


P2SC-ROB-WR-697 - 20230731	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Jul 31 to Sun Aug 06, 2023 09 Aug 2023  Dana Talpeanu Marie Dominique	Royal Observatory of Belgium - PROBA2 Science Center
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## 1. Science

### Solar & Space weather events

The level of solar activity<sup>1</sup> 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 31 Jul	Tuesday 01 Aug	Wednesday 02 Aug	Thursday 03 Aug	Friday 04 Aug	Saturday 05 Aug	Sunday 06 Aug
Activity	moderate	moderate	moderate	moderate	moderate	high	moderate
Flares	<b>M1.6</b>	<b>M1.0, M1.4, M1.5, M3.6, M1.3, M2.2, M1.2, M1.0</b>	<b>M1.1, M1.3, M1.7, M1.2, M1.3</b>	<b>M2.0</b>	<b>M1.9</b>	<b>X1.6 M2.1 M1.6</b>	<b>M5.5</b>

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

## **Solar Activity**

Solar flare activity fluctuated from moderate to 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>

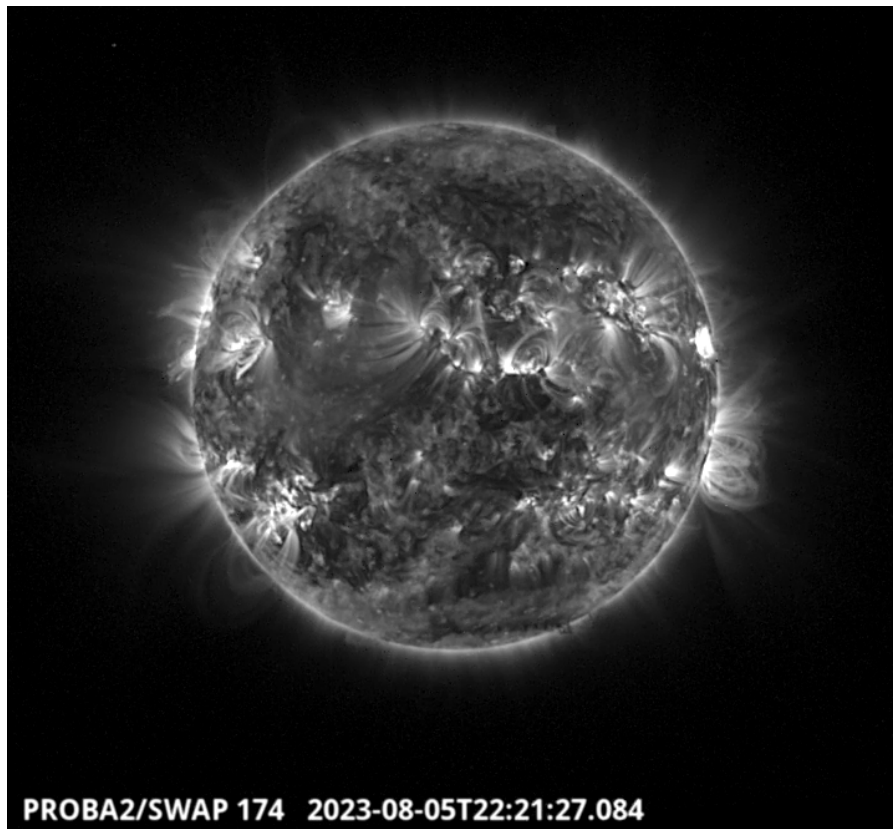
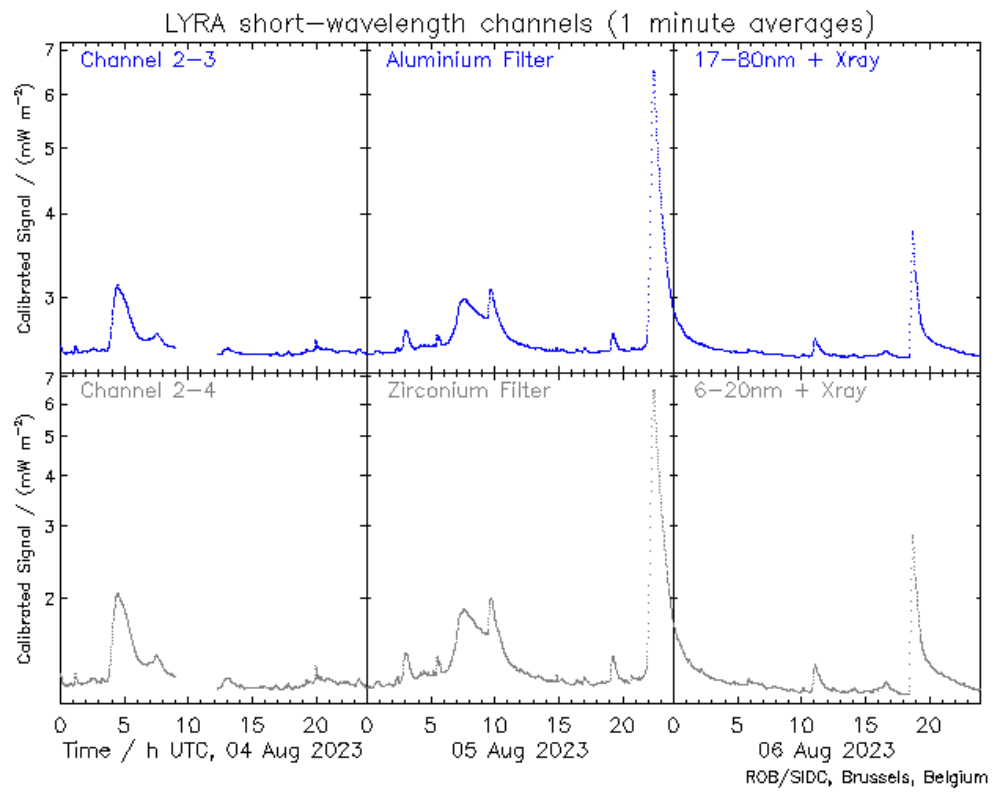
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 697).

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](#)

Saturday August 05



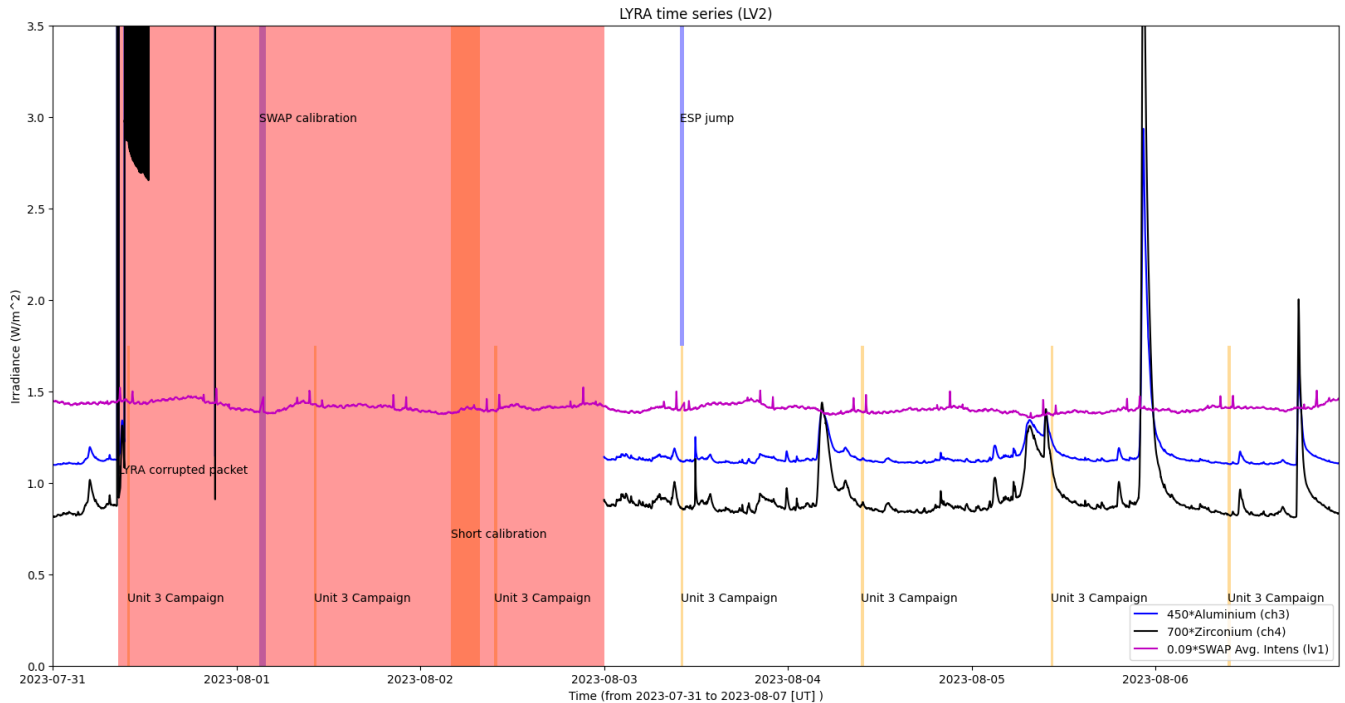
The largest flare of this active week, an X1.6, was observed by LYRA (top panel) and SWAP (bottom panel). The flare peaked on 2023-Aug-05 at 22:21 UT. It occurred close to the equator at the western solar limb, and it originated from NOAA AR3386.

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-Aug-01
- ESP jump, 2023-Aug-03

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

- Daily Unit3 campaign, 2023-Jul-31
- Daily Unit3 campaign, 2023-Aug-01
- Short calibration, 2023-Aug-02
- Daily Unit3 campaign, 2023-Aug-02
- Daily Unit3 campaign, 2023-Aug-03
- Daily Unit3 campaign, 2023-Aug-04
- Daily Unit3 campaign, 2023-Aug-05
- Daily Unit3 campaign, 2023-Aug-06

The red shaded periods related to other issues corresponds to:

- Bad LYRA data starting July 31 at ~08:30 until the ASIC reload was performed on August 02 between 09:20 - 10:36 UT; the issues seem to have been fixed after the ASIC reload, but the LYRA curve could not be produced until the next day (August 03), so we flagged the data as unreliable until the end of August 02.

## 2. LYRA instrument status

- Bad LYRA data was recorded starting July 31, so an ASIC reload was performed on August 02 between 09:20 - 10:36 UT

### IOS

Start IOS	Mon Jul 31 2023	LYIOS01026
End IOS	Sun Aug 06 2023	LYIOS01027

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 48.45 and 49.92 °C.

### 3. SWAP instrument status

#### MCPM errors

The number of MCPM recoverable errors increased from 45256 to 45594.

The number of MCPM unrecoverable errors remained at 3135.

#### IOS

Start IOS	Mon Jul 31 2023	IOS01131
End IOS	Sun Aug 06 2023	IOS01132

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.13 and -0.09 °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 44729 to 44788) was nominal, except for:

- 44746.

### 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.
- BINSWAP file for pass 44746 (August 02) was received on August 03.

Total number of images between 2023 Jul 31 00:00 UT and 2023 Aug 07 00:00 UT: 4105

Highest cadence in this period: 30 seconds

Average cadence in this period: 147.31 seconds

Number of image gaps larger than 300 seconds: 254

Largest data gap: 33.67 minutes

### Data coverage LYRA

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

- None
- Bad LYRA data starting July 31 at ~08:30 until the ASIC reload was performed on August 02 between 09:20 - 10:36 UT; the issues seem to have been fixed after the ASIC reload, but the LYRA curve could not be produced until the next day (August 03), so the data was flagged as unreliable until the end of August 02.



## 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)