



L1 Solar Wind, Kp, Aurora and GNSS-Error Alerts - via RSS feeds

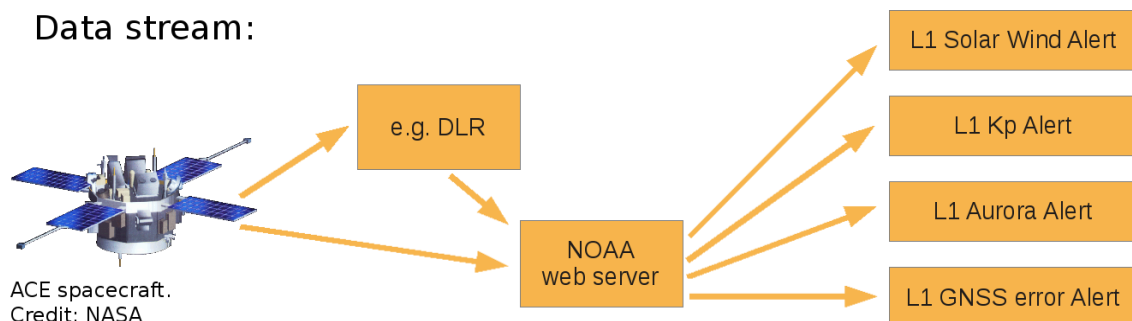
Documentation
March 6th, 2013

Overview

These RSS feeds provide L1 based short-term alerts of extreme space weather and its effects. Real-time in-situ solar wind data from the Advanced Composition Explorer (ACE) spacecraft at the Lagrange point 1 (L1) is used to generate threshold alerts of solar wind parameters ($|B|$, B_z and V), estimated Kp, auroral boundary and GNSS-error (in progress).

Data

The alerts are based on the parameters magnetic field magnitude $|B|$, magnetic field z-component B_z and the bulk speed V . Currently 1-minute real-time data is used. This data is measured by the ACE onboard instruments MAG and SWEPAM and is available in real-time from the NOAA Space Weather Prediction Center server (NOAA/SWPC/RTSW ACE Real Time Solar Wind, preliminary data, <http://www.swpc.noaa.gov/ace/index.html>).



Description

The **L1 Solar Wind Alert** generates a new alert if at least one threshold of $|B|$, B_z or V is exceeded by the last two hour extrema.

The **L1 Kp Alert** creates a new alert if an estimated Kp index exceeds a specified threshold and the last two hour extrema. The Kp estimate is based on an empirical correlation with solar wind data between 1995 and 2011 (NASA/GSFC/SPDF OMNIWeb interface, level 2 data, <http://omniweb.gsfc.nasa.gov>). The Kp estimate is derived in real-time from the solar wind product $V \cdot B_z$.

The **L1 Aurora Alert** produces a new alert if an estimated auroral boundary position is southern of a certain geomagnetic latitude. The midnight equatorward auroral boundary



position is derived via the empirical Kp estimate from tables at SWPC/NOAA (<http://www.swpc.noaa.gov/Aurora/>).

The **L1 GNSS Error Alert** will create a new alert if the specific error threshold is exceeded (the term L1 not to be confused with the L-band GPS carrier signal denoted L1 as well). Ionospheric Total Electron Content (TEC) data of strong Kp storms is used for the estimation of the GNSS error which scales with the TEC value. Work on this alert is currently in progress.

RSS subscription

Rich Site Summary (RSS) web feeds are used to publish frequently updated news. Their standardized XML file format can be accessed by various software like mobile apps, browsers and e-mail-clients. These RSS readers automatically check the user's subscribed feeds regularly for new content. The following links allow the subscription to the feeds:



L1 Solar Wind Alert:

<http://www.astro.physik.uni-goettingen.de/~mvenzmer/rssfeed/rssfeed.xml>

L1 Kp Alert:

http://www.astro.physik.uni-goettingen.de/~mvenzmer/rssfeed_kp/rssfeed_kp.xml

L1 Aurora Alert:

http://www.astro.physik.uni-goettingen.de/~mvenzmer/rssfeed_aurora/rssfeed_aurora.xml

L1 GNSS Error Alert:

The link will be published on the AFFECTS website.

Example alert:

[2013-02-19 17:45 Solar Wind Alert](#)

02/19/2013 06:51 PM

Last 2 hour extreme values: $|B| = 7.7$ nT, $B_z = -4.9$ nT and $V = 401.8$ km/s. With current threshold values: $|B| > 1$ nT, $B_z < -10$ nT and $V > 600$ km/s.

Disclaimer

This product was created on best efforts basis and is provided “as is” without warranties of any kind. The alerts issued by this product are accurate to the best knowledge of the developers; however, the developers cannot be held responsible for any damage, loss of profit and similar charges rising out of the use of this product and its output. In particular, the developers of this product cannot be held responsible for the consequences of any action, or the lack of, based on the forecast provided by this product. Any such consequences shall be at sole responsibility of the respective decision makers.



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