


P2SC-ROB-WR-705 - 20230925	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Sep 25 to Sun Oct 01, 2023 18 Oct 2023  Laurence Wauters & Dana Talpeanu 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 25 Sep	Tuesday 26 Sep	Wednesday 27 Sep	Thursday 28 Sep	Friday 29 Sep	Saturday 30 Sep	Sunday 01 Oct
Activity	low	low	low	moderate	low	moderate	moderate
Flares	-	-	-	<b>M1.2</b>	-	<b>M1.2</b>	<b>M2.5</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>

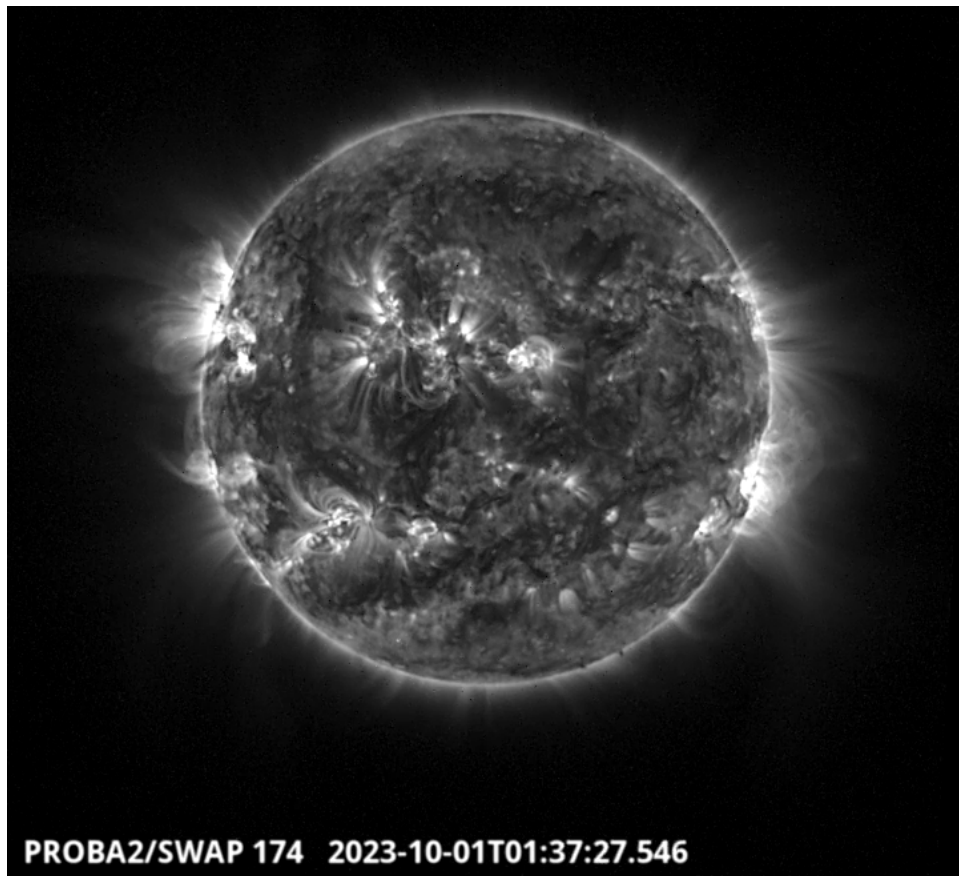
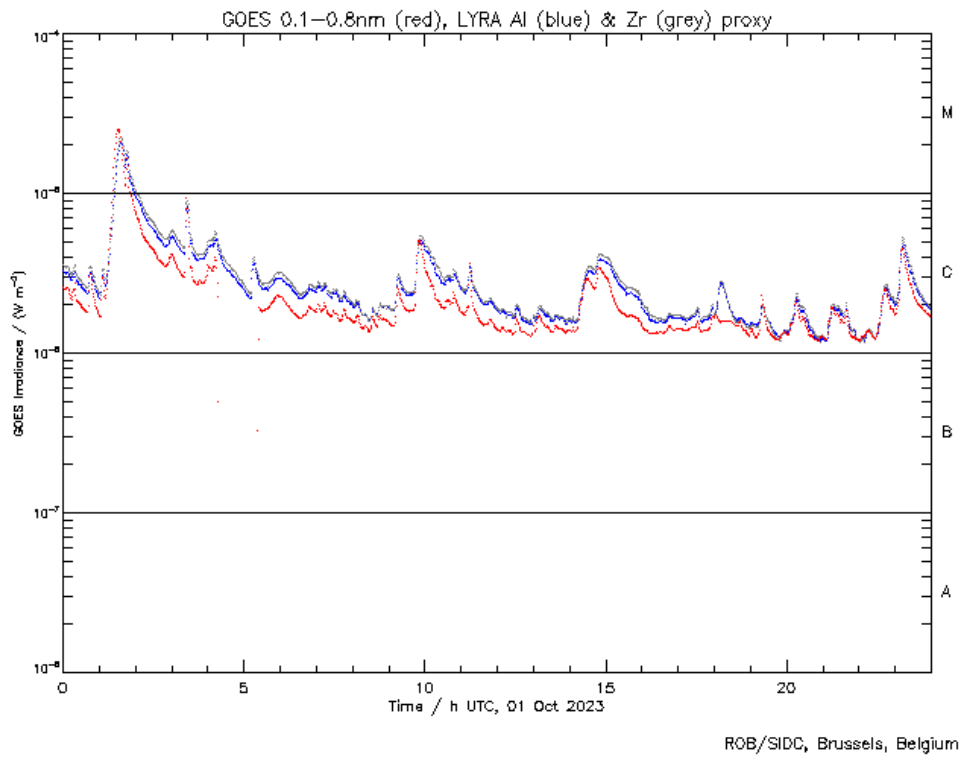
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 705).

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](#)

Sunday Oct 01



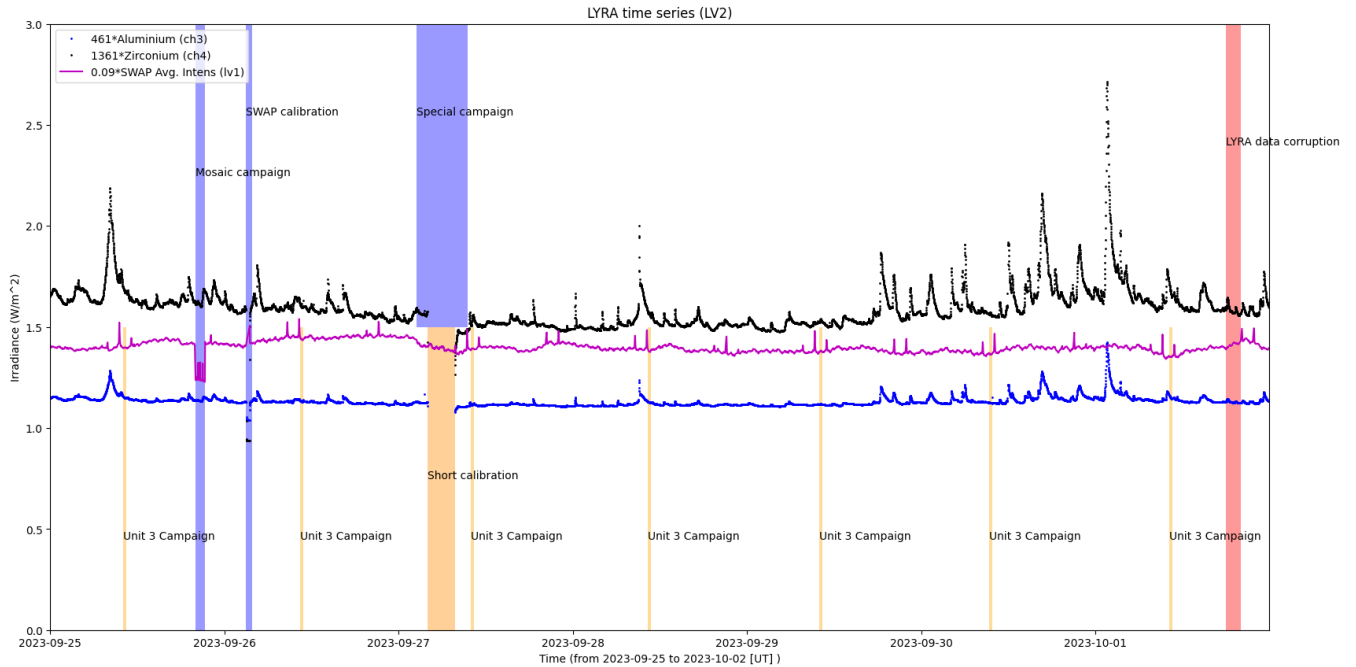
The largest flare of the week, an M2.5, was produced by the active region NOAA 3452 around 01:32 UT in the North-East part of the solar disk. This event is visible on the LYRA and SWAP images above.

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, 2023-Sep-25
- Bi-weekly calibration, 2023-Sep-26
- SWAP joint campaign with SOLO and PSP, 2023-Sep-27

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

- Daily Unit 3 campaign, 2023-Sep-25
- Daily Unit 3 campaign, 2023-Sep-26
- LYRA short calibration campaign, 2023-Sep-27
- Daily Unit 3 campaign, 2023-Sep-27
- Daily Unit 3 campaign, 2023-Sep-28
- Daily Unit 3 campaign, 2023-Sep-29
- Daily Unit 3 campaign, 2023-Sep-30
- Daily Unit 3 campaign, 2023-Oct-01

The red shaded periods related to other issues corresponds to:

- Corrupted LYRA data, 2023-Oct-01 between 17:59 - 20:00 UT; investigation ongoing

## 2. LYRA instrument status

### IOS

Start IOS	Mon Sep 25 2023	LYIOS01034
End IOS	Sun Oct 01 2023	LYIOS01035

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 49.44 and 51.75 °C.

### 3. SWAP instrument status

#### MCPM errors

The number of MCPM recoverable errors increased from 47824 to 48237.

The number of MCPM unrecoverable errors remained at 3135.

#### IOS

Start IOS	Mon Sep 25 2023	IOS01140
End IOS	Sun Oct 01 2023	IOS01141

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 0.23 and 1.27 °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 45202 to 45264) was nominal, except for:

- 45208: The signal was very bad during the support 45208 and SWAP data had been lost.
- 45263

### 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:

- Pass 45263

Total number of images between 2023 Sep 25 00:00 UT and 2023 Oct 02 00:00 UT: 4358

Highest cadence in this period: 29 seconds

Average cadence in this period: 138.80 seconds

Number of image gaps larger than 300 seconds: 246

Largest data gap: 12.83 minutes

### Data coverage LYRA

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

- Pass 45263, but the data was extracted during pass 45268 ( 2023-10-02T08:48:20z)
- LYRA data gap during pass 45264 (between 17:59-20:00 UT), potentially due to on-board corruption; investigation on-going



## 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)