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| P2SC-ROB-WR-647<br>- 20220815                               | <b>P2SC Weekly report</b>  |  |
| Period covered:<br>Date:<br><br>Written by:<br>Approved by: | Mon Aug 15 to Sun Aug 21, 2022<br>22 Aug 2022<br><br>Dana Talpeanu<br>Marie Dominique  | Royal Observatory of Belgium<br>-<br>PROBA2 Science Center                          |
| To:   | LYRA PI, marie.dominique@sidc.be<br>SWAP PI, elke.dhuys@sidc.be  | <a href="https://proba2.sidc.be">https://proba2.sidc.be</a><br>++ 32 (0) 2 3730559  |
| cc:   | ROB DIR, ronald@oma.be<br>ESA Redu, Rene.Wittmann@esa.int and<br>Marcus.De.Deus.Silva@esa.int<br>ESA D/SRE, Joe.Zender@esa.int<br>ESA D/TEC,<br>Juha-Pekka.Luntama@esa.int and<br>Melanie.Heil@esa.int |   |

## 1. Science

### Solar & Space weather events

The level of solar activity<sup>1</sup> fluctuated between **very low and moderate** this week.

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

|          | Monday<br>15 Aug   | Tuesday<br>16 Aug          | Wednesday<br>17 Aug        | Thursday<br>18 Aug                        | Friday<br>19 Aug | Saturday<br>20 Aug | Sunday<br>21 Aug |
|----------|--|----------------------------|----------------------------|---|------------------|--------------------|------------------|
| Activity | moderate   | moderate                   | moderate                   | moderate                                  | moderate         | very low           | low              |
| Flares   | <b>M1.1</b><br><b>M0.9</b><br><b>M2.7</b><br><b>M1.0</b> | <b>M1.8</b><br><b>M5.0</b> | <b>M1.0</b><br><b>M2.0</b> | <b>M1.3</b><br><b>M1.5</b><br><b>M1.3</b> | <b>M1.6</b>      | -                  | -                |

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

## **Solar Activity**

Solar flare activity fluctuated from very low to moderate 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>

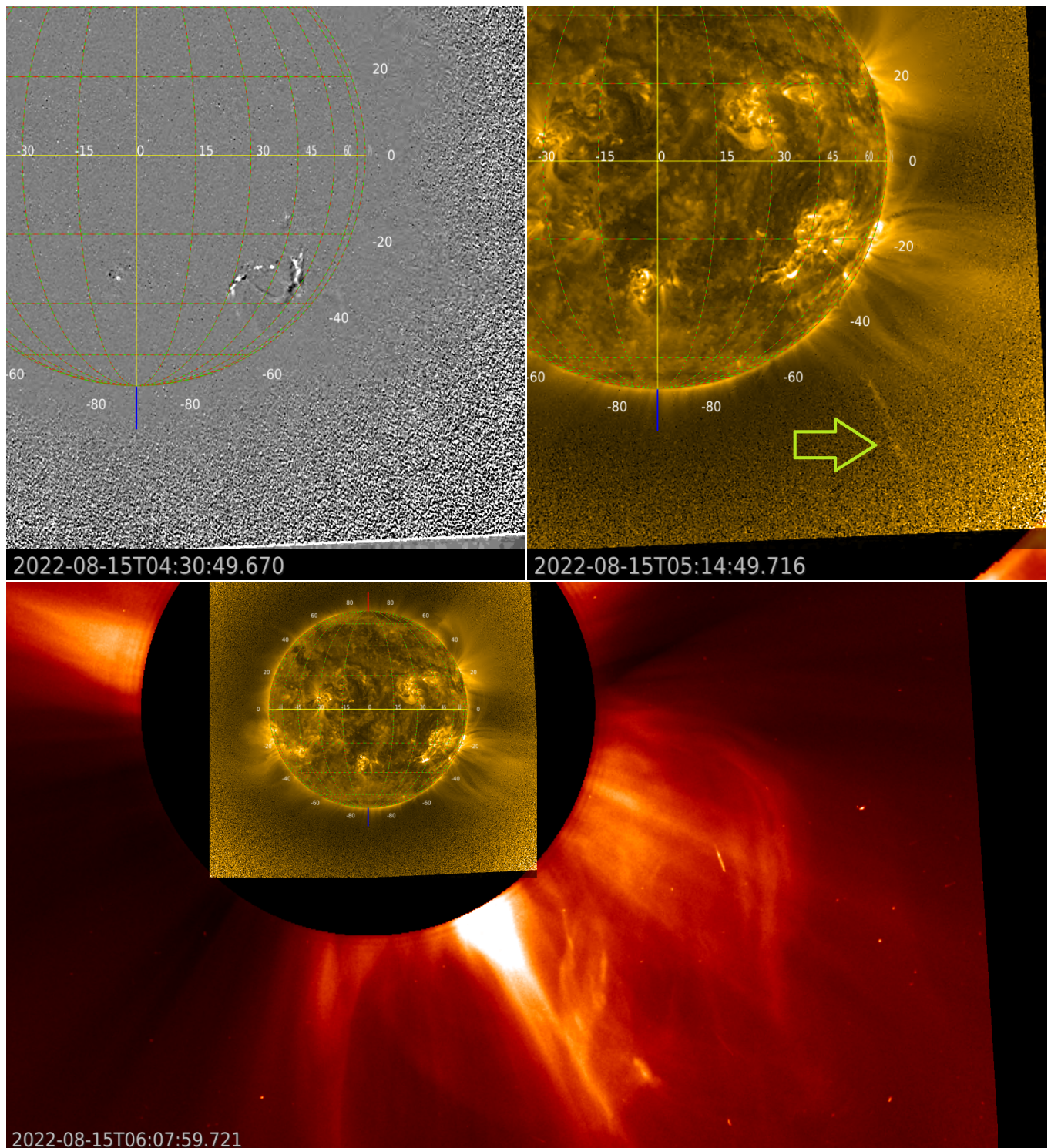
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 647).

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](#)

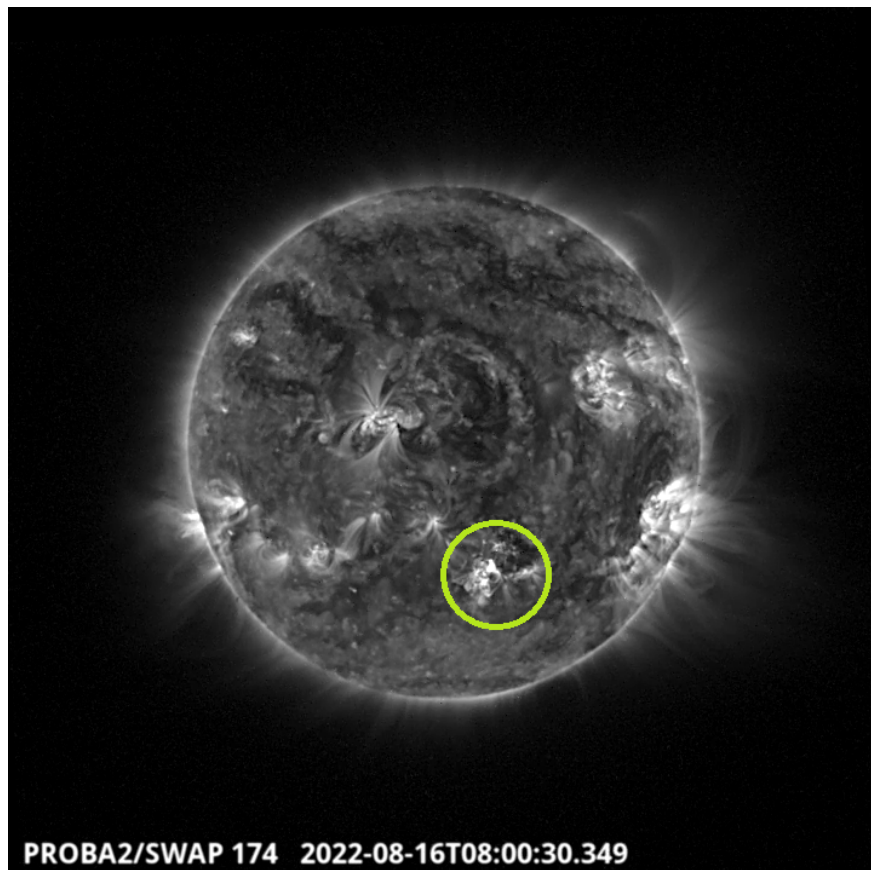
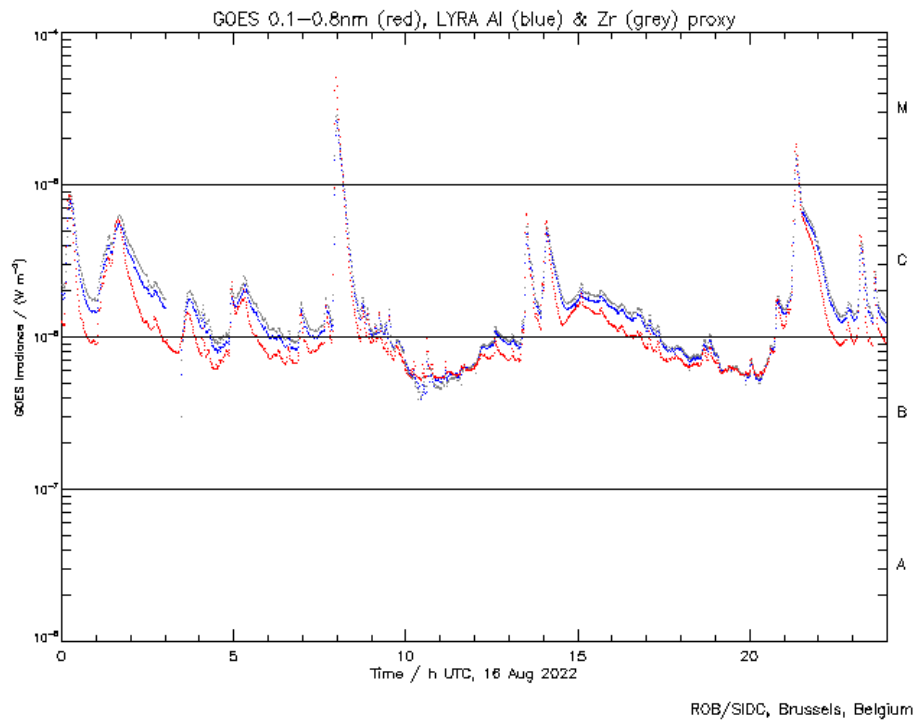
Monday Aug 15



**A large filament can be seen erupting in the top SWAP images on 2022-Aug-15. The running difference image in the left panel shows the origin of the filament, and the right panel contains an image of the erupting prominence material which can be tracked up to 2Rs (indicated by the green arrow). The bottom panel is a composite PROBA2/SWAP and SOHO/LASCO-C2 image, showing the CME associated with the filament eruption, at approximately 06:07 UT on the same day.**

Find a SWAP movie of the event [here](#).

Tuesday Aug 16



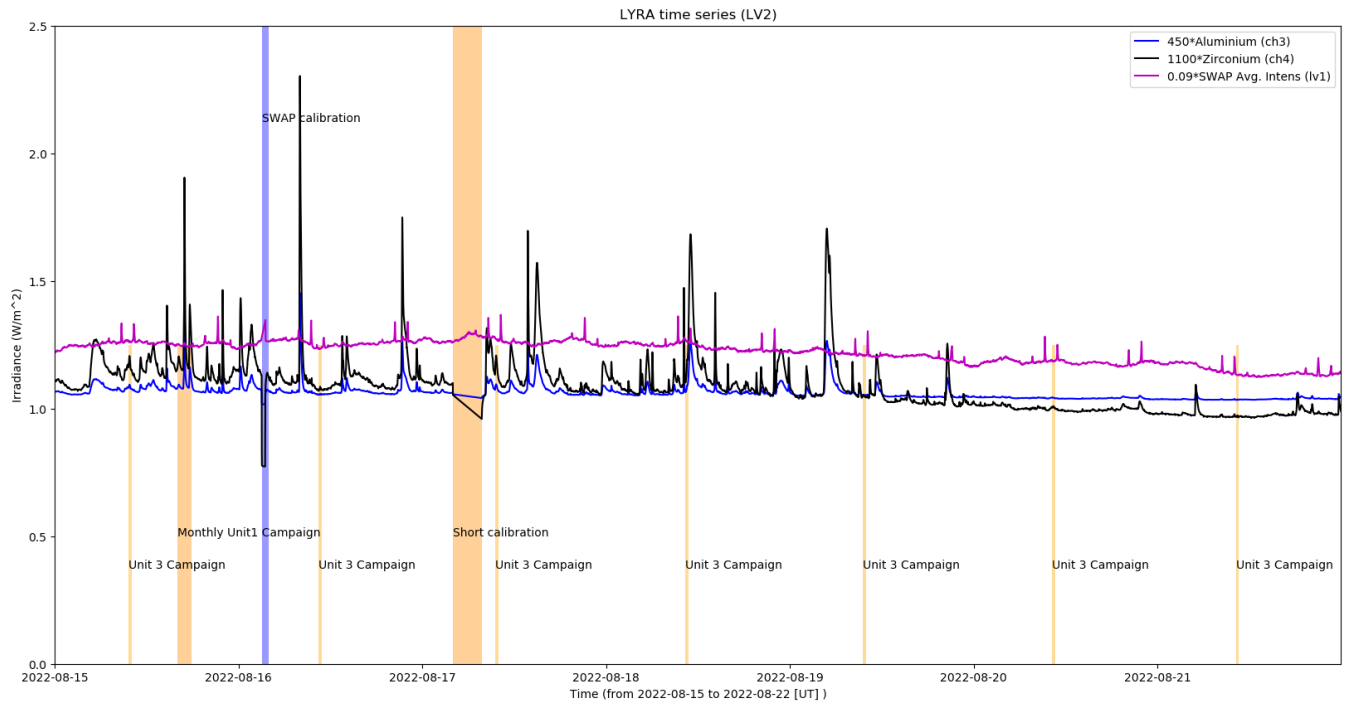
The largest flare of the week, an M5.0 flare, was observed by SWAP and LYRA. The flare was associated with NOAA AR3078, which was the most active this week and was located at S24W19 on 2022-Aug-16, as encircled in the SWAP image above taken at 08:00 UT.

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:

- SWAP bi-weekly calibration, 2022-Aug-16

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

- Daily Unit3 campaign, 2022-Aug-15
- Monthly Unit1 campaign, 2022-Aug-15
- Daily Unit3 campaign, 2022-Aug-16
- Short calibration, 2022-Aug-17
- Daily Unit3 campaign, 2022-Aug-17
- Daily Unit3 campaign, 2022-Aug-18
- Daily Unit3 campaign, 2022-Aug-19
- Daily Unit3 campaign, 2022-Aug-20
- Daily Unit3 campaign, 2022-Aug-21

The red shaded periods related to other issues corresponds to:

- None

## 2. LYRA instrument status

### IOS

|           |                 |            |
|-----------|-----------------|------------|
| Start IOS | Mon Aug 15 2022 | LYIOS00964 |
| End IOS   | Sun Aug 21 2022 | LYIOS00965 |

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 47.43 and 50.85 °C.

### 3. SWAP instrument status

#### MCPM errors

The number of MCPM recoverable errors increased from 32525 to 32667.

The number of MCPM unrecoverable errors remained at 3135.

#### IOS

|           |                 |           |
|-----------|-----------------|-----------|
| Start IOS | Mon Aug 15 2022 | IOS001054 |
| End IOS   | Sun Aug 21 2022 | IOS001054 |

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.21 and -0.33 °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 41644 to 41706) was nominal, except for:

- None.

### **Data coverage HK**

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

- None.

### **Data coverage SWAP**

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

- None.

Total number of images between 2022 Aug 15 00:00 UT and 2022 Aug 22 00:00 UT: 4236

Highest cadence in this period: 30 seconds

Average cadence in this period: 142.77 seconds

Number of image gaps larger than 300 seconds: 224

Largest data gap: 12.83 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)