


P2SC-ROB-WR-454 - 20181203 Weekly report #454	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Dec 03 to Sun Dec 09, 2018 12 Dec 2018 Laurence Wauters Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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1. Science

Solar & Space weather events

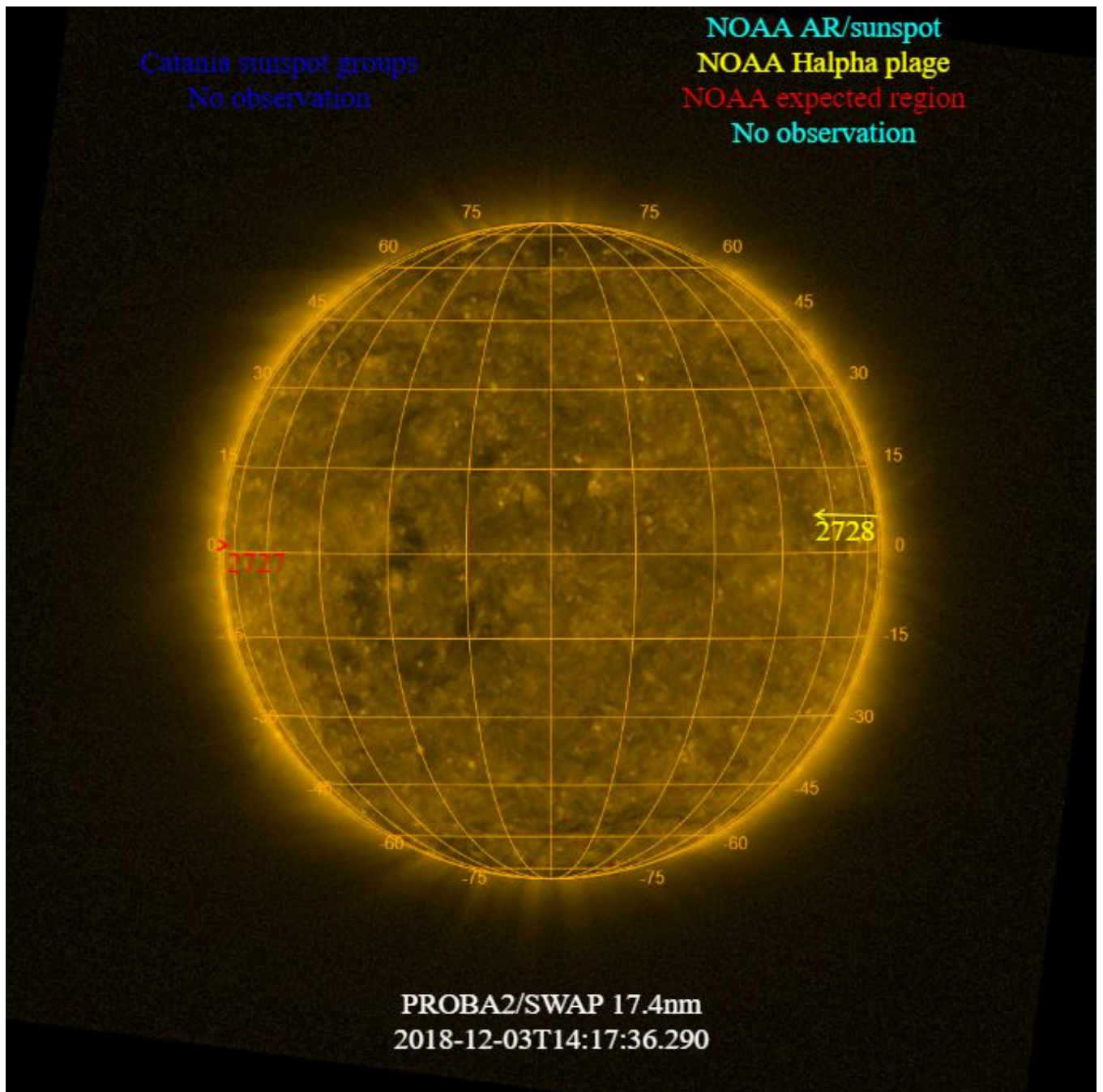
The level of solar activity¹ was **very low** this week.

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

	Monday 03 Dec	Tuesday 04 Dec	Wednesday 05 Dec	Thursday 06 Dec	Friday 07 Dec	Saturday 08 Dec	Sunday 09 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.

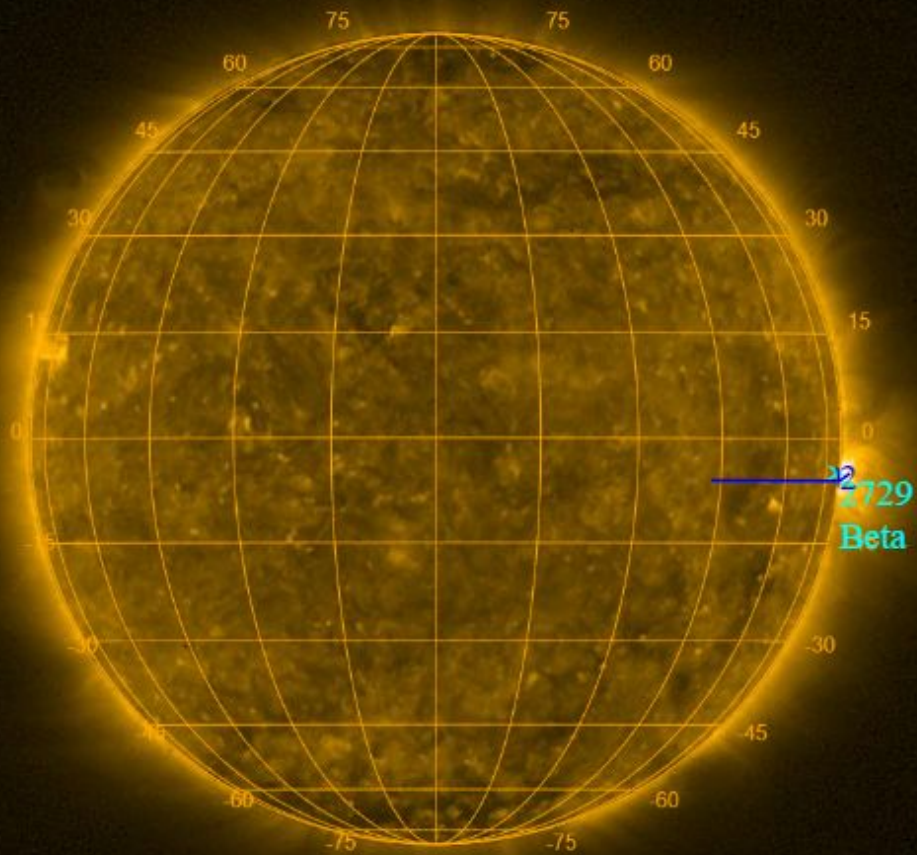
The SWAP images of Dec 03 and Dec 09 are shown below, with annotated active regions.



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

Catania sunspot groups
2018-12-06 09:18:00

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2018-12-09 00:30:00



PROBA2/SWAP 17.4nm
2018-12-09T14:43:56.790

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>

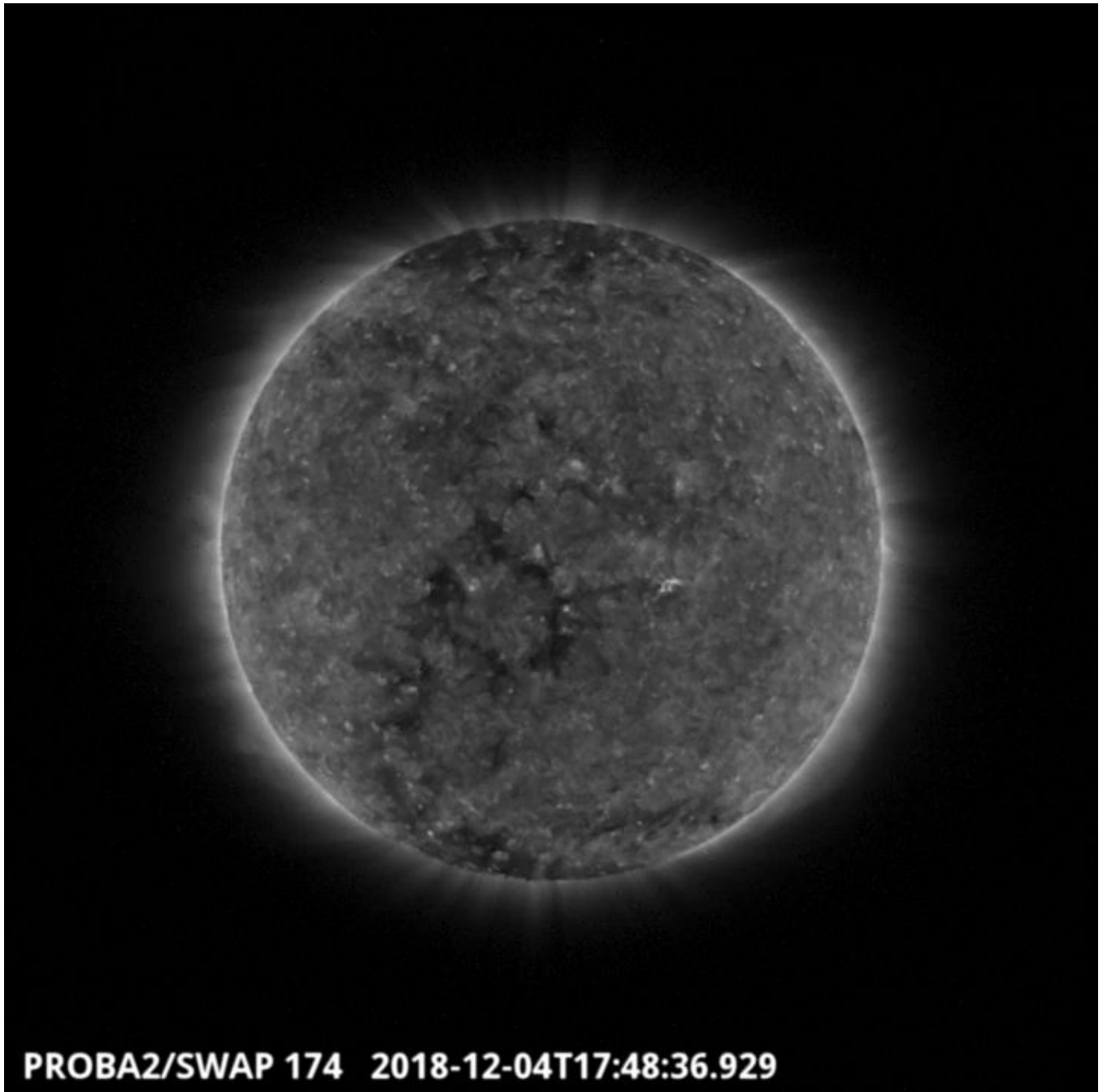
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 454).

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](#)

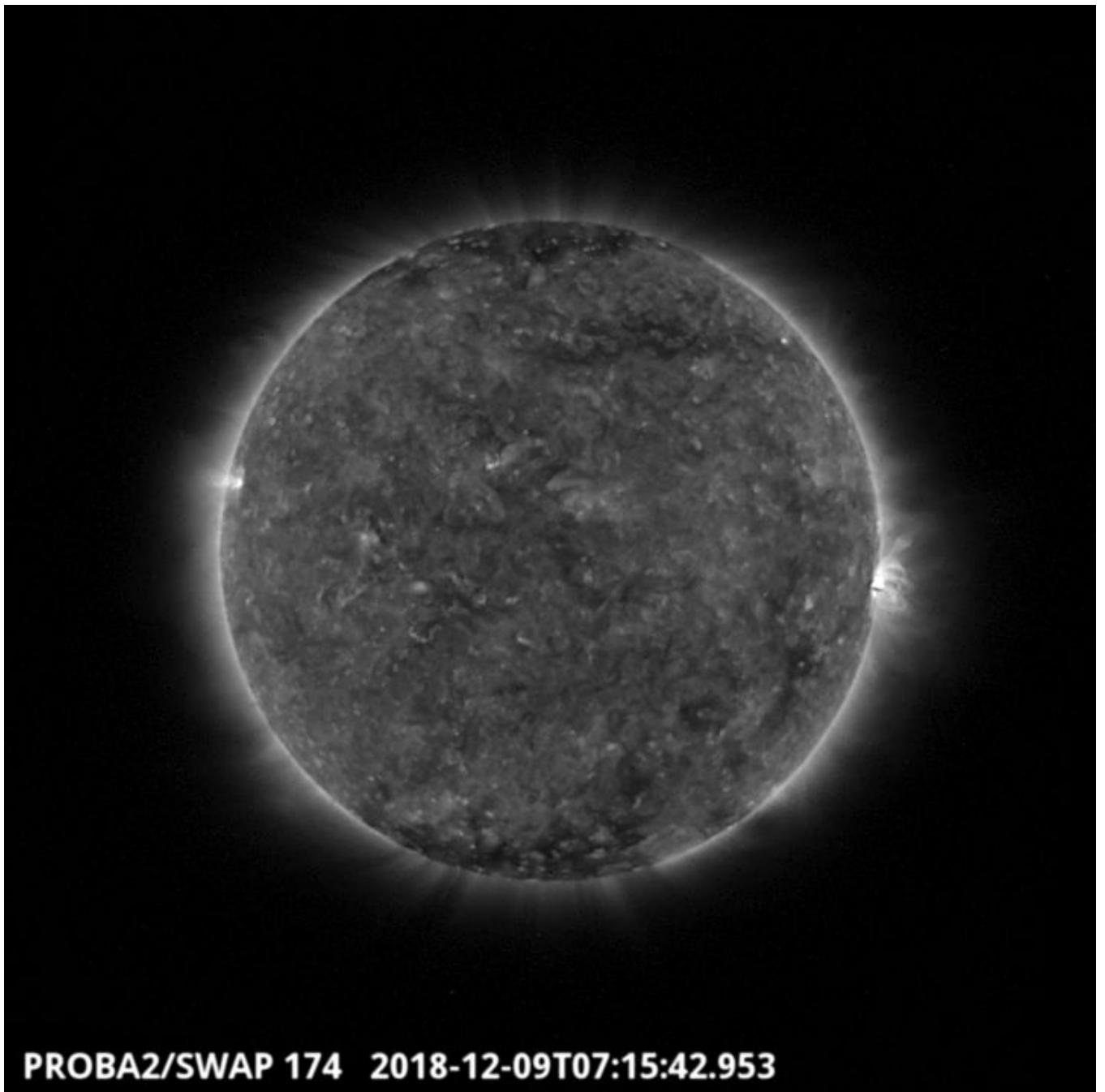
Tuesday Dec 04



A patchy coronal hole reached the central meridian on December 04, it is shown on the SWAP image above.

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

Sunday Dec 09



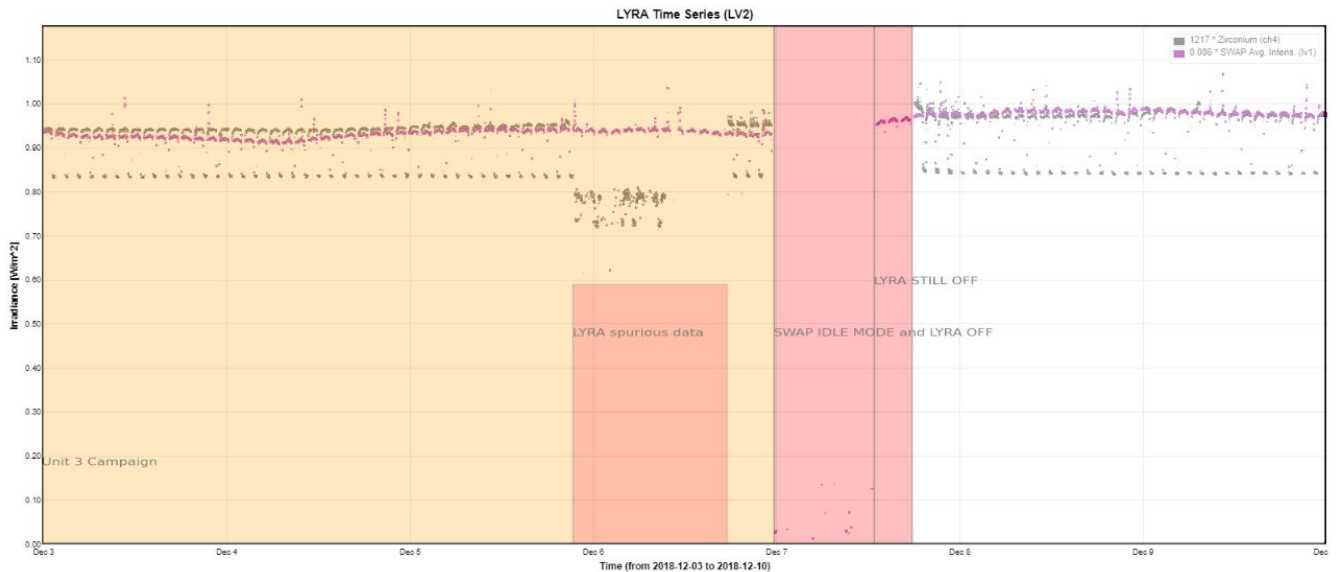
The biggest flare of the week was a B2.4 which occurred on 2018-Dec-09 around 07:15 UT. It erupted from the NOAA region 2729.

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:

- None

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

- Continuous unit 3 campaign (We forgot to command unit 3 data campaign after LYRA SWITCH ON on 2018-Dec-07 at 18:07 UT).

The red shaded periods related to other issues corresponds to:

- On 2018-Dec-05 around 21:34UT, spurious LYRA data has been recorded, an ASIC reload has been requested on 2018-Dec-06, LYRA data came back to nominal on the 6th at 17:43UT.
- On 2018-Dec-06 at 23:55, after 20 minutes of no control with a persistent corruption of the navigation timing, the switch to safe mode of PROBA2 occurred putting LYRA OFF and SWAP in idle mode (detailed in the PROBA-2 Operations Status Report #454 from REDU). PROBA2 was commanded to Sun mode on 2018-12-07 at 12:42 UT. With the sun mode and the SWAP commands still present in the schedule, SWAP has resumed images automatically. LYRA was restarted by ROB via LYRA IOS#741 (2018-12-07 at 17:59:00 UT)

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

- Jennifer O'Kane from Mullard Space Science Laboratory, UK, has visited the P2SC during this week. She worked on "Stealth Coronal Mass Ejections using SWAP data".

2. LYRA instrument status

Calibration

No Calibration campaign on Wednesday this week.

IOS & operations

Monday 03 Dec	Tuesday 04 Dec	Wednesday 05 Dec	Thursday 06 Dec	Friday 07 Dec	Saturday 08 Dec	Sunday 09 Dec
Nominal acquisition + U3 LYIOS00737	Nominal acquisition + U3 LYIOS00737	Nominal acquisition + U3 LYIOS00738	Nominal acquisition + U3+ ASIC RELOAD LYIOS00738	Nominal acquisition + daily U3+ LYRA SWITCH ON LYIOS00739 ->LYIOS00741	Nominal acquisition + daily U3 LYIOS00741	Nominal acquisition + daily U3 LYIOS00741

The following science campaigns were performed by LYRA:

- Continuous U3 observations campaign from 2018-Dec-03 until 2018-Dec-06 23:55 UT.
- ASIC RELOAD, 2018-Dec-06 just after pass 29399.
- LYRA switch OFF due to PROBA2 put in safe mode on 2018-Dec-06 at 23:55 UT.
- LYRA SWITCH ON, 2018-Dec-07 at 18:07

LYRA detector temperature

LYRA detector 2 temperature globally varied between 31.89 to 45.21 °C.

3. SWAP instrument status

Calibration

No calibration campaign on Tuesday this week.

MCPM errors

The number of MCPM recoverable errors increased from 271 to 278.

The number of MCPM unrecoverable errors remained at 0.

IOS & operations

Monday 03 Dec	Tuesday 04 Dec	Wednesday 05 Dec	Thursday 06 Dec	Friday 07 Dec	Saturday 08 Dec	Sunday 09 Dec
Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition+ ESP	Nominal acquisition+ SWITCH ON	Nominal acquisition	Nominal acquisition
IOS00808	IOS00808	IOS00809	IOS00809	IOS00809 -> IOS00814	IOS00729	IOS00729
740 images	723 images	787 images	773 images	340 images	744 images	733 images

Special operations for SWAP, this week:

- Occultation jumps from 2018-Nov-26 onwards.
- ESP JUMP, 2018-Dec-06
- SWITCH ON SWAP (from IDLE mode), 2018-Dec-07
- No parallel occultation due to SWAP in IDLE MODE on 2018-Dec-07

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -7.53 and 3.11 °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 29365 to 29429) was nominal, except for:

- 29404, 29405,29406,29407,29408,29409. On 2018-Dec-06 at 23:55, after 20 minutes of no control with a persistent corruption of the navigation timing, the switch to safe mode of PROBA2 occurred putting LYRA OFF and SWAP in idle mode (detailed in the PROBA-2 Operations Status Report #454 from REDU). PROBA2 was commanded to Sun mode on 2018-12-07 at 12:42 UT. With the sun mode and the SWAP commands still present in the schedule, SWAP has resumed images automatically. LYRA was restarted by ROB via LYRA IOS#741 (2018-12-07 at 17:59:00 UT)

Data coverage HK

All HK data files (LYRA_AD) have been received, except:

- None.
- Few points between 2018-Dec-06 23:56 UT and 2018-Dec-07 at 13:01 UT

Data coverage SWAP

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

- None.
- Black images due to Spacecraft in safe mode and SWAP in IDLE MODE since 2018-Dec-06 at 23:55 until 2018-Dec-07 at 12:42 UT.

Total number of images between 2018 Dec 03 00:00 UT and 2018 Dec 10 00:00 UT: 4886

Highest cadence in this period: 30 seconds

Average cadence in this period: 123.77 seconds

Number of image gaps larger than 300 seconds: 112

Largest data gap: 68.90 minutes

Data coverage LYRA

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

- 29404, 29405,29406,29407,29408,29409 (LYRA in OFF mode)

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)