

STCE Newsletter

11 Aug 2014 - 17 Aug 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. Word Search: SIP7

The seventh Solar Information Processing workshop (SIP7) is currently ongoing in La Roche-en-Ardenne, Belgium. About 80 solar and space scientists, statisticians, and data processing experts from all over the world have convened this week to discuss the challenges of optimizing the science return of solar and heliospheric missions and to address the data analysis issues of these missions.



Though the workshop is still ongoing, above pictures provide already an idea of the meeting's atmosphere. It also seemed fit to the goal of this meeting -finding more information from existing data- to provide a word search with some terminology often used by the experts. These words are hidden in an

apparent random grid of letters. They can be from left to right, top to bottom, diagonal, reverse, and they can even have letters in common. The purpose of the puzzle is to find all the words. Happy processing!

Solar Information Processing Workshop 7

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E G X N N T V G X M W I E B M M
L N R N O B U P E A Q L Z A D O
P I T A C I E R L O A K C Z M R
I T I H E M T R B C M H D A F P
T T E U S N E C S U I E G M I H
L I P J R W I L A N L N T V S O
U F O Z O L L L E R E E V R A L
M K I P I A C L N T E A N H Y O
I S N X M K E Y I O C T O C R G
P A T S B A X C G J N J N N E Y
C M D N R A K I N E M A T I C S
E M F N Y H P A R G O M O T H Q
K N I B A Y E S I A N B C T K U
C N L A T C A R F O C R U S F Z
G D T H O M S O N Y U S B C Q I
Y C N E T T I M R E T N I Z N D
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BAYESIAN
INTERACTION
MACHINELEARNING
MORPHOLOGY
POWERLAW
TIEPOINT

FRACTAL
INTERMITTENCY
MAGNETIC
MULTIPLE
SMALLSCALE
TOMOGRAPHY

GEOMETRY
KINEMATICS
MASKFITTING
NONLINEAR
THOMSON
TURBULENCE

2. PROBA2 Observations

The level of solar activity was between very low and low this 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: http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR229_Aug11_Aug_17/weekly_movie_2014_08_11.mp4 (SWAP week 229).

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

Tuesday Aug 12:

Early morning, a prominence eruption occurred on the North limb. This event can be nicely seen in the weekly overview movie above.

In addition an eruption occurred on the East limb during the evening:

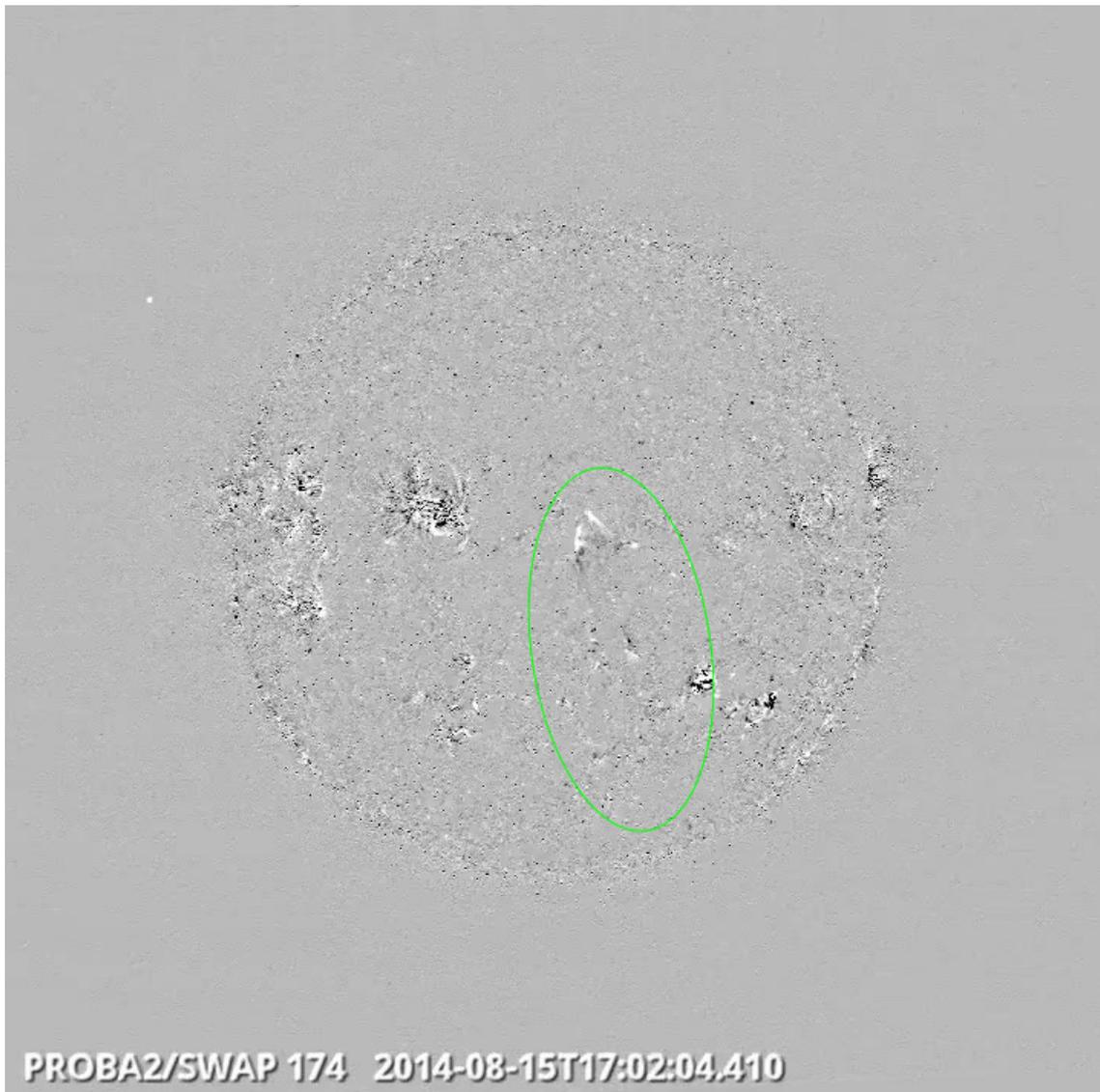


Eruption on East limb @ 22:09 - SWAP difference image

Find a movie of the event here: http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR229_Aug11_Aug_17/20140812_Eruption_EastLimb_2209_SWAPdiff.mp4 (SWAP difference movie)

Friday Aug 15:

During the evening, a prominence located in the south west quadrant erupted, generating a solar arcade.



Prominence Eruption in South West quadrant @ 17:02 - SWAP difference image
Find a movie of the event here: http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR229_Aug11_Aug_17/20140815_PromEruption_southwestquad_1702_SWAPdiff.mp4 (SWAP difference movie)

Sunday Aug 17:

A small eruption occurred in the South West quadrant, generating a nice plasma flow along the magnetic field lines of AR12144.

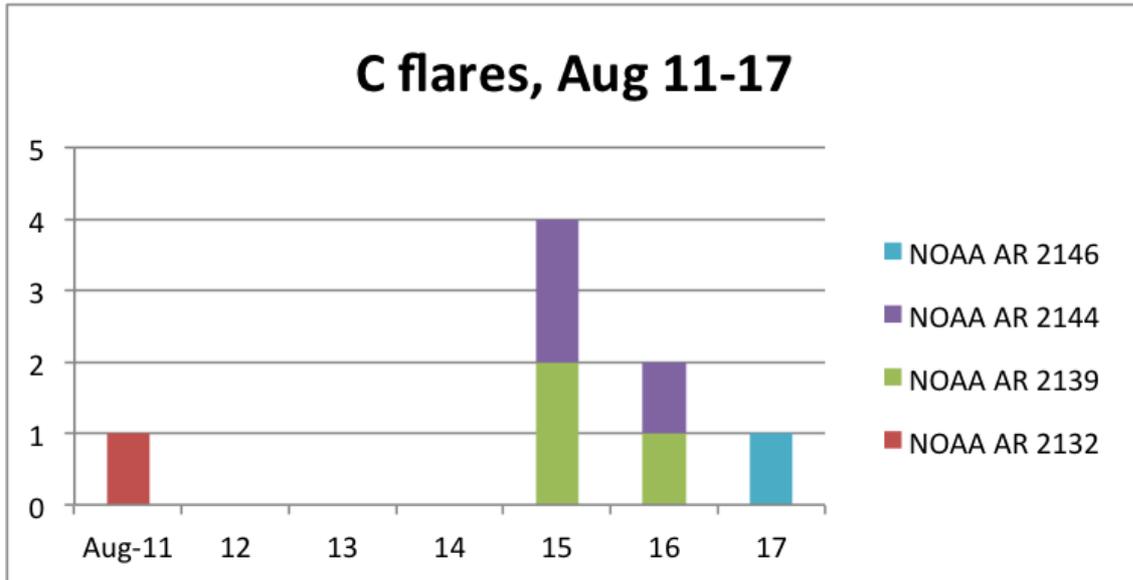


Eruption in South West quadrant - AR 12144 @ 07:20- SWAP difference image

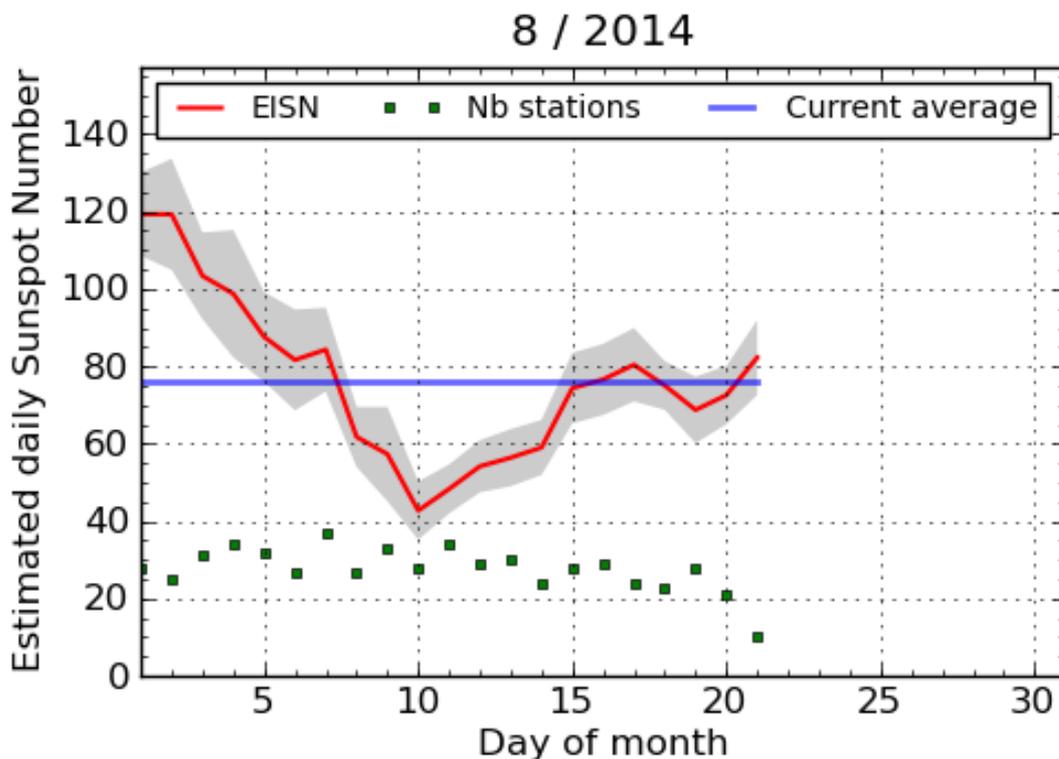
3. Review of solar and geomagnetic activity

Solar Activity

Solar activity was mostly at B level during the week of August 11 to 17, 2014. In total, eight C flares were observed, produced by NOAA regions 2139, 2144, 2132 and 2146.



For comparison, check the Estimated International Sunspot Number (EISN) provided by WDC-SILSO, Royal Observatory of Belgium, Brussels (<http://sidc.be/silso/>). The EISN is a real time estimate of the Definitive International Sunspot Number (ISN). The EISN gives an idea of how active the sun is: if there are more sunspot groups visible on the solar disk, the chances for a flare are higher.

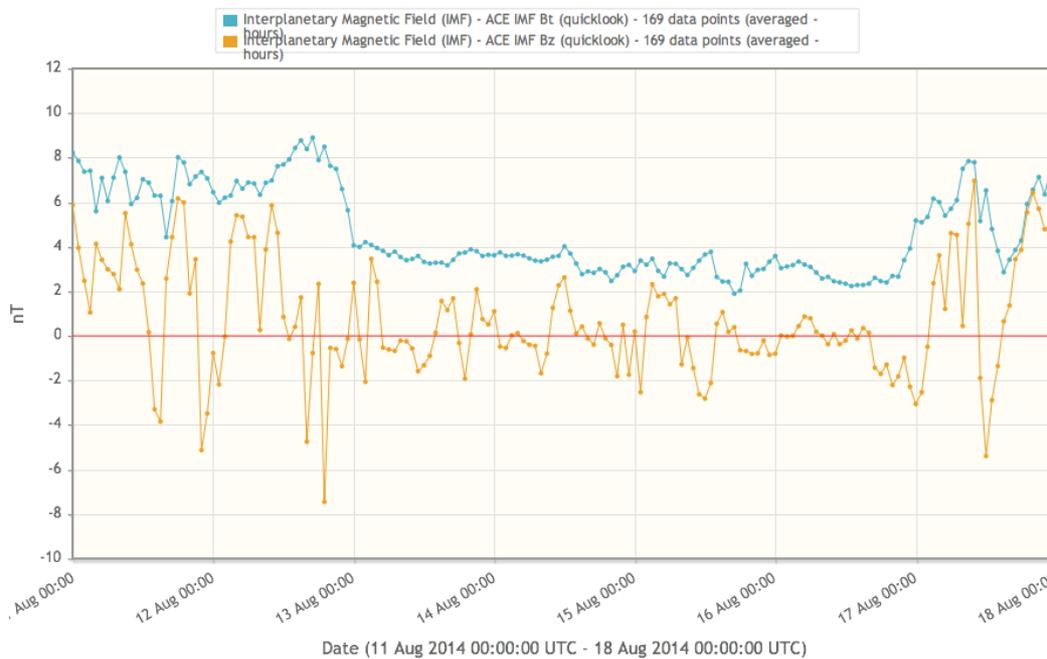
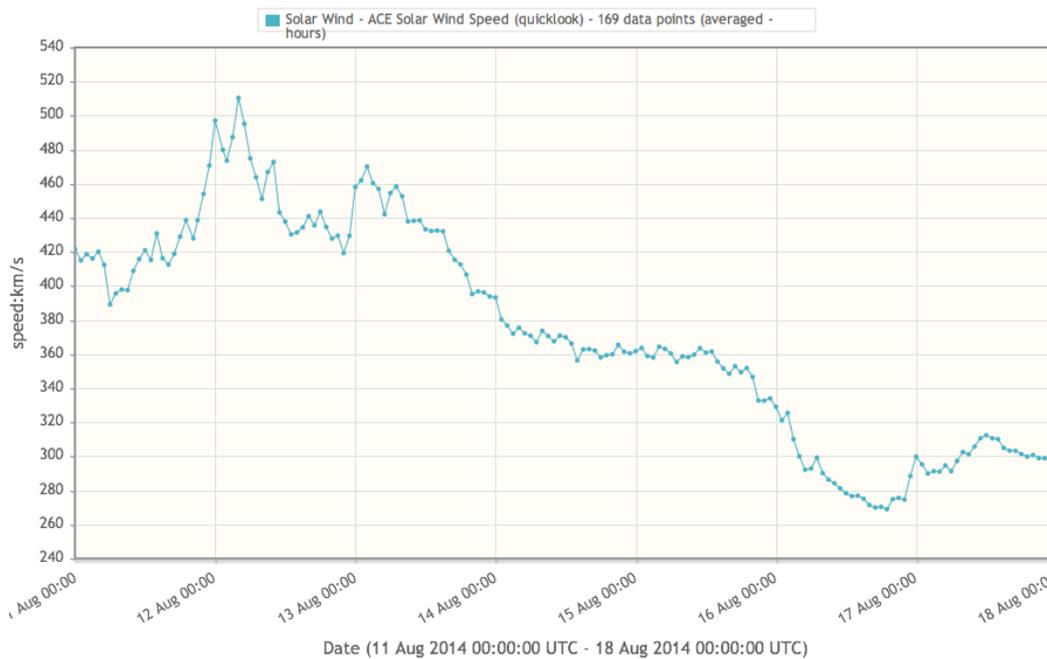


SILSO graphics (<http://sidc.be>) Royal Observatory of Belgium

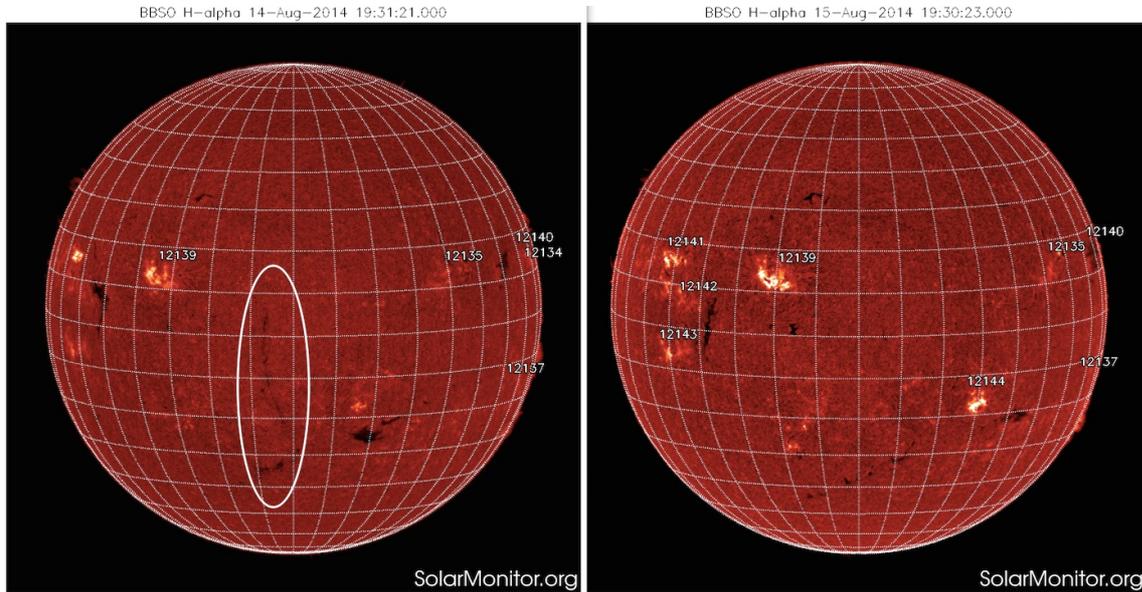
More information about the flavours (estimated, provisional and definitive) of sunspot numbers can be found in the text <http://sidc.be/news/x106x/sunspotnumberclarified.pdf>

Geomagnetic Activity

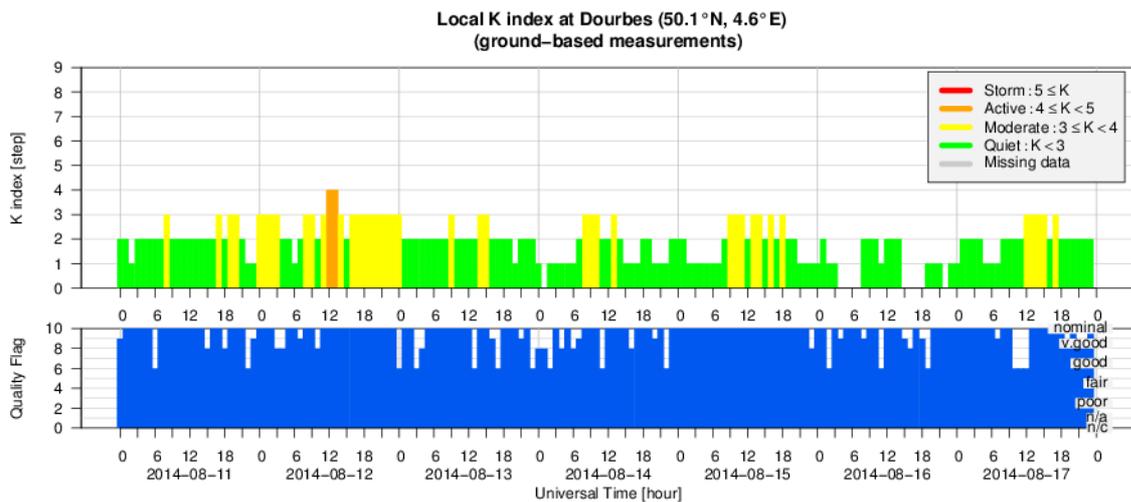
Solar wind speed as observed by ACE increased from about 400 to 500 km/s on August 11 and 12, probably due to the arrival of a coronal hole high speed stream. The magnitude of the Interplanetary Magnetic Field (IMF) at that time varied between about 6 and 12 nT. Afterwards, solar wind speed gradually decreased to about 300 km/s on August 17. The magnitude of the IMF ranged between 2 and 4 nT between August 13 and August 17, and reached values above 8 nT on August 17. Check the graphs.



Geomagnetic activity has been quiet (K Dourbes and NOAA Kp less than 4) except for a few short active intervals (K Dourbes equals 4). A large filament eruption took place near the central meridian around 16:54 UT on August 15, and an associated partial halo CME was observed in LASCO C2 starting around 18:00 UT. Analysis suggests an arrival time at Earth near the end of August 19. The H-alpha picture from BBSO (Big Bear Solar Observatory <http://www.bbso.njit.edu>) shows the filament on August 14. In the August 15 picture, it is not visible anymore.

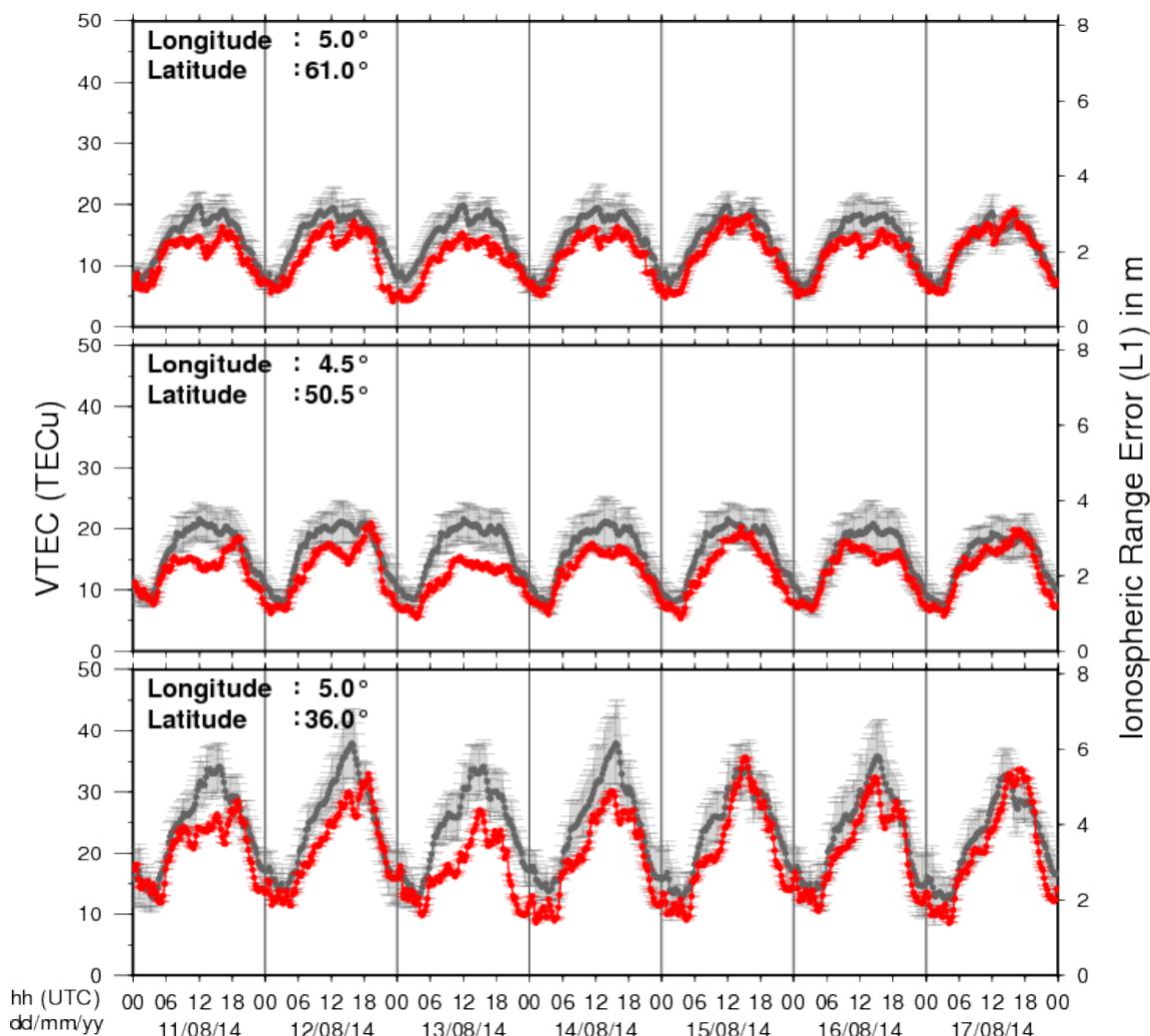


4. Geomagnetic Observations at Dourbes



5. Review of ionospheric activity

VTEC Time Series



The figure shows the time evolution of the Vertical Total Electron Content (VTEC) (in red) during the last week at three locations:

- in the northern part of Europe (N61°, 5°E)
- above Brussels (N50.5°, 4.5°E)
- 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 $\text{TECu} = 10^{16}$ 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

6. Future Events

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

European Planetary Science Congress 2014 in Cascais, Portugal

Start : 2014-09-07 - End : 2014-09-12

Planetary space weather can be characterised by changes in the ambient planetary magnetic field and plasma populations around the planetary environment while space climate refers to the long-term changes in space weather conditions. Space weather and space climate are driven by the changes in the Sun. The effects of Space Weather on the Earth's environment are well documented, particularly in terms of risk to satellites, communications and ground-based systems such as electrical power grids and pipelines. However, planetary space weather and space climate studies as well as better prediction models for space weather are needed. Typically differences in the magnetic field and plasma environment at different planets, as well as the distance of the planet from the sun drives different space weather effects as we move through the solar system. The use of solar wind propagation models combined with solar observations allows us to obtain and predict the interplanetary conditions around each planet.

We solicit papers on planetary as well as terrestrial space weather and space climate, where data from past and on-going space missions such as ACE, SOHO, SDO, MEX, VEX, MESSENGER and CASSINI is used. We welcome papers on observations as well as modeling of space weather and space climate in our solar system.

Website:

<http://meetingorganizer.copernicus.org/EPSC2014/session/16809>

Workshop on Radiation Monitoring for the International Space Station in Krakow, Poland

Start : 2014-09-09 - End : 2014-09-11

The Workshop on Radiation Monitoring for the International Space Station (WRMISS) has been held annually since 1996. The major purpose of WRMISS is to provide a forum for discussion of technical issues concerning radiation dosimetry aboard the International Space Station and other spacecraft. This includes discussion of new results, improved instrumentation, detector calibration, and radiation environment and transport models. The goal of WRMISS is to enhance international efforts to provide the best information on the space radiation environment in low-Earth orbit and on the exposure of astronauts and cosmonauts in order to optimize the radiation safety of space crew.

Website:

<http://www.ifj.edu.pl/conf/wrmiss/>

Geospace revisited: a Cluster/MAARBLE/Van Allen Probes Conference in Rhodos, Greece

Start : 2014-09-15 - End : 2014-09-20

The 'Geospace Revisited' conference aims at revisiting long-standing issues of geospace dynamic phenomena. New data from space missions like Cluster, THEMIS and the more recent Van Allen Probes, along with measurements from ground-based magnetometer arrays around the globe, processed with new methods and combined with theory and simulations are expected to shed light on the complex interplay of particles, fields and waves in geospace, and in particular the inner magnetosphere (radiation belts and ring current).

Website:

<http://geospacerev.space.noa.gr/index.php>

2014 Conference on Big Data from Space (BiDS '14) in Frascati, Italie

Start : 2014-11-12

This conference aims to bring together researchers, engineers, users in the area of Big Data in the Space sector.

The focus is on the whole data lifecycle, ranging from data acquisition by spaceborne and ground-based sensors to data management, analysis and exploitation in the domains of Earth Observation, Space Science, Space Engineering, Space Weather, etc.

Special emphasis will be put on highlighting synergies and cross-fertilization opportunities from domains like Climate Change, Solid Earth Science, Planetary Sciences, Life Science, Astrophysics, High Energy Physics, Social Sciences, etc.

We expect this conference to:

- * contribute towards a common "Big Data from Space" scientific and programmatic framework
- * widen competences and expertise of universities, labs and industrial actors
- * foster networking of experts and users towards better access and sharing of data, tools and resources
- * leverage innovation, spin-in, spin off of technologies, and business development arising from research and industry progress

Website:

<http://congrexprojects.com/2014-events/BigDatafromSpace/objectives>

European Space Weather Week in Liège, Belgium

Start : 2014-11-17 - End : 2014-11-21

The 11th Edition of the European Space Weather Week will take place on 17-21nd November 2014 in Liège, Belgium.

The ESWW will again adopt the central aim of bringing together the diverse groups in Europe working on different aspects of Space Weather. This includes but isn't limited to the scientific community, the engineering community, applications developers, service providers and service end users.

The meeting organisation is coordinated by the Belgian Solar-Terrestrial Centre of Excellence (STCE), ESA and the Space Weather Working Team. The local organisation is done by the STCE.

Website:

<http://www.stce.be/esww11/>

2014 AGU Fall Meeting in San Fransisco, USA

Start : 2014-12-15 - End : 2014-12-19

The AGU Fall Meeting is the largest worldwide conference in the geophysical sciences, attracting more than 22,000 Earth and space scientists, educators, students, and other leaders. For 46 years, energized and passionate Earth and space scientists from around the world gather at the AGU Fall Meeting to connect with colleagues, broaden their knowledge base, and embrace the joy of science. The 2014 meeting takes place Monday 15 - Friday 19 December 2014.

Several sessions about space weather are foreseen:

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When and Why Does Space weather Forecasting Fail?

*

Addressing Operational Space Weather Needs

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Near Real Time Data for Earth Science and Space Weather Applications

*

Understanding Hemispheric Asymmetry and Space Weather

*

Connection of Solar Events With the Variability of Space Environments

*

Bz from the Sun to the Earth: Observations and Modeling

*

Solar Sources and Heliospheric Consequences of Coronal Mass Ejections in Solar Cycle 24

*

Advances in Ionospheric Forecasting - Modeling, Observations, and Validation

Abstract Submission Deadline: August 6, 2014

Website:

<http://fallmeeting.agu.org/2014/>

Measurement Techniques for Solar and Space Physics, in Boulder, CO, USA

Start : 2015-04-20 - End : 2015-04-24

This gathering was born out of the desire to collect in one place the latest technologies required for advancement of science in the discipline of Solar and Space Physics. In doing so, it was recognized that the two 1998 volumes of 'Measurement Techniques in Space Plasmas' (Particles and Fields) have been a valuable reference and resource for advanced students and scientists who wish to know the fundamentals of measurement techniques and technology.

Website:

<https://mtssp.msfc.nasa.gov/>

26th General Assembly of the International Union of Geodesy and Geophysics (IUGG) in Prague, Czech Republic

Start : 2015-06-22 - End : 2015-07-02

We invite contributions on novel inversion methods with application across the geosciences. Of particular interest are 3D imaging, joint inversion of geodetic, geophysical and geochemical datasets, and multi-disciplinary interpretation approaches such as integration of gravity, EM and seismic data or thermo-mechanical modelling studies constrained by physical parameters.

Modelling of Space Weather Effects: Solar, Magnetospheric and Earth Resistivity Constraints (IAGA, IAMAS)

In this symposium we welcome contributions on all aspects of the modelling of space weather and its effects, from the Sun to Earth. This includes the modelling of the various interactions between travelling solar storms and the solar wind, magnetosphere, ionosphere and solid Earth and the validation of models through measurements. Contributions on models developed to aid end-users, such as satellite and power grid operators, survive the impact of space weather are also encouraged.

Website:

<http://www.iugg2015prague.com/joint-inter-association-symposia.htm#JA>