

MethaneSAT Pre-flight Calibration Analysis

BINGKUN

LUO

Center for Astrophysics | Harvard & Smithsonian

Bingkun Luo^{1*}, Xiong Liu¹, Jonathan Franklin², Eamon Conway^{1,6}, Kang Sun³, David Miller², Sébastien Roche⁴, Christopher Chan Miller⁴, Jonas Wilzewski², Maya Nasr², Josh Benmergui⁴, Kelly Chance¹, Steven Wofsy^{2,5}

1. Center for Astrophysics | Harvard & Smithsonian, Cambridge, MA, USA
2. Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, USA
3. Research and Education in Energy, Environment and Water Institute, University at Buffalo, Buffalo, NY, USA
4. Environmental Defense Fund, Washington, DC, 20009, USA
5. Department of Earth and Planetary Sciences, Harvard University, Cambridge, MA, USA
6. Kostas Research Institute, Northeastern University, Burlington, MA, USA

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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