

GOES-17 ABI L2+ Sea Surface Temperature (SST) Release

Beta Data Quality

September 9, 2018

Read-Me for Data Users

The GOES-17 Advanced Baseline Imager (ABI) L2+ Sea Surface Temperature (SST) product was 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.

The ABI L2+ SST product represents a 1 hour composite over a Full Disk (FD) of the Earth. A full description and format of the SST product can be found 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 the SST product from GOES-17 ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Sea Surface Temperature" (<https://www.goes-r.gov/products/ATBDs/baseline/baseline-SST-v2.0.pdf>).

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.

Beta users bear all responsibility for inspecting the data prior to use and for the manner in which the data are utilized. SST Team does not recommend using the Beta maturity SST product for any analyses. Users are strongly encouraged to consult the AWG SST lead for feasibility of the planned applications. The following disclaimer "NOAA's GOES-17 satellite has not been declared operational and its SST data are preliminary and undergoing testing" should be used prior to the Operational declaration.

The major issue with the G17 ABI is the loop heat pipe (LHP) anomaly, which critically affects all thermal Infrared (TIR) bands, including the four long-wave IR (LWIR) window bands 11, 13, 14, and 15 (centered at 8.4, 10.3, 11.2, and 12.3 μm , respectively). For more information about the LHP, consult the fact sheet www.nesdis.noaa.gov/sites/default/files/asset/document/NESDIS_factsheet_loopheatpipe.pdf and NESDIS update www.nesdis.noaa.gov/content/noaa-gives-update-goes-17-abi. The LHP anomaly results in the focal plane module (FPM) temperatures elevated over their nominal level ~65K, to 85K and higher. During some periods of the diurnal cycle up to 10 hours, when FPM gets too hot, the ABI radiances become unusable and no SST can be estimated. Outside of these periods, the radiometric performance of the SST bands is degraded to a degree depending on the FPM temperature.

In addition to the LHP anomaly, G17 SST may also be subject to the following limitations:

1. The SST product is sensitive to upstream calibration, navigation and cloud mask;
2. Some hourly FD files may be missing or incomplete, due to scheduled post-launch-activities;
3. The data following the data gaps maybe of degraded and suboptimal quality;
4. Diurnal cycle in observed SST may be distorted and unusable for physical analyses;
5. The data product is not reported in the Group for High Resolution SST (GHRSSST) Data Specification version 2 (GDS2) NetCDF format adopted in the international GHRSSST community.

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