| P2SC-ROB-WR-419 - 20180402<br>Weekly report #419 | **P2SC Weekly report** | |
|---|---|---|
| Period covered:<br>Date:<br><br>Written by:<br>Approved by: | Mon Apr 02 to Sun Apr 08, 2018<br>11 Apr 2018<br><br>Laurence Wauters<br>Matthew West | Royal Observatory of Belgium<br>-<br>PROBA2 Science Center |
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## 1. Science

**Solar & Space weather events**

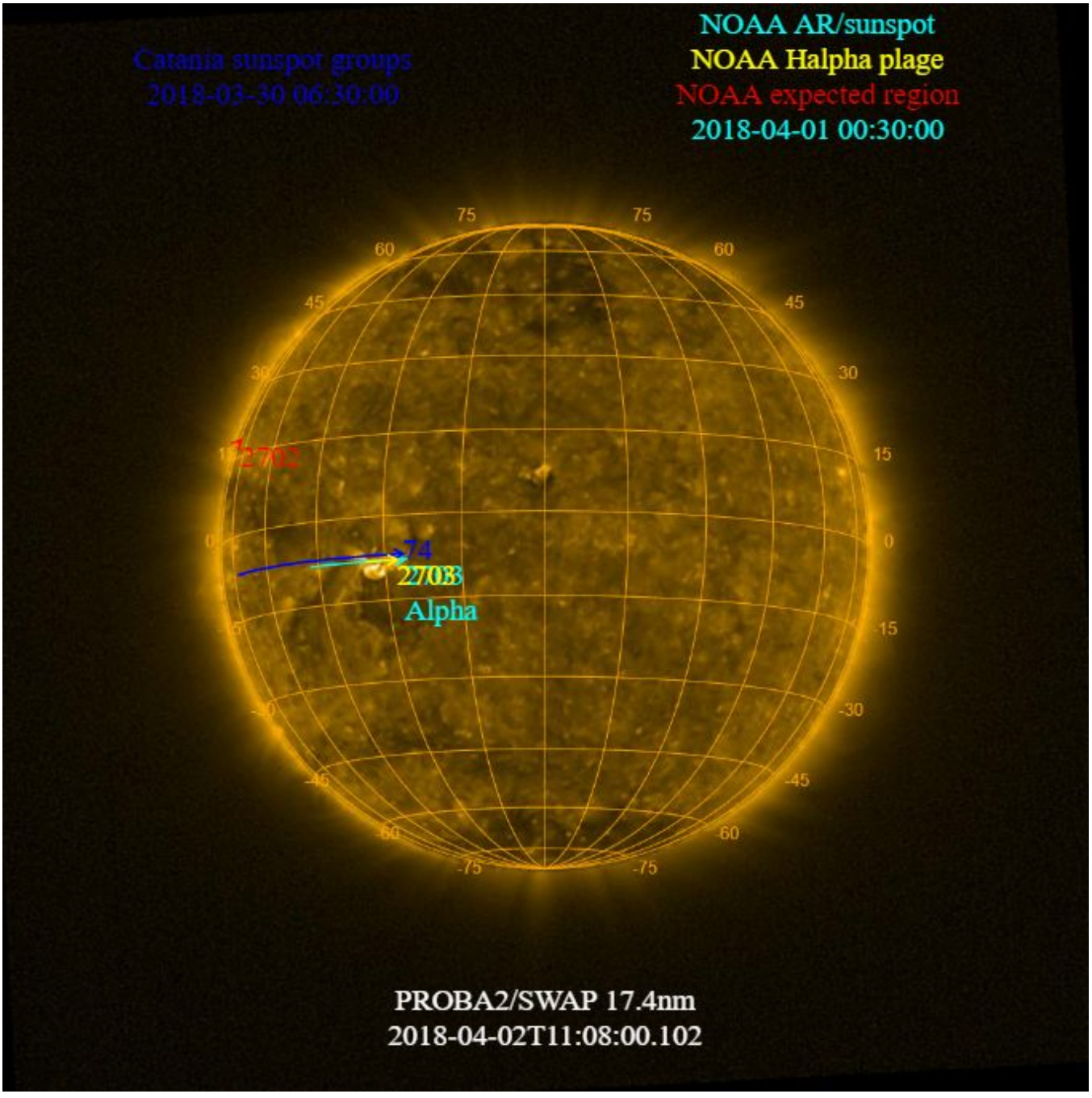
The level of solar activity[1] was **very low** this week.

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

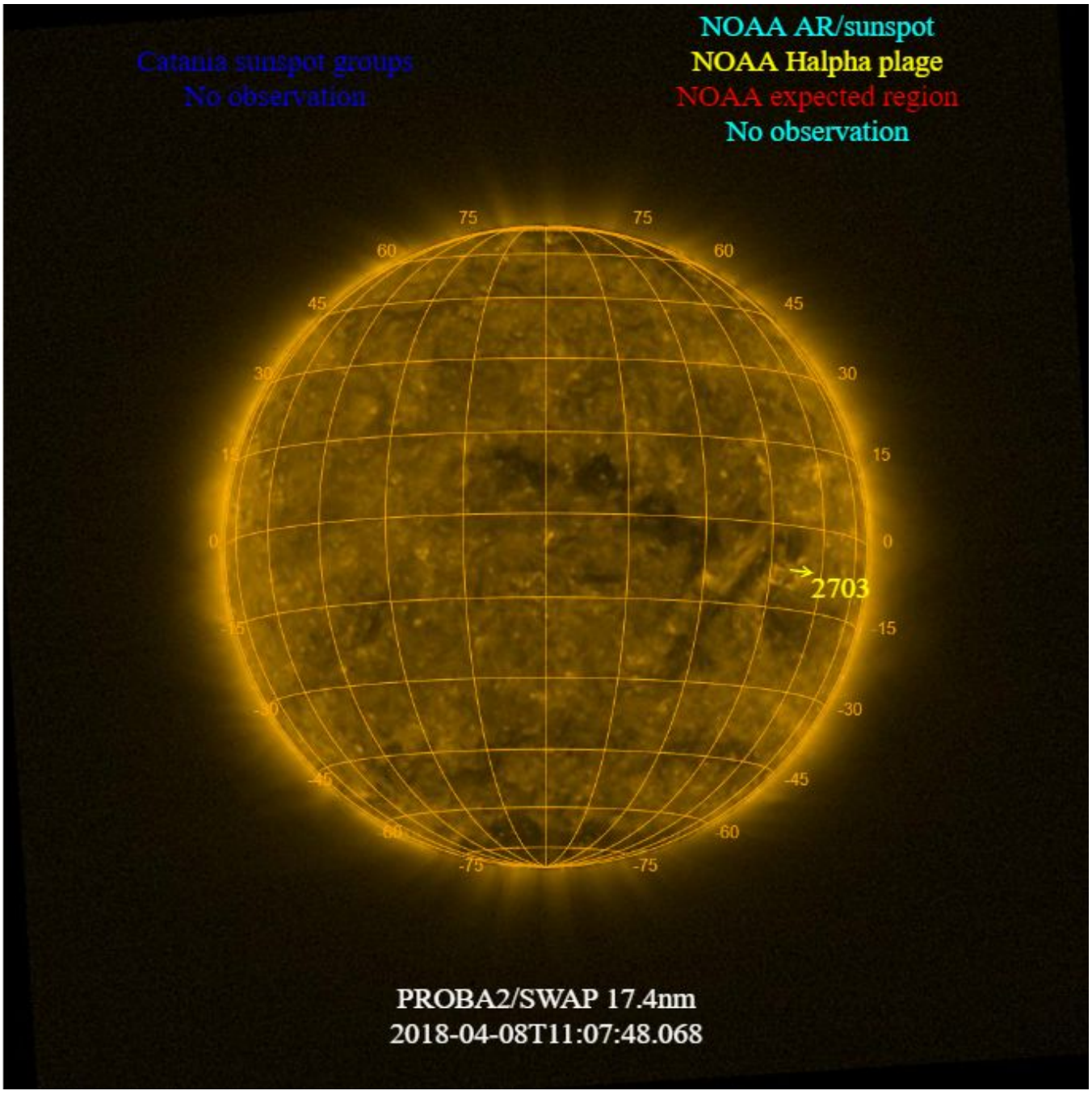
| | Monday 02 Apr | Tuesday 03 Apr | Wednesday 04 Apr | Thursday 05 Apr | Friday 06 Apr | Saturday 07 Apr | Sunday 08 Apr |
|---|---|---|---|---|---|---|---|
| Activity | very low | very low | very low | very low | very low | very low | very low |
| Flares | - | - | - | - | - | - | - |

[1] See appendix. All timings are given in UT.

The SWAP images of Apr 02 and Apr 08 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
75
75
60
60
45
45
30
30
15
15
0
0
-15
-15
-30
-30
-45
-45
-60
-60
-75
-75
2703
PROBA2/SWAP 17.4nm
2018-04-08T11:07:48.068

**Solar Activity**

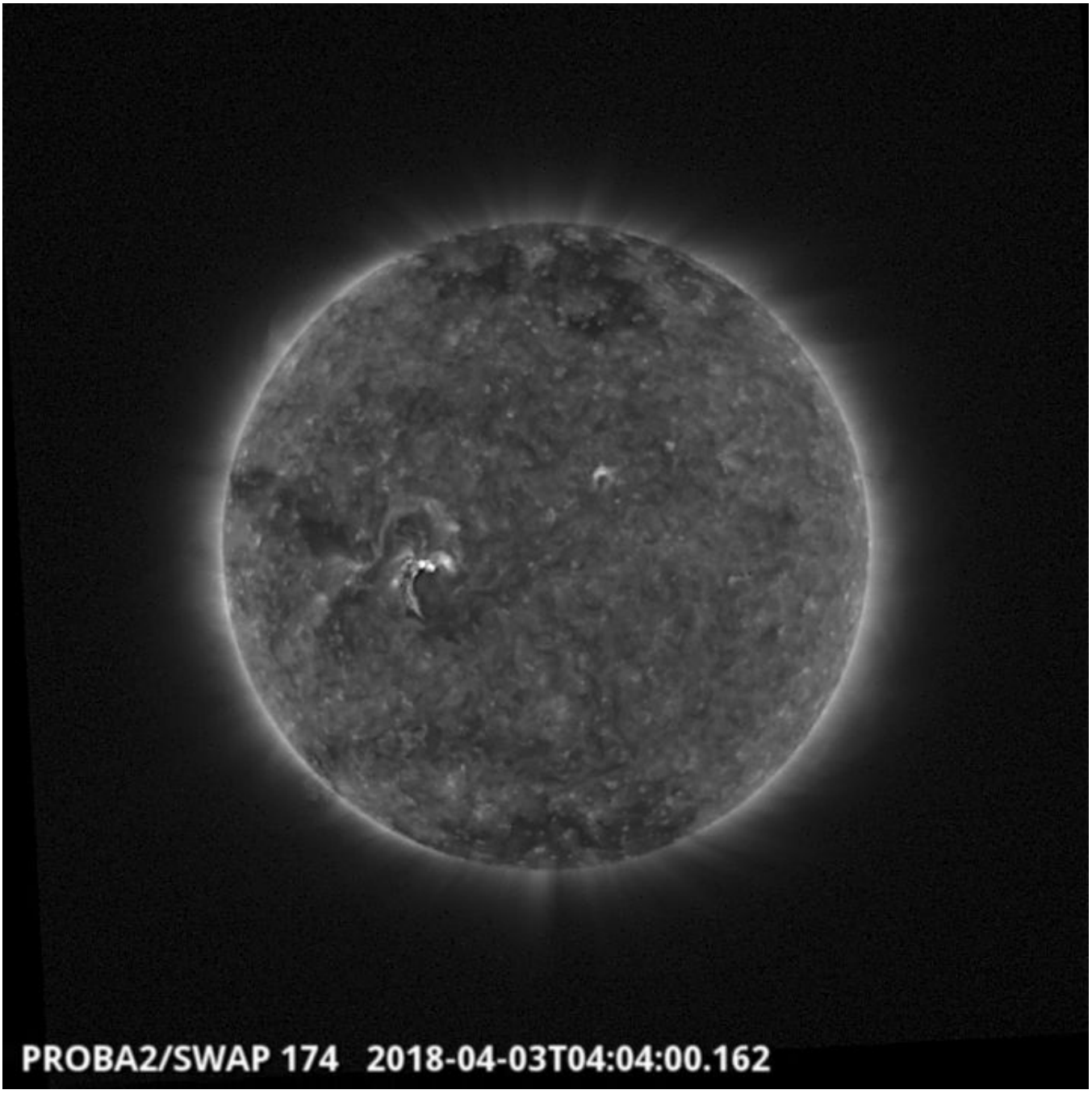
Solar flare activity was very low during the week.
In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: http://proba2.oma.be/ssa
This page also lists the recorded flaring events.

A weekly overview movie can be found here (SWAP week 419).

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

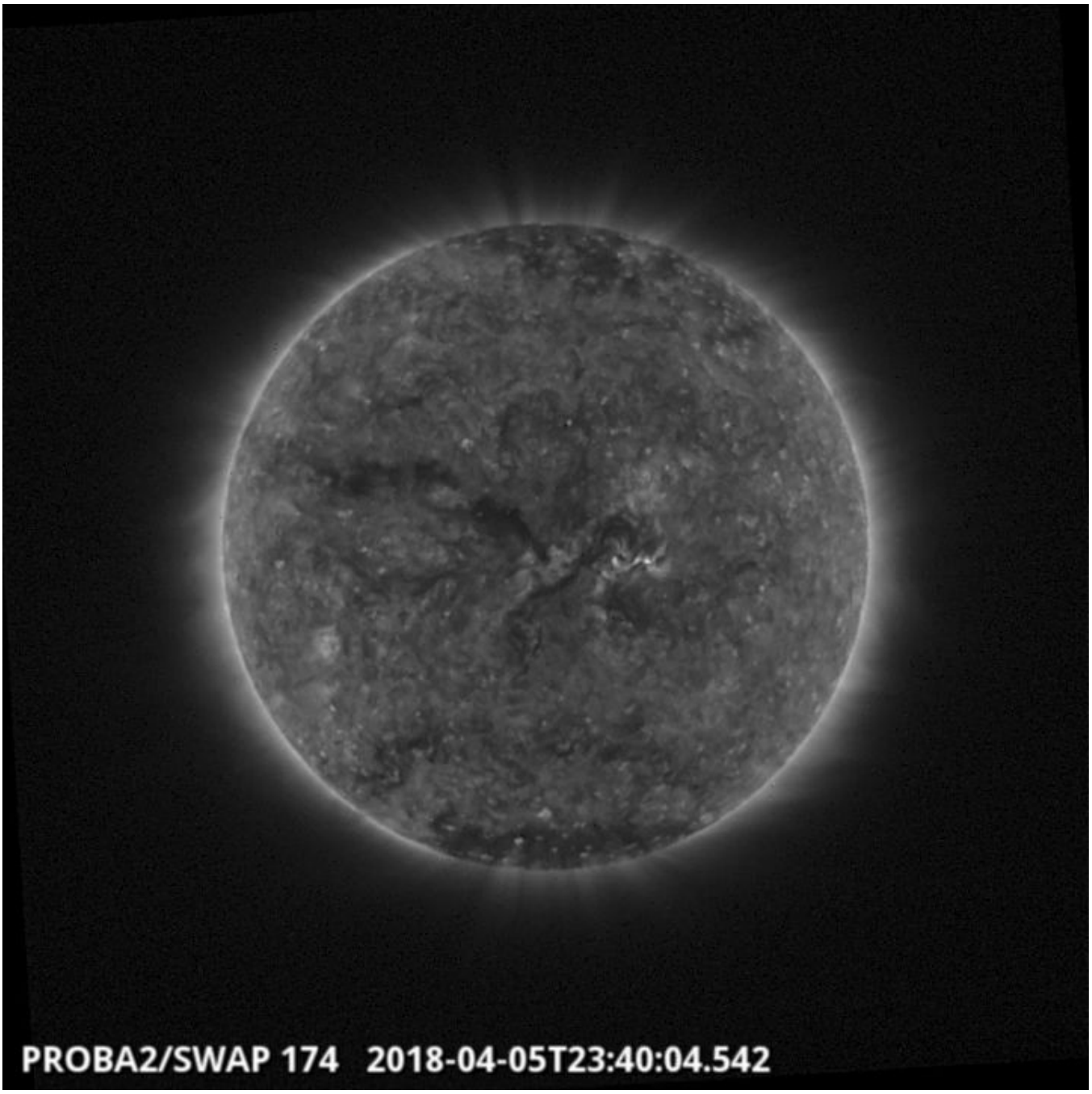
Tuesday Apr 03




**A B2.1 class flare from NOAA Active Region 2703 (South-East part of the Sun) erupted and interacted with the nearby filament on 2018-Apr-03. It was observed by SWAP at 04:04 UT and it is shown in the SWAP image above.**

Find a movie of the events **here** (SWAP movie)

Thursday Apr 05:

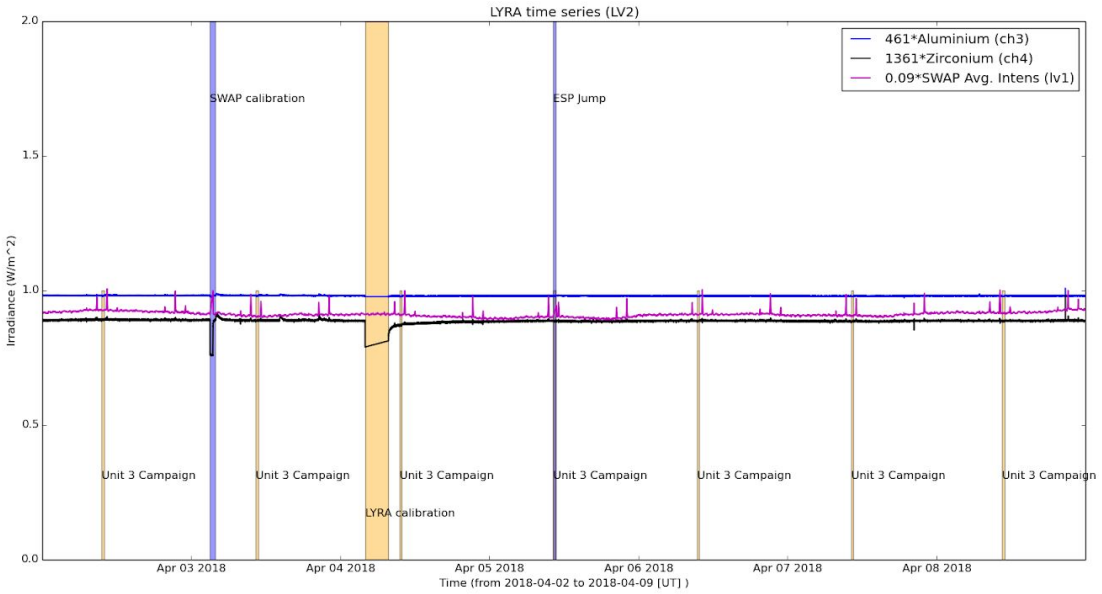



**The SWAP image above shows an elongated coronal hole which transited the central meridian at the end of 2018-Apr-05.**

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:

- Bi-weekly calibration, 2018-Apr-03
- Monthly ESP jump, 2018-Apr-05

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

- Daily Unit 3 campaign, 2018-Apr-02
- Daily Unit 3 campaign, 2018-Apr-03
- Short calibration campaign, 2018-Apr-04
- Daily Unit 3 campaign, 2018-Apr-04
- Daily Unit 3 campaign, 2018-Apr-05
- Daily Unit 3 campaign, 2018-Apr-06
- Daily Unit 3 campaign, 2018-Apr-07
- Daily Unit 3 campaign, 2018-Apr-08

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**

- Karen Meyer is visiting the P2SC between 26th March and 6th April to work on her project entitled “Investigation of the middle corona with SWAP and a data-driven non-potential coronal field model”.
- Alexandros Koukras continued his visit to the P2SC working on his project entitled “A unique opportunity of observing and modeling a CME event from the low to the outer corona”.

## 2. LYRA instrument status

### Calibration

Calibration campaign on Wednesday this week.

### IOS & operations

| Monday<br>02 Apr | Tuesday<br>03 Apr | Wednesday<br>04 Apr | Thursday<br>05 Apr | Friday<br>06 Apr | Saturday<br>07 Apr | Sunday<br>08 Apr |
|---|---|---|---|---|---|---|
| Nominal acquisition + daily U3<br><br>LYIOS00686 | Nominal acquisition + daily U3<br><br>LYIOS00686 | Nominal acquisition + daily U3 + calibration<br><br>LYIOS00686 | Nominal acquisition + daily U3<br><br>LYIOS00686 | Nominal acquisition + daily U3<br><br>LYIOS00686 | Nominal acquisition + daily U3<br><br>LYIOS00687 | Nominal acquisition + daily U3<br><br>LYIOS00687 |

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

On 2018-Apr-04

- Short calibration

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 47.37 and 50.14 °C.

## 3. SWAP instrument status

### Calibration

Calibration campaign on Tuesday this week.

### MCPM errors

The number of MCPM recoverable errors increased from 3393 and 3574.
The number of MCPM unrecoverable errors remained at 0.

### IOS & operations

| Monday<br>02 Apr | Tuesday<br>03 Apr | Wednesday<br>04 Apr | Thursday<br>05 Apr | Friday<br>06 Apr | Saturday<br>07 Apr | Sunday<br>08 Apr |
|---|---|---|---|---|---|---|
| Nominal acquisition<br><br>IOS00767<br>696 images | Nominal acquisition + calibration<br><br>IOS00767<br>711 images | Nominal acquisition<br><br>IOS00767<br>654 images | Nominal acquisition + ESP jump<br><br>IOS00767<br>694 images | Nominal acquisition<br><br>IOS00767<br>753 images | Nominal acquisition<br><br>IOS00767<br>696 images | Nominal acquisition<br><br>IOS00767<br>608 images |

Special operations for SWAP, this week:
On 2018-Apr-03

- Bi-weekly calibration campaign

On 2018-Apr-05

- Monthly ESP jump

### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.29 and 0.07 °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 27065 to 27129) 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 Apr 02 00:00 UT and 2018 Apr 09 00:00 UT: 4921
Highest cadence in this period: 30 seconds
Average cadence in this period: 122.91 seconds
Number of image gaps larger than 300 seconds: 99
Largest data gap: 33.67 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)