

Topics (T)

Earth Observing Missions and Systems to Address Climate Change and Its Impacts [2] (3B)

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HIGH-RESOLUTION METHANE DETECTION WITH THE GHGSAT CONSTELLATION

Abstract

Methane is a potent greenhouse gas which accounts for about 20 % of the current human contribution to global warming, second only to carbon dioxide. Because of its relatively short lifetime in the atmosphere, reducing methane emissions is one of the most effective ways to fight climate change in the short term. Reducing global emissions by 40-45 % by 2030 is required to limit the temperature rise below 1.5 C.

GHGSat operates a constellation of small satellites designed to detect and quantify methane emissions with high sensitivity compared with other satellite technologies. An important feature of our measurements is the high spatial resolution (25m), which enables attribution of emissions to specific facilities and subsequent corrective action from the operator. The GHGSat constellation currently has 6 satellites in orbit, and 6 more are planned for launch before the end of 2023 which will enable up to daily revisit times for any site in the world.

This presentation provides an overview of the GHGSat instrument and constellation design. We present example observations and detected methane emissions across various industrial sectors, including oil and gas, mining, and waste management. We analyze the instrument performance by quantifying measurement uncertainty and through independent third-party controlled release campaigns. Finally, we present an overview of worldwide methane emissions detected and quantified by the GHGSat constellation in 2022.