STCE Newsletter

18 Nov 2013 - 24 Nov 2013

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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.

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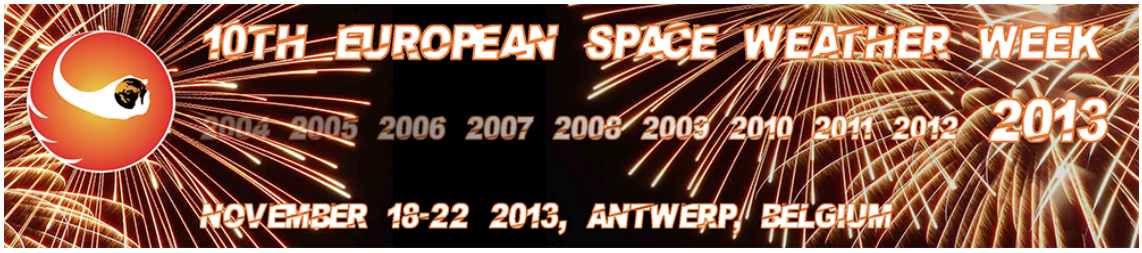
1. 10th European Space Weather Week



390 scientists, satellite and network operators from 36 countries worldwide gathered in Antwerp from November 18-22 to discuss the theme Space Weather during the tenth edition of the European Space Weather Week (ESWW). During this international congress, they addressed the question how vulnerable and at the same time how resilient the society is during severe space weather. Research into the causes of solar storms, the strategic organization of the data charts of the Sun, space, the Earth and its environment, as well as the continuous space weather monitoring should help them to find an appropriate answer on the threat and impact of space weather.

The conference got the label 'successful', if we might believe the participants twitters and comments. A few:

A new conference for my top: ESWW10 was a nice one! With fruitful discussions till the last second and lots of projects ahead!
Outstanding turnout for our Solar Flare Prediction session at European Space Weather Week ESWW10. Lots of questions and great discussion!
Very interesting to see many, many women, and lots of young scientists at ESWW10
2nd day in full swing at ESWW10 and i already have a brain full of ideas/information to follow up next week! Still 3 1/2 days to go!

Captured in a picture

Can this thing fly? - if space weather doesn't work out, a movie carrier is an option - full attention of the audience - a stand up comedian on stage

checking if the medal certificate is real - great laptop - keep on working during the beer tasting - comparing liquid volumes

more tweets and pictures at http://www.stce.be/esww10

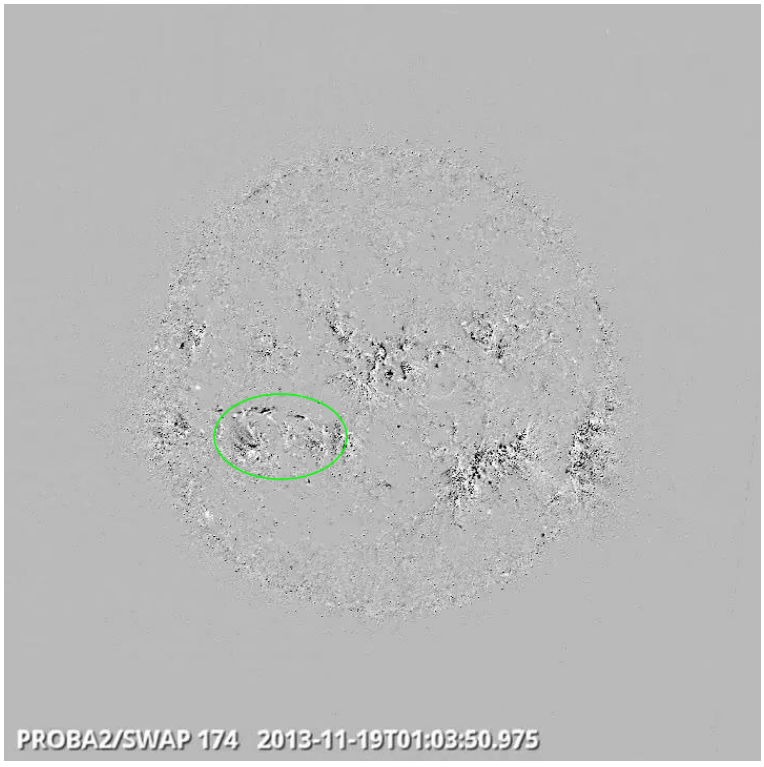
2. PROBA2 Observations (18 Nov 2013 - 24 Nov 2013)

Solar Activity

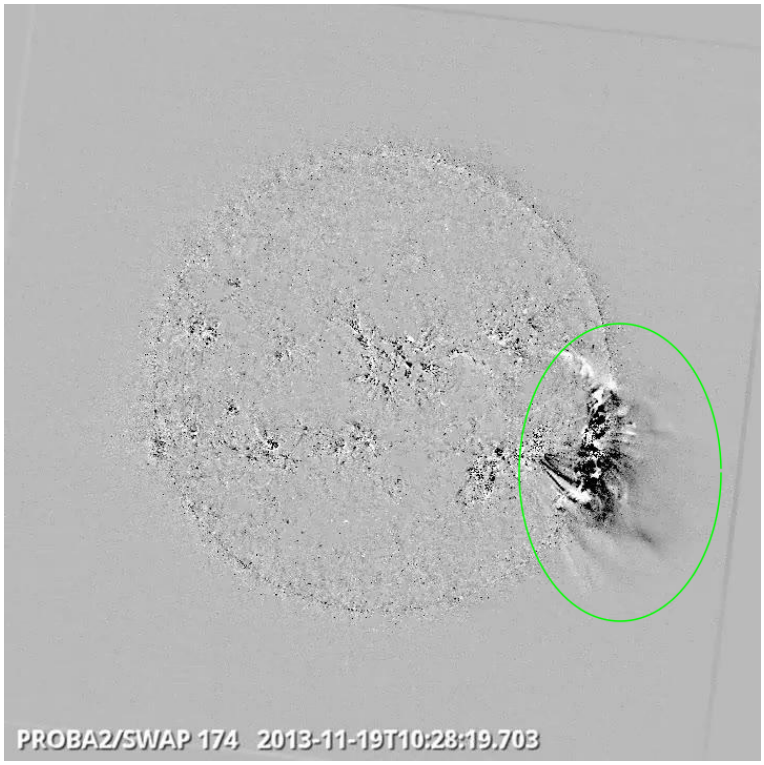
Solar flare activity fluctuated between low and high during the week.
In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: http://proba2.oma.be/ssa
This page also lists the recorded flaring events.
A weekly overview movie can be found here (SWAP week 191).
http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR191_Nov18_Nov24/weekly_movie_2013_11_18.mp4

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

Tuesday Nov 19:



Flow on South East Quad @ 01:03 - SWAP difference image
Find a movie of the event here (SWAP difference movie)
http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR191_Nov18_Nov24/Events/20131119_SplitFlow_SouthEastQuad_0103_swap_diff.mp4



Eruption on South West Limb @ 10:28 - SWAP difference image
Find a movie of the event here (SWAP difference movie)
http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR191_Nov18_Nov24/Events/20131119_Eruption_WestLimb_1028_swap_diff.mp4

Thursday Nov 21:

Eruption on West Limb @ 11:08 - SWAP difference image
Find a movie of the event here (SWAP difference movie)
http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR191_Nov18_Nov24/Events/20131121_Eruption_WestLimb_1108_swap_diff.mp4

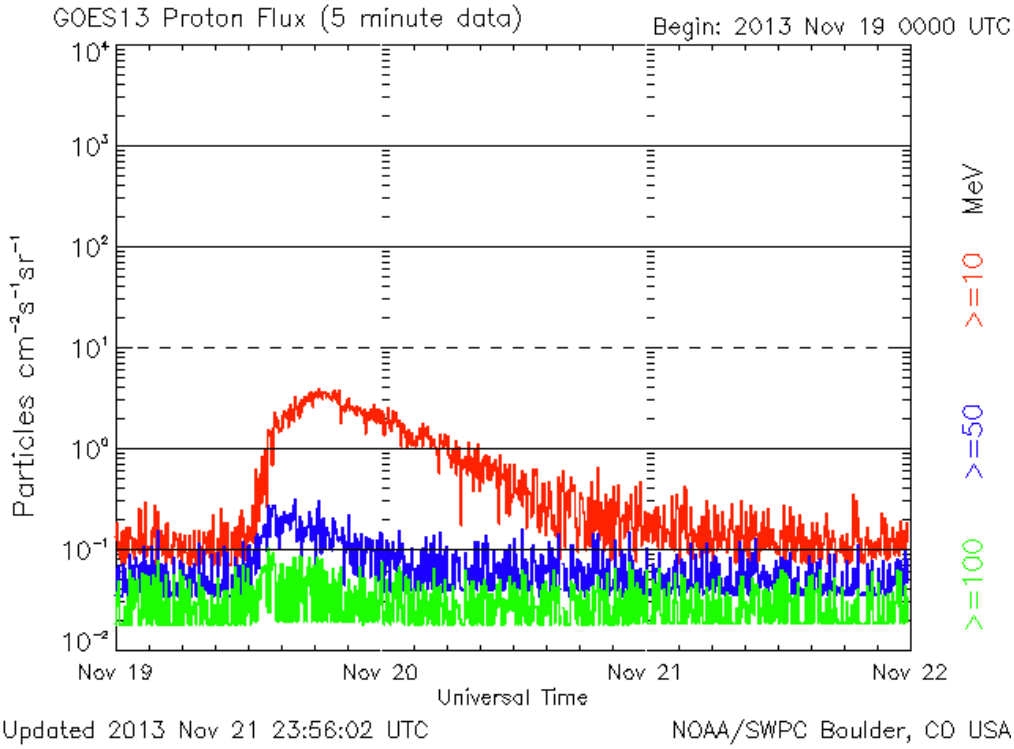
Friday Nov 22:

Eruption on West Limb @ 14:38 - SWAP difference image
Find a movie of the event here (SWAP difference movie)
http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR191_Nov18_Nov24/Events/20131122_Eruption_EastLimb_1438_swap_diff.mp4

3. Review of solar and geomagnetic activity (18 Nov 2013 - 24 Nov 2013)

SOLAR ACTIVITY

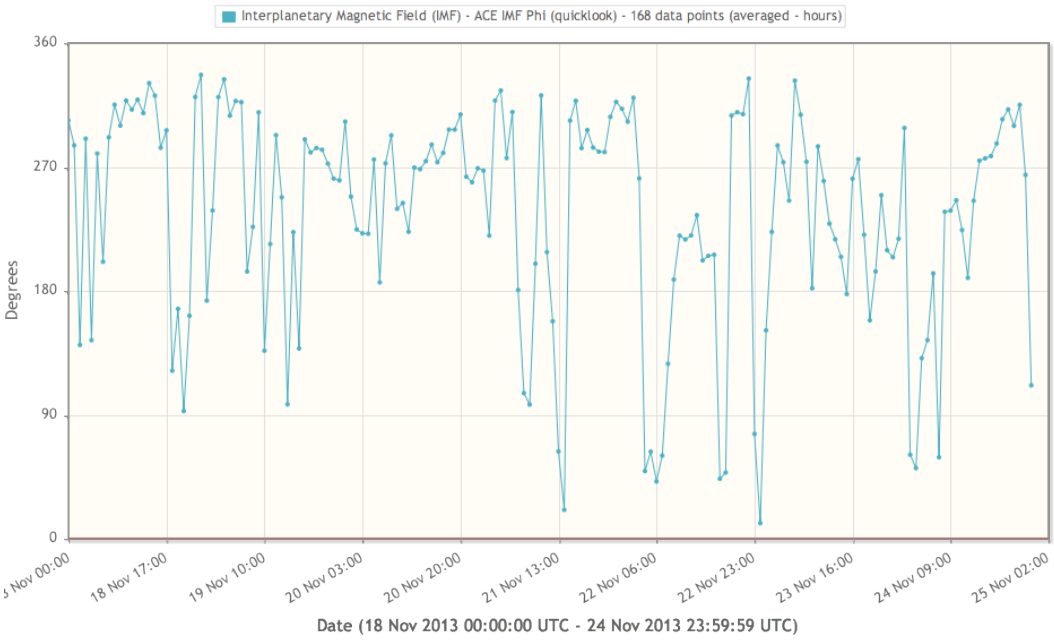
NOAA ARs 1893 and 1904 have been the dominant players in terms of flaring activity. AR 1893 produced an X1.0 flare on Nov. 19, peaking at 1026 UT, while close to the west limb. It was accompanied by a type II burst, a coronal EUV wave and a CME. The proton flux rose slightly in the aftermath of the flare, peaking on Nov. 19 around 1800UT, but never reached the official proton event threshold.



The same region produced, while on the west limb, a M1.2 flare on Nov. 21, peaking at 1111 UT. It was also associated with a CME.
NOAA AR 1904 appeared north of, and close to AR 1899 on Nov. 20, nearly vanished on Nov. 21, but grew up again on Nov. 22. It produced 2 M flares on Nov. 23, a M1.1 peaking at 0232 UT and a M1.0 peaking at 1257 UT. No CMEs were detected.

GEOMAGNETIC ACTIVITY

Geomagnetic activity has been very low for the whole week, with only a brief period of unsettled conditions at planetary and local (Dourbes) levels on Nov. 23 (from 3 to 6 UT) linked to a few jumps from one sector to another sector combined with a negative z-component of the interplanetary magnetic field (IMF). The parameter phi gives the polarity of the IMF: in the case of an extreme fast solar wind (no curved, thus straight magnetic field lines) phi equals 0 or 360/180 degrees, the IMF points inwards/ outwards. In the graph below phi has values around 45 degrees during a few hours on Nov 22 and Nov 23, while for the remaining hours phi is mainly situated between 270 and 360 degrees. The sector boundary crossing on Nov 22 could not influence the earth magnetic field.



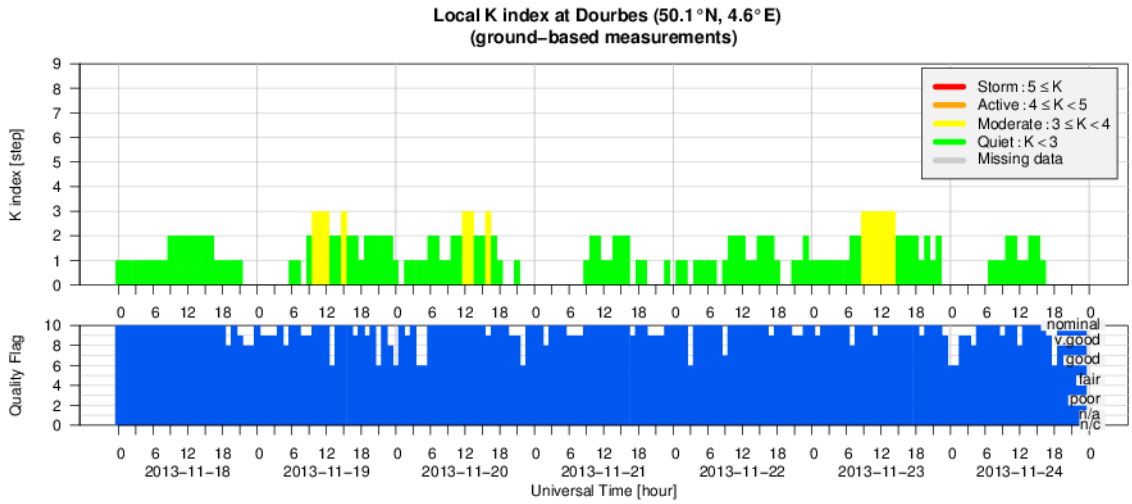
4. Noticeable Solar Events (18 Nov 2013 - 24 Nov 2013)

DAY	BEGIN	MAX	END	LOC	XRAY	OP	10CM	TYPE	Cat	NOAA
19	1014	1026	1034	S70W14	X1.0	SF	530	II/1	38	1893
21	1052	1111	1142		M1.2				38	1893
23	0220	0232	0249	N14W56	M1.1	1N				1904
23	1249	1257	1305		M1.0			I/1		1904

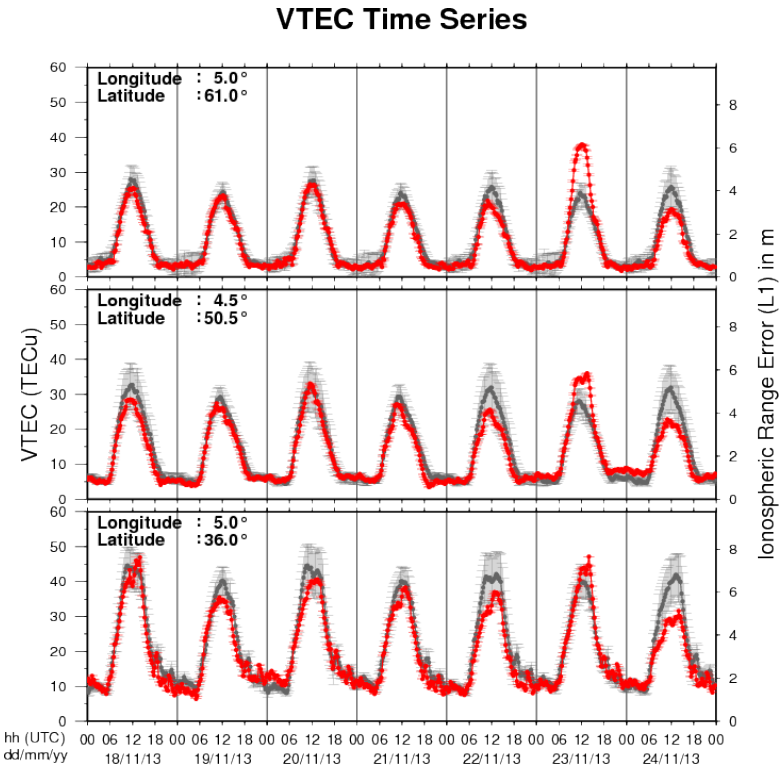
LOC: approximate heliographic location
XRAY: X-ray flare class
OP: optical flare class
10CM: peak 10 cm radio flux

TYPE: radio burst type
Cat: Catania sunspot group number
NOAA: NOAA active region number

5. Geomagnetic Observations at Dourbes (18 Nov 2013 - 24 Nov 2013)



6. Review of ionospheric activity (18 Nov 2013 - 24 Nov 2013)



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

7. New documents in the European Space Weather Portal Repository

See http://www.spaceweather.eu/en/repository

ESWW10: Splinter "Next Generation SPENVIS"

Slides presented during the ESWW10 Splinter "Next Generation SPENVIS" on Tuesday November 19th, 2013, by Kruglanski Michel The Space Environment Information System (SPENVIS, http://www.spenvis.oma.be/) is a ESA web-based interface for assessing the space environment and its effects on spacecraft systems and crews under continual development since 1996 and used by a worldwide community. This ESWW10 splinter meeting offered the opportunity to SPENVIS users and model developers to meet the SPENVIS development team and share their feedback and questions. Latest updates on the development of the new system (Next Generation SPENVIS) were reported.
http://www.spaceweather.eu/en/repository/show?id=484

8. Future Events

For more details, see http://www.spaceweather.eu/en/event/future

EGU General Assemby in Vienna, Austria

Start : 2014-04-27 - End : 2014-05-02
The EGU General Assembly 2014 will bring together geoscientists from all over the world to one meeting covering all disciplines of the Earth, planetary and space sciences. The EGU aims to provide a forum where scientists, especially early career researchers, can present their work and discuss their ideas with experts in all fields of geosciences.