


P2SC-ROB-WR-675 - 20230227	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Feb 27 to Sun Mar 05, 2023 07 Mar 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 **low and high** this week.

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

	Monday 27 Feb	Tuesday 28 Feb	Wednesday 01 Mar	Thursday 02 Mar	Friday 03 Mar	Saturday 04 Mar	Sunday 05 Mar
Activity	low	moderate	moderate	moderate	high	moderate	moderate
Flares	-	<b>M8.6</b>	<b>M1.0</b>	<b>M3.8</b>	<b>X2.1</b> <b>M3.3</b> <b>M3.2</b>	<b>M5.2</b> <b>M1.2</b> <b>M1.0</b>	<b>M5.0</b> <b>M1.0</b> <b>M1.0</b> <b>M1.3</b>

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

## **Solar Activity**

Solar flare activity fluctuated from low 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>

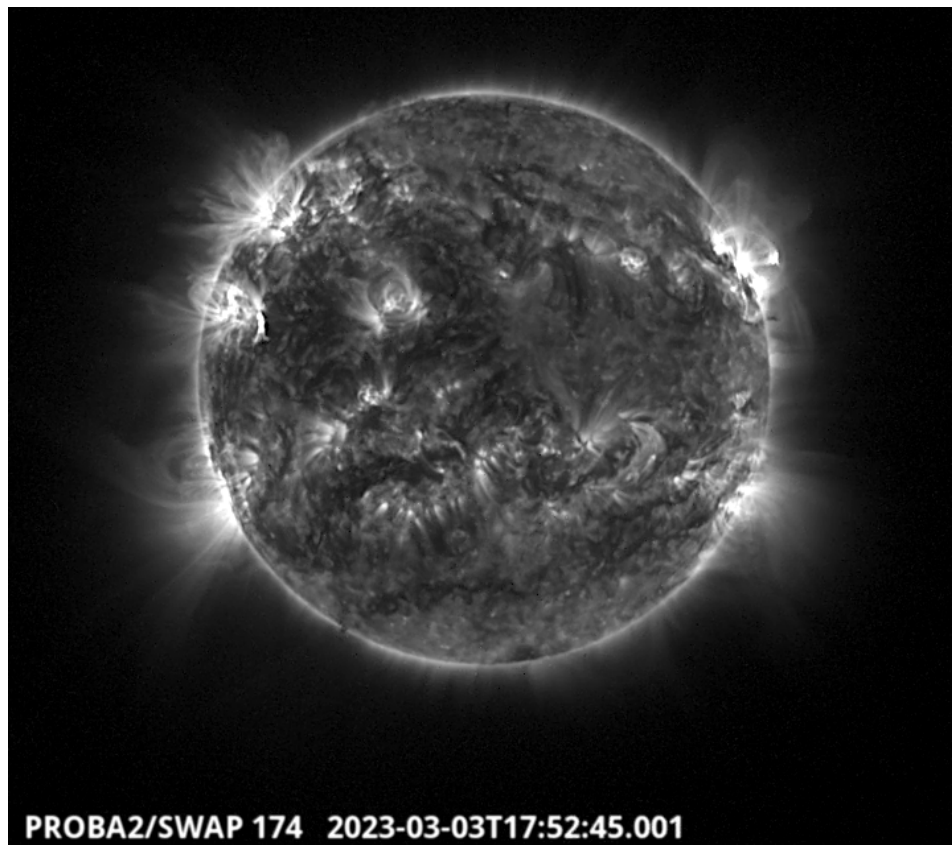
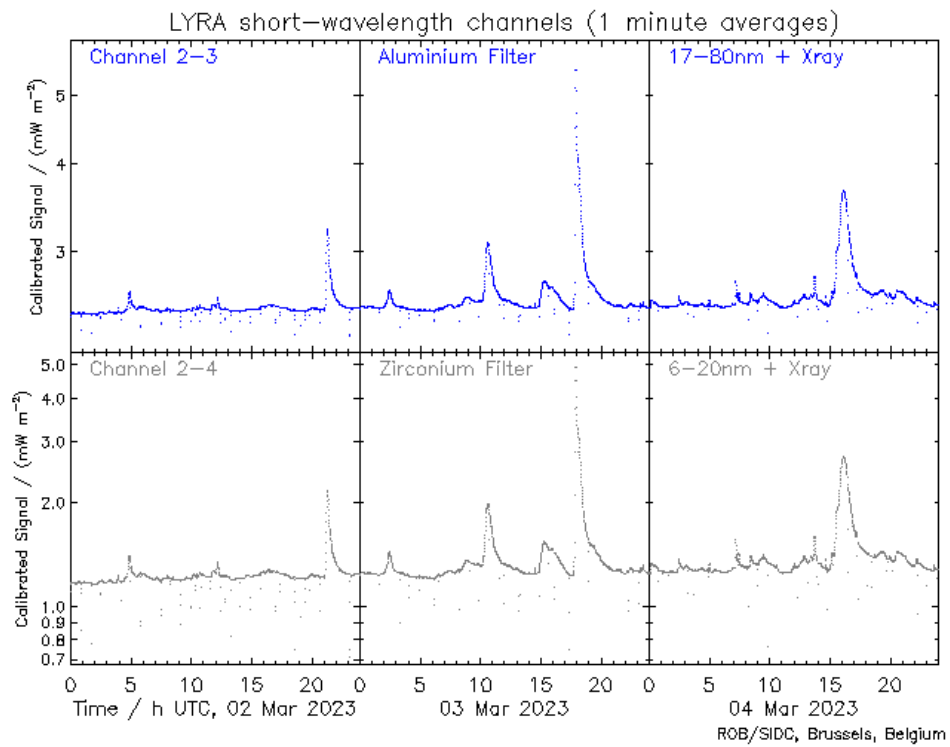
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 675).

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](#)

Friday Mar 03



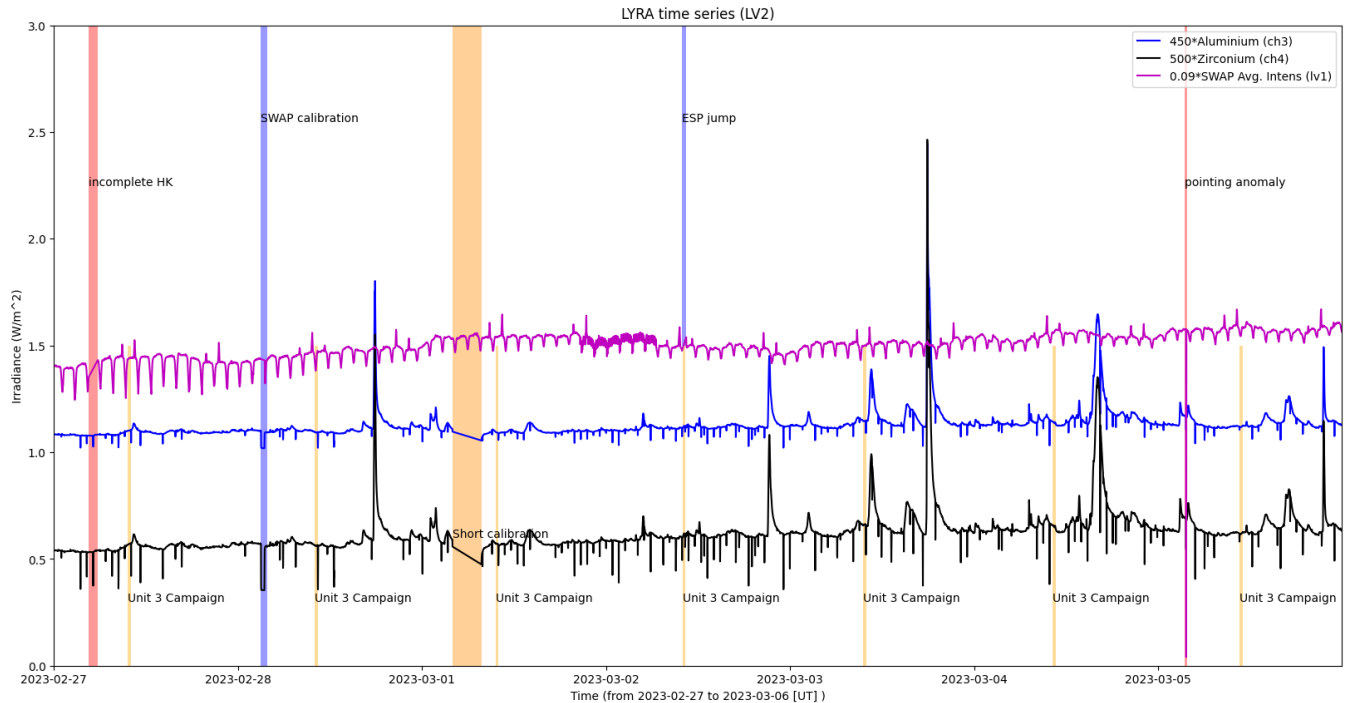
The largest flare of the week, an X2.1 flare, was observed by LYRA (top panel) and SWAP (bottom panel). The flare occurred on 2023-Mar-03 (peak at 17:52 UT) on the north-western hemisphere close to the limb, and it was associated with NOAA AR3234.

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-Feb-28
- ESP jump, 2023-Mar-02

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

- Daily Unit 3 campaign, 2023-Feb-27
- Daily Unit 3 campaign, 2023-Feb-28
- Short calibration, 2023-Mar-01
- Daily Unit 3 campaign, 2023-Mar-01
- Daily Unit 3 campaign, 2023-Mar-02
- Daily Unit 3 campaign, 2023-Mar-03
- Daily Unit 3 campaign, 2023-Mar-04
- Daily Unit 3 campaign, 2023-Mar-05

The red shaded periods related to other issues corresponds to:

- SWAP data gap due to incomplete HK data, 2023-Feb-27 between 04:31:29 and 05:43:00 UT.
- Two SWAP observations altered due to the Moon entering the field of view of the star tracker, causing a pointing anomaly (Sun was no longer centered) on 2023-Mar-05 at 03:40:27 and 03:42:17 UT.

## 2. LYRA instrument status

### IOS

Start IOS	Mon Feb 27 2023	LYIOS00994
End IOS	Sun Mar 05 2023	LYIOS00995

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 51.37 and 53.8 °C.

### 3. SWAP instrument status

#### MCPM errors

The number of MCPM recoverable errors increased from 38534 to 38871.

The number of MCPM unrecoverable errors remained at 3135.

#### IOS

Start IOS	Mon Feb 27 2023	IOS001110
End IOS	Sun Mar 05 2023	IOS001110

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 1.67 and 2.79 °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 43373 to 43434) was nominal, except for:

- pass 43375.

### Data coverage HK

All HK data files (LYRA\_AD) have been received, except:

- Small HK size for pass 43375 on 2023-Feb-27

### Data coverage SWAP

All SWAP Science data files (BINSWAP) have been received, except:

- Small HK size for pass 43375, resulting in a data gap on 2023-Feb-27 between 04:31:29 and 05:43:00 UT.
- During pass 43429: two SWAP observations altered due to the Moon entering the field of view of the star tracker, causing a pointing anomaly (Sun was no longer centered) on 2023-Mar-05 at 03:40:27 and 03:42:17 UT.

Total number of images between 2023 Feb 27 00:00 UT and 2023 Mar 06 00:00 UT: 4257

Highest cadence in this period: 30 seconds

Average cadence in this period: 142.10 seconds

Number of image gaps larger than 300 seconds: 212

Largest data gap: 33.67 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)