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Climate impact of aircraft-induced cirrus assessed from satellite observations before and during COVID-19

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Aircraft produce contrail in suitable atmospheric conditions, and these may spread out into cirrus. However, it is unclear how large this effect and its implied radiative forcing is. Here we use the opportunity of the COVID-19 related aircraft traffic reduction in boreal spring 2020 in comparison to the traffic in 2019 to assess satellite data. MODIS retrievals are examined for 2020 vs. the climatology 2011 to 2019. In order to account for weather variability, circulation analogues are defined for each region and day of the Spring 2020 period, and the cirrus coverage and emissivity in springtimes 2011 - 2019 is assessed for comparison to 2020. In conclusion, we find that cirrus are reduced by $9 \pm 1.5\%$ in absolute terms. This is consistent with a trend analysis. The implied radiative forcing by aviation-induced cirrus is assessed at $49 \pm 28 \text{ Wm}^{-2}$.