STCE Newsletter

11 Feb 2019 - 17 Feb 2019

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The Solar-Terrestrial Centre of Excellence (STCE) is a collaborative network of the Belgian Institute for Space Aeronomy, the Royal Observatory of Belgium and the Royal Meteorological Institute of Belgium.

Final Editor : Petra Vanlommel
Contact : R. Van der Linden, General Coordinator STCE,
Ringlaan - 3 - Avenue Circulaire, 1180 Brussels,
Belgium

1. PROBA2 Observations (11 Feb 2019 - 17 Feb 2019)

Solar Activity

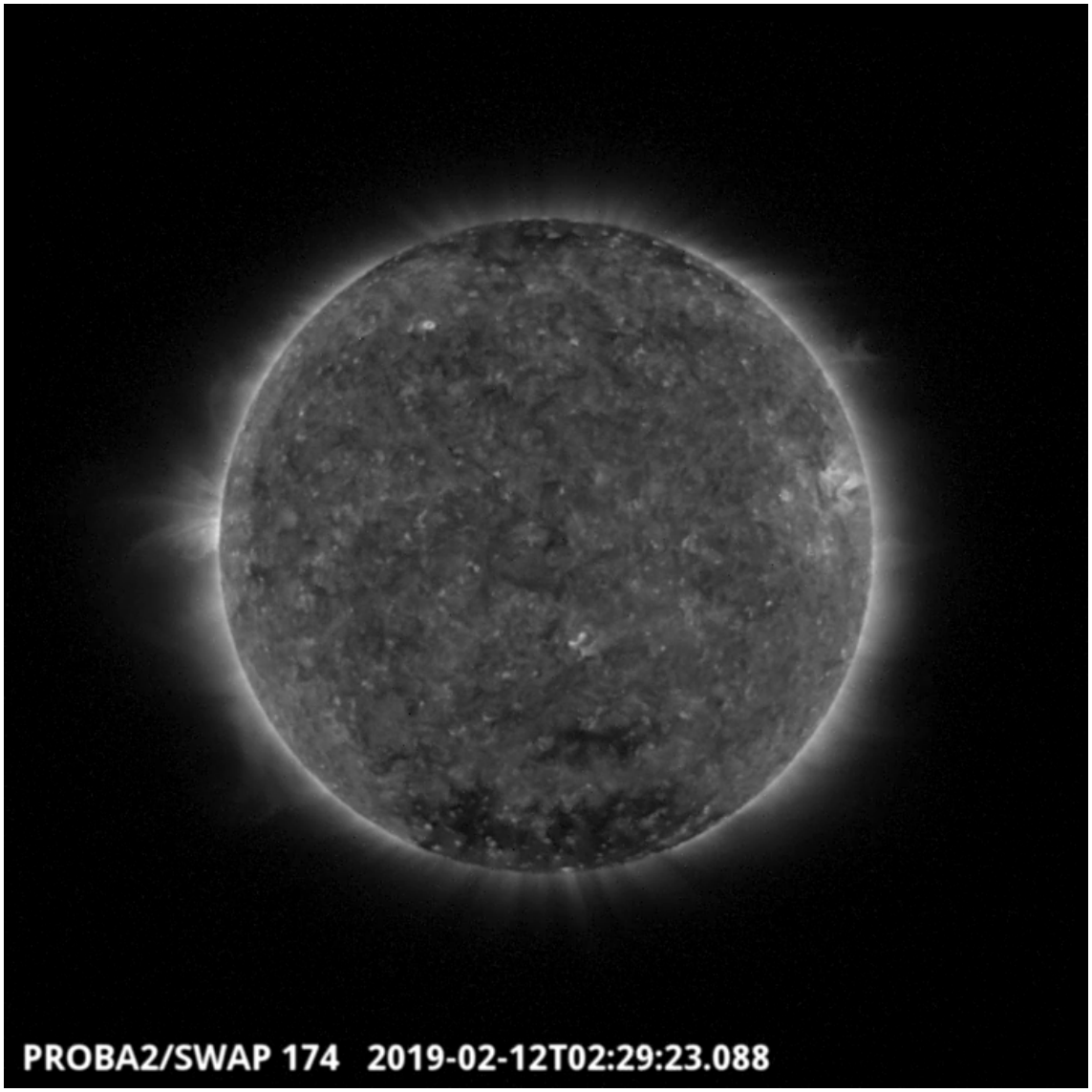
Solar flare activity was very low during the week.
In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: http://proba2.oma.be/ssa
This page also lists the recorded flaring events.

A weekly overview movie can be found here (SWAP week 464).
http://proba2.oma.be/swap/data/mpg/movies/weekly_movies/weekly_movie_2019_02_11.mp4

Details about some of this week's events, can be found further below.

If any of the linked movies are unavailable they can be found in the P2SC movie repository here
http://proba2.oma.be/swap/data/mpg/movies/

Tuesday Feb 12



A small high latitude southern coronal hole transited the solar disk last week, it is visible in the SWAP image above when it crossed the central meridian on 2019-Feb-12. Find a movie of the events here (SWAP movie) http://proba2.oma.be/swap/data/mpg/movies/20190212_swap_movie.mp4

2. Review of solar and geomagnetic activity

Solar activity

Solar activity was very low. No flares were recorded and the solar disk was spotless. No earth-directed coronal mass ejections (CMEs) were observed. The greater than 10 MeV proton flux was at nominal levels.

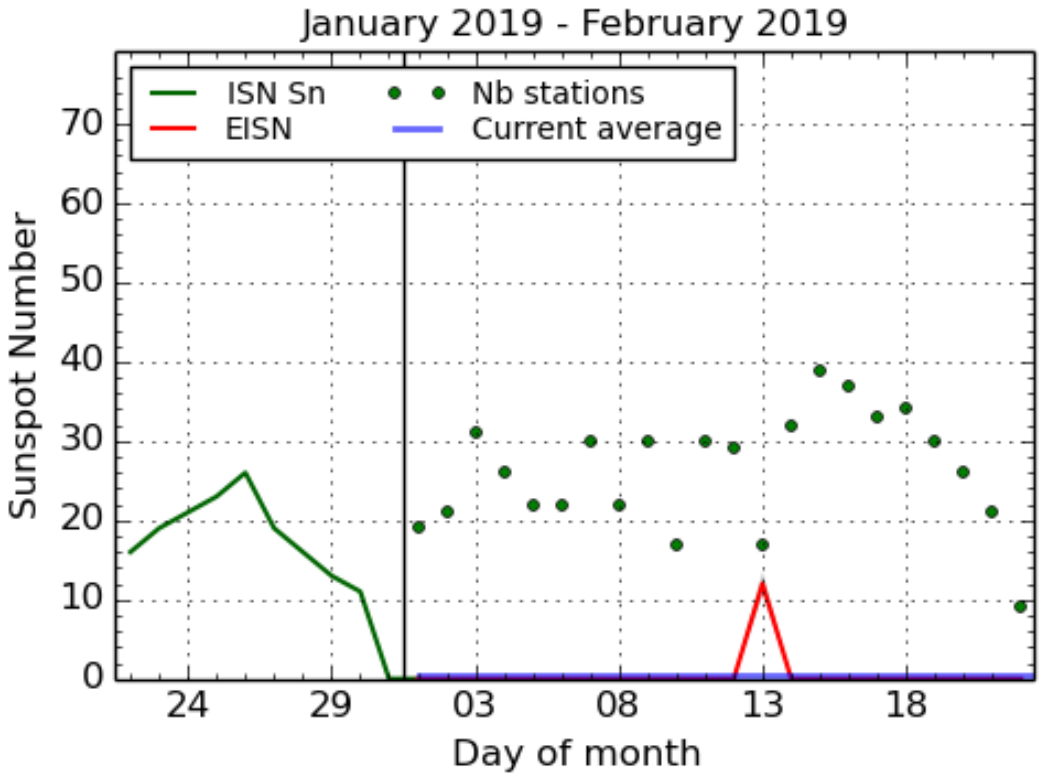
Geomagnetic activity

Solar wind parameters were at nominal levels at the start of the week. On February 13-14, the solar wind associated with the extension of the southern polar coronal hole, which transited the central meridian on the 10-13th of February reached the L1 point. DSCOVR recorded a maximum solar wind speed of 533

km/s on the 14th of February and a minimum Bz value of -8 nT on the 13th of February. The solar wind speed then gradually decreased from the 14th of February returning to background levels by the 16th. The interplanetary magnetic field (IMF) was predominantly directed towards the Sun (negative sector).

The geomagnetic conditions were mostly quiet to unsettled with a few short active periods coinciding with the observed enhanced negative Bz. The local K index at Dourbes became 4 on the 11th and 13th between 16-17 UT and 17-20 UT. The planetary K index became 4 for one interval between 9-12 UT on the 13th.

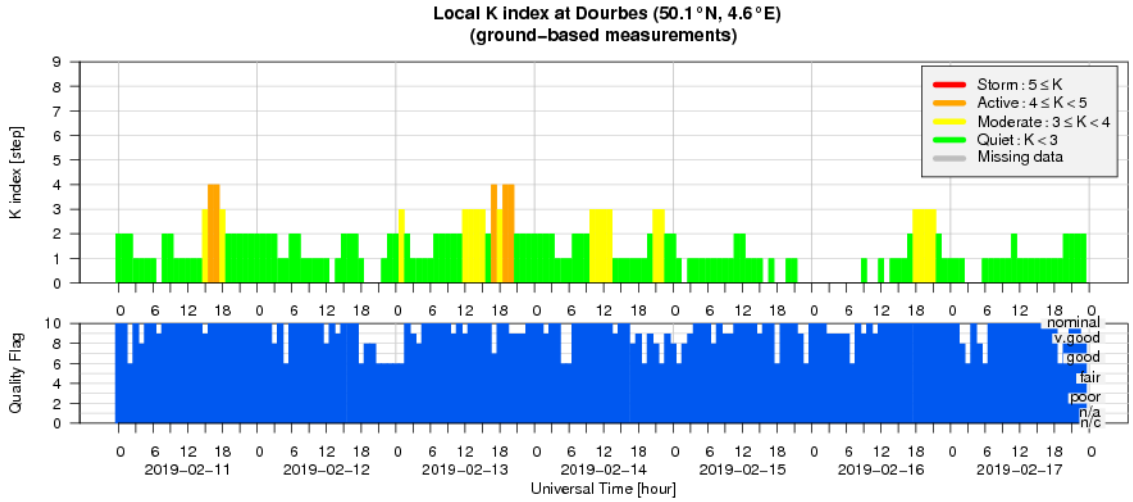
3. The International Sunspot Number



SILSO graphics (http://sidc.be/silso) Royal Observatory of Belgium, 2019 February 22

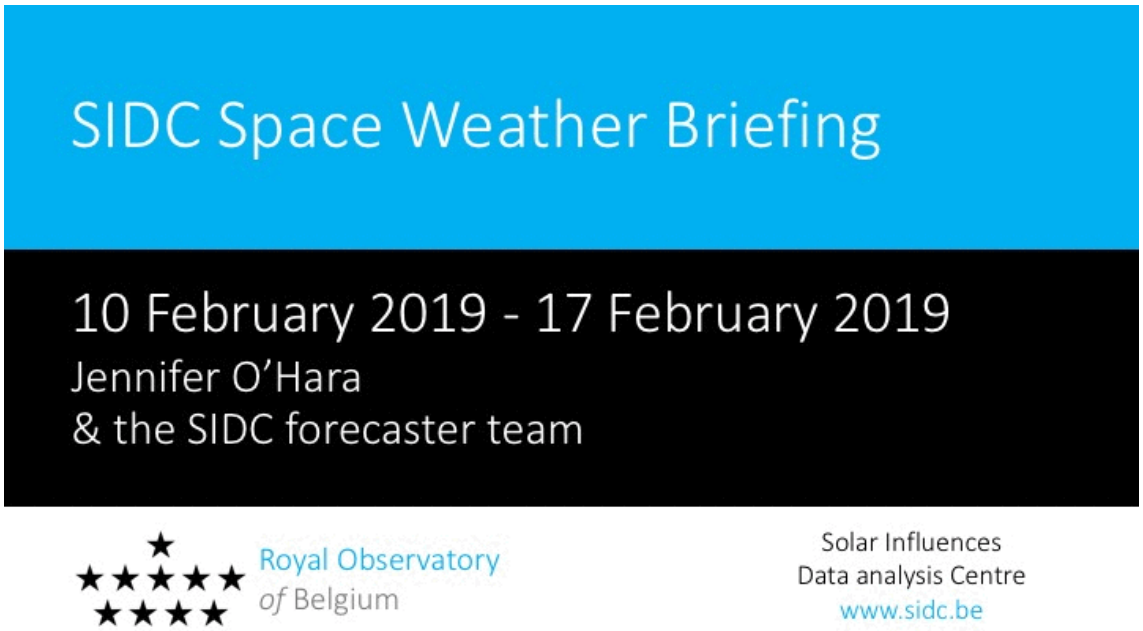
The daily Estimated International Sunspot Number (EISN, red curve with shaded error) derived by a simplified method from real-time data from the worldwide SILSO network. It extends the official Sunspot Number from the full processing of the preceding month (green line). The plot shows the last 30 days (about one solar rotation). The horizontal blue line shows the current monthly average, while the green dots give the number of stations included in the calculation of the EISN for each day.

4. Geomagnetic Observations at Dourbes (11 Feb 2019 - 17 Feb 2019)



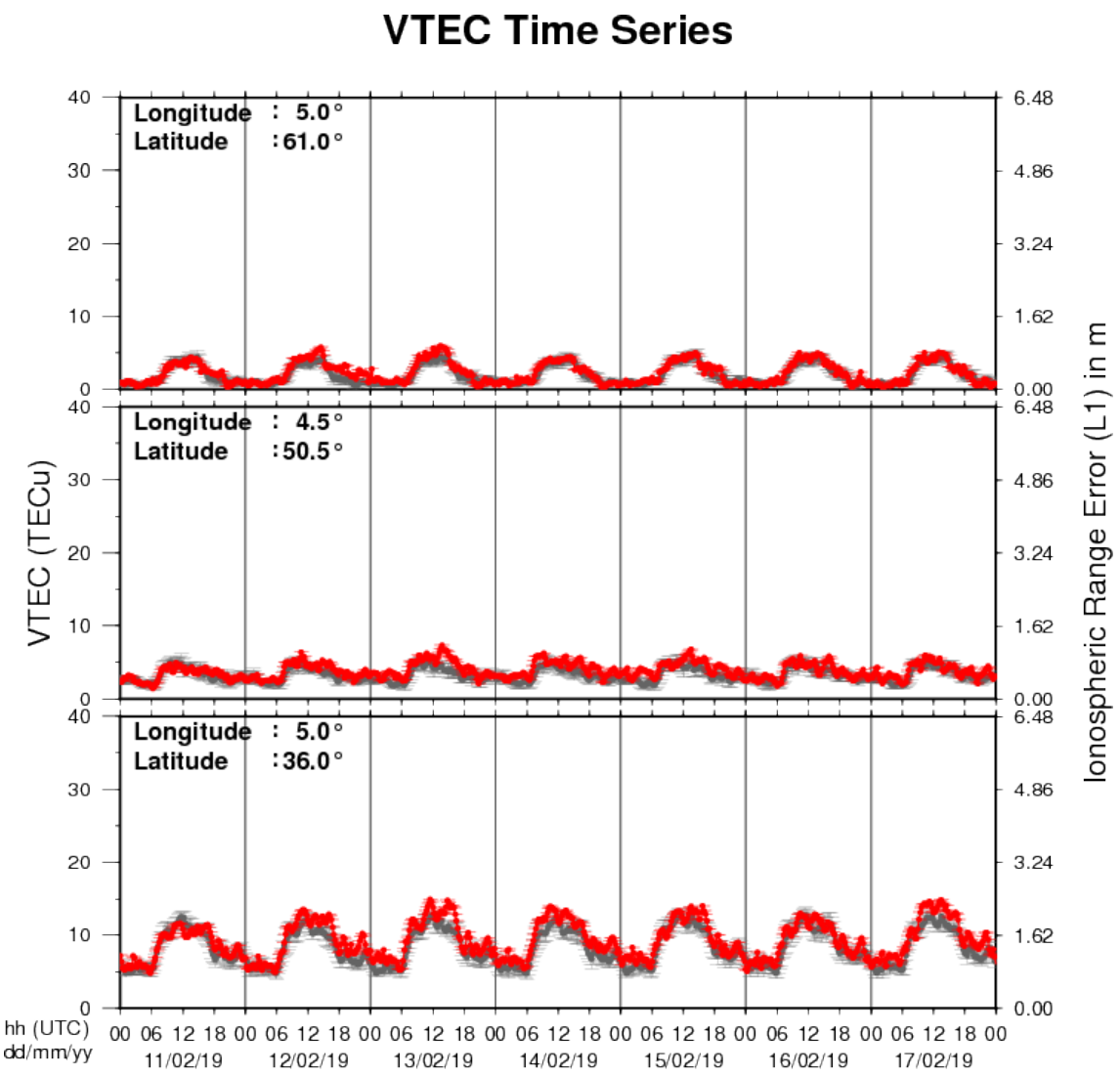
5. The SIDC space weather Briefing

The Space Weather Briefing presented by the forecaster on duty from February 11 to 17. It reflects in images and graphs what is written in the Solar and Geomagnetic Activity report.



The pdf-version: http://www.stce.be/briefings/20190218_SWbriefing.pdf
The automatically running presentation: http://www.stce.be/briefings/20190218_SWbriefing.ppsm

6. Review of ionospheric activity (11 Feb 2019 - 17 Feb 2019)



The figure shows the time evolution of the Vertical Total Electron Content (VTEC) (in red) during the last week at three locations:
a) in the northern part of Europe(N61°, 5°E)
b) above Brussels(N50.5°, 4.5°E)
c) in the southern part of Europe(N36°, 5°E)
This figure also shows (in grey) the normal ionospheric behaviour expected based on the median VTEC from the 15 previous days.

The VTEC is expressed in TECu (with TECu=10^16 electrons per square meter) and is directly related to the signal propagation delay due to the ionosphere (in figure: delay on GPS L1 frequency).
The Sun's radiation ionizes the Earth's upper atmosphere, the ionosphere, located from about 60km to 1000km above the Earth's surface.The ionization process in the ionosphere produces ions and free electrons. These electrons perturb the propagation of the GNSS (Global Navigation Satellite System) signals by inducing a so-called ionospheric delay.

See http://stce.be/newsletter/GNSS_final.pdf for some more explanations ; for detailed information, see http://gnss.be/ionosphere_tutorial.php