P2SC-ROB-WR-287 - 20150921 Weekly report #287	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Sep 21 to Sun Sep 27, 2015 30 Sep 2015 Katrien Bonte Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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1. Science

Solar & Space weather events

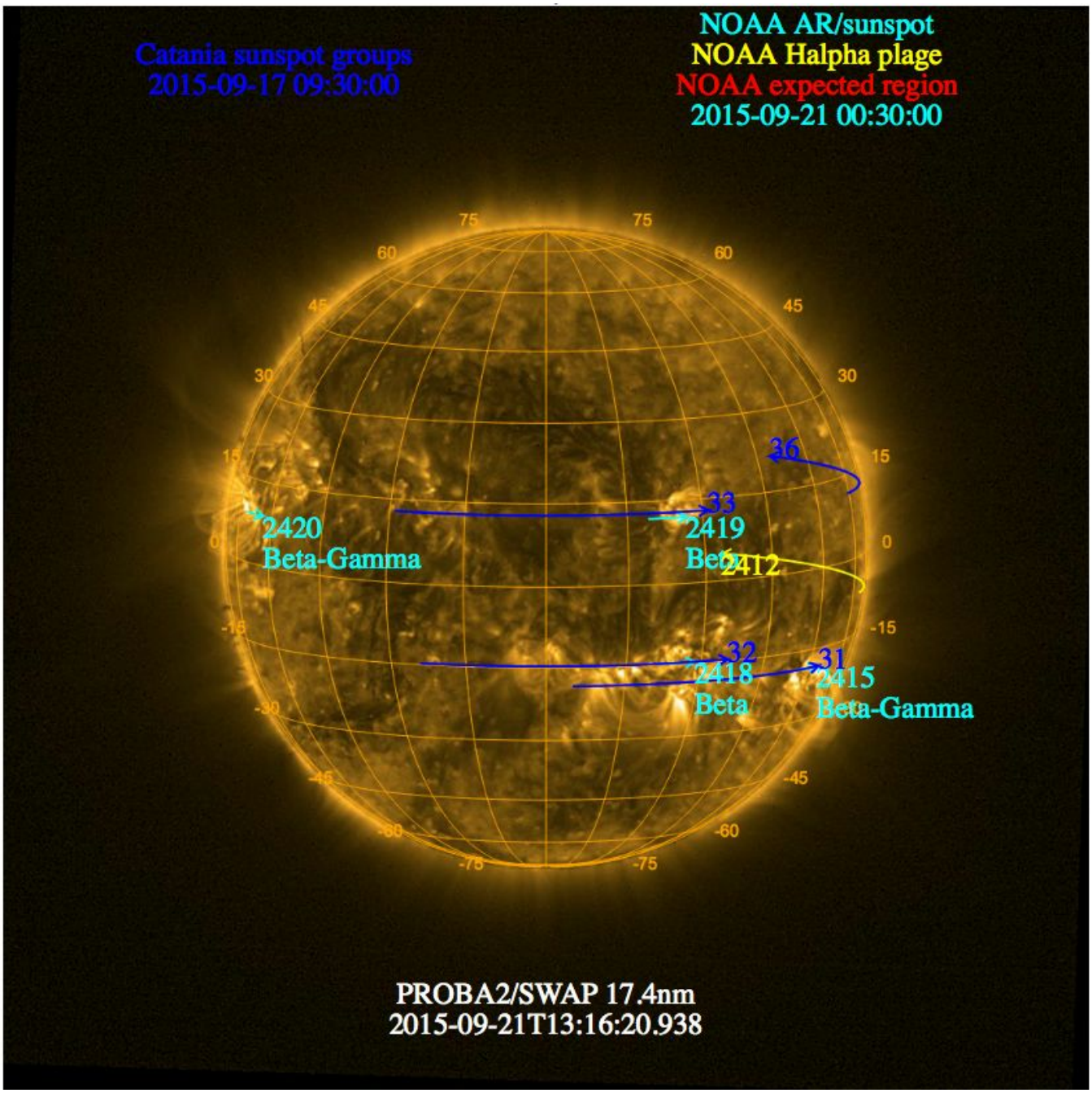
The level of solar activity[1] fluctuated between **very low** and **moderate** this week.

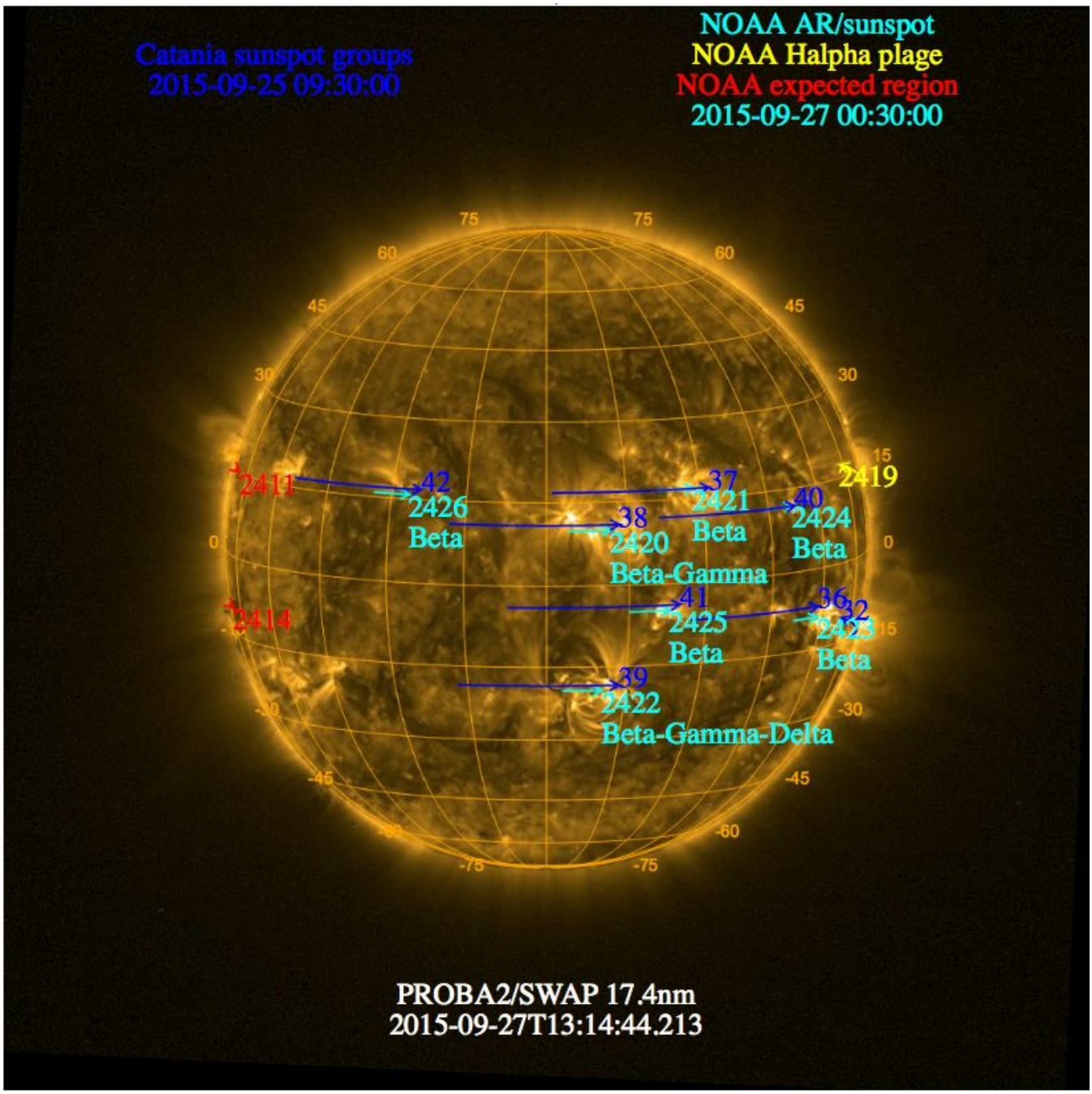
Only M- and X-flares are mentioned, the most energetic one(s) per day are presented in **bold**:

	Monday 21 Sep	Tuesday 22 Sep	Wednesday 23 Sep	Thursday 24 Sep	Friday 25 Sep	Saturday 26 Sep	Sunday 27 Sep
Activity	low	very low	low	low	low	low	moderate
Flares	-	-	-	-	-	-	**M1.9@10:40** **M1.0@21:00**

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

The SWAP images of 2015-09-21 and Sep 2015-09-27 are shown below, with annotated active regions.




Catania sunspot groups
2015-09-25 09:30:00
NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2015-09-27 00:30:00
75
60
45
30
15
0
-15
-30
-45
-60
-75
2411
42
2426
Beta
38
2420
Beta-Gamma
37
2421
Beta
40
2424
Beta
2419
2414
41
2425
Beta
36
32
Beta
39
2422
Beta-Gamma-Delta
PROBA2/SWAP 17.4nm
2015-09-27T13:14:44.213

Solar Activity

Solar flare activity fluctuated between very low and moderate 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 287).

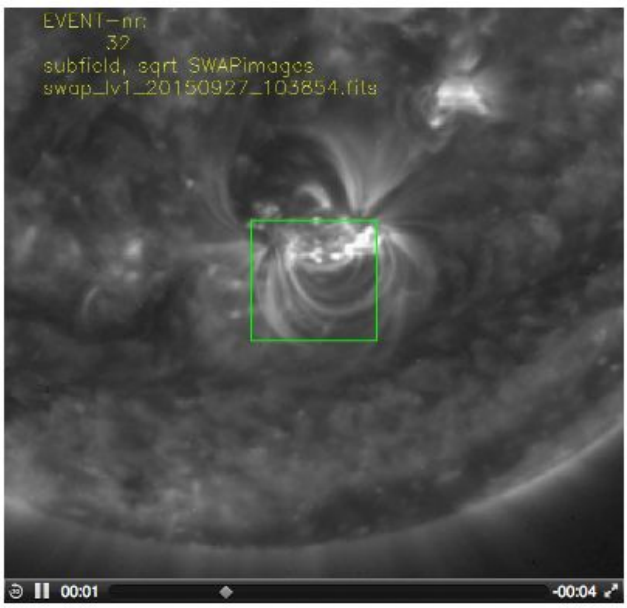
Details about some of this week's events:

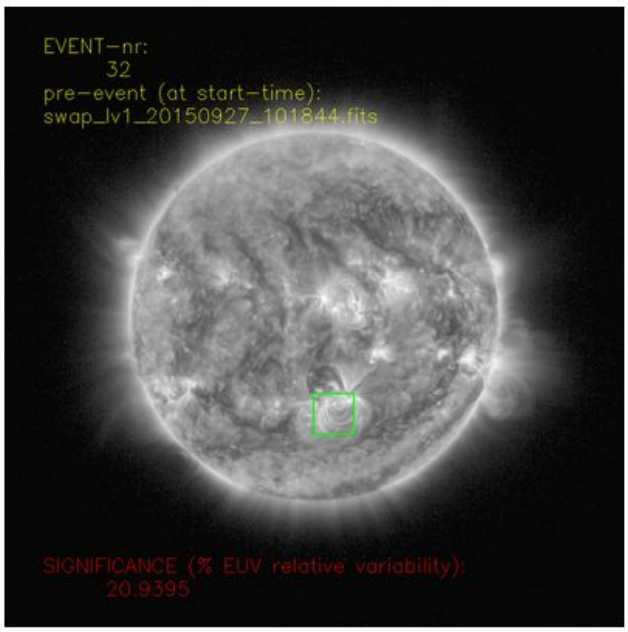
Solar activity increased towards the end of the week. AR 2422 produced two M-class flares on 2015-09-27: an M1.9 flare peaking around 10:40 UT and an M1.0 flare peaking around 21:00 UT. Below we provide SWAP images from the time when these M-flares occurred on 2015-Sep-27. The annotated snapshots are produced by the Solar Feature Automated Search Tool (SoFAST). This tool detects dynamic solar events in EUV images from SWAP in near real-time. The snapshots illustrate the location of the flare on the solar disk (right) and a zoomed image (left).

The complete SoFAST online event list and additional plots are available on http://www.sidc.be/sofast.

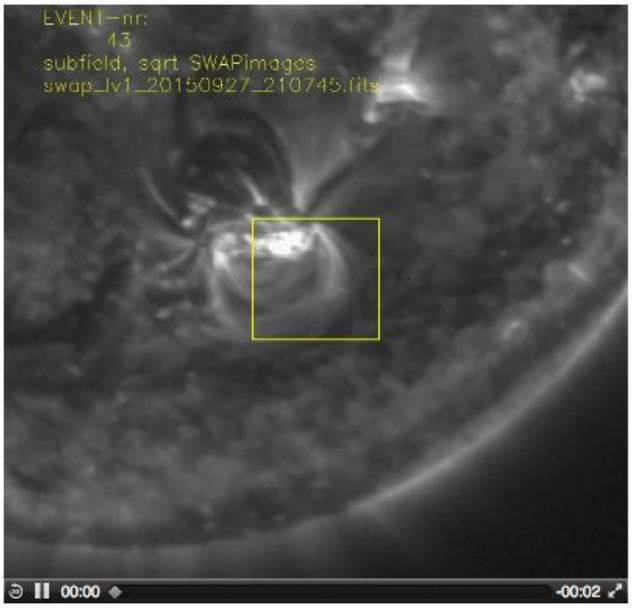
2015-09-27:

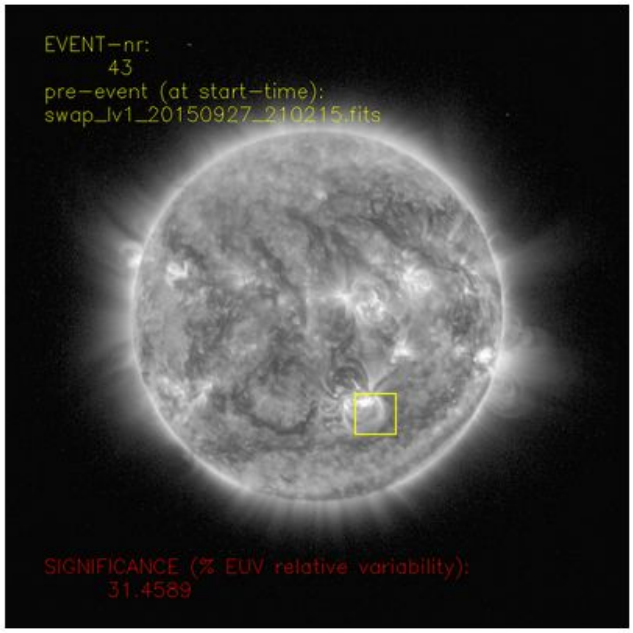
M1.9 flare peaking around 10:40 UT





M1.0 flare peaking around 21:00 UT

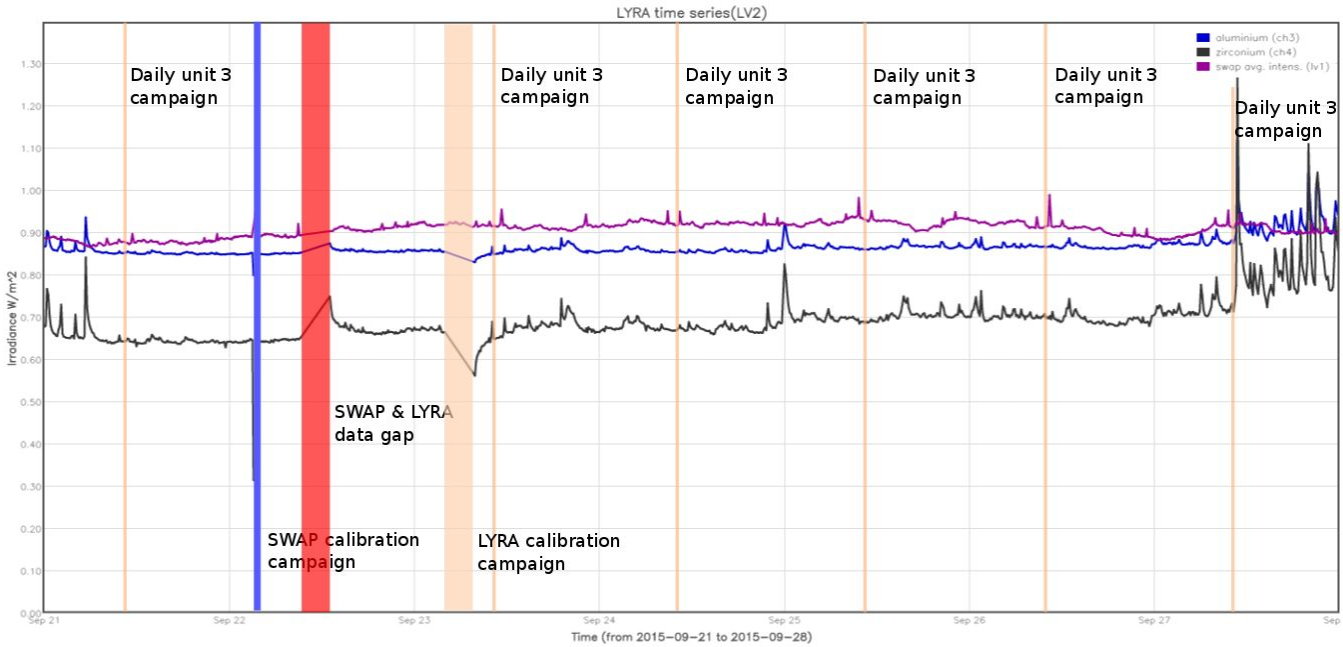




An overview of the weekly LYRA & SWAP data is provided below:

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 correspond to, from left to right:

- SWAP bi-weekly calibration campaign on 2015-09-22

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

- LYRA daily U3 campaign on 2015-09-21
- LYRA short bi-weekly calibration on 2015-09-23
- LYRA daily U3 campaign on 2015-09-23
- LYRA daily U3 campaign on 2015-09-24
- LYRA daily U3 campaign on 2015-09-25
- LYRA daily U3 campaign on 2015-09-26
- LYRA daily U3 campaign on 2015-09-27

The red shaded periods correspond to:

- SWAP and LYRA data gap due to spacecraft in safe mode

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).

Meeting

The CNES, the LATMOS and the STCE organised the second edition of the meeting **"Solar Metrology, Needs and Methods"**. This meeting was open to anyone involved in solar metrology and modelling.
It took place from 2015-09-21 to 2015-09-23, at the Royal Observatory of Belgium.

PROBA2 related talks that were on the program include:

Mid-term Periodicities of the LYRA data spectrum
L. Wauters

Long-term variability of LYRA data
I. Dammasch

Space-based instrument developments for UV solar observations - detector technology -
A. Benmoussa

Progress towards understanding the degradation affecting the PROBA2/LYRA instrument
M. Dominique

Guest Investigator Program

- None

2. LYRA instrument status

Calibration

Calibration campaign on Wednesday this week.

IOS & operations

Monday 21 Sep	Tuesday 22 Sep	Wednesday 23 Sep	Thursday 24 Sep	Friday 25 Sep	Saturday 26 Sep	Sunday 27 Sep
Nominal acquisition + daily U3 LYIOS00494	Nominal acquisition LYIOS00494 -> LYIOS00495	Nominal acquisition + daily U3 + calibration LYIOS00495	Nominal acquisition + daily U3 LYIOS00495	Nominal acquisition + daily U3 LYIOS00496	Nominal acquisition + daily U3 LYIOS00496 -> LYIOS00497	Nominal acquisition + daily U3 LYIOS00497

The following science campaigns were performed by LYRA:

- Daily U3 observation campaigns, except on 2015-09-22
- Short bi-weekly calibration on 2015-09-23

LYRA detector temperature

LYRA detector 2 temperature globally varied between 43.59 and 49.64 °C.

3. SWAP instrument status

Calibration

Calibration campaign on 2015-09-22.

MCPM errors

The number of MCPM recoverable errors remained 137.
The number of MCPM unrecoverable errors remained 0.

IOS & operations

Monday 21 Sep	Tuesday 22 Sep	Wednesday 23 Sep	Thursday 24 Sep	Friday 25 Sep	Saturday 26 Sep	Sunday 27 Sep
Nominal acquisition IOS00597 653 images	Nominal acquisition + calibration IOS00597 ->IOS00598 569 images	Nominal acquisition IOS00598 528 images	Nominal acquisition IOS00598 672 images	Nominal acquisition IOS00599 574 images	Nominal acquisition IOS00599 552 images	Nominal acquisition IOS00599 483 images

Special operations for SWAP, this week:

- Bi-weekly calibration on 2015-09-22

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -4.25 and -0.39 °C.

4. PROBA2 Science Center Status

The main operator is Katrien Bonte.

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 18526 to 18582) 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 2015-09-21 00:00 UT and 2015-09-28 00:00 UT: 3378
Highest cadence in this period: 30 seconds
Average cadence in this period: 153.48 seconds
Number of image gaps larger than 300 seconds: 197
Largest data gap: 222.95 minutes

There is a significant data gap because the spacecraft went to safe mode on 2015-09-22.

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
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)