Intercalibration of IASI with AIRS and CrIS
L. Strow, H. Motteler, Paul Schou, S. E. Hannon
Joint Center for Earth Systems and Technology, University of Maryland Baltimore County
Department of Physics, University of Maryland Baltimore County

Overview

- NPP/CrIS started operation Jan. 2013
- “Final” configuration: mid-April 2013
- CrIS extends EOS-AQUA AIRS in the “A.M.” orbit
- IASI provides radiances for the “P.M.” orbit

(AIRS + CrIS) together with (IASI) provides 4 daily global observations of the Earth.

Can these three instruments provide a “CLARREO” like climate radiance record for climate change trending with diurnal averages?

Climate research generally uses diurnally averaged quantities.

CrIS

- Three (longwave, midwave, shortwave) focal planes
- Each focal plane is a 3x3 detector array
- Apodization corrections are quite large
- Considerable effort (pre-,post-launch) to ensure common radiometric and spectral response for each of the 9 focal plane detectors. Goal: ~0.03K mean B(T) differences

SNOs: Simultaneous Nadir Overpasses (Provided by NASA/JPL NPP Sounding PEATE)

- SNOs used to intercompare CrIS with AIRS and IASI
- IASI-CrIS SNOs limited to two tight latitude ranges at ± 73 deg. latitude.
- AIRS-CrIS SNOs primarily at higher latitudes, but significant number at all latitudes with 10 minute, 8 km window match criteria.

Results use SNO’s for month of May 2012 for (IASI-CrIS), and for May 2012-Dec. 2012 for (AIRS-CrIS).

Conclusions

- Early CrIS vs AIRS, IASI assessment very encouraging, at the 0.1-0.2K level
- Spectral differences among instruments needs more work to create a “Climate” radiance record (CDR).
- All three instruments appear to be very stable, so most of the work to create a CDR is in removing SRF differences.

Funding provided by NOAA STAR/JPSS Program and NASA NPP Program
strow@umbc.edu