

STCE Newsletter

29 Jun 2015 - 5 Jul 2015



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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. ESWW12 - Fresh session programs!

The result of hard labour can be viewed on

<http://www.stce.be/esww12/program/sessions.php>



2. Space-Up: an un-conference for space enthusiasts

Registration is open!!

The SpaceUp movement started in 2010 in San Diego and has gone on to conquer the world! With events being held all across the globe, SpaceUp Belgium is part of a suite of un-conferences aimed at bringing space enthusiasts together. SpaceUp Belgium will take place in the Brussels Planetarium on 5-6 September 2015.



An un-conference is not a typical conference, but what does that really mean? The event is organized, apart from the actual program itself. The conference attendees determine the event content themselves. All participants are invited to fill a conference slot with a space-related topic, gradually filling an initially blank grid of time slots. This very open format allows a great variety of visions, ideas and projects to be presented and discussed.



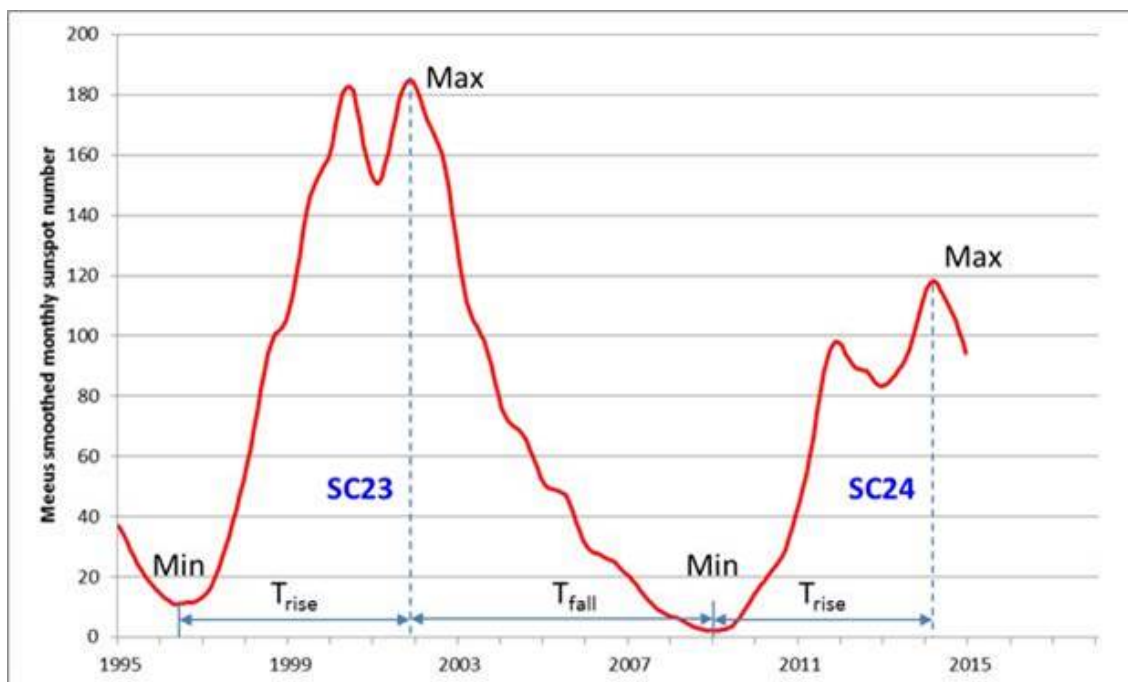
At SpaceUp, our goal is to provide the opportunity for space enthusiasts from all walks of life to meet, with the common goal of creating an atmosphere of open exchange between participants. It does not matter if you are a hardcore scientist or if you just find space awesome. So, are you interested in letting the world know how you're using space science and technology to make the world a better place and to learn about space from experts and amateurs? SpaceUp is a great platform for outreach and networking.



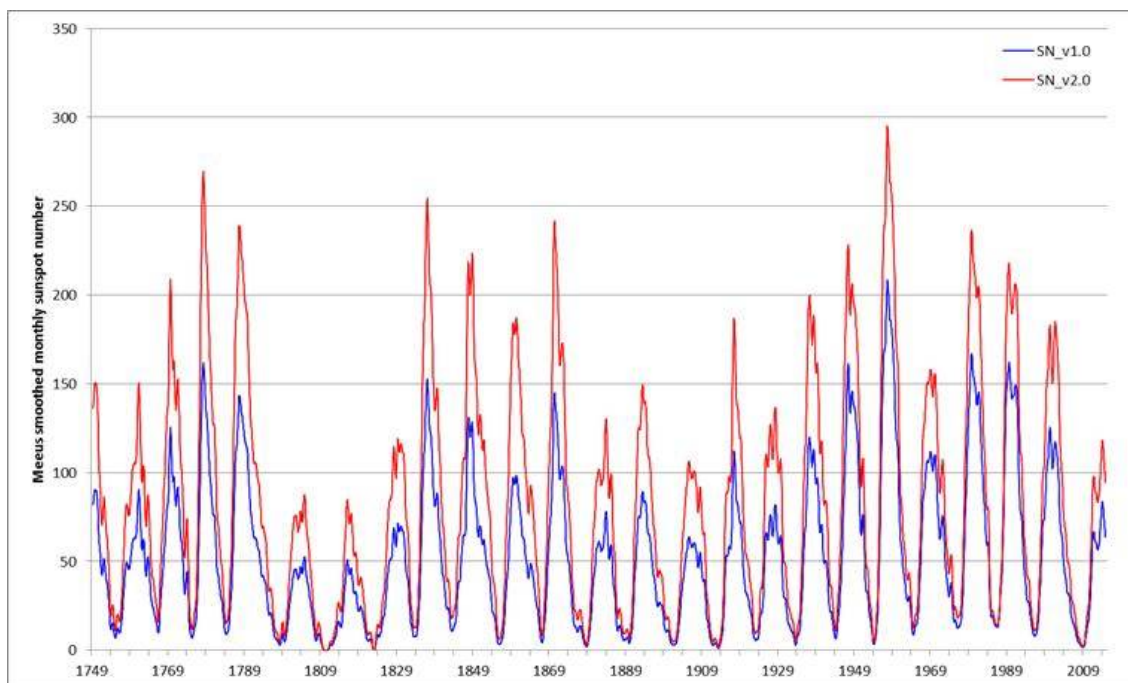
You can find more information and register on our website: <http://www.spaceup.be>
Register soon, because the total number of participants is limited!

3. The solar cycle's new clothes

On 1 July 2015, the revised sunspot number (SN) was introduced by the World Data Center SILSO (see <http://www.stce.be/press/01/welcome.html>). This "Version 2.0" obviously affects the maximum and minimum values of each solar cycle (SC), as well as some of the related timings, i.e. the time it takes for solar activity to rise from minimum to maximum (Trise), and back to the next minimum (Tfall).



These solar cycle characteristics are illustrated in the graph above for the previous and ongoing solar cycle. They are calculated using the Meeus smoothing formula (see Meeus, 1958: <http://adsabs.harvard.edu/abs/1958C%26T....74..445M>). As there exist several types of smoothing formulas and methods, (slightly) different values can be obtained for the various cycle parameters when using another formula.

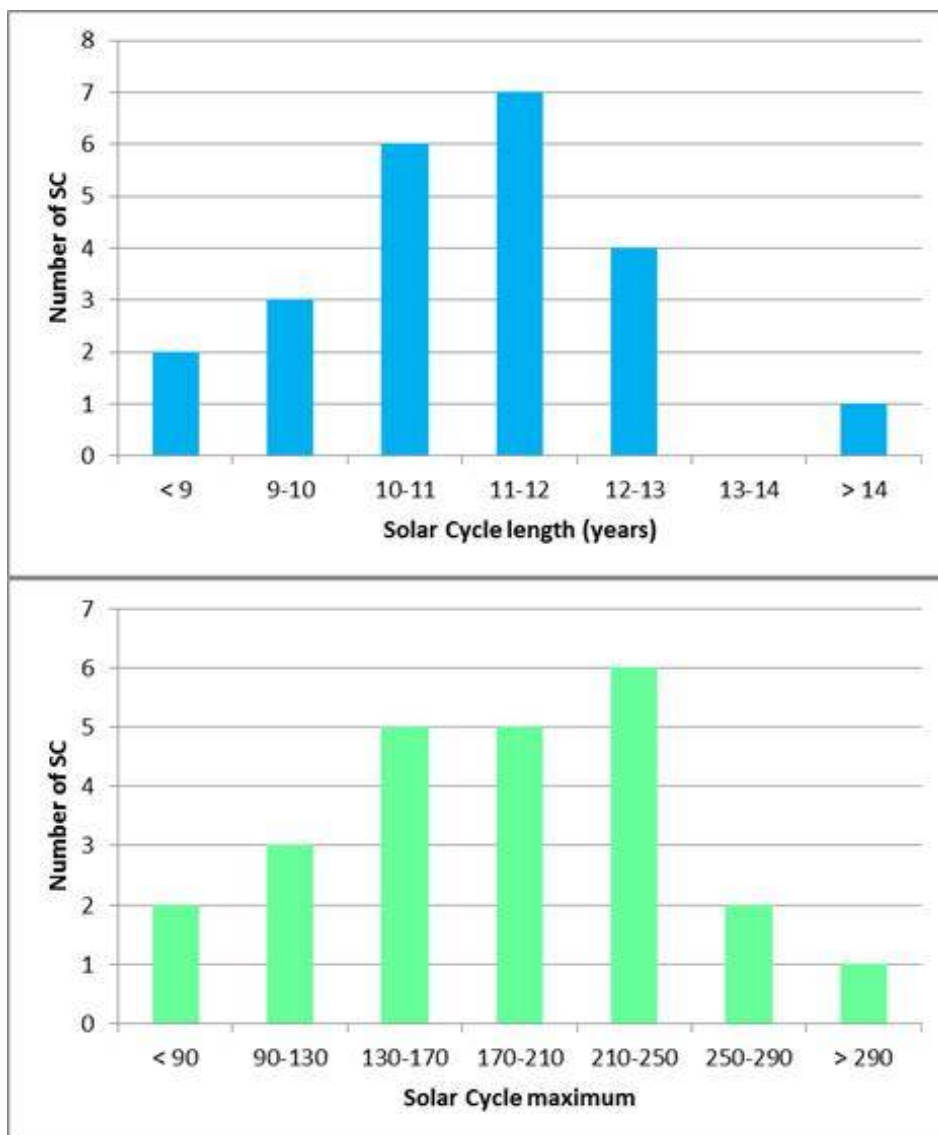


The graph above shows the various solar cycles according to the old and new version of the sunspot number resp. shown in blue and red color. The table underneath provides the timings for beginning,

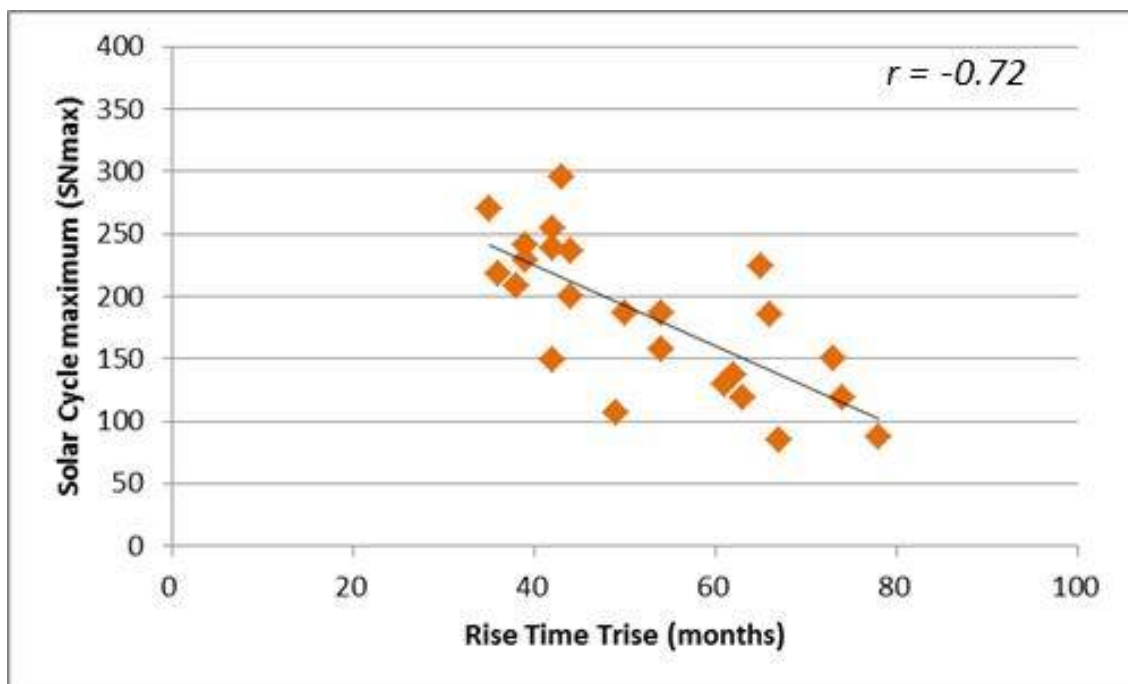
maximum and end of each SC, as well as the values for SC minimum and maximum, Trise and Tfall (in months). Data in italics indicate differences from the "Version 1.0" results, which can still be found e.g. at <http://users.telenet.be/j.janssens/Engzonnecyclus.html#Overzicht> The last two rows present the average and standard error for the various parameters.

SC_v2	Begin	Maximum	End	SNmin	SNmax	Trise	Tfall	Ttot
1	May 1755	Jun 1761	Aug 1766	<i>11.3</i>	<i>150.7</i>	73	62	135
2	Aug 1766	Oct 1769	Jun 1775	<i>16.0</i>	<i>208.9</i>	38	68	106
3	Jun 1775	May 1778	May 1784	<i>11.7</i>	<i>269.6</i>	35	72	107
4	May 1784	Nov 1787	Jun 1798	<i>15.2</i>	<i>239.0</i>	42	127	169
5	Jun 1798	Dec 1804	Aug 1810	<i>4.6</i>	<i>87.5</i>	78	68	146
6	Aug 1810	Mar 1816	Apr 1823	<i>0.0</i>	<i>84.6</i>	67	85	152
7	Apr 1823	Jun 1829	Aug 1833	<i>0.2</i>	<i>119.2</i>	74	50	124
8	Aug 1833	Feb 1837	Jul 1843	<i>12.4</i>	<i>254.7</i>	42	77	119
9	Jul 1843	<i>Dec 1848</i>	Jan 1856	<i>17.8</i>	<i>223.6</i>	<i>65</i>	<i>85</i>	150
10	Jan 1856	Jul 1860	Apr 1867	<i>6.3</i>	<i>187.1</i>	54	81	135
11	Apr 1867	Jul 1870	Dec 1878	<i>8.2</i>	<i>241.5</i>	39	101	140
12	Dec 1878	Jan 1884	Feb 1890	<i>3.2</i>	<i>130.1</i>	61	73	134
13	Feb 1890	Aug 1893	Sep 1901	<i>6.6</i>	<i>149.1</i>	42	97	139
14	Sep 1901	Oct 1905	Jun 1913	<i>4.8</i>	<i>106.6</i>	49	92	141
15	Jun 1913	Aug 1917	Apr 1923	<i>1.8</i>	<i>186.8</i>	50	68	118
16	Apr 1923	Jun 1928	Sep 1933	<i>9.3</i>	<i>136.7</i>	62	63	125
17	Sep 1933	May 1937	Apr 1944	<i>4.9</i>	<i>199.7</i>	44	83	127
18	Apr 1944	Jul 1947	Apr 1954	<i>10.8</i>	<i>228.3</i>	39	81	120
19	Apr 1954	Nov 1957	Aug 1964	<i>4.7</i>	<i>295.0</i>	43	81	124
20	Aug 1964	Feb 1969	Mar 1976	<i>12.6</i>	<i>157.9</i>	54	85	139
21	Mar 1976	Nov 1979	Sep 1986	<i>18.1</i>	<i>236.6</i>	44	82	126
22	Sep 1986	<i>Sep 1989</i>	May 1996	<i>14.1</i>	<i>217.9</i>	<i>36</i>	<i>80</i>	116
23	May 1996	<i>Nov 2001</i>	Dec 2008	<i>11.1</i>	<i>185.1</i>	<i>66</i>	<i>85</i>	151
24	Dec 2008	Mar 2014		<i>2.2</i>	<i>118.2</i>	63		
Average				8.7	183.9	52.5	80.3	132.3
St. Dev				5.5	59.4	13.3	15.5	15.4

Frequent users of the sunspot data will probably need some time to get used to the new values. For example, in the new version, the maximum of SC19 is now 295.0, in stead of 208.4 in the old version. For the ongoing SC24, maximum is 118.2 in stead of 83.7. Yet the overall distribution of the solar cycles for e.g. the total duration or the maximum sunspot number, remains pretty much the same as can be seen from graphs underneath (resp. blue and green bars). SC04, with its duration of 169 months, still remains an outlier compared to the other solar cycles, whereas SC02 and SC03 remain the only two solar cycles with a duration less than 9 years. The maximum of SC19 remains at the extremely high end, in contrast to SC05 and SC06 -constituting the famous Dalton minimum- which are the only two cycles with a maximum smoothed monthly sunspot number of less than 100.



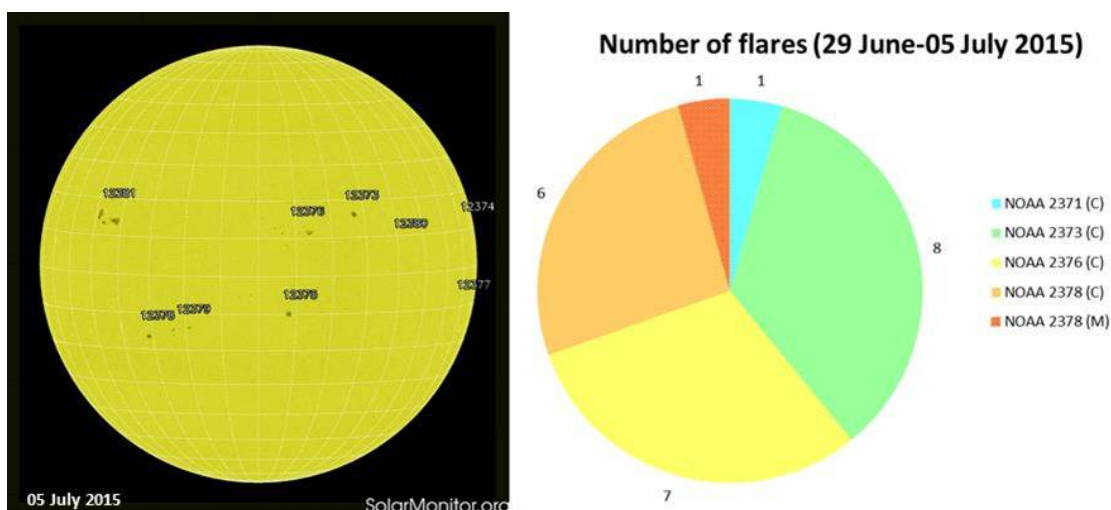
Some empirically found "laws" continue to hold. One of such laws is the famous Waldmeier law, stating that the longer (shorter) the rise time T_{rise} of a solar cycle, the lower (higher) the corresponding maximum (SN_{max}). This relationship still correlates quite well, though the correlation factor " r " ("best fit") has decreased somewhat: from $r = -0.77$ in the old version to the current $r = -0.72$.

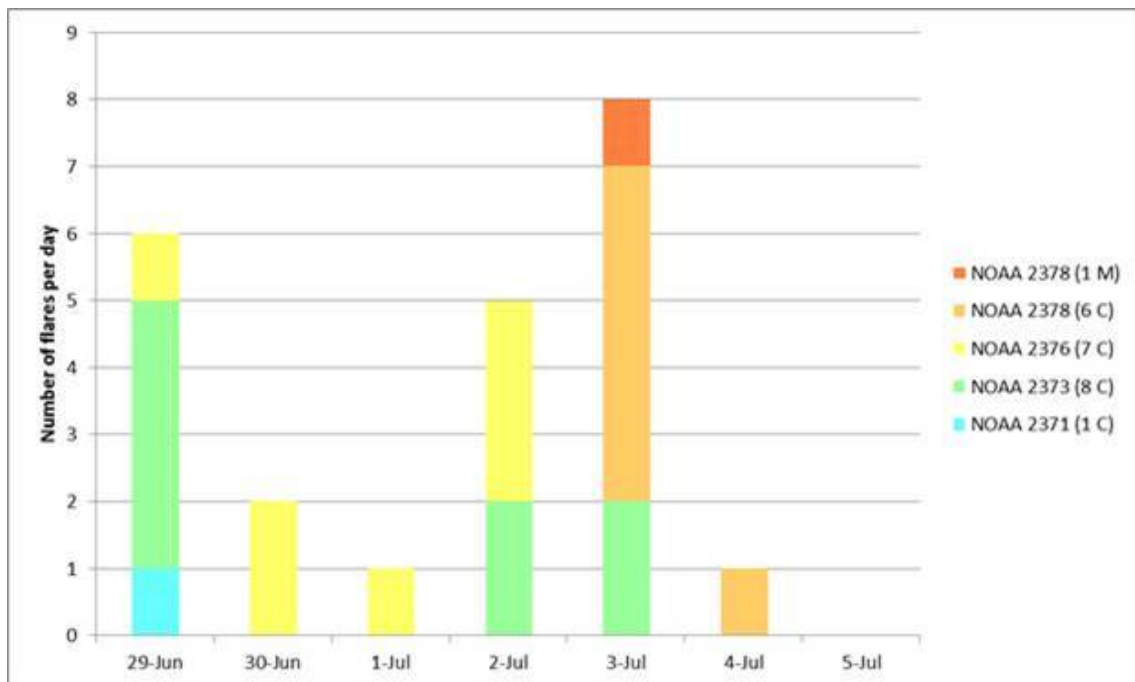


Credits - Data for the graphs in this news item were obtained from WDC-SILSO, Royal Observatory of Belgium, Brussels - <http://sidc.be/silso/home>

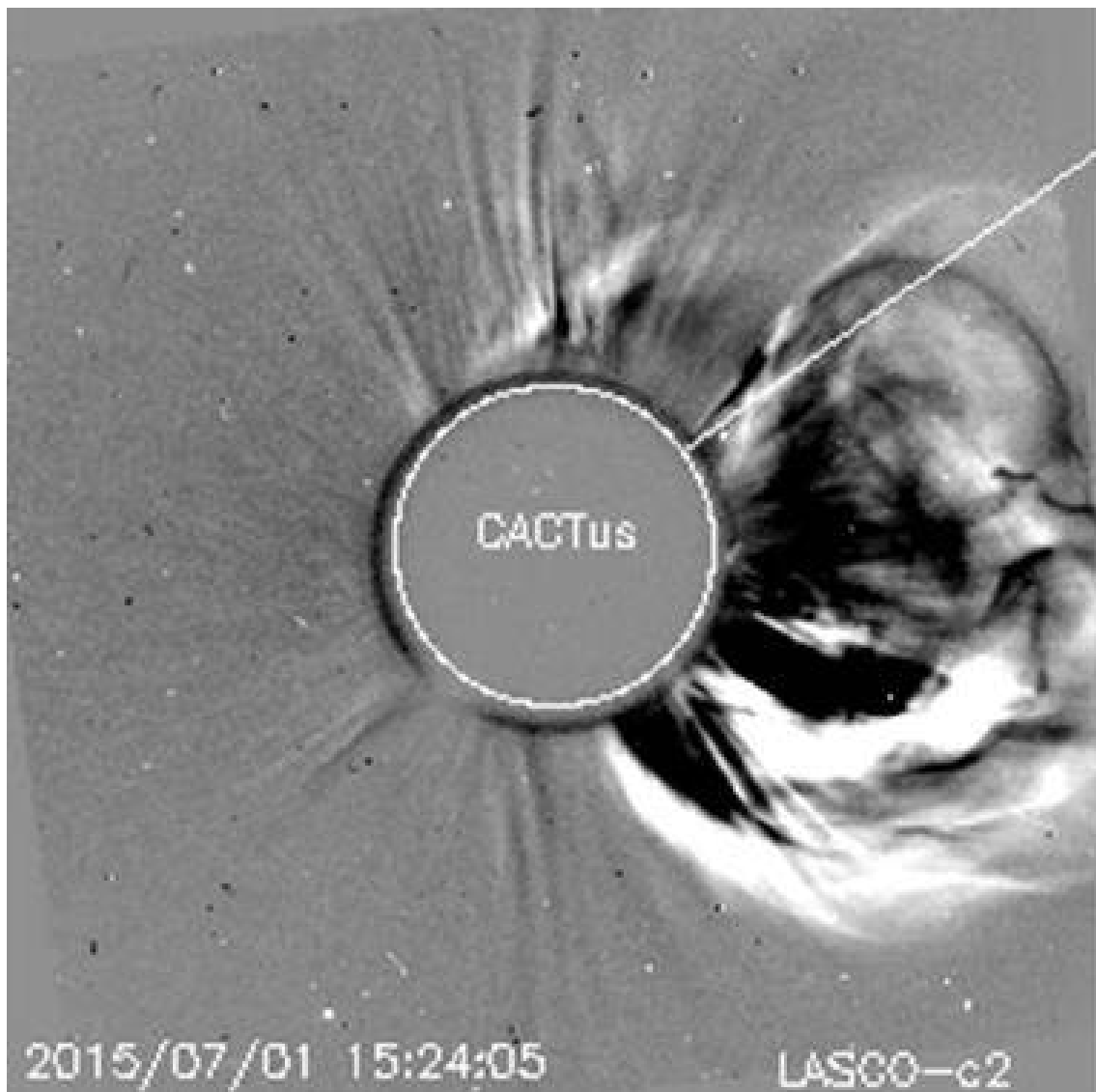
4. Review of solar activity

Solar activity was mostly dominated by active regions (AR) NOAA 2376 and 2373, and by NOAA 2378 later in the week. These groups produced several C-class flares and one M-class flares. AR 2378 has produced the largest flare of the week, an M1.5 peaking at 12:51UT on 03 July 2015. There was little evidence of a coronal mass ejection (CME) associated with the flare. No significant flares were recorded on 05 July, but NOAA 2381 was quickly increasing in size and magnetic complexity.





An eruption occurred from beyond the western solar limb on 1 July around 14:00UT. The eruption produced a full halo CME, which was detected by CACTus at 14:36UT on the same day, and had a velocity of 346 km/s. The CME exhibited no on-disk signatures and is believed to be back-sided, occurring close to the west limb.

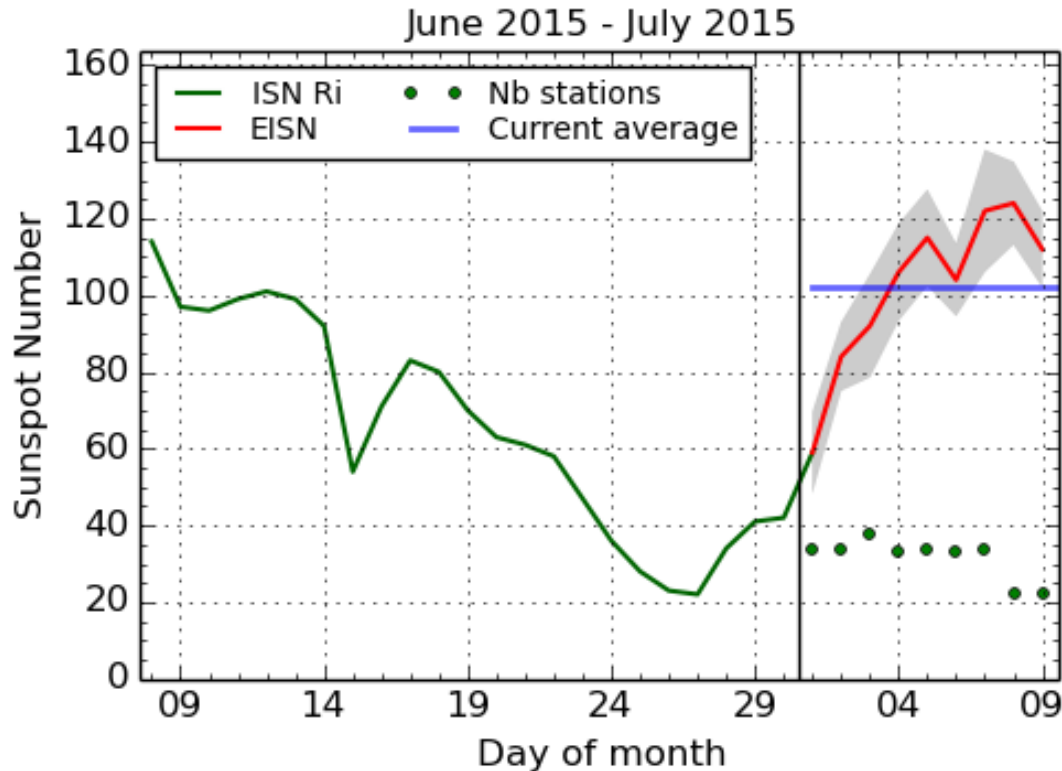


Several small ejections and flows were observed from beyond the northeast solar limb. An increase in solar activity is expected when the source region rotates into view. Solar proton levels were still enhanced but declining after last week's flaring activity. On 02 July 2015, there was a small increase in proton flux believed to be related to a back-sided halo CME, but this did not exceed 5 pfu (particle flux units) at the Earth. Following this, the proton flux was at nominal levels by the end of the week.



5. EISN - a flavour of the Sunspot Numbers

The Estimated International Sunspot Number



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium, 2015 July 9

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 (~ 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.

6. Noticeable Solar Events (29 Jun 2015 - 5 Jul 2015)

DAY	BEGIN	MAX	END	LOC	XRAY	OP	10CM	TYPE	Cat	NOAA
03	1247	1251	1253	S15E68	M1.5	1N			4	2378

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

7. PROBA2 Observations (29 Jun 2015 - 5 Jul 2015)

Solar Activity

Solar flare activity fluctuated between very low and moderate 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.

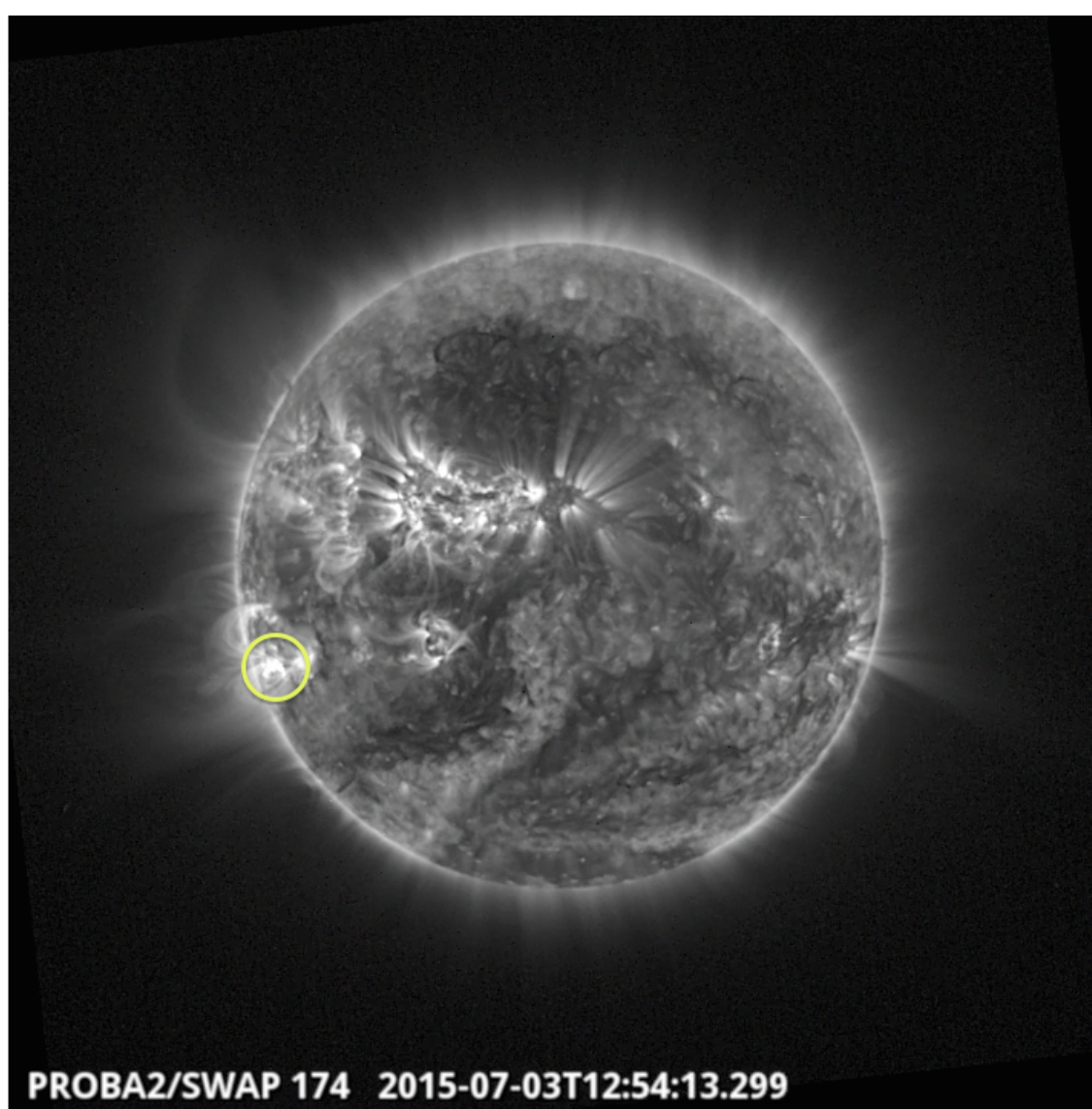
A weekly overview movie can be found here: http://proba2.sidc.be/swap/data/mpg/movies/weekly_movies/weekly_movie_2015_06_29.mp4 (SWAP week 275).

Details about some of this week's events:

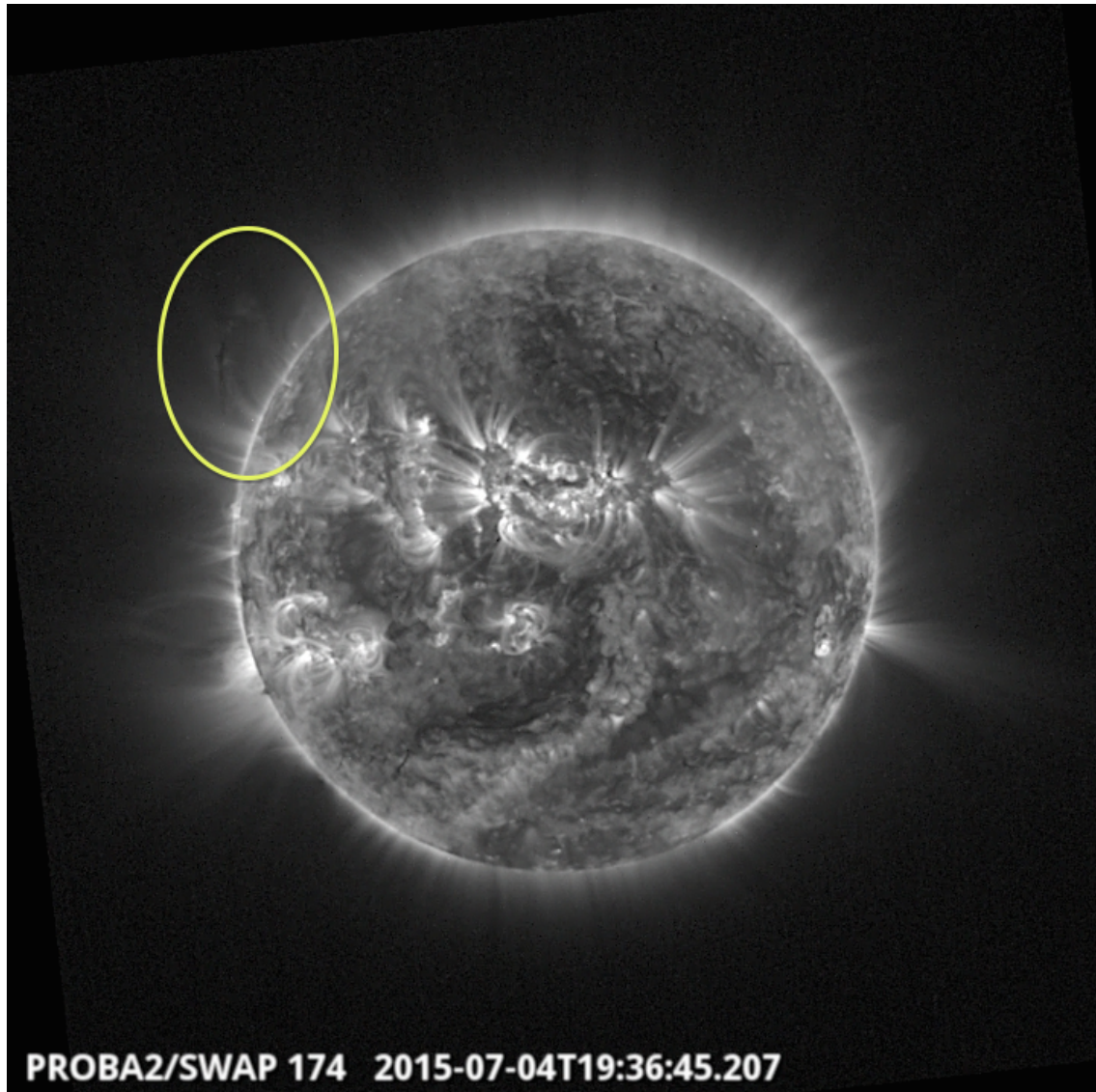
One strong flare occurred this week: on July 3rd, AR 2378 produced an M1.5 peaking around 12h51.

Below we provide an annotated SWAP image indicating the location of this flare on the solar disk.

A movie of this event can be found here: http://proba2.sidc.be/swap/data/mpg/movies/20150703_swap_movie.mp4 (SWAP daily movie).

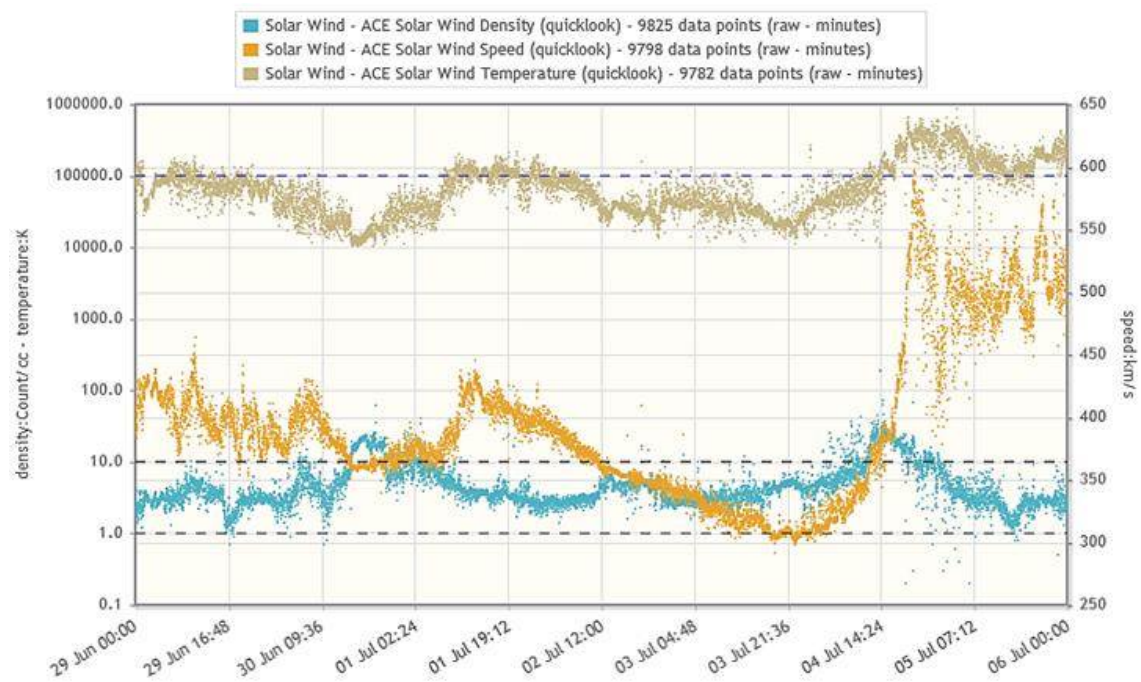


Throughout the week there were a series of prominence eruptions emerging from the north-east of the Sun, these eruptions were seen as a series of CMEs in LASCO coronagraph data. The source region was beyond the solar disk and all these events were backside. An example was on 2015-Jul-04 19:36 UT. See image below:

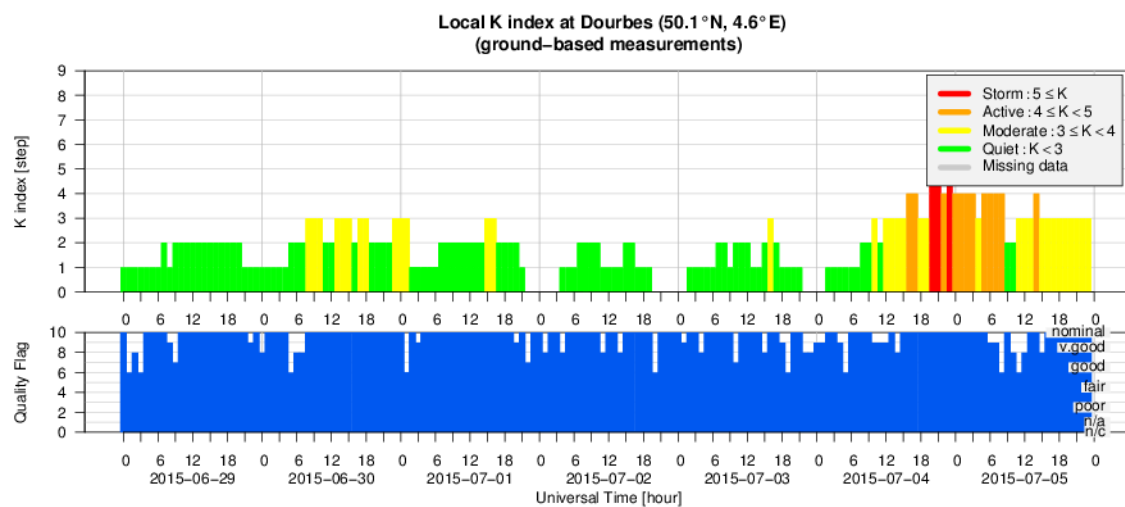


8. Review of geomagnetic activity

The solar wind speed remained low throughout the start of the week, mostly ranging between 300 km/s and 430 km/s. The speed then began rising on 04 July 2015, steady at first before rising fast and reaching a maximum near 600 km/s around 20:00UT on 04 July. Similarly, the total magnetic field remained low at the beginning of the week, around 6 nT, and peaked at approximately 20 nT at 18:00UT on 04 July. The density also peaked around 40 particles per cm³ (04 July, 14:00UT) and the temperature around 600,000 degrees at 22:00UT. Following these peaks, all these values began to decrease. The peak is believed to be caused by a co-rotating interaction region and coronal hole located in the southwest quadrant. These conditions, in combination with a fluctuating Bz, caused a geomagnetic storm with Kp (NOAA) reaching 6 and local K (Dourbes) reaching 5. No geoeffective CMEs were observed.

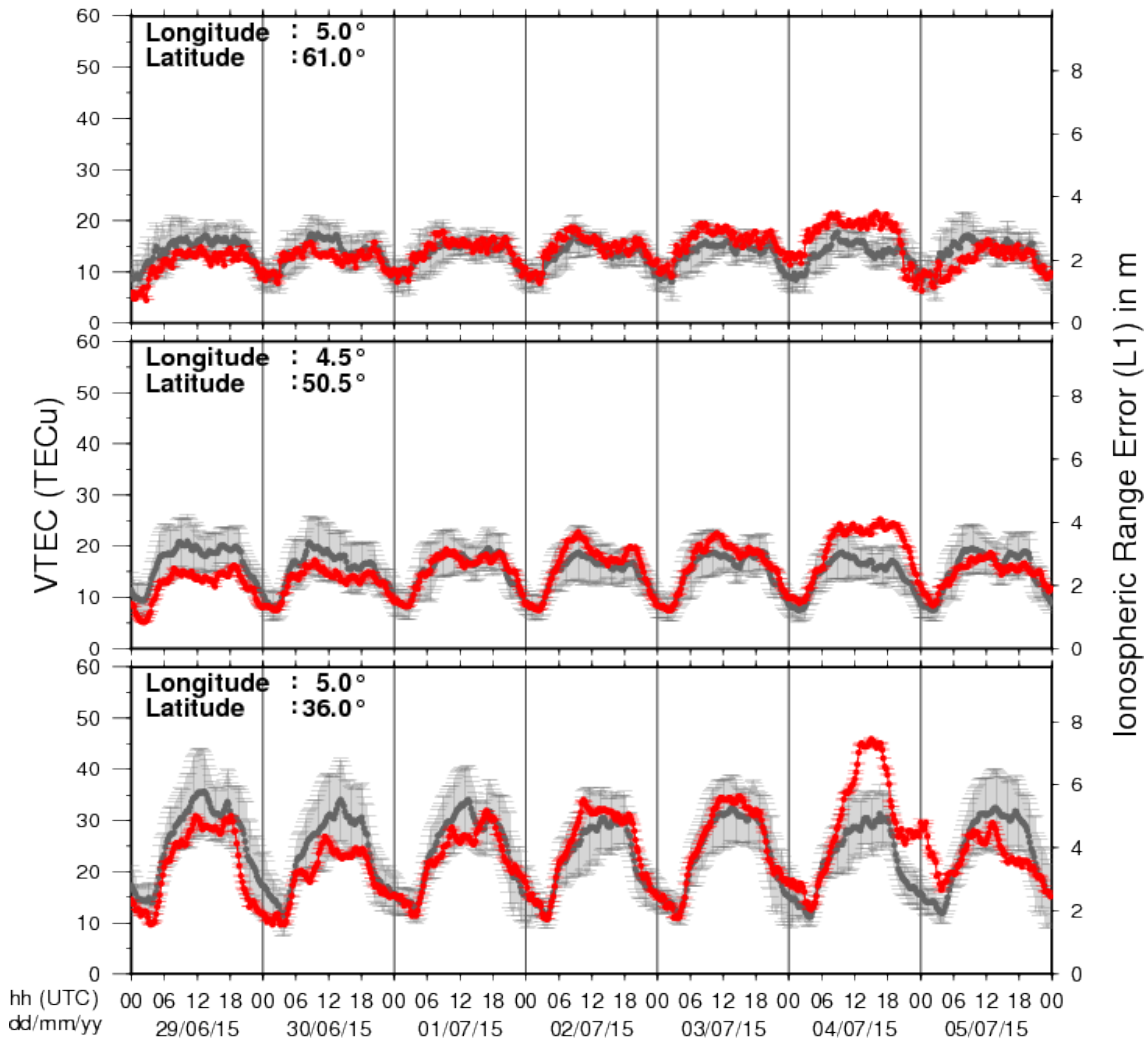


9. Geomagnetic Observations at Dourbes (29 Jun 2015 - 5 Jul 2015)



10. Review of ionospheric activity (29 Jun 2015 - 5 Jul 2015)

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:

- 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 $\text{TECu} = 10^{16}$ 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

11. Future Events

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

CISM Space Weather Summer School in Boulder, CO, USA

Start : 2015-07-13 - End : 2015-07-24

The CISM Summer School is intended to give students a comprehensive immersion in the subject of space weather: what it is, what it does, and what can be done about it. Space weather is many things: beautiful when seen through the eyes of a sun-viewing telescope, fascinating when studied for its alien worlds of magnetic structures and phenomena, awesome when witnessed as a solar eruption or auroral storm, and devastating to the users of services it disrupts. Space weather links the Sun, the Earth, and the space in between in a branching chain of consequences. Weather systems on the Sun can spawn interplanetary storms of colossal size and energy that envelop the whole planet in electrical hurricanes. Such storms attack high-tech, complex, and expensive technological systems that provide much of the infrastructure that allows modern society to function.

Website:

<https://www2.hao.ucar.edu/Events/2015-CISM-Summer-School>

Loops7: Heating of the Magnetically Closed Corona in Cambridge, UK

Start : 2015-07-21 - End : 2015-07-23

The conference will review past and recent achievements, as well as future challenges in the field of solar coronal loop physics.

Website:

<http://www.damtp.cam.ac.uk/user/astro/cl7/index.html>

Heliophysics Summer Schoool 2015: Seasons in Space: Cycles of variability of Sun-Planet systems, in Boulder, CO, USA

Start : 2015-07-28 - End : 2015-08-04

Heliophysics is all of the science common to the field of the Sun-Earth connections. This fast-developing field of research covers many traditional sub-disciplines of space physics, astrophysics, and climate studies. The NASA Living with a Star program, with its focus on the basic science underlying all aspects of space weather, acts as a catalyst to bring the many research disciplines together to deepen our understanding of the system of systems formed by the Sun-Earth connection.

Website:

<http://www.heliophysics.ucar.edu/>

34th International Cosmic Ray Conference (ICRC) in The Hague, The Netherlands

Start : 2015-07-30 - End : 2015-08-06

The 34th International Cosmic Ray Conference (ICRC) will be held from July 30 to August 6, 2015, in The Hague, The Netherlands. It is an important and large conference in the field of Astroparticle Physics. The ICRC covers: cosmic-ray physics, solar and heliospheric physics, gamma-ray astronomy, neutrino astronomy, and dark matter physics.

Website: <http://icrc2015.nl>

SOLARNET III / HELAS VII: The Sun, the stars, and solar-stellar relations, in Freiburg (Germany)

Start : 2015-08-31 - End : 2015-09-04

The purpose of this conference is to discuss the latest questions and results in solar and stellar physics. Solar and stellar seismology will be one particular focus but contributions on all aspects of solar-stellar relations will be welcome. We aim to establish links and synergies between the day- and night-time fields of astrophysics.

Website:

<http://www.iac.es/congreso/solarnet-3meeting/>

1st Joint Solar Probe Plus-Solar Orbiter Workshop, in Florence (Italy)

Start : 2015-09-02 - End : 2015-09-04

The Workshop will address how the joint exploration of the corona and inner heliosphere will lead to advances in our understanding of coronal heating and solar wind acceleration, the magnetic and plasma structure of the heliosphere, and the acceleration of energetic particles at shocks and flares. The workshop will inspire research that will make use of SO and SPP observations within the context of the NASA Heliophysics Observatory System and identify key areas for preparatory research. Synergistic observations from other ground based and space based assets will also be addressed.

Website:

<http://www.solarprobeplus.org/2015/>

International Workshop and School on Solar System plasma in Mamaia, Romania

Start : 2015-09-06 - End : 2015-09-13

The International Workshop and School on solar system plasma turbulence, intermittency and multifractals (STORM 2015) focus on the quantitative experimental, theoretical and numerical investigation of turbulence, intermittency, fractal/multifractal features, waves and coherent structures interaction, criticality and non-linear cross-scale coupling. As widely documented by in-situ satellite measurements and remote or ground-based observations, turbulence, intermittency and dynamical complexity are quite ubiquitous processes observed in the dynamics of solar, planetary and interplanetary plasmas, as well as in the dynamical evolution of proxies linked to magnetospheric and ionospheric variability.

Unfolding the spatio-temporal structure of magnetic field and plasma fluctuations from experimental observations and numerical simulations provides further insight on the structure of plasma turbulence and intermittency. On the theoretical side, the understanding of such complex dynamical behavior cannot be simply surmised from the basic fluid/kinetic equations, but instead requires novel theoretical, experimental and data analysis approaches. The workshop is a forum to present and discuss latest results in these fields. The purpose of the school is to give to a young audience of Graduate, Ph.D. students, and postdoc scientists, which ideally represents the next generation of scholars in the physics of space plasmas, an overall view of both theoretical and data analysis tools apt to fully exploit unique and unprecedented observations that will be provided by future upcoming mission like Solar Orbiter and Solar Probe Plus.

Website:

<http://www.space-science.ro/conferences/storm2015/>

3rd UK-Ukraine-Spain meeting on solar physics and space science in Lviv, Ukraine

Start : 2015-09-07 - End : 2015-09-11

The meeting will cover various aspects of solar physics and space weather related processes. The special emphasis will be paid to progress in data-driven simulations and high-resolution spectro-polarimetry as powerful diagnostic techniques to unravel information about magnetic fields in the photosphere and chromosphere of the Sun.

Website:

http://ssg.group.shef.ac.uk/Conferences/Ukraine_UK_2015/index.html

Summer School on Computational Solar and Astrophysical Modeling in Juelich, Germany

Start : 2015-09-14 - End : 2015-09-18

This summer school will acquaint a generation of young researchers (advanced master students, PhDs, and junior postdoctoral researchers) to modern open-source software efforts adapted to High Performance Computing platforms, with a deliberate focus on hands-on sessions. In these sessions, participants will work with three different open-source software packages, learn about their typical applications and evaluate their performance aspects on massively parallel systems.

Website:

http://www.fz-juelich.de/ias/jsc/EN/Expertise/Workshops/Conferences/CSAM-2015/_node.html

Hinode 9 - International Science Meeting in Belfast, UK

Start : 2015-09-14 - End : 2015-09-18

Hinode is a solar satellite funded jointly by JAXA, NASA, ESA and STFC/UKSA that has entered its ninth year of operations. It has had a major impact across many areas of solar physics and facilitated many fundamental discoveries. These findings are documented in over 850 papers in the refereed literature and hundreds of papers in conference proceedings. With 96 refereed publications in 2013 and more than 81 papers in 2014, Hinode has remained scientifically highly productive. A non-exhaustive list indicates over 100 students globally who are undertaking or have completed PhDs using Hinode data. With the Solar Orbiter on the horizon, there is a good chance that the two missions will operate at the same time. The meeting will help the solar physics community to maximise the science return from the Orbiter.

Website:

<https://star.pst.qub.ac.uk/wiki/doku.php/public/hinode9/start>

RADECS-2015 in Moscow, Russia

Start : 2015-09-14 - End : 2015-09-18

The aim of RADECS conferences is to provide an annual European forum for the presentation and discussion of the latest advances in the field of radiation effects on electronic and photonic materials, devices, circuits, sensors, and systems. The scope of the conference encompasses technological processes and design techniques for producing radiation tolerant systems for space, aeronautical or terrestrial applications, as well as relevant methodologies for their characterization and qualification. The conference features a technical program, an Industrial Exhibition, and one day tutorial or "short course" on radiation effects. The technical program includes oral and poster sessions and round tables.

Website:

<http://www.radecs2015.org/>

Multi-wavelength Studies of the Solar Atmosphere: Celebrating the Career of Costas Alissandrakis in Ioannina, Greece

Start : 2015-09-21 - End : 2015-09-24

On the occasion of the forthcoming retirement of Prof. Costas Alissandrakis, we organize an international solar physics conference as a tribute to his career. Speakers will address the present state of knowledge of topics that include: The quiet Sun; Coronal/chromospheric heating; Solar magnetic fields; Active regions; Flares; Coronal mass ejections; and Shocks.

Website: <http://solar15.uoi.gr/>

Heliospheric physical processes for understanding Solar-Terrestrial Relations in L'Aquila, Italie

Start : 2015-09-21 - End : 2015-09-26

A good understanding of solar-terrestrial processes is fundamental to modelling the influence of solar variability on the Earth's environment and climate. To capture all the physical aspects of the solar wind-magnetosphere-ionosphere-atmosphere interaction, and also the impact of solar variability on climate, the Sun-Earth system has to be studied as a whole. The main purpose of this school is to provide

graduate, PhD students and also young post-doc researchers with a global view of the main physical processes by which solar variability affects the Earth's environment. In addition, an overview of different data analysis and methods for describing solar-terrestrial relations will be given. The school will provide a mix of lectures and activities requiring students participation.

Website:

<http://www.cifs-iss.org/>

Ground-based Solar Observations in the Space Instrumentation Era in Coimbra, Portugal

Start : 2015-10-05 - End : 2015-10-09

This CSPM-2015 scientific meeting will cover various aspects of solar dynamic and magnetic phenomena which are observed over the entire electromagnetic spectrum: white-light, H α , Ca II, and radio from ground and in a variety of other wavelengths (white light, UV and EUV, and X-rays) from space. Emphasis will also be placed on instrumentation, observing techniques, and solar image processing techniques, as well as theory and modelling through detailed radiative transfer in increasingly realistic MHD models. The long-term (cyclic) evolution of solar magnetism and its consequence for the solar atmosphere, eruptive phenomena, solar irradiation variations, and space weather, will be in focus. Here, special attention will be devoted to the long-term observations made in Coimbra and also to the results of the SPRING / SOLARNET and SCOSTEP VarSITI studies. In particular, the weak solar activity during the current solar maximum will be discussed. Finally, since this meeting is organised around the 90th anniversary of performing the first spectroheliographic observations in Coimbra, a session will be specially dedicated to new solar instruments (both ground-based and space-borne) that will give access to unexplored solar atmospheric features and dynamic phenomena over the coming years.

Website:

<http://www.mat.uc.pt/~cspm2015/>

AMS-02 Energetic Particle Workshop in Hawaii, USA

Start : 2015-10-18 - End : 2015-10-24

The workshop aims to bring together experts in the field of cosmic rays and solar energetic particles with an additional focus on their propagation inside the heliosphere and their interaction with the magnetosphere. The talks will present the most recent results related to solar energetic particles (SEPs), solar modulation, space radiation and related phenomena.

Website:

<http://www.phys.hawaii.edu/ams02/pages/workshop.php>

Third Remote Sensing of the Inner Heliosphere and Space Weather Applications Workshop in Morelai, Michoacan (Mexico)

Start : 2015-10-19 - End : 2015-10-23

The workshop aims to gather experts from the various fields of remote sensing observations of the inner heliosphere, including white light, EUV, and radio observation, together with modellers in order to tackle key outstanding science and space weather operational issues, establish closer working relations, and devise the best ways to move the field forward as a whole. In addition, the science learned from remote sensing observations is critical to improving our capabilities of space weather forecasting. The workshop aims to look at ways in which we can more easily and efficiently share and access the various types of data between individual groups and subcommunities and to officially launch the IPS Common Data Format v1.0 (IPSCDFv1.0) now in use. It also aims to allow investigations into ways in which we model the inner heliosphere looking at the advantages and disadvantages of the available modelling, updates on present and future remote sensing capabilities, and investigating further the ways in which these data sets all complement each other and are necessary to gain knowledge and understanding of the fundamental physical processes that occur within the inner heliosphere. These are critical processes that are key to both Heliophysics science as well as to space weather operations and forecasting.

Website:

<http://www.sciesmex.unam.mx/workshop2015/>

12th Potsdam Thinkshop in Potsdam, Germany

Start : 2015-10-26 - End : 2015-10-29

In the tradition of the series of «Potsdam Thinkshops», we invite instrument specialists, observers, modellers, and theorists to exchange ideas, to stimulate discussion, to initiate future collaborations among participants, and to attract new users of instruments by showcasing the capabilities. The aim is to make progress towards a comprehensive description of solar eruptive events effectively aggregating their global properties as well as their highly dynamic fine structure.

Website:

<https://thinkshop.aip.de/12/cms/>

SEST/MiniMax Workshop in Mexico City, Mexico

Start : 2015-10-26 - End : 2015-10-30

The workshop is to improve the scientific understanding of the origin and propagation of solar transients, and develop the prediction capacity of these transients' arrival and potential impact on the Earth. The workshop engages coordinated international activities in observation, theory and modeling, and involves scientists in both developed and developing countries, and provides an online platform for educational opportunities for students.

Website:

<http://cintli.geofisica.unam.mx/congreso/>

2015 Sun-Climate Symposium in Savannah, Georgia, USA

Start : 2015-11-10 - End : 2015-11-13

Observations of the Sun and Earth from space have revolutionized our view and understanding about impacts of solar variability and anthropogenic forcing on Earth climate. For more than three solar cycles since 1978, the total and spectral solar irradiance (TSI and SSI) and global terrestrial atmosphere/surface have been observed continuously, enabling unprecedented quality data for Sun-climate studies. The primary objective of this symposium is to convene climate scientists, solar physicists, and experimentalists together for a better understanding how Earth climate system changes and responds to solar variability.

Website: <http://lasp.colorado.edu/home/sorce/news-events/meetings/2015-sun-climate-symposium/>

European Space Weather Week in Ostend, Belgium

Start : 2015-11-23 - End : 2015-11-27

The European Space Weather Week (ESWW) is the European forum for Space Weather users, forecasters, scientists and the involved industries, as proven by the high attendance to the ESWW 11 in November 2014.

The ESWW 12 will be held in Belgium in November, 23-27, 2015 and its organisation has already started and is benefiting from the experience and inputs from the past editions.

Website: <http://stce.be/esww12/>

AGU Chapman Conference on Currents in Geospace and Beyond in Dubrovnik, Croatia

Start : 2016-05-22 - End : 2016-05-27

Electric currents are fundamental to the structure and dynamics of space plasmas, including our own near-Earth space environment (also called "geospace"). This recognition is one of the great achievements in space research, going back to the beginning of the last century. With the current multi-spacecraft missions, such as Cluster, THEMIS and Swarm, we have unprecedented opportunities to unravel many of the intriguing puzzles about electric currents.

The conference will provide a forum in which various space science communities can come together to discuss recent achievements of observational, theoretical, and modelling studies. The emphasis will be on cross-disciplinary science sessions.

Website:

<http://chapman.agu.org/spacecurrents/general-informationabout-conference/>

41st COSPAR Scientific Assembly in Istanbul, Turkey

Start : 2016-07-30 - End : 2016-08-07

The 41st COSPAR Scientific Assembly will be held in Istanbul, Turkey from 30 July - 7 August 2016. This Assembly is open to all bona fide scientists.

Website:

<https://www.cospas-assembly.org/>

IAU Symposium 327: Fine Structure and Dynamics of the Solar Atmosphere in Cartagena de Indias, Colombia

Start : 2016-10-09 - End : 2016-10-13

The scientific goal of this symposium is to discuss recent results on the processes shaping the structure of the solar atmosphere and driving plasma eruptions and explosive events. Activity of the solar atmosphere entails numerous multi-scale processes. State-of-the-art solar instrumentation is revealing the dynamics of the Sun with unprecedented temporal and spatial resolutions. Together with advanced numerical simulations these investigations are making new steps in our understanding of the complex dynamical structure of the solar atmosphere.

Major unsolved problems of astrophysics such as how the solar corona is heated and how the solar wind and heliosphere are powered have their roots in the origin of small-scale magnetic fields constituting the Sun's 'magnetic carpet' in the photosphere and appearing as 'magnetic canopy' in the chromosphere.

Website:

<http://www.iau.org/science/meetings/future/symposia/1160/>