STCE Newsletter

22 Aug 2022 - 28 Aug 2022



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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. Review of solar activity

Flares

Solar activity reached high levels over the past week, with M7.2-class flare on 26 August 12:14 UTC from NOAA AR 3089 being the flare with the largest X-ray output. There were nine active regions present on the solar disc, most of them of small complexity and fairly stable. Of most interest were NOAA AR 3088 and 3089, which grew during the second part of the week and dominated the flaring activity.

Coronal Mass Ejections

Numerous Coronal Mass Ejections (CME) took place, which where either back sided or originated from NOAA AR 3088. The most noteworthy was the ICME on 27 August 02:12 UTC, associated with the M4.8-class flare 27 July 02:40 UTC (as well as type II and IV radio emissions and dimming). Said ICME arrived after the end of the past week.

Solar particles

A proton event was recorded when the greater than 10 MeV proton flux exceeded the 10 pfu threshold 27 August 11:53-21:45 UTC, as a response to the occurrence of the ICME of 27 August.

The greater than 2MeV electron flux was above the 1000 pfu threshold for the majority of the week, decreasing to below threshold from 27 August. Similarly, the 24h electron fluence started was at moderate levels for the majority of the week as well.

2. Review of geomagnetic activity

At the start of the week the solar wind parameters reflected waning high speed stream influences. After returning to background levels at the middle of the week, a possible arrival of a glancing blow on 27 August 08:36 UTC. There are multiple candidates for this, it is mostly believed it had been the CME 26 August 13:36 UTC for NOAA AR 3088.

Geomagnetic conditions reached active conditions at the time of the possible glancing blow of 27 August (NOAA Kp=Local K Dourbes 4).

3. PROBA2 Observations (22 Aug 2022 - 28 Aug 2022)

Solar Activity

Solar flare activity fluctuated from very low to 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: https://proba2.oma.be/ssa

This page also lists the recorded flaring events.

A weekly overview movie can be found here (SWAP week 648). https://proba2.sidc.be/swap/data/mpg/ movies/weekly_movies/weekly_movie_2022_08_22.mp4

Details about some of this week's events can be found further below. If any of the linked movies are unavailable they can be found in the P2SC movie repository here https:// proba2.sidc.be/swap/data/mpg/movies/ Wednesday Aug 24



Until the end of the week, the active region NOAA 3086 is surrounded by a coronal hole in the South-East hemisphere - SWAP image. Find a movie of the events here (SWAP movie) https:// proba2.sidc.be/swap/data/mpg/movies/20220824_swap_movie.mp4

Friday Aug 26



The largest flare of the week, an M7.2 flare, erupted in the NOAA active region 3089 - SWAP image. Find a movie of the events here (SWAP movie) https://proba2.sidc.be/swap/data/mpg/movies/20220826_swap_movie.mp4

Saterday Aug 27



A shock wave produced by an M4-class flare was observed around 02:43 UT in the South West quadrant.- SWAP image. Find a movie of the events here (SWAP movie) https://proba2.sidc.be/swap/ data/mpg/movies/20220827_swap_movie.mp4

4. The International Sunspot Number by SILSO



SILSO graphics (http://sidc.be/silso) Royal Observatory of Belgium, 2022 September 2

The 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), a few days more than one solar rotation. The horizontal blue line shows the current monthly average. The yellow dots gives the number of stations that provided valid data. Valid data are used to calculate the EISN. The triangle gives the number of stations providing data. When a triangle and a yellow dot coincide, it means that all the data is used to calculate the EISN of that day.

DAY	BEGIN	MAX	END	LOC	XRAY	OP	10CM	TYPE	Cat	NOAA
25	1939	1951	2002		M1.8					3088
25	2321	2327	2332	S20E61	M1.0	1N				3089
26	1041	1055	1105	S22E52	M2.1	1N			22	3089
26	1208	1214	1221	S22E51	M7.2	1B			22	3089
26	1224	1231	1238		M5.3				22	3089
27	0152	0240	0305	S19W58	M4.8	SF	130	II/1IV/1	21	3088
27	1129	1138	1143	S28W66	M1.2	SN			21	3088
27	1513	1525	1530	S28W71	M1.1	SF			21	3088
27	1545	1558	1621		M1.8			CTM/1	21	3088
28	0047	0134	0138		M1.4				21	3088

5. Noticeable Solar Events (22 Aug 2022 - 28 Aug 2022)

28	1548	1619	1646	S28W80	M6.7	SF	III/2VI/1IV/121	3088
28	1820	1832	1850		M4.6		21	3088

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

6. Geomagnetic Observations at Dourbes (22 Aug 2022 - 28 Aug 2022)



7. The SIDC space weather briefing

The Space Weather Briefing presented by the forecaster on duty from Aug 21 to 28. It reflects in images and graphs what is written in the Solar and Geomagnetic Activity report: https://www.stce.be/briefings/20220829_SWbriefing.pdf

SIDC Space Weather Briefing

21 August 2022-28 August 2022

Konstantina Loumou & the SIDC forecaster team

★ ★ ★ ★ ★ Royal Observatory ★ ★ ★ ★ ★ of Belgium Solar Influences Data analysis Centre www.sidc.be

If you need to access the movies, contact us: stce_coordination at stce.be

8. Action!

Check out our activity calendar: activities and encounters with the Sun-Space-Earth system and Space Weather as the main theme. We provide occasions to get submerged in our world through educational, informative and instructive activities.

If you want your event in our calendar, contact us: stce_coordination at stce.be

* September 24-25 Space Pole Open Days, Brussels, Belgium

* October 11, Webinar: Putting the FAIR principles into practice: the journey of a GNSS data repository, GNSS@Royal Observatory of Belgium

* October 24-28, 18th European Space Weather Week, Zagreb, Croatia

* November 21-23, Space Weather Introductory Course - onsite, by the STCE, Brussels, Belgium - fully booked

* December 5, 6, 8, 9, Space Weather Introductory Course - online, by the STCE, zoom - fully bookes Check: https://www.stce.be/calendar

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