

MethaneSAT Pre-flight Calibration Analysis

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Poster

MethaneSAT is a recently launched Environmental Defense Fund (EDF) satellite mission designed to monitor methane emissions from over 80% of global oil and gas production, as well as other methane sources, with high precision and fine spatial resolution. The MethaneSAT instrument consists of two push-broom imaging spectrometers: the CH₄ spectrometer (1.598-1.676 μm) to detect CH₄ and CO₂ absorption near 1.65 and 1.61 μm , and the O₂ spectrometer (1.249-1.305 μm) to detect O₂ absorption near 1.27 μm .

We present the results of the pre-flight calibration analysis of the MethaneSAT sensors. To reduce risk during the build, a sequence of thermal vacuum campaigns was conducted at component levels culminating in a final flight-system level TVAC during Q4 2023 when the two sensors were fully controlled using flight electronics. We will present the system performance including examples of detector-level residual image, dark current, nonlinearity, gain, and pixel response non-uniformity as well as system-level straylight, radiometric calibration and spectral response function.

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