


P2SC-ROB-WR-401 - 20171127 Weekly report #401	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Nov 27 to Sun Dec 03, 2017 05 Dec 2017 Laurence Wauters Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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1. Science

Solar & Space weather events

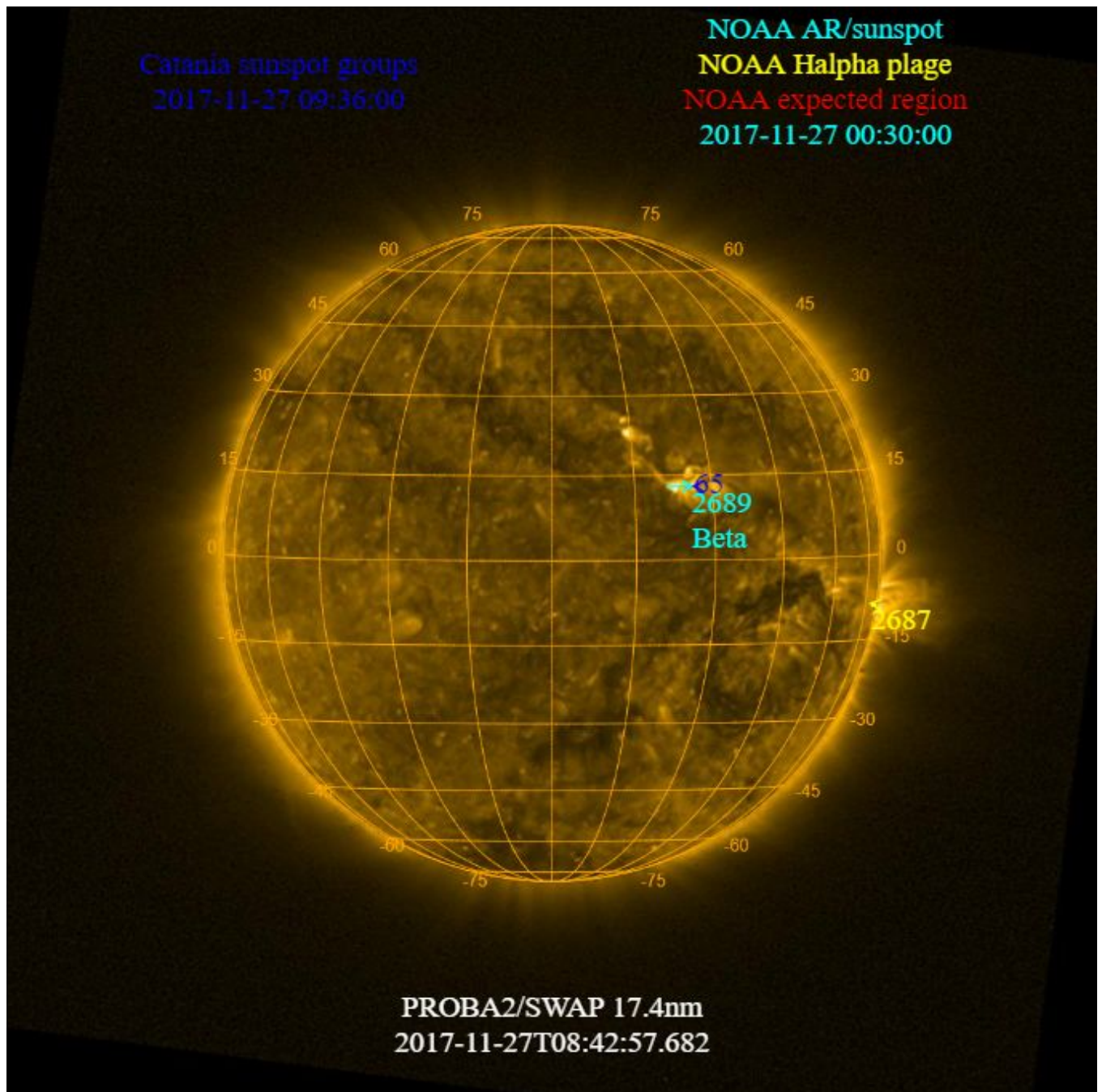
The level of solar activity¹ was **very low** this week.

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

	Monday 27 Nov	Tuesday 28 Nov	Wednesday 29 Nov	Thursday 30 Nov	Friday 01 Dec	Saturday 02 Dec	Sunday 03 Dec
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.

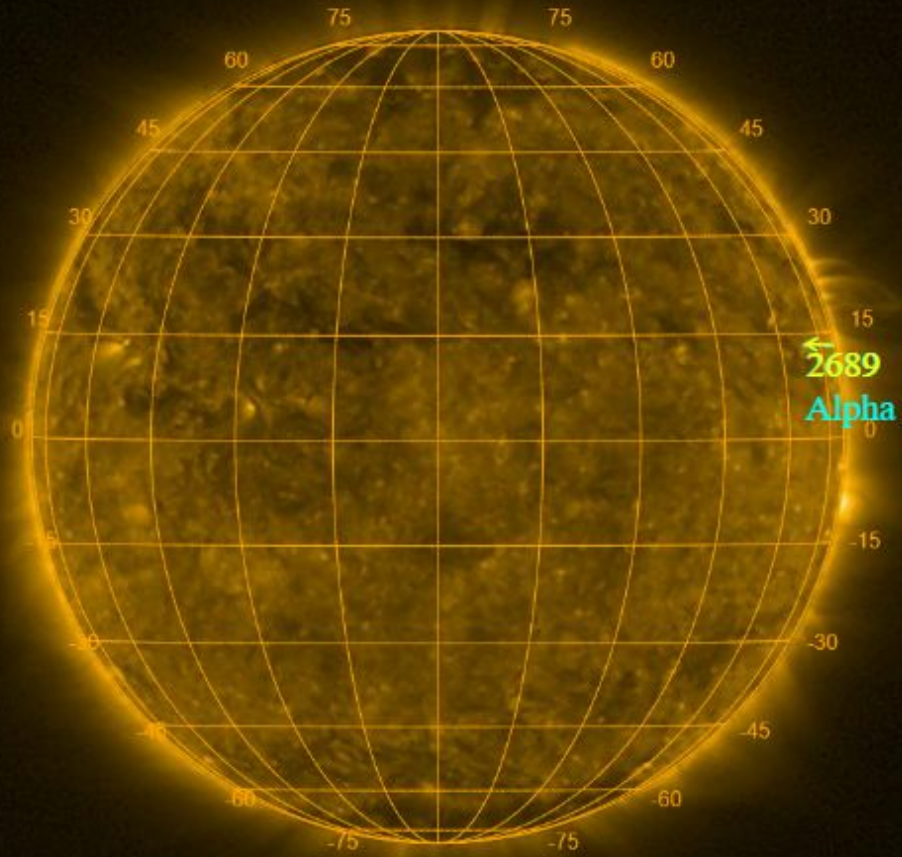
The SWAP images of Nov 27 and Dec 03 are shown below, with annotated active regions.



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

Catania sunspot groups
No observation

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2017-12-01 00:30:00



PROBA2/SWAP 17.4nm
2017-12-03T08:29:55.965

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>

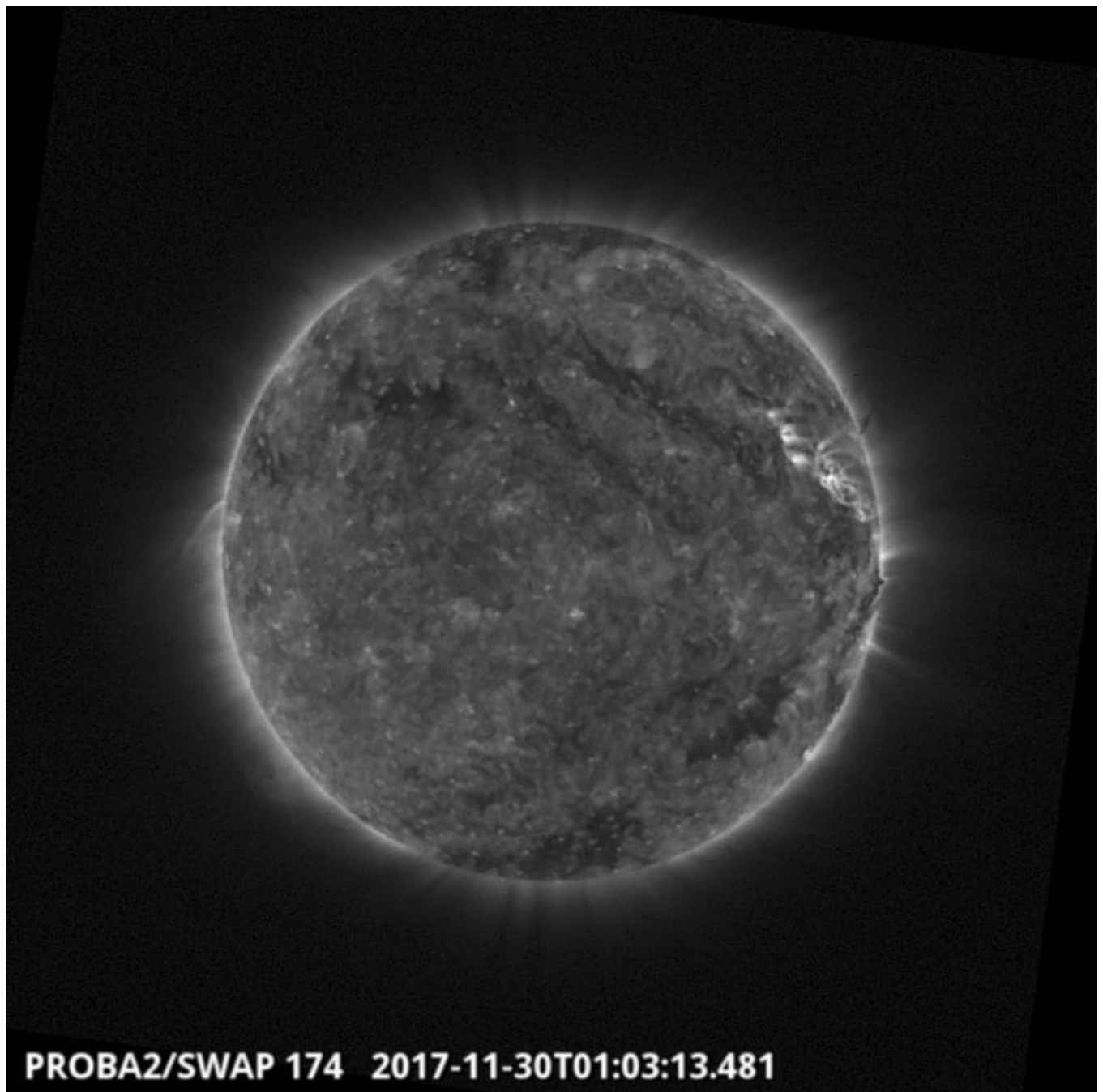
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 401).

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

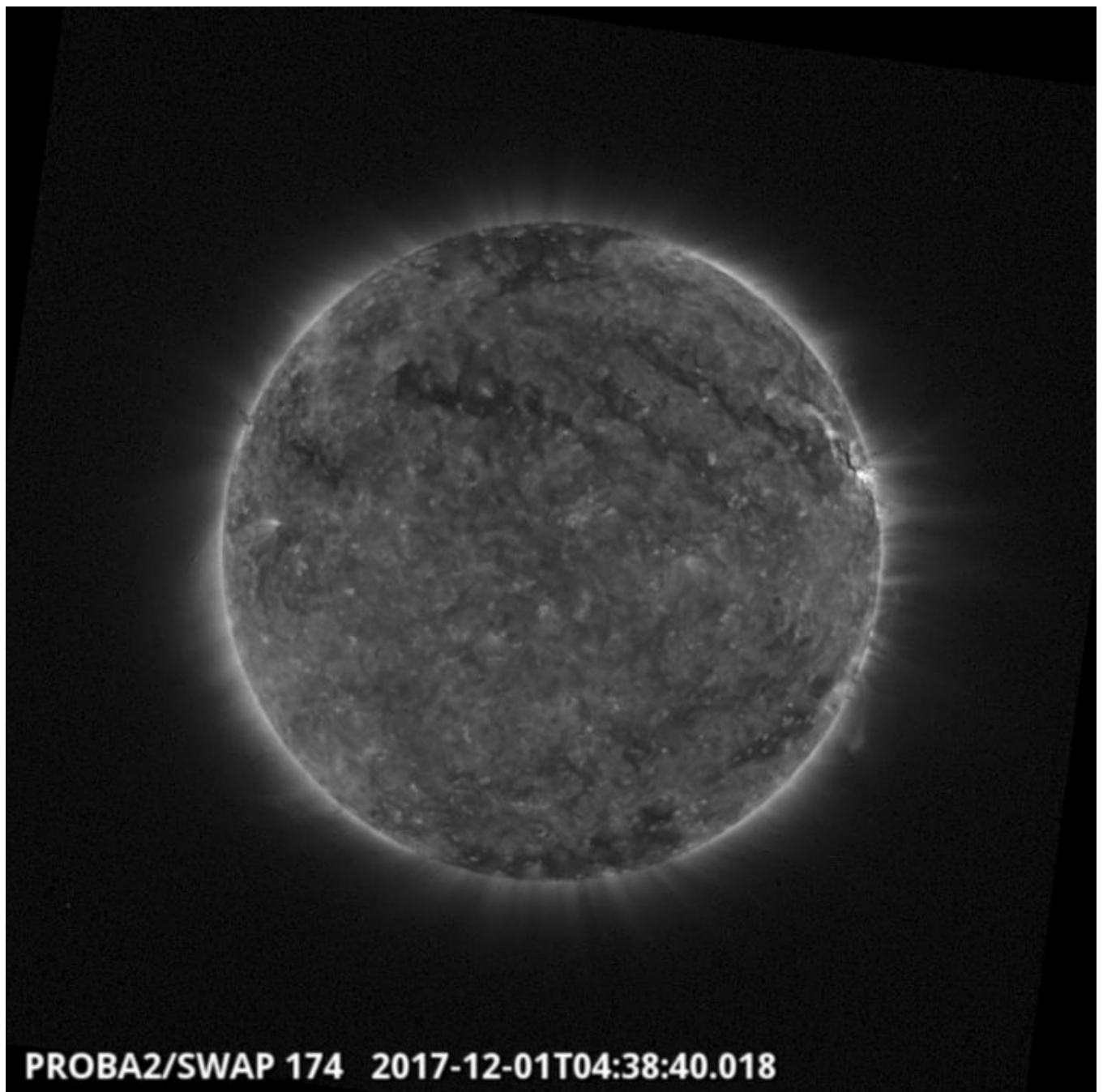
If any of the linked movies are unavailable they can be found in the P2SC movie repository [here](#)

Thursday Nov 30



A 40 degrees long filament rotated over the southwestern solar limb and erupted on 2017-11-30 around 01:00 UT, see the SWAP image above.
Find a movie of the events [here](#) (SWAP movie)

Friday Dec 01



**Early on 1 December, the extension of a positive northern polar coronal hole started transiting the central meridian. This Coronal hole was visible until the end of the week.
Find a movie of the event [here](#) (SWAP movie)**



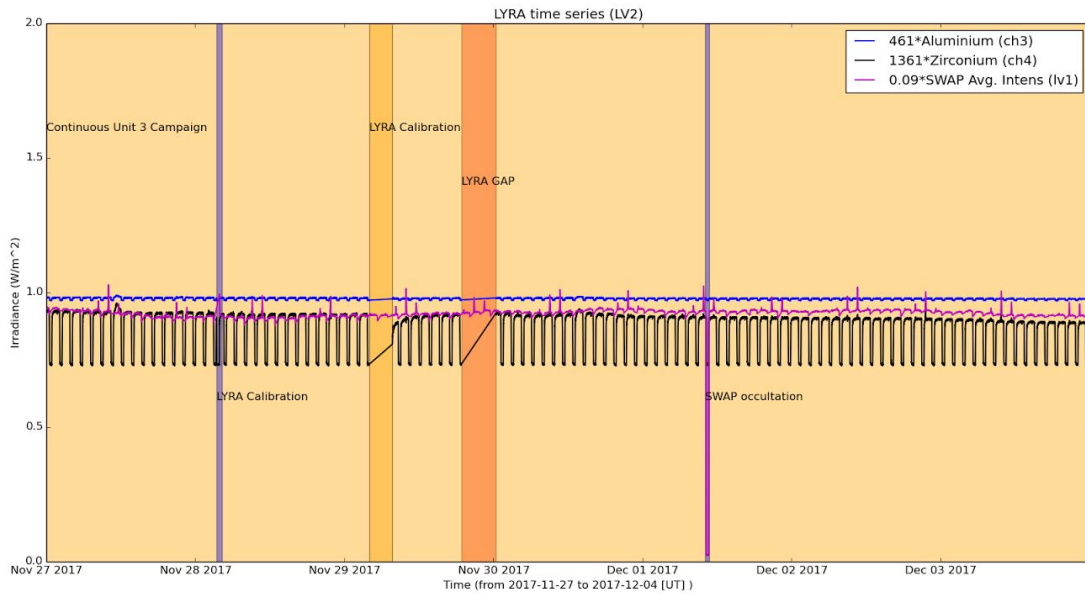
A B1.0 flare was produced from the single sunspot group (NOAA 2689) was observed by SWAP on 2017-Dec-01. The flare is visible on the Western limb of the Sun in the SWAP image above at 14:10 UT.

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:

- Bi-weekly calibration, 2017-Nov-28
- Parallel occultation campaign with LYRA, 2017-Dec-01

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

- Unit 3 campaign, from 2017-Nov-27 to 2017-Dec-03
- Bi-weekly short calibration, 2017-Nov-29

The red-orange shaded periods related to other issues corresponds to:

- No LYRA acquisition between 2017-11-29 18:50 and 2017-11-30 00:24 (corresponding to packet 25899 and 25900). Probably a single event upset - see below, data coverage LYRA.

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>).

- Barbara Thompson presented "Persistence Mapping for Coronal Imager Data"

ESWW14 - Space weather week - Ostende

- Judith De Patoul "Solar plumes network investigation with PROBA2/SWAP data"
- Dana Talpeanu "Observational Analysis of Coronal Fans"
- Elena Podladchikova "EUV jets direct observations with PROBA2/SWAP in low solar corona"
- Thanassis Katsiyannis "The detection of ultra-relativistic electrons in low Earth orbit"

Guest Investigator Program

- Willow M Reed from the University of Colorado completed her visit as part of Marty Snow's GI team.

2. LYRA instrument status

Calibration

Calibration campaign on Wednesday this week.

IOS & operations

Monday 27 Nov	Tuesday 28 Nov	Wednesday 29 Nov	Thursday 30 Nov	Friday 01 Dec	Saturday 02 Dec	Sunday 03 Dec
Nominal acquisition + acquisition U3	Nominal acquisition + acquisition U3	Nominal acquisition + acquisition U3 + calibration	Nominal acquisition + acquisition U3	Nominal acquisition + acquisition U3	Nominal acquisition + acquisition U3	Nominal acquisition + acquisition U3
LYIOS00659	LYIOS00659	LYIOS00659	LYIOS00660, LYIOS00661	LYIOS00661	LYIOS00661	LYIOS00661

The following science campaigns were performed by LYRA:

From 2017-Nov-27 onwards:

- Continual LYRA Unit 3 campaign over occultation season

On 2017-Nov-29

- Bi-weekly calibration campaign

LYRA detector temperature

LYRA detector 2 temperature globally varied between 40.93 and 45.67 °C.

3. SWAP instrument status

Calibration

Calibration campaign on Tuesday this week.

MCPM errors

The number of MCPM recoverable errors increased from 13074 and 13076.

The number of MCPM unrecoverable errors remained at 45.

IOS & operations

Monday 27 Nov	Tuesday 28 Nov	Wednesday 29 Nov	Thursday 30 Nov	Friday 01 Dec	Saturday 02 Dec	Sunday 03 Dec
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition	Nominal acquisition	Nominal acquisition+ Parallel occultation	Nominal acquisition	Nominal acquisition
IOS00731 757 images	IOS00731 766 images	IOS00731 744 images	IOS00733 794 images	IOS00733 817 images	IOS00734 776 images	IOS00734 626 images

Special operations for SWAP, this week:

On 2017-Nov-28

- Bi-weekly calibration campaign

On 2017-Dec-01

- SWAP and LYRA parallel occultation campaign

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -4.49 and -2.01 °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 25872 to 25938) 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 2017 Nov 27 00:00 UT and 2017 Dec 04 00:00 UT: 5291

Highest cadence in this period: 0 seconds

Average cadence in this period: 114.32 seconds

Number of image gaps larger than 300 seconds: 110

Largest data gap: 34.58 minutes

Data coverage LYRA

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

- None
- No LYRA acquisition between 2017-11-29 18:50 and 2017-11-30 00:24 (corresponding to packet 25899 and 25900).

The instrument started to acquire one of its calibration voltage at 18:50 on 2017-11-29 (the one at 0V). Probably again a SEU (single event upset). This one was fixed when the next command was released (the acquisition of the 5 V calibration voltage) at 00:24 on Nov 30.

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)