

GOES-18 SEISS Level 1b Release
Beta Data Quality
August 1, 2022
Read-Me for Data Users

On August 1, 2022, the GOES-R Program Scientist declared that the GOES-18 SEISS L1b products met the criteria for Beta Maturity.

The L1b data products derived from SEISS include:

- Magnetospheric Electrons and Protons: Low Energy (derived from Magnetospheric Particle Sensor – Low Energy (MPS-LO) observations)
- Magnetospheric Electrons and Protons: Medium and High Energy (derived from Magnetospheric Particle Sensor – High Energy (MPS-HI) observations)
- Solar and Galactic Protons (derived from Solar and Galactic Proton Sensor (SGPS) observations)
- Energetic Heavy Ions (derived from Energetic Heavy Ion Sensor (EHIS) observations)

Beta maturity, by definition, means that:

- Initial calibration applied (L1b);
- Rapid changes in product input tables / algorithms can be expected;
- Product quick looks and initial comparisons with ground truth data 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.

NCEI strongly advises against using GOES-18 SEISS L1b data available in CLASS prior to the Provisional Maturity declaration. Due to instrument issues and artifacts of erroneous processing, these L1b data are in general not suitable for scientific analysis prior to Provisional Maturity declaration. Users bear all responsibility for inspecting the data prior to use and for the manner in which the data are utilized. NCEI plans on reprocessing some pre-Provisional data as the instrument configuration permits. The NCEI website for GOES-R Space Weather data, which will eventually provide reprocessed data for the Beta time period, is <https://www.ngdc.noaa.gov/stp/satellite/goes-r.html>.

The GOES-18 SEISS Level 1b Beta level data products are currently undergoing testing and initial calibration and validation. Products are made available to users to gain familiarity with data formats and parameters in accordance with the GOES-R Product User Guide (PUG). Beta products have been minimally validated, and as noted above may still contain significant errors. Known issues under work for resolution include the following:

1. The high voltages on the GOES-18 MPS-LO detectors were optimized on July 1, 2022. Do not use data from dates prior to July 3, 2022. The MPS-LO background corrections are higher than

expected, resulting in negative fluxes reported in L1b data. This affects both electron and ion fluxes.

2. The MPS-HI electron fluxes are exhibiting high backgrounds in some channels and excessive background corrections in other channels. Both issues are in the process of being rectified. MPS-HI data should not be used prior to transition to provisional status.
3. As of the date of this note, no solar proton events (SPEs) have been observed by GOES-18 with sufficiently high energies to elevate Telescope 3 (T3) channels above background levels; therefore, it has not been possible to identify GOES-18 SGPS T3 anomalies.
4. GOES-18 SGPS+X T3 channels exhibit temperature dependence. The temperature dependence causes significant diurnal variations in the reported fluxes.
5. The EHIS ion fluxes are still undergoing analysis from a 3-month on-orbit calibration program. Therefore, the provisional processing constants have not yet been definitized. As of the date of this note, GOES-18 EHIS has not observed a solar energetic particle event that is sufficiently large for the evaluation of heavy ion fluxes above galactic cosmic ray backgrounds. Therefore, it has not been possible to identify GOES-18 EHIS anomalies that would be evident at high flux values.

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

NCEI contacts for specific information on the SEISS L1b data:

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