P2SC-ROB-WR-749 - 20240729	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Jul 29 to Sun Aug 4, 2024 6 Aug 2024 Marie Dominique Marie Dominique	Royal Observatory of Belgium - PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP PI, elke.dhuys@sidc.be	https://proba2.sidc.be ++ 32 (0) 2 3730559
cc:	ROB DIR, ronald@oma.be ESA Redu, Rene.Wittmann@esa.int and Marcus.De.Deus.Silva@esa.int ESA D/SRE, Joe.Zender@esa.int ESA D/TEC, Juha-Pekka.Luntama@esa.int and Melanie.Heil@esa.int	

1. Science

Solar & Space weather events

The level of solar activity[1] fluctuated between **moderate and high** this week.

Only M- and X-flares are mentioned, the most energetic one(s) per day are presented in **bold**:

	Monday 29 Jul	Tuesday 30 Jul	Wednesday 31 Jul	Thursday 1 Aug	Friday 2 Aug	Saturday 3 Aug	Sunday 4 Aug
Activity	high	moderate	moderate	moderate	moderate	moderate	moderate
Flares	**M1.1, M6.4, M4.2, M8.7, M1.6, M1.0, X1.5**	**M9.4, M1.9, 2*M1.5, M1.4, M1.3, M1.2, M1.7**	**M1.0, M1.2, M5.3, M1.4, M4.4, M6.0, M7.7, M4.7, M1.9**	**M1.4, M1.2, 2*M1.3, M1.0, 2*M4.1, M8.2, M1.5, M4.0, M1.9, 2*M1.2**	**M1.3, M1.5, M1.1, M1.2, M1.6, M1.2, M2.1, M7.4, 2*M1.1, M1.0**	**M5.4, M7.3, M1.9, M2.8, M1.8, M1.9, 2* M1.5, M1.0**	**M1.0, M2.2, M1.9, M1.4, M1.1, M1.2, M1.4**

[1] See appendix. All timings are given in UT.

Solar Activity

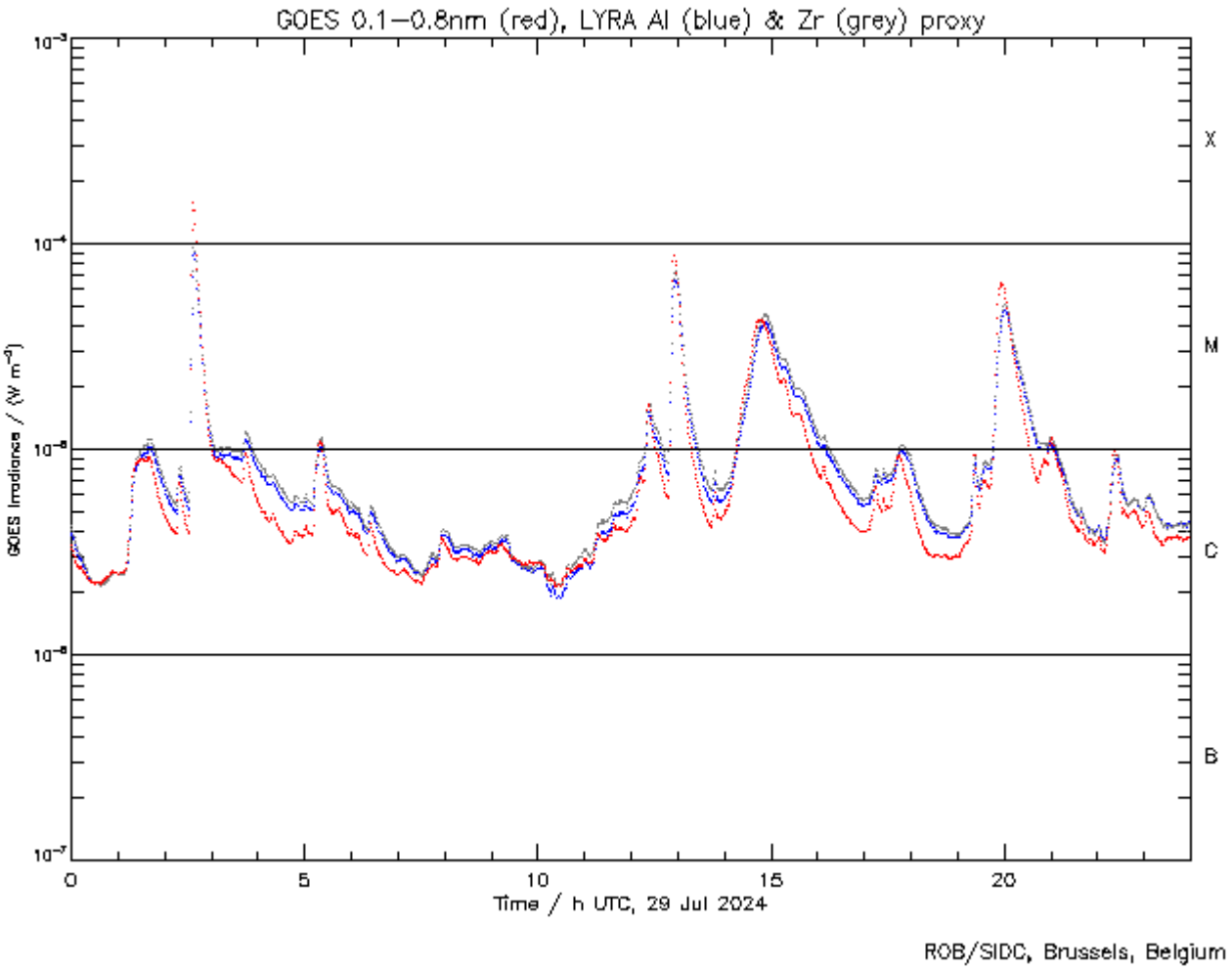
Solar flare activity ranged from moderate to high throughout the week. An unusually high number of active regions were observed on the solar disk, with several producing M-class flares. On several occasions, flares occurred in different regions in close succession, suggesting the possibility of sympathetic events.
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.

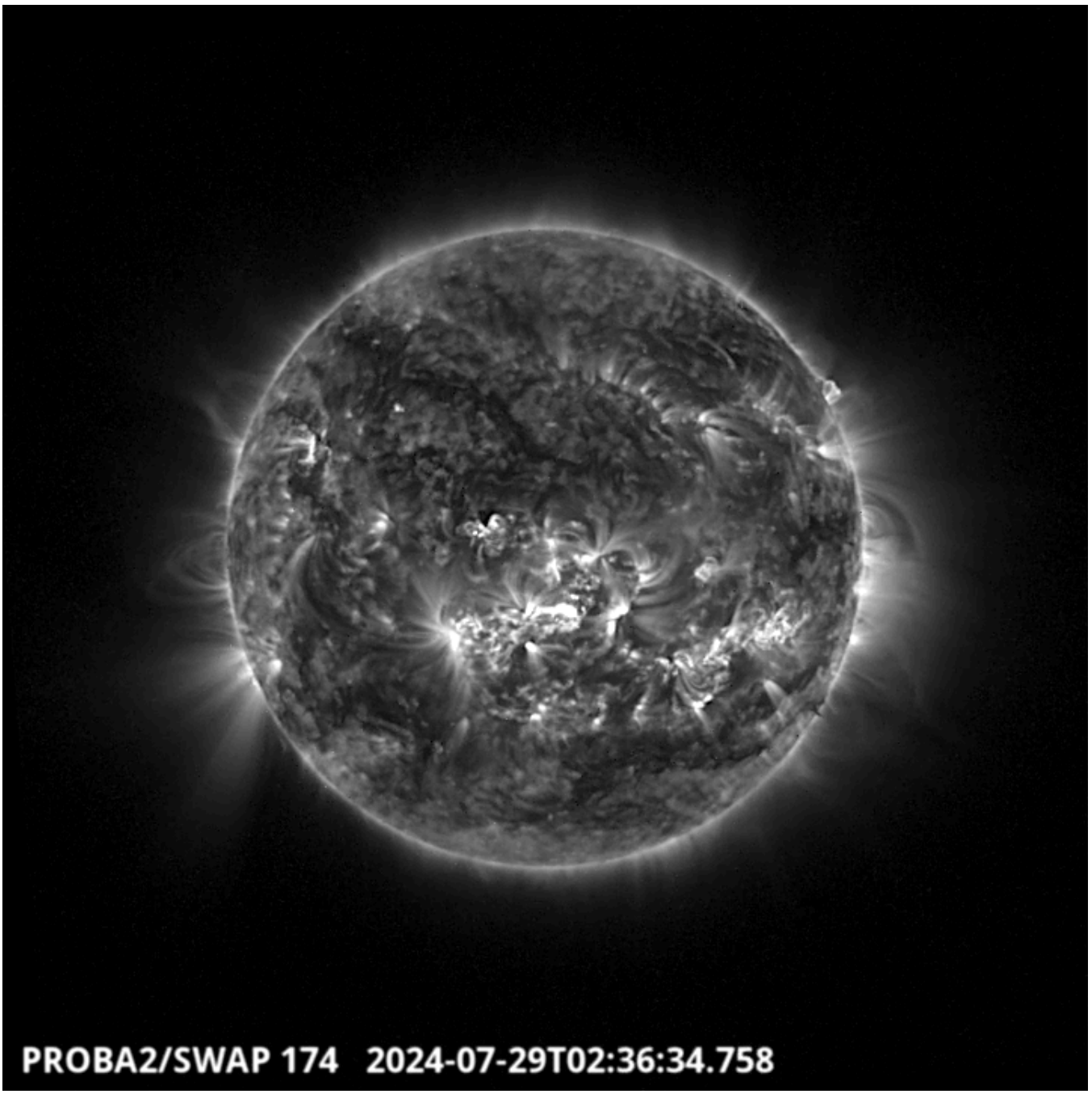
A weekly overview movie can be found here (SWAP week 749).

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

Monday Jul 29

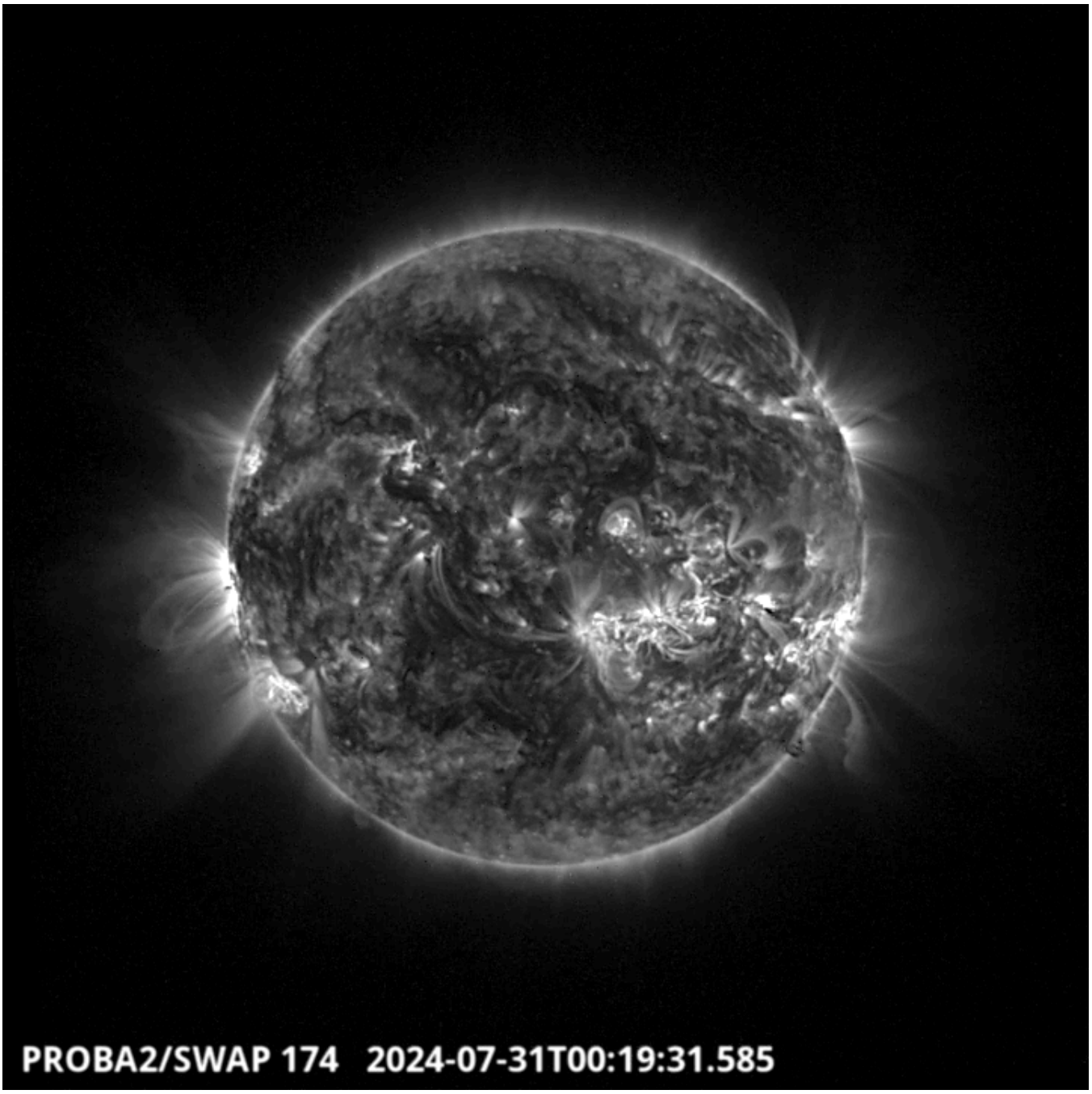




The biggest flare of the week, a X1.5, occurred around 2:37UT. It was produced by the NOAA active region 3766 located at S05W04. The LYRA time series and the SWAP image show the large event.

Find a SWAP movie of the event here.

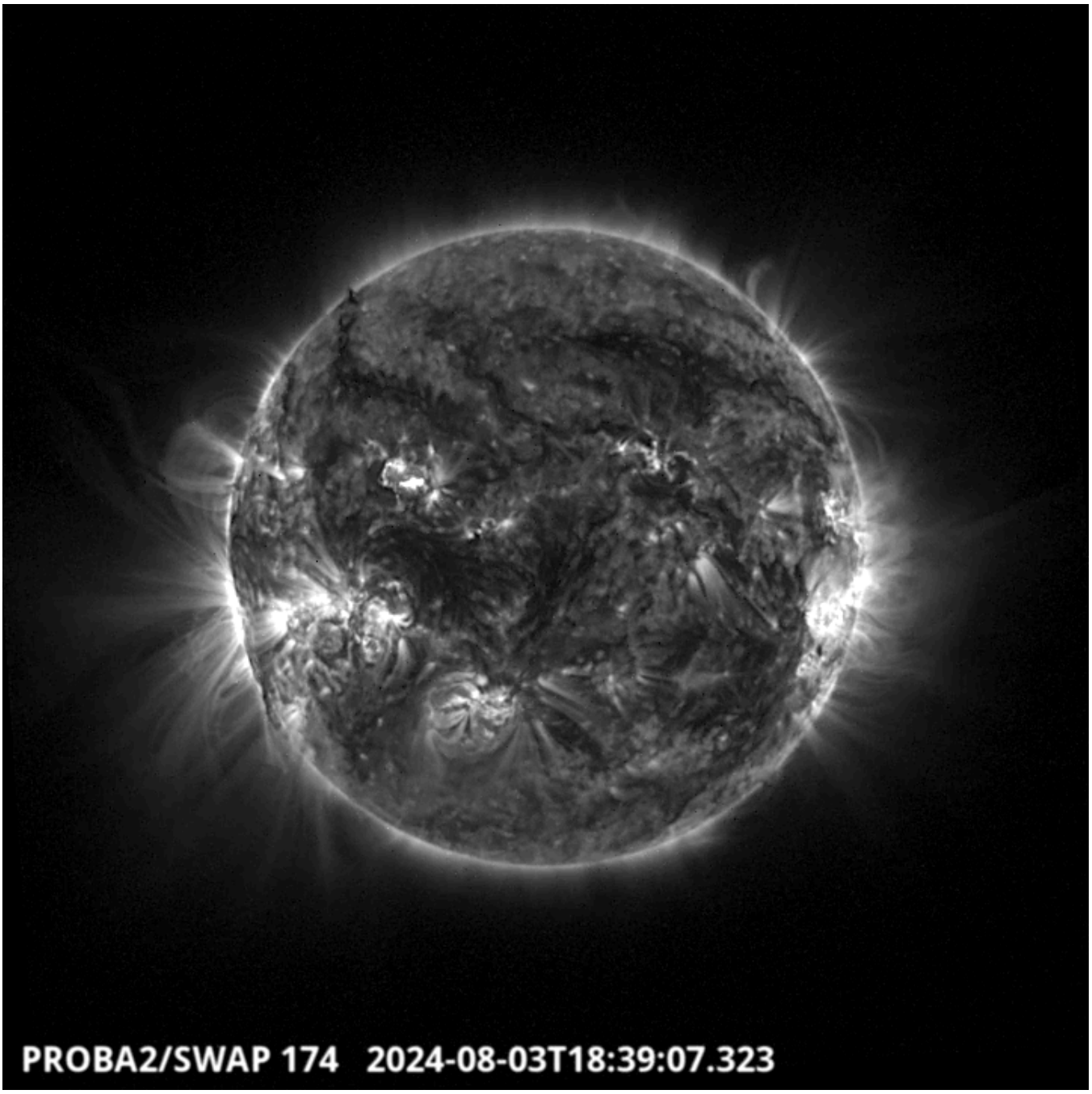
Wednesday Jul 31



A filament eruption occurred in the South-West part of the solar disk around 00:20 UT, immediately followed by a prominence eruption on the S-W limb.

Find a SWAP movie of the event here.

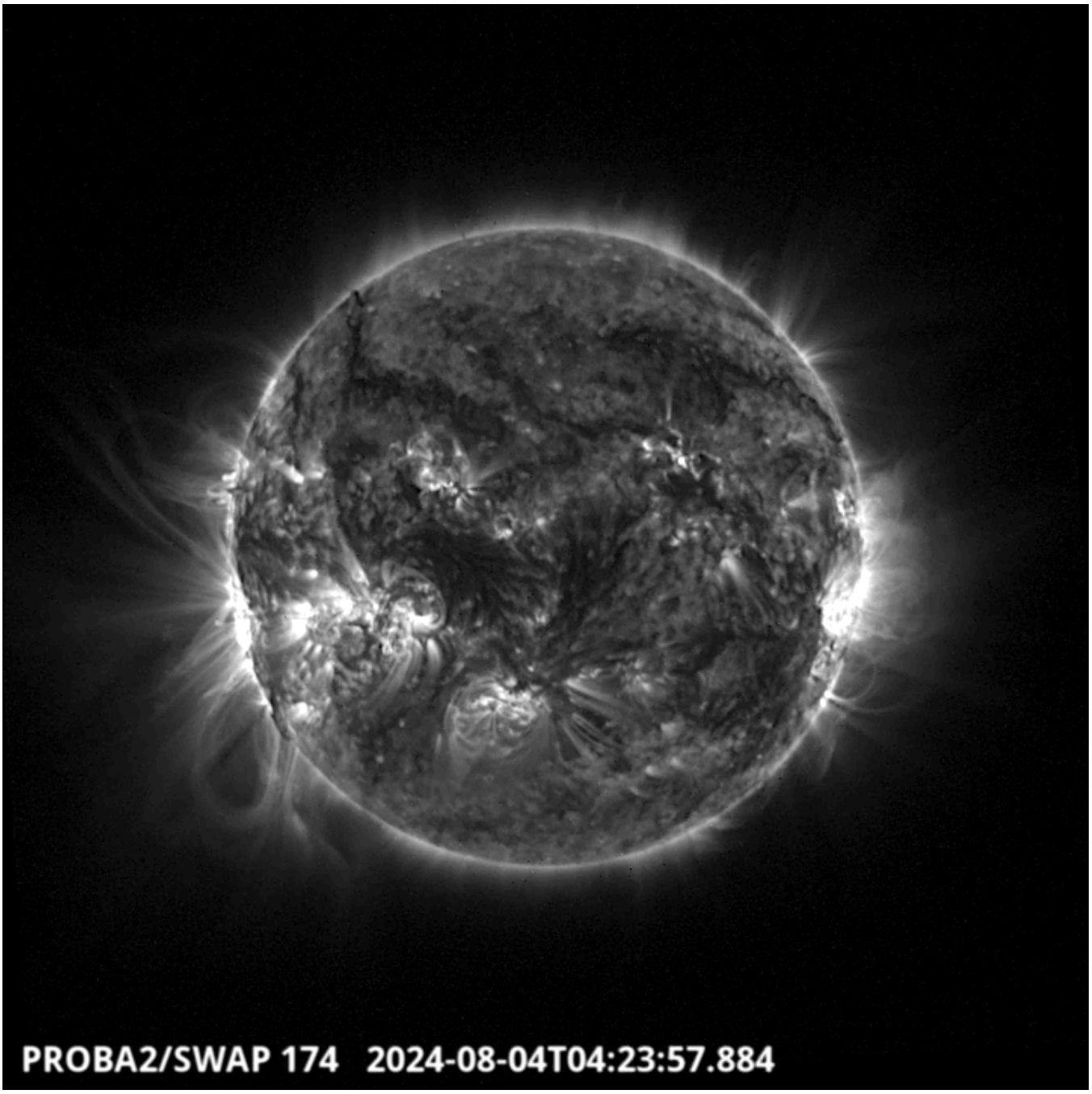
Sunday Aug 03



A M7.3 solar flare was observed in NOAA active region 3775 around 18:39 UT in the North East part of the solar disk. Another event, a M5.4 flare, happened shortly after at the East limb.

Find a SWAP movie of the event here.

Sunday Aug 04

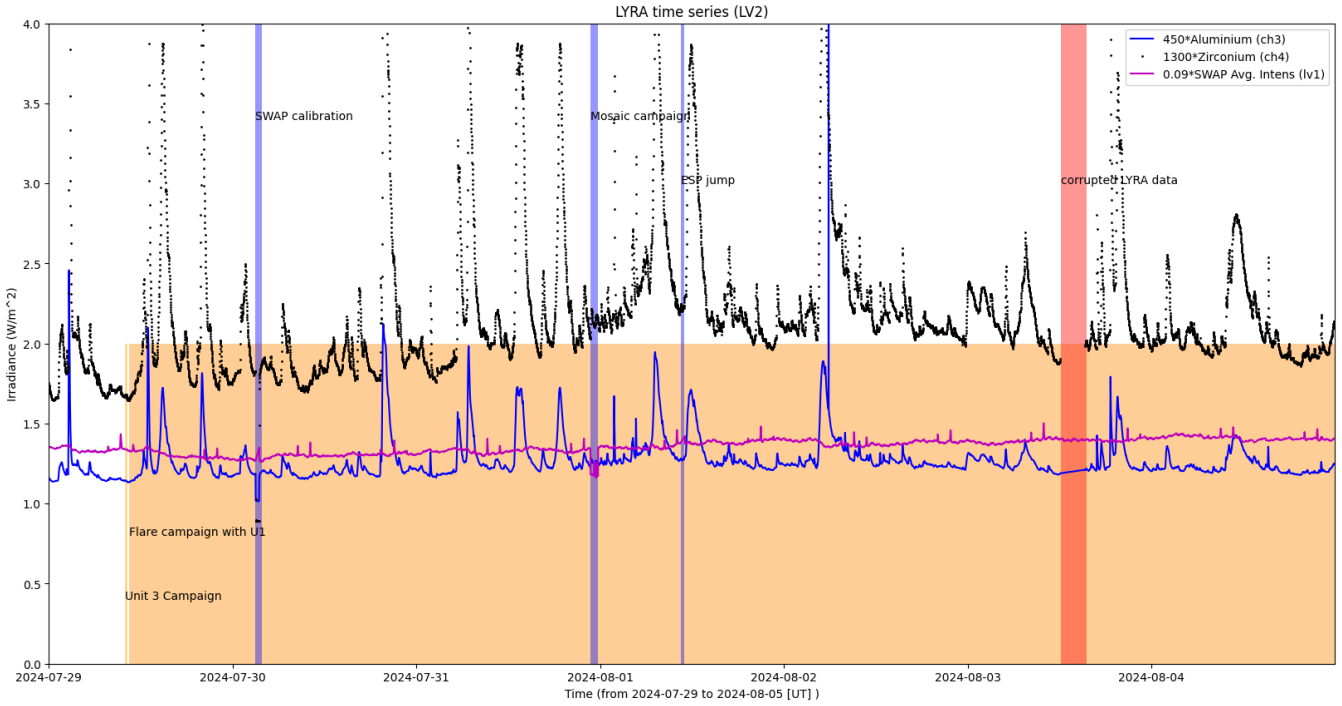


Plasma flows were observed in a giant prominence on the south west limb around 04:24 UT, highlighting the complex configuration and the magnetic connection of the structure with the whole region. This event did not result in an eruption, though.

Find a SWAP movie of the event here.

An overview of the weekly LYRA & SWAP data is provided below:
The following curves are visible:

- black: Zirconium Channel LYRA Unit 2
- blue: Aluminium Channel of LYRA Unit 2
- purple: SWAVINT (SWAP Average Intensity; integrated solar intensity per SWAP image pixel)



Operations and Calibrations:

The blue shaded periods related to SWAP, correspond to, from left to right:

- Bi-weekly calibration, 2024-Jul-30
- Mosaïc campaign, 2024-Jul-31
- ESP Jump, 2024-Aug-01

The orange shaded periods related to LYRA correspond to, from left to right:

- Unit 3 campaign, 2024-Jul-29
- LYRA unit 1 flare campaign, 2024-Jul-29 until 2024-Aug-05

The red shaded periods related to other issues corresponds to:

- LYRA pass 47880 seems corrupted on-board, giving a gap between 12:12 until 15:34 UT on 2024-Aug-03.

2. LYRA instrument status

IOS

Start IOS	Mon Jul 29 2024	LYIOS01099 -> LYIOS01101
End IOS	Sun Aug 04 2024	LYIOS01103

LYRA detector temperature

LYRA detector 2 temperature globally varied between 49.23 and 52.09 °C.

3. SWAP instrument status

MCPM errors
The number of MCPM recoverable errors increased from 60312 to 60572.
The number of MCPM unrecoverable errors remained at 3135.

IOS

Start IOS	Mon Jul 29 2024	IOS01211
End IOS	Sun Aug 04 2024	IOS01212

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -0.97 and 0.31°C.

4. PROBA2 Science Center Status

The following changes were made to the P2SC:

- None.

5. Data reception & discussions with MOC

Passes

The delivery of the passes for this week (passes 47828 to 47892) was nominal, except for:

- None.

Data coverage HK

All HK data files (LYRA_AD) have been received, except:

- None.

Data coverage SWAP

All SWAP Science data files (BINSWAP) have been received, except:

- None.

Total number of images between 2024 Jul 29 00:00 UT and 2024 Aug 05 00:00 UT: 4394
Highest cadence in this period: 30 seconds
Average cadence in this period: 137.65 seconds
Number of image gaps larger than 300 seconds: 210
Largest data gap: 33.67 minutes

Data coverage LYRA

All LYRA Science data files (BINLYRA) have been received, except:

- None

6. APPENDIX: Frequently used acronyms

ADPMS	Advanced Data and Power Management System
AOCS	Attitude and Orbit Control System
APS	Active Pixel image Sensor
ASIC	Application Specific Integrated Circuit
BBE	Base Band Equipment
CME	Coronal Mass Ejection
COGEX	Cool Gas Generator Experiment
CRC	Cyclic Redundancy Check
DAC	Data Acquisition Controller
DBR	Deployment, backup & recovery
DDA	Decommutated data archive
ESP	Experimental Solar Panel
FITS	Flexible Image Transport System
FOV	Field Of View FPA Focal Plane Assembly
FPGA	Field Programmable Gate Arrays
GPS	Global Positioning System
HK	Housekeeping
IOS	Instrument Operations Sheet
LED	Light Emitting Diode
LYRA	LYman alpha RAdiometer
LYTMR	LYRA Telemetry Reformatter (software module of P2SC)
LYEDG	LYRA Engineering Data Generator (software module of P2SC)
MCPM	Mass Memory, Compression and Packetisation Module
MOC	Mission Operation Center
NDR	Non Destructive Readout
OBSW	On board Software
PI	Principal Investigator
P2SC	PROBA2 Science Center
ROB	Royal Observatory of Belgium
SAA	South Atlantic Anomaly
SEU	Single Event Upset
SoFAST	Solar Feature Automated Search Tool
SWAP	Sun Watcher using APS detector and image Processing
SWAVINT	SWAP AVerage INTensity
SWBSDG	SWAP Base Science Data Generator
SWEDG	SWAP Engineering Data Generator (software module of P2SC)
SWTMR	SWAP Telemetry Reformatter (software module of P2SC)
TBC	To Be Confirmed
TBD	To Be Defined
TC	Telecommand
UTC	Coordinated Universal Time
UV	Ultraviolet
VFC	Voltage to Frequency Converter

7. APPENDIX Solar Activity Definitions

In the science section we use the following solar activity standards.

The standard scale for solar activity is:
- very low (almost no flares, only B)
- low (a few C flares)
- moderate (many C flares and at least an M flare)
- high (several M flares and an X flare)
- very high (continuous background of C flares, numerous M flares, more than one X flare)