


P2SC-ROB-WR-630 - 20220418	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon April 18 to Sun April 24, 2022 26 Apr 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<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 18 Apr	Tuesday 19 Apr	Wednesday 20 Apr	Thursday 21 Apr	Friday 22 Apr	Saturday 23 Apr	Sunday 24 Apr
Activity	moderate	moderate	high	moderate	moderate	low	low
Flares	<b>M1.9</b> M1.1 M1.3	<b>M1.6</b> M3.7 M1.0	<b>M1.9</b> X2.2 M7.2 M1.2	<b>M9.6</b>	<b>M3.4</b> M1.1	-	-

<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>

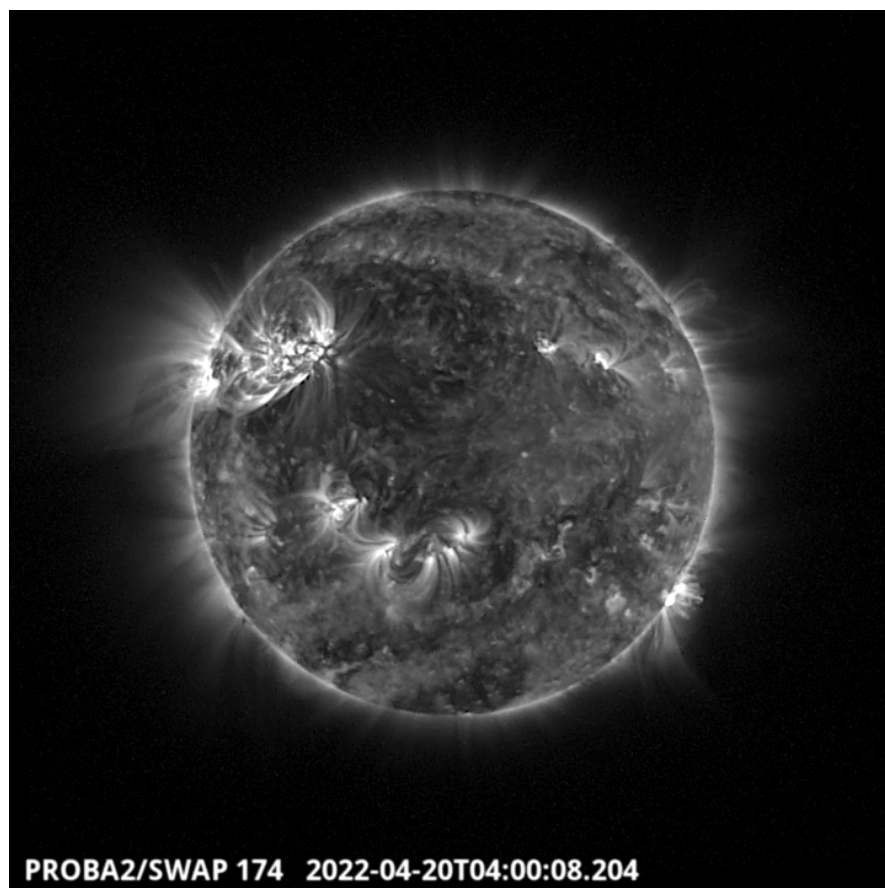
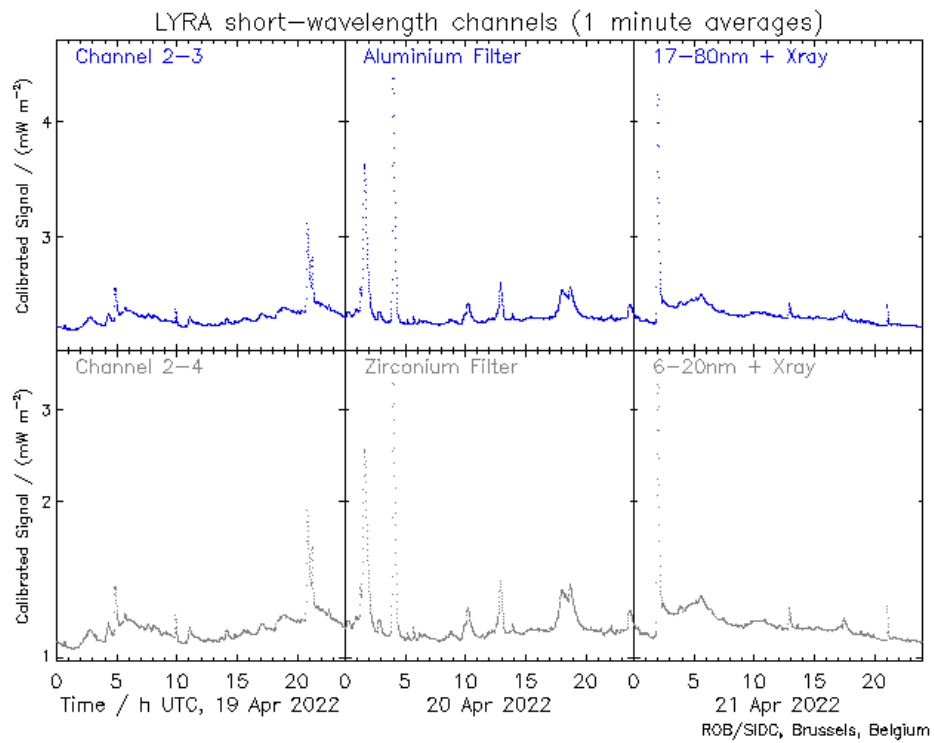
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 630).

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](#)

Wednesday April 20



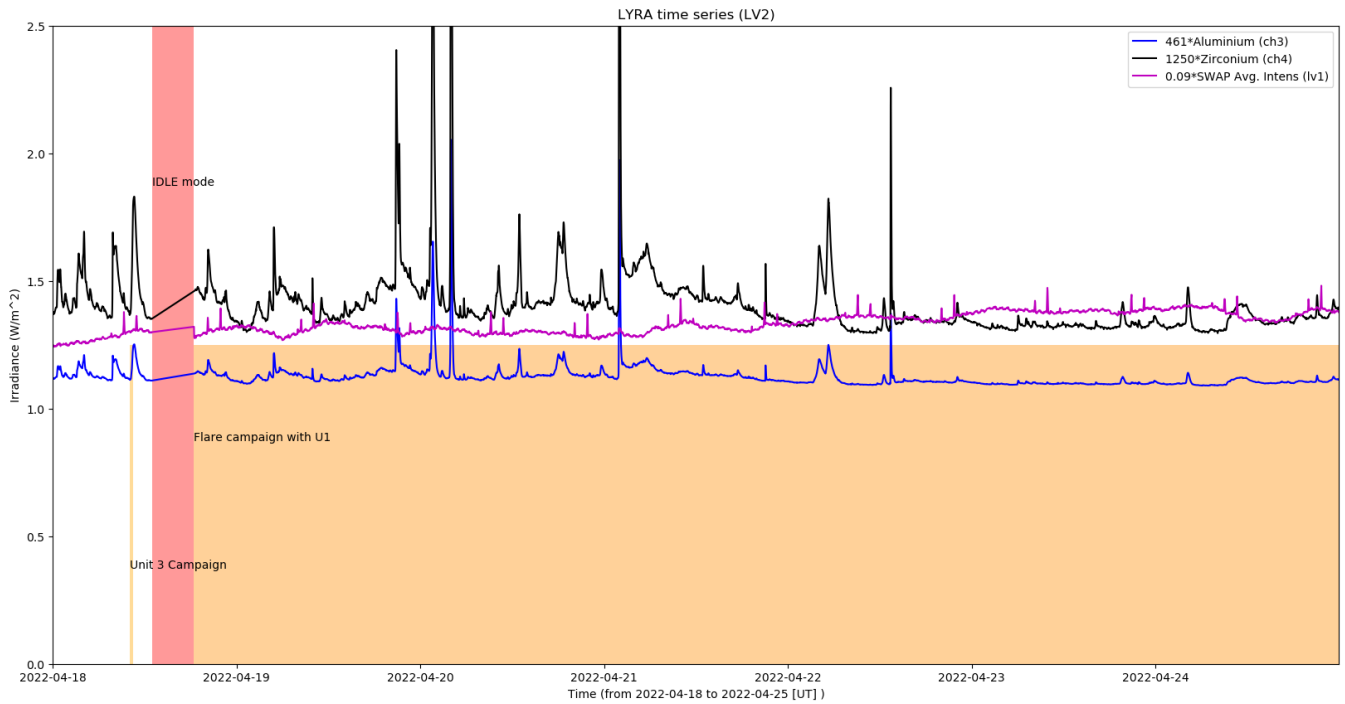
The largest flare of the week, an X2.2 flare originating from NOAA active region 2992, was observed by SWAP and LYRA. The flare is visible on the south-western limb on 2022-Apr-20, as shown in the SWAP image above taken at 04:00 UT.

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:

- None

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

- Daily unit 3 campaign, 2022-Apr-18
- Unit 1 flare campaign, from 2022-04-18 18:25 until 2022-04-25 18:05

The red shaded periods related to other issues corresponds to:

- Data gap due to collision avoidance maneuver that took place on 2022-04-18 between 13:15 and ~18:30

## 2. LYRA instrument status

### IOS

Start IOS	Mon Apr 18 2022	LYIOS00944
End IOS	Sun Apr 24 2022	LYIOS00948

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.787 and 52.79 °C.

### 3. SWAP instrument status

#### MCPM errors

The number of MCPM recoverable errors increased from 29560 to 29695.

The number of MCPM unrecoverable errors remained at 3135.

#### IOS

Start IOS	Mon Apr 18 2022	IOS01042
End IOS	Sun Apr 24 2022	IOS01044

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -5.21 and 0.39 °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 40596 to 40655) was nominal, except for:

- pass 40599 was turned into an uplink pass only in order to upload without interference the collision avoidance maneuver that took place on April 18; therefore, no data was downloaded during this pass
- 40602 and 40603, during which the instruments were turned off in order to perform the collision avoidance maneuver
- processing of BINSWAP file for pass 40639 failed due to corrupted data

### Data coverage HK

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

- LYRA\_AD file for pass 40599 was re-sent on April 20, but it was problematic and couldn't be used to create the SWAP files.
- passes 40602 and 40603 (instruments turned off)

### Data coverage SWAP

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

- passes 40599 and 40600 (data came down during other passes)
- passes 40602 and 40603 (instruments turned off)

Total number of images between 2022 Apr 18 00:00 UT and 2022 Apr 25 00:00 UT: 4234

Highest cadence in this period: 110 seconds

Average cadence in this period: 142.83 seconds

Number of image gaps larger than 300 seconds: 187

Largest data gap: 332.60 minutes

### Data coverage LYRA

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

- passes 40602 and 40603 (instruments turned off)



## 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)