

GOES-17 ABI L2+ Cloud Optical Properties Release
Beta Data Quality
October 26, 2018
Read-Me for Data Users

The GOES-17 Advanced Baseline Imager (ABI) L2+ Cloud Optical Properties (optical depth and particle size) 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 Cloud Optical Properties for both Daytime (DCOMP) and Nighttime (NCOMP) provide cloud optical depth (COD) and cloud particle size (CPS) over the Full Disk (FD) of the GOES-ABI domain, COD and CPS over the Continental United States (CONUS) region, and CPS over both Mesoscale (MESO) regions. They also include the processing information flags, parameter quality indicators and error estimates in the intermediate product (IP) files.

A full description and format of the COMP products 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 DCOMP and NCOMP products from GOES-16 ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Daytime Cloud Optical and Microphysical Properties (DCOMP)" (https://www.goes-r.gov/products/ATBDs/baseline/Cloud_DCOMP_v2.0_no_color.pdf) and the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Nighttime Cloud Optical Depths, Cloud Particle Size, Cloud Ice Water Path, and Cloud Liquid Water Path" (https://www.goes-r.gov/products/ATBDs/baseline/Cloud_NCOMP_2%200_no_color.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. Persons desiring to use the GOES-17 ABI Beta-maturity COMP for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA ABI calibration scientists for feasibility of the planned applications.

Known issues being resolved include:

1. All issues discussed in the cloud mask, cloud phase, and cloud height READMEs may have impacts on the COMP.
2. M4 Level 1b data drop outs from the PDA not evident in the GRB.

3. Striping in the 3.9-radiances causes striping in COMP products.
4. LUTs will be updated to for GOES-17 flight SRFs.
5. Wrong cloud phase input will cause COMP errors from up to 50%, particular for CPS.
6. DCOMP shows an increased number of thick clouds with COD greater than 80. Information depth is low due to radiation saturation.
7. The loop heat pipe Issue for ABI thermal channels for GOES-17 causes significant degradation of NCOMP data quality whenever the ABI temperatures required for NCOMP retrievals are impacted or missing. Figure 1 shows both COD and CPS retrievals for GOES-17 and GOES-16 for October 24, 2018, at 0715 (UTC). Both the GOES-17 COD and CPS retrievals in Figs. 1a and 1c, respectively, are severely degraded and are much less coherent than the contemporaneous GOES-16 retrievals in Figs. 1b and 1d due to the loop heat pipe problem. The upstream inputs to NCOMP that require thermal channels are also degraded, hence non-fill value COD and CPS retrievals during the impacted image times are not reliable. Future attempts to account for the impacted ABI radiances could result in improved NCOMP results, particularly at image times that see smaller effects, but those improvements and their impacts are to be determined.

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