| P2SC-ROB-WR-029-20100927 Weekly report #29	**P2SC Weekly report**	
Period covered: Date: Written by: Released by:	Mon Sept 27 to Sun 3 Oct 5 Oct 2010 Carlos Cabanas Anik De Groof	Royal Observatory of Belgium PROBA2 Science Center
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1. Science

Solar & Space weather events

Active regions evolution during the week:
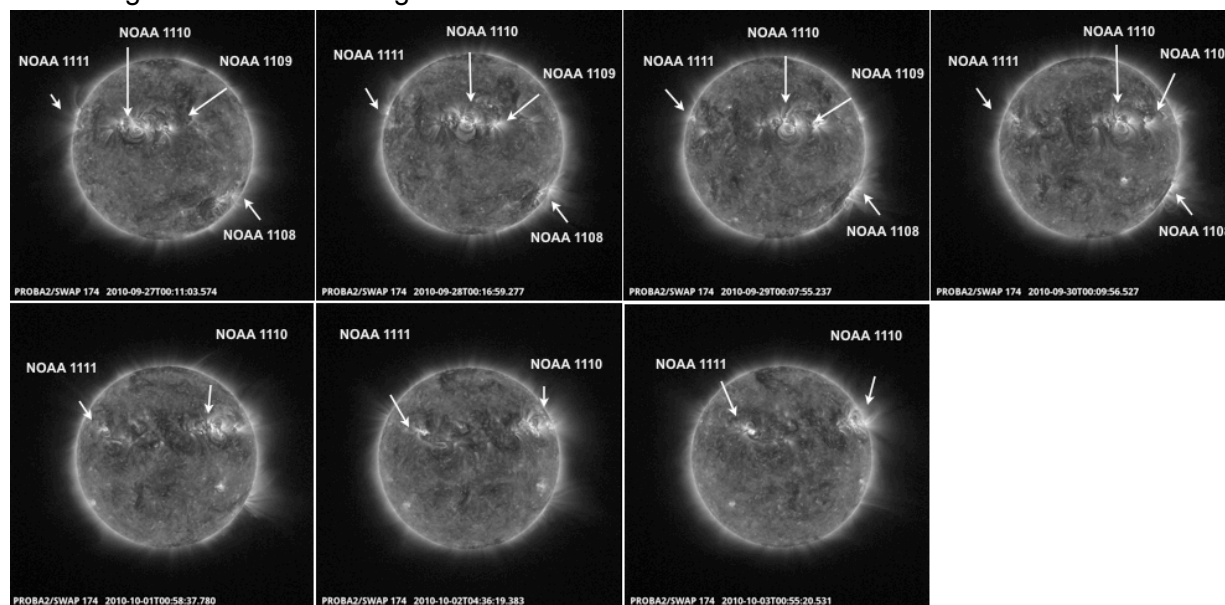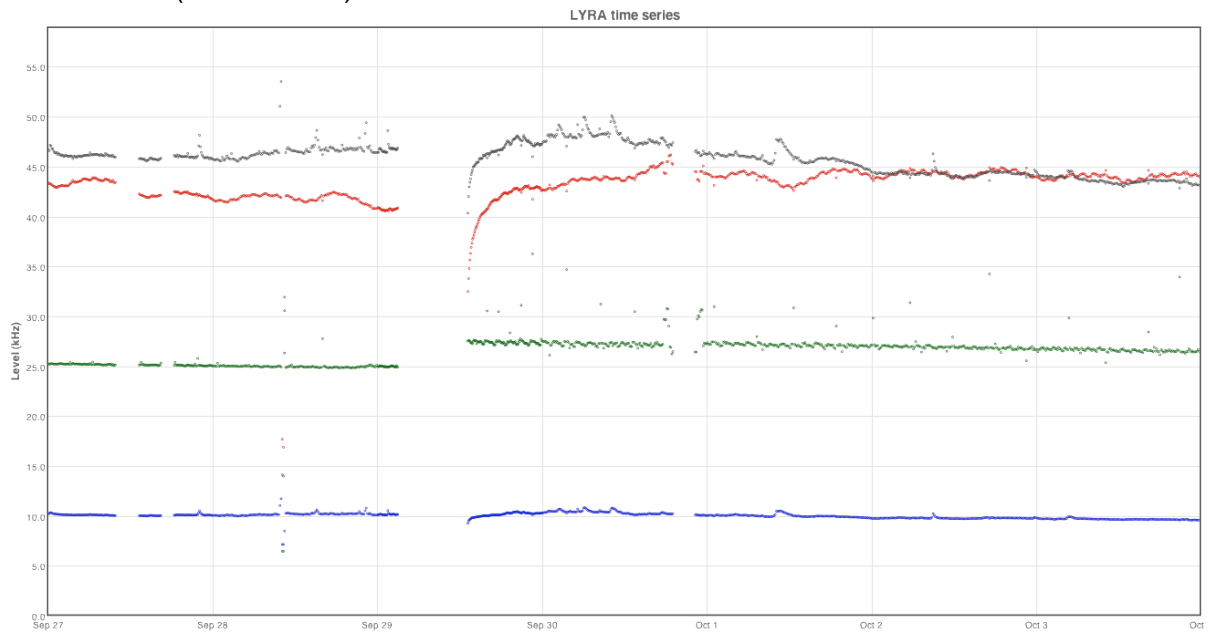
NOAA 1110 was the source of 2 C-flares (and several B-flares) during the reported period, observed both by SWAP and LYRA:

- 2010/09/28 09:48:00 C1.7 N19W21
- 2010/09/28 22:11:00 C2 N19W30
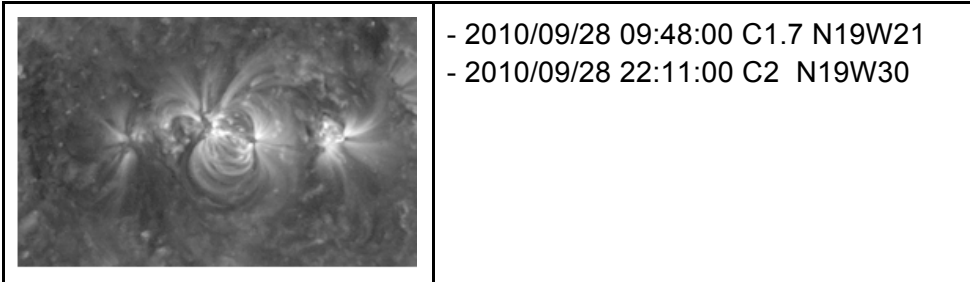
On Sep 30-Oct 1st, there are several interesting B-flares, some are long-lasting events, e.g. the B5-flare on Oct 1 10UT with source AR 1110.

Overview of (uncalibrated) LYRA science data over the week:

Scientific and calibration campaigns
The following campaigns were planned during the week:

Campaign 1: SWAP calibration
Period: Tuesday 28 September from 09:56 to 10:49.
Objectives: SWAP calibration
Asked by: SWAP team.

Campaign 2: LYRA calibration
Period: Wednesday 29 September from 03:00 to 13:00
Objectives: LYRA calibration
        - HEAD 2,3 (40 min DC + 40 min VIS + 40 min UV + 40 min DC)
        - HEAD 2,1 (40 min DC + 40 min VIS + 40 min UV + 40 min DC)
Asked by: LYRA team.

Campaign 3: Support SDO
Period:
    - 29 September 05:59 - 07:09 SDO Earth Eclipse
    - 30 September 05:59 - 07:07 SDO Earth Eclipse + 20:00 - 20:30 AIA calibration
    - 01 October   05:58 - 07:04 SDO Earth Eclipse
    - 02 October   05:58 - 07:01 SDO Earth Eclipse
    - 03 October   05:59 - 06:57 SDO Earth Eclipse
    - 04 October   06:01 - 06:53 SDO Earth Eclipse
    - 05 October   06:01 - 06:49 SDO Earth Eclipse + 20:00 - 20:30 AIA calibration
    - 06 October   06:04 - 06:43 SDO Earth Eclipse
    - 07 October   06:08 - 06:36 SDO Earth Eclipse + 20:00 - 20:30 AIA calibration
Objectives: high cadence imaging (60 sec) when AIA is not imaging.
Asked by: SWAP team.

Campaign 4: Support ESP
Period: Thursday 30th September from 10:08:05 to 10:33:11
Objectives: support ESP weekly campaign: SWAP is not imaging during 2 LARS and interLAR period (~28 minutes) without passes.
Asked by: REDU

Campaign 5: Off-point (Sun in the South East part of the FOV).
Period: Friday 30 September from 17:31 to 23:31.
Objectives: to catch a cavity eruption (it didn't go).
Asked by: Eva Robbrecht

Campaign 6: SWAP bright points study.
Period: Saturday 2 October from 04:00:00 to 10:00:00
Objectives: Observation of bright points evolution at different wavelengths (temperatures):
            SWAP 174 nm

- SWAP 174 nm.
- SDO (AIA) at 171 and 193 nm.
- HINODE (XRT) X-rays.
Asked by: Kariyappa (PROBA2 Guest Investigator)

Outreach, papers, presentations, etc.
- Elke D'Huys, Petra Vanlommel and Anik De Groof gave a seminar about Space Weather

and PROBA2 for Geography teachers (secondary school) in Leuven. (September 28th)
The presentations can be downloaded from http://proba2.sidc.be/Presentations/20100928-
WerkgroepAardrijkskundeBrabant/

- Marilena Mierla was present at the workshop: *Astronomy in Romania seen in international context* (Bucharest). She gave a presentation about the Coronal Mass Ejections seen by SWAP on April 3 and 8 2010.

- Dr. Kariyappa is visiting P2SC as Guest Investigator for LYRA and SWAP.

2. LYRA instrument status

Calibration
Nominal calibration campaign on September 29.
    - HEAD 2,3 (40 min DC + 40 min VIS + 40 min UV + 40 min DC)
    - HEAD 2,1 (40 min DC + 40 min VIS + 40 min UV + 40 min DC)

IOS & operations
Nominal acquisition (50 ms cadence with head 2).

Anomalies
The signal in the LYRA Herzberg channel shows a jump after the calibration of Tuesday Sep 29. Apart from the higher signal, it also shows instabilities in the signal, a bit similar to a small offpoint (shift at every LAR).

3. SWAP instrument status

MCPM errors
The number of MCPM recoverable errors increased from 201 to 202 at 2010-09-29T10:22:58.000Z..
The number of MCPM unrecoverable errors is still 0.

IOS & operations
During this week SWAP operations were done in a slightly different way:
 - The different campaigns were set as part of a main table via the 'table configuration' command.
 - Every time that SWAP commanding needed to be changed, a 'table acquisition' was commanded to point to the right part of the table.
 - No IDLE commands were used to begin a new campaign.

Example:
  SWAP
  00182
  2010.09.28T12:46:23.000
 2010.09.29T05:06:00.000

```
# generated on 2010-09-28T12:46:23Z by ios.xsl version 1.1
2010.09.29T05:57:00.000 table_configuration 7
0 10 0 0 1023 1023 1 120 0.0 0.0 off 253    # nominal
1 10 0 0 1023 1023 1 120 0.0 0.0 off 254    # nominal
2 10 0 0 1023 1023 1 120 0.0 0.0 off 255    # nominal
3 10 0 0 1023 1023 1 60 0.0 0.0 off 101      # during SDO eclipse
4 10 0 0 1023 1023 1 60 0.0 0.0 off 102      # during SDO eclipse
5 10 0 0 1023 1023 1 60 0.0 0.0 off 103      # during SDO eclipse
6 10 0 0 1023 1023 1 1740 0.0 0.0 off 255  # Support ESP test
##  29 September 05:59  - 07:09  SDO Earth Eclipse
2010.09.29T05:57:30.000 table_acquisition 3 3
2010.09.29T07:09:00.000 table_acquisition 0 3
##  30 September 05:59  - 07:07  SDO Earth Eclipse  + 20:00 - 20:30 AIA calibration
2010.09.30T05:57:30.000 table_acquisition 3 3
2010.09.30T07:07:00.000 table_acquisition 0 3
## ESP jump
2010.09.30T10:06:00.000 table_acquisition 6 1
2010.09.30T10:35:00.000 table_acquisition 0 3
2010.09.30T19:58:30.000 table_acquisition 3 3
2010.09.30T20:30:00.000 table_acquisition 0 3
```

SWAP detector and IIU temperature

The SWAP IIU temperature was nominal:
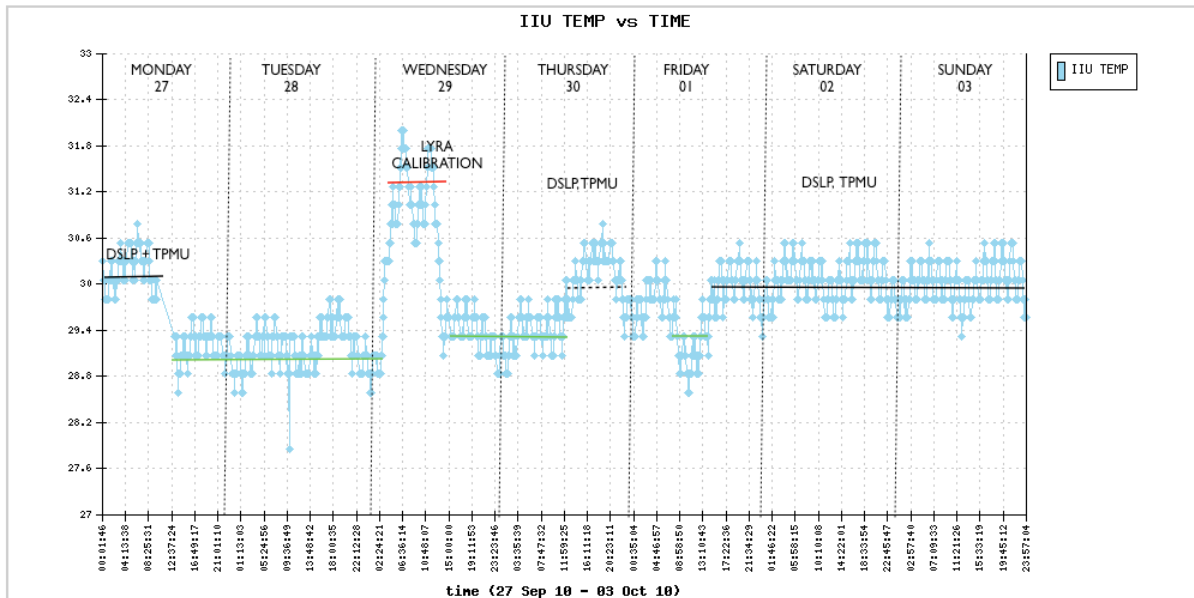
Note: Normally DSLP is switched on on Thursday. TMPU is switched on on Friday, operating at the same time with DSLP until Monday. Usually the IIU temperature raises a bit more when TPMU is activated. This is not the case during this week, maybe due to a different DSLP&TPMU campaign than the nominal one (not clear from the calendar).

No obvious further rise was seen in the SWAP detector temperature. It kept stable during the reported period at a very high level of

SW HK T CF vs TIME
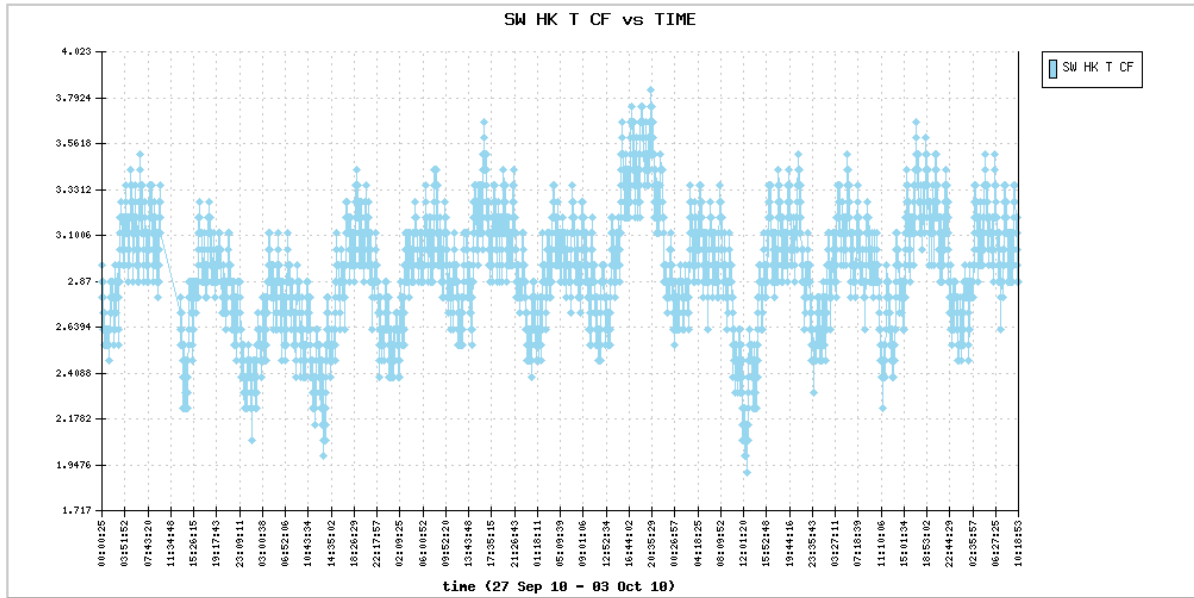
3.5C.

To be explored
none

4. PROBA2 Science Center Status

Carlos Cabanas was operator during this week.

The LYRA pipeline did not undergo modifications.

The SWAP pipeline was upgraded:

- **SWEDG**
  - Performance was improved. Database queries were optimized.
  - CLOG (software tool making a catalog database of the processed images) was inserted into SWEDG.
  - 4 new keywords were added:
    - delta time to next predicted LAR and from last predicted LAR
    - number of trapped particles (protons and electrons)
- **SWBSDG**
  - Modifications for processing the 4 new keywords were done.
  - Images taken during LAR are not processed to level1. They are moved to special directories (swap_cal_files = temp/SWAP/calib_files/ , swap_lar_files= temp/SWAP/lar_files/)

- **CLOG**
  - Triggered by SWBSDG

- **SWAVINT (SWap AVerage INT)**
  - Triggered by CLOG. This tool will produce timelines of the SWAP average intensity over a day, a bit similar to the LYRA curves.

5. Data reception & discussions with MOC

- There were some problems with the correlated time couples at MOC. As a consequence, SOC pipeline experienced some inconsistencies between what had been commanded and the related received housekeeping.

- Nominal HK during the reported period.

- Problematic passes for LYRA and SWAP can be seen below:

Date	Pass	Info
2010-09-27	2499	**LYRA** ● size of packet BINLYRA20100927163358000188764RAW000015608320100 927183914 is 1741, but the expected value given in the header is 1094 ● size of packet BINLYRA20100927163808000188765RAW000016109320100 927183914 is 1725, but the expected value given in the header is 1609 ● size of packet BINLYRA20100927164220000188765RAW000016610320100 927183914 is 1707, but the expected value given in the header is 1010 **SWAP** ● swap_reformat has encountered errors while reformatting BINSWAP201009271711200000159295PROCESSED
2010-09-28	2509	**SWAP** ● BINSWAP201009281310080000160050PROCESSED - Packet CRC does not validate
2010-09-30	2528	**SWAP** ● BINSWAP201009301934560000161623PROCESSED - Packet CRC does not validate ● BINSWAP201009302006560000161639PROCESSED - Packet CRC does not validate **LYRA** ● Packet processing fails, also reprocessing failed. The packet is probably corrupted, investigation is ongoing.

Total number of SWAP images between 2010 Sep 27 0UT and 2010 Oct 04 0UT: 5021
Highest cadence in this period: 30 seconds
Average cadence in this period: 120.44 seconds
Number of image gaps larger than 300 seconds: 34
Largest data gap: 33.00 minutes (due to ESP test - the other datagaps are all 360s and mainly due to images overwritten onboard)

6. APPENDIX Frequently used acronyms

ADP	Ancillary Data Processor
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
DR	Destructive Readout
DSLP	Dual Segmented Langmuir Probe
EIT	Extreme ultraviolet Imaging Telescope
FITS	Flexible Image Transport System
FOV	Field Of View FPA Focal Plane Assembly
FPGA	Field Programmable Gate Arrays
GPS	Global Positioning System
HAS	High Accuracy Star tracker
HK	Housekeeping
ICD	Interface Control Document
IIU	Instrument Interface Unit
IOS	Instrument Operations Sheet
LED	Light Emitting Diode
LEO	Low Earth Orbit
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
OBET	On board Elapsed Time
OBSW	On board Software
PE	Proximity Electronics
PGA	Programmable Gain Amplifier

PI	Principal Investigator
P2SC	PROBA2 Science Center
PPT	Pointing, Positioning and Time (software module of P2SC)
ROB	Royal Observatory of Belgium
SAA	South Atlantic Anomaly
SCOS	Spacecraft Operation System
SEU	Single Event Upset
SOHO	Solar and Heliospheric Observatory
SWAP	Sun Watcher using APS detector and image Processing
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
TBW	To Be Written
TC	Telecommand
TPMU	Thermal Plasma Measurement Unit
UTC	Coordinated Universal Time
UV	Ultraviolet