


P2SC-ROB-WR-713 - 20231120	P2SC Weekly report	
Period covered: Date:	Mon Nov 20 to Sun Nov 26, 2023 27 Nov 2023	Royal Observatory of Belgium - PROBA2 Science Center
Written by: Approved by:	Dana Talpeanu Marie Dominique	
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 activity¹ 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 20 Nov	Tuesday 21 Nov	Wednesday 22 Nov	Thursday 23 Nov	Friday 24 Nov	Saturday 25 Nov	Sunday 26 Nov
Activity	moderate	low	low	moderate	moderate	low	low
Flares	M1.2	-	-	M1.0 M1.4	M1.1	-	-

¹ 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>

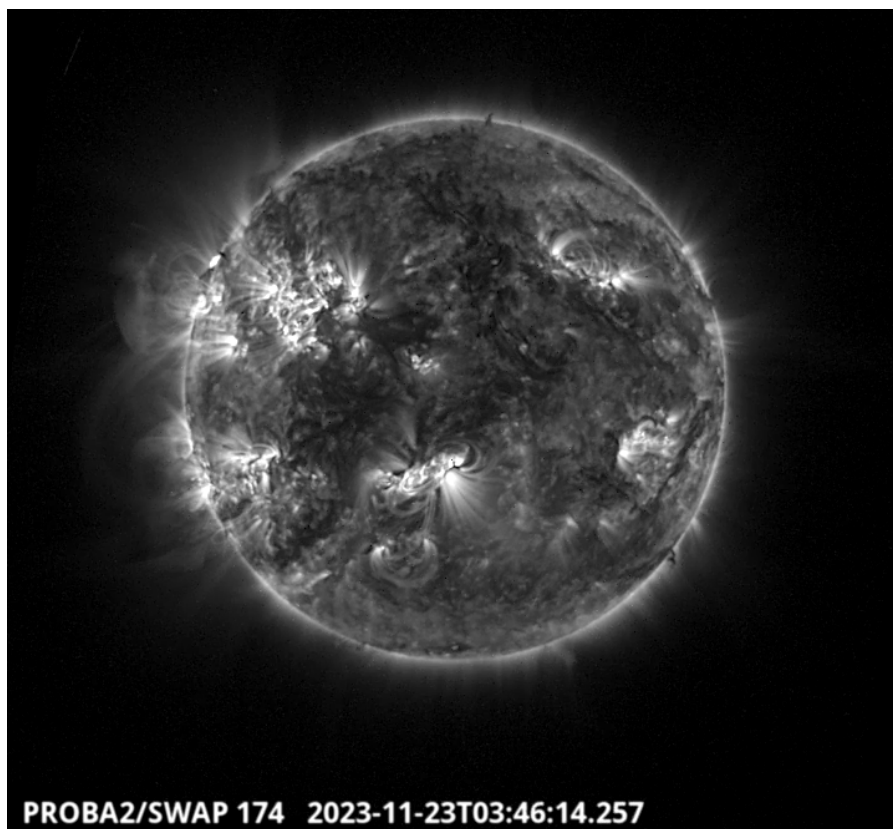
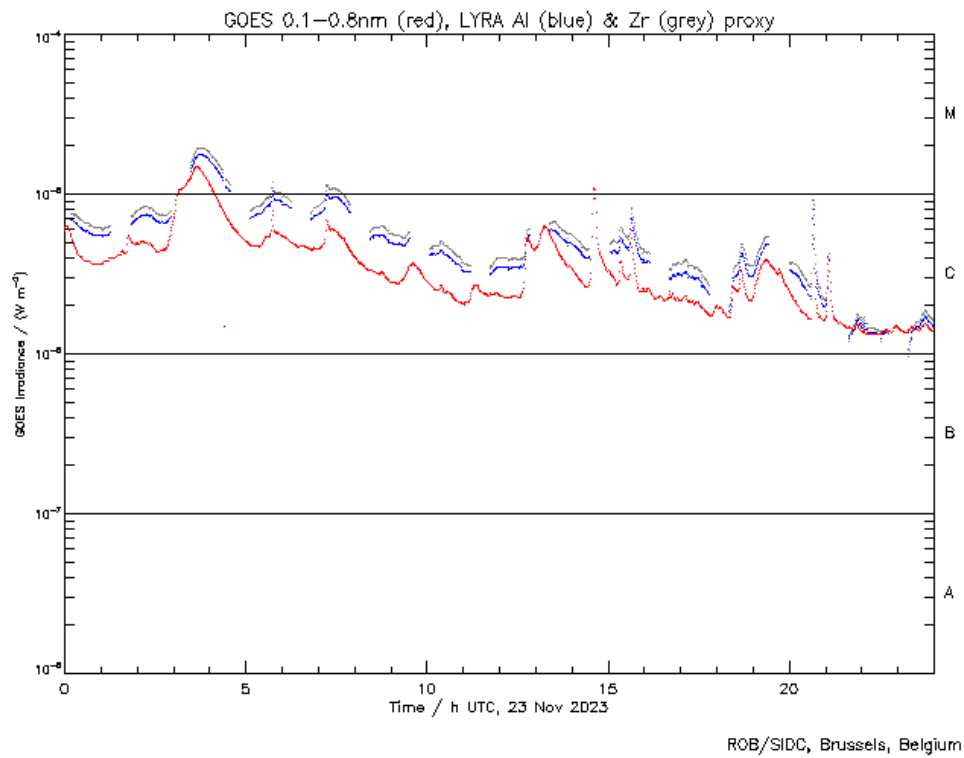
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 713).

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](#)

Thursday Nov 23

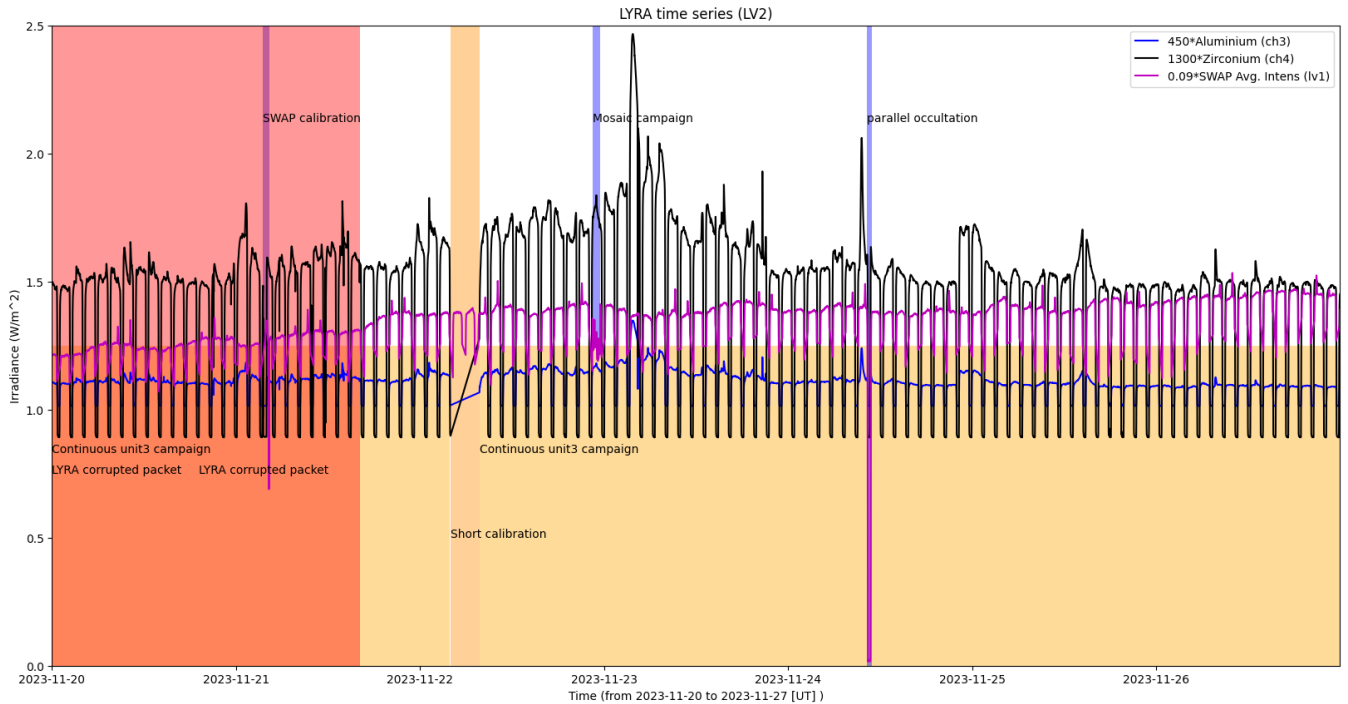


The largest flare of this week, an M1.4, was observed by LYRA (top panel) and SWAP (bottom panel). The flare peaked on 2023-Nov-23 at 03:38 UT. It occurred on the north-eastern limb, and it originated from the then still unnumbered NOAA AR3503, which was just behind the visible side of the solar disc. The flare was also associated with a large prominence eruption. 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, 2023-Nov-21
- SWAP mosaic campaign, 2023-Nov-22
- SWAP and LYRA parallel occultation, 2023-Nov-24

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

- Continuous unit 3 campaign (apart from during the calibration)
- Short bi-weekly calibration, 2023-Nov-22

The red shaded periods related to other issues corresponds to:

- corrupted data on 2023-Nov-20, between 00:00 - 19:12
- short periods of interleaved/overlapped and highly condensed data between 20 Nov 19:12 and 21 Nov 16:08:20, received with pass 45700 (22 Nov); data unreliable and investigation on-going.

2. LYRA instrument status

IOS

Start IOS	Mon Nov 20 2023	LYIOS01043
End IOS	Sun Nov 26 2023	LYIOS01044

LYRA detector temperature

LYRA detector 2 temperature globally varied between 44.87 and 49.71 °C.

3. SWAP instrument status

MCPM errors

The number of MCPM recoverable errors increased from 50945 to 51204.

The number of MCPM unrecoverable errors remained at 3135.

IOS

Start IOS	Mon Nov 20 2023	IOS01153
End IOS	Sun Nov 26 2023	IOS01154

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -2.01 and -0.01 °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 45680 to 45740) was nominal, except for:

- 45700.

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 Nov 20 00:00 UT and 2023 Nov 27 00:00 UT: 4412

Highest cadence in this period: 18 seconds

Average cadence in this period: 137.05 seconds

Number of image gaps larger than 300 seconds: 131

Largest data gap: 28.38 minutes

Data coverage LYRA

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

- None
- corrupted data on 2023-Nov-20, between 00:00 - 19:12
- short periods of interleaved/overlapped and highly condensed data between 20 Nov 19:12 and 21 Nov 16:08:20, received with pass 45700 (22 Nov). Investigation shows that the problem does not come from an on-board corruption of the on-board timestamps (obets), as we initially suspected. The error seems to appear when the pipeline converts those onboard timestamps into unix epochs. One of the possible explanations relates to the fact that there is no unique ID number associated with data samples (pass numbers, data counters, and obets are cycling). When re-extracting large amounts of data and associating them to pass numbers to which they don't initially belong we might lose track of the chronology of the data samples. It is therefore advised to limit the re-extraction as much as possible to the requested pass. We will keep an eye on the problem.

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)