STCE Newsletter

15 Jul 2013 - 21 Jul 2013

Published by the STCE - this issue : 25 Jul 2013. Available online at http://www.stce.be/newsletter/ .

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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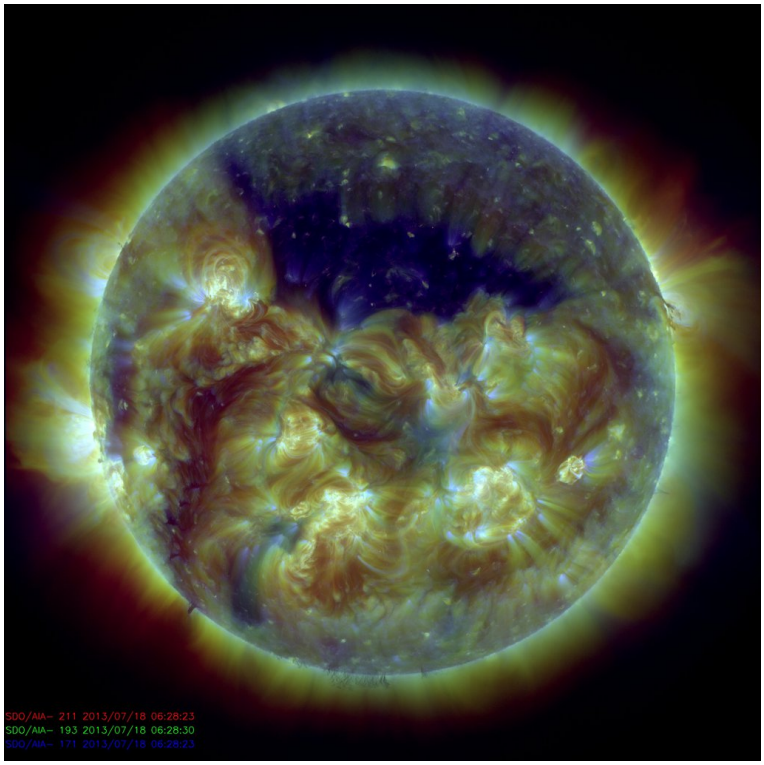
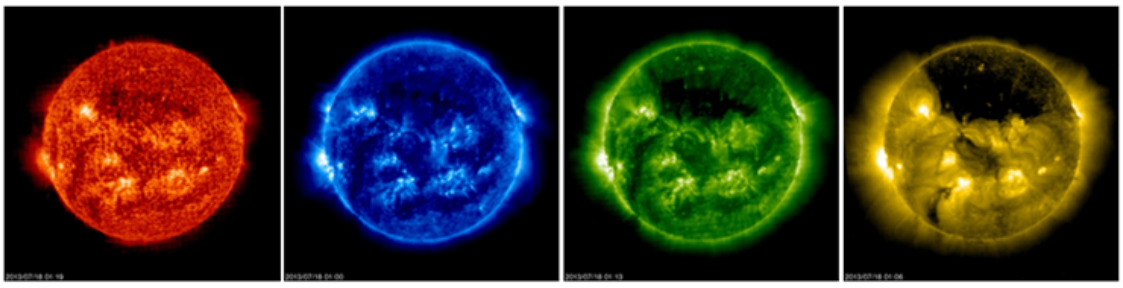
1. Coronal hole XL (15 Jul 2013 - 21 Jul 2013)

Last week, the Sun's outlook was dominated by a large coronal hole (see SDO-movie at http://www.youtube.com/watch?v=XmWF7b_GjiE). Coronal holes are regions in the hot solar atmosphere ("corona") where the plasma density at that temperature is very low compared to its surroundings, and thus they look like dark shapes in the corona. Linked to unipolar magnetic fields stretching into space, they are the source of the high-speed solar wind and can create geomagnetic disturbances. The wider the coronal hole, the longer any effects of the high speed stream will last.

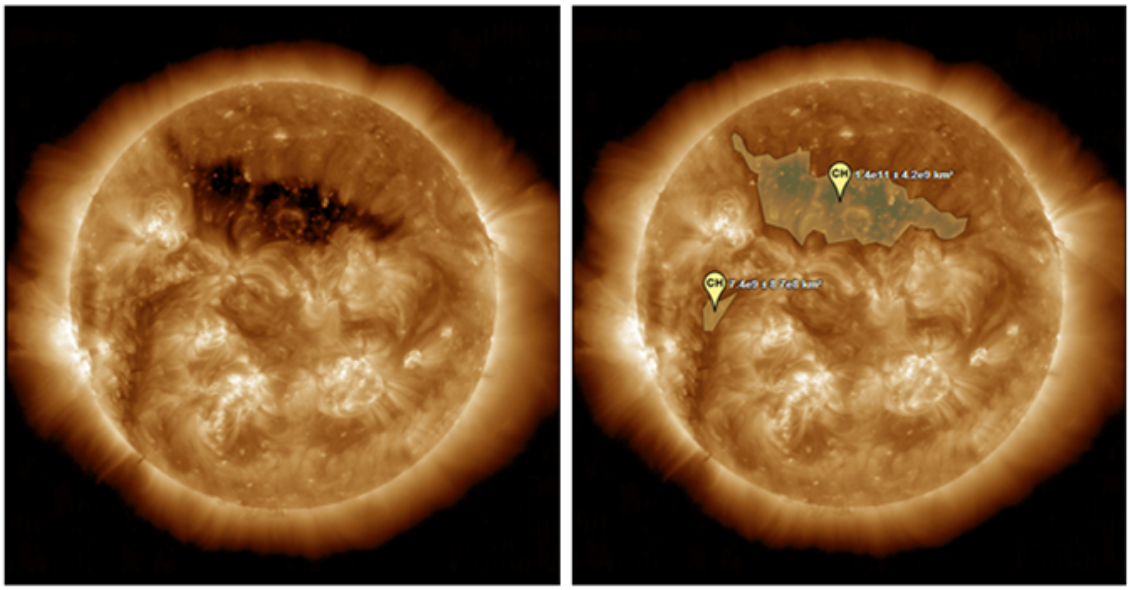


So, how big is this solar feature and how does it compare to other coronal holes? The size of a coronal hole is usually determined by measuring the area of the dark patches of which it consists. However, for reasons explained in a previous STCE Newsletter (http://www.stce.be/news/171/welcome.html), the outlook of a coronal hole can be quite different from one filter to the other. An illustration of this effect can be seen in the SOHO-images underneath (ranked from cool to hot temperatures – left to right; http://sohowww.nascom.nasa.gov/). This is important to keep in mind, when comparing areas over many years as observed by different spacecraft.

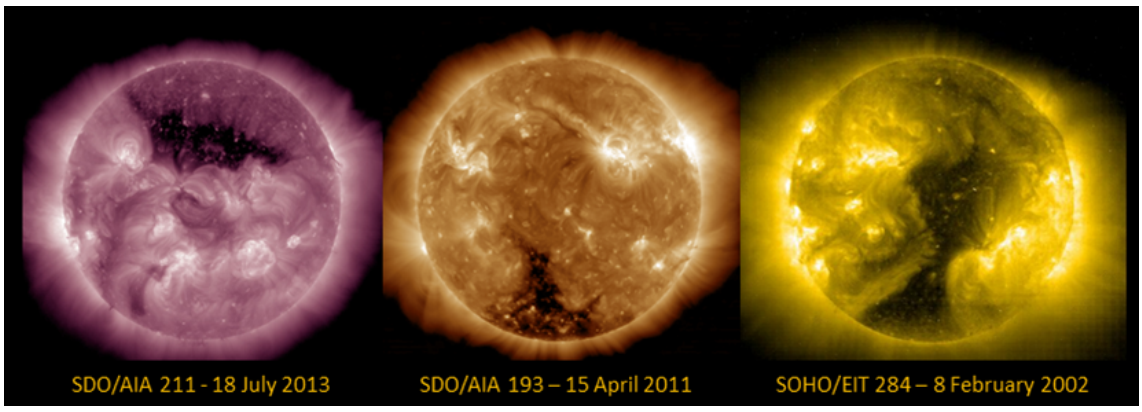


Just this week, the folks from Helioviewer added some new features to their renowned website (http://www.helioviewer.org/). It now also contains a tool displaying the area of the visible coronal holes. Interestingly, these areas are detected from modeling the Sun's magnetic field, and not from observing

a dark region in a coronal temperature bandpass. Using this method, the maximum area of this coronal hole was determined to be 150 billion km2 on 17 July, or nearly 300 times the total surface of the Earth.



Though last week's coronal hole certainly was a big one, it is not the largest coronal hole of the current solar cycle. First of all, during its previous passage in June, it was slightly larger (a total of 180 billion km2). But more importantly, several polar coronal holes have been much larger. These polar holes look smaller because of the perspective effect, but they can cover huge areas. Indeed, as recently as early July, a northern polar coronal hole was 30 billion km2 larger than this week's coronal hole. And in 2011, there were coronal holes near the south pole that were nearly twice as large (middle image underneath; http://sdo.gsfc.nasa.gov/data/).



Compared to previous solar cycles, there have been even much larger coronal holes. An example is the famous "kite" coronal hole from the previous solar cycle (SOHO/EIT 284, image above right). Visible early January 2002, this trans-equatorial hole measured about 400 billion km2, or nearly 800 times the Earth's surface! A few days later, its fast 700km/s wind stream caused a brief minor geomagnetic storm.

2. Review of solar activity (15 Jul 2013 - 21 Jul 2013)

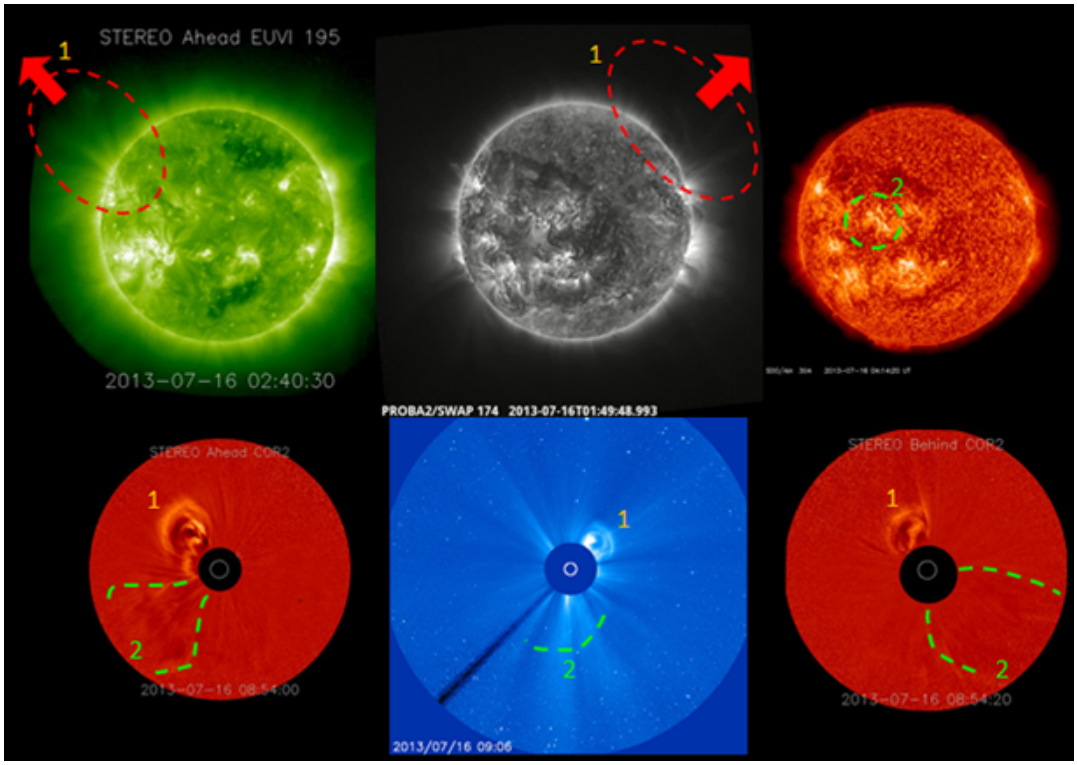
Solar activity was low. During the period, 15 C-class flares were recorded, with no M- or X-class flares.

The largest sunspot group was NOAA 1793 in the northern hemisphere. It had a simple magnetic configuration and produced only few flares.
NOAA 1791 decayed during the first few days of the observing period, producing several C-class flares, the strongest being a C3-flare on 15 July.
During the second half of the period, sunspot complex NOAA 1799/1800 developed slowly on the southern hemisphere, with little flare activity so far.

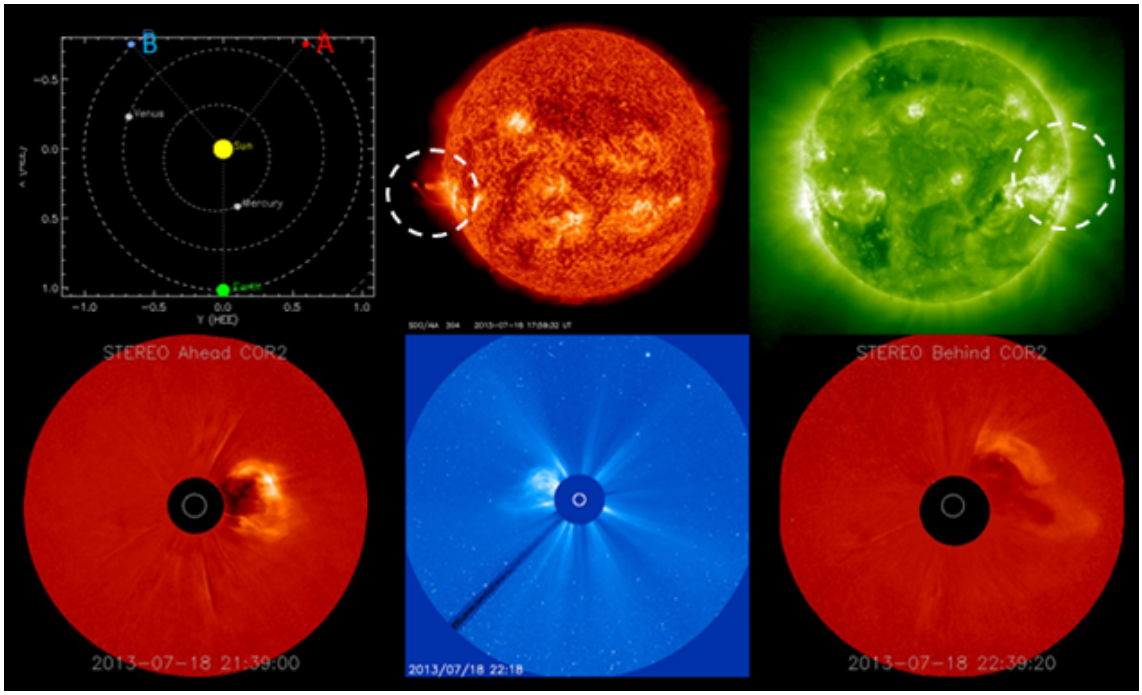
Various prominence eruptions and coronal mass ejections (CMEs) were observed, in particular on 16, 18 and 20/21 July. However, most events occurred either on the backside of the Sun, or near the limb. In all cases, no clear Earth directed component was detected.

Based on the various imagery available from SDO, SOHO, PROBA2, STEREO-A and -B, the events of 16 and 18 July have been depicted underneath, both in extreme ultraviolet (EUV; top) as through coronagraphs (bottom images). For the 16 July events, also a movie was created at http://www.youtube.com/watch?v=LPLKvtH34AU

The 16 July event contains the only wide CME observed this week. This fast moving CME (labeled 2 in the sketch) had an angular width of about 120 degrees, but most of it was directed southward of the Sun-Earth line. The CME was associated with an eruption from active region NOAA 1792, located about 20 degrees east of the disk's centre (SDO image, top right). The bright CME (labeled 1 in the sketch) is associated with other eruptive activity near the west limb (STEREO-A and PROBA2, resp. top left and middle image), and was directed away from the Earth.



The 18 July event near the Sun's east limb can be seen in the EUV images underneath by SDO and STEREO-B (resp. top middle and right). Interesting is that in coronagraph images by both STEREO-A and -B, the associated CME is directed to the right, clearly indicating that the CME is directed away from Earth.



A rather extended low-latitude coronal hole (more than 80 degrees long and nearly 30 degrees wide) was observed this week. It reached the central meridian on 17 July.

3. PROBA2 Observations (15 Jul 2013 - 21 Jul 2013)

Solar (flaring) activity was low to very low throughout 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: http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR173_Jul15to21_2013/2013_07_15_00_00_19_2013_07_21_22_51_43_SWAP_174__AIA_304-hq.mp4 (SWAP174/AIA304 combination; HelioViewer.org).

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

Thursday 18 July:

Prominence eruption on south-west limb @ 08:34 - SWAP difference image

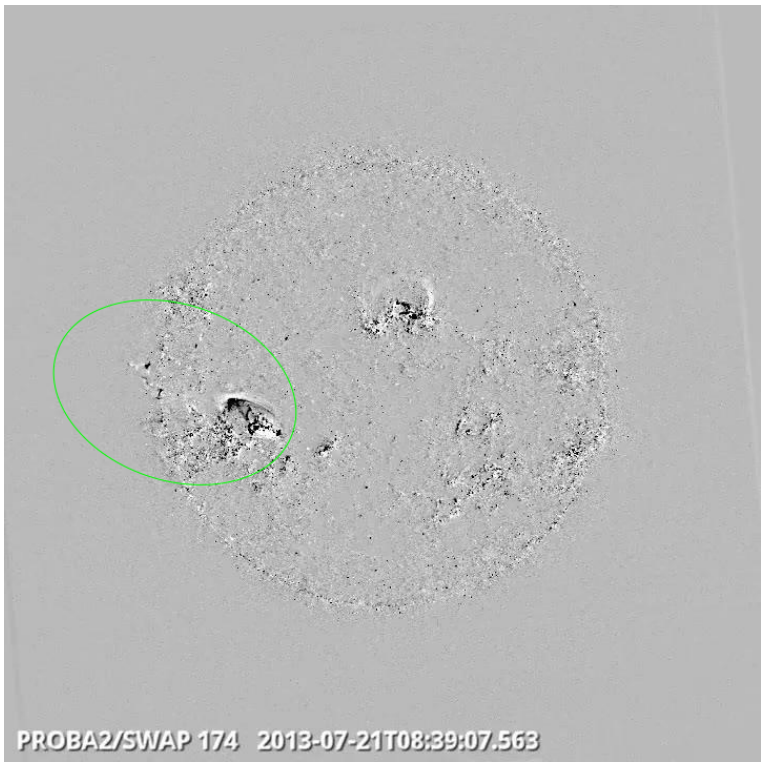
Find a movie of the event here: http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR173_Jul15to21_2013/Events/20130718_eruptionSouthWestLimb_0834_swap_diff.mp4 (SWAP difference movie)

Saturday 20 July:

Prominence eruption on north-west limb @ 14:46 - SWAP difference image

Find a movie of the event here: http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR173_Jul15to21_2013/Events/20130720_PromEruptionNorthWestLimb_1446_swap_diff.mp4 (SWAP difference movie)

Sunday 21 July:



Prominence eruption on east limb and eruption in south-east quadrant @ 08:39 - SWAP difference image

Find a movie of the event here: http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR173_Jul15to21_2013/Events/20130721_PromEruptionNorthEastLimb_0839_swap_diff.mp4 (SWAP difference movie)

Prominence eruption on north-west limb @ 21:54 - SWAP difference image

Find a movie of the event here: http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR173_Jul15to21_2013/Events/20130721_PromEruptionNorthNorthWestLimb_2154_swap_diff.mp4 (SWAP difference movie)

4. Review of geomagnetic activity (15 Jul 2013 - 21 Jul 2013)

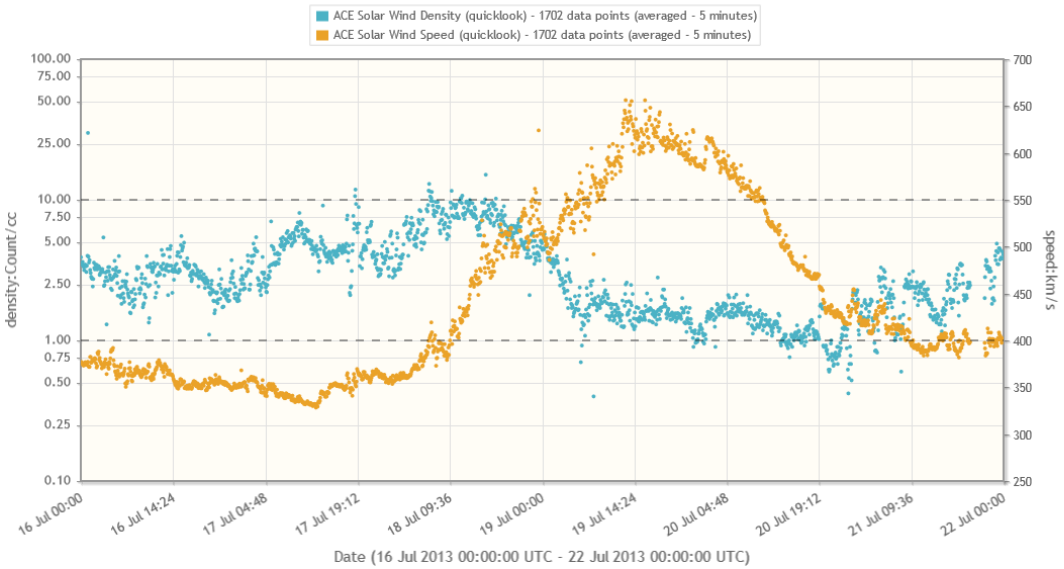
The week started with the lingering effects from a CME that hit Earth last weekend (13-14 July). The active to minor storm conditions decreased to quiet levels by the end of 15 July.

During the entire week, no obvious CME signatures were seen in the solar wind parameters.

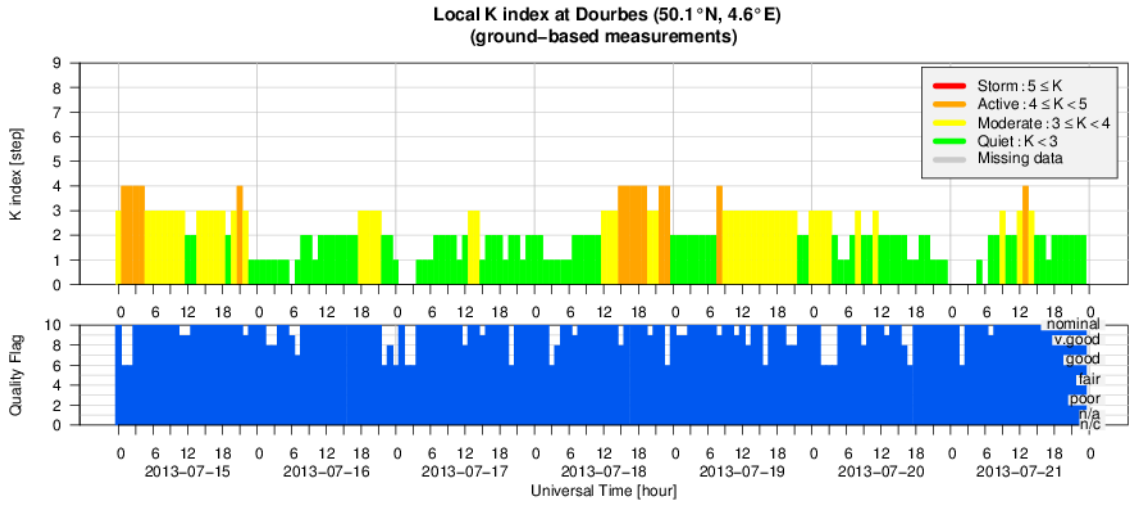
The fast flow from the extended low-latitude coronal hole arrived at the Earth on 18 July. The arrival of the coronal hole high speed stream resulted in active geomagnetic conditions (K = 4 reported by Dourbes, K = 5 reported by IZMIRAN, and NOAA reported Kp = 4) on 18 and 19 July. Solar wind speed reached a maximum value of 650 km/s on 19 July.

The interplanetary magnetic field (IMF) magnitude had the maximum value of about 18 nT on 18 July, when Earth was inside the fast solar wind.

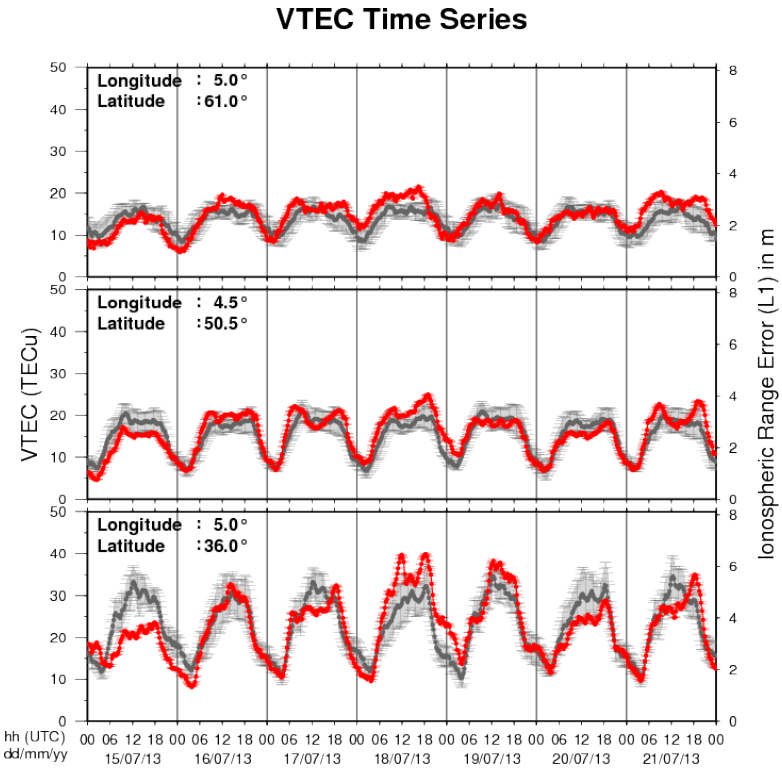
During the rest of the week, the IMF magnitude was stable at about 4 nT.



5. Geomagnetic Observations at Dourbes (15 Jul 2013 - 21 Jul 2013)



6. Review of ionospheric activity (15 Jul 2013 - 21 Jul 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

8. Future Events

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

1st SOLARNET - 3rd EAST/ATST meeting in Oslo, Norway

Start : 2013-08-05 - End : 2013-08-08
The goal of this workshop is to foster collaborations between ground and space solar projects. This workshop is expected
* to provide a forum to discuss the use of current and future observational solar facilities, and how to optimise their scientific returns;
* to identify the potentially paradigm-shifting observations that will become possible with the next generation ground- and space-based solar telescopes and their advanced instrumentation;
* to foster collaborations between researchers working at the development of ground- and space-based projects and creation of synergies between research programs at different wavelength bands.
Website:
http://folk.uio.no/matsc/oslo-13/info.html

1st SOLARNET Workshop, 3rd EAST/ATST meeting: 'Synergies between ground- and space-based solar research', in Oslo, Norway

Start : 2013-08-05 - End : 2013-08-08
The goal of this workshop is to foster collaborations between ground and space solar projects. This workshop is expected 1) to provide a forum to discuss the use of current and future observational solar facilities, and how to optimise their scientific returns; 2) to identify the potentially paradigm-shifting observations that will become possible with the next generation ground- and space-based solar telescopes and their advanced instrumentation; 3) to foster collaborations between researchers working at the development of ground- and space-based projects and creation of synergies between research programs at different wavelength bands.
A workshop webpage and more information will follow shortly - the purpose of this pre-announcement is to enable early bookings in your calendar.

XIIth IAGA Scientific Assembly in Merida, Yucatan, Mexico

Start : 2013-08-16 - End : 2013-08-31
The Local Organising Committee and the Mexico National Committee of IUGG have the great pleasure to welcome you to the 11th Scientific Assembly of the International Association of Geomagnetism and Aeronomy (IAGA) which is held in MÃ©rida YucatÃ¡n, Mexico from 26 to 31 August 2013 with the motto: "Living on a Magnetic Planet". Our Magnetic Planet Capricious (Changeable or Unpredictable) Field.
In order to increase the visibility and attractiveness of IAGA to young researchers, to motivate them to play active role within IAGA and to create (and enhance) their awareness of IAGA and sense of belonging to IAGA, the first IAGA Summer School will be organized just prior the Assembly. The summer school will provide overview of the activities carried out within all the IAGA divisions, with subjects from paleomagnetism and magnetic anisotropy through observatories and geomagnetic field modeling to ionospheric and aeronomic research. At least 20 young scientists from all around the world will be invited based on the nominations from Working Groups and Divisions. Special call and more information will be published before the end of 2012.
Website: http://iaga2013.org.mx/

Solar Physics and Space Weather Instrumentation V in San Diego, CA (USA)

Start : 2013-08-25 - End : 2013-08-29
This conference will focus on instrumentation, observatories, space missions, and programs for observations from the Sun to Earth's upper atmosphere and space environment. The aim is to bring together diverse communities working on all elements of solar physics and space weather instrumentation.
Studying solar phenomena and monitoring space weather requires observations using both space- and ground-based instrumentations covering the different regions of the Sun-Earth system, the Sun, interplanetary medium, magnetosphere, ionosphere, and thermosphere. Papers are solicited concerning all instrumentation-supporting solar physics and space weather. This includes, but is not limited to, concepts, designs, fabrication processes, calibration, data trending, information technologies, solar data mining, instrument modeling, and satellite lifetime prediction modeling. We are also interested in all past, current, and future solar space missions and satellite and ground constellations of space weather instrumentation with a strong focus on Space Situational Awareness.
This conference is intended to provide the solar physics community and that of Earth's space environment with a forum for discussing the latest updates on instrumentation, observation techniques, and programs in their respective fields, and for proposing innovative ideas for future Sun-Earth coordinated observations.
Website: http://spie.org/op423

2013 Meeting of the Italian Community in Solar and Heliospheric Physics in Catania, Italy

Start : 2013-09-04 - End : 2013-09-06
The purpose of the meeting is to provide a forum for the italian scientists in the field (some of which are abroad) to consolidate on-going collaborations and establish new ones, for example in future projects such as Solar Orbiter and EST, where several of us are involved.
The meeting is obviously open to scientists from all the countries!
Website:
http://www.oact.inaf.it/weboac/SoHe2013/

14th European Solar Physics Meeting in Dublin, Ireland.

Start : 2013-09-08 - End : 2013-09-12
The European Solar Physics Meetings aim to highlight all aspects of modern solar physics, including observation and theory that span from the interior of the Sun out into the wider heliosphere. These meetings provide a broad, yet stimulating, environment for European and international scientists to share their research in solar physics.
The meeting will mostly comprise of contributed talks and poster presentations, with several invited review talks (typically one per session). Posters will be on display for the whole meeting in close proximity to the lecture theatre. Refreshments will be served in the poster viewing area during two dedicated coffee/poster breaks on each full day.
Website: http://www.espm14.ie/

7th International Workshop on Solar Polarization in Kunming, China

Start : 2013-09-09 - End : 2013-09-14
We gain information about the universe through analysis of the spectra from celestial objects. However, while the intensity spectrum represents a scalar quantity but electromagnetic radiation occurs in the form of transverse waves, the polarized spectrum provides us with a 4-vector, the Stokes vector. The increased amount of information space opens new windows to the universe, in particular for the exploration of magnetic fields. It is well recognized that the magnetic field is a primary agent responsible for structuring and the source of all variability on intermediate time scales, which manifests itself in all forms of solar and stellar activity.

It is therefore not surprising that every year there are many scientific meetings organized with the objective of studying the role of magnetic fields in cosmic objects. What is largely missing in these meetings is however an in-depth investigation of the fundamental aspects of how magnetic fields can be determined by the means of spectro-polarimetry, our main gateway to cosmic magnetism. The primary aim of our series of Workshops is to address these fundamental aspects, with less emphasis on the morphological and physical properties of cosmic magnetic fields.
Website: http://spw7.ynao.ac.cn/

2nd UK-Ukraine meeting on Solar Physics and Space Science (UKU SPSS) in Kiev, Ukraine

Start : 2013-09-16 - End : 2013-09-20
The meeting will cover a broad range of aspects of solar physics, space science and solar-terrestrial relations. We aim to include every side of solar and space research, including observations, theory, and numerical modelling. The main idea behind the meeting is to treat the entire solar-terrestrial domain as one system, rather than each region independently.
The topics to be covered are:
* advanced solar observations
* waves and flows in the Solar atmosphere
* structure and dynamics of solar magnetic fields
* connecting analytical theory and modern numerical simulations to observations
* new physics in numerical modelling
* linking solar interior with heliosphere
* particle acceleration in the Sun and heliosphere
* non-linear phenomena in space plasmas
* physics of magnetosphere and ionosphere
Website:
http://swat.group.shef.ac.uk/Conferences/Ukraine_UK_2013/index.html

Space science training week: data driven modeling and forecasting in Leuven, Belgium

Start : 2013-09-16 - End : 2013-09-19
This summer school targets to introduce a generation of young researchers (advanced master students, PhDs, and junior postdoctoral researchers) to the diverse aspects of space weather related research.
It will introduce theoretical approaches to space weather and its drivers, present modern solar data analysis tools, and cover state-of-the-art solar and space science simulations. Participants will learn about forecasting aspects and their quality control for space weather events, but also experience hands-on training in scientific proposal writing and receive do-and-don't tips for scientific presentations.
The scientific program is enriched by a public evening lecture on the solar influence on our climate, and the lecturers are invariably expert scientists with international standing.
The school is open to a maximum of 40 participants, and can benefit from its embedding within two international research network activities: an Interuniversity Attraction Pole P7/08 CHARM connecting heliospheric to astrophysical communities with 7 partner institutes, and a European FP7 Project eHeroes with 15 different partner institutes. Participation from outside both network activities is strongly encouraged. Within Belgium, the school links up expertise from universities (KU Leuven, ULB, Gent University) to federal research institutes (the Solar-Terrestrial Centre of Excellence, the Royal Observatory of Belgium and the Belgian Institute for Space Aeronomy).
Website:
http://wis.kuleuven.be/CHARM/events/school/SSTW2013/

STEREO/WAVES & WIND/WAVES workshop on Solar Radio Emissions on Santorini, Greece

Start : 2013-10-07 - End : 2013-10-11

The aim of the workshop is to review the "state of the art" theories about generation and propagation of Solar radio burst and discuss the observational constrains and results that have been provided in this area by the WIND & STEREO missions during the last 20 years. Furthermore the STEREO & WIND observations will be put in the context of other missions such as RHESSI and ground based observatories. Finally, the preparation for the future explorations foreseen with Solar Orbiter and Solar Probe Plus will be discussed.
Website:
http://type3stereo.sciencesconf.org/

2nd Asian-Pacific Solar Physics Meeting, in Hangzhou, China

Start : 2013-10-24 - End : 2013-10-26
Initiated by Profs. Fang and Choudhury, the first Asian-Pacific Solar Physics Meeting (APSPM) was held in Bangalore two years ago. During the meeting, a consensus was achieved that it might be a good idea to have the APSPM every three years. Somehow the second APSPM was proposed to be held by mainland China in 2013. APSPM is aimed to exchange the recent research results in solar physics in the emerging asian-pacific region.
Asian-pacific regions are getting more and more active in solar physics, as signified by the construction of big facilities, including the Hinode satellite (Japan), SOXS (India), Chinese Solar Radio Heliogragh, and Optical & Near-Infrared Solar Eruption Tracer (ONSET). Therefore, colleagues have agreed to hold regional solar physics meetings regularly. The first Asian-Pacific Solar Physics Meeting (APSPM) was held in Bangalore during March 22-24 2011. During the meeting, a consensus was achieved that it might be a good idea to have the APSPM every three years. Somehow the second APSPM was proposed to be held by mainland China in 2013. APSPM is aimed to exchange the recent research results in solar physics in the emerging asian-pacific region.
Website:
http://sdac.nju.edu.cn/~solar/

Helicity Thinkshop on Solar Physics in Beijing, China

Start : 2013-10-27 - End : 2013-10-31
Magnetic helicity has been intensively studied from observational, theoretical, and many other aspects of solar physics. For this meeting we would like to invite solar physicists who are interested in the observational and theoretical studies of the helicity, to encourage thorough discussions on the relevant hot issues. The 1st Helicity Thinkshop was held successfully in 2009, and now the 2nd one will be held on October 27-31, 2013 in Beijing, China.
Website:
http://sun.bao.ac.cn/meetings/HT2013/

Workshop and School on Radio Sun in Zhengxiangbaiqi, Inner Mongolia, and Beijing, China

Start : 2013-10-28 - End : 2013-11-02
The Worshop and School on Radio Sun in Beijing and Inner Mongolia during Oct.28 - Nov. 2, 2013 is the first international academic seminar supported by the International Research Staff Exchange Scheme of the Seventh Fromework Programme of the European Union (FP7-IRSES-295272-RADIOSUN).
The primary aim of this programme is to establish close research interaction and collaboration between the key research groups involved in CSRH, SSRT, and ALMA projects and in development of relevant theory and data analysis tools, through the systematic research staff and knowledge exchange, joint research efforts exploiting existing data and facilities, and preparing the future world-class partnership in exploitation of the upcoming facilities.
The Workshop and School welcome all solar physicsts and students who are interested in solar radio astronomy to participate. We will discuss and exchange the scientific frontier problems, including the new-generation radio instruments (CSRH, Siberian multi-frequency radioheliograph, LOFAR, ALMA, and other new instruments), recent achievements and their scientific goals; methods and techniques of data

processing (for example, software, radio image reconstructions, and method for studying various types of solar radio fine structures); and the objectives of new observational data and new mathematical methods.
Website:
http://beijingradiosun.csp.escience.cn/

25th Winter School of Astrophysics: Cosmic Magnetic Fields, in La Laguna, Tenerife, Spain.

Start : 2013-11-11 - End : 2013-11-22
Magnetic fields play an important role in many astrophysical processes. But magnetic are difficult to detect and to model or understand, since the fundamental equations describing the behavior of magnetized plasmas are highly non-linear. Hence, magnetic fields are often an inconvenient subject which is overlooked or simply neglected. Such difficulty burdens the research on magnetic fields, which has evolved to become a very technical subject, with many small disconnected communities studying specific aspects and details.
The school tries to amend the situation by providing a unifying view of the subject. The students would have a chance to understand the behavior of magnetic fields in all astrophysical contexts, from cosmology to the Sun. From star-bursting regions to AGNs in galaxies. The school will present a balanced yet complete review of our knowledge. Extensions into the unknown are also important to indicate present and future lines of research.
The Winter School will bring together in a relaxed working atmosphere a number of the leading scientists in this field, PhD students and recent postdocs. The conditions for a successful interaction will be granted, including two special sessions for those students that want to present their own work.
Website:
http://www.iac.es/winterschool/2013/

7th Hinode science meeting in Takayama, Japan

Start : 2013-11-12 - End : 2013-11-15
Since its launch in Sep-2006, more than 600 refereed papers have been published based on Hinode observations, presenting many new and important findings to the scientific community. However, due to the unexpectedly low levels of solar activity, until now the focus has mainly been on the more quiescent aspects of the solar cycle. With the solar maximum expected this year, through cooperative observations with SDO, IRIS, and ground based observatories, Hinode observations should lead to our understanding of active Sun phenomena, such as solar flares and CMEs, to be greatly improved. Making Hinode-7 an excellent opportunity to discuss solar activity in the current solar cycle and the related science through the use Hinode data, as well as other solar/space weather data. It will also be interesting to use this meeting to broaden our focus to include the solar-stellar connection as a means to deepen our understanding of solar activity.
Momentum is also gaining for Solar-C, which is being developed as an international collaboration between Japan, US and Europe. To further discuss this mission, the Solar-C science meeting will be held on 11-Nov.
Website:
http://www.kwasan.kyoto-u.ac.jp/hinode-7/

International CAWSES-II Symposium in Nagoya, Japan

Start : 2013-11-18 - End : 2013-11-22
This International CAWSES-II Symposium hosted by SCOSTEP (Scientific Committee on Solar-Terrestrial Physics) will provide an excellent opportunity to discuss the scientific accomplishments of CAWSES-II and look forward to SCOSTEP's future programs at a moment toward the end of its five-year period. The symposium will cover the six major themes of CAWSES-II tasks: 1) What are the solar influences on the Earth's climate?, 2) How will geospace respond to an altered climate?, 3) How does short-term solar variability affect the geospace environment?, 4) What is the geospace response to variable inputs from the lower atmosphere?, 5) Capacity Building, 6) Informatics and eScience. The main functions of CAWSES-II are to help coordinate international activities in observations, modeling,

and applications crucial to achieving this understanding, to involve scientists in both developed and developing countries, and to provide educational opportunities for students of all levels. The symposium offers keynotes/lectures that will be interesting for all participants every morning and more specific sessions of presentations in the afternoon. We welcome all those who are involved and/or interested in CAWSES-II to Nagoya in the autumn when we will have the pleasure of being surrounded by beautiful colorful leaves of this season.
Website:
http://www.cawses.org/CAWSES/leaflet_CAWSES-II_120229.pdf

European Space Weather Week in Belgium

Start : 2013-11-18 - End : 2013-11-22
The 10th Edition of the European Space Weather Week will take place on 18-22nd November 2013 in Belgium. The venue will be confirmed early next year, but mark your calendars now for the 10th Anniversary of this growing European event.
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 will again be coordinated by the Belgian Solar-Terrestrial Centre of Excellence (STCE), ESA and the Space Weather Working Team. The local organisation will be done by the STCE.
Website:
http://www.stce.be/esww10/

40th COSPAR Scientific Assembly in Moscow, Russia

Start : 2014-08-02 - End : 2014-08-10
The 40th COSPAR Scientific Assembly will be held in Moscow, Russia from 2 - 10 August 2014. This Assembly is open to all bona fide scientists.
Website:
http://www.cospar-assembly.org/