


P2SC-ROB-WR-685 - 20230508	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon May 08 to Sun May 14, 2023 15 May 2023  Marie Dominique Marie Dominique	Royal Observatory of Belgium - 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 moderate** this week.

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

	Monday 08 May	Tuesday 09 May	Wednesday 10 May	Thursday 11 May	Friday 12 May	Saturday 13 May	Sunday 14 May
Activity	moderate	moderate	moderate	moderate	low	low	low
Flares	<b>M2.3</b>	<b>M6.5, M1.2, M1.3, M4.2, M5.0</b>	<b>M2.2</b>	<b>M2.1, M1.8</b>	-	-	-

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

## **Solar Activity**

Solar flare activity fluctuated from 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>

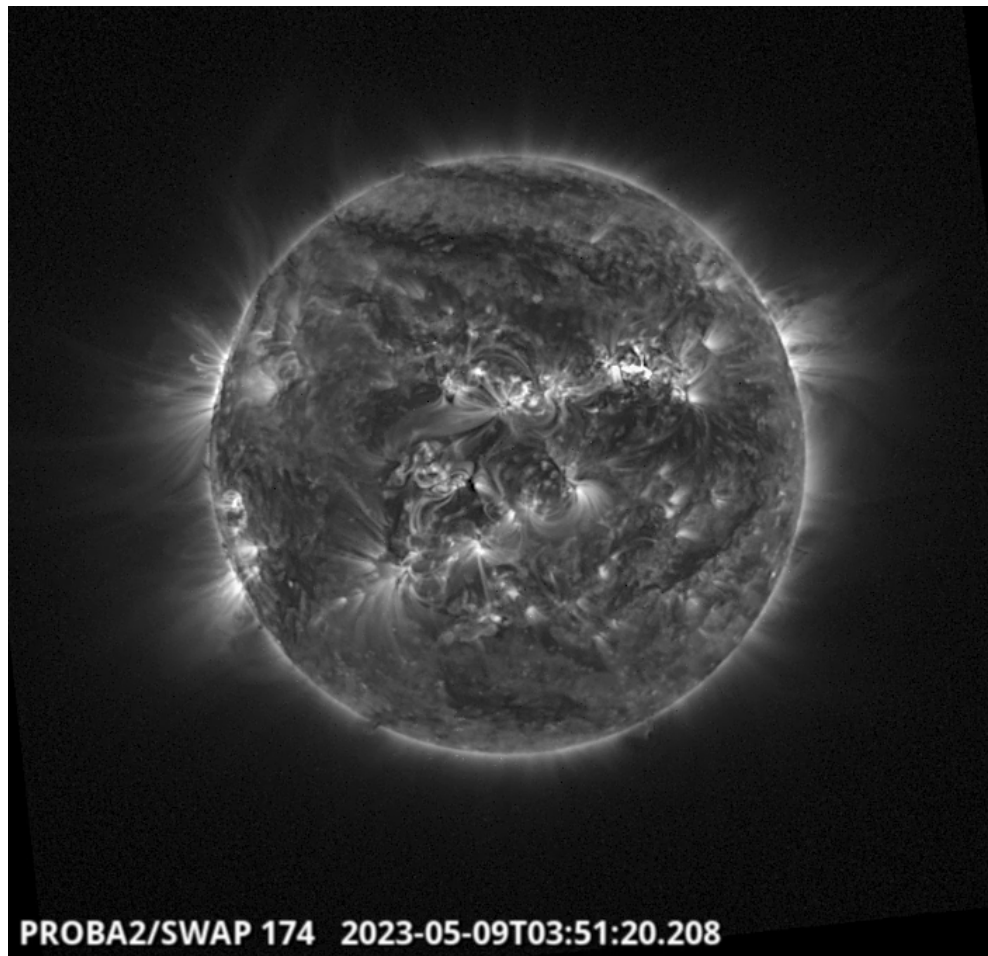
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 685).

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](#)

Tuesday May 09



Four magnetically connected active regions, i.e. NOAA AR 3293, 3294, 3296, and 3297 were at the origin of most of the activity of the week and the source of several M-class flares and CMEs. The strongest one, an M6.5 flare peaking at 03:54 on May 9 is shown on the SWAP image above, close to the disk center.

Find a movie of the events [here](#) (SWAP movie)

Thursday May 12



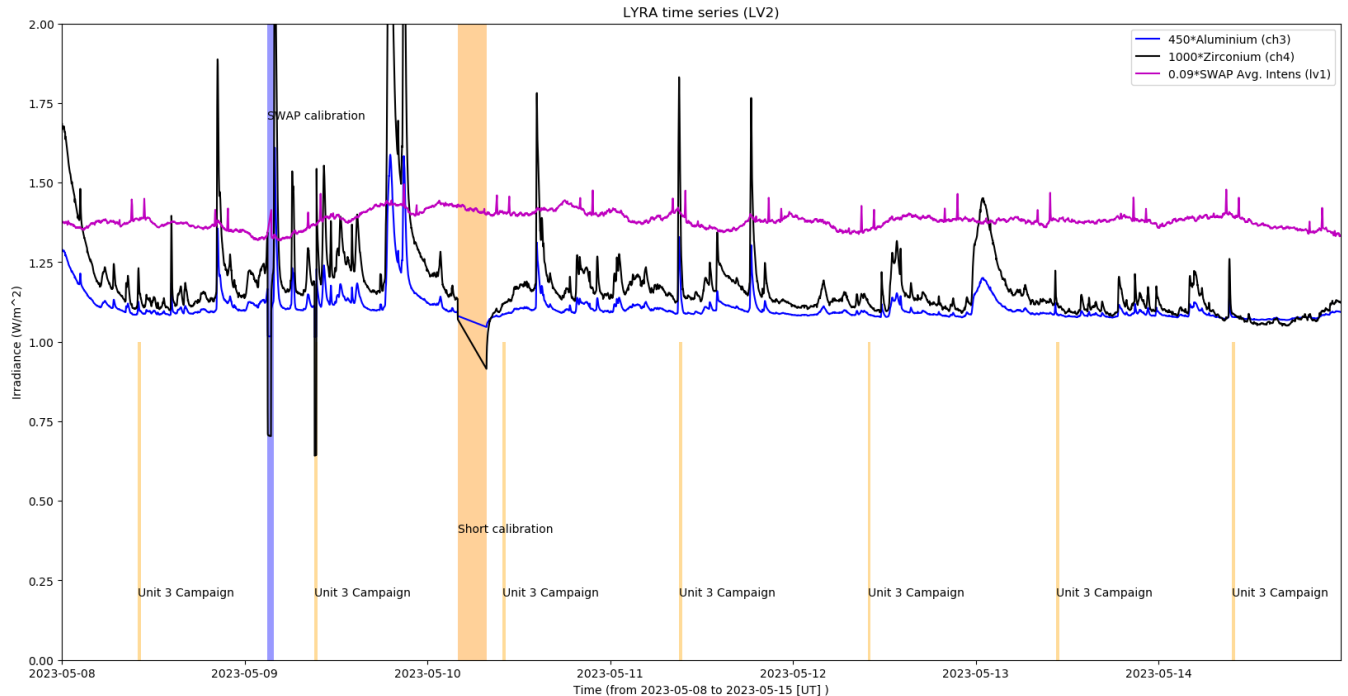
Those four regions remained active until the end of the week, and produced among others a nice eruption at the west limb, starting on May 12 just before midnight. It can be seen in the **SWAP** running-difference image above.

Find a movie of the events [here](#) (SWAP movie)

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:

- SWAP calibration, 2023-May-09

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

- Daily unit 3 campaign, 2023-May-08
- Daily unit 3 campaign, 2023-May-09
- Short bi-weekly calibration, 2023-May-10
- Daily unit 3 campaign, 2023-May-10
- Daily unit 3 campaign, 2023-May-11
- Daily unit 3 campaign, 2023-May-12
- Daily unit 3 campaign, 2023-May-13
- Daily unit 3 campaign, 2023-May-14

The red shaded periods related to other issues corresponds to:

- None



## 2. LYRA instrument status

### IOS

Start IOS	Mon May 08 2023	LYIOS01006
End IOS	Sun May 14 2023	LYIOS01008

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 48.04 and 50.41 °C.

### 3. SWAP instrument status

**MCPM errors**

The number of MCPM recoverable errors increased from 41712 to 42172.

The number of MCPM unrecoverable errors remained at 3135.

**IOS**

Start IOS	Mon May 08 2023	IOS01121
End IOS	Sun May 14 2023	IOS01121

**SWAP detector temperature**

The SWAP Cold Finger Temperature globally varied between -0.65 and 0.07 °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 44001 to 44060) 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 2023 May 08 0UT and 2023 May 14 0UT: 3664

Highest cadence in this period: 30 seconds

Average cadence in this period: 141.44 seconds

Number of image gaps larger than 300 seconds: 186

Largest data gap: 11.00 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)