

Satellite Infrared Radiance Validation Studies using a Multi-Sensor/ Model Data Fusion Approach

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Global remote sensing of the Earth system to enhance our scientific understanding and monitoring capability of the land, ocean, atmosphere, clouds and, ultimately, climate requires accurate and precise long-time-series of radiometric measurement data from multiple instruments on multiple platforms. Understanding and correctly interpreting these data require the ability to separate geophysical variability from instrument response changes, as well as some absolute reference to the true geophysical state. This requires a detailed instrument system-level characterization pre-launch, as well as extensive in-flight calibration and validation activities. Field validation measurements from high-altitude airborne interferometric sensors are critical for this validation task, since only such observations can provide the proper spatial and temporal context needed as well as an accurate emulation of the satellite measurement system being validated. This study addresses some of the challenges encountered validating high spectral resolution infrared systems, using data from the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Airborne Sounding Testbed--Interferometer (NAST-I), along with data from other independent measurement systems and model simulations.

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