GOES-18 EXIS EUVS Level 1b (L1b) Data Release
Provisional Data Quality
Read-Me for Data Users
December 5, 2022

The GOES-R Peer Stakeholder Product Validation Review (PS-PVR) for GOES-18 EXIS EUVS Level 1b (L1b) Provisional Maturity was held on November 17, 2022. As a result of this review, the PS-PVR panel chair recommended that the GOES-18 EXIS EUVS L1b data be promoted to Provisional Validation Maturity.

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-18 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 November 17, 2022, there are many issues in the data, some of which are described in the GOES-18 EXIS L1b Beta Release notes. Because some of these issues are significant, this earlier data should not be used.

Next year, a corrected GOES-18 EUVS L1b dataset will be released on the NCEI website (listed below). This updated dataset will retrospectively correct the data to June 2022. Additionally, L2 products such as averages 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 via comparisons of data from GOES-16 , -17, and -18.
- 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 calibration/validation activities and product optimization.

The following is the list of known caveats for the GOES-18 EUVS L1b data at Provisional maturity status. Solutions are in development and testing.

1. During lunar transits, the irradiances and Mg II ratio are improperly set to fill values.
2. 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.
3. Solar array currents are incorrect.
4. There is an annual cycle oscillation in EUVS-B line irradiances with a magnitude of about 1%.
5. The signals and currents variables should have long names that note that these are "corrected currents/signals".
6. The EUVS global attribute "title" should be "EXIS L1b Solar Flux: EUV" instead of "EXIS XRS L1b Solar Flux: EUV".
7. Calibrations for all products will have future revisions.
8. The data is currently not flagged when the satellite is in the penumbra.
9. The data is not clearly flagged when calibrations occur.
10. There are small discrepancies in some of the line irradiances after eclipses due to uncorrected temperature impacts.
11. The ECEF_Z range needs to be increased.
12. 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-18 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-18 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: James Mothersbaugh III (james.mothersbaugh@noaa.gov), Janet Machol (janet.machol@noaa.gov), Courtney Peck (courtney.peck@noaa.gov)
Data access issues: Pamela Wyatt (pamela.wyatt@noaa.gov)

NCEI website for GOES-R Space Weather data (daily aggregations of EUVS L1b and L2 data):
https://www.ngdc.noaa.gov/stp/satellite/goes-r.html