GOES-19 SEISS Level 1b Release
Beta Data Quality
October 22, 2024
Read-Me for Data Users

On October 22, 2024, the GOES-R Program Scientist declared that the GOES-19 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-19 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.ncei.noaa.gov/products/satellite/goes-r.

The GOES-19 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. Provisional and Full characterizations of GOES-19 SEISS anomalies are in-work and will be available in the SEISS Peer Stakeholder-Product Validation Review (PS-PVR) presentations. These

presentations will be available from https://www.noaasis.noaa.gov/GOES/product_quality.html, by sequentially selecting menu items: GOES-16, -17, -18, or -19 PS-PVRs, SEISS tab, the SEISS product of interest, then Provisional or Full "Science Presentation". The GOES-19 SEISS Provisional PS-PVRs are currently scheduled as follows:

SGPS: 12/6/2024

MPS-HI: 02/05/2025

EHIS: 02/07/2025

MPS-LO: 02/11/2025

2. The GOES-19 MPS-LO MCPs reached optimal operational status on October 4, 2024, do not use data prior to this date. The MPS-LO background corrections are higher than expected, resulting in negative fluxes reported in L1b data. This affects both electron and ion fluxes.
3. 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.
4. Initial inspection of GOES-19 SGPS fluxes confirm that GOES-19 SGPS is performing well overall. Comparisons with GOES-16 and -18 SGPSs are in-work. GOES-19 SGPS channel anomalies will be reported in the Provisional and Full validation PS-PVR presentations.
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-19 EHIS has observed only one solar energetic particle event that had any heavy ion fluxes above galactic cosmic ray backgrounds, and iron was not among the species above backgrounds. Therefore, it has not yet been possible to evaluate the calibration of the most abundant heavy ion solar energetic particle (SEP) fluxes observed by GOES-19 EHIS.

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