P2SC-ROB-WR-731 - 20240325	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Mar 25 to Sun Mar 31, 2024 01 Apr 2024 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[1] 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 25 Mar	Tuesday 26 Mar	Wednesday 27 Mar	Thursday 28 Mar	Friday 29 Mar	Saturday 30 Mar	Sunday 31 Mar
Activity	moderate	moderate	moderate	high	moderate	moderate	low
Flares	**M4.4**	**M1.6, M1.7, M1.9, M1.3, M1.0, M1.8**	**M1.1 M1.1**	**X1.1 M1.1 M6.1 M7.1**	**M1.2 M3.2**	**M9.4**	-

[1] See appendix. All timings are given in UT.

Solar Activity

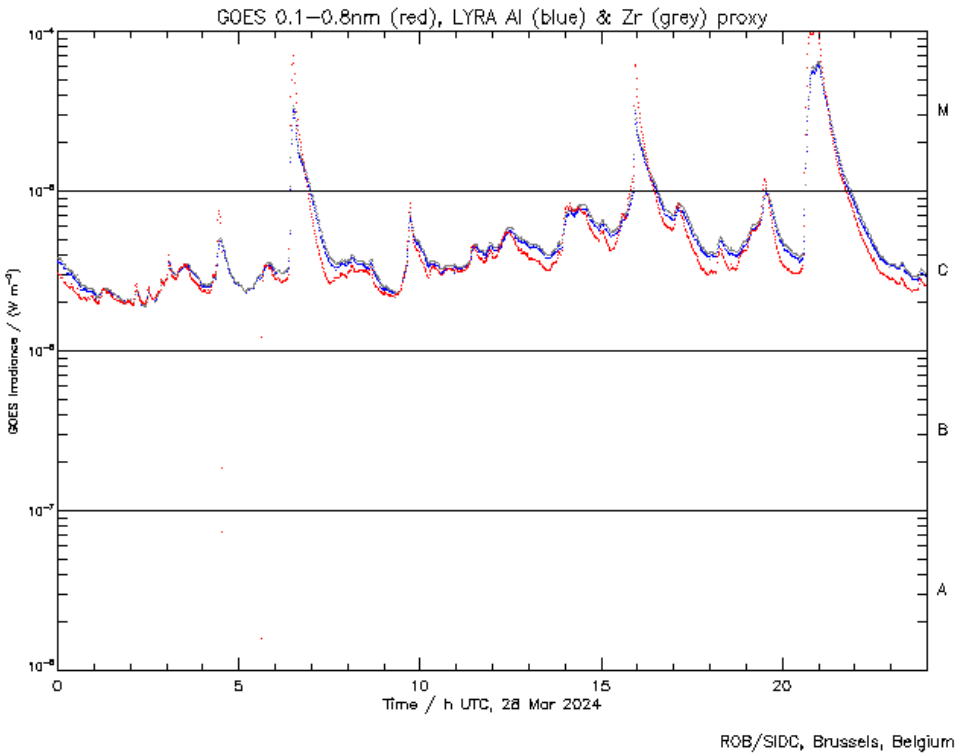
Solar flare activity fluctuated from low to high during the week.
In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: https://proba2.oma.be/ssa
This page also lists the recorded flaring events.

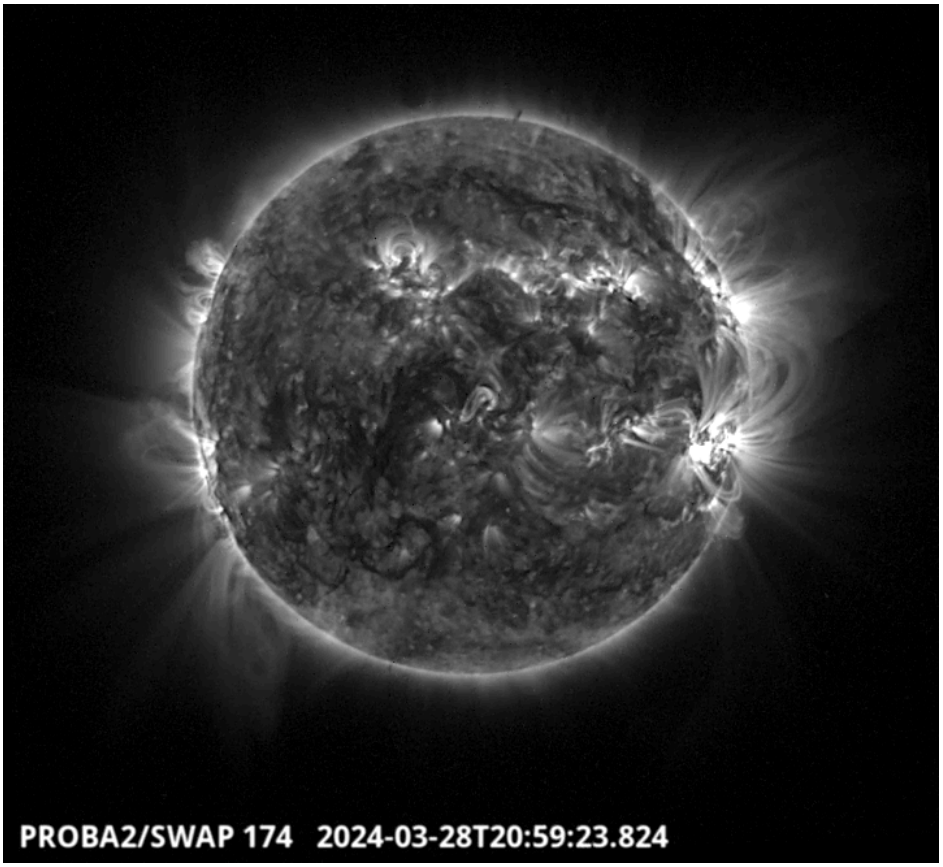
A weekly overview movie can be found here (SWAP week 731).

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 Mar 28



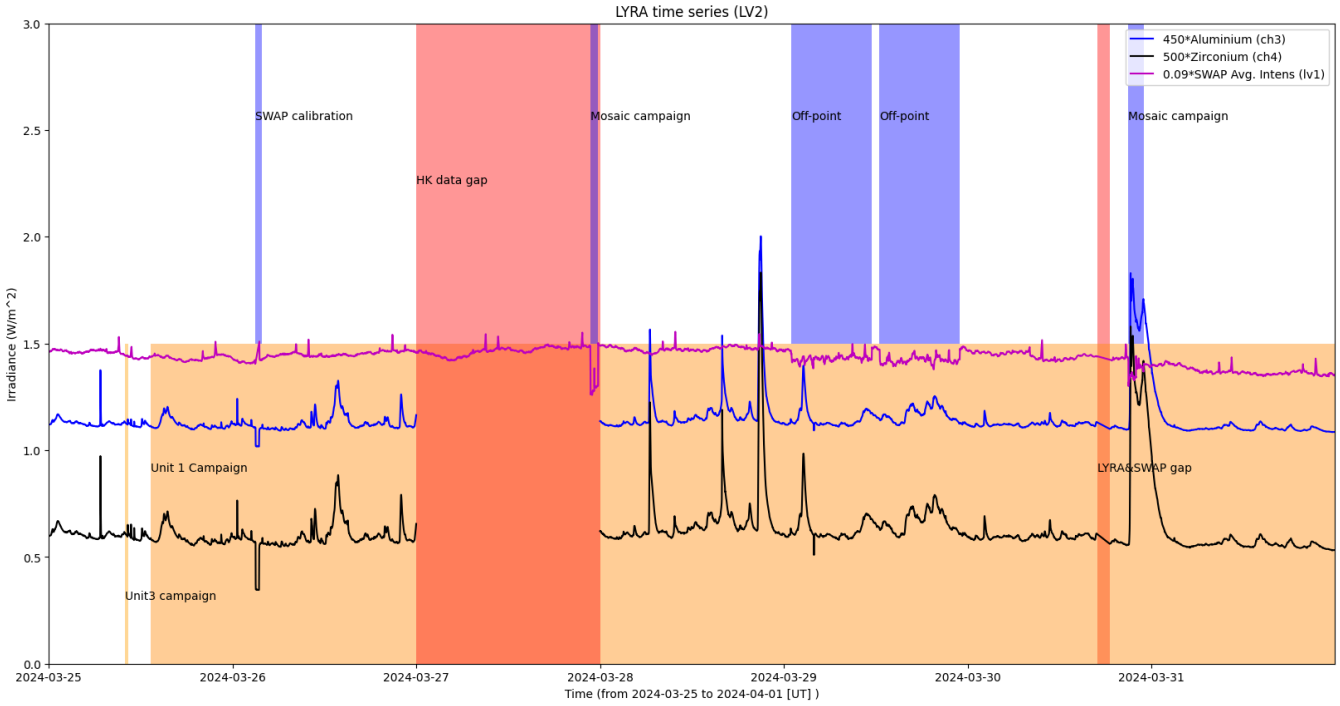


The largest flare of this week was an X1.1, and it was observed by LYRA (top panel) and SWAP (bottom panel). The flare peaked on 2024-Mar-28 at 20:56 UT. It occurred on the western hemisphere close to the central meridian, and it originated from NOAA AR3615.

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, 2024-Mar-26
- Weekly mosaic campaign, 2024-Mar-27
- SWAP off-point (to East) joint campaign with SolO and PSP, 2024-Mar-29 between 01:00-11:30 and 12:30-23:00 UT
- Mosaic joint campaign with Solar Orbiter/EUI, 2024-Mar-30

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

- Daily Unit 3 campaign, 2024-Mar-25
- Unit 1 flare campaign from 2024-Mar-25 at 13:15 UT until 2024-Apr-05 at 00:00 UT (next reporting week), with a gap on 2024-Mar-27

The red shaded periods related to other issues corresponds to:

- due to on-board issues and LYRA reboot, there is a HK data gap the entire day on 2024-Mar-27, so no level 2 LYRA data could be created; however, SWAP level 1 images were created. During this time, LYRA switched from “acquisition mode” to Recover latch up on 2024-03-27 at 09:42:54 and had to be restarted from Redu.
- LYRA and SWAP data gap on 2024-Mar-30 between 16:58 - 18:35 UT (pass 46792), due to antenna failure.

2. LYRA instrument status

On 2024-Mar-27, several issues occurred:

- At 04:09:34 UT, the following variables dropped to 0: LYRA POW ON DH1, LYRA POW ON DH2, LYRA POW ON VFC1, LYRA POW ON VFC2, as well as the covers status. The covers went into an inconsistent state. Even before that, as of 00:00, the values were constant.
- LYRA switched from “acquisition mode” to “Recover latch up” at 09:42:54 and had to be restarted from Redu.
- On the pass 46767 (17:55): LYRA was commanded OFF by MOC command. The automated LYRA "close cover" procedure was executed to recover the instrument.
- At 18:20:35, LYRA went back to acquisition mode, but probably due to the still warming up of the instrument, data could be calibrated starting 00:00 next day (2024-03-28).

IOS

Start IOS	Mon Mar 25 2024	LYIOS01068
End IOS	Sun Mar 31 2024	LYIOS01072

LYRA detector temperature

LYRA detector 2 temperature globally varied between 47.95 and 53.86 °C.

3. SWAP instrument status

MCPM errors
The number of MCPM recoverable errors increased from 55106 to 55567.
The number of MCPM unrecoverable errors remained at 3135.

IOS

Start IOS	Mon Mar 25 2024	IOS01191
End IOS	Sun Mar 31 2024	IOS01194

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 0.07 and 1.11 °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 46743 to 46802) was nominal, except for:

- 46792.

Data coverage HK

All HK data files (LYRA_AD) have been received, except:

- due to on-board issues and LYRA reboot, there is a HK data gap the entire day on 2024-Mar-27, so no level 2 LYRA data could be created; however, SWAP level 1 images were created. During this time, LYRA switched from “acquisition mode” to Recover latch up on 2024-03-27 at 09:42:54 and had to be restarted from Redu.
- pass 46792, hence data gap on 2024-Mar-30 between 16:58 - 18:35 UT, due to antenna failure.

Data coverage SWAP

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

- pass 46792, hence data gap on 2024-Mar-30 between 16:58 - 18:35 UT.

Total number of images between 2024 Mar 25 00:00 UT and 2024 Apr 01 00:00 UT: 4075
Highest cadence in this period: 18 seconds
Average cadence in this period: 148.41 seconds
Number of image gaps larger than 300 seconds: 294
Largest data gap: 110.00 minutes

Data coverage LYRA

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

- due to on-board issues and LYRA reboot, there is a HK data gap the entire day on 2024-Mar-27, so no level 2 LYRA data could be created.
- pass 46792, hence data gap on 2024-Mar-30 between 16:58 - 18:35 UT..

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)