GOES-17 ABI L2+ Downward Shortwave Radiation: Surface (DSR) and Reflected Shortwave Radiation: TOA (RSR) Release
Beta Data Quality
September 13, 2018
Read-Me for Data Users

The GOES-17 Advanced Baseline Imager (ABI) L2+ Downward Shortwave Radiation: Surface (DSR) and Reflected Shortwave Radiation: TOA (RSR) products were declared Beta maturity on August 27, 2018. No formal review was conducted because the algorithms are identical to the ones running with GOES-16, so the Beta declaration of the ABI L1b and CMI flows down to the ABI L2+ products.

Beta maturity, by definition, means that:

- Rapid changes in product input tables / algorithms can be expected;
- Product quick looks and initial comparisons with ground truth data were not adequate to determine product quality;
- Anomalies may be found in the product and the resolution strategy may not exist;
- Product is made available to users to gain familiarity with data formats and parameters;
- Product has been minimally validated and may still contain significant errors; and
- Product is not optimized for operational use.

Users bear all responsibility for inspecting the data prior to use and for the manner in which the data are utilized. Persons desiring to use the GOES-17 ABI DSR and RSR products for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA algorithm working group (AWG) scientists for feasibility of the planned applications. The DSR and RSR products are sensitive to upstream processing, such as the quality of calibration, navigation and cloud mask.

The ABI L2+ DSR and RSR products include the downwelling shortwave radiation at the surface (DSR) and the shortwave radiation reflected at the top of the atmosphere (RSR). The DSR and RSR retrievals are produced during daytime with view and solar zenith angles less than 90 degrees. Data over the Full Disk (FD) of the Earth is available in an equal angle latitude-longitude grid of 0.50 degrees for DSR and 0.25 degrees for RSR. Over the Continental United States (CONUS) spatial resolutions are 0.25 degrees for both DSR and RSR. For mesoscale (MESO), only DSR is produced at 0.05 degrees. The products are generated once per hour.

Full description and format of the DSR and RSR products are in the Product Definition and User's Guide (PUG) document (http://www.goes-r.gov/products/docs/PUG-L2+-vol5.pdf). The algorithm used to derive DSR and RSR from GOES-17 ABI observations is described in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Downward Shortwave Radiation (Surface), and Reflected Shortwave Radiation (TOA)" (http://www.goes-r.gov/products/ATBDs/baseline/baseline-DSR-v2.0.pdf).

Known product issues (as of September 13, 2018):

1. GOES-17 SRB products have an artifact manifesting itself as a negative imprint of land masses as would be seen from the current location of GOES 16. The reason for this is not yet known, but it may be caused by incorrectly mapped ancillary data. Because of this quality of the beta product is suboptimal.
2. The retrieval algorithm uses coefficients for converting narrowband reflectances to broadband albedos that have been derived for GOES 16 not GOES-17.
3. Flux statistics in metadata (min, max, mean, and stddev) may have incorrect values in Mode 4 CONUS domain.
4. "Lon_image_bounds" in metadata may have incorrect values in CONUS.
5. DQF attributes 'percent_good_retrieval_qf' and 'percent_bad_retrieval_qf' may have incorrect values.
6. Focal Plane Module (FPM) overheating impacts the longwave infrared (LWIR) channels of the GOES-17 ABI. This has the following consequences for the DSR and RSR products.
    - The upstream Clear Sky Mask (CSM), used for calculating cloud fraction in the retrieval grid, is impacted by the LWIR FPM overheating. This in turn may affect the quality of DSR and RSR in the first few hours of the daytime.
    - Because the algorithm uses the visible and near-infrared channels (channels 1-6) for DSR and RSR retrievals, there is minimal impact of LWIR FPM temperature anomaly on these products overall as long as the quality flags of upstream products used in algorithm are correctly reflect impact of FPM temperature anomaly. However, due to the artifact mentioned above the impact cannot be currently quantified.

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