

# QUARTERLY REPORT ON PAST SPACE WEATHER

Q1 2022

16.12.2021 – 31.3.2022

## SUNSPOT NUMBERS

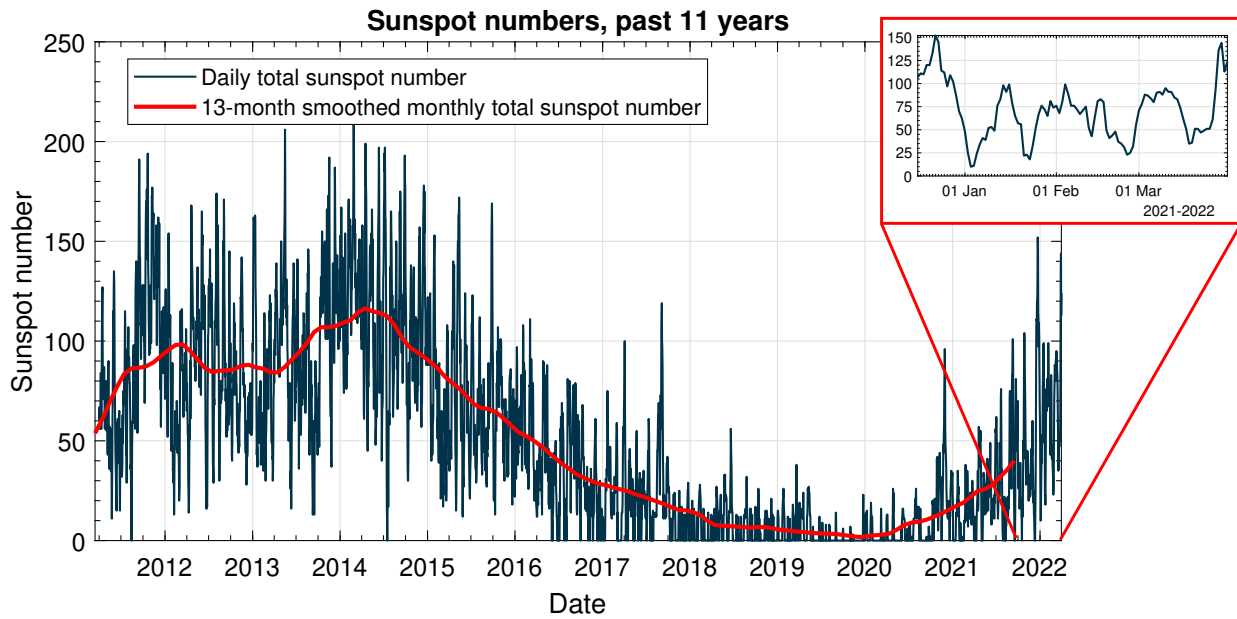


Figure 1: Sunspot numbers for the past 11 years and the last quarter. (Data from SILSO)

## FLARES

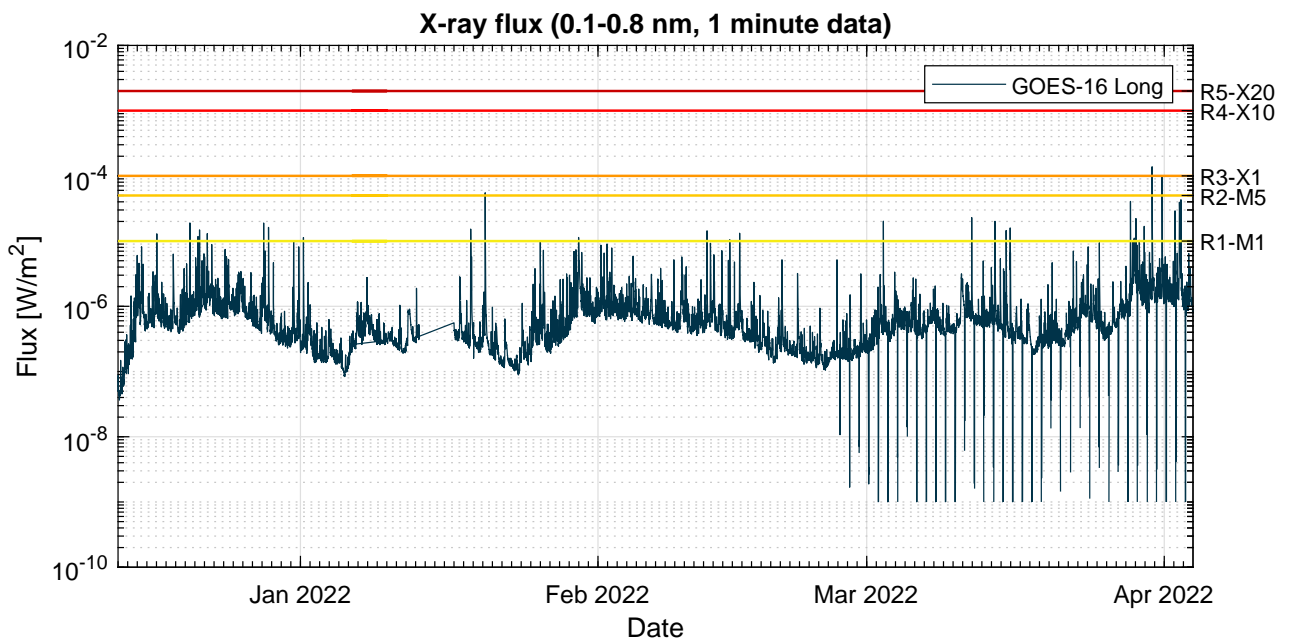
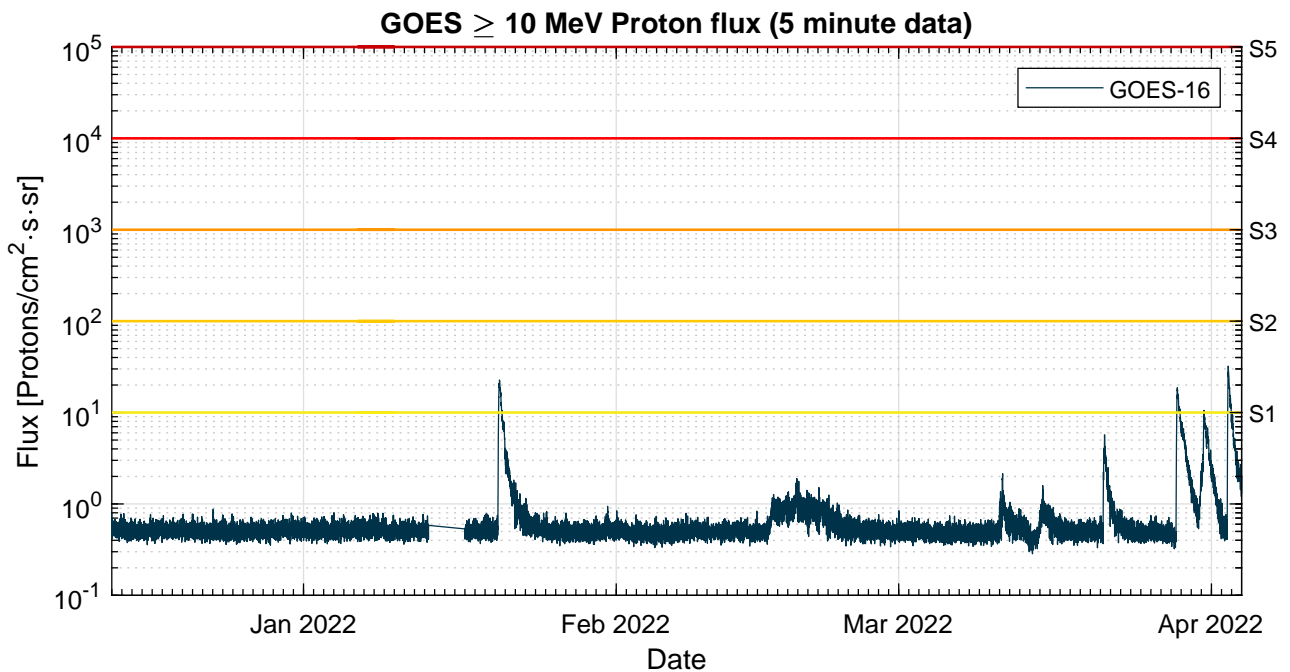


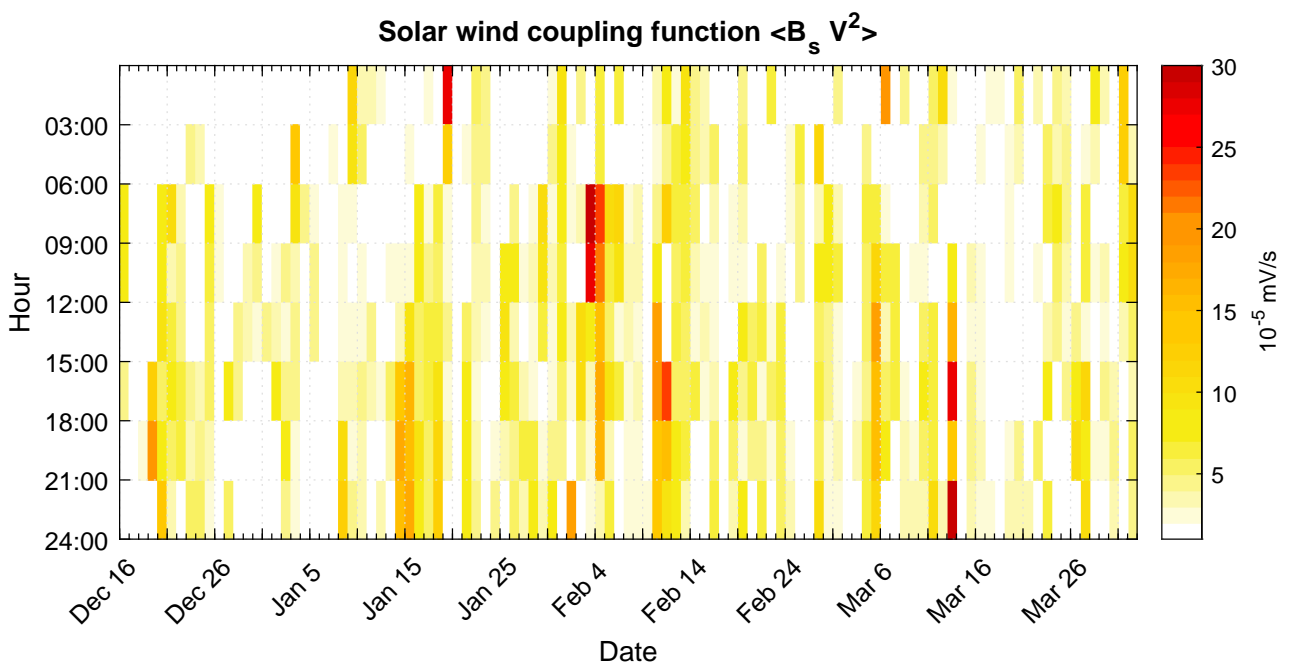
Figure 2: GOES X-ray flux (GOES – SWPC/NOAA) together with the NOAA Space weather scale thresholds for radio blackouts. (For more information on the NOAA Space Weather Scales, see <https://www.swpc.noaa.gov/noaa-scales-explanation>)

**SOLAR ENERGETIC PARTICLES**



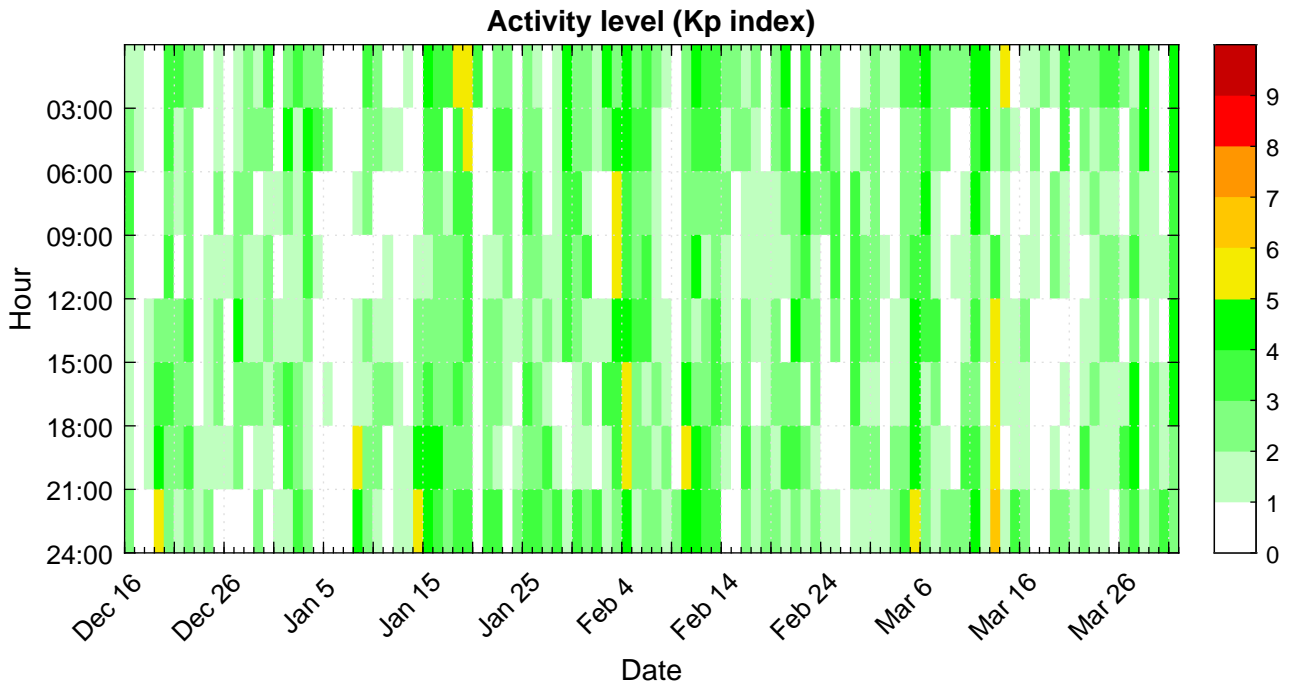
**Figure 3:** GOES proton flux (GOES - SWPC/NOAA) together with the NOAA Space weather scale thresholds for Solar Radiation Storms. (For more information on the NOAA Space Weather Scales, see <https://www.swpc.noaa.gov/noaa-scales-explanation>)

**SOLAR WIND**



**Figure 4:** 3-hourly mean values of the Solar wind coupling function  $\langle B_s V^2 \rangle$  based on ACE data. (NOAA/SWPC)

**GEOMAGNETIC CONDITIONS**



**Figure 5:** Kp index. (Data from GFZ Potsdam.)

**CMES AND HIGH-SPEED STREAMS**

**Table 1:** Major geoeffectivet CMEs and High-speed streams

Date	Type	Start (UT)	Storm level	Max Kp
15. December 2021	High-speed stream	02:40		3.3
19. December 2021	Shock/High-speed stream	12:08	minor	5
27. December 2021	Shock/High-speed stream	08:38		4
29. December 2021	High-speed stream			3
1. January 2022	High-speed stream			4
8. January 2022	High-speed stream		minor	5
14. January 2022	CME		minor	5.7
15. January 2022	High-speed stream	14:30		4.7
17. January 2022	CME		minor	5
18. January 2022	CME		minor	5.3
21. January 2022	CME			3.3
24. January 2022	CME + High-speed stream			3.3
29. January 2022	CME	23:36	minor	4

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Date	Type	Start (UT)	Storm level	Max Kp
3. February 2022	CME (same as 29.)		minor	5.3
4. February 2022	CME		minor	5.3
9. February 2022	Shock/CME		minor	5
20. February 2022	High-speed stream			4.7
27. February 2022	High-speed stream			3.7
5. March 2022	High-speed stream		minor	5.3
11. March 2022	CME		minor	4.7
13. March 2022	Shock/CME	10:15	moderate	6.3
16. March 2022	CME			2
20. March 2022	High-speed stream			3.7
31. March 2022	Shock/CME	01:41	minor	4.7

(Source: Solar Influences Data analysis Center – RWC Belgium )

## ACKNOWLEDGEMENTS

Data from:

SILSO - <http://www.sidc.be/silso/>

GOES - <https://www.ngdc.noaa.gov/stp/satellite/goes/index.html>

DONKI - <https://kauai.ccmc.gsfc.nasa.gov/DONKI/>

DSCOVR/ACE – NASA/NOAA /SWCP - <https://www.ngdc.noaa.gov/dscover/portal/index.html#/>

GFZ Potsdam - <https://www.gfz-potsdam.de/en/kp-index/>