

GOES-16 MAG Level 1b (L1b) Release  
Provisional Data Quality  
August 29, 2018  
Read-Me for Data Users

The GOES-16 Peer Stakeholder Product Validation Review (PS-PVR) for MAG L1b Provisional Maturity was held on August 29, 2018. The result of this review was the PS-PVR panel recommending that the MAG L1b data be declared Provisional validation maturity.

The L1b data products derived from MAG are vector measurements of the geomagnetic field sampled at 10 Hz from the inboard and outboard magnetometers.

The GOES-16 MAG Level 1b (L1b) Provisional data products are ready for operational use but have documented known issues. Product performance has been demonstrated through analysis of a small number of independent measurements obtained from select locations, periods, and comparisons to nearby spacecraft and magnetic field models. The product is ready for use in comprehensive calibration and validation activities and product optimization. Users bear all responsibility for inspecting the data prior to use and for the manner in which the data are utilized.

Later this year, the L1b GOES-16 data set released on the NCEI website (listed below) will be corrected for arcjet contamination. Sometime in 2019, this data set will include retrospectively corrected L1b to early 2017. Additionally, L2 products 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, and shared with the user community.
- Testing has been fully documented.
- Product is ready for operational use and for use in comprehensive cal/val activities and product optimization.

We recommend that persons using the GOES-16 MAG Provisional maturity L1b products for scientific and technical investigations, particularly model validation, model development, and plasma waves analysis, contact the responsible NOAA scientists before making definitive scientific or technical conclusions derived directly from the MAG data.

Cautions, known issues, and issues under work for resolution at Provisional maturity status:

1. The inboard sensor (IB\_\* variables in the L1b files) suffers significant magnetic contamination issues and should not be used in science and technical investigations. We are working to understand the inboard sensor issues.
2. The outboard sensor (OB\_\* variables in the L1b files) can be used for science and technical investigations.
3. The amb\_mag\_\* variables in the L1b files refer to the best observation of the geomagnetic field, which is currently set to the outboard sensor values due to issues with the inboard sensor. This variable should be the default magnetic field observation used by users for science and technical investigations.
4. The outboard sensor observations show slow diurnal and seasonal variations in magnitude when compared to other GOES satellites and models. We are currently investigating this issue and some of these variations are likely due to outboard sensor thermal issues, while others may be due to issues with other GOES sensors and inaccuracies in magnetic field models. The maximum magnitude variation due to the thermal issues on the GOES-16 outboard sensor is likely to be no more than about 5 nT.

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

NCEI contacts for specific information on the MAG L1b data:

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NCEI website for GOES-R Space Weather data: <https://www.ngdc.noaa.gov/stp/satellite/goes-r.html>