

ATMS SDR Release, Beta Data Quality
August 2012
Recommended Cautions for Data Users

The JPSS Algorithm Engineering Review Board has released the ATMS Sensor Data Record product with a Beta product maturity level. Beta quality is defined as:

- Early release product
- Initial calibration applied
- Minimally validated and may still contain significant errors (rapid changes can be expected)
- Available to allow users to gain familiarity with data formats and parameters
- Product is not appropriate as the basis for quantitative scientific publications, studies and applications

The Board recommends that users be aware of certain specific data product characteristics. The product caveats for ATMS at this time are:

1. ATMS SDR data products include both the Temperature Data Record (TDR) and Sensor Data Record (SDR). The TDR product is the calibrated antenna temperatures obtained directly from the sensor antenna measurements of earth's outgoing radiation at the top of the atmosphere while the SDR product is the brightness temperature after applying a beam efficiency and scan position dependent bias correction to the TDR data. For beta maturity, no beam efficiency and scan position dependent bias correction has been applied to the SDR data product, so the antenna temperatures in the TDRs are identical to the brightness temperatures in the SDRs.
2. Not all ATMS TDR/SDR data product quality flags were implemented accurately in the beta release due to non-optimized data quality dynamic ranges, which include granule level and scan level quality flags. Users need to be aware of this when directly using the quality flags in the TDR/SDR data products for operational data quality evaluation.
3. Minor striping phenomena have been noticed at ATMS selected V-Band channels (channels 10 to 15) when compared against Numerical Weather Prediction models. Preliminary investigation indicates that such phenomena could be caused by insufficient averaging scan numbers in calibration processing, but the root cause is still under investigation.
4. There is a strong indication that direct solar intrusion causes a slight heating (0.15 Kelvin) of the "WG" band (Chan. 16-22) internal calibration target (ICT) as the NPP satellite enters the eclipse. The "KAV" band ICT had no direct solar intrusion due to the sun shade and varied only ~0.05 Kelvin during these events. The worst-case temperature variation, however, is within the specified allowable temperature drift for the calibration target, and does not compromise calibration accuracy.

5. Some ATMS TDR/SDR data may not contain valid values due to spacecraft maneuvers and anomalies, which are listed below:
 - a. 65 deg. ATMS (anti-sun side) roll maneuver: 12 Jan 2012 between 12:00 to 12:35 UTC
 - b. 25 deg. ATMS (sun-side) roll maneuver: 12 Jan 2012 between 13:50 to 14:10 UTC
 - c. Pitch maneuver: 20 Feb 2012 between 18:15 to 19:00 UTC
 - d. NPP Spacecraft Anomaly: ATMS data loss from 21 Jun 2012 18:00 UTC to 22 Jun 2012 12:56 UTC
 - e. Near monthly VIIRS calibration maneuvers will impact ATMS SDRs (approx. nine maneuvers a year). The monthly VIIRS calibrations consist of a 14 deg. anti-sun side roll maneuver with a dwell time of four minutes.

Another caveat is that the N_Spacecraft_Manuever metadata in the ATMS data products is not working as expected, and therefore it isn't correctly identifying maneuvers. A fix is not expected until 2013.

6. Preliminary evaluation on ATMS geolocation accuracy did not show a significant problem in Beta release data.
7. The ATMS SDR remapped to the CrIS SDR is available starting on April 19, 2012 to match when the CrIS SDR became available on CLASS. A false positive "synchronization error" quality flag (QF4) was fixed after May 17, 2012 by changing a ground look-up table parameter value.

More information about ATMS can be found at the following ATMS websites, where users can find the Algorithm Theoretical Basis Document (ATBD), Operational Algorithm Description (OAD), data format descriptions (CDFCB), image gallery, etc.:

- 1) <http://www.star.nesdis.noaa.gov/jpss/ATMS.php>
- 2) <http://npp.gsfc.nasa.gov/atms.html>
- 3) <http://npp.gsfc.nasa.gov/science/documents.html>

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