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|---|---|---|
| P2SC-ROB-WR-448<br>- 20181022<br>Weekly report #448         | <b>P2SC Weekly report</b>   |  |
| Period covered:<br>Date:<br><br>Written by:<br>Approved by: | Mon Oct 22 to Sun Oct 28, 2018<br>29 Oct 2018<br><br>Jennifer O'Hara<br>Matthew West  | Royal Observatory<br>of Belgium<br>-<br>PROBA2 Science<br>Center                    |
| To:   | LYRA PI, marie.dominique@sidc.be<br>SWAP PI, elke.dhuys@sidc.be   | <a href="http://proba2.sidc.be">http://proba2.sidc.be</a><br>++ 32 (0) 2 3730559    |
| cc:   | ROB DIR, ronald@oma.be<br>ESA Redu, Etienne.Tilmans@esa.int<br>ESA D/SRE, Joe.Zender@esa.int<br>ESA D/TEC, Juha-Pekka.Luntama@esa.int |   |

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## 1. Science

### Solar & Space weather events

The level of solar activity<sup>1</sup> remained **very low** this week.

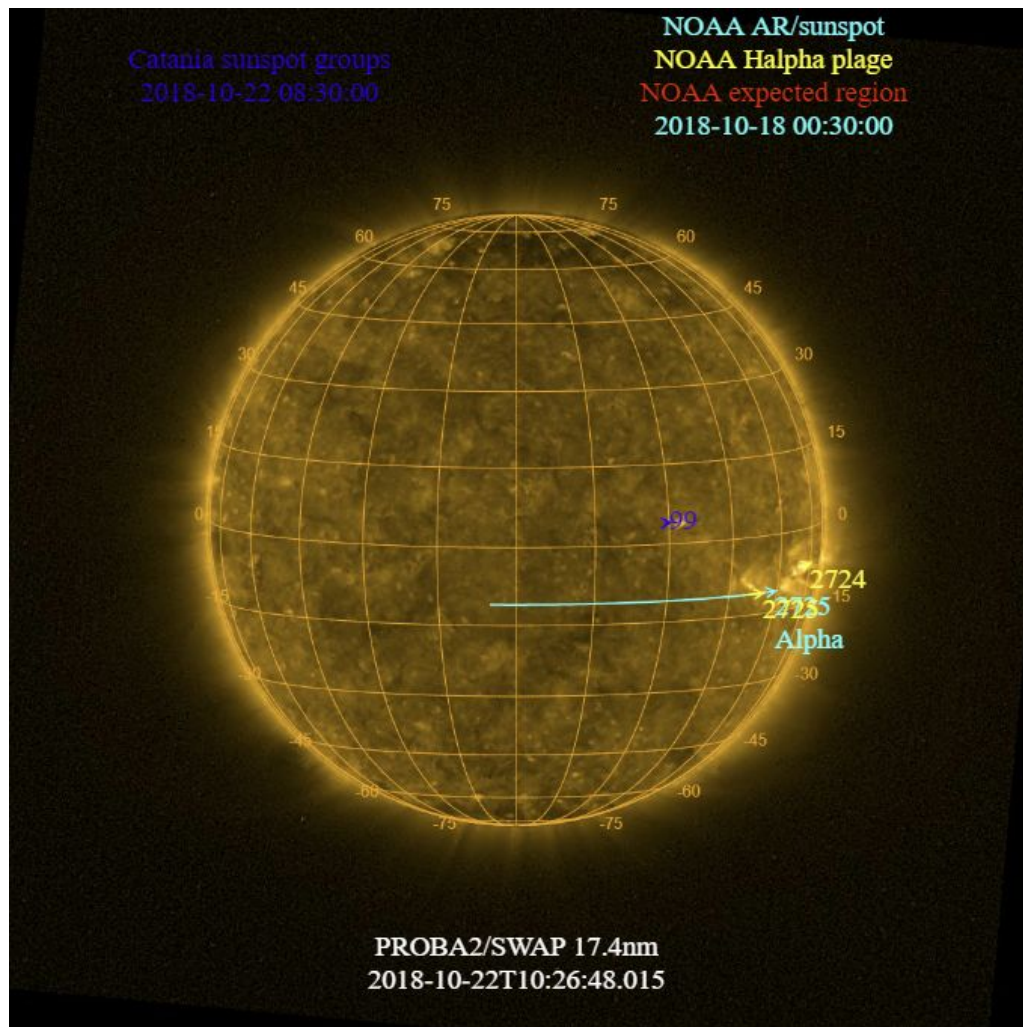
Only M- and X-flares are mentioned, the most energetic one(s) per day are presented in **bold**:

|          | Monday<br>22 Oct | Tuesday<br>23 Oct | Wednesday<br>24 Oct | Thursday<br>25 Oct | Friday<br>26 Oct | Saturday<br>27 Oct | Sunday<br>28 Oct |
|----------|------------------|-------------------|---------------------|--------------------|------------------|--------------------|------------------|
| Activity | very low         | very low          | very low            | very low           | very low         | very low           | very low         |
| Flares   | -                | -                 | -                   | -                  | -                | -                  | -                |

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

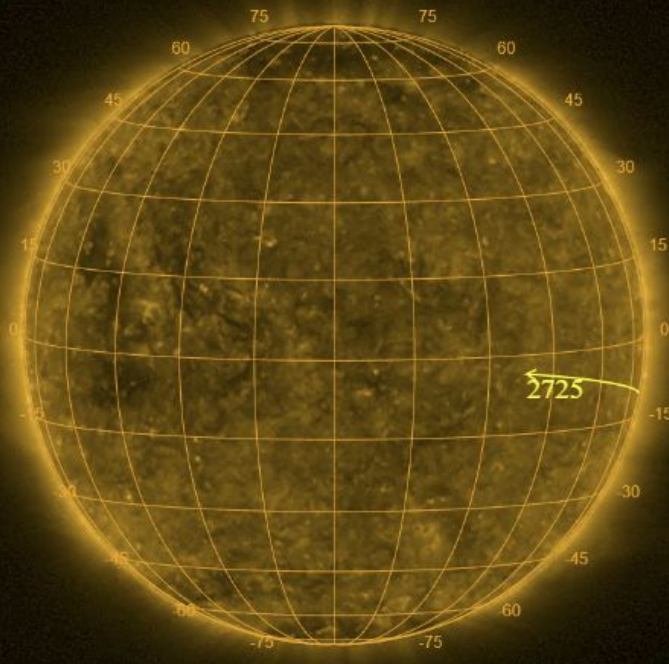
The SWAP images of Oct 22 and Oct 28 are shown below, with annotated active regions.



<http://sidc.be/soteria/soteria.php>

Catania sunspot groups  
No observation

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
No observation



PROBA2/SWAP 17.4nm  
2018-10-28T10:29:34.158

## Solar Activity

Solar flare activity remained very low 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: <http://proba2.oma.be/ssa>

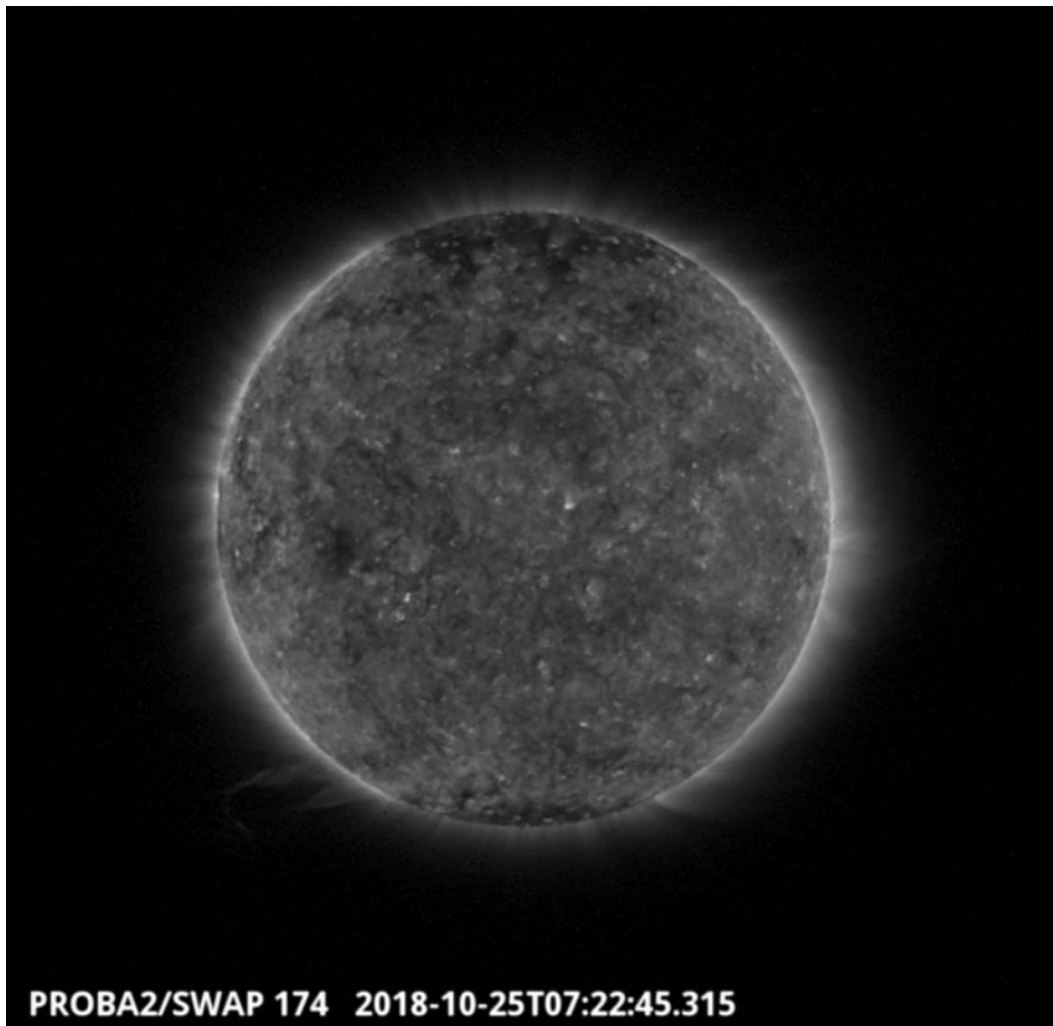
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 448).

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](#)

Thursday Oct 25



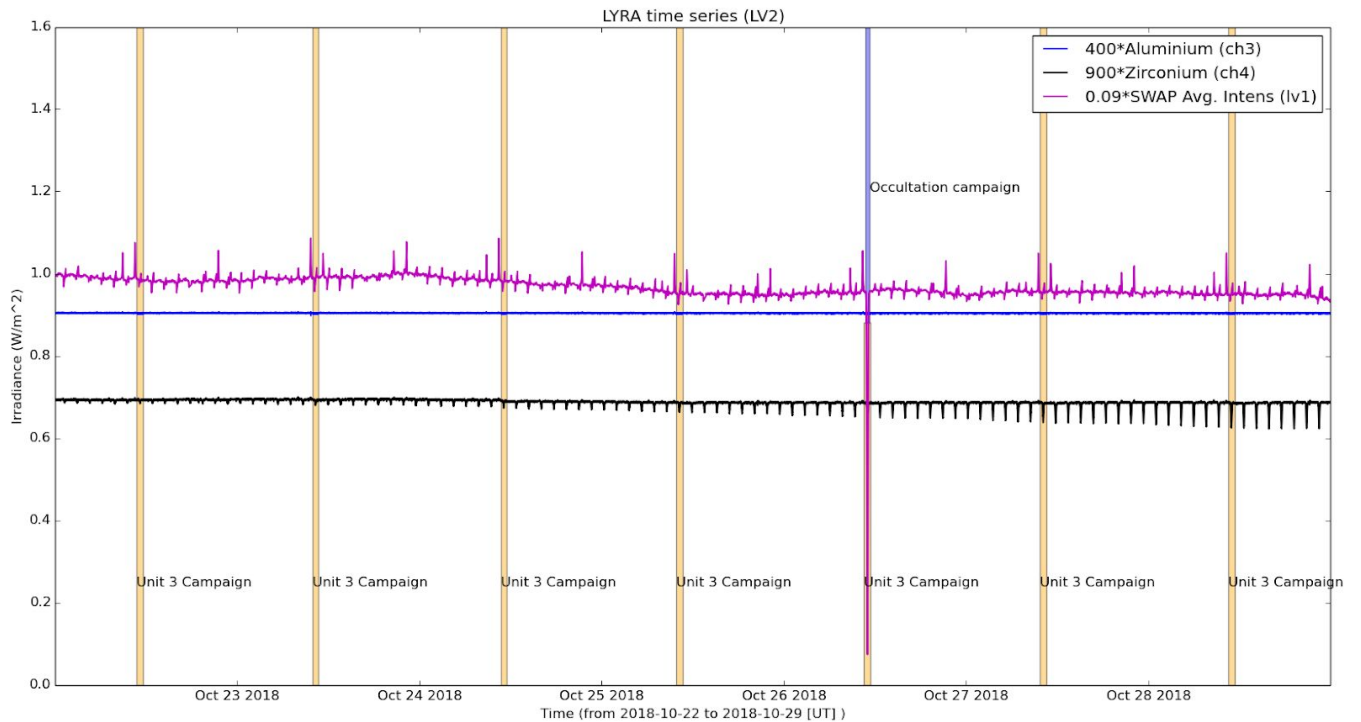
**An eruption was observed by SWAP on 2018-Oct-25 on the south-east limb of the Sun, as shown in the SWAP image above taken at 07:22 UT.**

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 )



The blue shaded periods related to SWAP, correspond to, from left to right:

- Parallel occultation with LYRA, 2018-Oct-26

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

- Daily Unit 3 campaign, 2018-Oct-22
- Daily Unit 3 campaign, 2018-Oct-23
- Daily Unit 3 campaign, 2018-Oct-24
- Daily Unit 3 campaign, 2018-Oct-25
- Daily Unit 3 campaign, 2018-Oct-26
- Daily Unit 3 campaign, 2018-Oct-27
- Daily Unit 3 campaign, 2018-Oct-28

The red shaded periods related to other issues corresponds to:

- None

### **Outreach, papers, presentations, etc.**

Please consult <http://proba2.oma.be/science/publications> for a list of interesting articles using SWAP & LYRA data, as well as a link to the complete article list.

The science section of this weekly report is also published in the weekly STCE newsletter (<http://www.stce.be/newsletter/newsletter.php>).

### **Guest Investigator Program**

- Erika Palmerio, from the University of Helsinki, continued her visit to the P2SC between 14th and the 28th October working on her project entitled “Earth-impacting coronal mass ejections erupting from the solar limb”.
- Farid Goryaev continued his visit to the P2SC between 17th and the 28th October.

## 2. LYRA instrument status

### Calibration

No calibration campaign this week.

### IOS & operations

| Monday<br>22 Oct               | Tuesday<br>23 Oct              | Wednesday<br>24 Oct            | Thursday<br>25 Oct             | Friday<br>26 Oct               | Saturday<br>27 Oct             | Sunday<br>28 Oct               |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 |
| LYIOS00731                     | LYIOS00731                     | LYIOS00731                     | LYIOS00731                     | LYIOS00731                     | LYIOS00732                     | LYIOS00732                     |

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 51.80 and 53.53 °C.

### 3. SWAP instrument status

#### Calibration

No calibration campaign this week

#### MCPM errors

The number of MCPM recoverable errors increased from 1163 to 1440.

The number of MCPM unrecoverable errors remained at 0.

#### IOS & operations

| Monday<br>22 Oct       | Tuesday<br>23 Oct      | Wednesday<br>24 Oct    | Thursday<br>25 Oct     | Friday<br>26 Oct       | Saturday<br>27 Oct     | Sunday<br>28 Oct       |
|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Nominal<br>acquisition | Nominal<br>acquisition | Nominal<br>acquisition | Nominal<br>acquisition | Nominal<br>acquisition | Nominal<br>acquisition | Nominal<br>acquisition |
| IOS00792<br>726 images | IOS00792<br>660 images | IOS00793<br>699 images | IOS00793<br>778 images | IOS00793<br>734 images | IOS00794<br>758 images | IOS00794<br>745 images |

Special operations for SWAP, this week:

On 2018-Oct-26:

- Parallel occultation with LYRA

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 1.91 and 3.43 °C.



## **4. PROBA2 Science Center Status**

The main operator is Jennifer O'Hara.

The following changes were made to the P2SC:

- LY-BSDG: Update of calibration software installed in revision 5368.

## 5. Data reception & discussions with MOC

### Passes

The delivery of the passes for this week (passes 28965 to 29031) 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 2018 Oct 22 00:00 UT and 2018 Oct 29 00:00 UT: 5100

Highest cadence in this period: 18 seconds

Average cadence in this period: 118.59 seconds

Number of image gaps larger than 300 seconds: 117

Largest data gap: 21.02 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)