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The current GHGSat satellite constellation retrieves the methane column density over an area of ~100,000 square km per day at 25 m spatial resolution and 100 kg/hr emission rate detection sensitivity. This coverage allows us to estimate the annually averaged emission rates and temporal behaviour from Oil-gas and Coal point sources around the world, providing a complementary picture to the regional emission inversion estimates of global flux mappers.

For the 16 months between June 2022 to September 2023, the GHGSat constellation estimated 8.7 Mt/yr worth of methane emissions from 2,110 distinct sites and 11,713 plumes, representing ~11% of the global estimated total emissions from Oil-gas and Coal combined. The temporal behaviour of emissions is measured with Oil-gas and Coal sites found to be emitting 13% and 50% of the time, respectively, above GHGSat's ~100 kg/hr detection threshold, with a similar persistence distribution for each sector across continents. When comparing our gridded emissions estimates to the Global Fuel Exploitation Inventory (GFEI) at GHGSat observed areas and 0.2 deg x 0.2 deg resolution, we find that GHGSat estimated emission fluxes represent 37% and 32% of the emissions estimated by GFEI for the Oil-gas and Coal sectors, respectively, though with relatively weak spatial correlation between grid cells (Pearson correlation coefficient of ?=0.08 and 0.48 for Oil-gas and Coal, respectively). Finally, we present GHGSat estimated emissions at the country level and compare against the national totals reported by the UNFCCC.
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