GOES-16 ABI L2+ Cloud Type and Cloud Top Phase (CPH) Release
Provisional Data Quality
February 23, 2018
Read-Me for Data Users

The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for ABI L2+ Cloud Type and Cloud Top Phase (CPH) Provisional Maturity was held on February 22, 2018. As a result of this review, the PS-PVR panel recommended that the ABI Cloud Top Phase product be declared Provisional. This was accomplished at approximately 2215 UTC on February 22, 2018.

The ABI L2+ Cloud Top Phase product assigns each earth-navigated pixel one of the following classifications: clear sky (based on the ABI clear sky mask), liquid water, supercooled liquid water, mixed phase, ice phase, or unknown cloud phase. Aside from the clear sky designation, the classification is relative to the highest cloud layer present. Only infrared channels are used to determine the cloud thermodynamic phase. The cloud top phase product is generated for every ABI Full Disk (FD) of the Earth, Continental United States (CONUS) region, and the Mesoscale (MESO) regions.

A full description and format of the CPH 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 CPH products from GOES-16 ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Cloud Type and Cloud Top Phase" (https://www.goes-r.gov/products/ATBDs/baseline/Cloud_CldType_v2.0_no_color.pdf).

Provisional maturity, by definition, means that:

- Validation activities are ongoing and the general research community is now encouraged to participate;
- Severe algorithm anomalies are identified and under analysis. Solutions to anomalies are in development and testing.
- Incremental product improvements may still be occurring;
- Product performance has been demonstrated through analysis of a small number of independent measurements obtained from select locations, periods, and associated ground truth or field campaign efforts;
- Product analysis is sufficient to communicate product performance to users relative to expectations (Performance Baseline);
- Documentation of product performance exists that includes recommended remediation strategies for all anomalies and weaknesses. Any algorithm changes associated with severe anomalies have been documented, implemented, tested, and shared with the user community;
- Testing has been fully documented; and
- Product is ready for operational use and for use in comprehensive cal/val activities and product optimization.

Provisional 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-16 ABI Provisional maturity Cloud Top Phase 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. This product is sensitive to upstream processing, such as the quality of the calibration, navigation and cloud mask.

Known issues at the Provisional validation stage include:

1. Missing values occur randomly due to upstream L1b issues;
2. The upstream cloud detection algorithm can lead to clear regions being assigned a cloud thermodynamic phase or cloudy regions being classified as clear sky;
3. Optically thin cirrus clouds are sometimes misclassified as liquid water, supercooled liquid water or mixed phase;
4. The risk of misclassifying liquid water clouds as ice is greatest in regions with broken cumulus clouds;
5. The ability to correctly identify clouds that have both liquid water and ice within the portion of the cloud influencing the measured ABI radiances is limited.
6. The baseline cloud phase classification is sometimes inconsistent with near-infrared based assessments of cloud phase, such as false color imagery constructed with phase sensitive near-infrared spectral channels.

Contact for further information: OSPO User Services at SPSD.UserServices@noaa.gov

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