

GOES-16 EXIS EUVS Level 1b (L1b) Data Release
Provisional Data Quality
January 7, 2020
Read-Me for Data Users

The GOES-R Peer Stakeholder Product Validation Review (PS-PVR) for EXIS EUVS Level 1b (L1b) Provisional Maturity was held on September 25, 2019. As a result of this review, the PS-PVR panel chairperson determined that the EXIS EUVS L1b data should be promoted to Provisional Validation Maturity. Although the data were deemed Provisional, there were a few software updates that were needed before data were approved for distribution. These fixes were applied to the Operational Environment on December 10, 2019.

The L1b data products derived from EXIS Extreme Ultraviolet Sensor (EUVS) observations are line irradiances, Magnesium II indices, and EUV proxy spectra. The EUVS measures solar spectral irradiance at discrete wavelengths between 25 and 141 nm and in the vicinity of 280 nm. The GOES-16 EXIS EUVS L1b Provisional level data products are still undergoing calibrations and corrections. The product formats are defined in the GOES-R Product User Guide (PUG), but the PUG may not be fully up-to-date. Prior to the data release date of December 10, 2019, there are many issues in the data, some of which are described in the GOES-16 EXIS L1b Beta Release notes. Because some of these issues are significant, this earlier data should not be used.

In 2020, a corrected EUVS L1b GOES-16 dataset will be released on the NCEI website (listed below). This updated dataset will retrospectively correct the data to early 2017. Additionally, L2 products such as averages and flare locations based on this scientific data set will be released at this site.

Provisional validation means:

- 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 GOES-15.
- Product analysis is sufficient to establish product performance 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, and tested.
- Testing has been fully documented.
- Product is ready for operational use and for use in comprehensive cal/val activities and product optimization.

The following is the list of known caveats for the GOES-16 EUVS L1b data at Provisional maturity status:

- The spectral model and MgII_NOAA are invalid prior to January 7, 2020 1800 UTC.

- During lunar transits, the irradiances, Mg II ratio, and temperatures are improperly set to fill values. Pointing flags are also incorrect.
- In the time variable, the phrase “neglecting leap seconds” needs to be moved from units attribute to the long name.
- The 28.4 nm line irradiance may have errors as large as 10% at low signal levels.
- There are significant errors in the model spectra due to inclusion of calibration signals in the daily gliding averages used to calculate the model. These result in offsets of as much as 17% lasting for many hours in some model bins.
- Model bins that use the 121 nm line in the daily average have errors of approximately 5% due to incorrect inclusion of the line irradiance during periods of geocoronal absorption.
- The 121 nm line irradiance has an error of approximately 0.02%.
- Dark diode currents do not have dark drift correction or delta temperature correction.
- Calibrations for all products are likely to have future revisions. Of special note, EUVS-B lines have been scaled to SORCE SOLSTICE which is expected to be decommissioned in at the end of February 2020, after which EUVS-B lines will be adjusted based on the Mg II index.
- The scaling of the secondary Mg II index product, called Mg_NOAA, is likely to change in the future.
- There are small discrepancies in some of the line irradiances after eclipses due to uncorrected temperature impacts.
- The spectral model may be improved in the future for flare periods.
- The Mg II index may have small improvements in the future to account for non-linear behavior in the wings and lines and spikes in the data.

Persons desiring to use the GOES-16 EUVS Provisional maturity L1b products for any reason, including but not limited to scientific and technical investigations, should involve the responsible NOAA scientists before proceeding. Users of the GOES-16 EUVS L1b data bear responsibility for inspecting the data and understanding the known caveats prior to use.

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

NCEI contacts for specific information on the EUVS L1b data:

Scientific issues: Janet Machol (janet.machol@noaa.gov)

Data access issues: Pamela Wyatt (pamela.wyatt@noaa.gov)

NCEI website for GOES-R Space Weather data (will provide daily aggregations of EUVS L1b and L2 data):

<https://www.ngdc.noaa.gov/stp/satellite/goes-r.html>