P2SC-ROB-WR-631 - 20220425	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon April 25 to Sun May 01, 2022 02 May 2022 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 Apr	Tuesday 26 Apr	Wednesday 27 Apr	Thursday 28 Apr	Friday 29 Apr	Saturday 30 Apr	Sunday 01 May
Activity	moderate	low	low	low	moderate	high	low
Flares	**M1.1** **M1.2**	-	-	-	**M1.2** **M1.2**	**M2.6** **M1.4** **M4.8** **X1.1** **M1.9**	-

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

Solar Activity

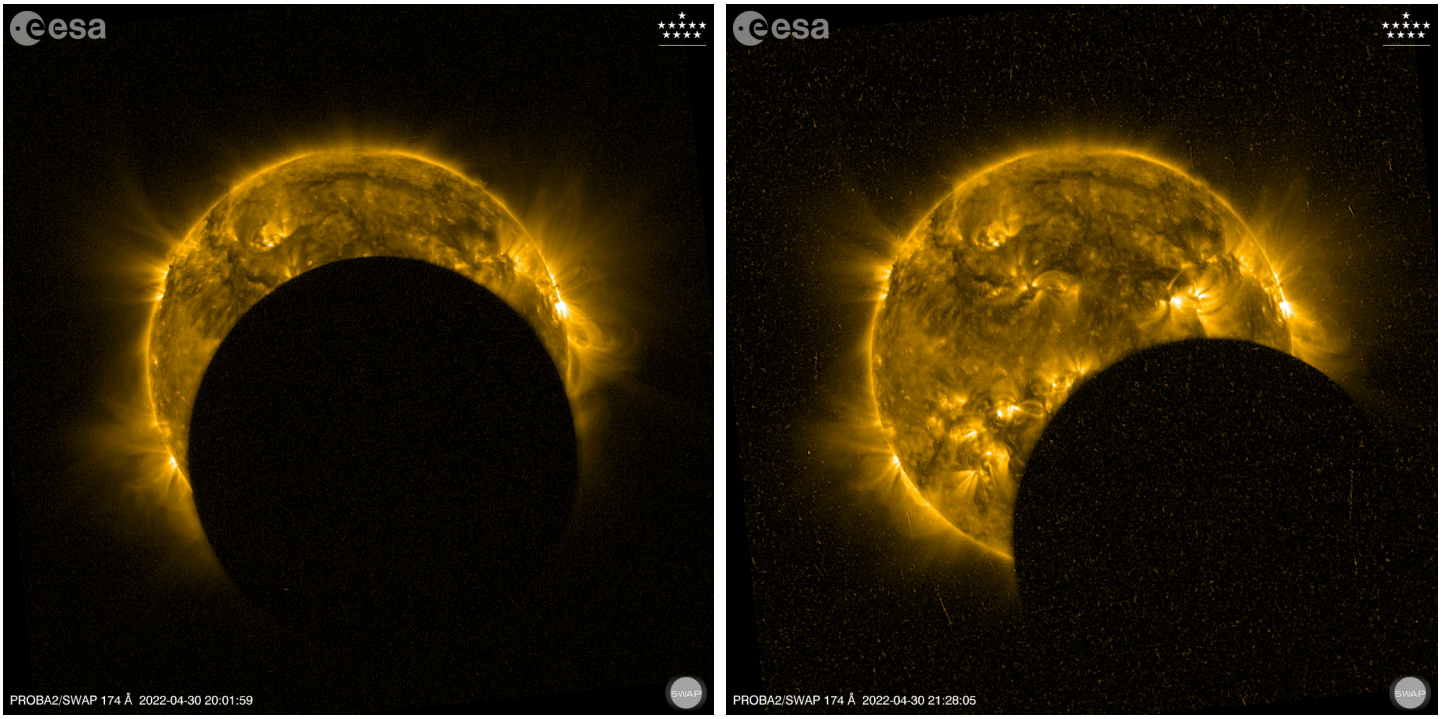
Solar flare activity fluctuated from low to high during the week.
In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: https://proba2.oma.be/ssa
This page also lists the recorded flaring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

A weekly overview movie can be found here (SWAP week 631).

Details about some of this week's events can be found further below.

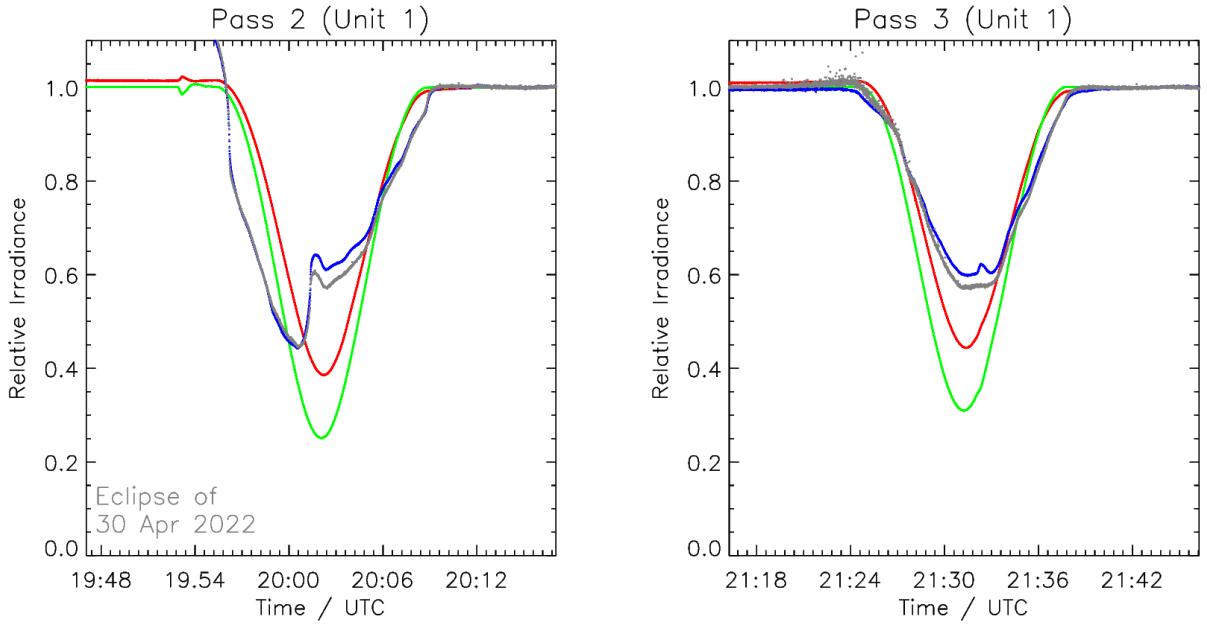
If any of the linked movies are unavailable they can be found in the P2SC movie repository here

Saturday April 30



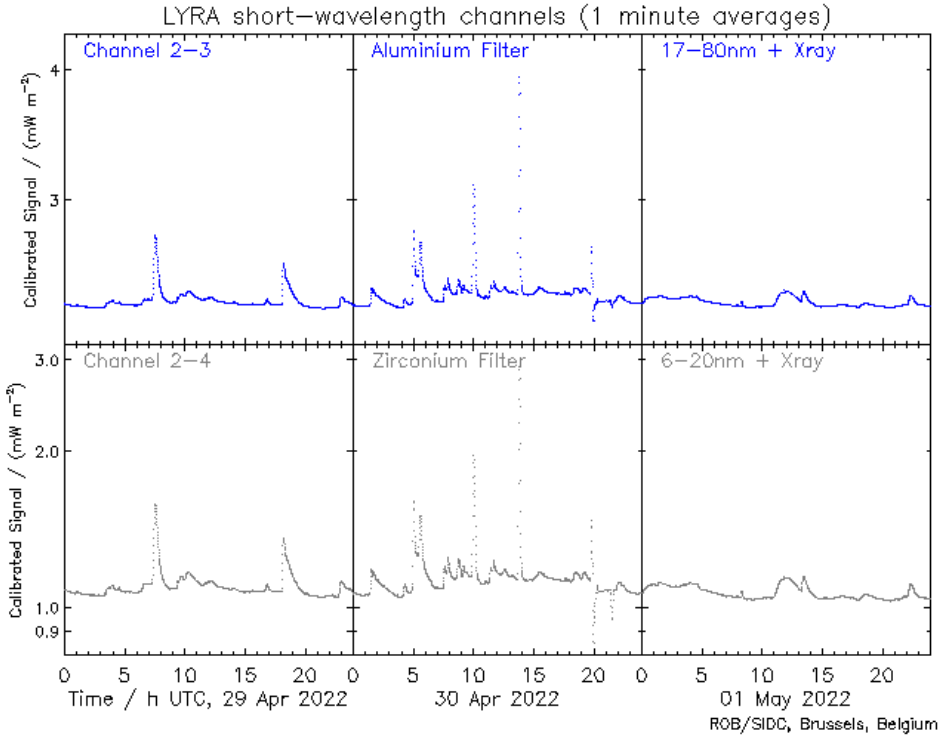
On 2022-Apr-30 a partial eclipse as seen from Earth was observed by SWAP and LYRA as three partial solar eclipses, with an additional pass of the Moon just in front of the solar corona (but not occulting the disk). The SWAP images above were taken during the second (left panel) and third (right panel) partial occultation. The third one occurred during an SEP event.

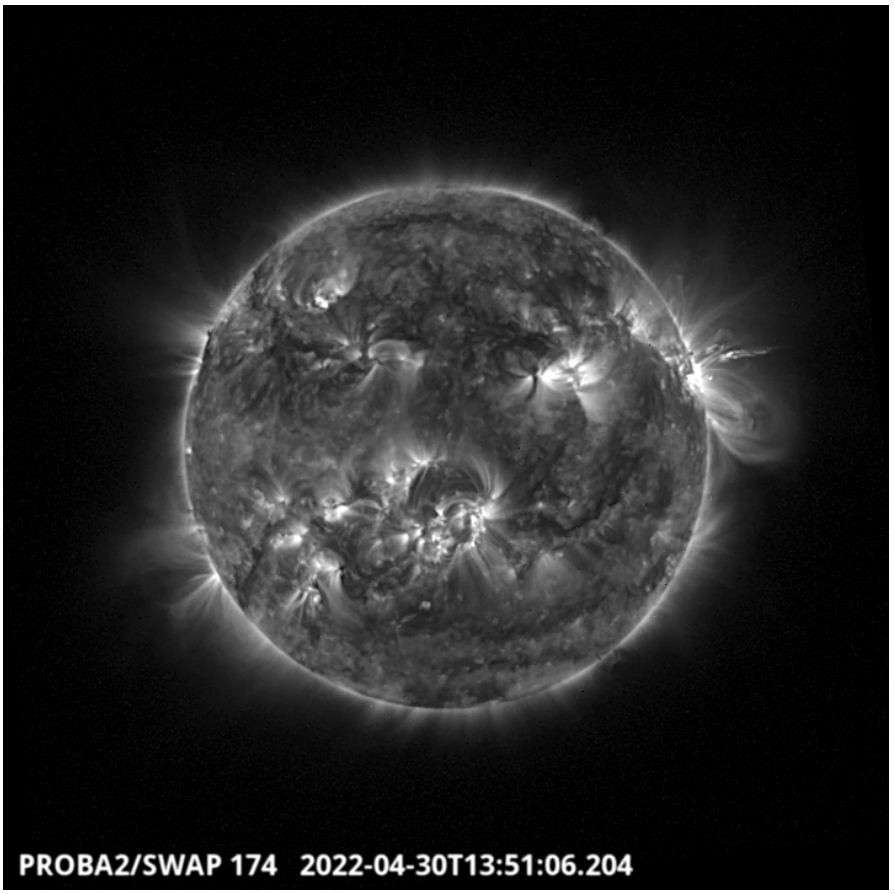
Find a movie of the event here and further images available here



The occultations were also observed by LYRA's "calibration unit" (unit 1) in addition to the nominal one (unit 2). The plots above show normalized observations by LYRA during two passes in the eclipse zone. The colors correspond to the observations by the four channels of LYRA: red = Lyman-alpha, green = Herzberg, blue = Aluminum, black = Zirconium.

Saturday April 30



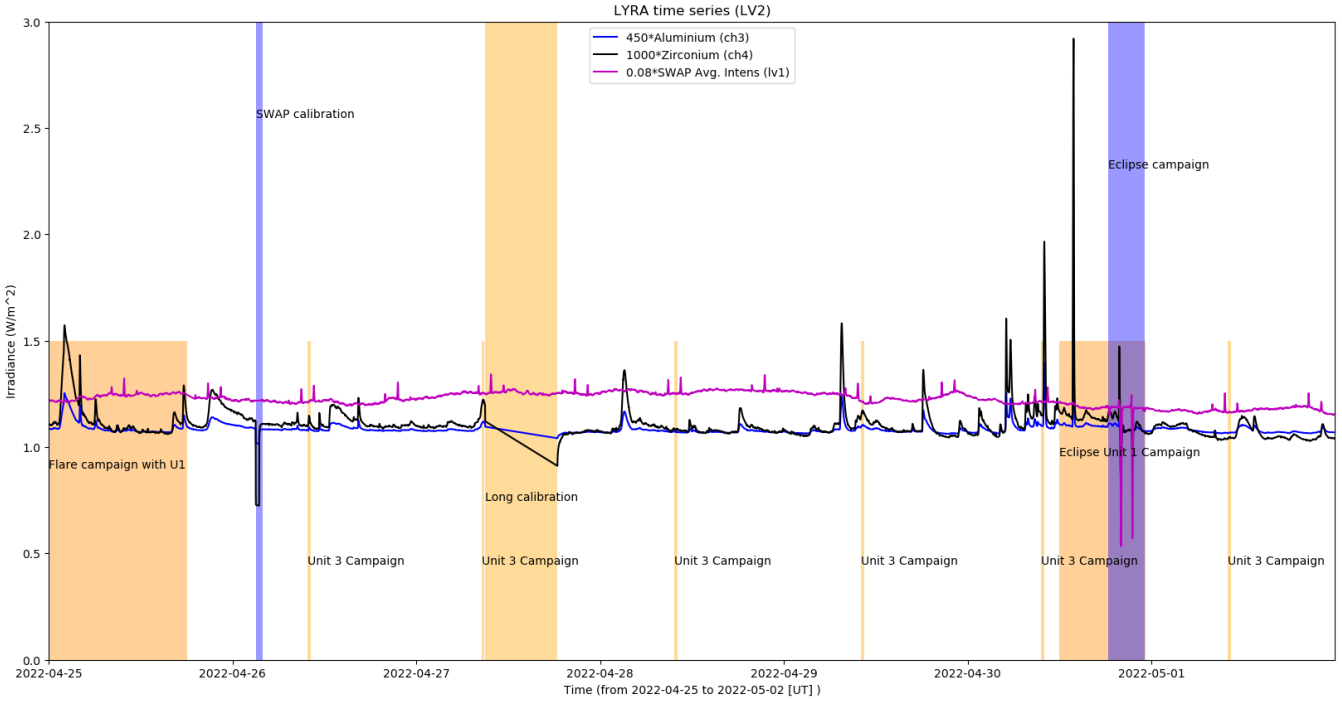


The largest flare of the week, an X1.1 flare originating from NOAA active region 2994, was observed by SWAP and LYRA. The prominence material is visible on the western limb on 2022-Apr-30, as shown in the SWAP image above taken at 13:51 UT.

Find a movie of the event **here** (SWAP movie).

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 on 2022-Apr-26
- High-cadence (every 15 sec) eclipse campaign on 2022-Apr-30, split into 4 intervals: 18:24:10 - 18:37:02, 19:52:45 - 20:14:10, 21:19:15 - 21:40:35, and 22:57:25 - 23:08:35.

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

- Unit 1 flare campaign, from 2022-04-18 18:25 until 2022-04-25 18:05
- Daily unit 3 campaign, 2022-Apr-26
- Daily unit 3 campaign, 2022-Apr-27
- Long calibration campaign on 2022-Apr-27
- Daily unit 3 campaign, 2022-Apr-28
- Daily unit 3 campaign, 2022-Apr-29
- Daily unit 3 campaign, 2022-Apr-30
- Unit 1 eclipse campaign on 2022-Apr-30, between 12:00 - 23:16
- Daily unit 3 campaign, 2022-May-01

The red shaded periods related to other issues corresponds to:

- None

2. LYRA instrument status

IOS

Start IOS	Mon Apr 25 2022	LYIOS00948
End IOS	Sun May 01 2022	LYIOS00949

LYRA detector temperature

LYRA detector 2 temperature globally varied between 48.233 and 52.434 °C.

3. SWAP instrument status

MCPM errors
The number of MCPM recoverable errors increased from 29695 to 29766.
The number of MCPM unrecoverable errors remained at 3135.

IOS

Start IOS	Mon Apr 25 2022	IOS01044
End IOS	Sun May 01 2022	IOS01045

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.05 and 0.23 °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 40656 to 40719) was nominal, except for:

- 40662 (see below)
- Processing of BINSWAP files for passes 40673 and 40691 failed due to corrupted data.

Data coverage HK

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

- The file for pass 40662 lacked sufficient data.

Data coverage SWAP

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

- The pass 40662 could not be processed due to lack of sufficient house-keeping data, resulting in a gap of level 1 data on April 25 between 17:40 - 19:00.

Total number of images between 2022 Apr 25 00:00 UT and 2022 May 02 00:00 UT: 4472
Highest cadence in this period: 0 seconds
Average cadence in this period: 135.19 seconds
Number of image gaps larger than 300 seconds: 190
Largest data gap: 11.00 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)