
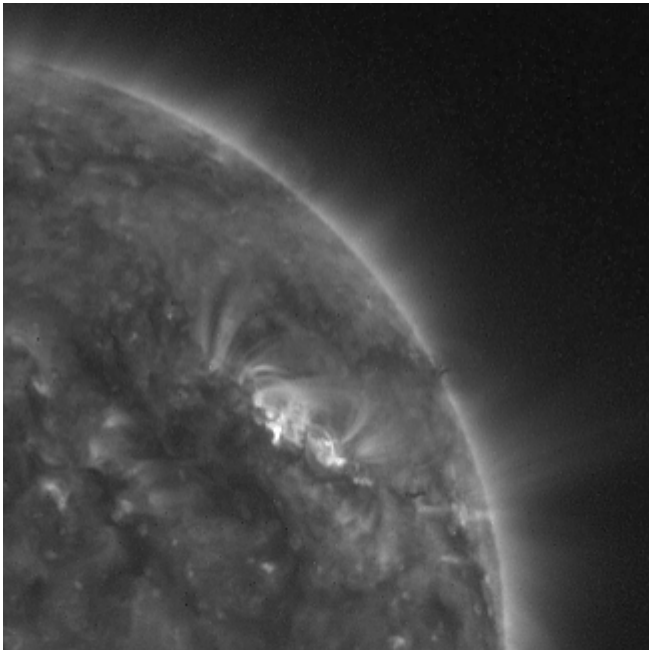


P2SC-ROB- WR-015-20100621 Weekly Report # 015	P2SC Weekly report	
Period Covered: Date: Written By: Released By:	Mon June 21 to Sun Jun 27 2010 Wed Jun 30 2010 Anik De Groof Anik De Groof	Royal Observatory of Belgium PROBA2 Science Center
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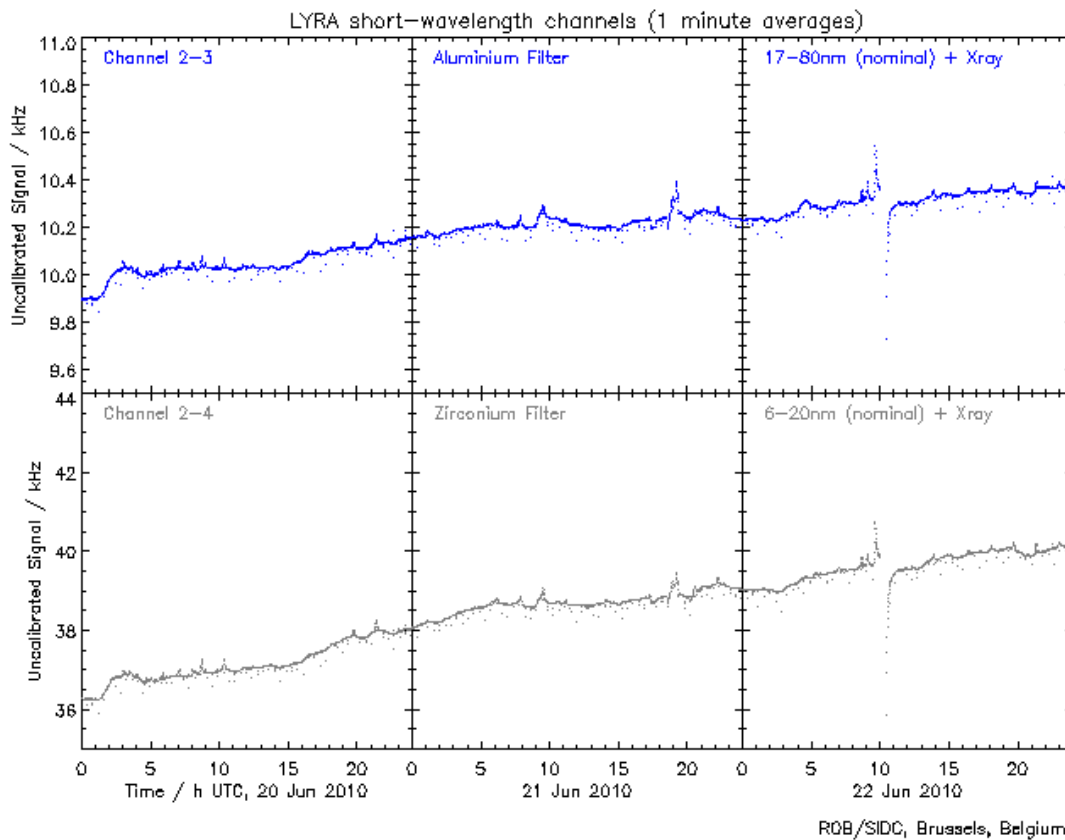
1. Science

Space weather events

June 23 afternoon: interesting activity in AR 11082: at least 2 B-flares are nicely covered by the SWAP data. LYRA was in calibration mode up to 16:30. There seems to be a small eruption around 16:10 and brightening around 17UT which is not listed in the solar soft events but seen by SWAP:



From June 20 to June 24, the LYRA signal in channels 3 and 4 was clearly increasing. GOES did not show the same trend so we investigated this behaviour in order to rule out an instrumental defect.



The SWAP average intensity (average intensity over the whole detector) confirmed a rising trend in the EUV (17-18nm) channel, and so did TIMED-SEE. We concluded this effect is of solar origin and exclusive for EUV channels. Solar X-ray channels as GOES cannot observe this rise.

June 25: LYRA flare around 10:20UT & small events after 22UT (all B-class)

June 27:

Interesting event around 3UT:

- SWAP shows start of an eruption in an AR on South East limb. The plasma falls back on the sun.
- LYRA shows at the same time an interesting signal in Zr channel:

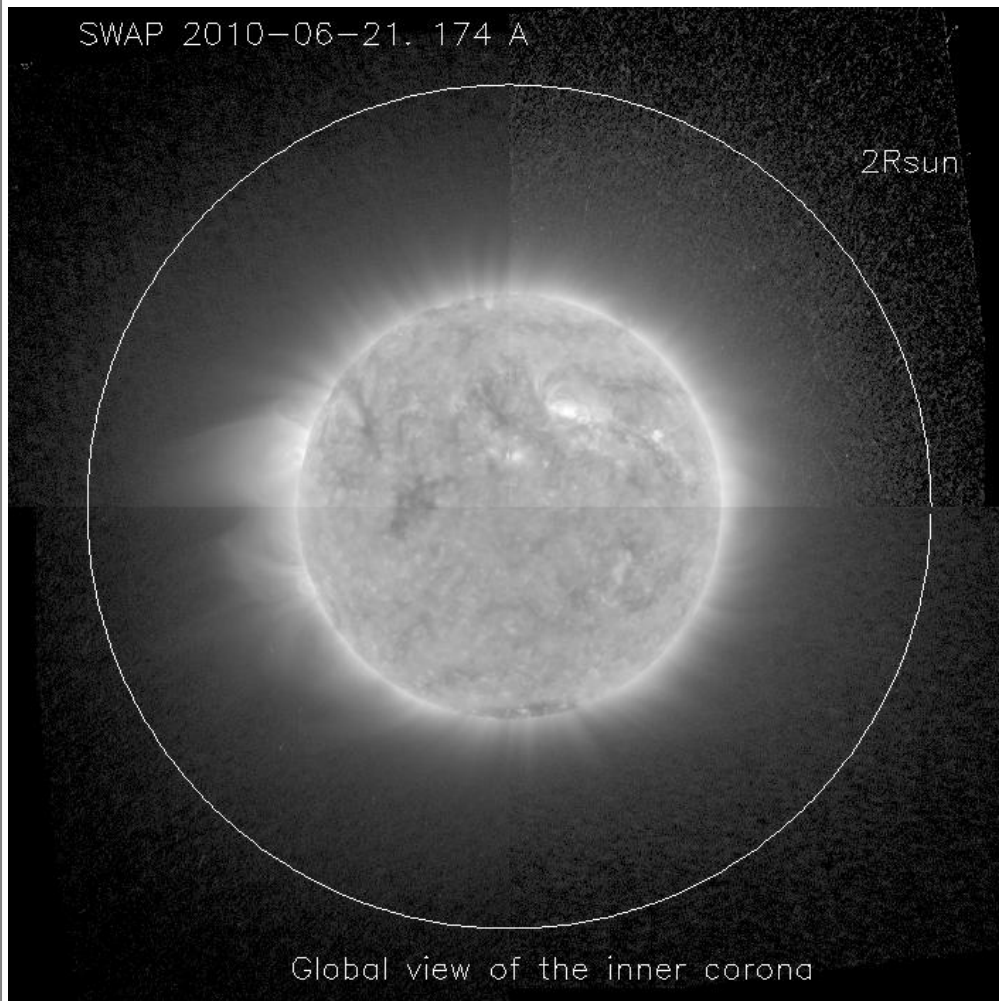
Scientific campaigns

On Monday June 21, a scientific campaign took place.

Vladimir Slemzin and Louise Harra were visiting ROB and in collaboration with them a first off-pointing campaign was commanded which aimed at a reconstruction of the complete inner corona off-limb in a FOV of 74 arcmins = 1,25 degrees (via PROBA2 off-point of 10 arcmin).

We did not get all data down (see SWAP Operations below) and the SAA was also spoiling some of the images but we already got a first reconstruction of the inner

corona, with thanks to Vladimir Slemzin:



Outreach, papers, presentations, etc.

On Tuesday, there was a PROBA2 workshop organized by the D/TEC department of ESA, at the Space Expo in Noordwijk (NL).

Presentations were given on the platform status, the scientific payload and technology demonstrators. The P2SC team gave 3 presentations: one on SWAP, one on LYRA and one on the Science Centre. They can be downloaded from: http://proba2.sidc.be/Presentations/20100622_PROBA2workshop_ESTEC/

2. LYRA instrument status

Calibration

IOS & operations

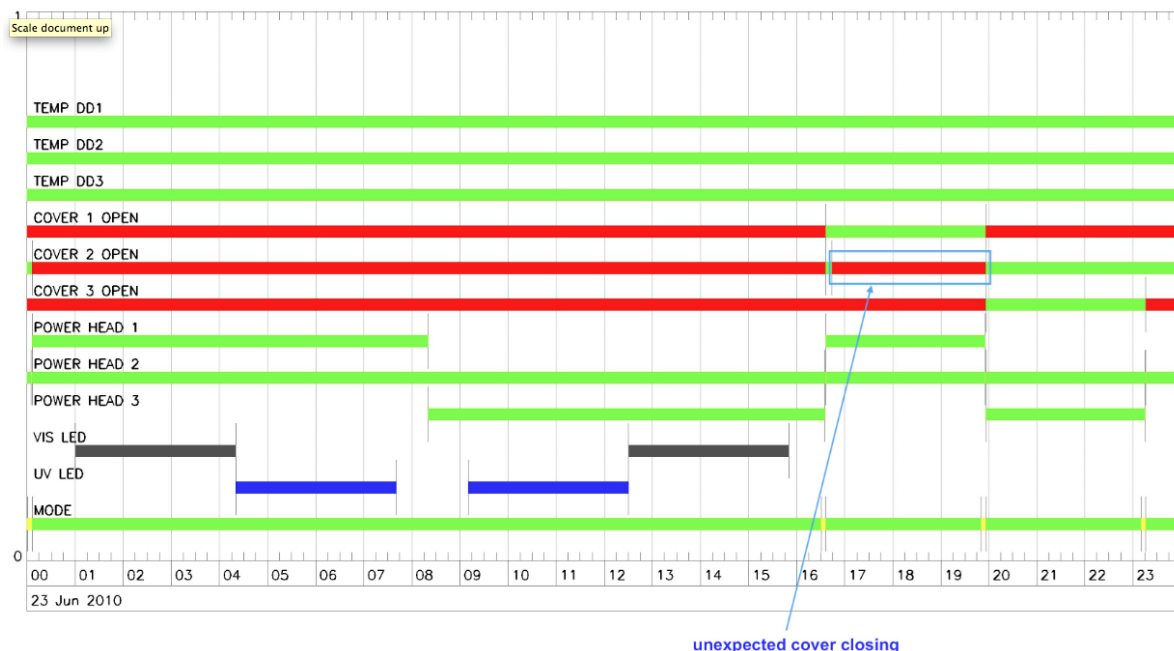
This week several campaigns took place:

1) On Wednesday June 23 2010, the weekly calibration campaign (LREP_02_Calibration) was executed. It was followed by a backup acquisition campaign (LREP_03_BackupAcquisition).

2) On Thursday June 24 2010, a paving campaign (LREP_05_Paving) was commanded via SWAP IOS. This is to be compared to the previous one on April 22, 2010.

LYRA anomalies

On June 23 2010, during campaign LREP_03_BackupAcquisition, the cover of unit 2 was closed unexpectedly (uncommanded).



The first analysis revealed that:

- the cover closed while the instrument was performing a VFC calibration. This is a similar situation as during the previous LYRA anomalies (Jan 22 & May 20 2010).
- the cover switched back to the commanded position at the time of the next warmup command (which also specified the status of both covers)
- in between unexpected cover closing and the cover opening, an acquisition command was given, which triggered another VFC calibration. This did not set the situation straight, in contrast to the anomaly on May 20.

However, it must be noted that on May 20, the anomalous switch happened in acquisition parameters, while now the cover status was affected.

More investigation is ongoing.

To be explored:

From time to time, the Data Consistency and Validation Checker (DCVC) reports a

warning that the value of the HK parameter "LY HK22 FS" goes out of limit, i.e. it goes beyond the allowed interval 60621+-15 (see e.g June 23 00:20UT). This week, we noticed that this typically happens during long periods of VFC calibration -> TBC.

3. SWAP instrument status

MCPM recoverable errors

increased from 185 to 186 on 2010-06-25T22:21.

The number of MCPM unrecoverable errors is still 0.

IOS & operations

This week several campaigns took place:

1) On Monday June 21, an off-pointing campaign was commanded which aimed at a reconstruction of the complete inner corona off-limb in a FOV of 74 arcmins = 1,25 degrees. SWAP was off-pointed 10 arcmin to all 4 corners and took ~90 images in each corner. High cadence imaging was used (30s) to limit the time period and as such fluctuations in temperature and solar activity.

Result:

All images were successfully taken onboard but some got lost by overwriting onboard. In the last part of the campaign, the SAA was crossed and this might hamper the data analysis.

To be explored:

Investigation is ongoing why the highest priority images were overwritten while images with lower priority and taken before the campaign were still downloaded the next day. It seems that the algorithm for image overwriting onboard did not work as expected (TBC).

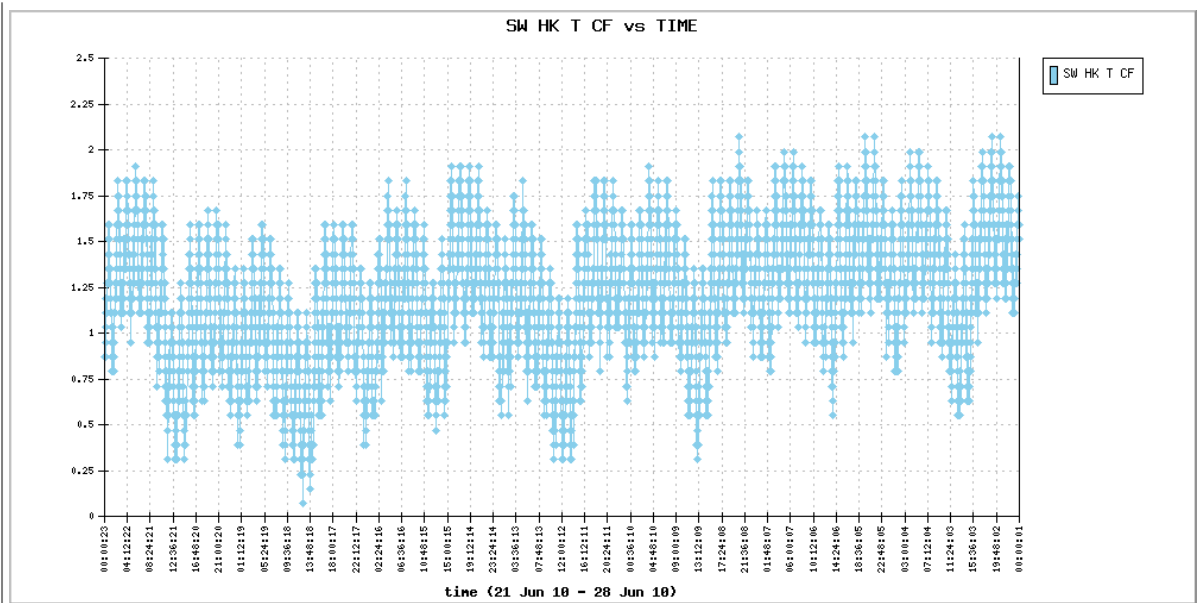
2) Tuesday 22 June 2010: 2-weekly calibration campaign: LEDs, darks and unprocessed images taken in 45 mins (30 mins of off-pointing).

3) Thursday 24 June 2010: 2 hours of paving campaign to support the LYRA LREP_05_Paving Sequence.

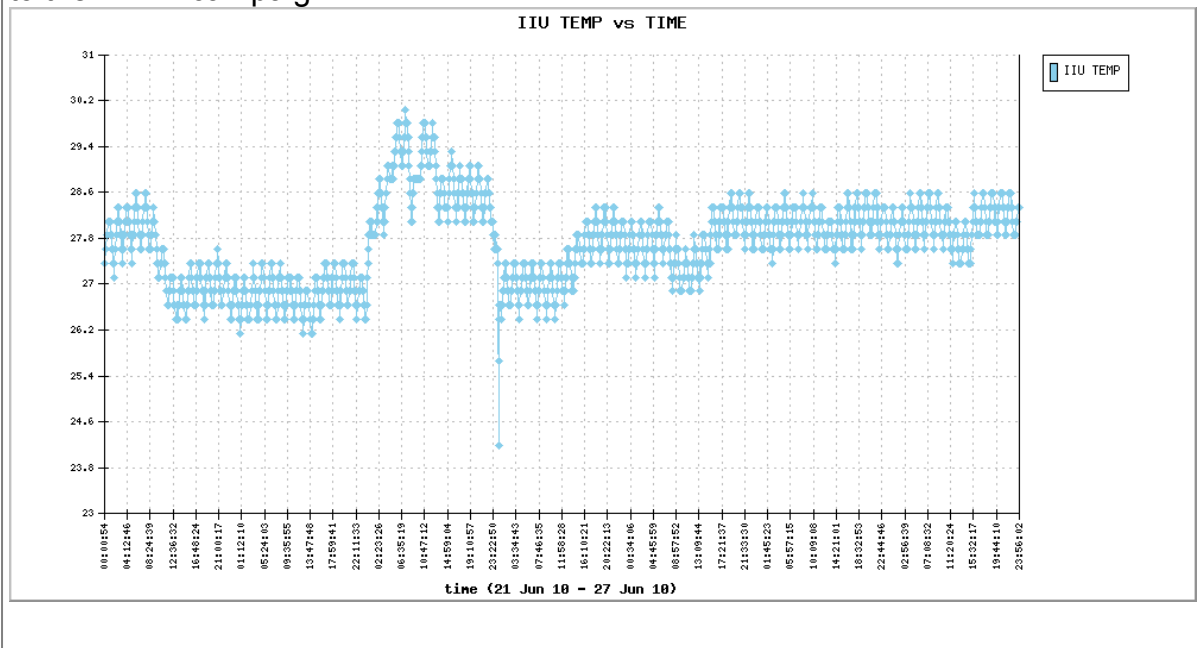
To keep the continuous Sun watch, SWAP took a few sun-centered images around each LAR.

SWAP detector and IIU temperature

The SWAP detector temperature fluctuated around 1 degree this week. The temperature increased towards the end of the week, probably due to TPMU & DSLP acquisitions but it is remarkable that the T rise was less pronounced than the previous weeks.



In the IIU temperature, the influence is a bit higher. The rise on Wednesday is due to the LYRA campaign.



4. PROBA2 Science Center Status

Anik De Groof was operator during this week.

The LYRA EDG was operated manually. SWAP daily movies were also created manually.

The reprocessing of all SWAP data since the beginning of the mission was finished on a separate server. On June 24, 2010, all data were moved to the operational server. This happened in the following way:

- stop crontab to temporarily block the processing of incoming files from MOC

- move the old SWAP data files and databases to other directories (old data partition)
- move the following files & databases to the operational server:
 - complete SWAP data partition
 - SWAP RAW fits files (this step had to be restarted on June 25)
 - TMR database
- copy movies from old to new public data partition
- copy quicklook barplots from old to new data partition
- restart crontab

The reprocessing revealed the following statistics for SWAP data up to pass1632 (June 24):

total # input files AD: 1765

total # input files BINSWAP: 1443

Number of Level-0 FITS files: 93227

Number of Level-1 FITS files: 88279 (94,7%)

Number of files with insufficient temperature data: 3791 (4,1%)

Number of files determined to be calibration files (dark or far off-pointed): 1157 (1,2%)

The following tools were updated on the operational server:

Software name	Update	Date	Comment
DCVC	3376	24 June 2010	Inconsistencies between commanding and HK values are shown as errors.
SWBSDG	3377	25 June 2010	Update to the version which was used on the reprocessing server & adjust comments of SW[X/Y]CEN

5. Data reception & discussions with MOC

Passes No passes were missed.
Data coverage HK Perfect, no missing HK data.
Data coverage SWAP Few corrupt or truncated images:

- pass 1610: 1 image corrupted
 BINSWAP201006212303220000094438PROCESSED
 - pass 1624: 1 truncated JPEG image
 - pass 1655: 1 truncated JPEG image
 - pass 1657: 1 image corrupted
 BINSWAP201006262249530000098454PROCESSED
 - pass 1667: 1 truncated JPEG image BINSWAP201006272323540000099264

Overall, good coverage of SWAP data, except one big gap during the off-pointing campaign due to images overwritten onboard:

Total number of images between 2010062100 and 2010062800: 5589
Highest cadence in this period: 29 seconds
Average cadence in this period: 108.20 seconds
Number of image gaps larger than 300 seconds: 1
Largest data gap: 44.67 minutes

Data coverage LYRA

All fine.

The FITS files of 23 June are not consistent due to the LYRA unexpected cover closing (see anomaly above). Dark current ended up in the scientific STD FITS file instead of in the CAL FITS file as the LYEDG takes the commanding database as input for the instrument status.

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
DSLPL	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