

Validation of IASI spectral radiances using aircraft underflight data collected during JAIVEx



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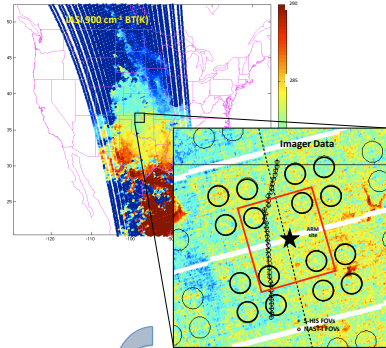
Summary

Direct airborne validation of radiances from the new IASI interferometer sounder on Metop was successfully performed during the Joint Airborne IASI Validation Experiment (JAIVEx) conducted 14 April - 4 May 2007. The experiment included the NASA WB57 aircraft carrying the UW Scanning HIS, the LaRC NAST-I, and the MIT/LL NAST-Microwave, flown in coordination with the Facility for Airborne Atmospheric Measurements BAe146-301 carrying the ARIES interferometer plus a wide range of *in situ* instrumentation and dropsondes. This poster focuses on validation of IASI spectral radiances using the high altitude aircraft observations and a double observed minus calculated analysis technique.

Conclusions

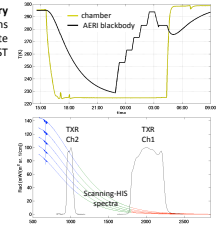
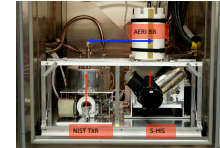
- JAIVEx underflight evaluations of IASI show agreement with the aircraft observations on the order of 0.1K or less.
- The absolute calibration of IASI and AIRS Radiance are comparable and represent a huge improvement over past IR sounders for both weather and climate applications
- The value of aircraft observations for direct radiance validation has now been definitively proven (0.1 K sensitivity)
- Validation over the mission lifetimes is still needed to assure the long-term stability

Flight over ARM SGP site, 19 April 07

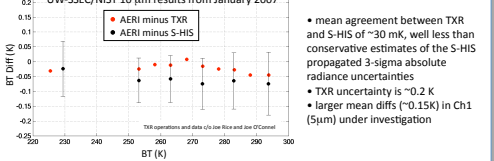


NIST TXR tests of Scanning HIS Radiance Calibration & AERI Blackbody Radiance Knowledge

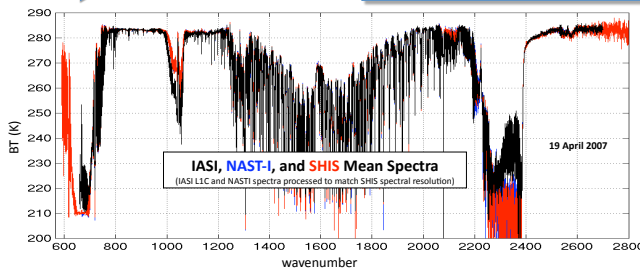
Plan: perform periodic end-to-end laboratory radiance evaluations under flight-like conditions with NIST transfer sensors such that satellite validation analyses are traceable to the NIST radiance scale.



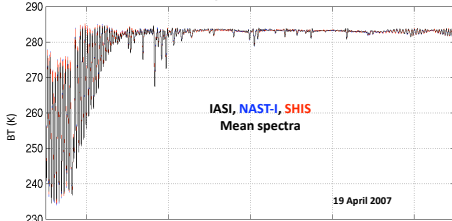
UW-SSEC/NIST 10 μm results from January 2007



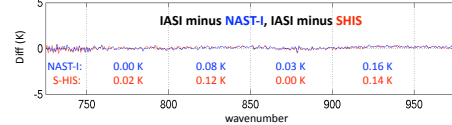
- mean agreement between TXR and S-HIS of ~30 mK, well less than conservative estimates of the S-HIS propagated 3-sigma absolute radiance uncertainties
- TXR uncertainty is ~0.2 K
- larger mean diffs (~0.15K) in Ch1 (5μm) under investigation



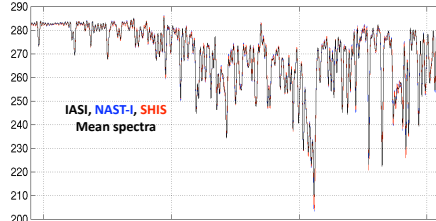
IASI Longwave Validation



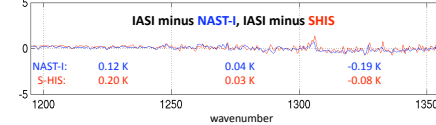
Double obs-calc method



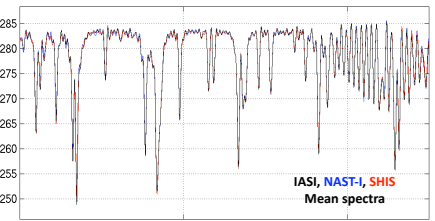
IASI Midwave Validation



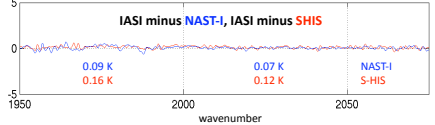
Double obs-calc method



IASI Shortwave Validation



Double obs-calc method



Other JAIVEx Cal/Val Flights: Four SGP CART-site (2 day & 2 night); Three Gulf of Mexico (2 day & 1 night); Five joint MetOp & Aqua (3 day & 2 night)

