



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[Suskind]**
- **Available only to NPP Science Team members**



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**



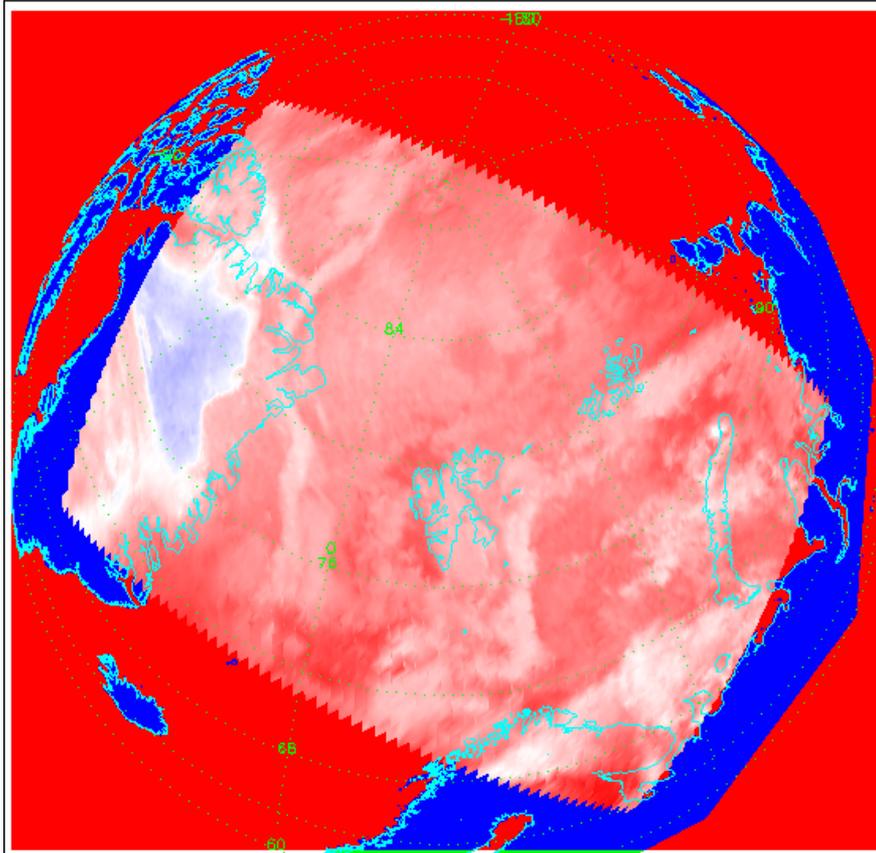
mini-IDPS at NASA SDS



- 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 milli-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

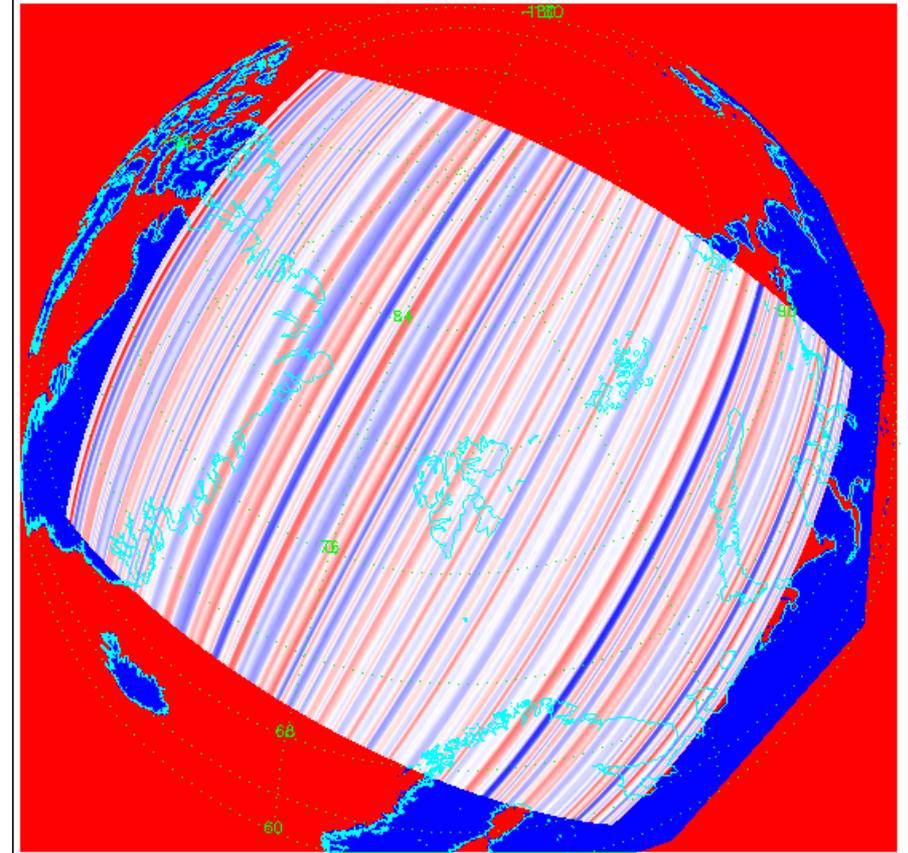
Difference Map

Difference Map (SDS - NOAA)



CrIS 1231.25 cm^{-1} Channel

ATMS 21 Antenna Temp Diff Map for d20120920_t0805086_e0813083



ATMS channel 21

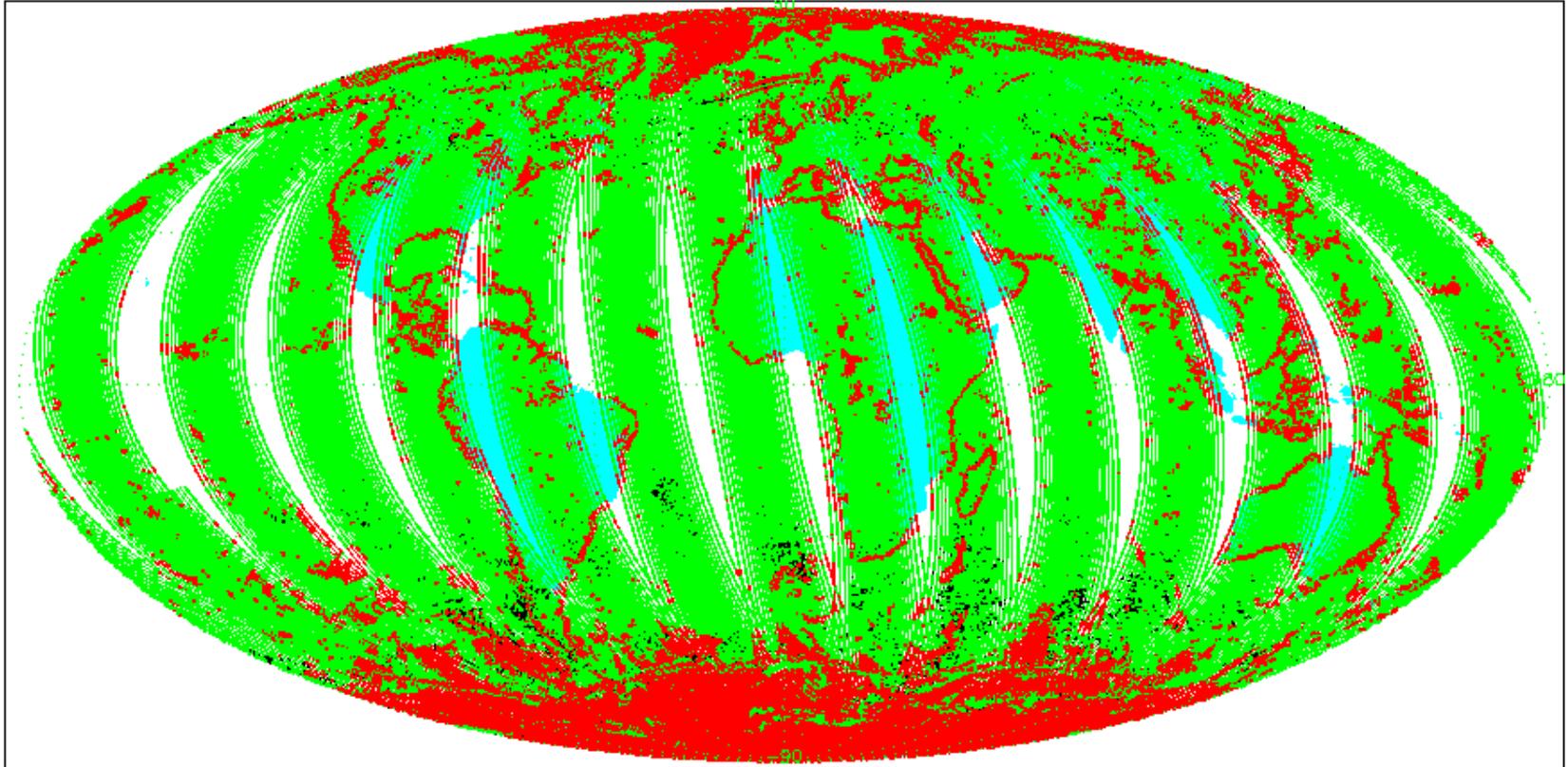


Issues with Repaired Granules



- **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.**

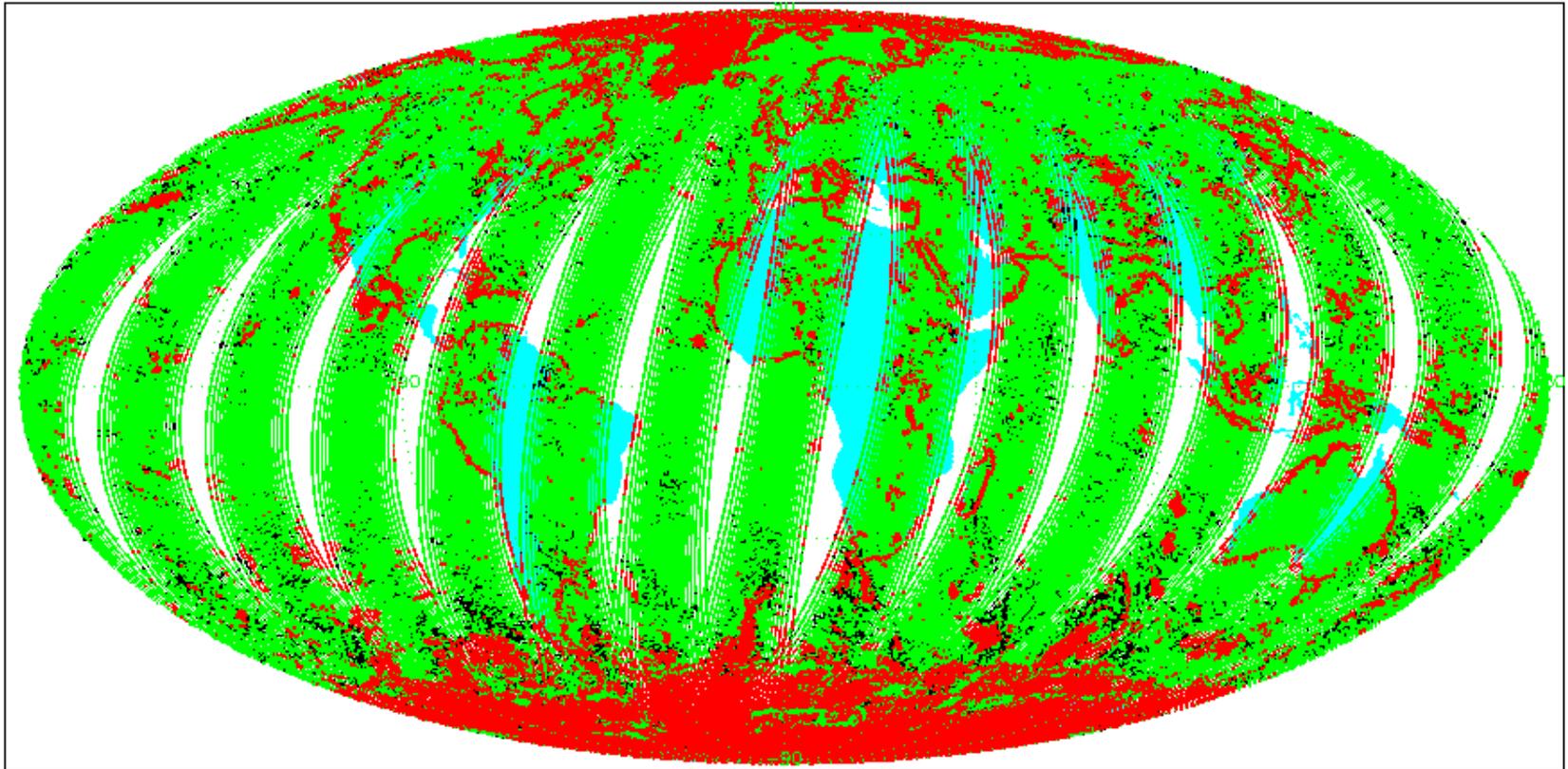
Plot of Retrieval Quality for 20120810



Black(HighQ), Blue(LowIR), Green(LowMW), Red(Poor)

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

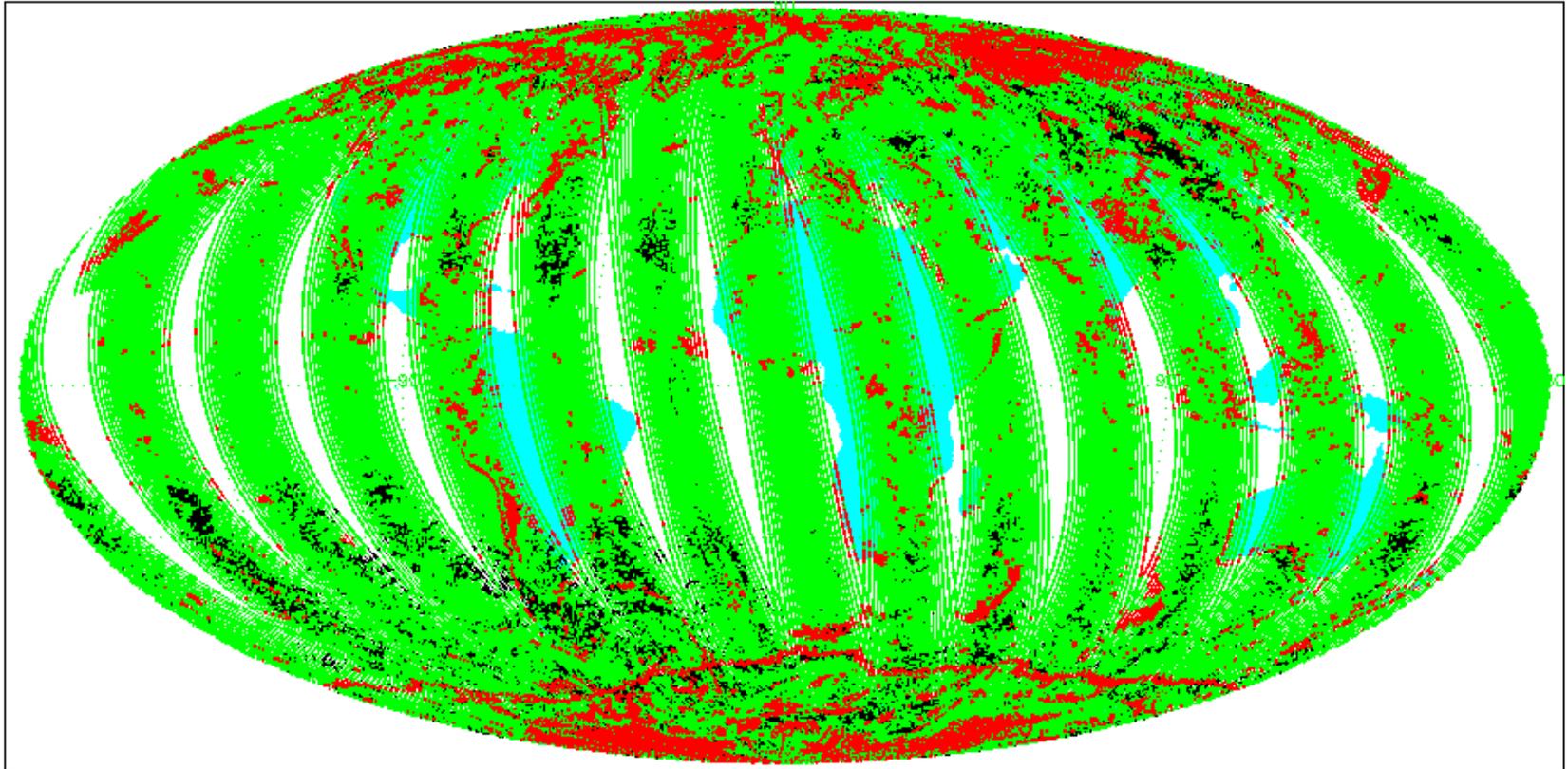
Plot of Retrieval Quality for 20120810



Black(HighQ), Blue(LowIR), Green(LowMW), Red(Poor)

- **Most IR+MW retrievals are rejected due to lack of MW tuning**
- **Issues with polar cases and coast lines**

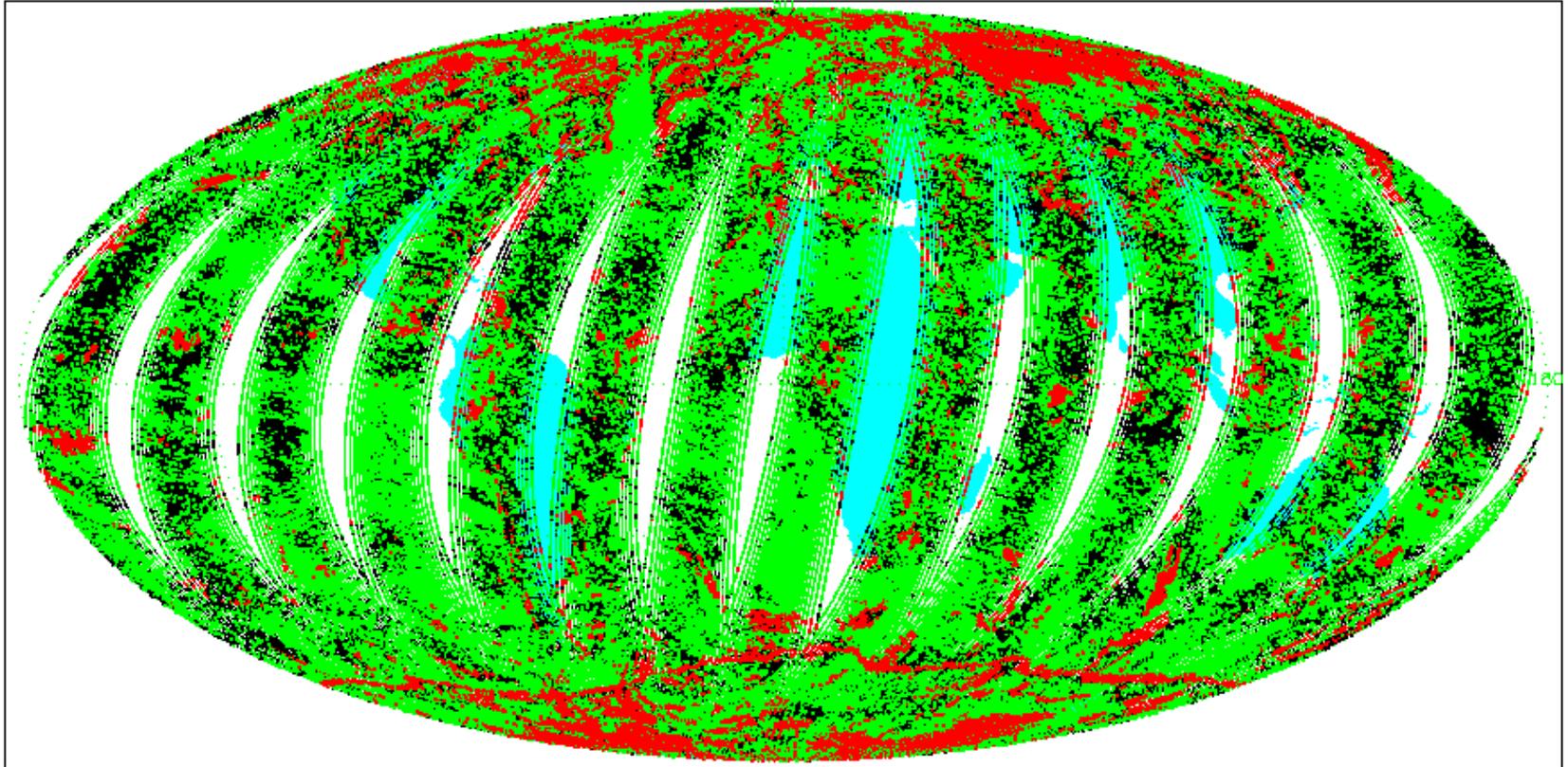
Plot of Retrieval Quality for 20121020



Black(HighQ), Blue(LowIR), Green(LowMW), Red(Poor)

- **Some accepted IR+MW retrievals, but still daytime yield is lower, due to an issue with non-LTE channels**

Plot of Retrieval Quality for 20121020

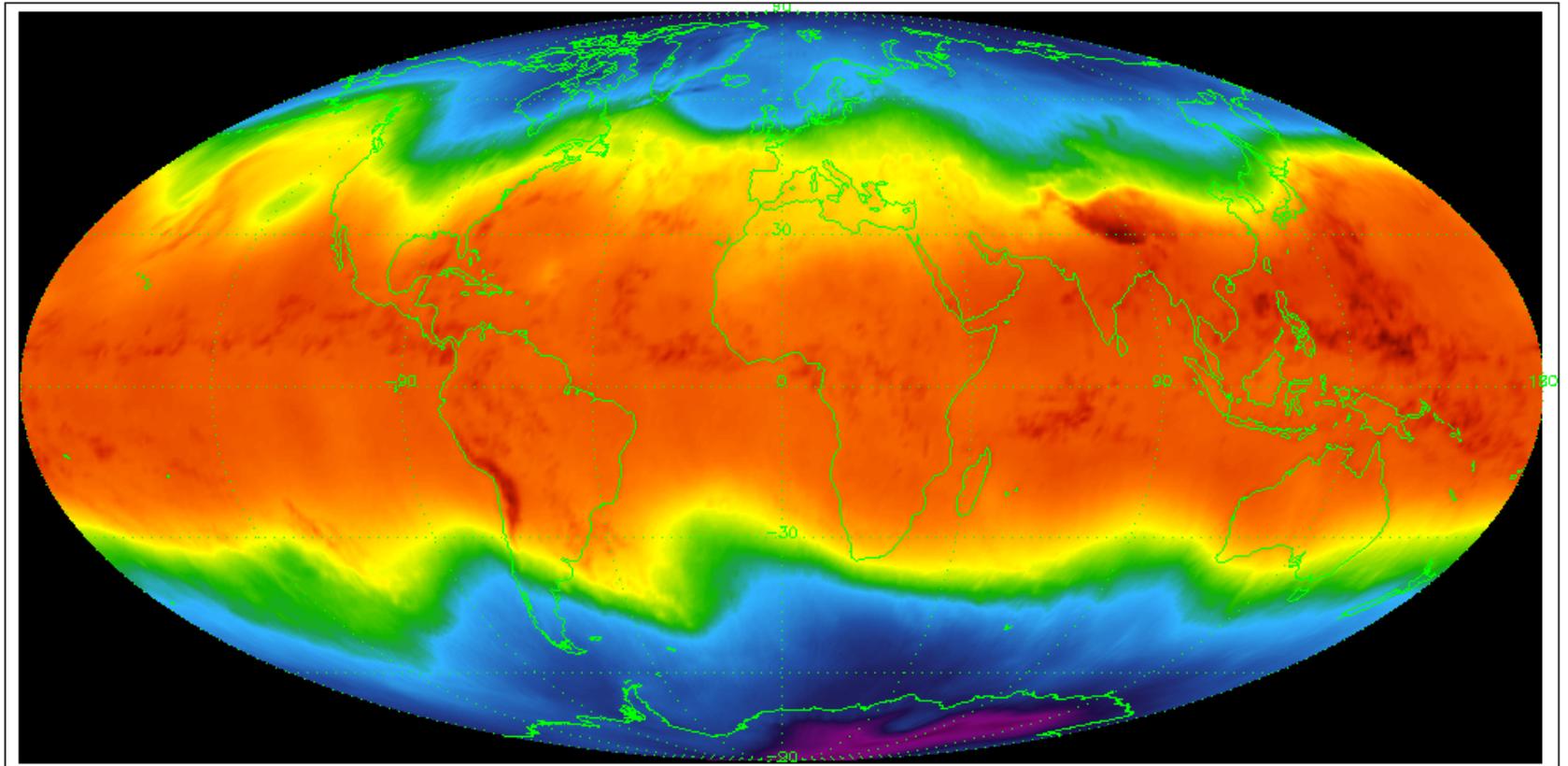


Black(HighQ), Blue(LowIR), Green(LowMW), Red(Poor)

- **Some accepted IR+MW retrievals, but still daytime yield is lower with issues with non-LTE channels**

Map of MW Only Level 3 Temperature

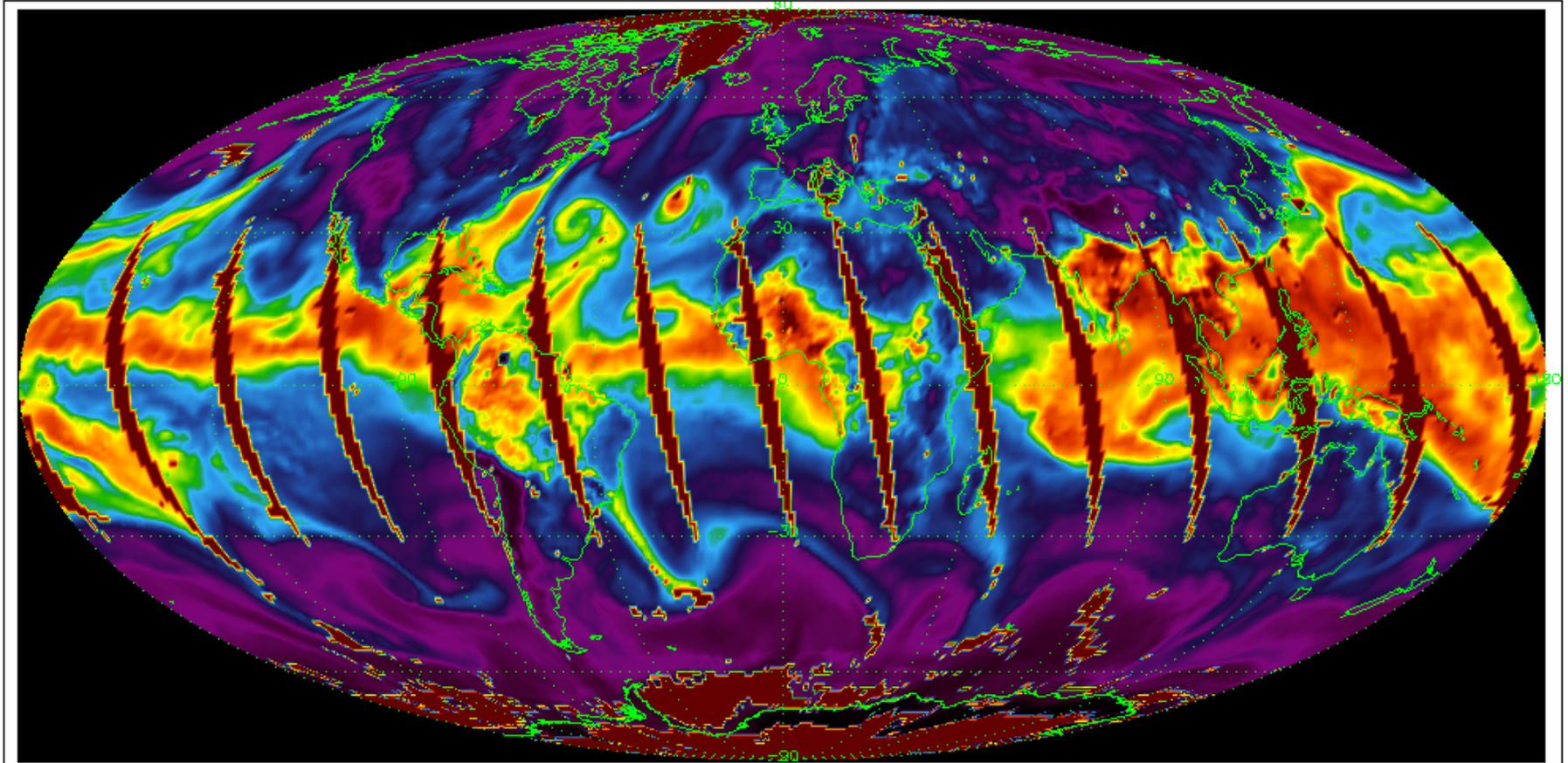
Level 3 Temperature at 515.720 mb for 20121001.D7

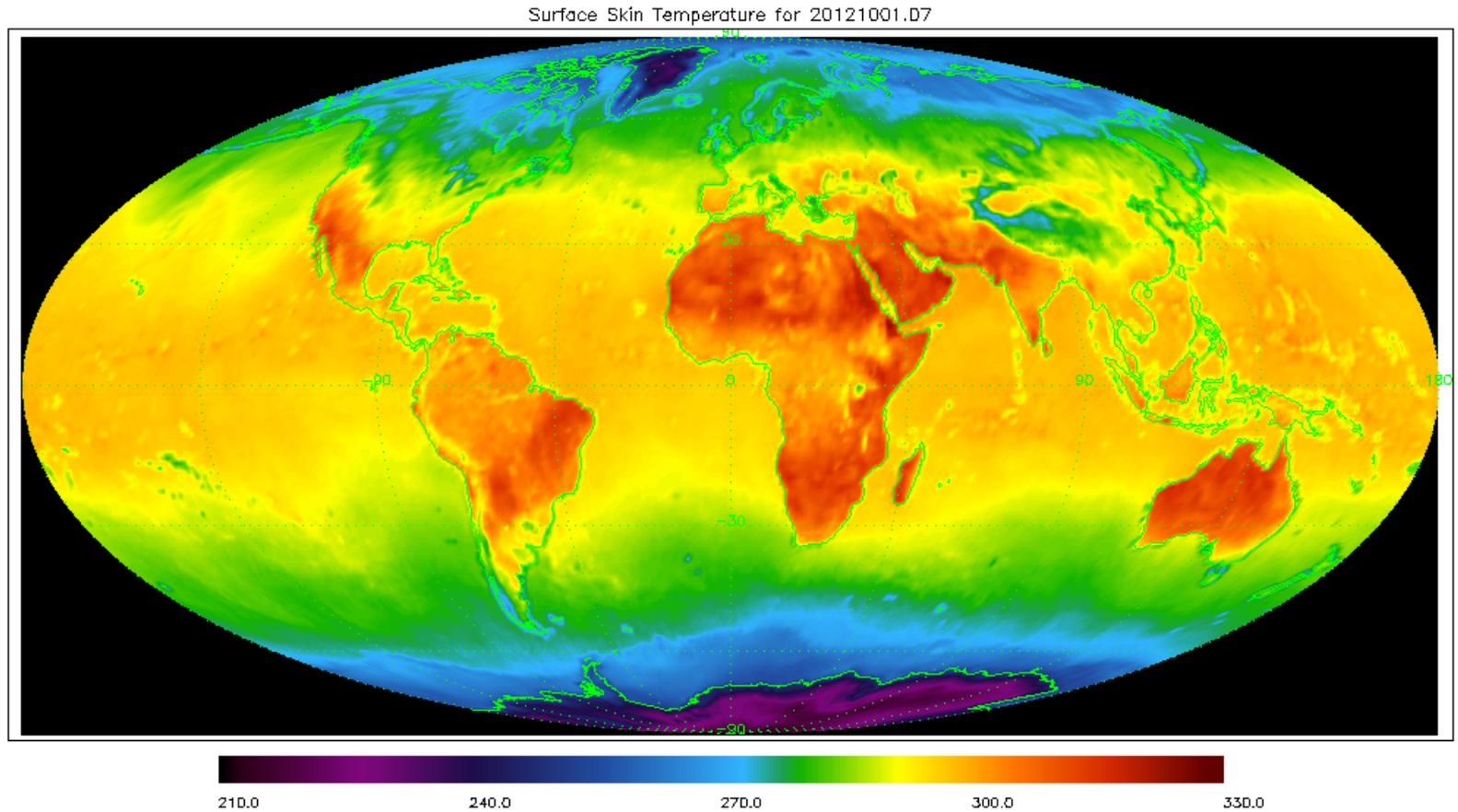


515 mb temperature (7 day mean)

Map of Level 3 MW Total Precip WV

Total Precipitable Water Vapor for 20120920.01

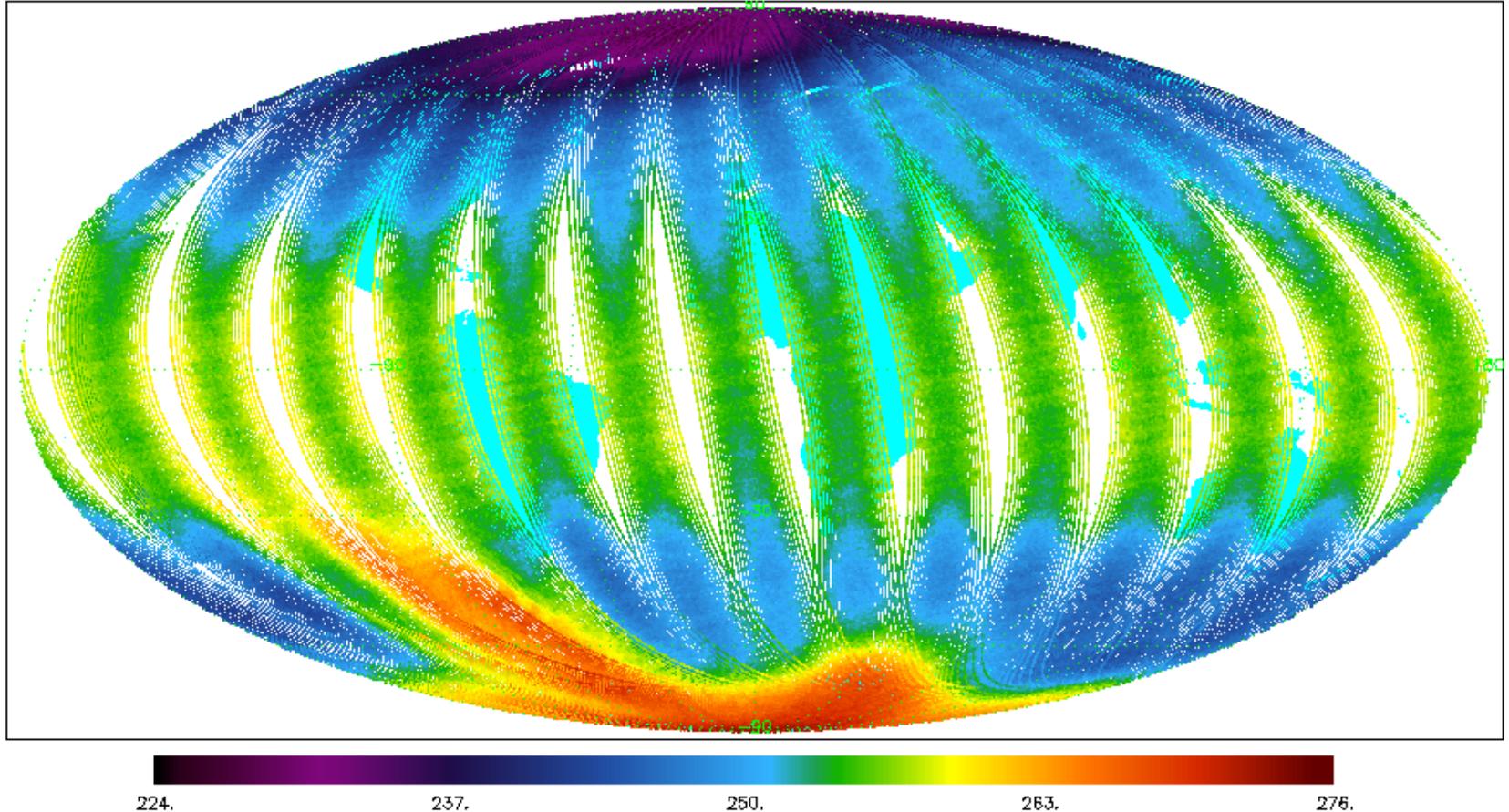




7 day mean

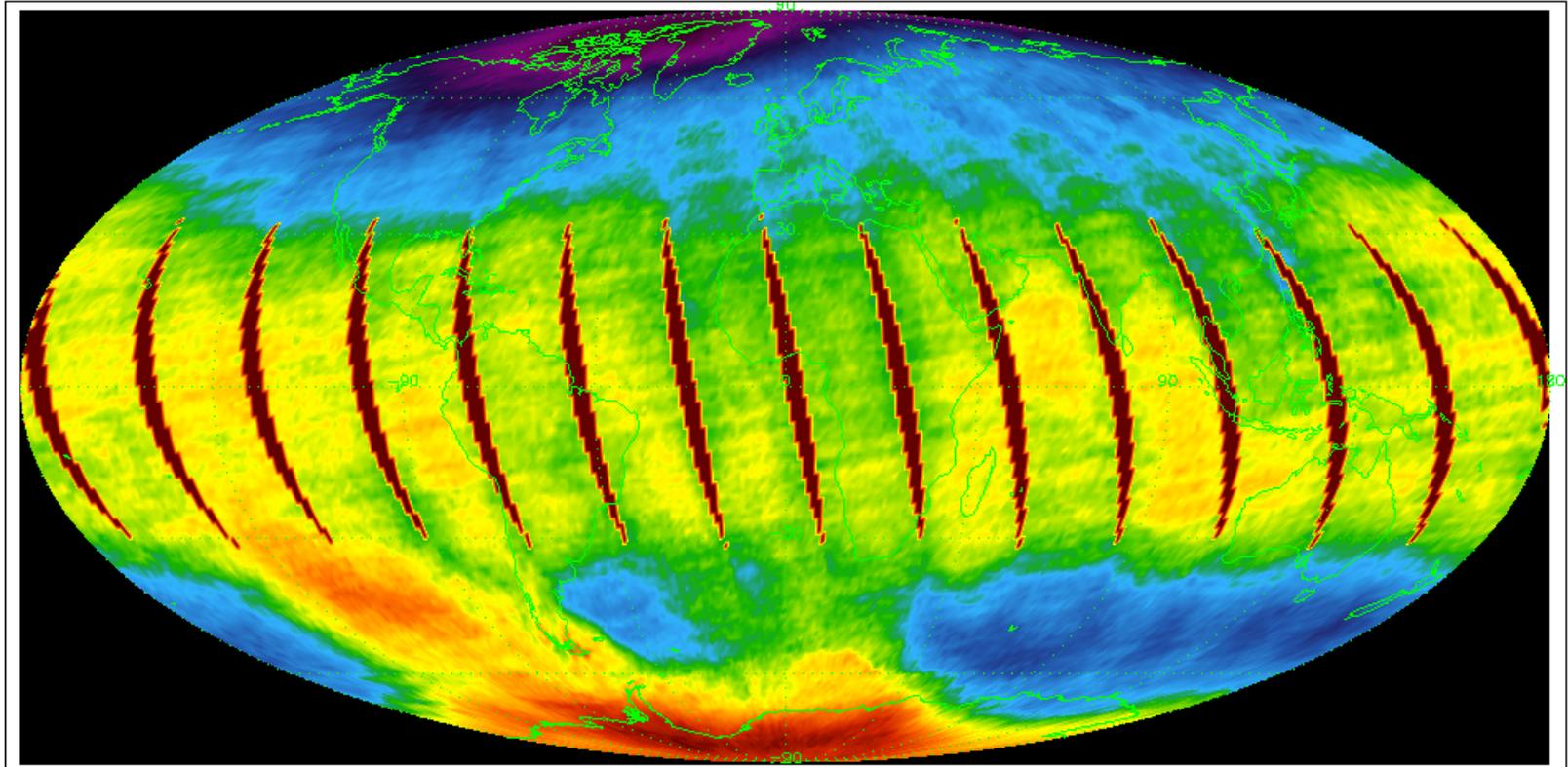
MW Only product

Plot of ATMS-15 Brightness Temperature (Day) for 20121003



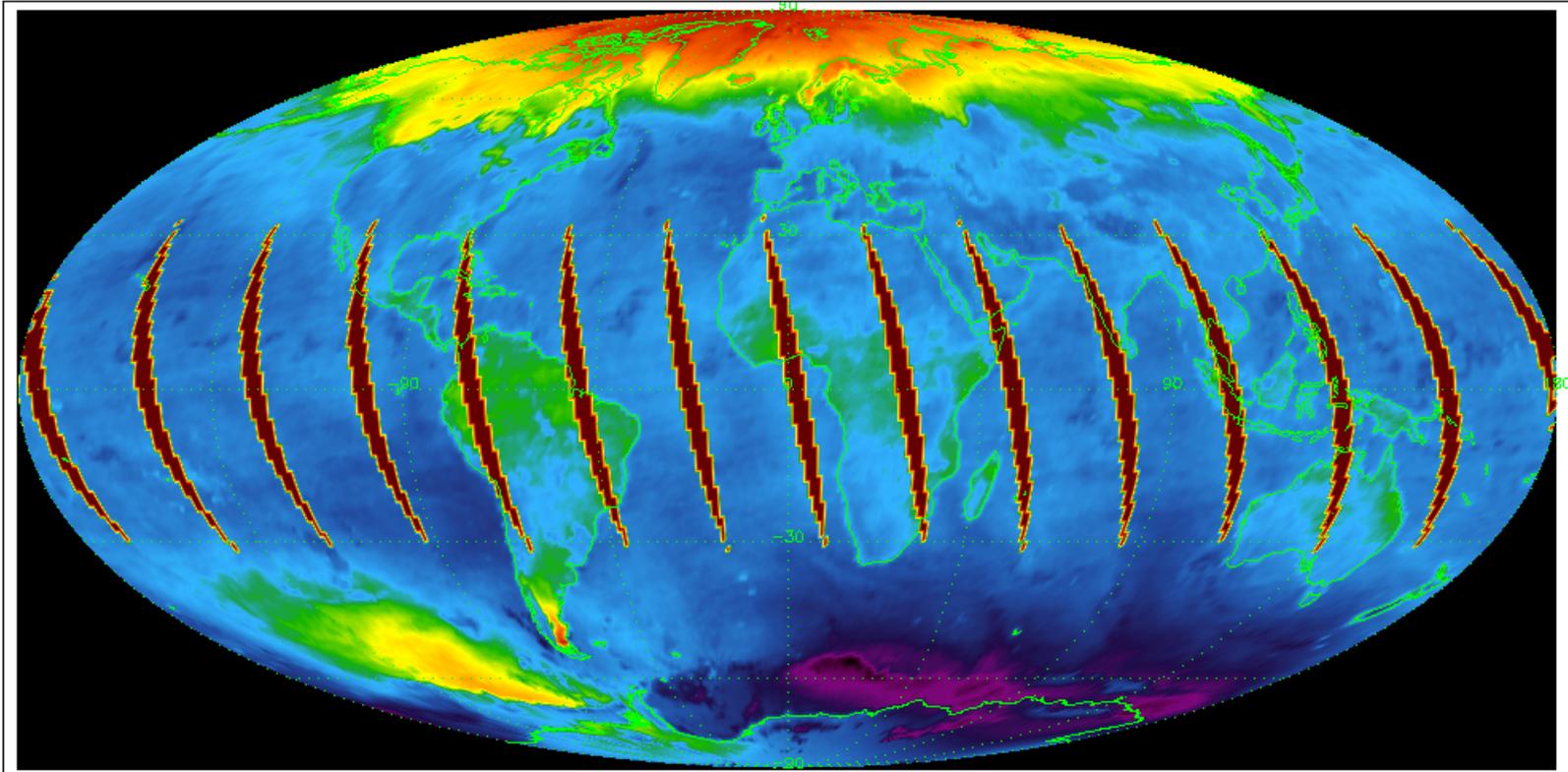
- **ATMS-15 has striping issue due to low frequency sensitivity fluctuation (1/f noise)**

MW Only 0.975300 mb Temperature for October 3, 2012



- The ATMS-15 striping is transferred to EDR temperature (striping may have been exaggerated)

MW Only 0.00500000 mb Temperature for October 3, 2012



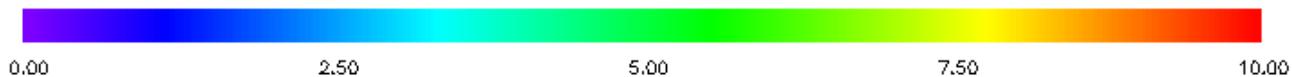
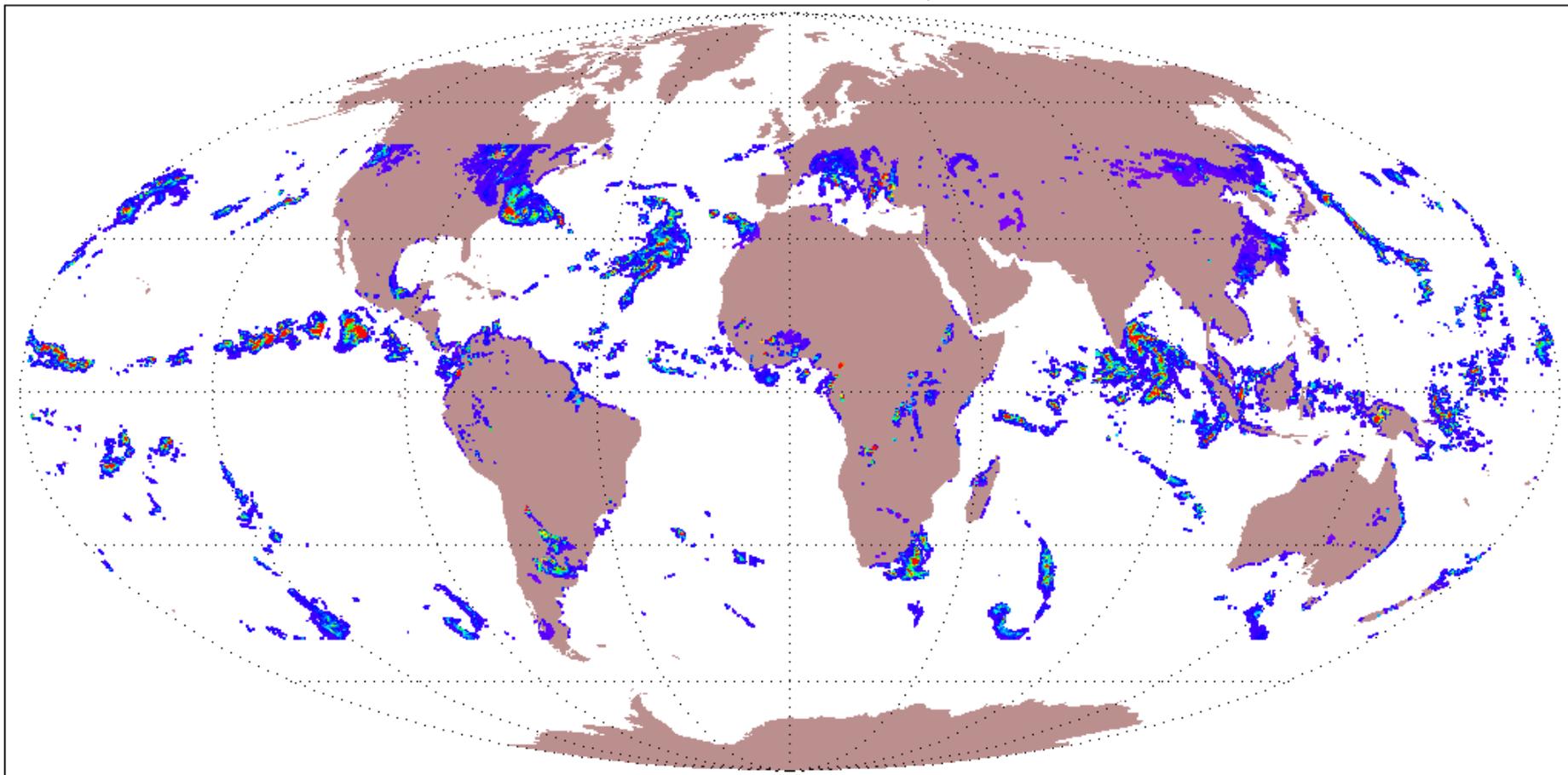
- **ATMS has no sensitivity at 0.001 mb**
- **Some retrieval artifacts seen in the map**

MW Only product

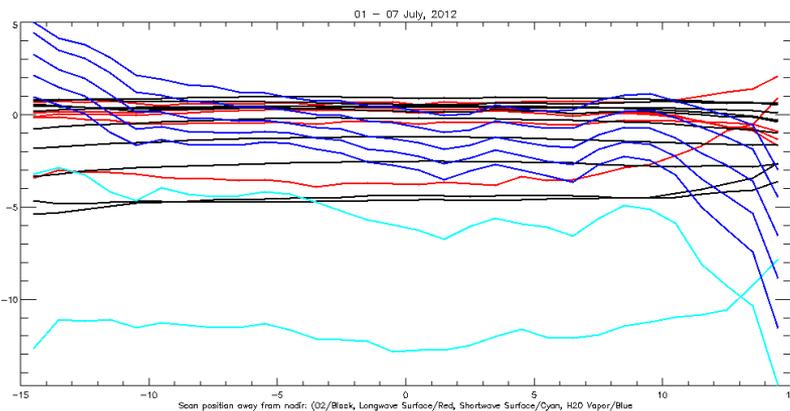
Rain Rate from ATMS (MIT)

Plot of ATMS Rain Rate for Oct 29, 2012

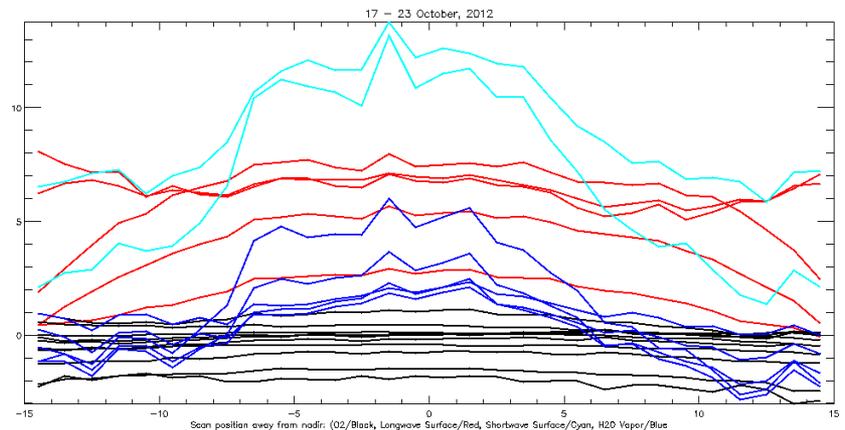
Notice Sandy hitting NJ



- 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.

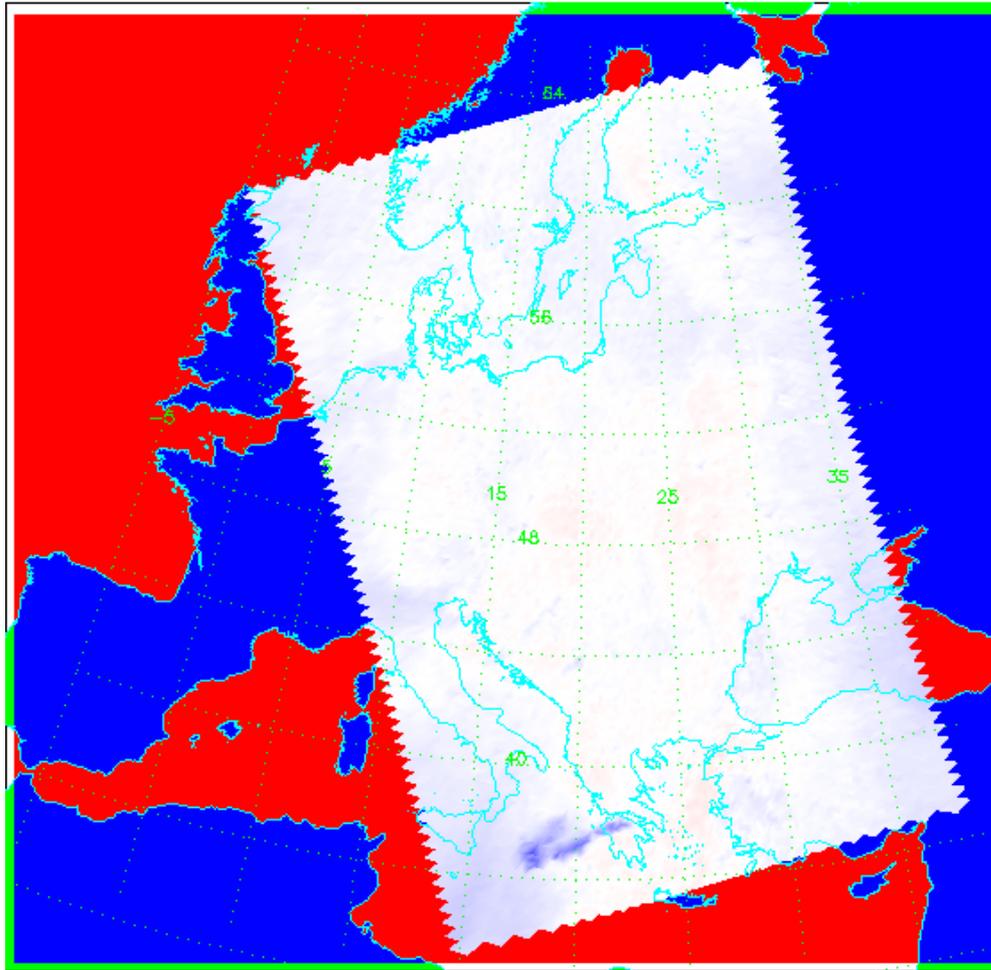


Mx6.2



Mx6.4

SO2 Plume Predictor for d20120424_t1113149_e1121127



-12.00 -6.000 0.000 6.000 12.00

Lee: Sounder PEATE – Nov 2012

- **SO₂ flag developed for AIRS is degrading**
 - Occasional false warning at edge of scan in recent years
- **Developed SO₂ flag for CrIS with scan angle bias removed**
 - 5 channels used to predict an SO₂ 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.**