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| P2SC-ROB-WR-407 - 20170108 Weekly report #407 | P2SC Weekly report |  |
| Period covered: Date: Written by: Approved by: | Mon Jan 08 to Sun Jan 14, 2018 17 Jan 2018 Laurence Wauters Matthew West | Royal Observatory of Belgium - PROBA2 Science Center |
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1. Science

Solar & Space weather events

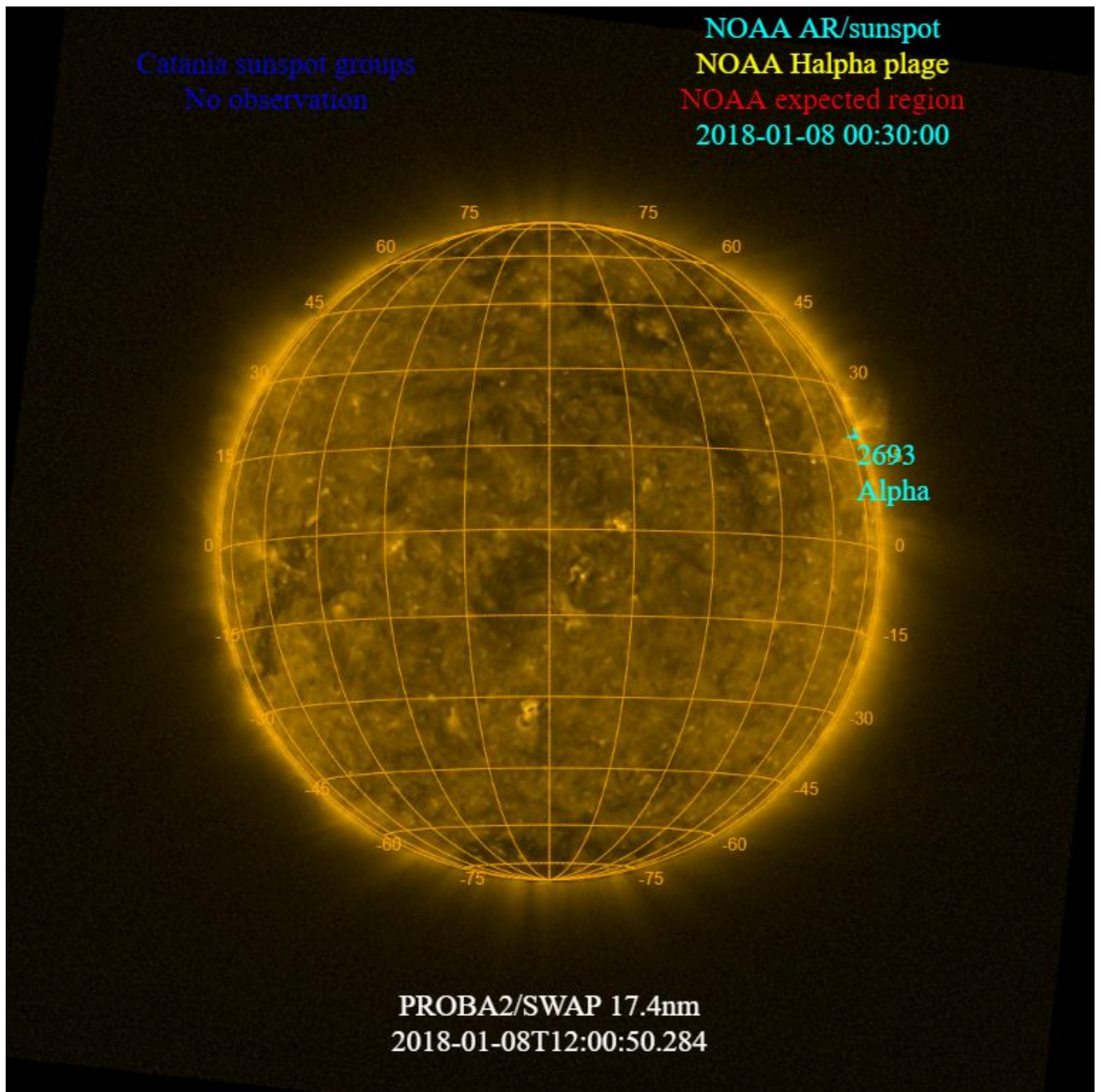
The level of solar activity¹ was **very low** this week.

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

| | Monday 08 Jan | Tuesday 09 Jan | Wednesday 10 Jan | Thursday 11 Jan | Friday 12 Jan | Saturday 13 Jan | Sunday 14 Jan |
|----------|------------------|-------------------|---------------------|--------------------|------------------|--------------------|------------------|
| Activity | very low | very low | very low | very low | very low | very low | very low |
| Flares | - | - | - | - | - | - | - |

¹ See appendix. All timings are given in UT.

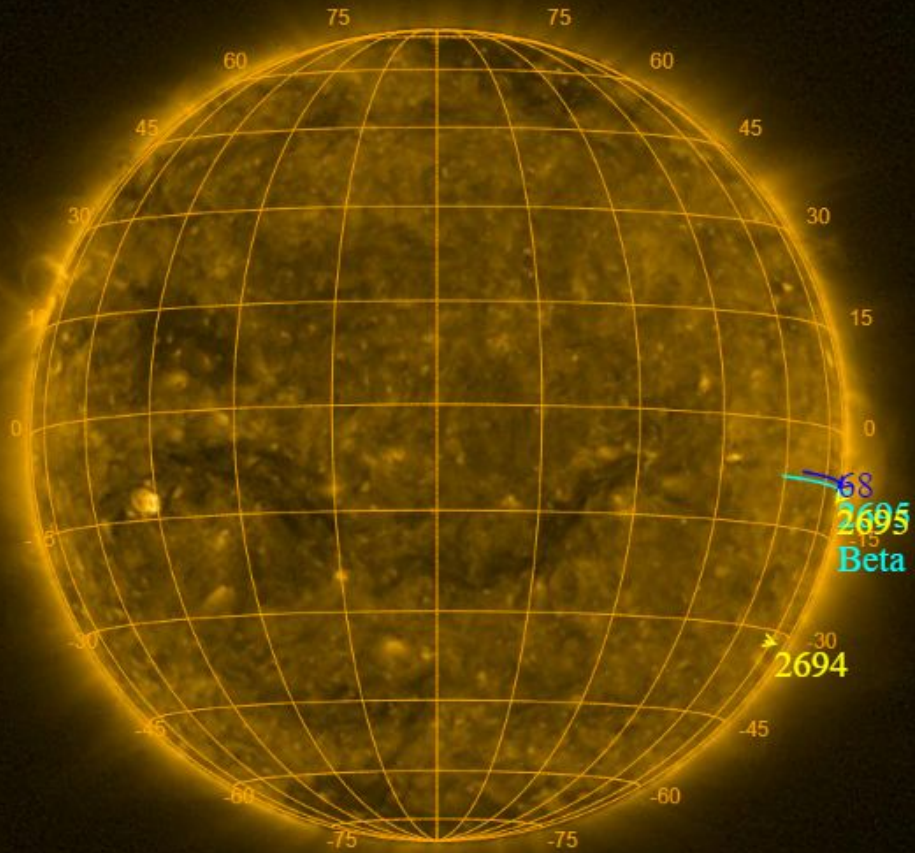
The SWAP images of Jan 08 and Jan 14 are shown below, with annotated active regions.



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

Catania sunspot groups
2018-01-12 10:30:00

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2018-01-12 00:30:00



PROBA2/SWAP 17.4nm
2018-01-14T11:53:24.717

Solar Activity

Solar flare activity was 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>

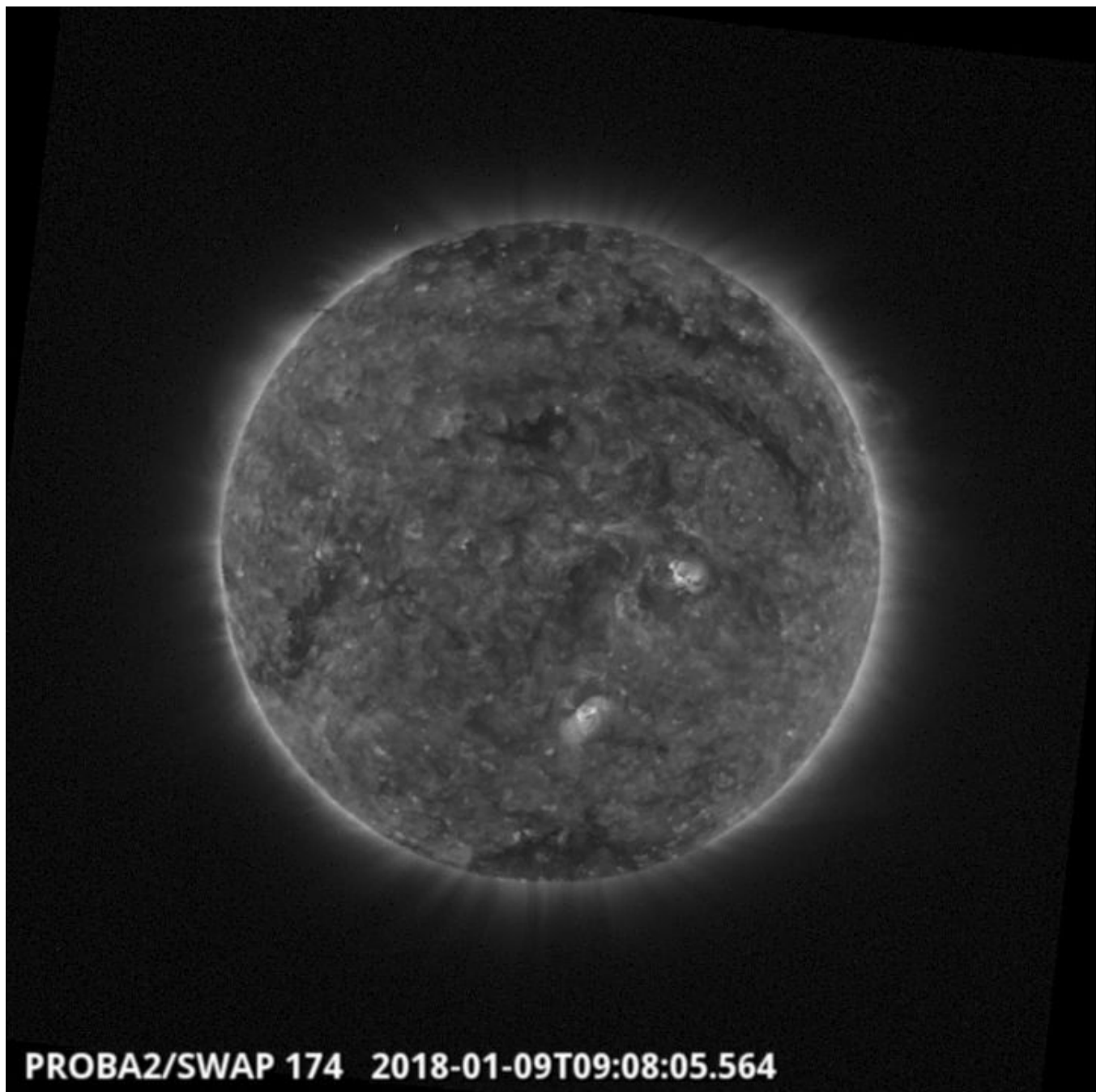
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 407).

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

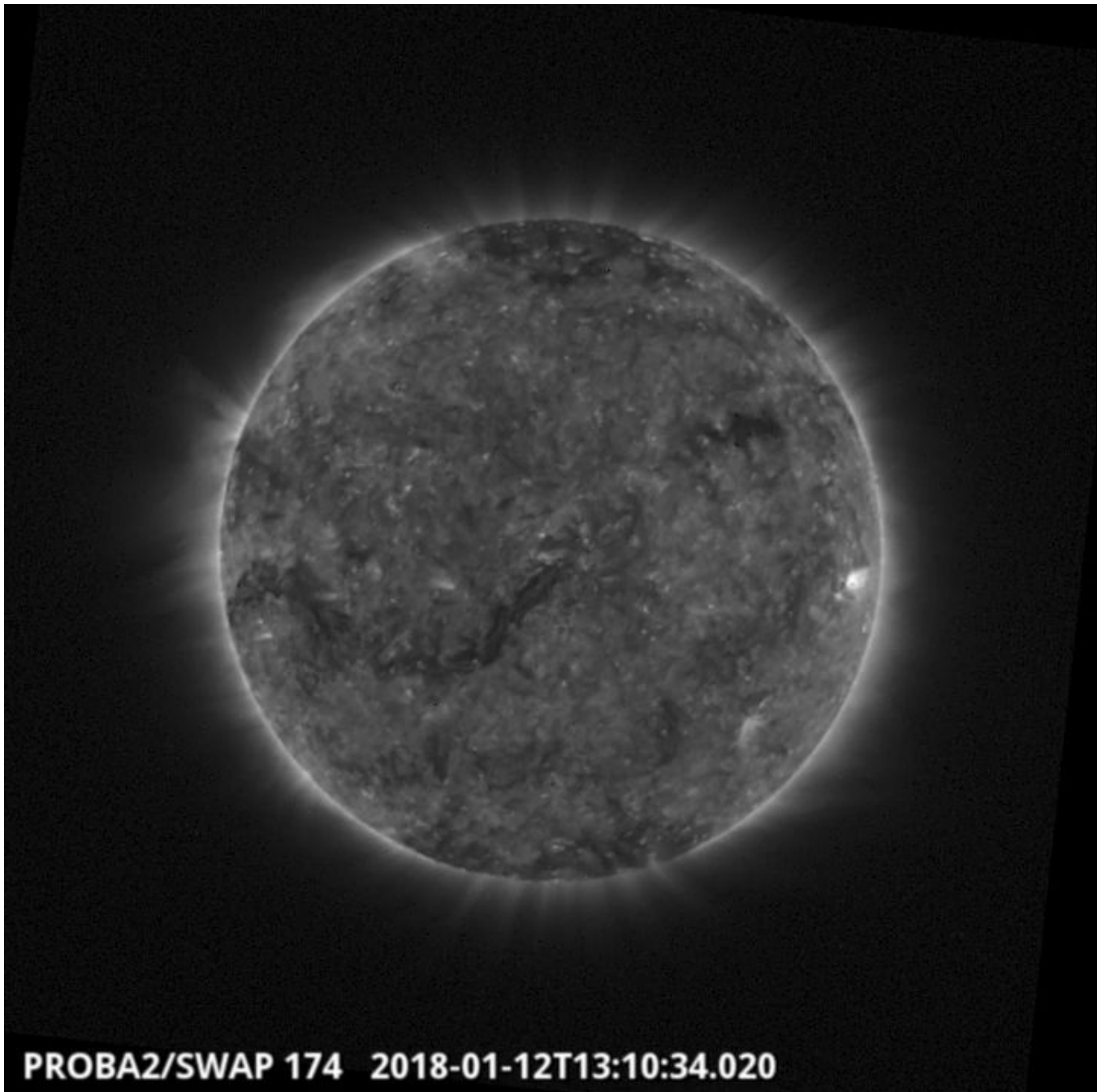
If any of the linked movies are unavailable they can be found in the P2SC movie repository [here](#)

Tuesday Jan 09



A coronal hole observed by SWAP reached the central meridian in the morning of January 09
Find a movie of the events [here](#) (SWAP movie)

Friday Jan 12



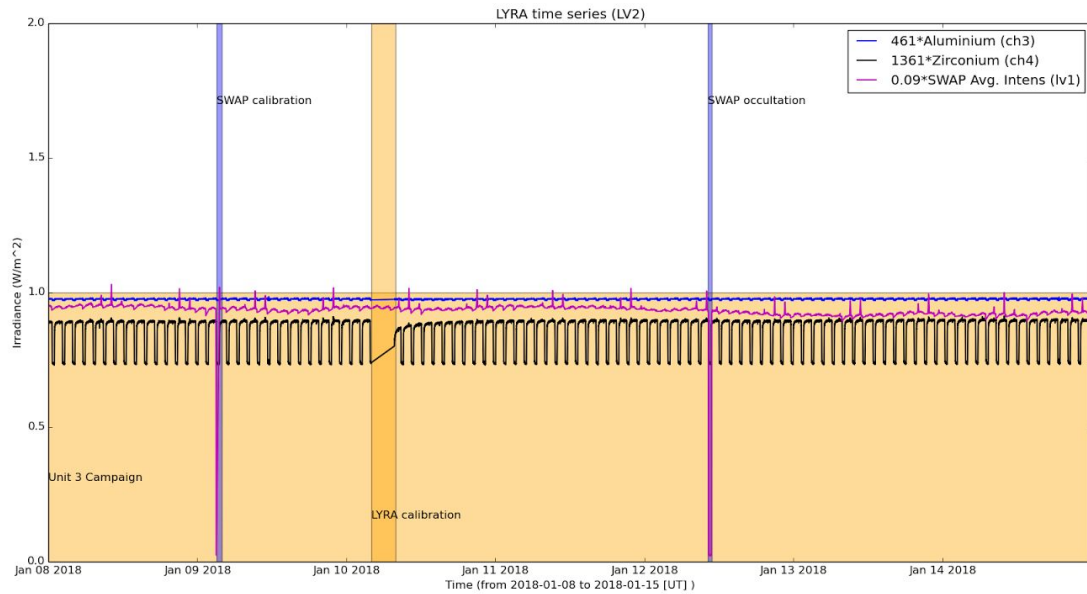
The single flare of the week, a B1.9, is visible near the western limb of the Sun in the SWAP image above.

Find a movie of the events [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:

- Bi-weekly calibration, 2018-Jan-09
- Parallel occultation campaign with LYRA, 2018-Jan-12

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

- Continuous Unit 3 campaign, from 2018-Jan-08 to 2018-Jan-14
- Bi-weekly calibration, 2018-Jan-10

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>).

A montage of 365 images showing the changing activity of our Sun through the eyes of ESA's PROBA2 satellite during 2017 featured as ESAs picture of the week on 08-Jan-2018:

http://www.esa.int/spaceinimages/Images/2018/01/The_Sun_in_2017 and a separate poster can be found here: http://proba2.sidc.be/Presentations/20180103_YearlyPoster/

Guest Investigator Program

- None

2. LYRA instrument status

Calibration

Calibration campaign on Wednesday this week.

IOS & operations

| Monday 08 Jan | Tuesday 09 Jan | Wednesday 10 Jan | Thursday 11 Jan | Friday 12 Jan | Saturday 13 Jan | Sunday 14 Jan |
|--------------------------------|--------------------------------|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Nominal acquisition + U3 | Nominal acquisition + U3 | Nominal acquisition + U3 + calibration | Nominal acquisition + U3 | Nominal acquisition + U3 | Nominal acquisition + U3 | Nominal acquisition + U3 |
| LYIOS00668 | LYIOS00668 | LYIOS00668 | LYIOS00668 | LYIOS00670 | LYIOS00670 | LYIOS00670 |

The following science campaigns were performed by LYRA:

- Continuous U3 observation campaign for occultation season

On 2018-Jan-10

- Bi-weekly calibration campaign

LYRA detector temperature

LYRA detector 2 temperature globally varied between 41.23 and 46.78 °C.

3. SWAP instrument status

Calibration

Calibration campaign on Tuesday this week.

MCPM errors

The number of MCPM recoverable errors increased from 639 to 667.

The number of MCPM unrecoverable errors remained at 0.

IOS & operations

| Monday 08 Jan | Tuesday 09 Jan | Wednesday 10 Jan | Thursday 11 Jan | Friday 12 Jan | Saturday 13 Jan | Sunday 14 Jan |
|------------------------|---|------------------------|------------------------|--|------------------------|------------------------|
| Nominal acquisition | Nominal acquisition + calibration | Nominal acquisition | Nominal acquisition | Nominal acquisition+ occultation | Nominal acquisition | Nominal acquisition |
| IOS00750 587 images | IOS00750 827 images | IOS00751 776 images | IOS00751 750 images | IOS00751 676 images | IOS00751 682 images | IOS00752 619 images |

Special operations for SWAP, this week:

On 2018-Jan-09

- Bi-weekly calibration campaign

On 2018-Jan-12

- SWAP and LYRA parallel occultation campaign

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -3.77 and -1.29 °C.

4. PROBA2 Science Center Status

The main operator is Laurence Wauters.

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 26271 to 26337) 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 Jan 08 0UT and 2018 Jan 15 0UT: 4918

Highest cadence in this period: 30 seconds

Average cadence in this period: 122.98 seconds

Number of image gaps larger than 300 seconds: 134

Largest data gap: 33.03 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)