	378.2	8.2	1159.74	12.57	1655.07
529.5	25.7	521.57	5.31			587.6	5.6	508.66	5.25	1542.8	5.7	2752.20	28.78	381.5	5.6	2.92	0.21	1634.58
530.9	5.8	523.32	6.37			587.6	25.6	508.72	5.21	1543.3	14.7	1151.77	11.98	386.4	16.6	3.75	0.27	1656.97
531.1	17.9	616.20	8.58			587.8	12.3	509.00	5.32	1544.1	19.7	952.89	11.59	387.2	19.9	9.40	0.92	1618.98
532.2	14.5	723.03	14.92			588.6	14.6	509.01	5.40	1544.2	23.7	954.39	11.35	387.6	4.3	497.37	5.82	1608.34
532.3	9.3	941.18	9.62			588.6	7.3	509.34	5.34	1544.5	23.8	1170.33	12.18	391.5	8.5	499.14	5.81	1624.18
532.4	12.4	953.28	10.22			588.8	38.5	509.61	5.31	1545.0	8.5	1345.95	13.75	391.9	60.6	83.48	5.59	1686.12
532.9	16.4	964.65	12.44			589.6	12.5	509.80	5.26	1546.1	10.7	1110.72	11.84	392.3	9.7	125.18	5.74	1635.44
533.5	16.4	971.31	20.18			591.2	29.4	509.81	5.22	1547.0	32.7	1107.00	11.31	393.3	19.8	416.98	4.65	1580.25
533.6	3.5	976.35	12.56			593.3	33.5	509.81	5.53	1547.5	74.2	1116.08	11.62	397.2	34.2	478.95	5.82	1583.01
533.9	52.0	979.39	10.96			594.8	27.4	510.59	9.40	1548.4	27.7	1059.18	10.95	399.2	17.3	482.47	6.05	1799.91
533.9	12.6	979.78	19.82			595.5	16.8	511.65	5.42	1549.5	28.0	1142.17	11.76	408.3	9.2	483.71	5.33	1581.00
534.2	7.0	991.75	11.91			595.6	35.4	514.03	5.23	1550.7	8.1	1284.20	13.07	423.7	10.9	489.74	5.67	1592.50
534.5	10.7	992.65	11.49			596.4	20.9	514.31	5.19	1551.6	14.8	1150.40	11.80	459.2	14.0	491.64	6.33	1594.74
534.9	37.0	994.78	11.42			597.9	33.6	514.35	5.23	1552.1	56.4	1128.27	12.75	459.8	24.7	492.43	6.58	1598.26
535.3	21.6	1000.71	11.66			598.2	13.7	515.47	5.32	1552.3	8.5	1144.21	12.08	475.3	6.7	502.77	5.33	1602.40

535.4	10.7	1002.71	14.44	601.0	20.2	515.98	5.27	1553.9	12.2	1152.68	12.06	475.4	38.0	528.24	5.81	1607.13
535.4	7.6	1010.72	13.64	601.8	23.1	516.19	5.24	1554.0	9.7	1064.73	11.88	479.2	43.7	628.91	44.29	1617.25
535.8	20.0	1028.72	11.69	602.4	11.5	517.37	5.33	1555.7	7.7	1107.84	12.17	488.1	20.6	914.75	40.98	1618.66
536.0	4.9	1035.98	21.14	602.4	21.5	517.67	5.24	1555.7	10.6	1085.39	11.82	492.2	8.8	1179.68	12.23	1619.78
536.4	18.4	1049.86	12.18	603.9	13.5	517.70	5.22	1555.8	38.8	1118.47	11.54	494.3	13.7	1901.25	24.09	1624.88
536.6	9.0	1058.78	12.15	604.0	43.5	520.60	5.54	1555.9	11.2	1120.20	11.60	495.7	12.8	501.30	9.06	1635.41
537.2	6.0	1064.87	23.09	606.9	21.0	520.90	5.39	1556.4	53.5	1494.71	16.19	499.0	19.6	541.80	8.35	1640.17
537.5	5.2	1086.51	21.87	607.5	5.9	521.03	5.56	1557.0	51.8	1252.39	12.74	501.0	10.2	495.14	12.66	1659.98
538.2	14.3	493.01	10.15	608.2	5.8	521.17	5.41	1560.0	6.4	1204.24	12.81	506.8	7.7	447.92	14.53	1674.24
538.3	52.5	479.54	9.96	608.3	18.3	522.19	5.37	1560.7	12.6	1351.01	15.05	506.9	21.2	439.83	9.60	1698.25
538.4	32.4	1150.07	23.10	608.8	17.5	522.30	5.28	1561.2	3.7	1131.44	12.05	510.2	20.9	34.56	0.64	
538.6	9.0	171.48	3.48	610.9	5.8	522.38	5.44	1561.5	7.7	1116.00	11.71	522.6	8.7	48.79	1.38	
539.2	25.5	316.73	6.53	611.9	18.8	523.36	5.32	1561.8	28.8	1010.27	10.42	522.8	44.6	84.99	1.22	
539.9	7.2	520.22	10.62	612.9	11.0	523.43	5.40	1562.0	18.1	1376.48	14.07	523.0	4.7	87.68	4.87	
540.3	6.0	929.95	19.68	617.2	9.6	523.91	5.29	1562.6	12.6	1302.40	13.40	525.4	18.3	204.56	2.61	
540.3	6.0	980.73	20.42	618.0	9.2	523.94	5.36	1563.0	17.0	1449.42	16.97	525.8	37.5	285.38	4.03	
540.5	10.7	1064.65	21.46	619.0	44.1	523.98	5.61	1563.4	5.7	1432.81	14.77	527.4	20.4	472.42	5.01	
540.9	12.9	508.35	10.27	619.1	14.9	524.90	5.54	1563.5	48.6	1146.33	14.49	536.4	5.7	490.93	5.11	
541.0	95.3	820.22	16.85	619.7	14.1	525.42	5.55	1564.4	6.8			538.9	23.3	2310.67	24.56	
541.3	28.1	191.00	3.44	620.0	33.0	525.46	5.34	1566.1	49.6			539.5	88.1	2594.96	27.08	
541.6	15.6	517.27	6.94	620.2	34.1	525.62	5.52	1566.9	9.0			540.9	61.3	3.03	11.28	
542.0	36.4	478.90	6.61	620.8	17.0	526.15	5.43	1567.1	70.3			547.4	13.7	5.71	1.45	
543.4	5.2	169.68	2.08	621.3	16.8	526.47	5.39	1568.9	62.9			560.8	24.2	16.08	1.46	
543.8	16.7	603.23	27.27	621.7	8.8	527.56	5.59	1569.0	7.1			561.9	22.5	23.15	1.24	
544.1	59.3	185.45	2.98	623.2	15.4	527.94	5.92	1569.4	14.6			563.0	8.5	9.63	0.13	
544.4	74.8	225.85	2.99	623.5	46.9	529.31	5.38	1569.6	9.3			563.9	18.2	0.77	0.35	
544.4	8.2	465.51	7.03	626.4	25.2	529.49	5.39	1569.8	52.8			571.5	18.5	2.69	0.76	
544.5	14.0	275.83	54.38	630.3	6.8	531.06	5.35	1571.1	24.1			572.7	32.8	4.10	0.25	
545.4	18.6	279.31	3.44	630.7	6.5	532.94	5.48	1571.6	7.5			572.9	9.5	6.78	2.03	
545.5	10.5	174.21	2.04	631.2	27.8	533.60	5.59	1571.8	13.6			577.6	7.9	11.44	1.04	
545.9	11.1	168.54	6.20	632.6	14.9	534.82	5.64	1572.5	33.0			579.9	76.6	98.78	1.06	
545.9	20.2	180.40	6.08	634.2	7.7	537.59	5.42	1573.4	9.0			582.3	11.6	6.80	0.69	
546.5	19.3	463.76	9.84	634.3	52.5	539.32	5.46	1573.5	36.9			589.9	21.0	8.37	1.97	
546.8	11.4	472.94	9.57	635.7	16.7	540.68	6.31	1574.8	11.2			592.1	14.7	10.13	1.82	
547.6	7.1	507.22	10.48	637.6	22.8	542.68	5.69	1576.2	43.9			598.6	29.1	10.38	0.27	
548.0	5.3	509.50	10.25	638.1	32.5	545.45	6.26	1576.3	59.5			974.3	76.6	83.57	12.23	
548.2	15.0	740.61	15.72	638.5	11.8	546.68	5.62	1577.3	87.0			1042.7	15.6	330.55	3.96	
548.3	14.4	947.52	19.41	641.3	16.0	546.75	5.55	1579.9	9.8			1046.4	34.5	333.58	18.60	
548.3	14.0	1029.94	21.04	643.0	13.5	547.83	5.64	1580.6	36.3			1063.5	63.8	476.50	5.34	
548.4	20.8	91.28	1.91	643.2	43.7	550.78	5.82	1580.9	2.6			1134.2	18.0	477.86	10.10	
549.3	18.5	166.85	3.37	646.8	13.3	552.38	5.74	1581.0	37.6			1137.5	14.3	485.42	5.75	
549.4	93.0	421.05	5.21	648.3	6.2	553.00	5.60	1581.9	23.0			1181.8	175.1	18.40	0.51	
549.4	11.2	441.42	4.74	648.5	47.1	554.36	5.61	1582.0	14.8			1203.5	10.3	28.46	1.11	
549.7	7.7	468.78	11.73	649.3	41.7	558.44	6.39	1582.6	6.8			1233.8	10.7	9.10	0.28	
550.3	105.0	472.75	4.16	649.4	21.3	560.53	5.98	1583.1	45.8			1324.4	104.0	2.49	0.48	
550.7	11.8	479.60	9.74	650.0	8.1	562.58	5.90	1583.2	4.0			1785.5	8.0	3.08	0.55	
551.2	9.2	484.54	5.37	652.9	11.6	564.33	5.88	1584.9	12.4			1803.7	25.8	155.76	1.98	
551.6	9.8	491.94	10.23	658.0	25.7	565.88	5.76	1585.5	6.3					111.83	1.28	
551.8	5.3	515.28	3.74	658.7	12.7	572.37	5.89	1586.1	24.8					15.06	0.53	
551.9	35.4	568.36	14.86	660.3	16.6	572.48	6.19	1586.8	51.2					0.78	0.39	
552.0	7.1	705.87	14.64	660.4	28.2	574.17	5.89	1587.8	4.2					5.34	0.27	
552.0	12.4	735.00	15.86	661.5	16.6	574.89	6.78	1588.3	37.9					2.25	0.30	
552.3	6.6	1128.51	25.37	661.8	20.3	579.65	5.90	1589.2	4.6					31.00	13.92	

553.0	10.0	1633.96	35.60
553.4	95.3	2530.67	50.71
553.6	11.1	2531.93	29.54
554.0	6.0	2687.99	59.91
554.5	20.4	2800.66	56.77
554.5	83.8	2831.41	57.22
554.6	12.8	2840.60	46.03
554.8	7.3	2875.58	7.21
554.9	56.2	2879.55	13.84
555.7	15.6	2885.45	39.37
556.5	63.2	2885.89	33.11
556.9	7.1	2924.37	15.41
557.2	5.3	2930.68	39.14
557.3	8.7	2935.77	32.64
558.6	58.4	2937.02	10.53
558.8	11.8	2961.45	59.61
558.9	10.0	2966.74	44.13
560.9	6.1	2997.20	7.64
561.6	11.0	3003.92	60.71
562.1	19.4	3006.79	60.58
562.1	11.0	3013.04	61.44
562.3	6.1	3018.45	38.80
562.6	51.6	3025.21	27.80
563.2	8.4	3025.71	34.89
563.9	26.1	3037.85	33.66
564.5	26.0	3054.23	61.67
565.5	17.6	3057.95	61.65
565.6	9.2	3065.17	61.75
565.6	9.2	3068.07	6.96
565.8	18.3	3205.14	6.66
566.0	10.6	3380.24	44.55
566.1	62.3	3527.88	70.85
566.1	17.6	17.72	67.07
566.1	11.3	167.46	13.05
567.2	5.4	189.15	3.82
567.3	5.5	197.05	6.24
567.5	5.4	202.48	13.42
567.9	40.7	346.39	12.39
568.0	56.6	439.82	12.64
568.8	6.5	446.79	12.20
569.1	19.4	451.84	52.76
569.3	42.4	463.23	18.63
569.6	78.4	469.50	11.16
569.7	7.0	471.05	5.93
570.0	7.9	472.15	6.14
570.4	8.2	475.93	50.72
570.4	6.1	477.00	7.21
571.1	25.3	478.69	15.68
572.3	5.4	481.45	7.47
572.4	5.7	481.90	8.26
572.8	12.3	483.30	55.58
573.3	8.8	485.92	6.40
573.9	18.4	486.93	8.56

663.8	40.5	582.79	5.93
664.7	44.4	583.32	6.24
664.9	11.5	587.42	5.99
665.1	48.4	592.16	6.26
669.7	6.4	593.04	7.36
669.8	24.8	595.99	6.03
673.3	49.2	597.12	6.07
673.8	14.8	600.68	6.38
674.0	20.7	602.12	7.07
674.9	30.4	605.06	6.38
679.2	38.2	605.94	6.15
681.7	37.5	609.33	6.20
682.4	65.3	613.43	6.24
682.7	12.6	614.29	6.33
684.3	11.0	616.75	6.38
685.3	39.7	617.05	6.51
688.6	9.1	617.64	6.38
688.6	13.7	620.44	6.32
690.0	28.6	622.48	6.26
691.2	31.1	624.04	7.24
691.8	13.4	625.62	6.30
693.1	9.4	628.26	6.35
693.4	21.8	628.32	6.46
694.7	31.2	629.79	6.38
695.0	15.8	632.49	7.11
695.6	51.2	663.23	7.12
696.5	12.5	670.54	6.75
698.1	23.4	674.15	6.96
699.8	15.6	698.61	7.11
700.1	10.1	700.58	7.04
700.2	60.4	712.51	7.37
701.6	20.6	714.89	7.37
701.7	25.8	720.07	7.89
702.4	29.8	725.13	7.93
702.6	26.1	734.11	7.88
710.7	43.5	740.01	7.46
711.0	23.2	745.38	8.31
714.7	59.5	762.92	8.09
715.4	26.8	770.37	7.90
715.5	47.4	775.54	8.03
716.2	28.7	843.66	8.80
716.6	64.8	849.93	8.54
718.0	31.1	862.15	8.69
718.1	8.5	878.50	8.93
718.4	57.3	882.20	11.03
720.2	25.6	889.37	9.56
730.0	35.5	892.93	9.52
734.5	43.7	902.06	9.15
734.6	30.6	913.96	9.32
735.8	24.9	923.30	9.39
736.1	39.6	982.25	9.97
737.3	10.0	998.14	10.18
738.5	9.5	1025.63	10.41

1590.7	6.3
1590.8	19.9
1591.0	59.1
1592.2	55.6
1593.7	19.4
1593.8	12.2
1594.6	10.0
1595.3	16.1
1596.7	12.3
1599.4	19.5
1600.7	27.2
1600.8	58.1
1601.5	5.6
1601.9	54.0
1602.9	9.3
1606.2	31.2
1606.6	72.9
1607.2	8.3
1607.6	25.8
1607.8	63.0
1609.1	25.7
1610.1	17.9
1610.3	87.4
1610.8	64.8
1615.1	35.6
1624.9	68.7
1625.9	22.6
1627.0	28.3
1637.4	47.6
1637.8	123.1
1638.4	53.3
1655.4	32.8
1673.2	54.1
1706.9	11.0
1716.4	566.9
1734.7	13.7
1764.7	35.8
1774.8	5.0
1825.9	130.2
2411.0	609.1
2641.3	15.9
2811.6	2.6

126.15	4.78
243.96	15.69
476.95	5.31
504.20	8.92
372.94	5.70
362.89	7.84
363.12	4.67

573.9	9.3	488.55	5.17
574.0	5.5	489.43	5.17
575.1	16.7	489.71	5.23
575.4	6.8	490.39	39.00
575.7	10.1	491.60	5.60
576.7	4.3	492.28	6.19
577.0	9.9	492.46	11.29
577.5	10.6	493.12	5.71
579.2	20.8	493.28	24.54
579.8	5.1	498.30	8.23
580.1	7.7	498.40	6.45
580.7	60.1	498.96	6.93
581.6	38.2	499.71	9.00
582.4	9.2	501.09	7.45
582.9	7.7	501.56	6.72
583.0	5.6	503.13	12.33
584.9	15.3	507.26	6.04
585.1	10.0	508.12	5.62
585.4	19.2	508.17	6.78
586.4	12.6	509.55	6.33
586.6	8.5	509.93	8.17
586.7	11.0	510.23	5.93
586.7	33.3	512.57	10.33
588.1	12.4	513.67	9.17
588.4	18.4	516.06	8.44
588.9	22.1	519.19	22.32
589.4	7.5	525.00	6.49
589.4	12.3	525.35	8.86
590.4	25.9	528.48	5.57
591.5	5.7	529.41	6.17
591.5	5.7	530.75	10.33
592.3	10.2	535.83	5.93
593.3	5.7	539.90	6.44
593.3	5.7	552.35	7.25
593.5	8.0	554.25	6.48
593.5	5.4	561.52	7.19
593.7	19.8	567.69	9.74
594.0	55.4	587.86	8.31
594.7	8.1	590.69	7.07
595.4	12.0	638.67	9.89
595.6	13.9	696.41	8.70
595.8	174.2	698.66	9.67
596.3	32.8	825.58	9.02
596.5	2.8	932.35	23.38
598.7	13.5	1041.29	13.88
599.1	10.5	1082.89	21.57
599.4	14.4	1113.02	14.83
599.9	20.0	1203.54	22.61
602.1	8.5	1225.77	15.01
602.7	12.2	1268.19	14.71
603.6	33.5	176.35	68.22
603.9	28.9	346.74	61.34
604.4	71.2	481.92	4.85

743.1	43.1	1056.73	10.71
743.7	31.4	1072.12	11.68
745.8	18.2	1108.09	11.44
748.7	38.8	1123.53	11.36
750.4	40.3	1243.50	16.39
751.7	21.4	1250.04	14.66
753.4	17.7	1266.49	12.89
754.4	38.3	1274.91	13.38
755.0	32.6	1300.94	20.81
756.9	60.5	1323.77	13.45
758.1	69.0	1338.62	14.04
759.9	74.4	1396.06	14.35
762.7	32.8	1446.70	14.60
764.8	29.6	1472.84	15.55
765.5	55.3	1672.24	17.38
771.4	20.7	2164.01	21.84
773.2	16.2	2190.54	207.36
777.6	32.6	2205.08	22.32
783.6	43.7	414.99	6.26
785.0	21.3	418.71	7.42
787.4	33.4	419.59	5.19
790.4	57.7	421.05	14.34
794.0	23.5	421.86	30.58
798.2	14.5	436.69	7.92
800.3	10.5	449.58	5.49
801.1	21.9	458.02	5.27
803.8	36.5	460.98	4.71
803.9	9.7	465.33	5.30
808.6	67.9	469.93	5.20
810.4	12.9	471.83	4.95
812.9	20.9	472.15	5.64
813.1	25.3	473.08	16.00
814.0	26.6	473.14	43.89
816.6	28.3	474.16	5.53
816.7	15.6	476.15	5.13
823.1	14.5	477.05	5.23
827.5	13.6	477.58	5.21
830.0	63.4	478.41	5.02
831.2	28.7	478.78	10.01
831.7	49.1	478.85	5.32
838.9	39.9	479.57	4.96
840.4	60.7	481.57	5.07
842.5	21.0	482.25	5.91
843.9	9.3	482.82	4.92
847.2	21.5	483.09	23.65
848.8	25.2	483.43	5.14
850.6	29.5	484.48	6.57
851.2	20.6	485.08	6.31
852.8	44.7	485.83	5.14
854.7	8.3	486.28	5.68
856.2	23.5	486.73	5.80
856.3	46.6	486.91	5.18
857.2	33.3	486.98	5.04

604.4	8.4	489.50	7.58
604.6	21.5	490.24	5.93
605.6	17.9	893.69	23.22
606.4	5.8	73.06	86.12
606.8	6.7	495.89	6.57
607.9	16.2	498.39	7.13
609.3	11.6	499.40	6.59
609.4	57.9	505.72	6.05
609.9	13.8	505.77	5.16
610.2	11.8	509.29	6.74
611.7	10.6	512.89	7.16
612.3	18.4	516.65	6.16
612.3	18.4	518.15	5.38
613.9	58.7	518.24	6.82
614.6	7.0	520.06	5.64
614.7	82.7	524.12	5.54
615.2	56.6	526.33	5.62
616.1	22.4	531.49	6.35
617.4	54.6	555.96	7.15
618.0	8.9	558.81	12.78
619.9	25.2	596.92	8.95
620.2	9.9	598.12	7.47
620.3	10.1	599.27	14.83
620.5	89.9	724.71	9.46
621.9	6.0	727.75	37.65
623.6	7.3	757.83	37.57
624.5	9.5	773.39	9.59
624.8	14.7	920.95	12.27
625.0	14.8	989.82	9.98
626.1	17.1	993.62	10.53
626.6	33.6	994.27	10.32
626.8	94.6	995.34	11.58
626.8	15.2	998.48	10.08
627.3	9.8	1024.78	11.20
628.4	34.2	1026.38	11.97
628.8	17.1	1028.16	12.39
630.3	10.0	1034.12	14.13
630.8	9.6	1039.49	13.13
630.9	13.4	1042.65	10.89
631.5	18.2	1045.38	10.61
634.4	12.7	1047.35	10.59
635.6	16.3	1048.54	11.21
637.2	23.9	1049.06	10.57
637.4	8.5	1049.26	11.34
637.8	10.6	1055.29	11.01
639.5	36.8	1056.49	10.97
640.6	24.6	1063.18	11.58
642.5	4.7	1066.64	12.44
644.5	6.1	1090.30	10.83
644.5	12.9	517.98	13.36
646.2	18.1	666.56	29.03
646.2	25.4	773.94	15.29
646.7	27.7	773.97	44.68

857.3	68.7	487.17	5.14
858.8	15.2	487.22	5.12
859.2	23.8	487.41	7.59
860.0	26.7	487.88	5.20
860.4	16.8	488.01	9.61
860.5	17.5	488.58	5.28
860.9	17.0	489.51	5.67
861.6	19.1	489.84	5.08
863.2	20.5	490.21	6.98
863.3	29.8	491.02	5.38
864.7	9.2	491.57	4.97
864.7	38.2	491.83	6.56
865.0	22.2	492.34	7.12
865.9	36.0	492.89	4.98
868.5	13.5	493.21	5.13
868.6	25.7	493.90	5.70
869.7	14.8	494.27	5.87
872.6	28.7	494.59	6.22
875.0	43.1	495.10	5.61
878.8	14.4	495.31	5.06
879.9	9.3	495.69	5.12
881.8	21.2	495.77	5.77
882.7	52.5	496.09	5.20
882.8	14.4	496.31	5.38
883.3	18.9	496.34	5.93
883.3	34.3	496.37	5.31
884.0	30.3	497.19	5.03
884.6	30.3	497.43	5.16
884.8	51.8	498.09	5.58
885.3	36.9	498.10	5.32
886.8	13.6	498.21	5.25
887.5	34.1	498.24	5.27
888.0	11.5	498.61	5.68
888.1	31.8	498.77	5.45
888.6	24.3	499.38	5.17
889.0	23.0	499.46	11.33
889.5	84.0	499.46	5.87
889.9	8.3	500.12	5.23
891.2	9.9	500.17	8.59
892.2	48.8	500.59	5.99
894.1	13.2	500.81	5.30
894.4	22.9	503.08	5.46
894.8	24.2	503.83	6.71
894.9	8.4	503.90	5.14
895.9	24.1	504.21	5.08
897.2	48.7	504.45	5.30
898.5	17.8	504.52	6.10
899.6	17.0	504.64	5.39
900.1	19.9	504.78	5.23
901.1	26.5	505.26	5.18
901.1	87.5	505.93	20.97
901.9	29.3	506.83	5.95
903.1	20.2	506.86	5.22

647.6	8.0	851.36	20.69
648.7	11.2	881.91	10.33
650.1	22.3	900.84	31.80
651.7	64.8	909.46	18.42
652.4	10.9	940.90	10.15
652.7	65.3	971.02	19.46
652.9	8.3	973.58	9.97
653.0	8.2	977.32	13.49
653.5	11.8	979.49	13.91
654.3	8.4	983.55	19.79
656.9	6.2	995.16	11.73
658.0	24.0	995.34	13.00
658.2	18.2	995.39	15.85
658.3	39.6	997.76	22.39
659.2	20.0	1001.98	23.51
660.0	14.9	1003.70	31.86
660.6	19.7	1006.33	11.54
661.4	17.0	1008.96	15.23
662.5	13.7	1009.62	14.85
663.6	18.9	1010.51	10.11
665.1	6.7	1010.86	15.86
665.1	30.1	1011.74	16.85
667.0	8.0	1016.49	12.00
667.3	54.9	1017.06	13.69
667.4	292.4	1017.74	14.56
667.5	233.6	1018.57	12.04
670.9	72.6	1022.49	12.79
671.9	156.5	1025.52	17.12
671.9	68.3	1027.16	14.84
672.2	11.6	1031.78	10.95
674.9	53.8	1033.29	20.68
675.8	59.0	1033.91	10.97
675.9	6.5	1034.51	11.59
675.9	6.5	1036.72	13.35
679.8	26.5	1036.97	14.67
681.3	26.3	1038.77	12.68
683.8	5.5	1039.72	14.49
694.9	41.4	1039.81	11.41
696.4	59.1	1041.60	22.67
698.5	24.5	1043.02	18.28
701.0	8.5	1043.08	30.76
703.4	22.3	1048.24	19.86
706.9	51.1	1048.55	11.04
707.6	9.2	1052.26	16.52
716.7	25.8	1052.61	11.79
717.6	121.8	1054.36	12.16
722.5	41.9	1058.77	23.55
725.1	10.7	1058.93	13.46
731.1	36.1	1059.15	13.63
739.6	104.7	1059.96	13.85
746.0	20.8	1061.38	15.78
747.9	131.7	1063.15	11.91
748.2	78.4	1063.43	14.68

903.5	18.7	507.67	5.27
903.6	11.9	507.67	6.38
904.8	8.9	507.85	5.37
905.4	15.4	507.92	5.75
908.2	35.7	508.29	5.31
909.7	20.1	508.65	5.13
910.2	24.8	508.76	5.35
911.1	55.0	508.86	5.67
912.5	16.2	509.27	8.80
914.8	13.2	509.54	5.60
915.0	16.4	509.74	5.58
915.4	18.9	510.54	5.86
915.6	53.6	511.37	7.84
916.9	8.5	511.71	5.78
917.2	29.3	513.30	5.70
917.7	19.3	515.49	6.07
918.2	27.1	515.86	6.06
919.9	19.4	516.27	5.31
920.2	12.5	516.78	6.89
920.5	28.5	516.87	8.84
921.1	28.2	520.26	8.98
921.2	13.3	520.45	5.67
923.1	9.7	520.81	6.66
923.6	32.0	521.20	7.32
924.0	14.8	521.76	5.49
924.0	11.7	522.69	5.80
925.6	22.5	525.44	6.99
927.2	57.7	526.37	5.49
927.3	24.1	527.08	5.50
928.4	70.7	529.10	6.91
928.5	10.6	531.66	7.54
930.7	18.4	531.94	9.71
931.4	14.9	533.76	7.05
931.6	41.7	536.20	5.59
932.3	18.1	538.76	5.76
932.4	37.5	538.79	5.67
932.8	30.7	545.59	6.66
932.9	52.4	549.74	5.57
933.1	15.7	550.17	7.16
933.2	35.9	553.05	7.30
933.4	61.7	570.20	8.08
933.9	13.2	574.63	8.58
934.1	26.5	578.20	6.03
934.1	10.6	581.78	6.24
934.6	43.7	589.45	6.84
937.6	24.0	589.62	6.38
938.5	13.4	593.56	6.31
939.5	40.9	594.87	6.10
939.6	70.9	600.08	11.58
940.5	70.5	603.80	11.74
941.3	28.2	609.35	9.84
941.8	27.8	620.75	6.27
942.9	12.3	638.65	6.47

752.1	100.1	1064.04	15.45
754.2	7.1	1065.28	34.04
754.5	105.2	1066.72	13.31
754.5	8.4	1067.38	19.31
756.5	49.0	1067.82	13.74
757.6	53.8	1072.92	11.19
761.8	112.2	1072.92	15.83
769.5	44.4	1074.75	15.63
777.8	14.1	1074.84	16.91
779.2	58.5	1074.98	23.90
790.4	45.2	1075.93	13.60
795.7	47.3	1081.32	34.16
813.5	55.0	1081.87	11.87
814.7	64.1	1090.28	12.15
824.3	17.4	1092.30	14.44
830.6	88.8	1100.90	18.57
855.6	38.9	1101.66	15.20
858.8	131.8	1106.17	15.03
859.1	59.5	1106.17	20.65
866.5	52.1	1113.47	12.39
879.7	40.4	1114.95	16.79
879.7	40.4	1115.35	22.21
882.4	8.2	1125.97	13.62
906.5	33.4	1128.58	14.26
918.7	13.7	1138.24	14.39
923.8	57.1	1151.90	16.02
924.3	4.1	1154.58	19.31
925.9	22.2	1166.22	13.00
940.2	190.6	1171.16	23.34
945.2	12.6	1172.32	18.58
985.8	50.1	1181.03	14.01
987.8	26.8	1194.31	18.49
989.2	33.8	1205.48	25.25
989.6	54.8	1244.86	32.05
989.9	25.4	1267.03	23.51
992.5	100.4	1278.21	20.23
994.3	24.5	1318.78	16.77
998.9	78.5	1591.07	40.62
1004.5	52.9	1700.07	29.40
1006.0	119.7	33.22	8.92
1007.2	31.9	57.23	1.67
1008.9	29.8	60.90	1.66
1009.1	39.7	63.43	3.39
1011.3	14.4	69.77	4.26
1012.9	24.6	87.34	3.66
1016.8	70.0	93.38	6.30
1017.0	52.4	125.71	1.35
1018.6	35.4	131.20	3.20
1019.4	62.4	238.42	3.57
1021.2	18.3	286.42	7.57
1022.4	77.0	336.67	4.79
1022.6	44.7	353.73	5.38
1023.4	35.7	362.06	10.23

943.0	53.0	640.05	6.47
943.1	53.8	646.13	6.76
944.3	40.8	660.60	40.28
944.9	25.5	669.52	7.10
944.9	39.4	675.71	7.63
946.2	40.5	681.21	6.93
946.4	40.0	689.00	8.02
946.7	8.8	691.14	7.27
946.8	19.4	698.97	7.46
949.5	35.6	741.77	8.05
950.9	19.7	742.55	11.25
950.9	32.5	799.31	8.16
951.2	69.8	828.29	9.51
952.2	17.3	832.29	10.66
953.7	95.2	1349.72	13.60
954.2	18.6	1526.67	16.37
954.4	20.6	1887.97	19.50
955.3	15.5	2411.93	24.50
955.7	22.4	3189.22	108.11
956.0	18.5	489.64	5.21
956.2	41.6	495.84	5.15
956.8	32.7	496.04	5.17
957.0	18.7	498.70	5.09
957.4	23.5	499.01	5.18
957.5	15.3	499.70	5.09
958.7	28.8	499.91	5.11
960.0	18.0	500.38	5.04
962.2	36.1	501.34	5.15
963.0	30.2	502.04	5.19
964.0	54.3	502.58	5.15
964.8	12.2	502.88	5.21
965.5	12.5	503.32	5.10
965.6	38.6	503.33	5.11
965.9	71.6	504.31	5.18
966.1	53.9	504.35	5.17
966.1	38.9	504.61	5.22
969.0	9.0	505.47	5.19
970.0	33.4	508.36	5.12
970.8	16.5	511.67	5.16
971.0	15.4	517.29	5.24
971.3	30.8	521.94	5.25
971.4	34.6	531.85	5.38
973.2	44.2	538.00	5.40
973.6	12.4	542.30	5.57
974.3	12.4	543.62	5.47
974.9	36.7	551.48	5.66
975.9	20.1	554.77	5.94
977.8	33.2	582.69	5.97
978.7	16.6	606.80	6.31
982.5	67.9	616.80	6.33
982.6	20.4	1423.21	15.83
982.8	67.2	1815.50	110.62
986.7	51.3	1863.95	82.04

1023.8	17.3	385.98	5.79
1026.5	9.5	397.48	4.55
1029.4	13.6	402.82	10.65
1029.9	13.1	408.10	4.51
1030.8	15.1	414.32	4.75
1031.0	10.7	431.15	19.53
1033.7	15.4	431.17	14.10
1035.3	34.0	435.45	6.94
1035.8	11.7	443.43	4.77
1036.9	7.0	443.46	6.93
1037.1	27.0	451.25	19.30
1039.1	38.6	452.34	12.78
1042.5	50.5	453.28	6.26
1043.3	30.3	456.11	4.96
1044.0	48.9	462.90	11.15
1044.3	12.5	466.20	5.97
1045.0	41.7	468.81	6.18
1045.3	37.5	469.11	5.20
1046.6	97.8	474.88	9.44
1047.1	14.8	475.49	5.16
1048.4	15.3	478.87	6.93
1048.4	8.5	480.89	6.63
1048.5	122.1	480.89	5.22
1048.7	71.6	485.08	9.50
1053.2	10.5	486.53	5.57
1054.0	45.0	487.44	6.05
1054.7	16.2	487.71	6.08
1055.3	14.7	491.44	8.33
1055.8	7.4	492.08	6.54
1059.0	52.6	492.36	6.53
1059.7	24.5	493.04	5.14
1060.5	45.3	494.79	6.74
1061.1	37.9	495.29	14.02
1062.5	43.9	495.38	5.74
1064.6	20.9	495.92	6.95
1065.4	24.5	496.61	10.22
1066.7	71.3	497.86	6.70
1069.1	16.9	499.25	5.13
1069.2	11.8	500.68	5.41
1069.9	6.8	502.52	8.53
1071.8	88.0	505.15	7.71
1074.7	23.2	505.58	7.28
1074.9	23.2	506.21	10.16
1077.1	72.5	508.09	6.67
1078.2	19.0	508.42	11.51
1078.9	132.8	519.46	9.28
1079.8	37.3	520.57	7.96
1081.4	7.8	521.15	7.38
1081.6	50.2	523.03	6.59
1082.9	16.6	523.92	7.69
1083.4	27.9	531.38	5.63
1084.1	63.6	534.69	6.24
1084.6	17.2	535.46	9.17

987.7	34.5	2767.23	150.16
989.4	9.6	3015.56	131.64
992.0	40.9	4144.39	176.86
992.7	21.8		
993.6	52.2		
993.9	23.6		
994.1	9.2		
994.9	56.5		
997.3	9.2		
1000.1	15.1		
1001.0	25.9		
1001.6	21.9		
1002.5	68.1		
1004.4	19.3		
1004.7	17.2		
1006.8	34.4		
1008.7	16.2		
1009.3	21.0		
1009.6	17.8		
1010.6	16.9		
1012.3	26.4		
1012.4	64.5		
1014.0	17.8		
1014.6	54.9		
1016.2	64.2		
1022.7	28.8		
1024.0	22.4		
1025.2	14.2		
1025.6	33.1		
1026.0	64.3		
1026.2	20.9		
1026.2	43.2		
1029.5	25.7		
1030.3	17.2		
1033.2	60.0		
1035.3	58.6		
1036.5	12.1		
1038.6	32.7		
1039.5	25.1		
1040.2	20.7		
1040.2	51.3		
1042.0	35.2		
1042.6	49.4		
1045.9	53.6		
1057.3	34.1		
1063.0	27.5		
1070.1	24.5		
1074.2	29.0		
1081.9	67.9		
1083.1	81.3		
1083.7	34.5		
1087.4	45.7		
1087.8	34.6		

1085.5	20.2	537.68	8.94
1086.0	25.9	593.25	10.08
1086.0	39.9	680.94	16.19
1086.1	61.2	768.32	7.69
1086.1	57.7	1005.27	12.61
1086.2	67.1	1683.94	16.60
1088.4	37.0	2535.93	36.37
1089.9	14.8	2634.81	26.47
1091.5	9.1	2843.52	41.44
1091.5	20.6	2874.80	31.51
1091.6	26.6	2905.22	35.54
1091.8	17.0	2927.88	30.52
1092.9	70.2	2971.54	31.30
1092.9	70.2	3000.00	39.82
1094.9	19.6	3050.93	34.12
1096.7	37.6	3062.66	32.89
1096.9	28.4	3069.37	31.94
1097.1	4.8	3071.21	32.36
1098.7	8.2	3102.91	32.45
1101.1	25.7	3103.85	31.18
1101.9	69.8	3105.47	33.62
1102.2	31.7	3114.34	31.17
1103.3	7.5	3121.72	41.19
1103.7	38.4	3141.83	42.44
1105.3	42.4	3144.12	31.57
1105.4	33.7	3146.63	32.14
1106.9	7.4	3156.13	33.64
1109.4	107.9	3175.13	40.13
1109.8	10.8	3207.18	36.15
1110.5	120.6	3322.22	37.66
1111.6	18.6	51.80	1.18
1111.8	16.5	89.00	2.34
1112.8	13.6	109.61	3.57
1114.8	65.4	113.89	6.07
1115.1	70.2	135.68	2.84
1115.6	61.4	174.75	12.97
1116.6	14.7	181.87	10.67
1121.4	14.0	343.97	34.72
1122.9	47.1	364.21	47.30
1124.0	66.2	672.39	13.72
1124.0	66.2	977.78	19.58
1124.4	30.1	978.93	9.92
1124.7	26.5	990.66	10.60
1125.9	102.9	993.12	12.90
1126.2	96.5	993.75	10.19
1127.5	37.3	1001.63	11.46
1128.5	51.5	1013.53	15.21
1129.1	16.6	1019.41	10.48
1129.9	16.7	1024.65	15.78
1130.7	107.7	1029.93	10.36
1131.4	79.0	1034.34	18.02
1131.5	6.8	1035.00	35.94
1132.6	62.4	1037.92	11.39

1088.2	19.4
1089.2	94.5
1094.5	69.2
1094.6	23.2
1099.3	23.9
1100.1	46.0
1103.5	95.0
1109.1	51.2
1117.3	34.8
1120.4	59.3
1133.2	47.8
1142.4	73.8
1149.8	67.4
1153.8	36.5
1161.3	68.6
1162.0	44.1
1170.8	114.9
1174.2	71.8
1175.8	56.2
1175.8	71.5
1179.7	69.7
1180.5	63.2
1195.3	31.6
1201.6	81.1
1226.2	85.0
1257.8	82.5
1258.5	60.2
1265.8	72.0
1275.6	77.1
1283.8	133.4
1322.9	116.9
1336.2	70.4
1339.4	19.4
1352.0	98.0
1389.5	42.1
1398.2	147.3
1452.6	54.2
1477.6	59.4
1504.7	45.3
1509.8	70.1
1563.2	40.1
1589.2	104.2
1637.1	29.5
1644.0	216.0
1647.0	74.8
1657.1	72.3
1657.8	346.7
1698.5	118.6
1715.9	29.5
1718.3	231.4
1722.3	106.8
1746.2	68.6
1769.5	76.4

1133.5	38.4	1040.54	14.59
1139.3	149.7	1046.54	28.47
1140.4	69.0	1049.42	39.65
1144.2	12.3	1060.18	11.32
1144.7	22.6	1062.23	14.74
1145.9	13.9	1064.30	12.02
1148.7	29.9	1076.43	14.65
1149.7	49.5	1078.15	29.10
1155.2	34.3	1079.63	17.29
1159.1	9.3	1087.97	12.16
1160.7	33.0	1088.29	11.10
1162.6	111.5	1089.12	11.91
1170.3	70.3	1091.09	21.28
1170.3	70.3	1096.65	15.15
1176.0	20.3	1105.07	14.42
1177.0	67.2	1113.16	11.91
1181.0	102.2	1114.63	11.36
1181.2	42.2	1119.87	12.49
1183.0	60.9	1123.54	16.19
1188.4	78.0	1128.21	11.25
1188.5	8.3	1128.79	12.81
1195.4	95.6	1135.72	15.32
1198.1	34.1	1136.60	16.97
1202.8	39.3	1150.23	12.68
1216.8	160.5	1155.94	26.68
1218.4	56.4	1170.32	38.33
1219.1	120.7	1170.71	15.90
1219.1	120.7	1170.86	12.25
1219.8	70.7	1185.52	18.21
1226.6	70.3	1186.71	15.55
1236.2	64.7	1205.53	12.95
1241.8	139.3	1211.83	14.19
1244.7	686.1	1213.06	12.74
1249.2	45.7	1218.08	16.26
1291.9	173.5	1221.73	17.66
1321.7	16.3	1225.71	13.91
1323.6	83.7	1226.16	19.41
1345.0	52.2	1229.66	15.14
1383.5	257.4	1241.55	13.49
1385.2	65.9	1251.07	24.47
1402.8	13.3	1253.15	12.86
1458.5	15.0	1283.44	18.15
1513.7	61.6	1378.72	14.36
1594.4	95.5	1486.77	33.67
1621.9	47.3		
1630.9	674.5		
1638.5	185.4		
1642.4	1491.9		
1647.0	9.7		
1654.6	132.9		
1656.2	23.3		
1700.7	22.2		
1702.8	739.7		

1779.1	18.6
1798.5	162.3
1856.6	60.8
1868.2	55.5
1922.0	137.4
1931.5	51.4
2000.3	71.3
2001.5	58.3
2007.1	48.6
2023.3	31.9
2026.8	124.0
2032.2	35.9
2047.2	30.6
2057.3	32.0
2073.6	29.8
2092.6	70.7
2113.5	37.4
2155.4	67.9
2184.2	24.2
2295.2	33.7
2317.4	30.7
2396.1	66.0
2419.4	27.6
2444.1	45.5
2480.3	58.0
2494.6	65.2
2564.1	34.8
2678.5	152.2
2680.4	38.4
2682.3	47.3
2687.8	34.7
2715.4	36.9
2716.9	25.4
2722.4	22.1
2727.8	34.8
2734.2	79.2
2745.2	16.5
2748.1	43.2
2753.9	67.9
2781.2	52.6
2803.6	89.2
2856.4	56.0
2900.2	65.4
2994.9	43.0
3102.2	38.6
3110.7	61.2
3140.1	26.4
3199.1	34.5
3439.3	105.0
3454.1	15.5
3481.8	48.8
3496.2	97.2
3525.4	73.3

Core1

Core4

Core2

Core5

Core3

Core6

Age (Ma)

Age (Ma)

Core7

Core10

Core8

Core11

Core9

Core12

Age (Ma)

Age (Ma)

Core13

Core17

Core14

Core18

Core15

Core19

Age (Ma)

Age (Ma)

Core20

Core23

Core21

Core24

Core22

Core25

Age (Ma)

Age (Ma)

Core26

Core27

Core28

Appendix F. References for onland ages plotted in Figures 5A-C. ArAr compilations for Prydz Bay, Wilkes Land and Adélie Land taken from Williams et al. (2010) compilation

Onland U-Pb Zircon Ages

Long	Lat	Age (Ma)	Study	Geographic Location
75.00	-72.75	543	Liu, 2007	Grove Mountains
68.00	-70.87	990	Boger, 2000	Northern Prince Charles Mountainrs
68.00	-70.87	936	Boger, 2000	Northern Prince Charles Mountainrs
68.00	-70.87	942	Boger, 2000	Northern Prince Charles Mountainrs
68.00	-70.87	954	Boger, 2000	Northern Prince Charles Mountainrs
68.00	-70.87	955.5	Boger, 2000	Northern Prince Charles Mountainrs
67.60	-70.60	980	Kinny et al 1997	Northern Prince Charles Mountainrs
66.70	-71.50	984	Kinny et al 1997	Northern Prince Charles Mountainrs
65.20	-70.85	517	Carson et al 2000	Northern Prince Charles Mountainrs
65.20	-70.85	910	Carson et al 2000	Northern Prince Charles Mountainrs
65.20	-70.85	991	Carson et al 2000	Northern Prince Charles Mountainrs
73.00	-70.00	533	Liu et al., 2007	McKaskie Hills
98.90	-66.50	516	Black 1992	Denman Glacier/Bunger Hills
98.90	-66.50	567	Black 1992	Denman Glacier/Bunger Hills
100.75	-66.25	1521	Sheraton 1992	Denman Glacier/Bunger Hills
100.75	-66.25	1171	Sheraton 1992	Denman Glacier/Bunger Hills
100.75	-66.25	1170	Sheraton 1992	Denman Glacier/Bunger Hills
100.75	-66.25	1151	Sheraton 1992	Denman Glacier/Bunger Hills
100.75	-66.25	1190	Sheraton 1992	Denman Glacier/Bunger Hills
110.50	-66.30	1275	Oliver et al., 1983	Windmill Islands
110.50	-66.33	1156	Post via Moller et al. 2002	Windmill Islands
110.50	-66.33	1137	Post via Moller et al. 2002	Windmill Islands
0.37	-72.50	1040	Board et al. (2005)	Sverdrupfjella
0.37	-72.50	1070	Board et al. (2005)	Sverdrupfjella
0.37	-72.50	1135	Board et al. (2005)	Sverdrupfjella
0.37	-72.50	1765	Board et al. (2005)	Sverdrupfjella
0.37	-72.50	480	Board et al. (2005)	Sverdrupfjella
-50.60	83.30	183.9	Minor and Mikasa (1997)	Sonora Bluff
-50.60	83.30	182.7	Minor and Mikasa (1997)	Sonora Bluff
-11.33	-74.50	1075	Jacobs et al. (2003b)	Sverdrupfjella
-11.33	-74.50	500	Jacobs et al. (2003b)	Sverdrupfjella
3.50	-72.00	525	Jacobs et al. (2003a)	Sverdrupfjella
-65.23	-68.17	236	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
-104.20	-82.68	180	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
-64.00	-66.78	182	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
-56.51	-83.91	517	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
-0.06	-72.17	186	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
-9.63	-74.28	1150	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
-12.78	-75.10	1150	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land

1.48	-72.10	520	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
1.48	-72.11	520	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
1.22	-72.10	1150	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
1.28	-72.26	1150	Unpub from Flowerdew et al (2011)	West Antarctica to Droning Maud Land
-64.42	-69.94	260	Millar et al. (2002)	West Antarctica
-54.81	-83.57	512	Curtis et al. (2004)	Pensacola Mountains
-62.33	-72.17	105	Vaughan et al. (2002)	West Antarctica
-70.34	-75.94	107	Vaughan et al. (2002)	West Antarctica
-34.90	-77.80	112	Gose et al. (1997)	Shackleton Range
-6.21	-72.60	3060	Marschall et al. (2010)	Dronning Maud Land
-6.21	-72.60	3060	Marschall et al. (2010)	Dronning Maud Land
-6.21	-72.60	3060	Marschall et al. (2010)	Dronning Maud Land
-29.37	-80.42	530	Zeh et al. (1999)	Shackleton Range
-2.25	-73.10	980	Jackson (1999)	Central Kirwangeggen Southwest
-2.25	-73.10	1011	Jackson (1999)	Central Kirwangeggen Southwest
-2.25	-73.10	1081	Jackson (1999)	Central Kirwangeggen Southwest
-2.25	-73.10	1074	Jackson (1999)	Central Kirwangeggen Southwest
-2.25	-73.10	1134	Jackson (1999)	Central Kirwangeggen Southwest
-2.25	-73.10	1143	Jackson (1999)	Central Kirwangeggen Southwest
-2.25	-73.10	475	Harris et al. (1995)	Northern Kirwanveggen
-2.25	-73.10	585	Harris et al. (1995)	Northern Kirwanveggen
-2.25	-73.10	1061	Harris et al. (1995)	Northern Kirwanveggen
-2.25	-73.10	1103	Harris et al. (1995)	Northern Kirwanveggen
-2.25	-73.10	1127	Harris et al. (1995)	Northern Kirwanveggen
-2.25	-73.10	1131	Harris et al. (1995)	Northern Kirwanveggen
-2.25	-73.10	1139	Harris et al. (1995)	Northern Kirwanveggen
2.60	-72.15	483	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	487.3	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	497	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	500	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	504	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	529	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	570	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	1070	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	1104	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	1124	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	1133	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	1163	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	1130	Bisnath et al. (2006)	Gjelsvikfjella
2.60	-72.15	1140	Bisnath et al. (2006)	Gjelsvikfjella
3.10	-72.00	486.9	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
3.10	-72.00	523	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
3.10	-72.00	521	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
3.10	-72.00	528	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
3.10	-72.00	558	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
3.00	-72.00	1061	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
3.00	-72.00	1096	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
3.00	-72.00	1115	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
3.00	-72.00	1123	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet

3.00	-72.00	1137	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
3.00	-72.00	1142	Jacobs et al. (2003 a,b,d)	Festninga/Risemedet
10.00	-71.83	527	Jacobs et al. (2003 a,b,d)	Central Droning Maud Land Northeast
10.00	-71.83	530	Jacobs et al. (2003 a,b,d)	Central Droning Maud Land Northeast
10.00	-71.83	570	Jacobs et al. (2003 a,b,d)	Central Droning Maud Land Northeast
10.10	-71.83	1080	Jacobs et al. (2003 a,b,d)	Central Droning Maud Land Northeast
10.10	-71.83	1076	Jacobs et al. (2003 a,b,d)	Central Droning Maud Land Northeast
10.10	-71.83	1130	Jacobs et al. (2003 a,b,d)	Central Droning Maud Land Northeast
3.00	-74.00	507	Jacobs et al. (2008)	Gjelsvikfjella
3.00	-74.00	1098	Jacobs et al. (2008)	Gjelsvikfjella
11.00	-73.00	499	Jacobs et al. (2008)	Otto von Gruber Gebirge
13.00	-72.00	501	Jacobs et al. (2008)	Otto von Gruber Gebirge
3.00	-71.80	495	Paulsson and Austrehein (2003)	Gjelsvikfjella
3.00	-71.80	504	Paulsson and Austrehein (2003)	Gjelsvikfjella
3.00	-72.20	1163	Paulsson and Austrehein (2003)	Gjelsvikfjella
22.90	-71.80	1009	Shiriashi et al. (2008)	Sør Rondane Mountains
23.90	-71.70	1013	Shiriashi et al. (2008)	Sør Rondane Mountains
24.10	-71.80	951	Shiriashi et al. (2008)	Sør Rondane Mountains
23.50	-72.00	571	Shiriashi et al. (2008)	Sør Rondane Mountains
24.40	-72.10	920	Shiriashi et al. (2008)	Sør Rondane Mountains
26.10	-72.30	1138	Shiriashi et al. (2008)	Sør Rondane Mountains
27.60	-72.10	549	Shiriashi et al. (2008)	Sør Rondane Mountains
27.50	-72.30	601	Shiriashi et al. (2008)	Sør Rondane Mountains
23.40	-72.10	564	Shiriashi et al. (2008)	Sør Rondane Mountains
25.10	-71.60	1125	Shiriashi et al. (2008)	Sør Rondane Mountains
35.90	-71.00	539	Shiriashi et al. (2003)	Yamato-Belgica Complex
33.00	-71.00	663	Shiriashi et al. (2003)	Yamato-Belgica Complex
36.00	-71.00	532	Shiriashi et al. (2003)	Yamato-Belgica Complex
37.00	-70.00	1000	Shiriashi et al. (2003)	Yamato-Belgica Complex
38.00	-70.00	533	Shiriashi et al. (2003)	Lützo-Holm Complex
39.90	-69.90	521	Shiriashi et al. (2003)	Lützo-Holm Complex
40.00	-69.70	1006	Shiriashi et al. (2003)	Lützo-Holm Complex
39.00	-69.50	532	Shiriashi et al. (2003)	Lützo-Holm Complex
41.00	-69.30	518	Shiriashi et al. (2003)	Lützo-Holm Complex
43.00	-69.10	1017	Shiriashi et al. (2003)	Lützo-Holm Complex
44.00	-69.10	553	Shiriashi et al. (2003)	Lützo-Holm Complex
-34.53	-77.92	1113	Gose et al. (1997)	Coats Land/Bertrab Nunataks
-34.33	-77.88	1112	Gose et al. (1997)	Coats Land/ Littlewood Nunataks
12.33	-71.58	512	Mikhalsky et al. (1997)	Wohlthatmassiv
25.00	-72.00	520	Pasteels and Michot (1970)	Sør Rondane Mountains
1.00	-72.00	1112	Moyes and Barton (1990)	Sverdrupfjella
1.00	-72.00	1107	Moyes and Barton (1990)	Sverdrupfjella
1.00	-72.00	1045	Moyes and Barton (1990)	Sverdrupfjella
59.47	-67.42	913	Kelly et al. (2002)	Kemp Land/ Stillwell Hills
57.54	-66.97	924	Kelly et al. (2002)	Kemp Land/ Oygarden Group
57.54	-66.97	929	Kelly et al. (2002)	Kemp Land/ Oygarden Group
57.54	-66.97	904	Kelly et al. (2002)	Kemp Land/ Oygarden Group
57.54	-66.97	844	Kelly et al. (2002)	Kemp Land/ Oygarden Group
57.54	-66.97	1600	Kelly et al. (2002)	Kemp Land/ Oygarden Group
57.54	-66.97	931	Kelly et al. (2002)	Kemp Land/ Oygarden Group

23.10	-72.23	524	Craddock 1972	Mt Nils Larsen
23.10	-72.23	512	Craddock 1972	Mt Nils Larsen
24.00	-71.52	555	Craddock 1972	Romnaes Mountain
24.00	-71.52	555	Craddock 1972	Romnaes Mountain
24.00	-71.52	510	Craddock 1972	Romnaes Mountain
24.00	-71.52	508	Craddock 1972	Romnaes Mountain

Onland Ar/Ar Hornblende Ages

Long	Lat	Age (Ma)	Study	Geographic Location
66.22	-73.10	517	Phillips et al., 2007	Prydz Bay
66.91	-73.52	645	Phillips et al., 2007	Prydz Bay
76.39	-69.37	514	Zhao et al., 1997	Prydz Bay
76.39	-69.37	1036	Laixi Tong, 1998	Prydz Bay
76.39	-69.37	554	Laixi Tong, 1998	Prydz Bay
77.92	-68.85	500.3	Wilson et al, 2007	Prydz Bay
77.92	-68.85	563.3	Wilson et al, 2007	Prydz Bay
39.53	-69.03	546	Takigami et al., 1992	Dronning Maud Land
144.20	-67.38	1540	Duclaux et al., 2007	Adélie Land
143.37	-66.85	1750	Duclaux et al., 2007	Adélie Land
141.32	-66.84	1720	Duclaux et al., 2007	Adélie Land
140.92	-66.73	1685	Duclaux et al., 2007	Adélie Land
143.77	-66.93	1681	Di Vincenzo et al., 2007	Adélie Land
144.20	-67.38	1900	Di Vincenzo et al., 2007	Adélie Land
144.23	-67.58	1635	Di Vincenzo et al., 2007	Adélie Land
143.37	-67.10	1710	Di Vincenzo et al., 2007	Adélie Land
140.92	-66.75	1682	Duclaux et al., 2008	Adélie Land
140.92	-66.75	1678	Duclaux et al., 2008	Adélie Land
140.92	-66.75	1691	Duclaux et al., 2008	Adélie Land
140.50	-66.72	1651	Duclaux et al., 2008	Adélie Land
163.50	-71.75	487.8	Goodge Dallmeyer, 1996	George V Land
155.00	-82.75	534.4	Goodge Dallmeyer, 1996	George V Land
155.00	-82.75	510.7	Goodge Dallmeyer, 1996	George V Land
155.00	-82.75	510.8	Goodge Dallmeyer, 1996	George V Land
0.37	-72.50	520	Board et al. (2005)	Dronning Maud Land
0.37	-72.50	488	Board et al. (2005)	Dronning Maud Land
-50.60	-83.295833	175	Minor and Mukasa (1997)	Coats Land
-50.93	-83.2375	179	Minor and Mukasa (1997)	Coats Land
-11.33	-74.5	500	Jacobs et al. (1995,1997,1999)	Coats Land

Onland Ar/Ar Biotite Ages (K-Ar ages are indicated)

Long	Lat	Age (Ma)	Study	Geographic Location
------	-----	----------	-------	---------------------

66.28	-73.08	486	Phillips et al., 2007	Prydz Bay
66.64	-75.27	524	Phillips et al., 2007	Prydz Bay
66.82	-74.29	486	Phillips et al., 2007	Prydz Bay
66.91	-73.52	530	Phillips et al., 2007	Prydz Bay
76.39	-69.37	495	Zhao et al., 1997	Prydz Bay
76.39	-69.37	552	Tong et al., 2002	Prydz Bay
77.92	-68.85	497.9	Wilson et al, 2007	Prydz Bay
77.92	-68.85	498.6	Wilson et al, 2007	Prydz Bay
77.92	-68.85	494	Wilson et al, 2007	Prydz Bay
77.92	-68.85	500.6	Wilson et al, 2007	Prydz Bay
77.92	-68.85	497.775	Wilson et al, 2007	Prydz Bay
66.70	-67.78	450	Takigami et al., 1992	Dronning Maud Land
25.00	-72.00	498.5	Takigami and Funaki, 1991	Dronning Maud Land
110.42	-66.35	960	Tingey, 1991, reporting Cameron et al 1960	
110.42	-66.35	1130	Tingey, 1991, reporting Cameron et al 1960	
110.42	-66.35	1060	Tingey, 1991, reporting Cameron et al 1960	
110.42	-66.35	1110	Tingey, 1991, reporting Cameron et al 1960	
-66.35	110.42	1080	Tingey, 1991, reporting Webb et al 1964	
110.42	-66.35	1120	Tingey, 1991, reporting Webb et al 1964	
110.42	-66.35	1090	Tingey, 1991, reporting Webb et al 1964	
110.42	-66.35	1060	Tingey, 1991, reporting Webb et al 1964	
110.42	-66.35	1150	Tingey, 1991, reporting Webb et al 1964	
110.42	-66.35	1140	Tingey, 1991, reporting Webb et al 1964	
110.42	-66.35	1060	Tingey, 1991, reporting Webb et al 1964	
110.42	-66.35	1070	Tingey, 1991, reporting Webb et al 1964	
110.42	-66.35	1120	Tingey, 1991, reporting Webb et al 1964	
110.42	-66.35	1088.5	Tingey, 1991, reporting Webb et al 1964	
144.20	-67.38	1560	Duclaux et al., 2007	Adélie Land
143.37	-66.85	1700	Duclaux et al., 2007	Adélie Land
141.32	-66.84	1690	Duclaux et al., 2007	Adélie Land
140.92	-66.73	1653	Duclaux et al., 2007	Adélie Land
140.52	-66.72	1628	Duclaux et al., 2007	Adélie Land
140.02	-66.67	1567	Duclaux et al., 2007	Adélie Land
140.02	-66.67	1577	Duclaux et al., 2007	Adélie Land
144.56	-67.03	1537	Duclaux et al., 2008	Adélie Land
143.89	-66.98	1612	Duclaux et al., 2008	Adélie Land
143.89	-66.98	1509	Duclaux et al., 2008	Adélie Land
143.54	-66.85	1702	Duclaux et al., 2008	Adélie Land
141.56	-66.78	1700	Duclaux et al., 2008	Adélie Land
141.40	-66.81	1681	Duclaux et al., 2008	Adélie Land
141.40	-66.81	1687	Duclaux et al., 2008	Adélie Land
141.40	-66.81	1678	Duclaux et al., 2008	Adélie Land
140.92	-66.75	1643	Duclaux et al., 2008	Adélie Land
140.92	-66.75	1664	Duclaux et al., 2008	Adélie Land
140.50	-66.72	1606	Duclaux et al., 2008	Adélie Land
139.98	-66.66	1567.2	Duclaux et al., 2008	Adélie Land
143.77	-66.93	1641	Di Vincenzo et al., 2007	Adélie Land

144.20	-67.38	1502	Di Vincenzo et al., 2007	Adélie Land
144.23	-67.58	1536	Di Vincenzo et al., 2007	Adélie Land
146.20	-67.65	486.3	Di Vincenzo et al., 2007	George V Land
157.08	-69.15	465	Adams et al., 2006	Northern Victoria Land
156.95	-69.23	472	Adams et al., 2006	Northern Victoria Land
157.98	-69.18	476	Adams et al., 2006	Northern Victoria Land
157.98	-69.18	465	Adams et al., 2006	Northern Victoria Land
157.72	-69.20	475	Adams et al., 2006	Northern Victoria Land
158.07	-69.97	412	Adams et al., 2006	Northern Victoria Land
158.22	-69.43	463	Adams et al., 2006	Northern Victoria Land
157.67	-69.48	466	Adams et al., 2006	Northern Victoria Land
157.72	-69.20	468	Adams et al., 2006	Northern Victoria Land
158.10	-69.52	484	Adams et al., 2006	Northern Victoria Land
158.25	-69.23	473	Adams et al., 2006	Northern Victoria Land
158.25	-69.23	464	Adams et al., 2006	Northern Victoria Land
158.78	-69.28	482	Adams et al., 2006	Northern Victoria Land
160.15	-70.50	477	Adams et al., 2006	Northern Victoria Land
159.85	-70.57	476	Adams et al., 2006	Northern Victoria Land
159.73	-70.55	462	Adams et al., 2006	Northern Victoria Land
159.67	-70.38	463	Adams et al., 2006	Northern Victoria Land
160.05	-70.22	497	Adams et al., 2006	Northern Victoria Land
160.67	-70.12	507	Adams et al., 2006	Northern Victoria Land
161.00	-70.47	509	Adams et al., 2006	Northern Victoria Land
161.25	-70.48	513	Adams et al., 2006	Northern Victoria Land
161.08	-70.37	485	Adams et al., 2006	Northern Victoria Land
161.00	-70.38	502	Adams et al., 2006	Northern Victoria Land
164.07	-70.55	367	Adams et al., 2006	Northern Victoria Land
163.52	-70.33	366	Adams et al., 2006	Northern Victoria Land
160.27	-72.97	467	Adams et al., 2006	Northern Victoria Land
160.32	-73.05	488	Adams et al., 2006	Northern Victoria Land
163.97	-74.45	495	Adams et al., 2006	Northern Victoria Land
163.97	-74.45	472	Adams et al., 2006	Northern Victoria Land
163.98	-74.47	495	Adams et al., 2006	Northern Victoria Land
163.25	-74.25	472	Adams et al., 2006	Northern Victoria Land
163.98	-74.38	482	Adams et al., 2006	Northern Victoria Land
163.97	-74.38	481	Adams et al., 2006	Northern Victoria Land
163.65	-74.62	483	Adams et al., 2006	Northern Victoria Land
163.75	-74.63	475	Adams et al., 2006	Northern Victoria Land
164.22	-74.63	473	Adams et al., 2006	Northern Victoria Land
164.07	-74.70	468	Adams et al., 2006	Northern Victoria Land
168.03	-73.40	328	Adams et al., 2006	Northern Victoria Land
166.45	-73.05	385	Adams et al., 2006	Northern Victoria Land
166.10	-72.85	375	Adams et al., 2006	Northern Victoria Land
0.37	-72.50	488	Board et al. (2005)	Sverdrupfjella
-11.80	-74.6	504.5	Jacobs et al. (1995)	Sverdrupfjella
-14.33	-74.55	974	Jacobs et al. (1995)	Sverdrupfjella
-12.83	-75.15	812	Jacobs et al. (1995)	Sverdrupfjella
11.50	-70.75	475	Verma et al. (2006) (K-Ar biotite)	Humboldt
-56.00	-83.5		Craddock 1972 (K-Ar Biotite)	Neptune Range
-64.50	-84.716667	224	Craddock 1972 (K-Ar Biotite)	Patuxet, Coats Land
-64.50	-84.716667	219	Craddock 1972 (K-Ar Biotite)	Patuxet, Coats Land
-62.33	-84.87	233	Craddock 1972 (K-Ar Biotite)	Mt Wanous

-5.00	-72		Craddock 1972 (K-Ar Biotite)	Giaever
-5.00	-72	1	Craddock 1972 (K-Ar Biotite)	Giaever
47.87	-67.97	530	Craddock 1972 (K-Ar Biotite)	Mt Christensen
47.87	-67.97	490	Craddock 1972 (K-Ar Biotite)	Mt Christensen
57.54	-66.98		Craddock 1972 (K-Ar Biotite)	Oygarden Group

Onland Ar/Ar Muscovite Ages (K-Ar ages are indicated)

Long	Lat	Age (Ma)	Study	Geographic Location
66.97	-73.56	489	Phillips et al., 2007	Prydz Bay
66.98	-73.60	496	Phillips et al., 2007	Prydz Bay
65.13	-73.45	503	Phillips et al., 2007	Prydz Bay
63.67	-73.17	491	Phillips et al., 2007	Prydz Bay
157.73	-69.23	471	Adams et al., 2006	Prydz Bay
160.27	-72.97	491	Adams et al., 2006	Prydz Bay
163.67	-74.42	472	Adams et al., 2006	Prydz Bay
142.34	-66.95	1585	Duclaux et al., 2008	Adélie Land
139.90	-66.69	1576.8	Duclaux et al., 2008	Adélie Land
149.62	-68.32	593.4	Di Vincenzo et al., 2007	George V Land
-11.30	-74.5	973.5	Jacobs et al. (1995) (K-Ar muscovite)	Coats Land
8.33	-72.93	515	Craddock, 1972 (K-Ar muscovite)	Sverdrupfjella

Onland K/Ar Whole Rock ages

Long	Lat	Age (Ma)	Study	Geographic Location
-53.50	-82.80	168	Craddock, 1972	Cordiner Peak
-25.00	-80.50	457	Craddock, 1972	Shackleton Range
-25.00	-80.50	1446	Craddock, 1972	Shackleton Range
-25.00	-80.50	297	Craddock, 1972	Shackleton Range
-53.50	-80.50	161	Craddock, 1972	Mt Faraway
-53.50	-80.50	154	Craddock, 1972	Mt Faraway
-53.50	-80.50	169	Craddock, 1972	Mt Faraway
-53.50	-80.50	161	Craddock, 1972	Mt Faraway
-53.50	-80.50	164	Craddock, 1972	Mt Faraway
-53.50	-80.50	162	Craddock, 1972	Mt Faraway
-14.17	-73.33	400	Craddock, 1972	Kraul Mountain
-14.17	-73.33	220	Craddock, 1972	Kraul Mountain
-14.17	-73.33	172	Craddock, 1972	Kraul Mountain
-14.17	-73.33	168	Craddock, 1972	Kraul Mountain
-11.00	-74.58	259	Craddock, 1972	Heimefront Range
-11.00	-74.58	256	Craddock, 1972	Heimefront Range
-11.00	-74.58	580	Craddock, 1972	Heimefront Range
-11.00	-74.58	547	Craddock, 1972	Heimefront Range
12.42	-75.03	458	Craddock, 1972	Tottan Hills
12.42	-74.03	452	Craddock, 1972	Tottan Hills
12.42	-73.03	179	Craddock, 1972	Tottan Hills
12.42	-72.03	173	Craddock, 1972	Tottan Hills
12.42	-71.03	173	Craddock, 1972	Tottan Hills
12.42	-70.03	172	Craddock, 1972	Tottan Hills
12.42	-69.03	164	Craddock, 1972	Tottan Hills
-3.50	-72.50	860	Craddock, 1972	Borg Massif

-3.50	-72.50	515	Craddock, 1972	Borg Massif
-0.25	-72.17	340	Craddock, 1972	Gborek Peaks
-0.25	-72.17	260	Craddock, 1972	Gborek Peaks
-0.25	-72.17	330	Craddock, 1972	Gborek Peaks
-0.25	-72.17	225	Craddock, 1972	Gborek Peaks
-45.00	-72.62	475	Craddock, 1972	Roots Heights
-45.00	-72.62	450	Craddock, 1972	Roots Heights
-45.00	-72.62	425	Craddock, 1972	Roots Heights
-45.00	-72.62	400	Craddock, 1972	Roots Heights
2.60	-72.15	510	Craddock, 1972	Gjelsvilk Mountains
2.60	-72.15	475	Craddock, 1972	Gjelsvilk Mountains
2.60	-72.15	460	Craddock, 1972	Gjelsvilk Mountains
2.60	-72.15	420	Craddock, 1972	Gjelsvilk Mountains
2.60	-72.15	480	Craddock, 1972	Gjelsvilk Mountains
5.33	-72.00	455	Craddock, 1972	Hofman Mountains
5.33	-72.00	445	Craddock, 1972	Hofman Mountains
5.33	-72.00	420	Craddock, 1972	Hofman Mountains
5.33	-72.00	315	Craddock, 1972	Hofman Mountains
5.33	-72.00	425	Craddock, 1972	Hofman Mountains
5.33	-72.00	405	Craddock, 1972	Hofman Mountains
5.33	-72.00	410	Craddock, 1972	Hofman Mountains
5.33	-72.00	410	Craddock, 1972	Hofman Mountains
9.00	-72.00	540	Craddock, 1972	Orvin Mountains
9.00	-72.00	450	Craddock, 1972	Orvin Mountains
9.00	-72.00	435	Craddock, 1972	Orvin Mountains
9.00	-72.00	15	Craddock, 1972	Orvin Mountains
9.00	-72.00	365	Craddock, 1972	Orvin Mountains
10.33	-71.72	480	Craddock, 1972	Mt Dallman
10.33	-71.72	450	Craddock, 1972	Mt Dallman
10.33	-71.72	420	Craddock, 1972	Mt Dallman
10.33	-71.72	410	Craddock, 1972	Mt Dallman
15.50	-71.50	480	Craddock, 1972	Vorposten Peak
15.50	-71.50	475	Craddock, 1972	Vorposten Peak
15.50	-71.50	460	Craddock, 1972	Vorposten Peak
15.50	-71.50	420	Craddock, 1972	Vorposten Peak
23.10	-72.23	350	Craddock, 1972	Mt Nils Larsen
24.00	-71.52	380	Craddock, 1972	Romnaes Mountain
24.00	-71.52	475	Craddock, 1972	Romnaes Mountain
47.87	-67.97	465	Craddock, 1972	Mt Christensen
47.87	-67.97	460	Craddock, 1972	Mt Christensen
57.54	-66.98	620	Craddock, 1972	Oygarden Group
57.54	-66.98	611	Craddock, 1972	Oygarden Group
62.81	-67.81	650	Craddock, 1972	Masson Range
62.81	-67.81	555	Craddock, 1972	Masson Range
62.81	-67.81	535	Craddock, 1972	Masson Range
62.81	-67.81	490	Craddock, 1972	Masson Range
-14	-73.16667	171	Furnes et al. 1987	Vestfjella
-14	-72.9	180	Peters et al. 1991	northern Vestfjella
89.20	-66.80	20	Ravich 1964	na
154.17	-68.90	175	Ravich 1964	na
149.62	-68.32	195	Ravich 1964	na
163.33	-70.33	325	Ravich 1964	na
98.78	-66.42	330	Ravich 1964	na
161.85	-70.23	330	Ravich 1964	na
93.00	-66.57	415	Ravich 1964	na
72.55	-70.20	420	Ravich 1964	na

76.22	-69.40	420	Ravich 1964	na
164.80	-70.57	425	Ravich 1964	na
93.00	-66.52	430	Ravich 1964	na
164.80	-70.57	435	Ravich 1964	na
158.50	-69.67	450	Ravich 1964	na
93.00	-66.57	455	Ravich 1964	na
93.00	-66.57	460	Ravich 1964	na
98.78	-66.42	460	Ravich 1964	na
93.00	-66.57	470	Ravich 1964	na
98.78	-66.42	470	Ravich 1964	na
146.87	-67.87	470	Ravich 1964	na
92.97	-66.55	475	Ravich 1964	na
146.87	-67.87	475	Ravich 1964	na
146.87	-67.87	475	Ravich 1964	na
146.87	-67.87	475	Ravich 1964	na
158.50	-69.67	475	Ravich 1964	na
93.00	-66.52	480	Ravich 1964	na
146.58	-67.73	480	Ravich 1964	na
156.07	-69.22	480	Ravich 1964	na
158.50	-69.67	480	Ravich 1964	na
62.87	-67.60	490	Ravich 1964	na
146.58	-67.73	505	Ravich 1964	na
93.00	-66.52	520	Ravich 1964	na
156.07	-69.22	530	Ravich 1964	na
57.53	-66.97	535	Ravich 1964	na
62.87	-67.60	535	Ravich 1964	na
76.22	-69.40	540	Ravich 1964	na
99.77	-66.58	545	Ravich 1964	na
93.00	-66.52	550	Ravich 1964	na
62.87	-67.60	555	Ravich 1964	na
98.78	-66.42	560	Ravich 1964	na
101.07	-66.10	570	Ravich 1964	na
101.22	-66.10	585	Ravich 1964	na
99.20	-67.42	605	Ravich 1964	na
100.37	-67.37	610	Ravich 1964	na
57.53	-66.97	615	Ravich 1964	na
57.53	-66.97	620	Ravich 1964	na
101.00	-66.20	635	Ravich 1964	na
100.75	-66.27	640	Ravich 1964	na
62.87	-67.60	650	Ravich 1964	na
100.98	-66.27	650	Ravich 1964	na
62.37	-68.08	700	Ravich 1964	na
100.55	-66.42	700	Ravich 1964	na
101.07	-66.10	700	Ravich 1964	na
120.98	-66.78	700	Ravich 1964	na
99.20	-67.42	710	Ravich 1964	na
101.02	-66.12	715	Ravich 1964	na
100.88	-66.17	730	Ravich 1964	na
100.77	-66.23	735	Ravich 1964	na
100.88	-66.17	740	Ravich 1964	na
101.22	-66.10	745	Ravich 1964	na
100.83	-66.17	750	Ravich 1964	na
120.63	-66.88	755	Ravich 1964	na
100.75	-66.27	775	Ravich 1964	na
100.75	-66.27	775	Ravich 1964	na
100.58	-66.10	800	Ravich 1964	na
110.42	-66.33	880	Ravich 1964	na
110.42	-66.33	895	Ravich 1964	na
110.42	-66.33	945	Ravich 1964	na

99.20	-67.42	980	Ravich 1964	na
101.02	-66.12	995	Ravich 1964	na
100.75	-66.27	1000	Ravich 1964	na
126.75	-66.47	1000	Ravich 1964	na
100.75	-66.27	1005	Ravich 1964	na
100.80	-66.30	1050	Ravich 1964	na
100.88	-66.17	1075	Ravich 1964	na
110.42	-66.33	1080	Ravich 1964	na
100.75	-66.27	1130	Ravich 1964	na
99.77	-66.58	1135	Ravich 1964	na
101.02	-66.22	1175	Ravich 1964	na
78.25	-68.55	1185	Ravich 1964	na
101.02	-66.12	1265	Ravich 1964	na
78.25	-68.55	1350	Ravich 1964	na
78.25	-68.55	1460	Ravich 1964	na
78.25	-68.55	1475	Ravich 1964	na
78.25	-68.55	1525	Ravich 1964	na
			Ravich 1964	na