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IASI spectral radiance validation inter-comparisons: case study assessment from the JAIVEx field campaign

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Abstract. Advanced satellite sensors are tasked with improving global-scale measurements of the Earth's atmosphere, clouds, and surface to enable enhancements in weather prediction, climate monitoring, and environmental change detection. Measurement system validation is crucial to achieving this goal and maximizing research and operational utility of resultant data. Field campaigns employing satellite under-flights with well-calibrated Fourier Transform Spectrometer (FTS) sensors aboard high-altitude aircraft are an essential part of this validation task. The National Polar-orbiting Operational Environmental Satellite System (NPOESS) Airborne Sounder Testbed-Interferometer (NAST-I) has been a fundamental contributor in this area by providing coincident high spectral and spatial resolution observations of infrared spectral radiances along with independently-retrieved geophysical products for comparison with like products from satellite sensors being validated. This manuscript focuses on validating infrared spectral radiance from the Infrared Atmospheric Sounding Interferometer (IASI) through a case study analysis using data obtained during the recent Joint Airborne IASI Validation Experiment (JAIVEx) field campaign. Emphasis is placed upon the benefits achievable from employing airborne interferometers such as the NAST-I since, in addition to IASI radiance calibration performance assessments, cross-validation with other advanced sounders such as the AQUA Atmospheric InfraRed Sounder (AIRS) is enabled.

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