

GOES-18 ABI L2+ Legacy Atmospheric Profiles (LAP) Release  
Beta Data Quality  
May 20, 2022  
Read-Me for Data Users

The GOES-18 Advanced Baseline Imager (ABI) L2+ Legacy Atmospheric Profiles (LAP) products were declared Beta maturity on May 11, 2022. No formal review was conducted because the algorithms are identical to the ones running with GOES-16/17, so the Beta declaration of the ABI L1b and CMI flows down to the ABI L2+ products.

The GOES-R series ABI LAP products provide Legacy Vertical Temperature Profiles (LVT), Legacy Vertical Moisture Profiles (LVM), Total Precipitable Water (TPW), and Derived Atmospheric Stability Indices (DSI) over each 5x5 ABI pixels box with clear sky infrared band radiances.

DSI includes five atmospheric instability indices: Lifted Index (LI), Convective Available Potential Energy (CAPE), Total Totals Index (TT), K-Index (KI), and Showalter Index (SI). The GOES-R series ABI LAP products are retrieved based on the ABI infrared band radiance measurements with NWP (NOAA GFS) short range forecasts as first guess and background information in a one-dimensional variational (1Dvar) process. The LAP products are generated every 10 minutes over the ABI Full Disk (FD), every 5 minutes over the Continental United States (CONUS) region, and every 1 minute over the Mesoscale (MESO) regions. A full description and format of the LAP 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 LAP products from GOES-R series ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Legacy Atmospheric Moisture Profiles, Legacy Atmospheric Temperature Profiles, Total Precipitable Water, and Derived Atmospheric Stability Indices". ATBDs are available at [https://www.star.nesdis.noaa.gov/goesr/documentation\\_ATBDs.php](https://www.star.nesdis.noaa.gov/goesr/documentation_ATBDs.php).

GOES-18 ABI LAP for several derived products (TPW, LI, CAPE) were compared to GOES-16 and GOES-17 products in the overlap regions. The results are reasonably consistent with GOES-16 and GOES-17, with differences much smaller than product requirements. There is better agreement between GOES-16 and GOES-17 than either with GOES-18. This is most likely due to to-be-resolved co-registration issues on GOES-18. Overall, the LAP products look stable.

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-18 ABI Beta-maturity LAP products for any reason, including but not limited to scientific and technical investigations, are encouraged to consult the NOAA AWG scientists for feasibility of the planned applications. Any calibration or registration issues in the radiance files can affect the LAP products.

There are no specific known issues under investigation at this time.

Contact for further information: OSPO User Services at [SPSD.UserServices@noaa.gov](mailto:SPSD.UserServices@noaa.gov)

Contacts for specific information on the ABI LAP data:

Tim Schmit: [tim.j.schmit@noaa.gov](mailto:tim.j.schmit@noaa.gov)