P2SC-ROB-WR-783 - 20250324	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Mar 24 to Sun Mar 30, 2025 02 Apr 2025 Dana Talpeanu Marie Dominique	Royal Observatory of Belgium - PROBA2 Science Center
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 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 24 Mar	Tuesday 25 Mar	Wednesday 26 Mar	Thursday 27 Mar	Friday 28 Mar	Saturday 29 Mar	Sunday 30 Mar
Activity	low	low	moderate	moderate	high	moderate	moderate
Flares	-	-	**M1.0**	**M2.0**	**M1.7** **M1.1** **M1.0** **X1.1**	**M1.9** **M1.4**	**M1.0** **M1.5** **M1.4** **M1.4** **M1.6** **M1.5**

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

Solar Activity

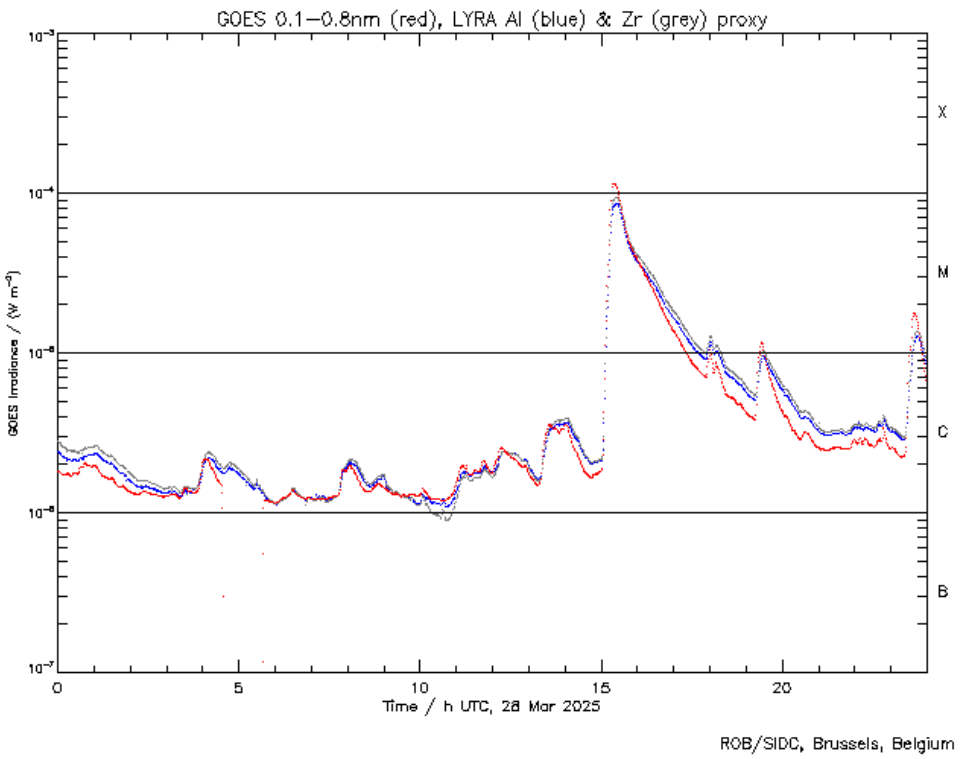
Solar flare activity fluctuated from low to high during the week.
In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: https://proba2.oma.be/ssa
This page also lists the recorded flaring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

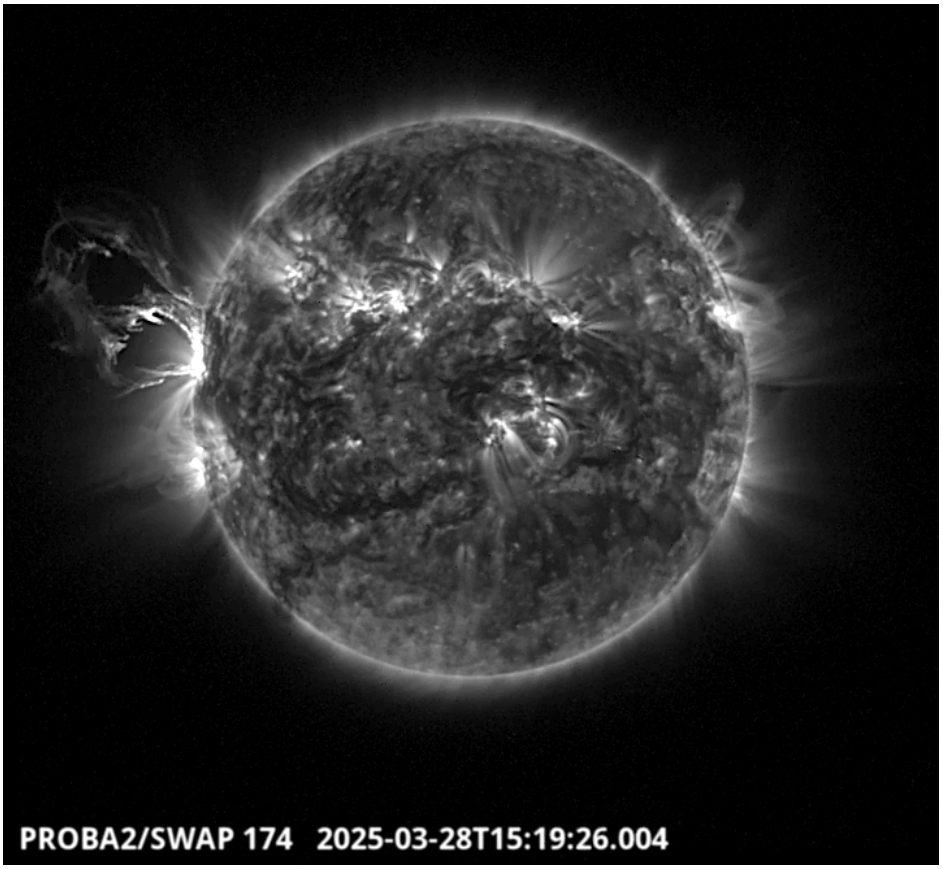
A weekly overview movie can be found here (SWAP week 783).

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

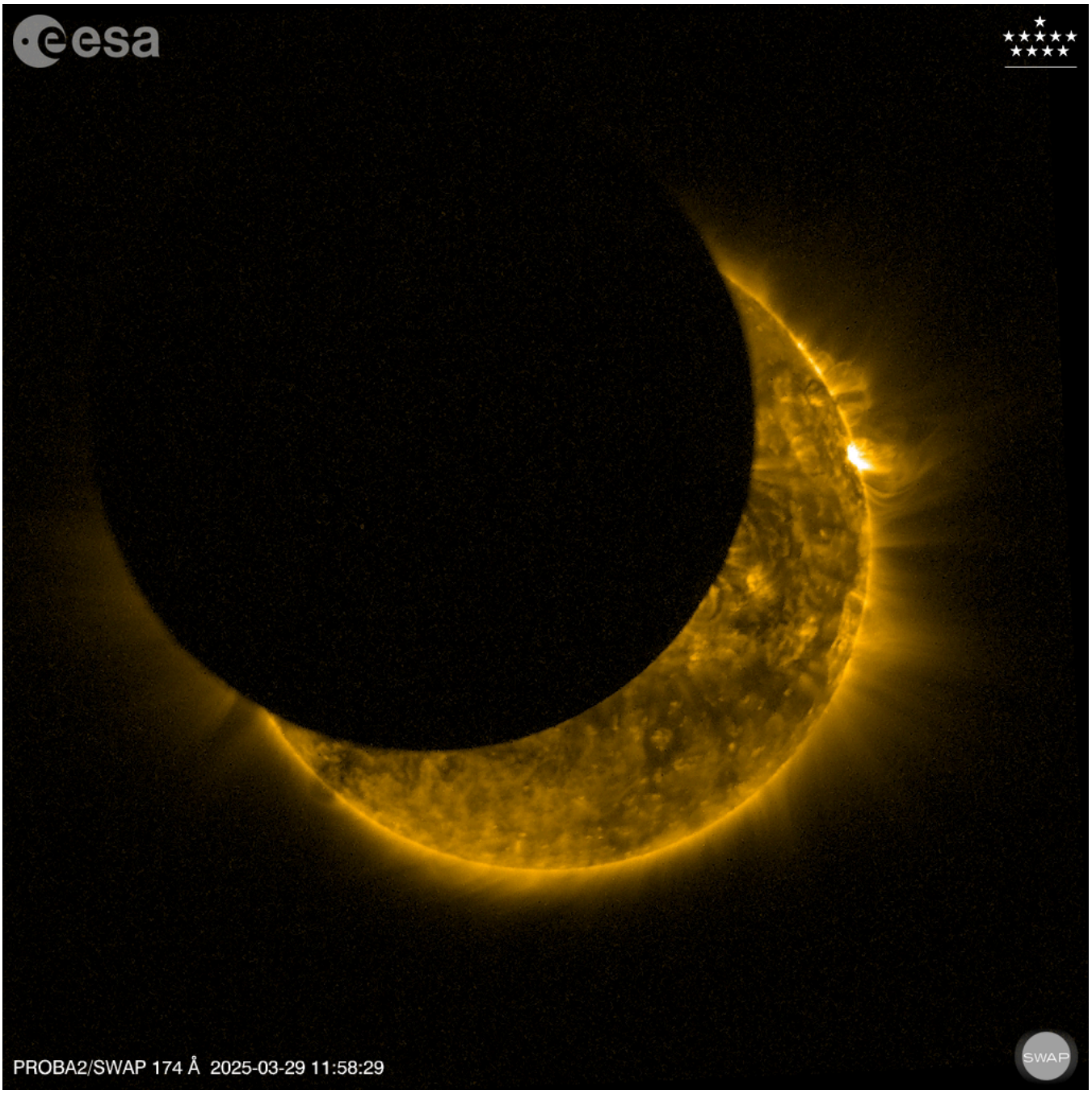
Friday Mar 28





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 2025-Mar-28 at 15:21 UT and it was associated with a large prominence eruption. It occurred at the eastern limb of the Sun, originating from active region NOAA4046. Find a SWAP movie of the event here.

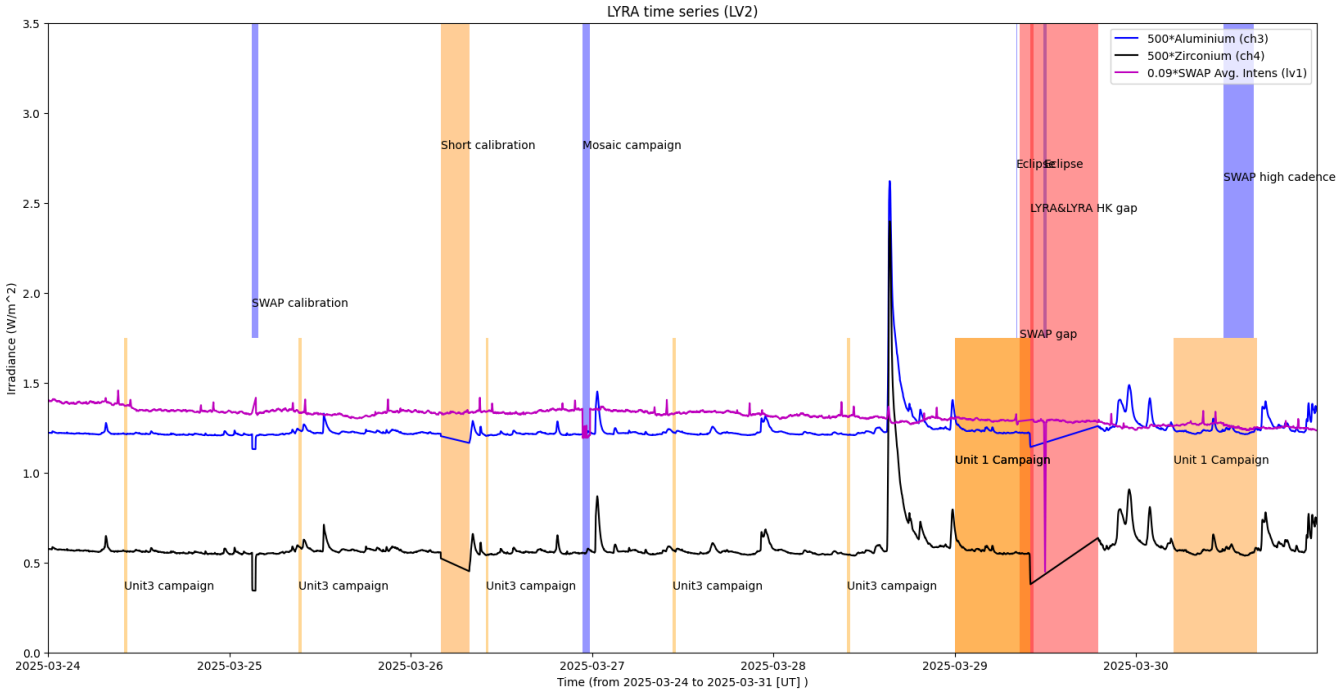
Saturday Mar 29



On March 29 a partial solar eclipse was primarily visible in North America, and parts of Asia, Africa and Europe. Given the satellite's orbit, PROBA2 passed twice through the shadow of the Moon, and the first pass had an almost 100% coverage. Sadly, due to a minor under-voltage issue, SWAP and LYRA turned off at the time of the greatest eclipse and the scientific data were lost. SWAP automatically turned back on following the commands issued for the second passage of the Moon, and observed a 70% eclipsed Sun. Here you can enjoy a movie of the SWAP observations taken during this pass. Unfortunately, the LYRA instrument was unavailable for several hours, resulting in a lack of data for this event.

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, 2025-03-25
- SWAP weekly mosaic, 2025-03-26
- Eclipse high-cadence (18 sec) campaign, on 2025-03-29 between 08:10:00 - 08:20:30 UT and 11:47 - 12:10 UT
- High-cadence (35 sec) joint campaign with EUI, 2025-03-30 between 11:35 - 15:35 UT

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

- Daily Unit 3 campaign, 2025-Mar-24
- Daily Unit 3 campaign, 2025-Mar-25
- Short calibration, 2025-Mar-26
- Daily Unit 3 campaign, 2025-Mar-26
- Daily Unit 3 campaign, 2025-Mar-27
- Daily Unit 3 campaign, 2025-Mar-28
- Unit 1 eclipse campaign, 2025-Mar-29
- Unit 1 campaign joint with EUI, 2025-Mar-30

The red shaded periods related to other issues corresponds to:

- SWAP data gap on 2025-03-29 between 08:37:11 - 10:25:08 UT (pass 49991), due to SWAP being off from an under-voltage issue
- LYRA and LYRA HK data gap on 2025-03-29 between 10:00 - 18:59 UT (passes 49992 - 49995), due to LYRA being off from an under-voltage issue

2. LYRA instrument status

IOS

Start IOS	Mon Mar 24 2025	LYIOS01159
End IOS	Sun Mar 30 2025	LYIOS01163

LYRA detector temperature

LYRA detector 2 temperature globally varied between 41.81 and 53.98 °C.

3. SWAP instrument status

MCPM errors
The number of MCPM recoverable errors increased from 1411 to 1817.
The number of MCPM unrecoverable errors remained at 0.

IOS

Start IOS	Mon Mar 24 2025	IOS01278
End IOS	Sun Mar 30 2025	IOS01279

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.53 and 1.03 °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 49943 to 50006) was nominal, except for:

- 49991 - 49995

Data coverage HK

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

- None
- LYRA HK data gap on 2025-Mar-29 between 09:59:49 - 18:53:43 UT, due to LYRA being off from an under-voltage issue.

Data coverage SWAP

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

- pass 49991, due to SWAP being off from an under-voltage issue, resulting in data gap on 2025-Mar-29 between 08:37:11 - 10:25:08 UT.

Total number of images between 2025 Mar 24 00:00 UT and 2025 Mar 31 00:00 UT: 4557
Highest cadence in this period: 17 seconds
Average cadence in this period: 132.71 seconds
Number of image gaps larger than 300 seconds: 209
Largest data gap: 107.95 minutes

Data coverage LYRA

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

- passes 49992 - 49995, due to LYRA being turned off from an under-voltage issue, resulting in a data gap on 2025-Mar-29 between 10:03 - 18:59 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)