


P2SC-ROB-WR-405 -20171225 Weekly report #405	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Dec 25 to Sun Dec 31, 2017 5 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 activity<sup>1</sup> was **very low** this week.

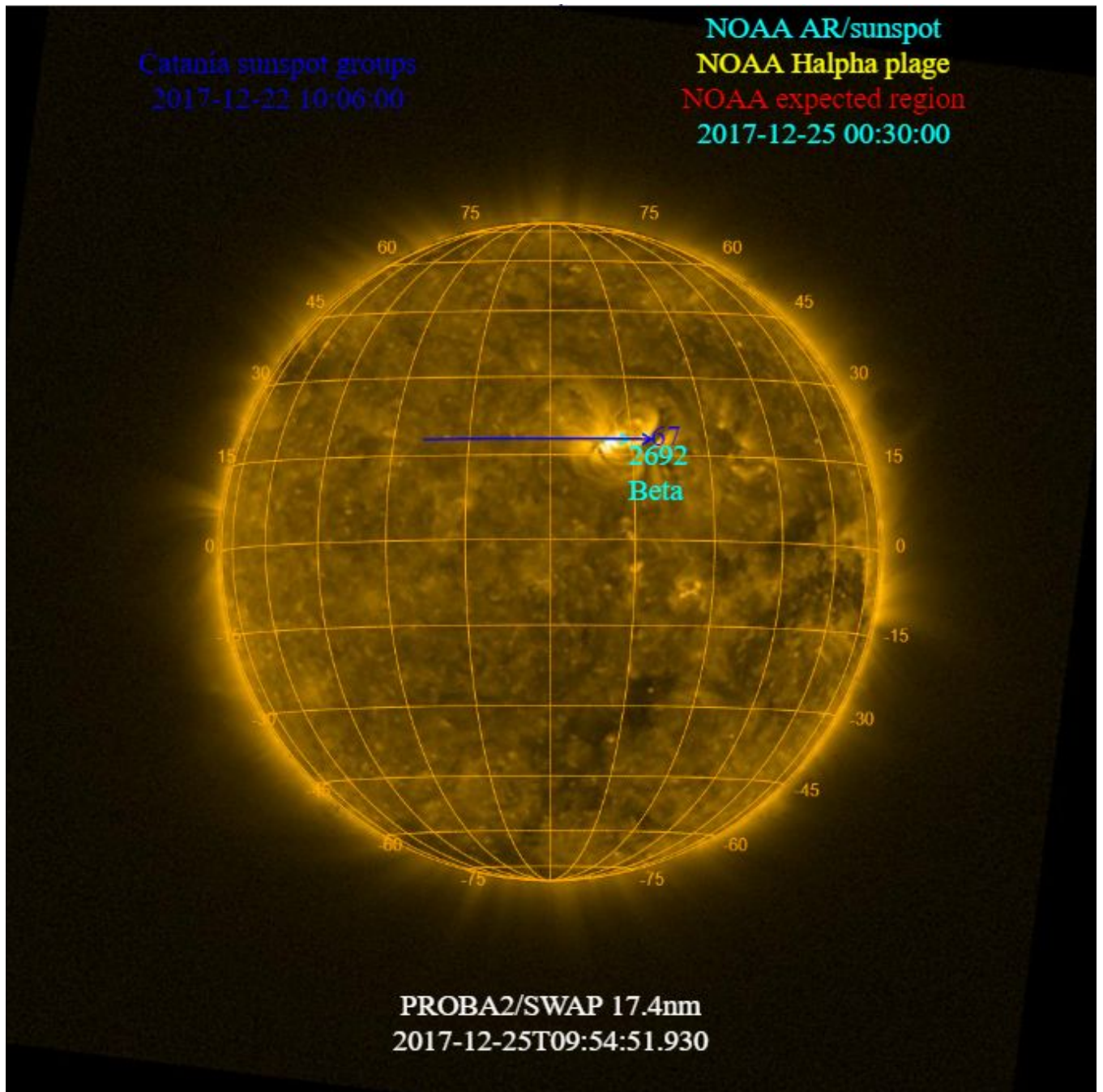
Only M- and X-flares are mentioned, the most energetic one(s) per day are presented in **bold**:

	Monday 25 Dec	Tuesday 26 Dec	Wednesday 27 Dec	Thursday 28 Dec	Friday 29 Dec	Saturday 30 Dec	Sunday 31 Dec
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.

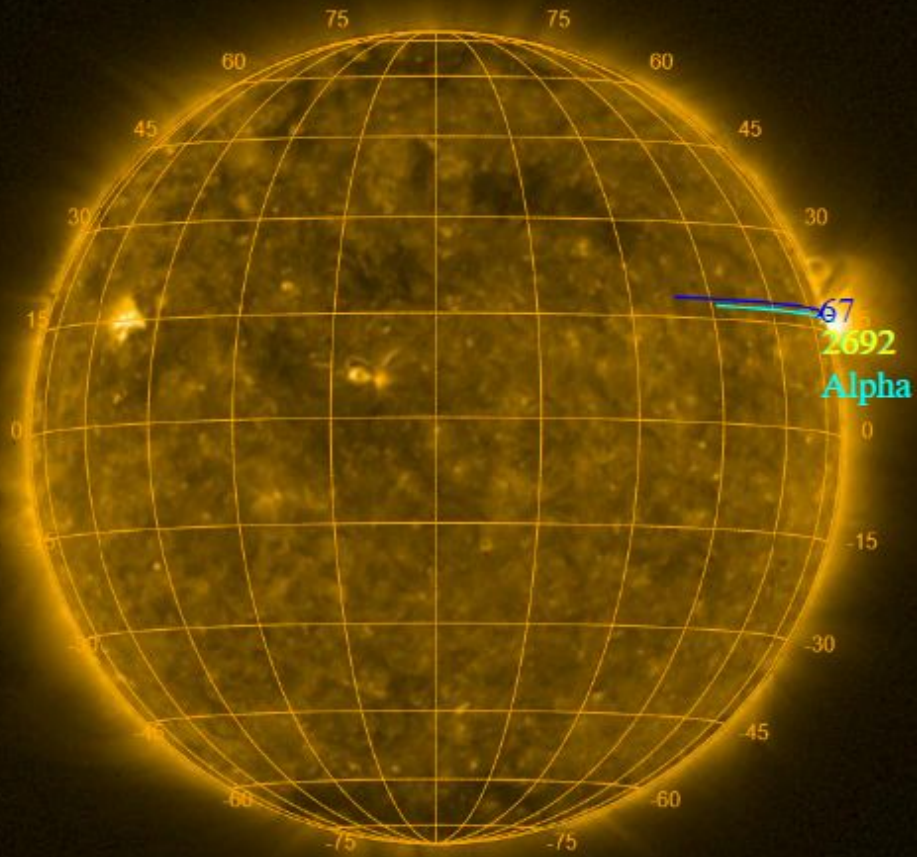
The SWAP images of Dec 25 and Dec 31 are shown below, with annotated active regions.



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

Catania sunspot groups  
2017-12-27 08:48:00

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2017-12-28 00:30:00



PROBA2/SWAP 17.4nm  
2017-12-31T09:54:49.883

## **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>

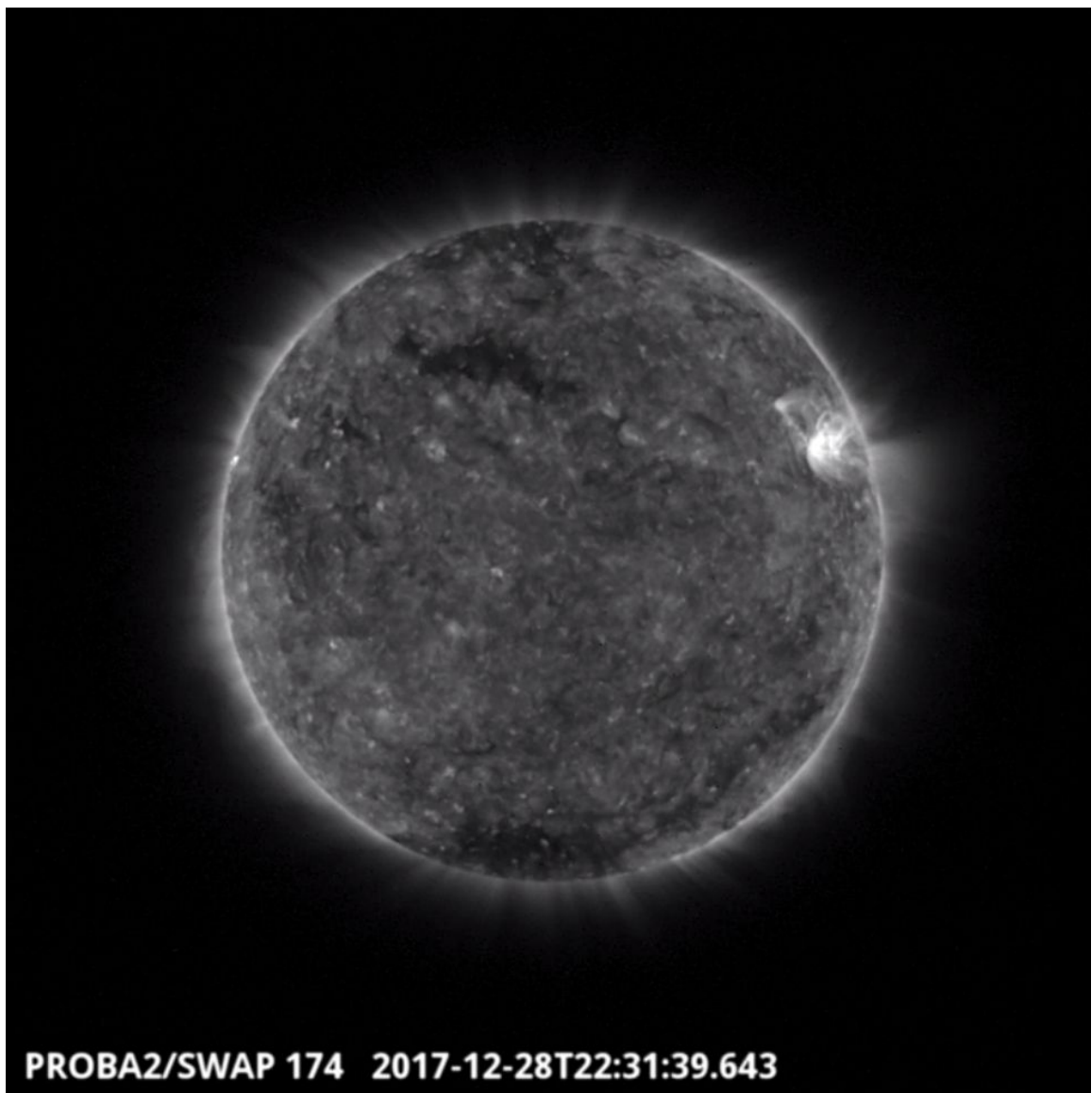
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 405).

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 Dec 28



The largest flare of the week was a B-class (B8.3) flare and was observed by SWAP on 2017-Dec-28. The flare is visible near the east limb in the SWAP image above at 22:31 UT.

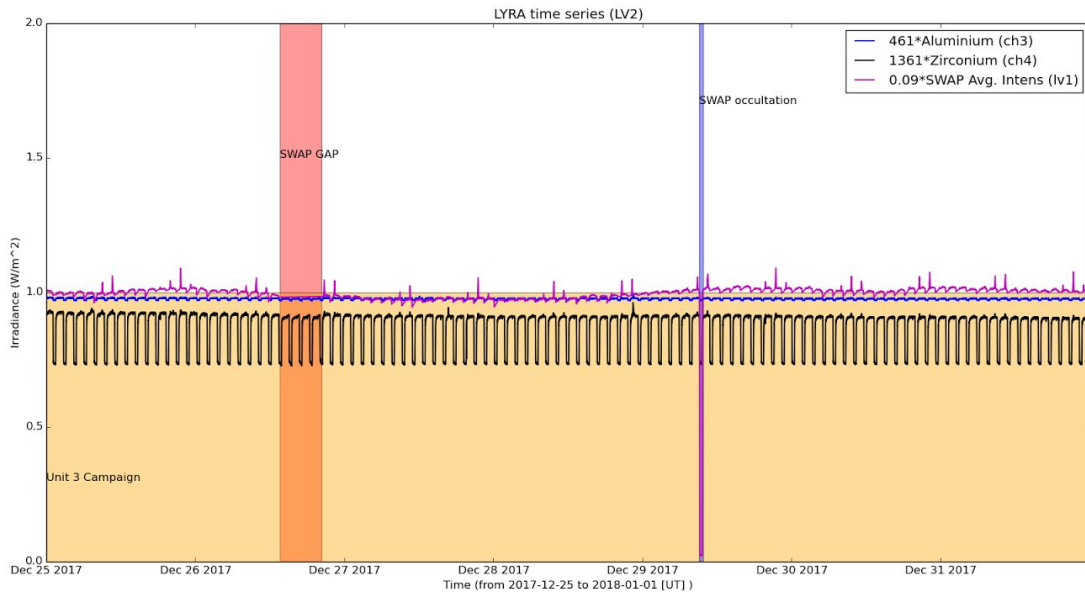
Find a movie of the event [here](#) (SWAP movie)



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 campaign with LYRA, 2017-Dec-29

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

- Unit 3 campaign, from 2017-Dec-25 to 2017-Dec-31.

The red shaded periods related to other issues corresponds to:

- SWAP Data gap corresponding to missing passes 26155, 26156 and 26157 on 2017-Dec-26 from 13:35 UT until 20:19 UT (see below - Data reception section).

**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**

- None

## 2. LYRA instrument status

### Calibration

No Calibration campaign this week.

### IOS & operations

Monday 25 Dec	Tuesday 26 Dec	Wednesday 27 Dec	Thursday 28 Dec	Friday 29 Dec	Saturday 30 Dec	Sunday 31 Dec
Nominal acquisition + U3	Nominal acquisition + U3	Nominal acquisition + U3	Nominal acquisition + U3	Nominal acquisition + U3	Nominal acquisition + U3	Nominal acquisition + U3
LYIOS00666	LYIOS00666	LYIOS00666	LYIOS00666	LYIOS00667	LYIOS00667	LYIOS00667

The following science campaigns were performed by LYRA:

- Continuous U3 observation campaign for occultation season

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 42.58 and 45.02 °C.



### 3. SWAP instrument status

#### Calibration

No Calibration campaign this week.

#### MCPM errors

The number of MCPM recoverable errors increased from 315 to 484..

The number of MCPM unrecoverable errors remained at 0.

#### IOS & operations

Monday 25 Dec	Tuesday 26 Dec	Wednesday 27 Dec	Thursday 28 Dec	Friday 29 Dec	Saturday 30 Dec	Sunday 31 Dec
Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition + Occultation	Nominal acquisition	Nominal acquisition
IOS00745 755 images	IOS00745 530 images	IOS00746 781 images	IOS00746 753 images	IOS00746 796 images	IOS00746 672 images	IOS00748 751 images

Special operations for SWAP, this week:

On 2017-12-29

- SWAP and LYRA parallel occultation campaign

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -4.41 and -2.25 °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 26140 to 26205) was nominal, except for: 26155, 26156, 26157: No data have been recorded for the REDU pass 26155-26156-26157 from 13:35 UT until 20:19 UT, the flow of these REDU passes didn't start properly.

### Data coverage HK

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

- 26155,26156,26157

### Data coverage SWAP

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

- 26155,26156,26157

Total number of images between 2017 Dec 25 00:00 UT and 2018 Jan 01 00:00 UT: 5038

Highest cadence in this period: 29 seconds

Average cadence in this period: 120.05 seconds

Number of image gaps larger than 300 seconds: 118

Largest data gap: 36.35 minutes

### Data coverage LYRA

All LYRA Science data files (BINLYRA) have been received, except:

- 26155, 26156, 26157
- the BINLYRA\_26162\_SVA1\_2017.12.27T09.58.04.tar has reprocessed one in two samples between 2017-12-24T15:06:20.934Z and 2017-12-27T09:26:53.311Z which fill the LYRA data gap for passes 26155, 26156, 26157.

## 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)