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| P2SC-ROB-WR-650 - 20220905 | P2SC Weekly report |  |
| Period covered: Date: Written by: Approved by: | Mon Sep 05 to Sun Sep 11, 2022 14 Sep 2022 Laurence Wauters Marie Dominique | Royal Observatory of Belgium - PROBA2 Science Center |
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1. Science

Solar & Space weather events

The level of solar activity¹ fluctuated between **low and moderate** this week.

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

| | Monday 05 Sep | Tuesday 06 Sep | Wednesday 07 Sep | Thursday 08 Sep | Friday 09 Sep | Saturday 10 Sep | Sunday 11 Sep |
|----------|------------------|-------------------|---------------------|--------------------|------------------|--------------------|------------------|
| Activity | moderate | low | low | low | low | low | low |
| Flares | M1.0 | - | - | - | - | - | - |

¹ See appendix. All timings are given in UT.

Solar Activity

Solar flare activity fluctuated from 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>

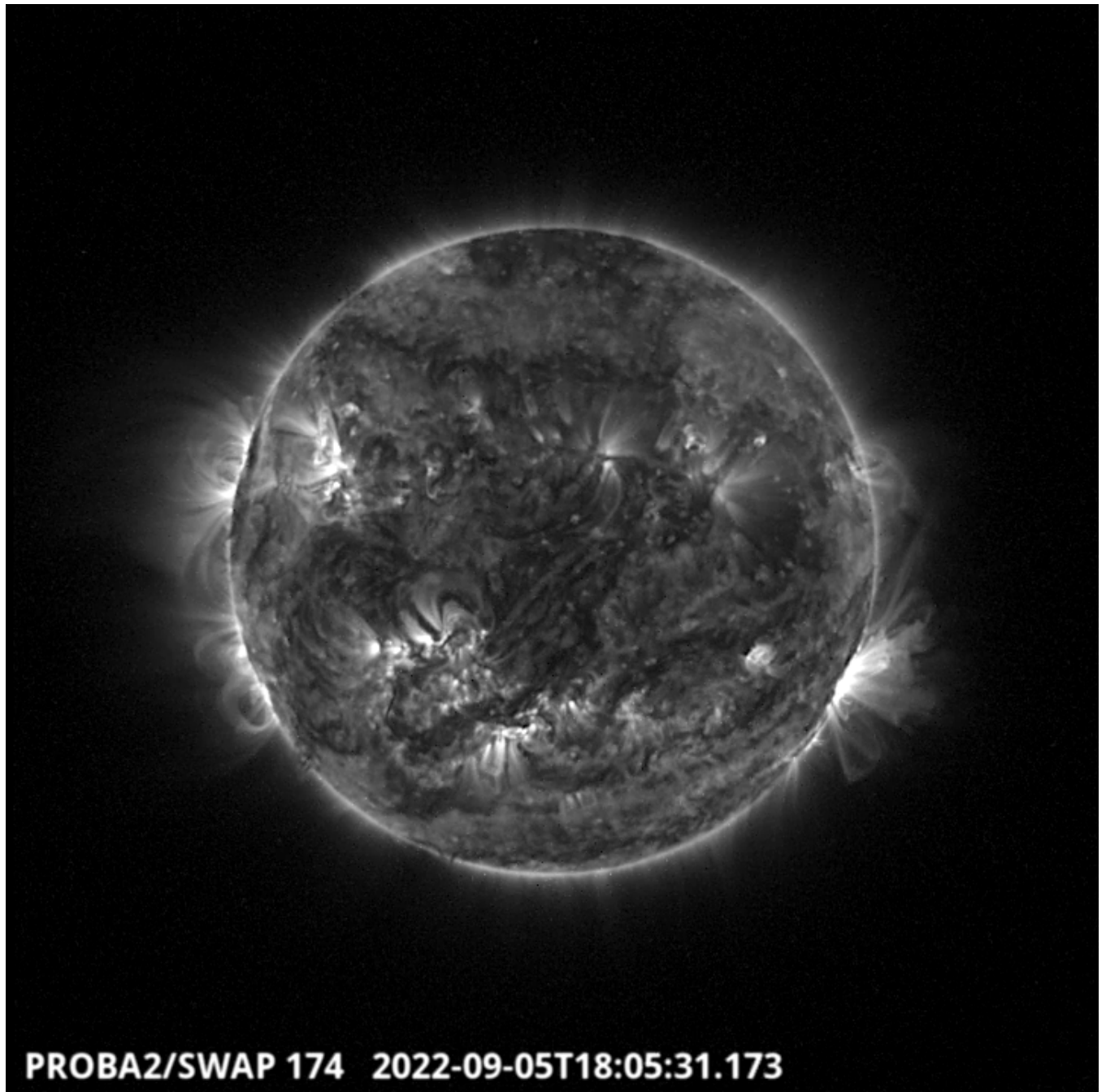
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 650).

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 Sep 05



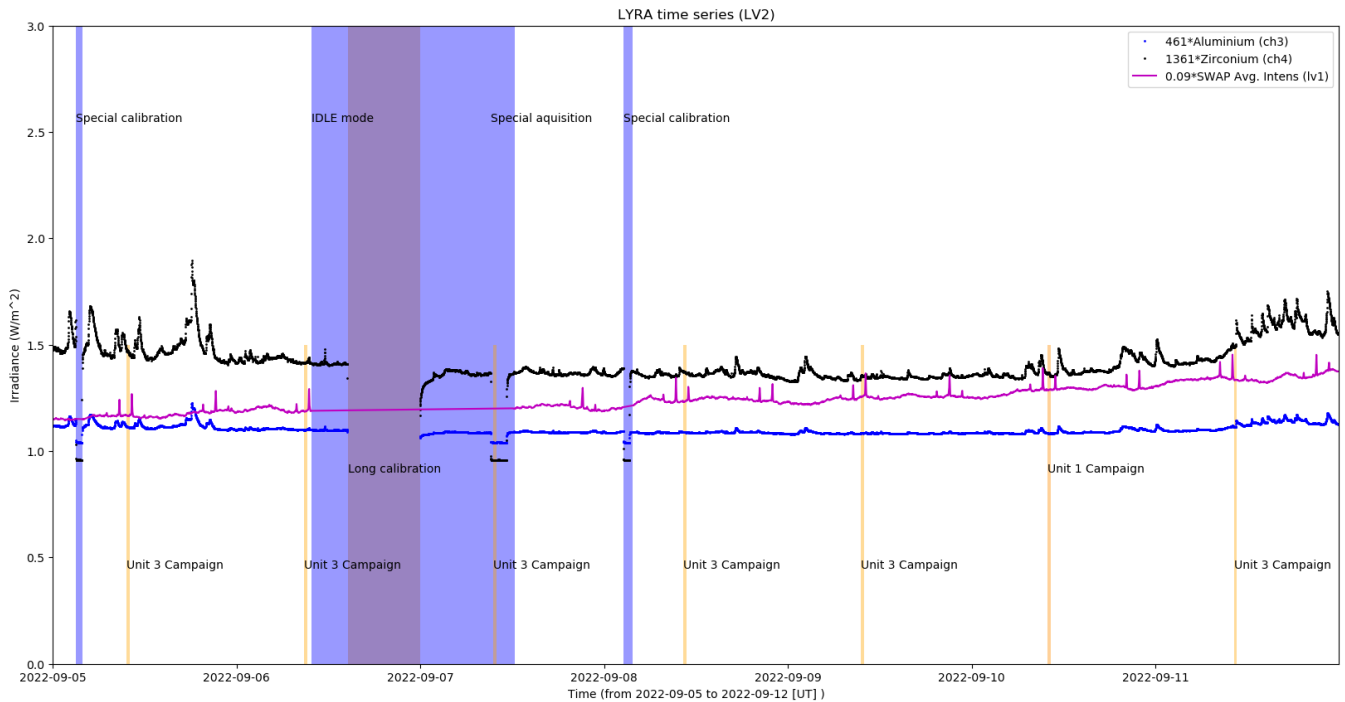
The largest eruption of the week (a M1.0 flare) was produced on the South West Limb around
18:05 UT - SWAP image

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:

SWAP bake out campaign:

- SWAP special calibration campaign starting on 2022-Sep-05 03:00:00 UT (5° off-point with extra images at 15 and 20 sec integration time, then return to Sun center pointing),
- IDLE mode from 2022-Sep-06 09:44:00 UT till 2022-Sep-07 09:09:40 UT,
- Bake out from 2022-09-06 09:55:00 till 2022-09-07 09:02:00,
- 5° off-point and acquisition of uncompressed images with varying integration times (10,15,20) starting on 2022-Sep-07 09:09:40 UT,
- return to nominal acquisition on 2022-Sep-07 11:15:10,
- special post bake-out calibration starting on 2022-Sep-08 02:30 (5° off-point with extra images at 15 and 20 sec integration time),
- Nominal Sun-center acquisition mode from 03:42:30.

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

- Daily unit 3 campaign, 2022-Sep-05
- Daily unit 3 campaign, 2022-Sep-06
- Long calibration on 2022-Sep-06 from 14:30 to 23:55 (during the SWAP bake-out).
- Daily unit 3 campaign, 2022-Sep-07

- Daily unit 3 campaign, 2022-Sep-08
- Daily unit 3 campaign, 2022-Sep-09
- Daily unit 3 campaign, 2022-Sep-10
- Daily unit 3 campaign, 2022-Sep-11

The red shaded periods related to other issues corresponds to:

SWAP data gap between 2022-Sep-06 at 09:44 and 2022-Sep-07 at ~12:04 due to SWAP being on idle mode during the bake-out campaign.

2. LYRA instrument status

IOS

| | | |
|-----------|-----------------|------------|
| Start IOS | Mon Sep 05 2022 | LYIOS00969 |
| End IOS | Sun Sep 11 2022 | LYIOS00970 |

LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.19 and 49.95 °C.

3. SWAP instrument status

MCPM errors

The number of MCPM recoverable errors increased from 32881 to 33038.

The number of MCPM unrecoverable errors remained at 3135.

IOS

| | | |
|-----------|-----------------|----------|
| Start IOS | Mon Sep 05 2022 | IOS01056 |
| End IOS | Sun Sep 11 2022 | IOS01057 |

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.61 and 50.1 °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 41832 to 41897) 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 (except during idle mode of bake-out campaign)

Total number of images between 2022 Sep 05 00:00 UT and 2022 Sep 12 00:00 UT: 4334

Highest cadence in this period: 20 seconds

Average cadence in this period: 139.55 seconds

Number of image gaps larger than 300 seconds: 132

Largest data gap: 1408.40 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)