SuperMAG:
The Global Ground Magnetometer Network

http://supermag.uib.no/ http://supermag.jhuapl.edu/

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The purpose of SuperMAG is to provide easy access to validated and standarized measurements of geomagnetic activity from ground based magnetometers to researchers, students and the general public.

A large number of ground magnetometer stations provide high quality measurements of the earth magnetic field. Magnetometer data from different data sources are highly hetereogenous, with varying levels of noise, different resolution and coordinate systems and in different formats. Many are not even available online. These obstacles have resulted in a serious underutilization of ground based magnetometer data.

SuperMAG processes the measurements from different sources through several steps: All data are resampled to a common time resolution, converted to a common coordinate system, and errors and artifacts are removed by both automated routines and manual work by an experienced operator. Studying ionoshperic and magnetospheric coupling using ground magnetometer data also requires removal of other magnetic sources, e.g. the earth main field and daily variations (baseline), which SuperMAG solves using a common completely automated algorithm. With the introduction of SuperMAG both the expert and the non-expert is given an opportunity to use this powerful dataset to perform studies of the global electric current system, and magnetometer providers are given an opportunity to make their data available for research.

Some numbers

- 300+ registered users
- 20+ published peer reviewed papers
- Approximately 1 600 million data points collected from 1980
- Data from more than 300 stations
- More than 150 simultaneous stations at any time from 1996
- 3.2 million auroral images from IMAGE FUV and Polar VIS
- 24 member institutions

References

Gjerloev, J. W., The SuperMAG data processing technique, *Geophys. Res., 117*, A09213,doi:10.1029/2012JA017683, 2012.

Gjerloev, J. W., A Global Ground-Based Magnetometer Initiative, *EOS, 90*, 230-231,doi:10.1029/2009EO270002,2009.

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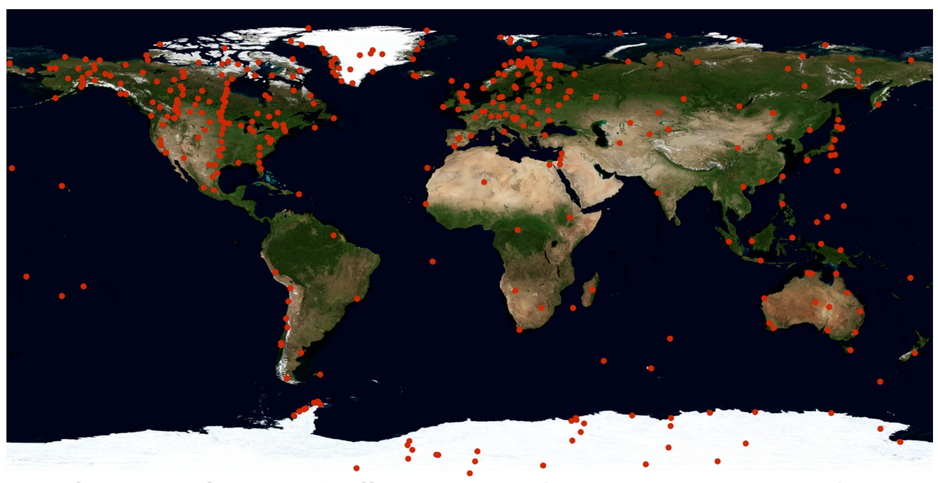
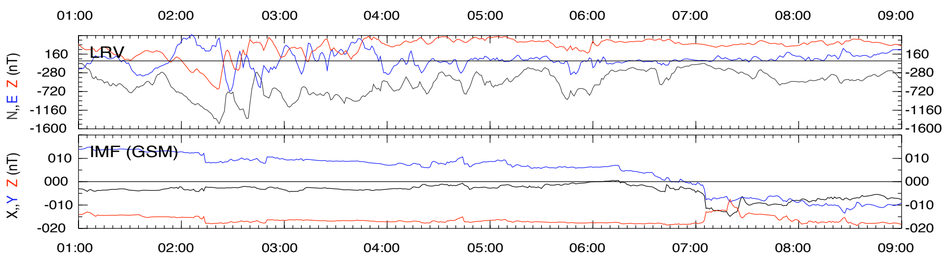
Global coverage



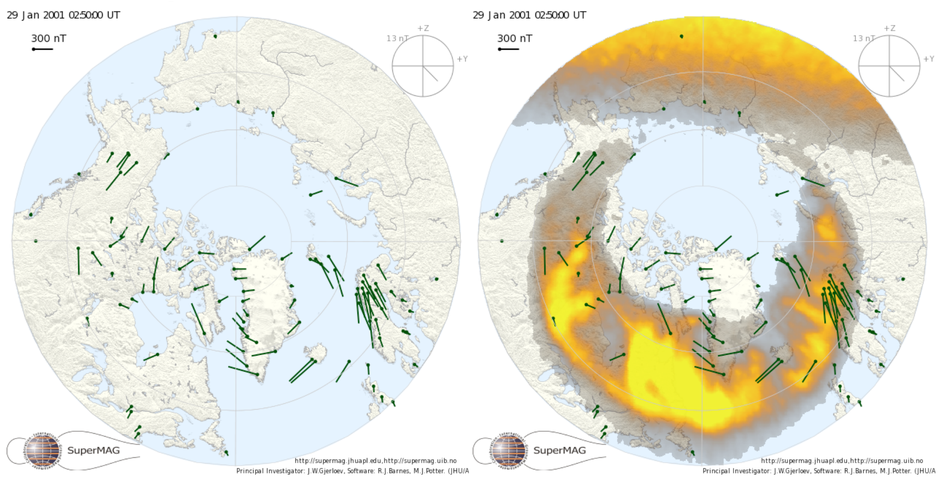
The SuperMAG dataset offers a uniquely continous and nearly global monitoring of geomagnetic activity.

Plots and downloads



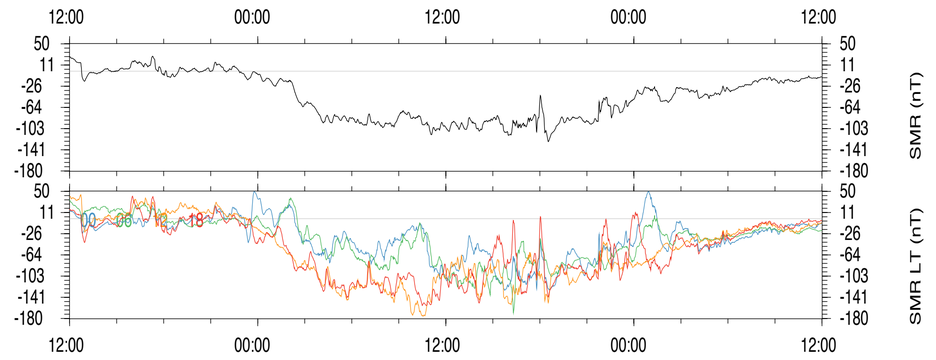
Validated data from more than 300 stations can be plotted and downloaded at the SuperMAG web site. The figure shows magnetometer data from a single station during a magnetic storm together with supporting solar wind data.

Polar plots and movies



Study space weather events with polar plots and movies. In addition to ground magnetometer data the SuperMAG web site offers global auroral imaging for both plots and movies.

Magnetic indices



Magnetic indices are an important tool to study solar wind-magnetosphere couplings. At the SuperMAG web site users can plot and download several auroral electrojet indices and ring current indices. The figure shows the SMR-Local index, a new ring current index made possible by the high resolution of the SuperMAG dataset.