P2SC-ROB-WR-423 - 20180430 Weekly report #423	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Apr 30 to Sun May 06, 2018 09 May 2018 Laurence Wauters Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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1. Science

Solar & Space weather events

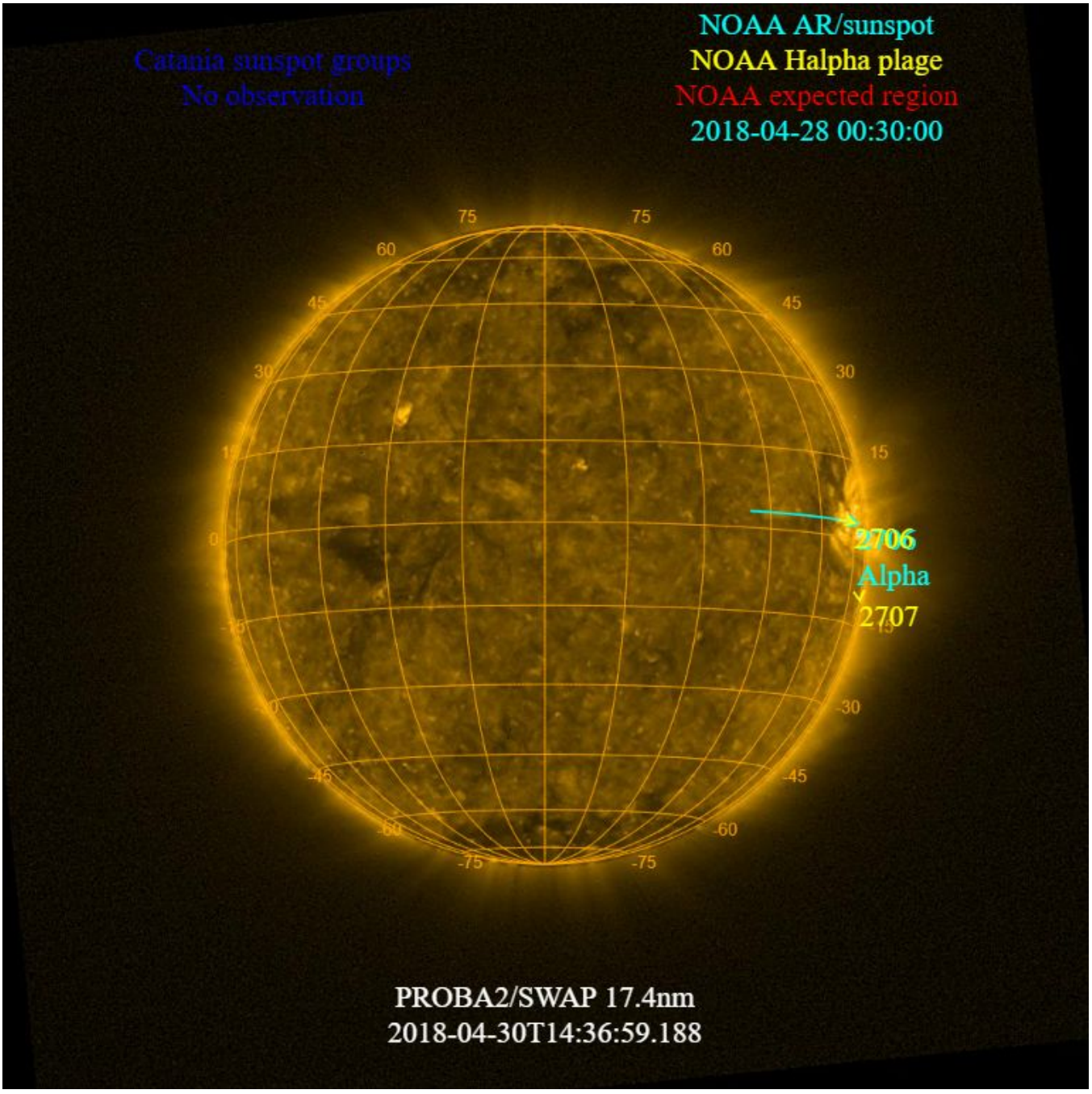
The level of solar activity[1] was **very low** this week.

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

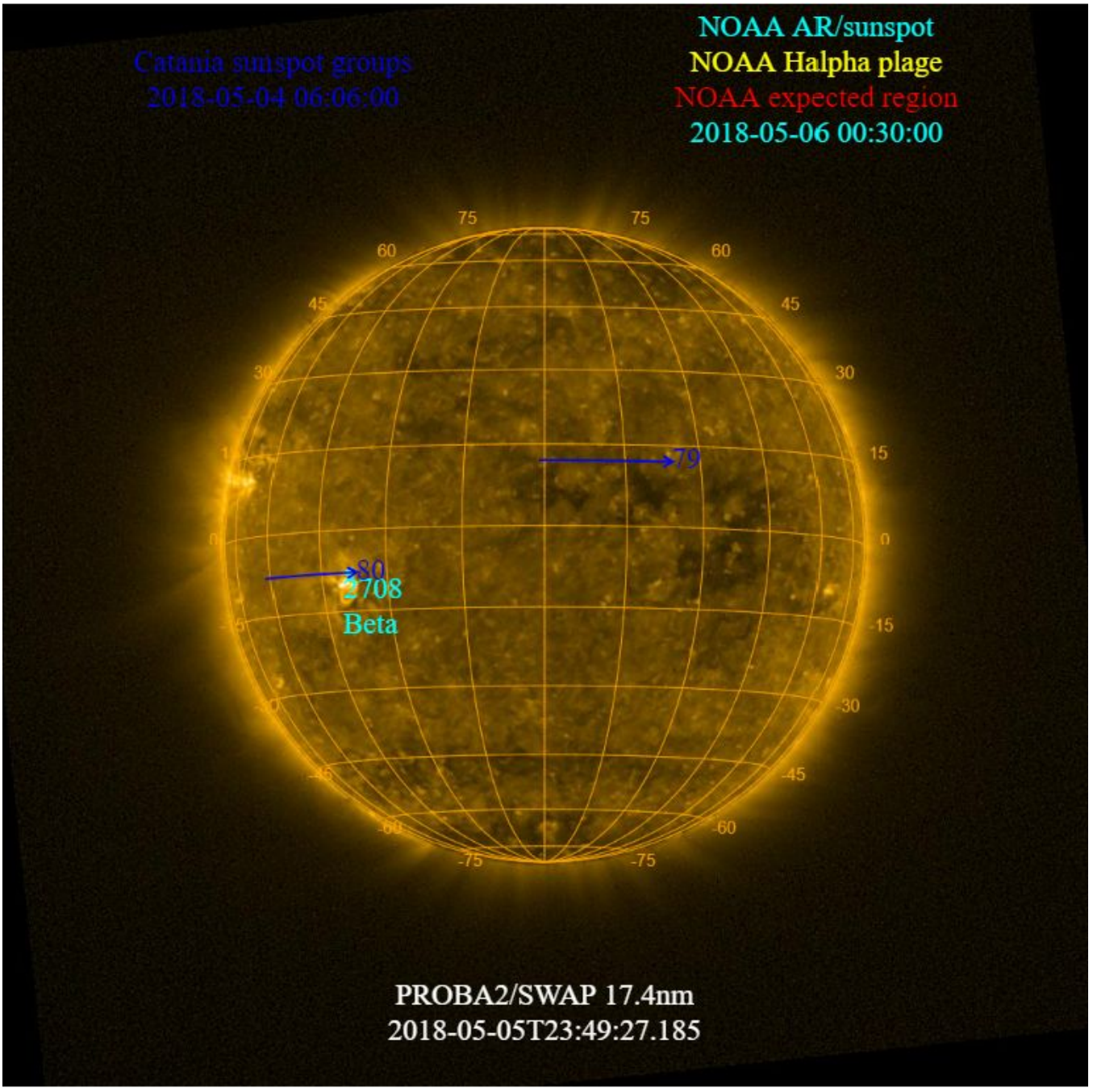
	Monday 30 Apr	Tuesday 01 May	Wednesday 02 May	Thursday 03 May	Friday 04 May	Saturday 05 May	Sunday 06 May
Activity	very low	very low	very low	very low	very low	very low	very low
Flares	-	-	-	-	-	-	-

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

The SWAP images of Apr 30 and May 05 (last image of the week) are shown below, with annotated active regions.



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


Catania sunspot groups
2018-05-04 06:06:00
NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2018-05-06 00:30:00
75
75
60
60
45
45
30
30
15
0
-15
-30
-45
-60
-75
-75
79
80
2708
Beta
PROBA2/SWAP 17.4nm
2018-05-05T23:49:27.185

Solar Activity

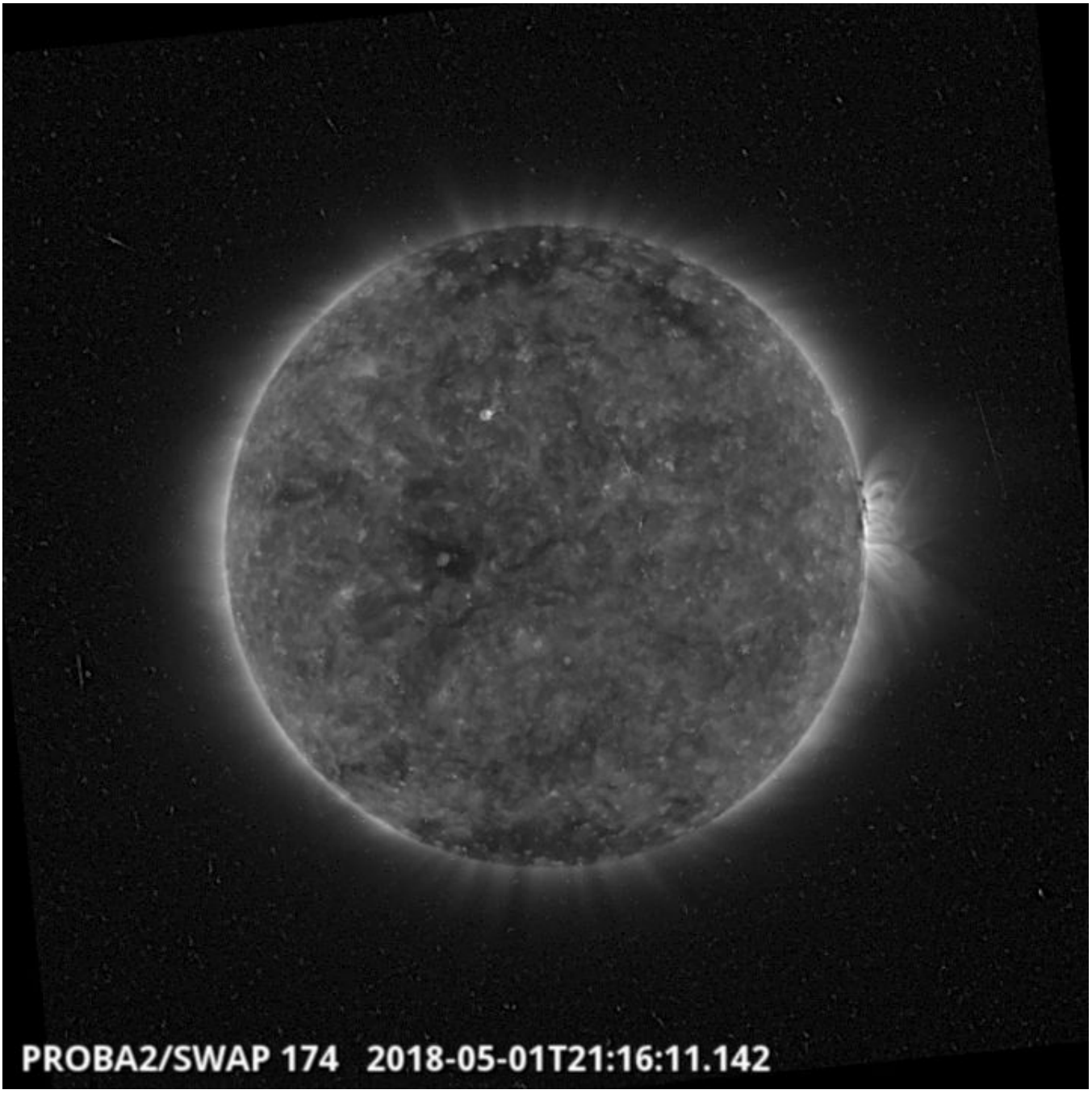
Solar flare activity was very low during the week.
In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: http://proba2.oma.be/ssa
This page also lists the recorded flaring events.

A weekly overview movie can be found here (SWAP week 423).

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 May 01

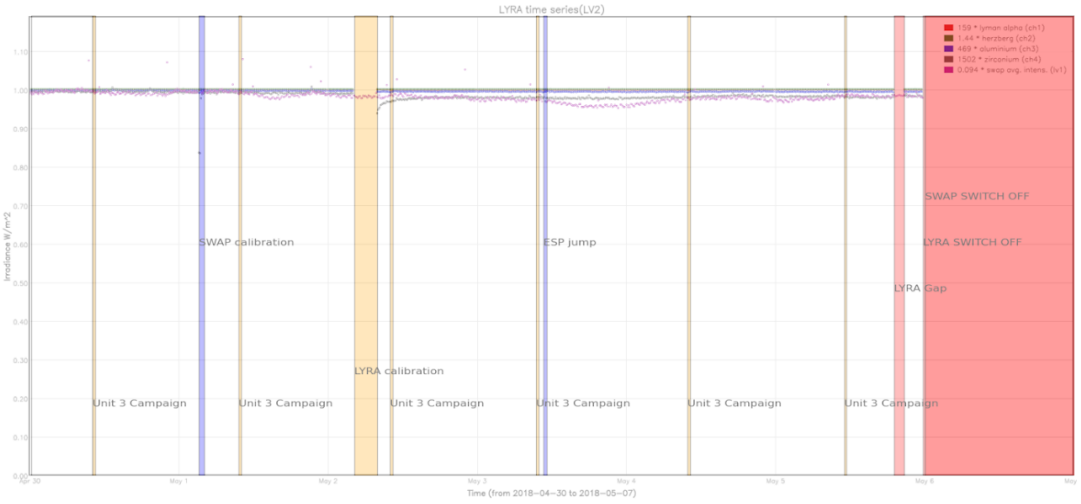


The largest flare of the week was a B1.6 associated with NOAA AR 2706. The flare is visible on the West limb in the SWAP image above at 21:16 UT.

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:

- SWAP calibration, 2018-May-01
- ESP jump, 2018-May-03

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

- daily U3 observations campaign, 2018-Apr-30
- daily U3 observations campaign, 2018-May-01
- LYRA calibration, 2018-May-02
- daily U3 observations campaign, 2018-May-02
- daily U3 observations campaign, 2018-May-03
- daily U3 observations campaign, 2018-May-04
- daily U3 observations campaign, 2018-May-05

The red shaded periods related to other issues corresponds to:

- No LYRA data from 2018-May-05 at 18:57 until 2018-May-05 at 20:37 (One or more lump(s) of this pass 27376 are corrupted)
- LYRA switch OFF on 2018-May-05 at 23:40 (for On-board elapsed time roll-over during pass 27378) until 2018-05-07 at 05:40 (nominal situation after On-board elapsed time wrap-around)
- SWAP switch OFF on 2018-May-05 at 23:57 until 2018-05-07 at 05:50, for the On-board elapsed time wrap-around.

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

- PhD student Ranadeep Sarkar from Udaipur Solar Observatory continued his visit to the P2SC to working on his project entitled "Evolution of coronal cavities leading to CMEs".

2. LYRA instrument status

Calibration

Calibration campaign on Wednesday this week.

IOS & operations

Monday 30 Apr	Tuesday 01 May	Wednesday 02 May	Thursday 03 May	Friday 04 May	Saturday 05 May	Sunday 06 May
Nominal acquisition + daily U3 LYIOS00693	Nominal acquisition + daily U3 LYIOS00693	Nominal acquisition + daily U3 + calibration LYIOS00693	Nominal acquisition + daily U3 LYIOS00693	Nominal acquisition + daily U3 LYIOS00693	Nominal acquisition + daily U3 LYIOS00694	Nominal acquisition + daily U3 LYIOS00694

The following science campaigns were performed by LYRA:

- daily U3 observations campaigns
- LYRA switch OFF command, 2018-05-05 at 23:40
- LYRA switch ON, 2018-05-07 at 5:40

LYRA detector temperature

LYRA detector 2 temperature globally varied between 47.15 and 49.45 °C.

3. SWAP instrument status

Calibration

Calibration campaign on Tuesday this week.

MCPM errors

The number of MCPM recoverable errors increased from 4386 to 4537.
The number of MCPM unrecoverable errors remained at 0.

IOS & operations

Monday 30 Apr	Tuesday 01 May	Wednesday 02 May	Thursday 03 May	Friday 04 May	Saturday 05 May	Sunday 06 May
Nominal acquisition IOS00768 626 images	Nominal acquisition + calibration IOS00769 610 images	Nominal acquisition IOS00769 685 images	Nominal acquisition IOS00769 680 images	Nominal acquisition IOS00769 712 images	Nominal acquisition IOS00770 598 images	Nominal acquisition IOS00770 598 images

Special operations for SWAP, this week:

- Calibration, 2018-May-01
- Monthly ESP jump, 2018-May-03
- SWAP Switch OFF, 2018-May-05 at 23:57 UT
- SWAP Switch ON, 2018-May-07 at 05:50 UT

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.61 and -0.17 °C.

4. PROBA2 Science Center Status

The main operator is Laurence Wauters.

The following changes were made to the P2SC:

- Update to revision 5351 of the tools PPT (Pointing and Positioning Tool), ADP (Ancillary Data Processor), LY-TMR (LYRA Telemetry Reformatter) and SW-TMR (SWAP Telemetry Reformatter) on 2018-May-02 for OBET (On-Board Elapsed Time) wrap-around occured on Sunday 2018-May-06 at 03:04:48 UT as expected i.e. 8.5 years after the launch. After the roll-over, Redu's time correlation might be slightly less accurate which involved the update made to the P2SC. This update has been successfully completed.

5. Data reception & discussions with MOC

Passes

The delivery of the passes for this week (passes 27322 to 27386) was nominal, except for:

- 27378 until 27389

Data coverage HK

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

- 27378 (OBET ROLL-OVER pass)

Data coverage SWAP

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

- 27378 until 27389 (SWAP OFF)

Total number of images between 2018 Apr 30 00:00 UT and 2018 May 07 00:00 UT: 3966
Highest cadence in this period: 30 seconds
Average cadence in this period: 130.60 seconds
Number of image gaps larger than 300 seconds: 132
Largest data gap: 33.67 minutes

Data coverage LYRA

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

- 27378 until 27389 (LYRA OFF)
- 27376 (One or more lump(s) of this pass are corrupted)

Explanation of one or more lump(s) of the pass are corrupted:

The size of the lump is computed by the on-board software and stored in the header of the lump. And then, once downloaded, the LY-TMR at P2SC checks the size and raises an error if it is different from the one mentioned in the header. The problem is that sometimes, a particle changes the value written in the header while the lump is stored on-board (the same kind of problem that causes the covers to open by themselves). So basically, the mismatch in sizes is caused by corrupted data on-board.

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)