

CLARREO and IR Intercal

Dave Tobin, Bob Holz

Fred Nagle, Bob Knuteson, Fred Best, Hank Revercomb

**Space Science and Engineering Center,
University of Wisconsin-Madison**



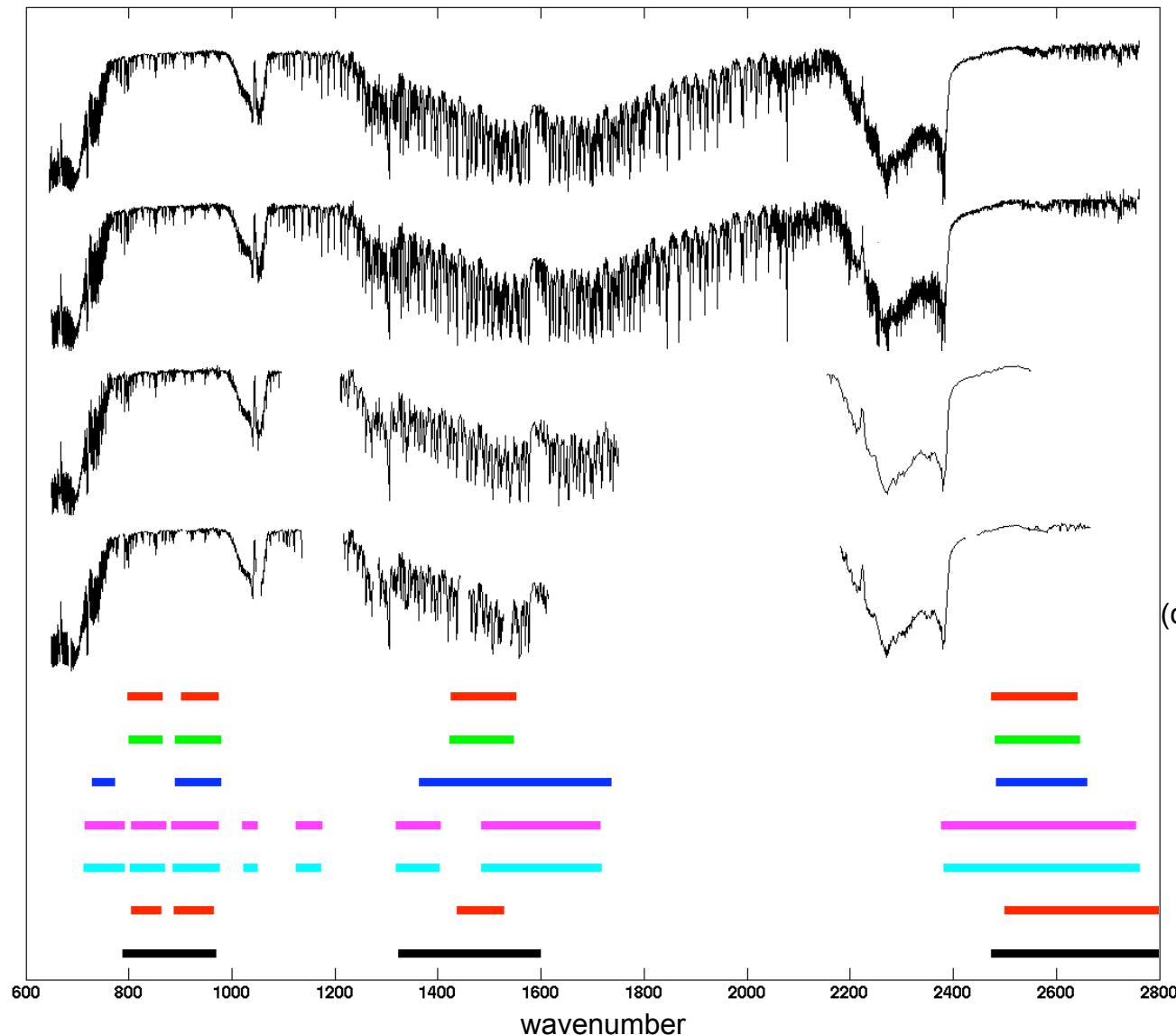
CLARREO Science Definition Team Meeting
Hampton, VA
17-19 May 2011



Outline

- 1. Some IR Intercal examples**
- 2. IR Intercal simulation studies for CLARREO**
- 3. Going forward**

High Spectral Resolution IR for Intercal



IASI L1C

SHIS

(deapodized, truncated
to 1cm MOPD)

CrIS

(truncated to 0.8, 0.4,
and 0.2 cm MOPD)

AIRS

(convolved with AIRS SRFs)

GOES-10

GOES-11

GOES-12

MET-8

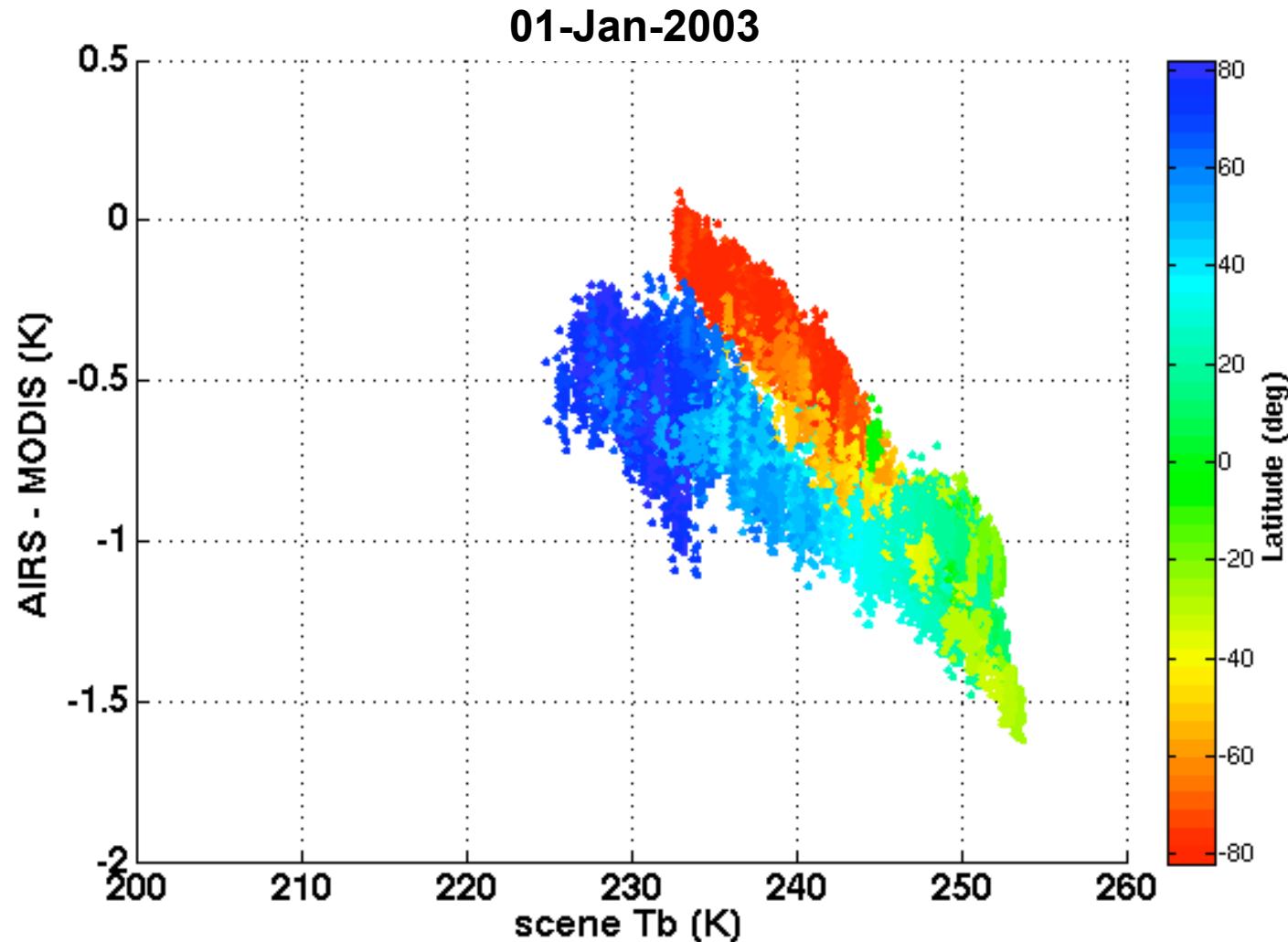
MET-9

MTSAT

FY2C

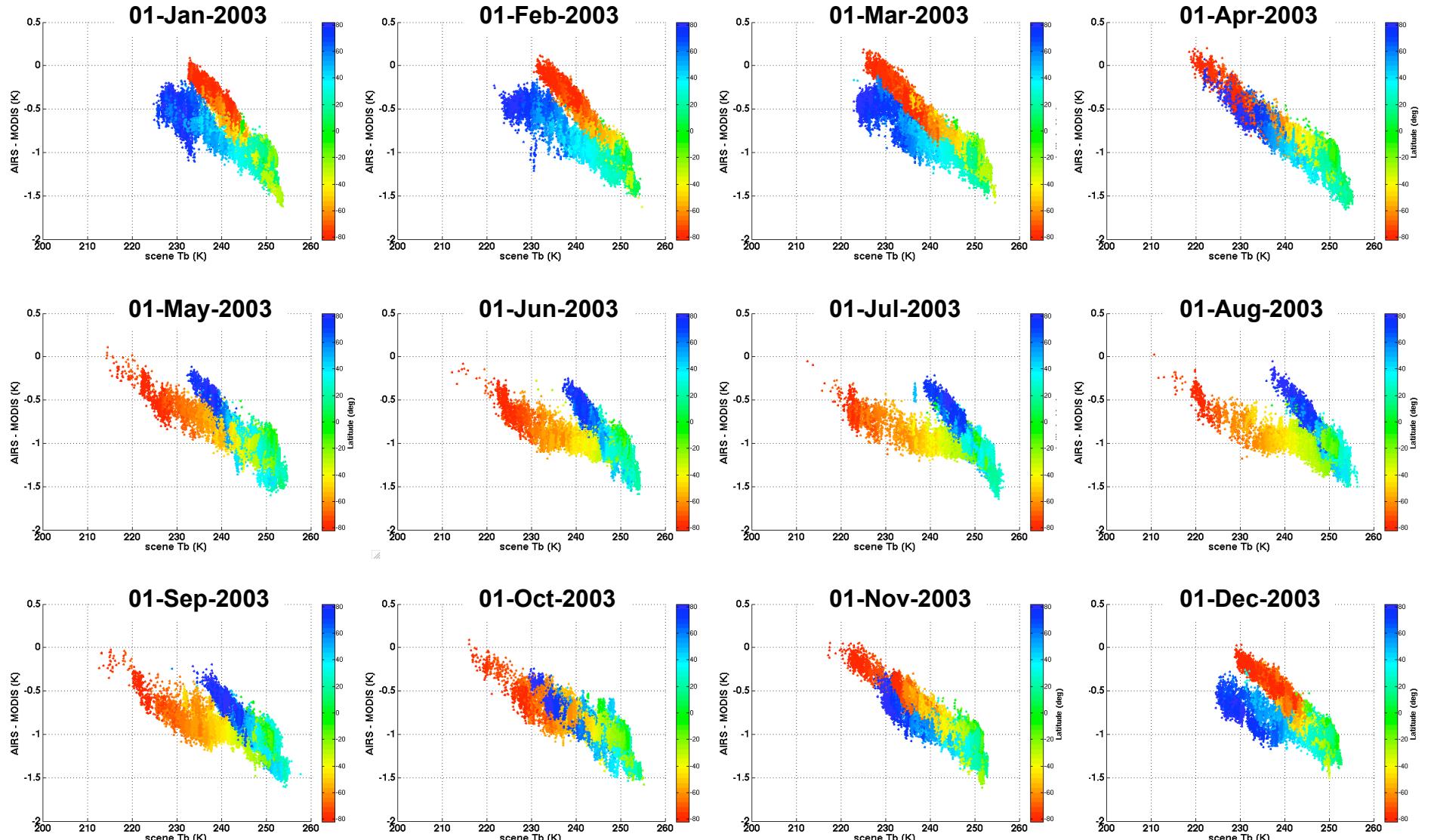
AIRS/MODIS radiance comparison example

MODIS Band 35 (13.9 μm)



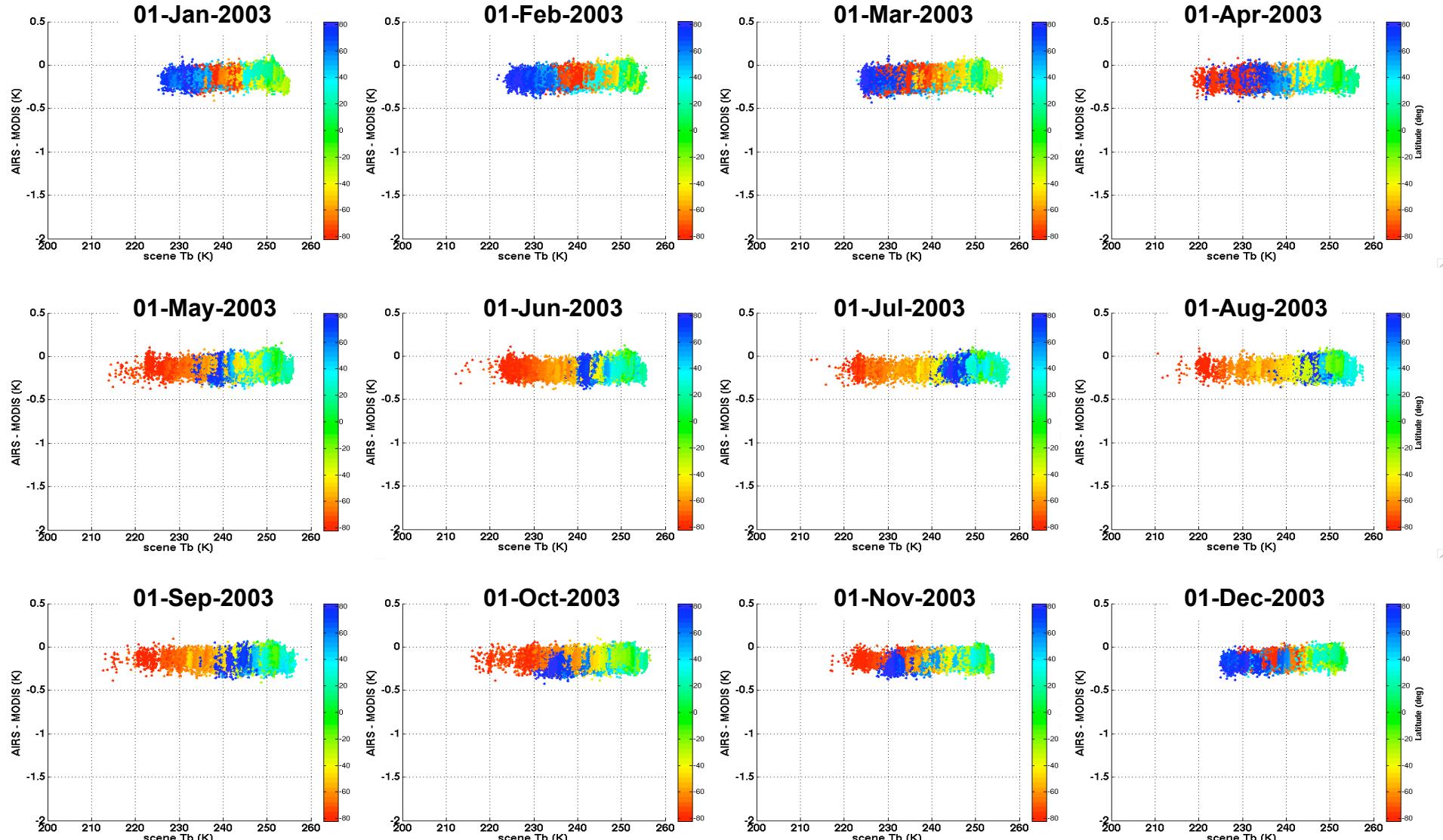
AIRS/MODIS radiance comparison example

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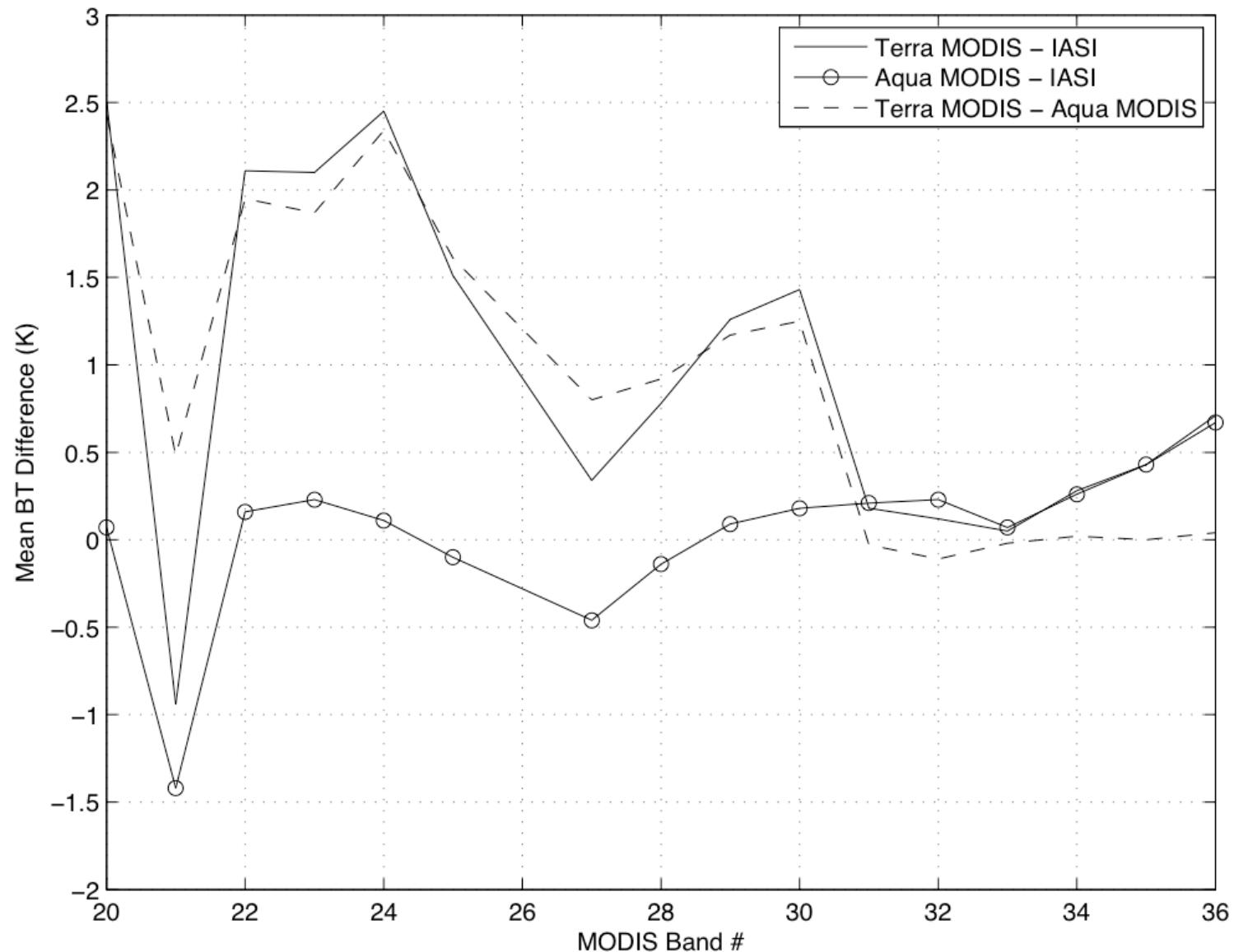


AIRS/MODIS radiance comparison example

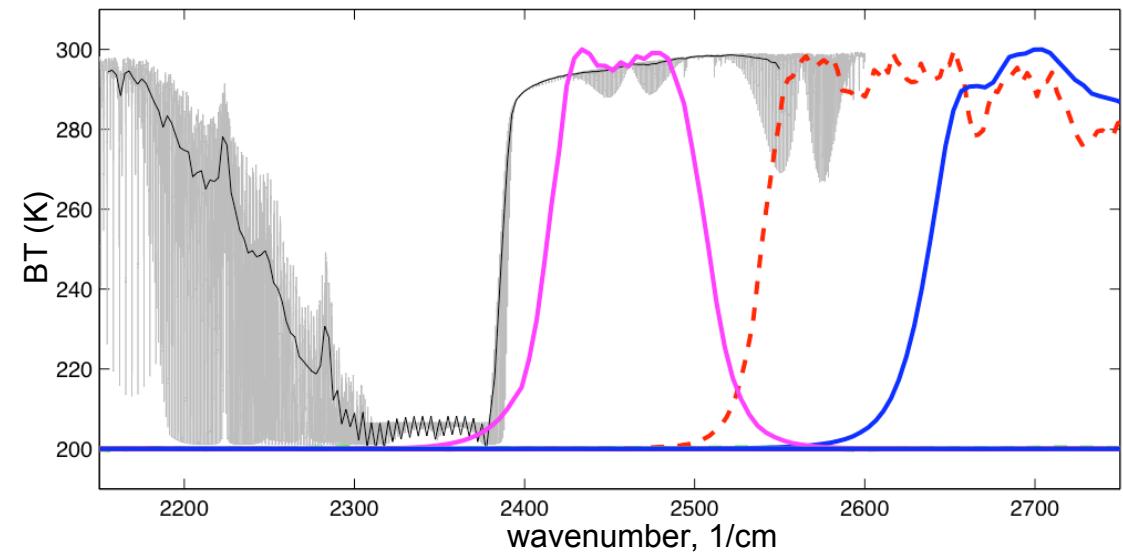
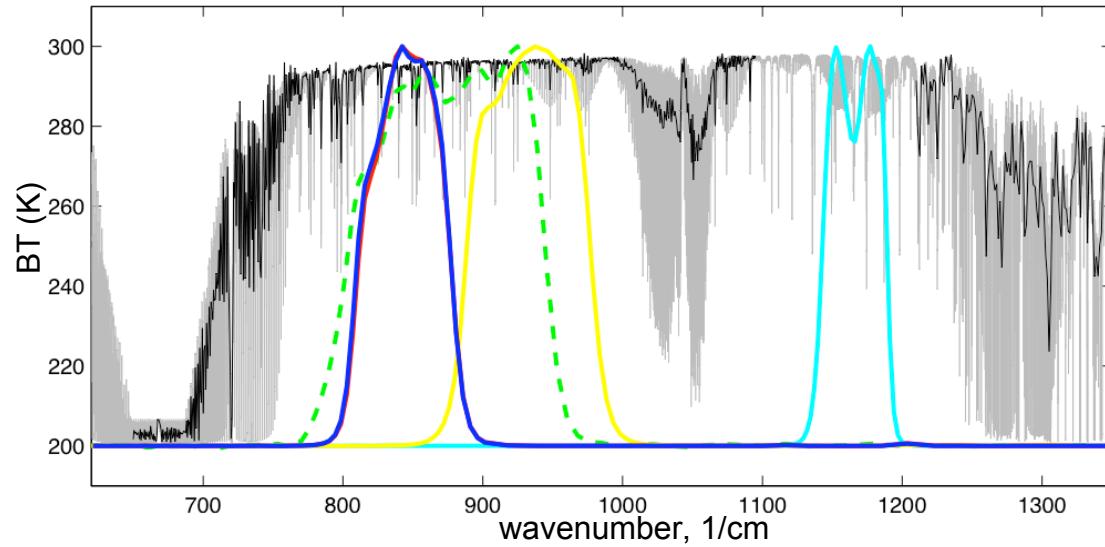
MODIS Band 35 (13.9 μm), with 0.8 cm^{-1} MODIS SRF shift



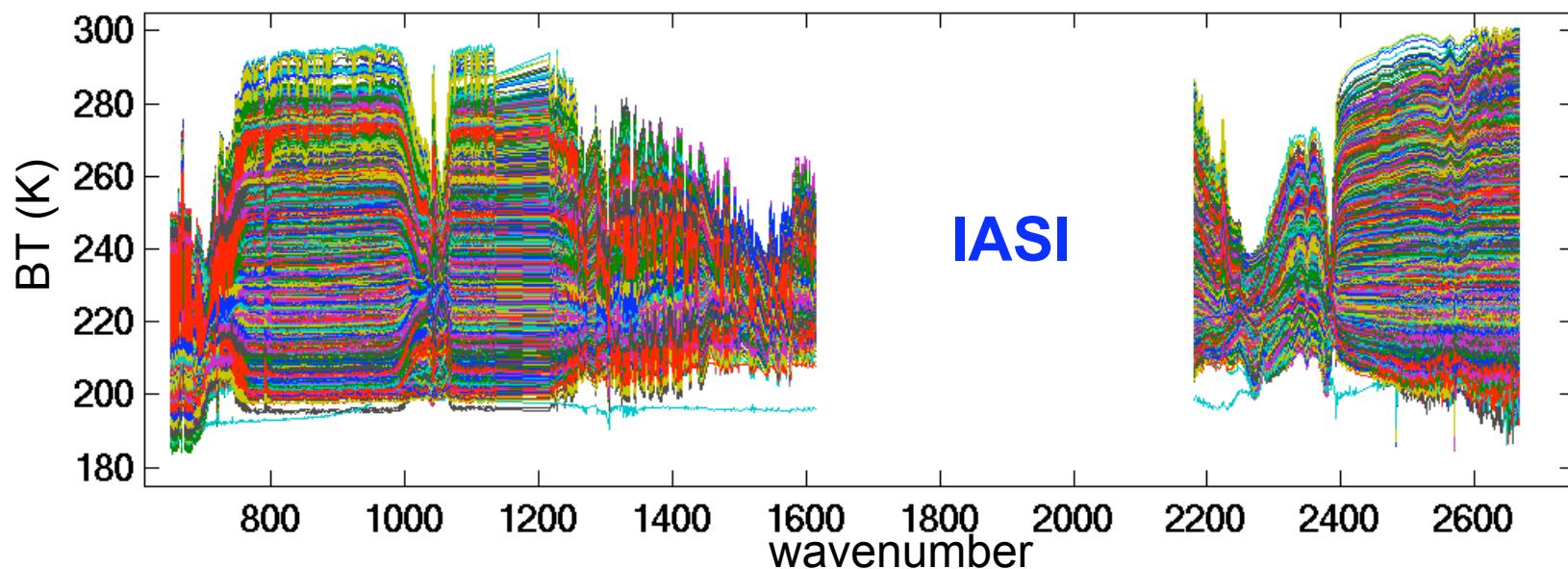
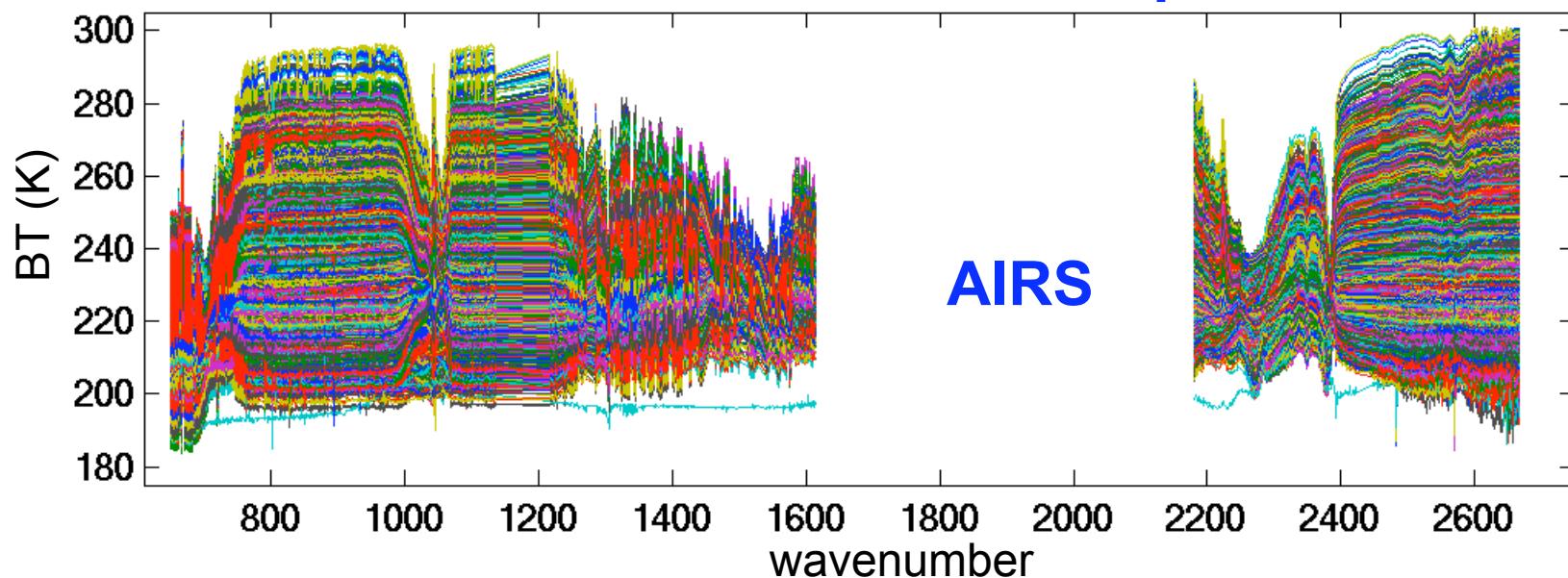
IASI/MODIS SNOs; Mean Differences for each band:



CrIS spectrum and VIIRS SRFs

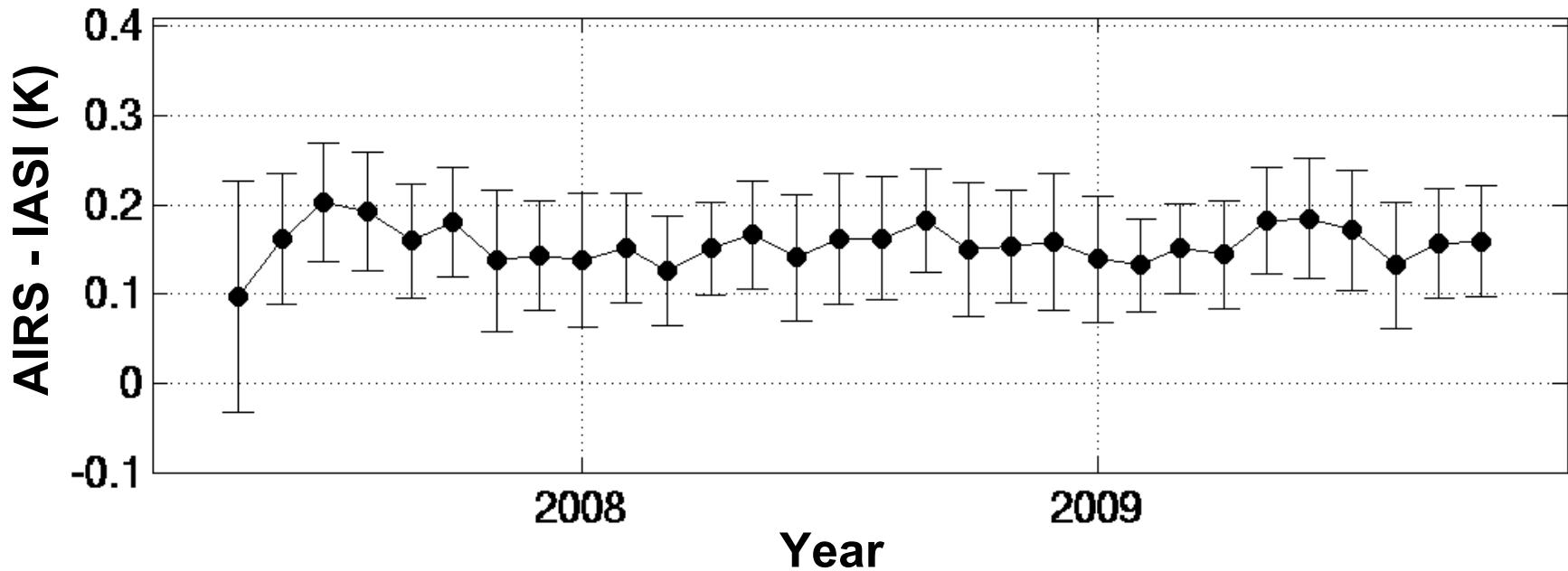


AIRS/IASI SNOs; Mean Spectra:



Time Series of AIRS-IASI Monthly Means

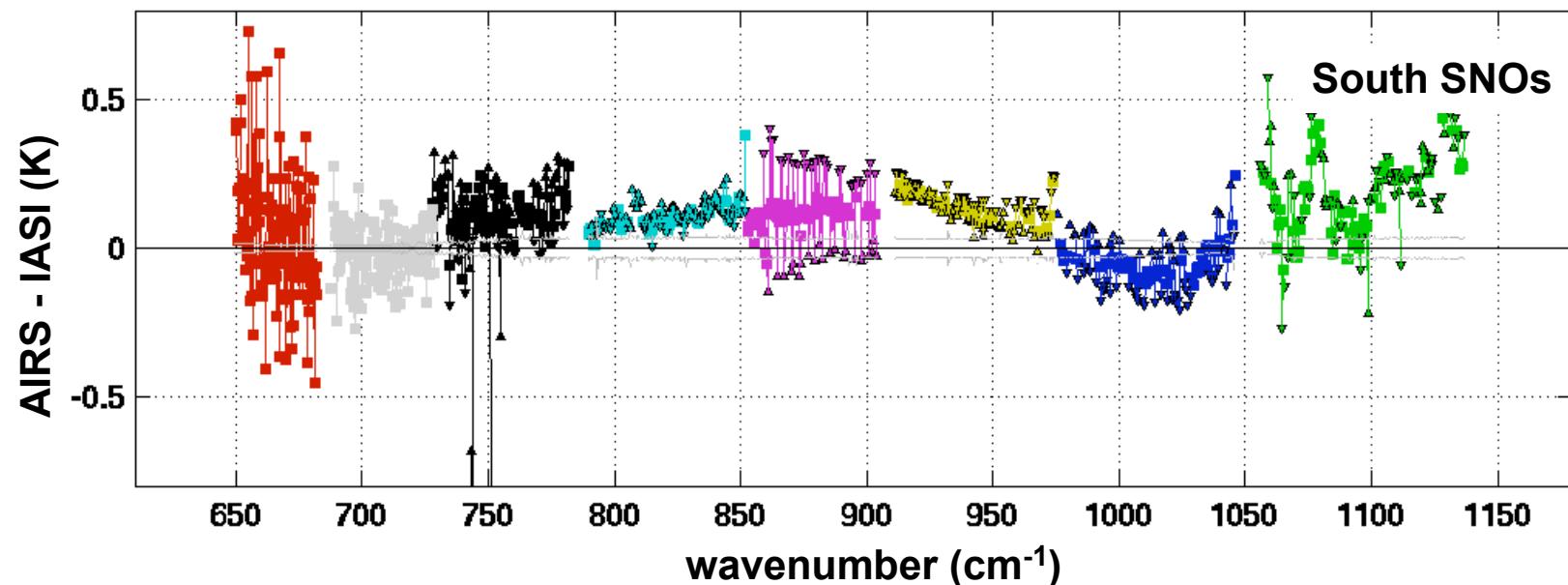
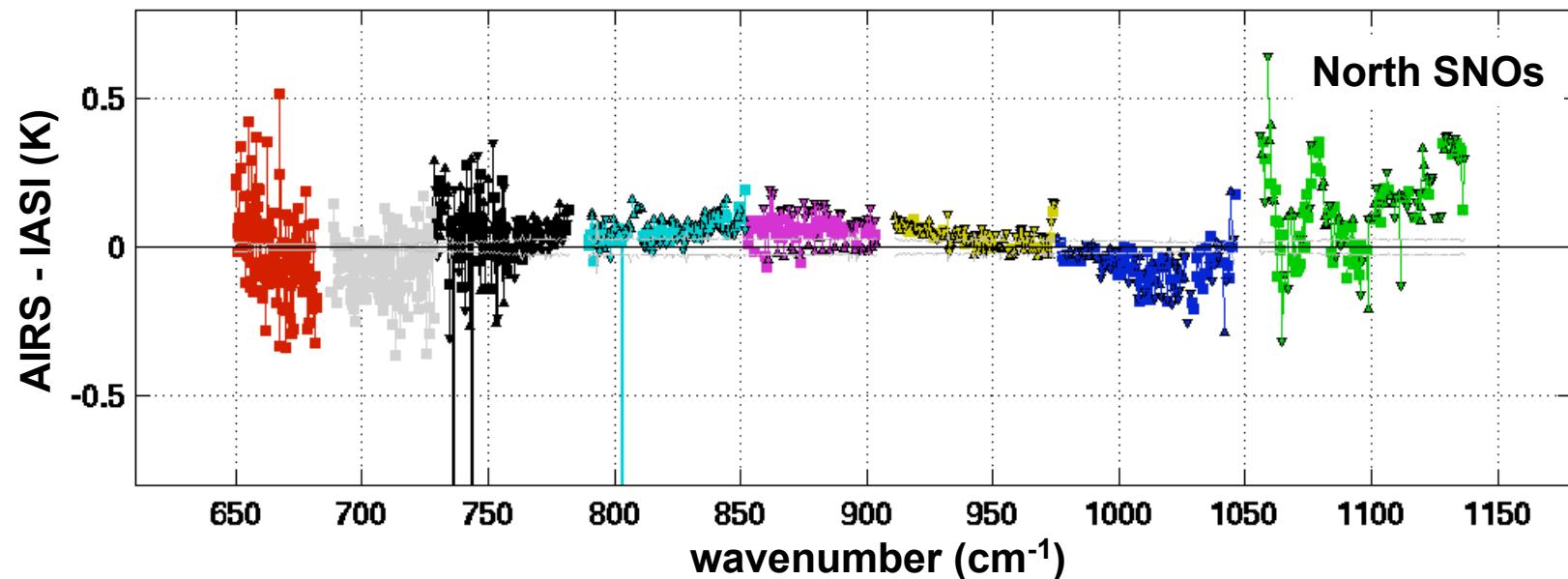
Module M-04b (1460-1527 cm⁻¹)



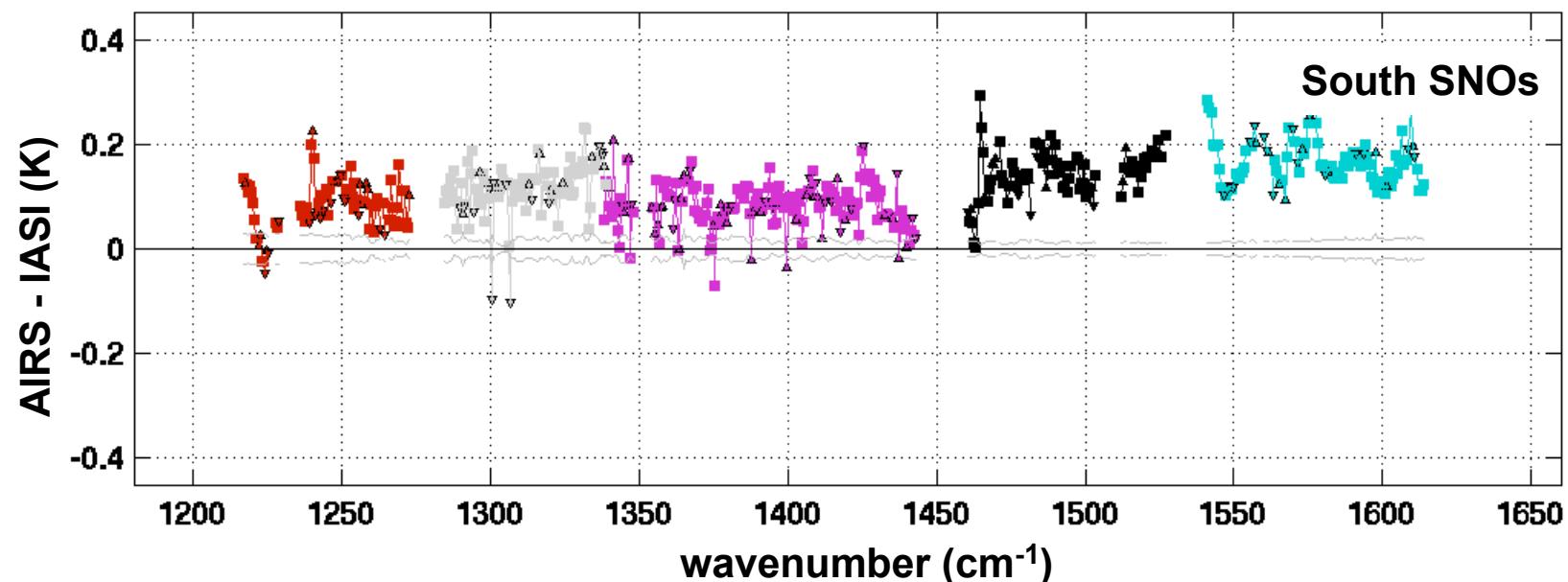
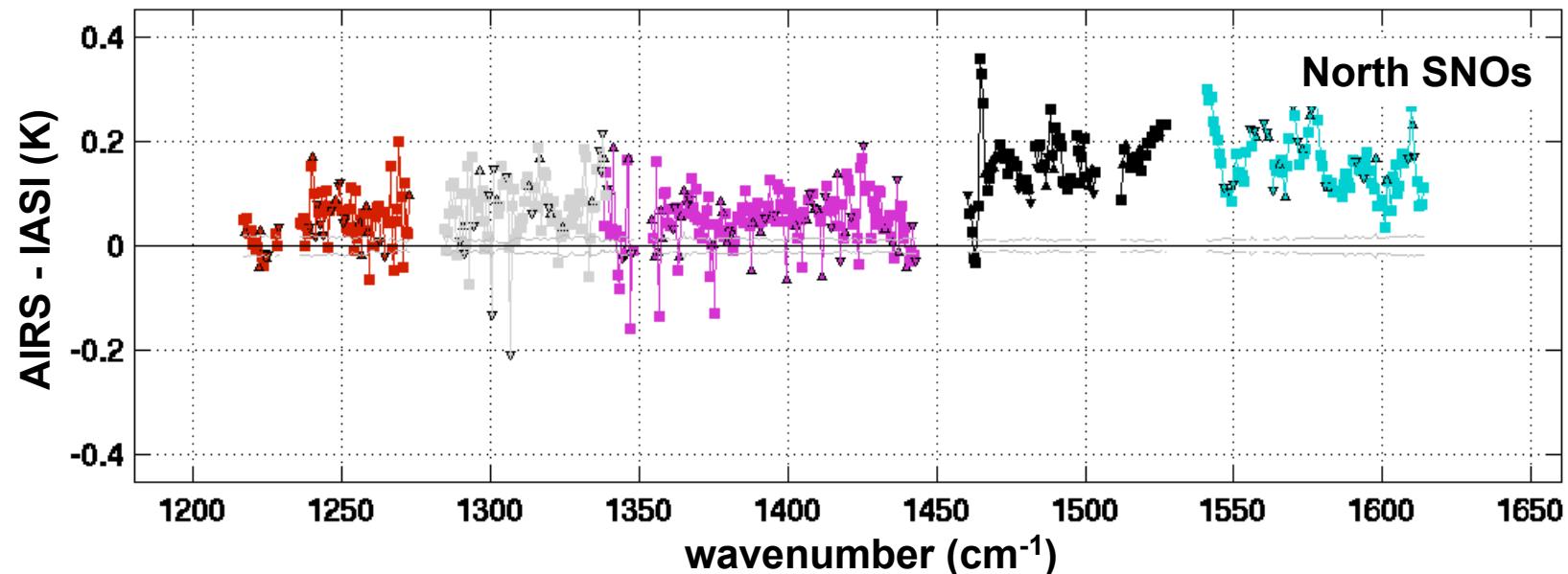
Mean difference is **150 mK**

Slope is **0.9 +/- 5.6 (1 sigma) mK/yr**

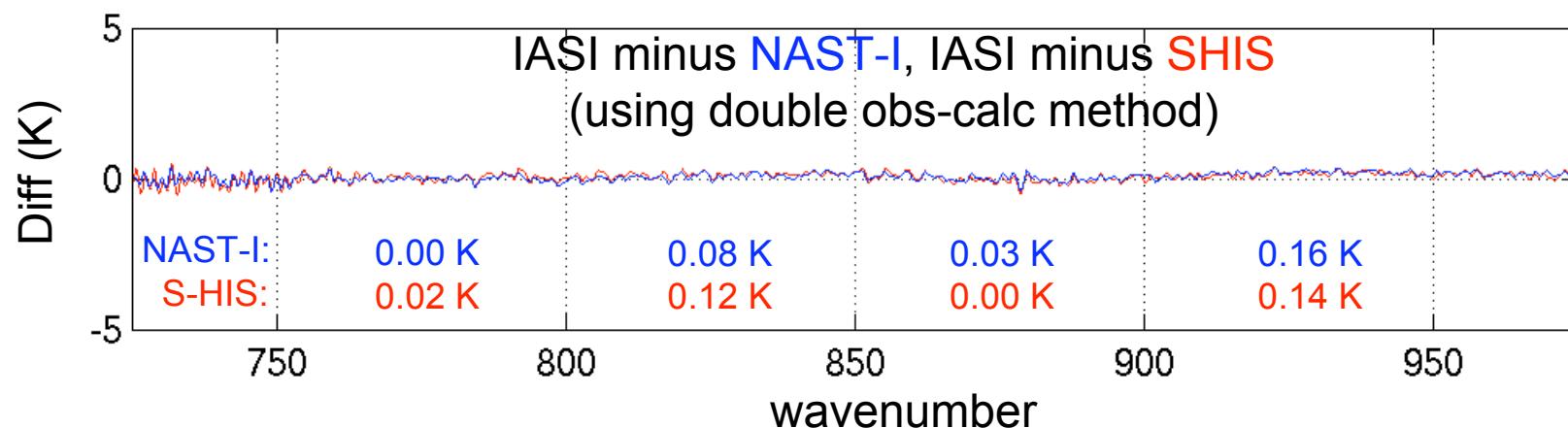
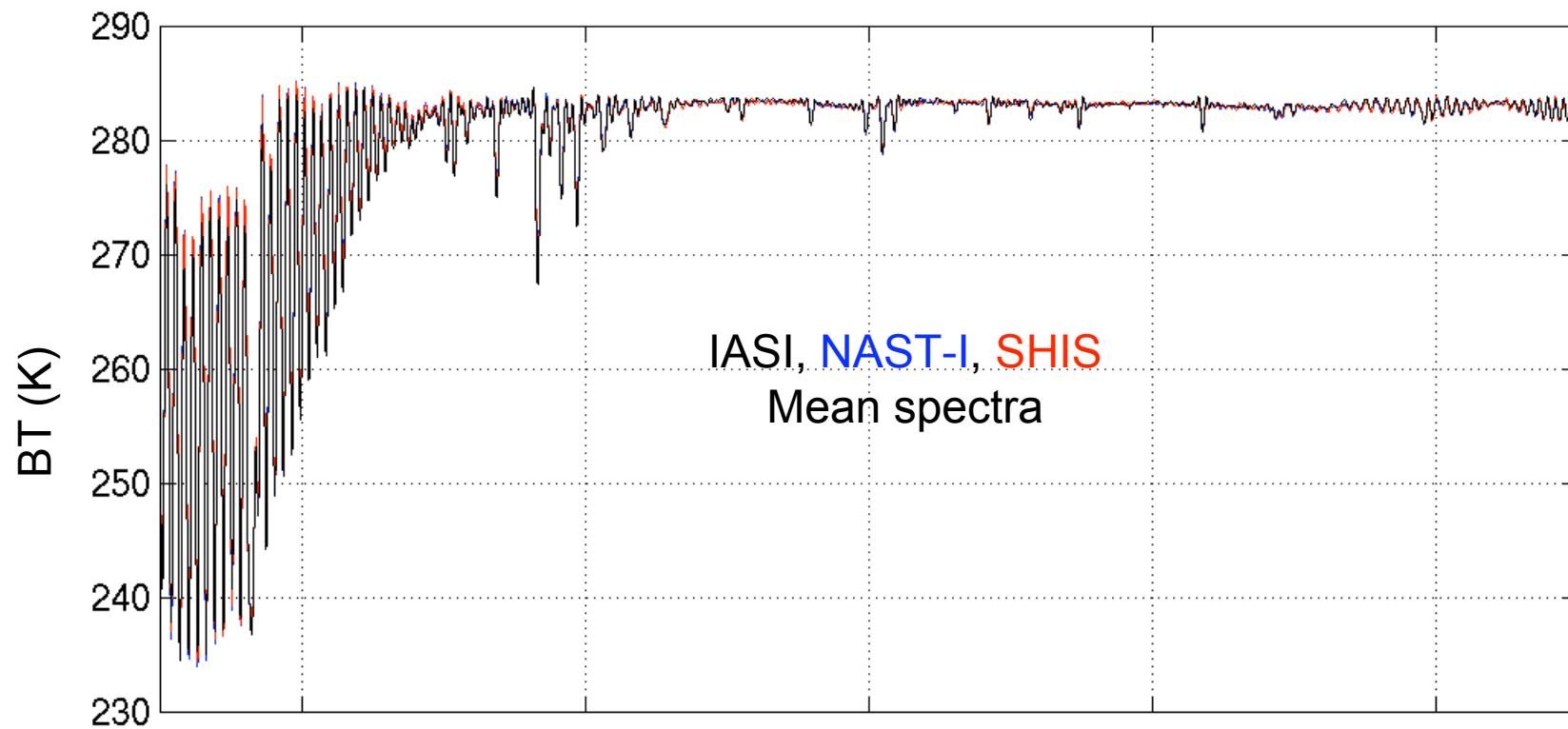
AIRS-IASI Mean Spectral Residuals



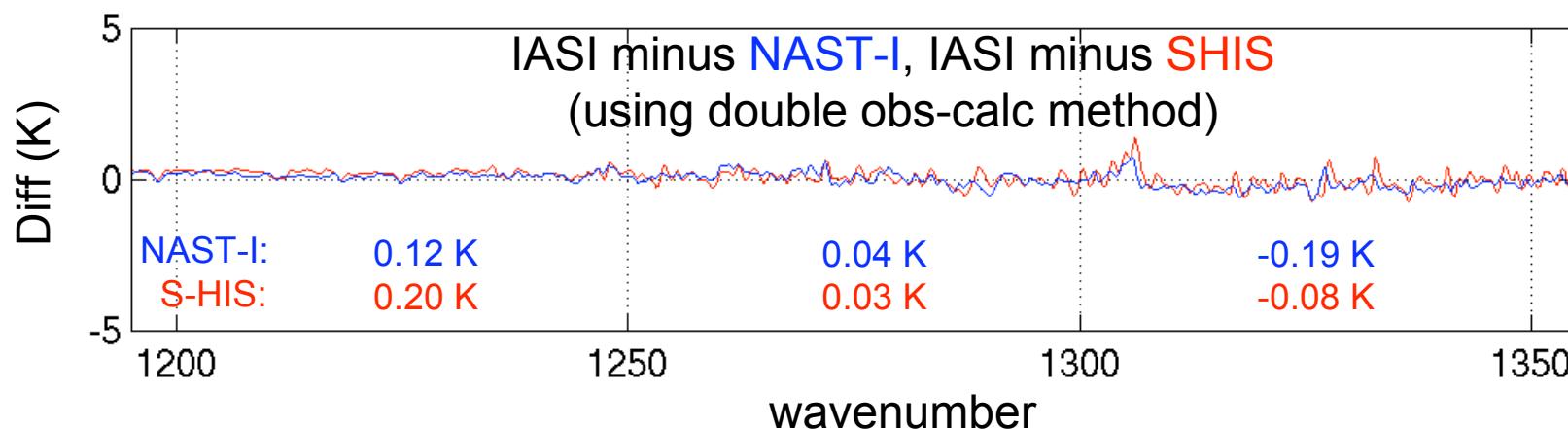
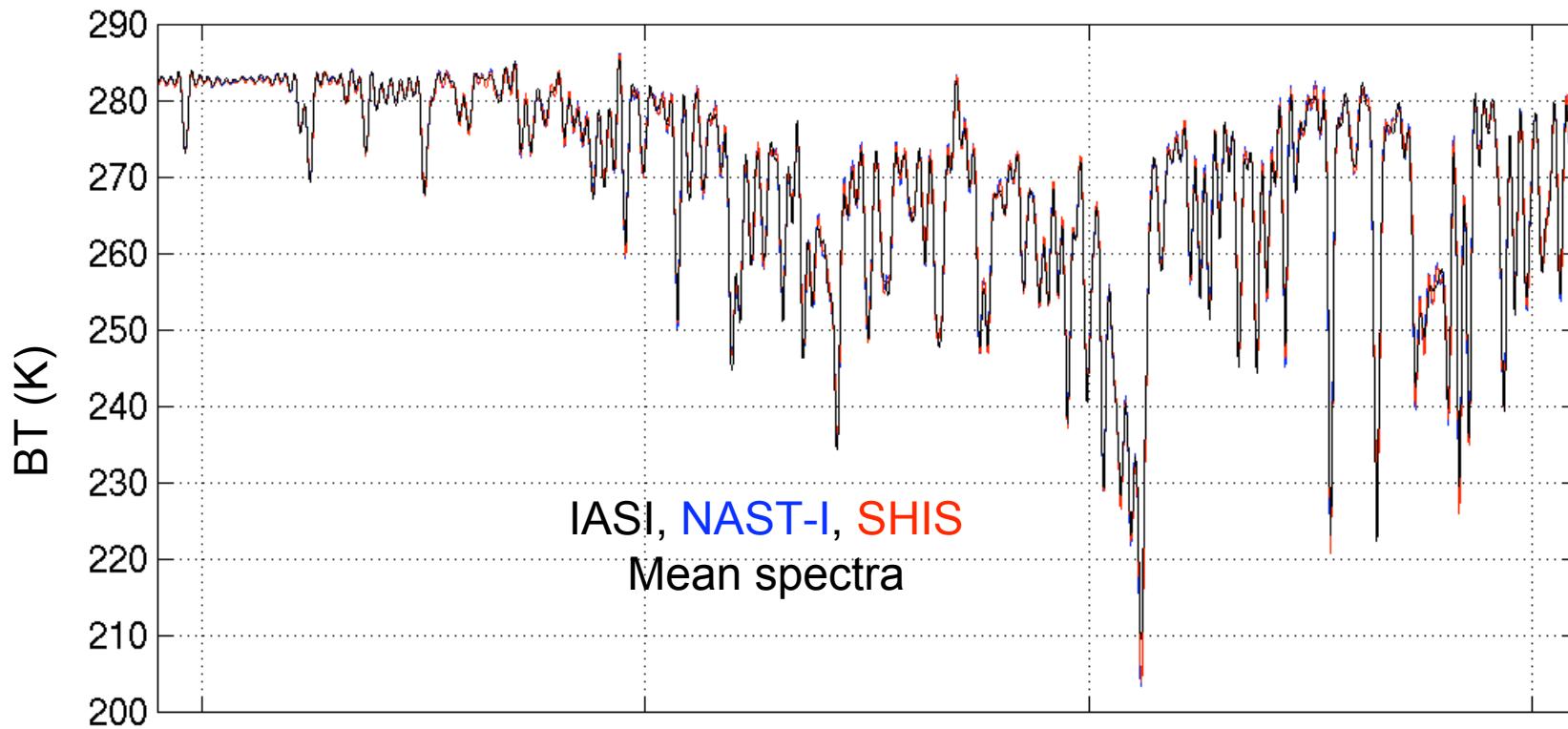
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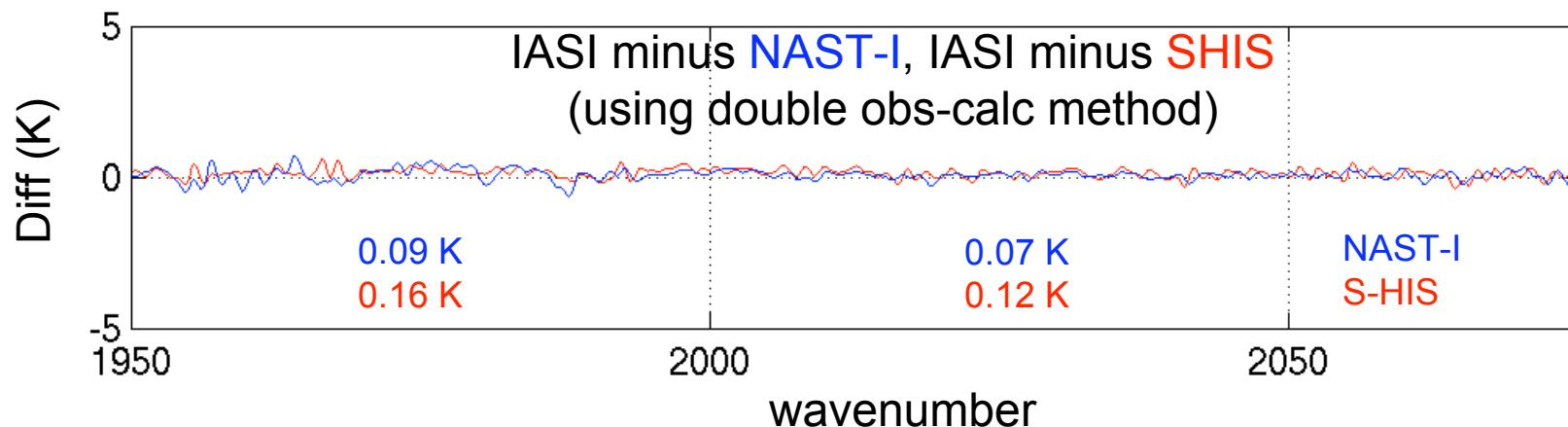
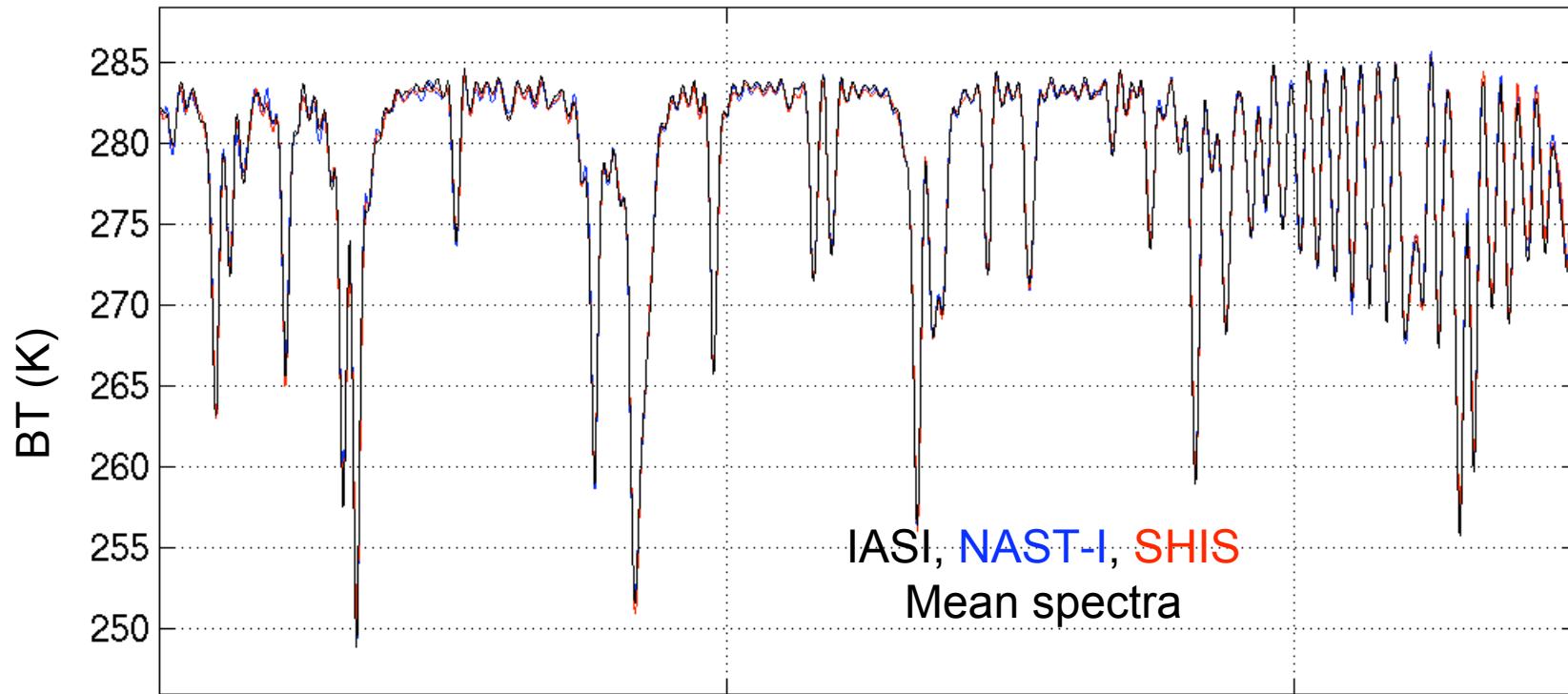
IASI Longwave Validation, JAIVEX



IASI Midwave Validation, JAIVEX



IASI Shortwave Validation, JAIVEX



(previous) CLARREO Studies:

Question: Given a candidate CLARREO mission optimized for producing the climate benchmark products, how well can we meet the CLARREO objective to serve as an inter-calibration reference for the operational IR sounders ?

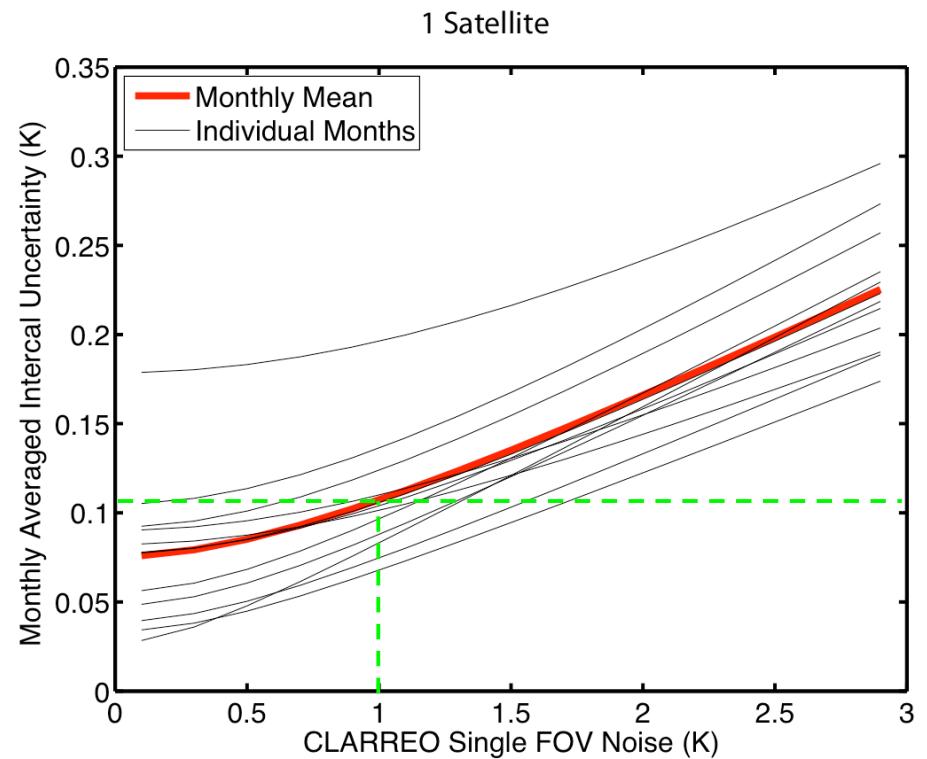
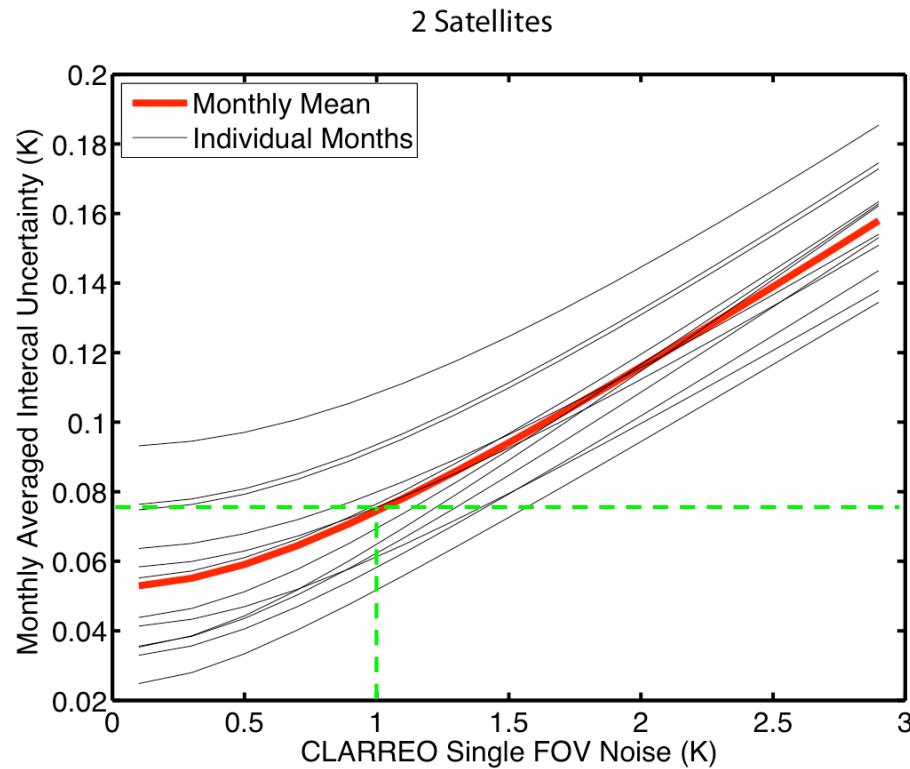
Study: A simulation study using real MODIS data.

Find Simultaneous Nadir Overpasses (SNOs) of CLARREO and EOS Aqua for 2006, and for each SNO use MODIS radiances to estimate the spatial and temporal sampling differences between CLARREO and CrIS/AIRS or IASI.

Opposed to actual inter-comparison studies involving two sensors, this approach removes the unknown sensor biases and allows spatial and temporal inter-calibration differences to be examined.

Sample Results

11 μ m 1-sigma monthly intercal uncertainty vs. NEDT:



The results are generated using 30 sec sampling, 25 KM (diameter) FOV, and for each SNO allowing FOVs with less than 10 deg scan angles to be included in the intercal. The red curve is the monthly mean uncertainty for 2006, with each black curve representing the individual months.

Going Forward

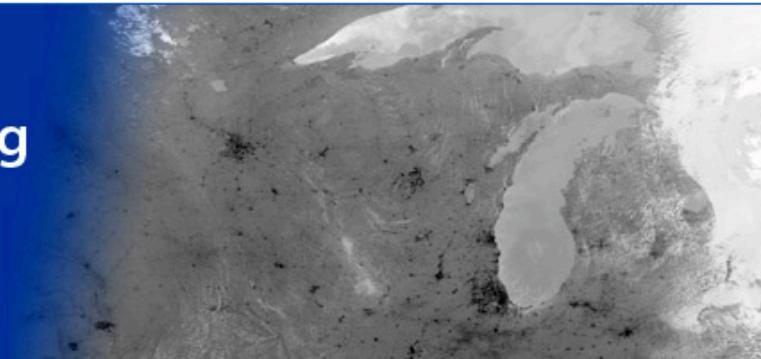
There is still a need for an IR intercal reference sensor with on-orbit calibration verification.

Requirements can be set based on intercalibration needs and trend accuracy for/from the resulting intercalibrated datasets.

Submit paper on to-date CLARREO IR intercal study

Use our intercal simulation framework to help assess and promote potential missions.

http://www.ssec.wisc.edu/farir_workshop/2011/



2011 Workshop on Far-Infrared Remote Sensing

November 8-9
Madison, WI

[Home](#) [Program](#) [Registration](#) [Accomodations](#) [Madison](#)

The 2011 Workshop on Far-Infrared Remote Sensing focuses on the scientific and observing challenges of characterizing the Earth's spectral radiance properties in the 15 to 100 μm region. Topics that will be discussed include:

- Instrumentation
- Radiative transfer model development and validation
- Thermodynamic profiling
- Cloud property remote sensing
- Climate studies

The workshop presenters will be from research groups worldwide involved in far-infrared remote sensing. An agenda will be posted on this webpage as the presentations get finalized.

Please complete the registration section if you would like to attend. For more information, contact [Maria Vasys](#) or the [program chairs](#):

- Dr. David Turner, NOAA
- Dr. David Tobin, University of Wisconsin—Madison
- Dr. Jonathan Gero, University of Wisconsin—Madison



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