


P2SC-ROB-WR-738 - 20240513	<b>P2SC Weekly report</b>	
Period covered: Date:	Mon May 13 to Sun May 19, 2024 22 May 2024	Royal Observatory of Belgium -
Written by: Approved by:	Dana Talpeanu Marie Dominique	PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP PI, elke.dhuys@sidc.be	<a href="https://proba2.sidc.be">https://proba2.sidc.be</a> ++ 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<sup>1</sup> fluctuated between **low and very high** this week.

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

	Monday 13 May	Tuesday 14 May	Wednesday 15 May	Thursday 16 May	Friday 17 May	Saturday 18 May	Sunday 19 May
Activity	moderate	very high	very high	moderate	moderate	low	moderate
Flares	<b>M1.5, M1.0,</b> <b>M3.7, M6.6,</b> <b>M4.9, M1.4,</b> <b>M1.2, M1.2</b>	<b>M4.4</b> <b>X8.7</b> <b>X1.2</b> <b>X1.7</b>	<b>X2.9</b> <b>M3.2</b> <b>M2.9</b> <b>X3.4</b>	<b>M1.0</b>	<b>M7.2</b>	-	<b>M1.6</b> <b>M2.5</b> <b>M1.9</b>

<sup>1</sup> See appendix. All timings are given in UT.

## **Solar Activity**

Solar flare activity fluctuated from low to very high 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.

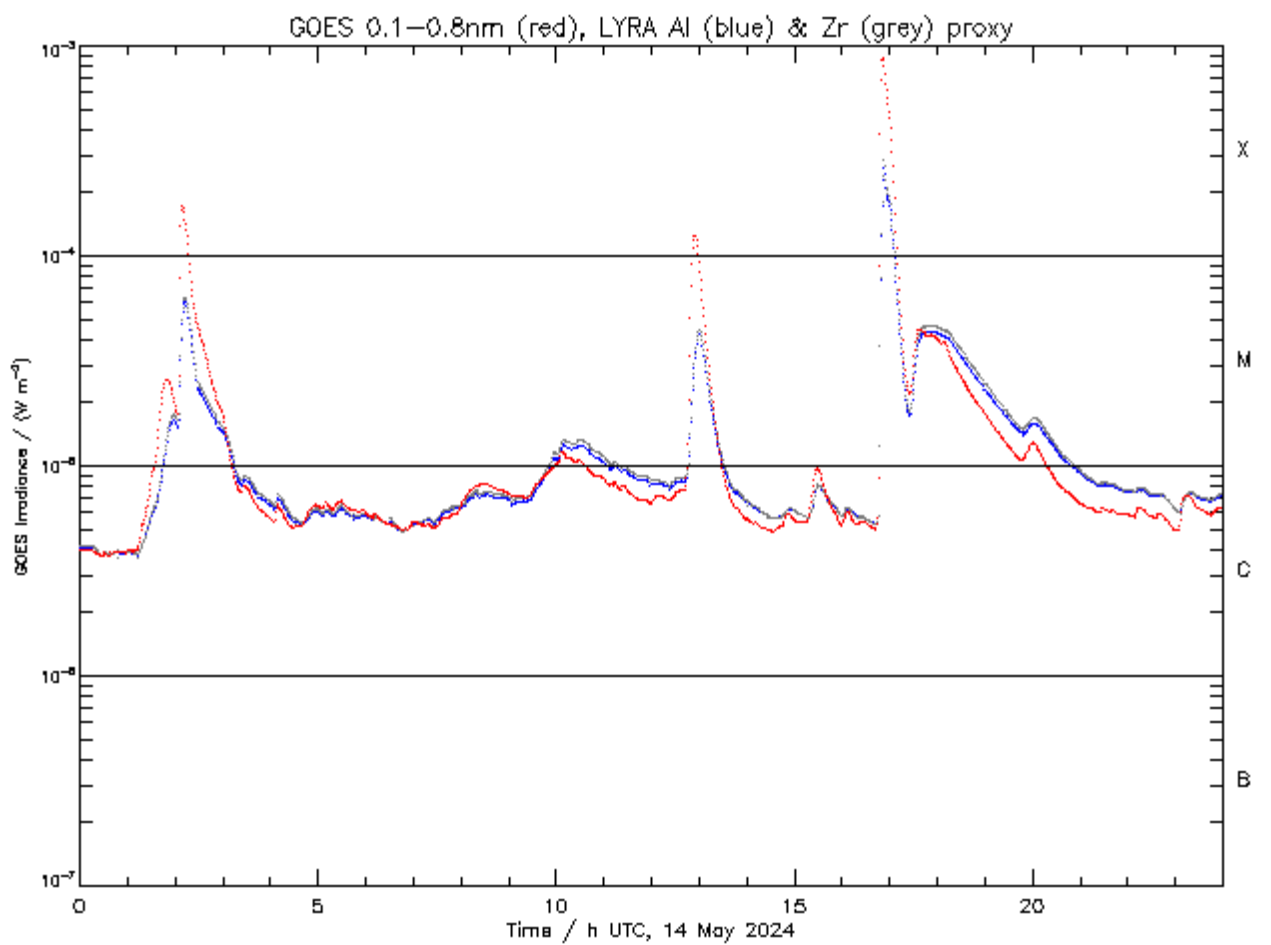
A weekly overview movie can be found [here](#) (SWAP week 738).

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

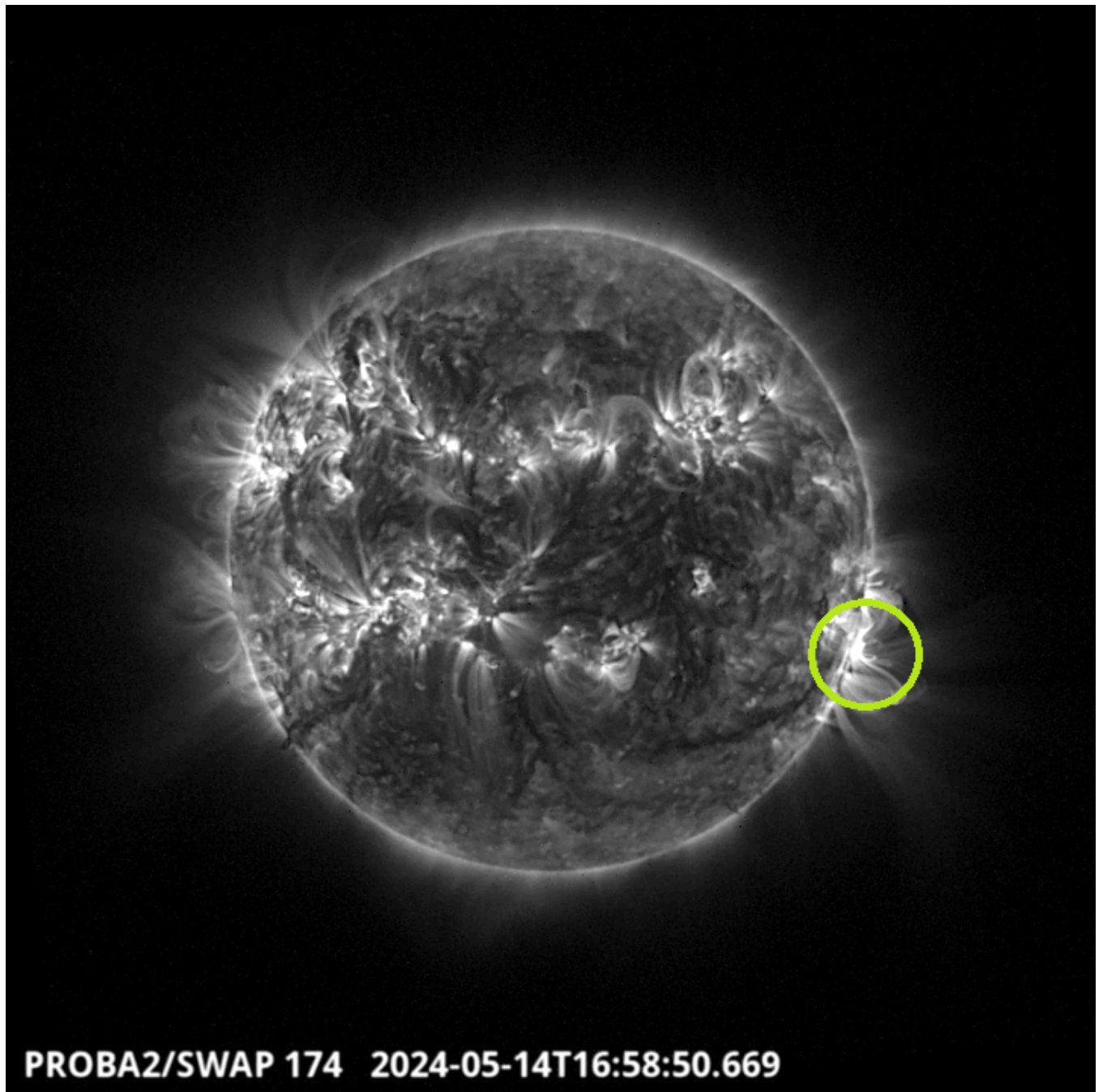
If any of the linked movies are unavailable they can be found in the P2SC movie repository [here](#)

This week was less productive than the previous one in the amount of flares, but AR 3664 continued to be the origin of several X-class flares, including the current strongest flare of the solar cycle 25. However, since AR 3664 was just rotating over the western limb, it was not as impactful as the ones from the previous week and their associated CMEs.

### Tuesday May 14



ROB/SIDC, Brussels, Belgium



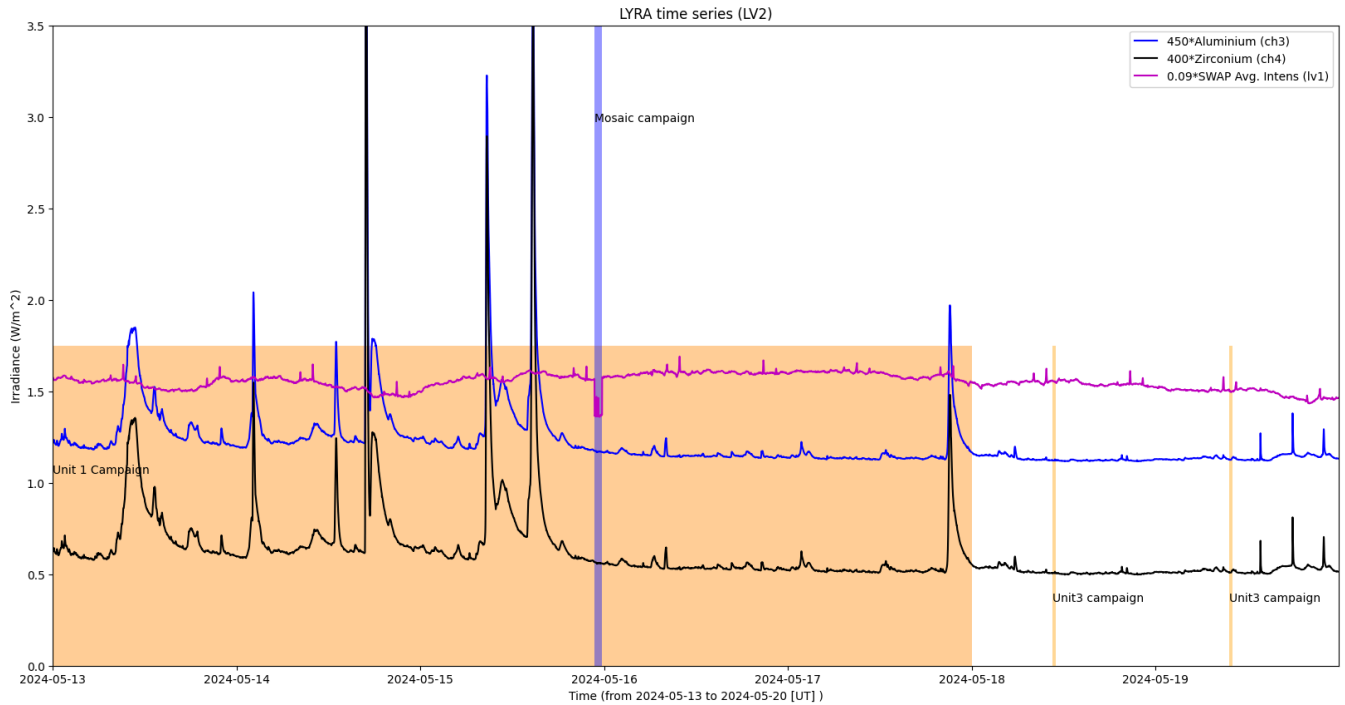
The largest flare of this week and so far of the current solar cycle was an X8.7, and it was observed by LYRA (top panel) and SWAP (bottom panel). The flare peaked on 2024-May-14 at 16:51 UT. It occurred in the southern hemisphere, just behind the western limb of the Sun (encircled in green), and it originated from NOAA AR3664.

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:

- Mosaic campaign, 2024-May-15

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

- Unit1 flare campaign, from 2024-May-13 (continuation from previous week) until 2024-May-18 at 00:00 UT
- Daily Unit 3 campaign, 2024-May-18
- Daily Unit 3 campaign, 2024-May-19

The red shaded periods related to other issues corresponds to:

- None

## 2. LYRA instrument status

### IOS

Start IOS	Mon May 13 2024	LYIOS01080
End IOS	Sun May 19 2024	LYIOS01082

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 49.83 and 52.64 °C.

### 3. SWAP instrument status

#### MCPM errors

The number of MCPM recoverable errors increased from 58145 to 58538.

The number of MCPM unrecoverable errors remained at 3135.

#### IOS

Start IOS	Mon May 13 2024	IOS01200
End IOS	Sun May 19 2024	IOS01201

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -0.57 and 0.55 °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 47172 to 47226) was nominal, except for:

- 47173

### 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.
- Small BINSWAP file for pass 47198 (May 16) due to download blocked 05:11 UT (pass should have ended at 05:21 UT).

Total number of images between 2024 May 13 00:00 UT and 2024 May 20 00:00 UT: 3697

Highest cadence in this period: 0 seconds

Average cadence in this period: 163.57 seconds

Number of image gaps larger than 300 seconds: 290

Largest data gap: 12.83 minutes

### Data coverage LYRA

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

- None
- corrupted LYRA package during pass 47173, but was re-sent during pass 47192

## 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)