

STCE Newsletter

7 Jul 2014 - 13 Jul 2014



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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. Summer Break

Next week, no STCE newsletter will be published. We will be back in 2 weeks.



2. Sessions and splinters at ESWW11

The time schedule for the ESWW11 sessions and splinters is being served

The organisers of the 11th European Space Weather Week received 350 submissions - a success and put their heads together to fit all the sessions and splinters into five days of Space Weather science, techniques and applications.

Monday 17-Nov	Tuesday 18-Nov	Wednesday 19-Nov	Thursday 20-Nov	Friday 21-Nov
Tutorial at CSL 9:45-13:30 includes lunch	Sessions orals+posters 9:00-13:00 Coffee at 11:00	Sessions orals+posters 9:00-13:00 Coffee at 11:00	Sessions orals+posters 9:00-13:00 Coffee at 11:00	Plenary orals+posters 9:00-13:00 Coffee at 11:00
Welcome 13:30-14:00	Lunch 13:00-14:00	Lunch 13:00-14:30	Lunch 13:00-14:30	10' news Lunch 13:00-14:30
Plenary 14:00-15:30	Splinters 14:00-15:30	SWWT 14:30-16:00	Splinters 14:30-16:00	Splinters 14:30-16:00
Coffee 15:30-16:00	Splinters 15:30-17:00	Coffee 16:00-16:30	Coffee 16:00-16:30	Coffee 16:00-16:30
Sessions orals+posters 16:00-18:00	Coffee 17:00-17:30	Fair 16:30-18:00	Splinters 16:30-18:00	Splinters 16:30-18:00
Keynote & Reception 18:30-22:00	Splinters 17:30-19:00	Beer after work 18:00-19:30	Dinner+Medals 19:00-23:00	

Check

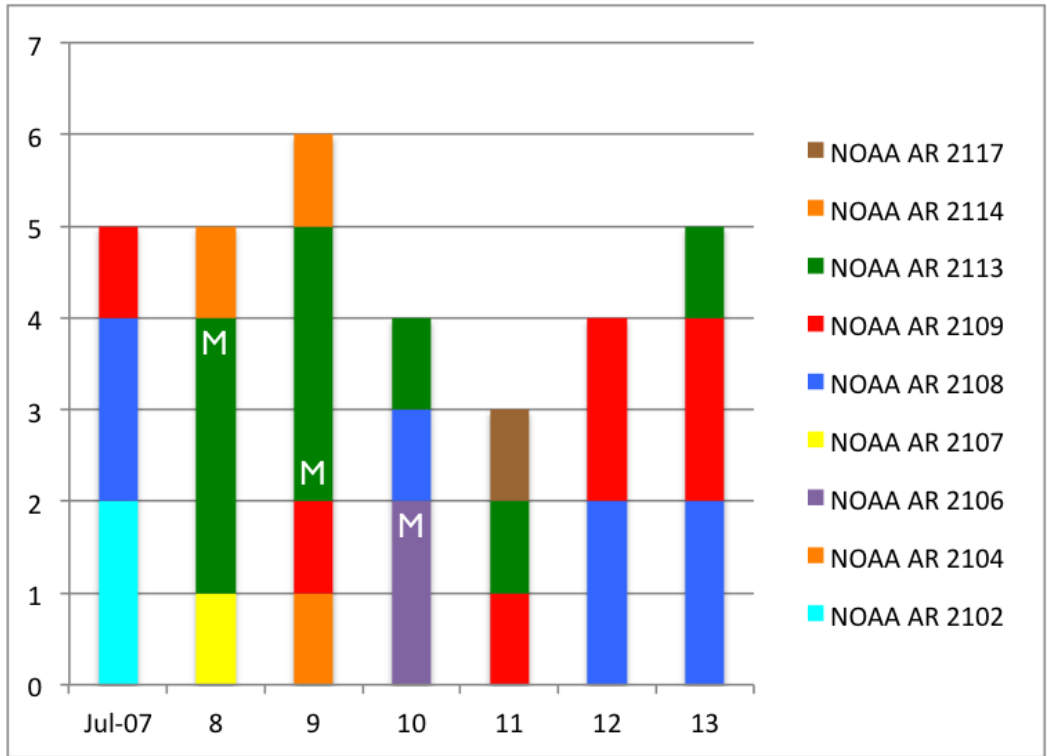
the sessions <http://www.stce.be/esww11/program/sessions.php>

the splinters <http://www.stce.be/esww11/program/splinters.php>

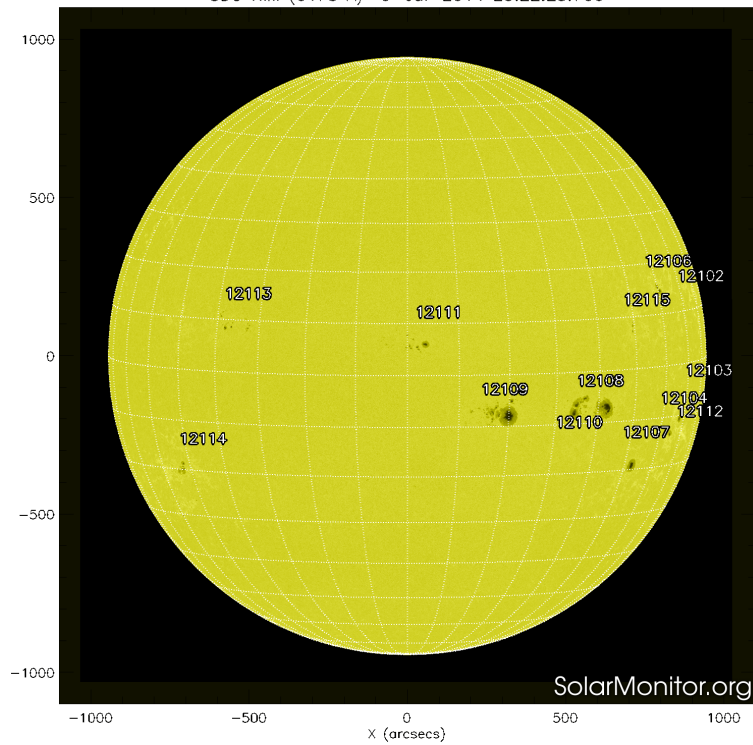
3. Review of solar and geomagnetic activity

Solar flares

The Sun produced 29 C-flares and three M-flares. NOAA active regions 2108 and 2109 were the most complex regions, with a beta-gamma-delta configuration of their photospheric magnetic field for a large part of the week. Together with NOAA AR 2113, these regions were responsible for the majority of the flares.



SDO HMI (6173 Å) 9-Jul-2014 23:22:25.700



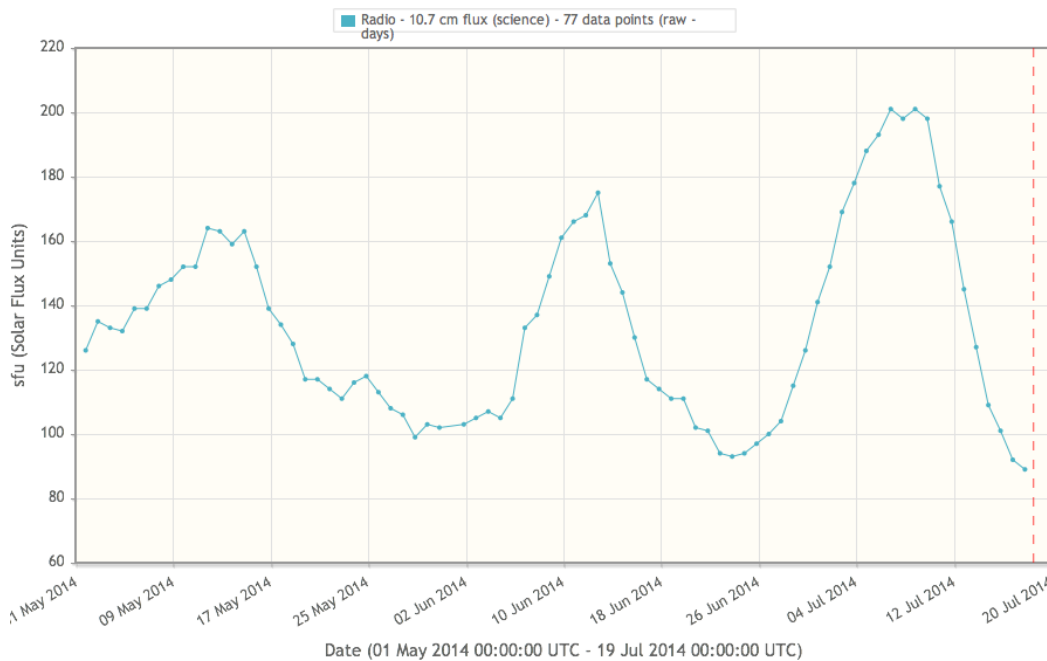
The picture of the solar disk above is from the HMI telescope onboard SDO and shows sunspots which are the photospheric counterparts of coronal active regions.

Coronal Mass Ejections

The largest flare, an M6.5 on July 8 originated from NOAA AR 2113 and was associated with a dimming, EUV-wave, type II and IV radio bursts and a partial halo CME. A filament eruption on July 9, occurring near the disk center, was also associated with a CME. Both CMEs were mainly propagating east from the Sun-Earth line. A halo CME occurred on July 10 and was mainly propagating to the West.

x-ray background and 10 cm radio flux as indicators for solar activity

The x-ray background flux decreased from the C1- to the B5-level and the radio flux declined from 201 sfu on July 8 to 127 sfu on July 13. Below, the 10cm radio flux starting from May 1 is plotted. It shows that this week was more extreme compared to the previous periods when it comes to the maximum and minimum sfu value.



Solar Wind at L1

The solar wind speed smoothly increased from 280 to 400 km/s during the first half of the week and then gradually declined to 340 km/s. The magnitude of the interplanetary magnetic field remained below 10 nT, till the end of July 13 when it increased to 11 nT. Bz was mainly negative and varying between -6 and +5 nT.

No signatures of a shock arrival were noticed of the July 8 and July 10 CMEs. The solar wind observations of ACE indicate the arrival of a transient at 13:30UT on July 14, possibly related to the July 9 CME.

Geomagnetic activity

Geomagnetic conditions were quiet to unsettled.

4. Noticeable Solar Events (7 Jul 2014 - 13 Jul 2014)

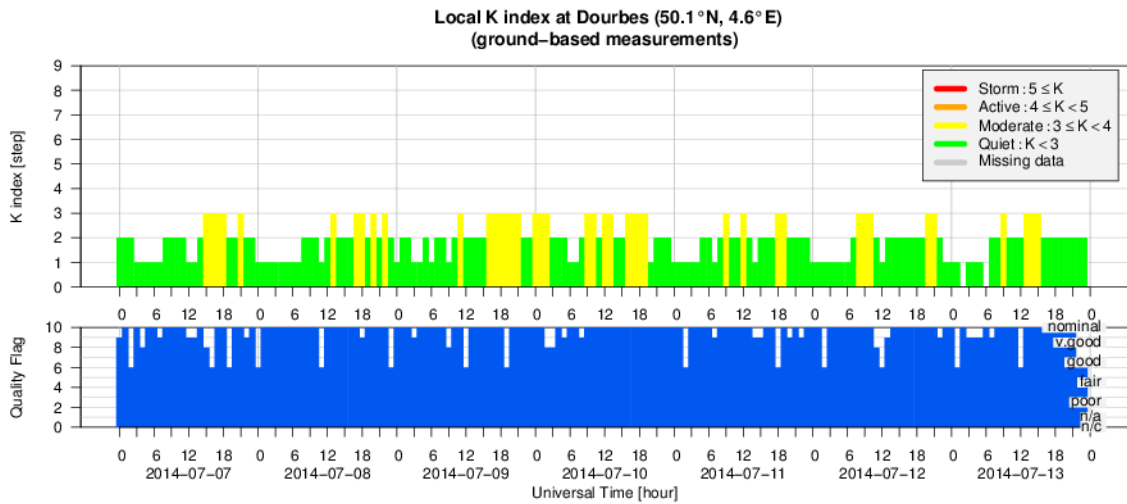
DAY	BEGIN	MAX	END	LOC	XRAY	OP	10CM	TYPE	Cat	NOAA
08	1606	1620	1630		M6.5	B	150	I/2 9V/1	16	2113
09	0020	0026	0033		M1.2	F		/2II/3I/1	16	2113

1

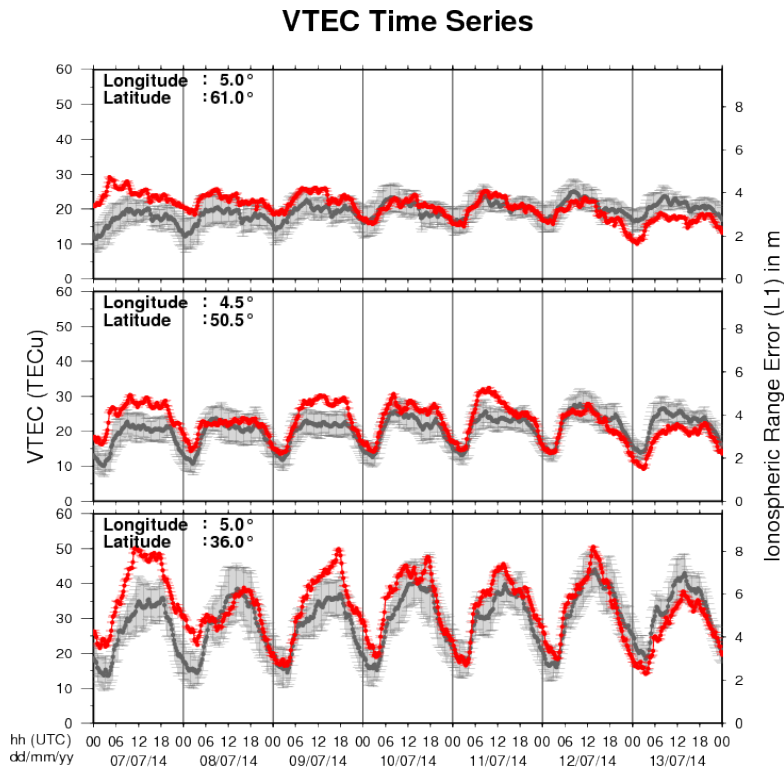
LOC: approximate heliographic location
 XRAY: X-ray flare class
 OP: optical flare class
 10CM: peak 10 cm radio flux

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

5. Geomagnetic Observations at Dourbes (7 Jul 2014 - 13 Jul 2014)



6. Review of ionospheric activity (7 Jul 2014 - 13 Jul 2014)



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>

STCE workshop - UAV-based Antenna Pattern Measurements at Low Frequencies

Presentation given during the STCE workshop Modelling of antennas and calibration of radio instruments.

<http://www.spaceweather.eu/en/repository/show?id=526>

STCE workshop - Calibration of LOFAR antennas

Presentation given during the STCE workshop Modelling of antennas and calibration of radio instruments.

<http://www.spaceweather.eu/en/repository/show?id=527>

STCE workshop - Spectral and imaging solar observations at Nançay: calibration strategies and problems

Presentation given during the STCE workshop Modelling of antennas and calibration of radio instruments.

<http://www.spaceweather.eu/en/repository/show?id=528>

STCE workshop - Calibration of the BRAMS antenna and solar radio telescope in Hainaut

Presentation given at the STCE workshop Modelling of antennas and calibration of radio instruments, June 2014.

<http://www.spaceweather.eu/en/repository/show?id=529>

STCE workshop - Common methods for GNSS Antenna Calibration

Presentation given at the STCE workshop Modelling of antennas and calibration of radio instruments, June 2014.

<http://www.spaceweather.eu/en/repository/show?id=530>

STCE workshop - GNSS antenna calibration for mini-UAV

Presentation given at the STCE workshop Modelling of antennas and calibration of radio instruments, June 2014.

<http://www.spaceweather.eu/en/repository/show?id=531>

STCE workshop - Caibration of the AMISR phased array radar with local test antennas and modelling

Presentation given at the STCE workshop Modelling of antennas and calibration of radio instruments, June 2014.

<http://www.spaceweather.eu/en/repository/show?id=532>

STCE workshop - Phase-calibration of a 2-antenna ISR system

Presentation given at the STCE workshop Modelling of antennas and calibration of radio instruments, June 2014.

<http://www.spaceweather.eu/en/repository/show?id=533>