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Slug front gas entrainment in gas-liquid two-phase horizontal flow using hi-speed slug-tracking[1] IVAN ZADRAZIL, OMAR MATAR, CHRISTOS MARKIDES, Imperial College London — A gas-liquid flow regime where liquid-continuous regions travel at high speeds (i.e. slugs) through a pipe separated by regions of stratified flow (i.e. elongated bubbles) is referred to as a "slug flow." This regime is characterised by the turbulent entrainment of gas into the slug front body. We use a high-speed camera mounted on a moving robotic linear rail to track the formation of naturally occurring slugs over 150 pipe diameters. We show that the dynamics of the slugs become progressively more complex with increasing liquid and gas Reynolds numbers. Based on the slug- tracking visualization we present, over a range of conditions: (i) phenomenological observations of the formation and development of slugs, and (ii) statistical data on the slug velocity and gas entrainment rate into the slug body.

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