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## Meter-scale retrieval of industrial methane emissions using GHGSat's satellite constellation

**Mathias Strupler**<sup>1</sup>, Hanford Deglint<sup>1</sup>, David Gains<sup>1</sup>, Dylan Jervis<sup>1</sup>, Jean-Philippe MacLean<sup>1</sup>, Jason McKeever<sup>1</sup>, Antoine Ramier<sup>1</sup>, Warren Shaw<sup>1</sup>, Ewan Tarrant<sup>1</sup>, Daniel Varon<sup>1,2</sup>, and David Young<sup>1</sup>

<sup>1</sup>GHGSat, Montreal, Canada (info@ghgsat.com)

<sup>2</sup>School of Engineering and Applied Science, Harvard University, Cambridge, 02138, United States

Actionable feedback to industrial operators is extremely valuable to help them reduce their greenhouse gas emissions. With this goal in mind, GHGSat launched in 2016 a demonstration satellite called GHGSat-D ("Claire"). It was the first satellite built specifically to detect and quantify methane emissions from individual sites.

With the launches of GHGSat-C1 ("Iris") in September 2020 and of GHGSat-C2 ("Hugo") planned in January 2021, GHGSat will have three methane-sensing meter-scale resolution satellites in orbit. In addition to those satellites, GHGSat has also deployed an aircraft version of the instrument to survey specific areas with even lower detection threshold thanks to its higher spatial resolution.

This presentation will show the improvements done since GHGSat-D that allow our instruments to reach column precision of 1% of background. With this enhanced sensitivity, sources such as oil and gas facilities, mines, landfills and dams can be measured from space. Emission quantification of various sources will be presented and will demonstrate that GHGSat-C1 is approaching its target detection threshold of 100 kg/h. We will also illustrate the complementarity of GHGSat's instruments with Sentinel-5P, the first ones able to detect individual sources with low emission rates, the second able to measure daily and with high accuracy global methane concentrations. We will also discuss the data calibration and validation plan of our instruments. Finally, an update on the future expansion of GHGSat's constellation will be given.