Data Sets Available from Sounder PEATE

- All CrIMSS related RDR, TDR, SDR, EDR and IP are archived at the Sounder PEATE
  - 8 minute aggregated xDRs
  - IPs are not aggregated (GRAVITE issue)
- Various Radiative Transfer Profile version 3 (RTP3) files
  - SNOs (CrIS-AIRS, CrIS-IASI, AIRS-IASI, ATMS-AMSU) with or without ECMWF analysis, with or without calculated radiances
  - Cal Subset (AIRS, IASI, CrIS) [Aumann]
  - Ra Obs matchup
  - Reformatted EDRs and IPs (MW only as well as IR+MW)
- Level 3 files in NetCDF4 format
  - Temperature and water vapor profiles at IP levels
  - Skin temperatures, total precipitable water vapor, and total ozone burden
- Rain rate [Surussavadee MIT]
- AIRS like retrieval from CrIS and ATMS SDRs[Susskind]
- Available only to NPP Science Team members

Blue: to be implemented
IDP Software Versions (1)

- **Mx5.0 (I1.05.00) – November 2011**
  - Launch ready version
  - Issue with ATMS sidelobe correction (ATMS SDR invalid)

- **Mx5.1 (I1.05.01) – December 9, 2012**
  - Zero sidelobe correction for ATMS SDR

- **Mx5.2 (I1.05.02) – February 1, 2012**
  - Invalid CrIS geolocation (-9999s) made remapped ATMS SDR and hence EDR invalid

- **Mx5.3 (I1.05.03) - April 2, 2012**
  - CrIS geolocation issue fixed
  - CrIS/ATMS SDR declared to be of beta maturity
  - New ATMS OSS table with measured SRF
  - IR tuning
  - New covariance matrix with new MW spectral emissivity
  - Still no MW tuning, rejecting most IR+MW retrievals
**IDP Software Versions (2)**

- **Mx6.2 (I1.06.02) – August 9, 2012**
  - Main branch merged with Mx5.3 branch
  - Many CrIS/ATMS quality flag related issues are fixed
  - Not much change in CrIMSS EDR

- **Mx6.3 and Mx6.4 (no difference for CrIMSS) – October 15 2012**
  - CrIS/ATMS SDR to be of provisional maturity
  - Initial ATMS bias tuning implementation
  - **Known Issues**
    - Still issues with not using none-LTE channels during daytime
    - Issues with output IR Noise Amplification Factor
    - Issue with surface pressure, $P_{\text{surf}} > 1100$ mb
      - Indicates issues with surface elevation map

- **CrIMSS Cal/Val team is shooting for making EDR provisional maturity by Mx7.0, due out in early 2013**
mini-IDPS at NASA SDS

• The mini-IDPS at SDS is in the process of installing and testing Mx6.2

• Sounder PEATE volunteered to compare SDS output with operational data products to validate their proper operation.

• CrIS SDR differences are about one mili-Kelvin, possibly due to CMO differences
  • Similar differences seen in Mx5.3 comparison

• ATMS differences are on the order of two tenths of a Kelvin, possibly due to differences in ATMS-SDR-AC file
  • The Mx6.2 RPM seems to have copies of old LUTs and AUXs
  • Working with Wael Ibrahim of Raytheon to get a copy of current files

• EDR products have not been compared
CrIS and ATMS Br Temp Differences

Difference Map

CrIS 1231.25 cm\(^{-1}\) Channel

ATMS channel 21

Lee: Sounder PEATE – Nov 2012
Issues with Repaired Granules

• IDPS processes all the data as soon as practical
  • Even when not all necessary packets are downloaded
  • Missing packets cause much of data anomalies

• The granules are reprocessed, or repaired, when additional packets become available
  • Under normal circumstances, this happens mostly in the downlink boundaries, over northern high latitude area
  • But previously downloaded packets in neighboring granules, but in the calibration window, are not used

• Sounder PEATE currently ignores all unaggregated xDR data products, which are almost all repaired granules.
Map of Retrieval Quality for Mx6.2 (Day)

- Most IR+MW retrievals are rejected due to lack of MW tuning and an issue with non-LTE channels

Black(HighQ), Blue(LowIR), Green(LowMW), Red(Poor)
Map of Retrieval Quality for Mx6.2 (Night)

- Most IR+MW retrievals are rejected due to lack of MW tuning
- Issues with polar cases and coast lines
Some accepted IR+MW retrievals, but still daytime yield is lower, due to an issue with non-LTE channels.
• Some accepted IR+MW retrievals, but still daytime yield is lower with issues with non-LTE channels
Map of MW Only Level 3 Temperature

Level 3 Temperature at 515.720 mb for 20121001.07

515 mb temperature (7 day mean)
Map of Level 3 Surface Skin Temperature

Surface Skin Temperature for 20121031.07

7 day mean
MW Only product

Lee: Sounder PEATE – Nov 2012
Remapped ATMS 15 Br Temp

- ATMS-15 has striping issue due to low frequency sensitivity fluctuation (1/f noise)
• The ATMS-15 striping is transferred to EDR temperature (striping may have been exaggerated)
• ATMS has no sensitivity at 0.001 mb
• Some retrieval artifacts seen in the map
Rain Rate from ATMS (MIT)

Notice Sandy hitting NJ

Plot of ATMS Rain Rate for Oct 29, 2012
• Not enough data is written out to correctly calculate the residual
  • IR bidirectional surface reflectance is not written out
  • MW spectral emissivity after MW only step is missing
  • MW skin temperature after MW only step is missing
  • Cloud liquid water after MW only step and after IR+MW step are missing
  • Emissivity and skin temp after IR+MW step are written out
• Preliminary and INACCURATE calculation shows issues
  • Asymmetry in ATMS channels 18 – 22 in Mx6.2 data
  • Mx6.4 data shows little asymmetry but the residuals for surface channels are too large and have large angle dependency.
Volcanic SO$_2$ Plume Flag

- SO$_2$ flag developed for AIRS is degrading
  - Occasional false warning at edge of scan in recent years
- Developed SO$_2$ flag for CrIS with scan angle bias removed
  - 5 channels used to predict an SO$_2$ channel
  - Scan bias removed
  - Only four detections since April
    - Two near Mt Aetna
    - Two over Aleutians
  - One case of possible false warning being investigated
Summary

- Many data products are available to Science Team members
  - Some will be released to public through GSFC-ESDIS
  - Request from others will be considered

- **RTP3 is a powerful tool for Sounder PEATE activity**
  - NetCDF4 format that has excellent metadata capability
  - Tools for HDF5 can be used

- Level 3 is also useful for finding issues with EDR processing

- Supported JPSS Cal/Val activities
  - CrIS SDR, ATMS SDR, CrIMSS EDR

- CrIS and ATMS SDR are ready for prime time
  - Still some minor issues

- Climate applicability study continues, but EDR is not yet ready for prime time.