P2SC-ROB-WR-032-20101018 Weekly report #032	**P2SC Weekly report**	
Period covered: Date: Written by: Released by:	Mon Oct 18 to Sun Oct 24 2010 Mon Oct 25 2010 Anik De Groof David Berghmans	Royal Observatory of Belgium PROBA2 Science Center
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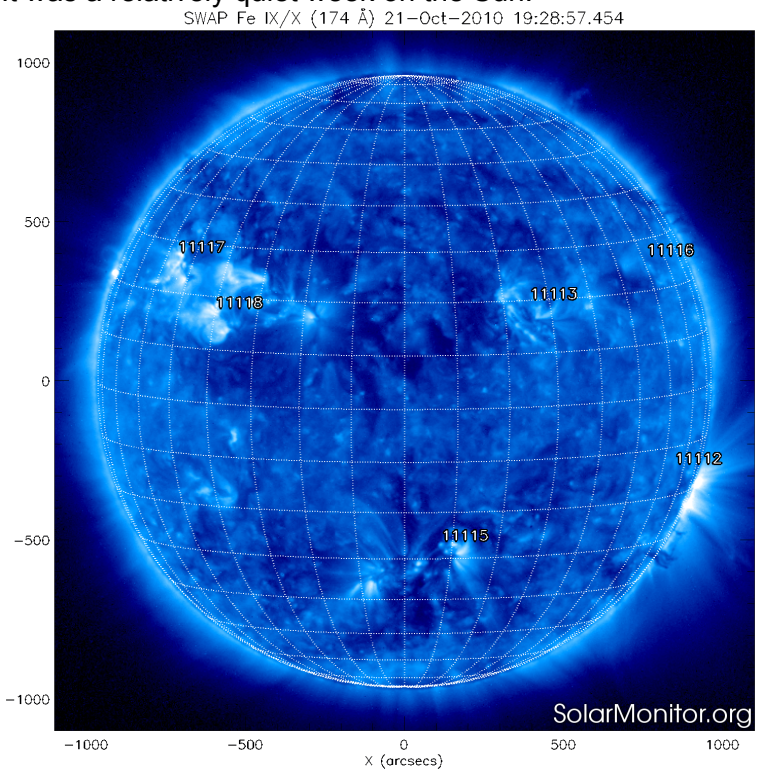
1. Science

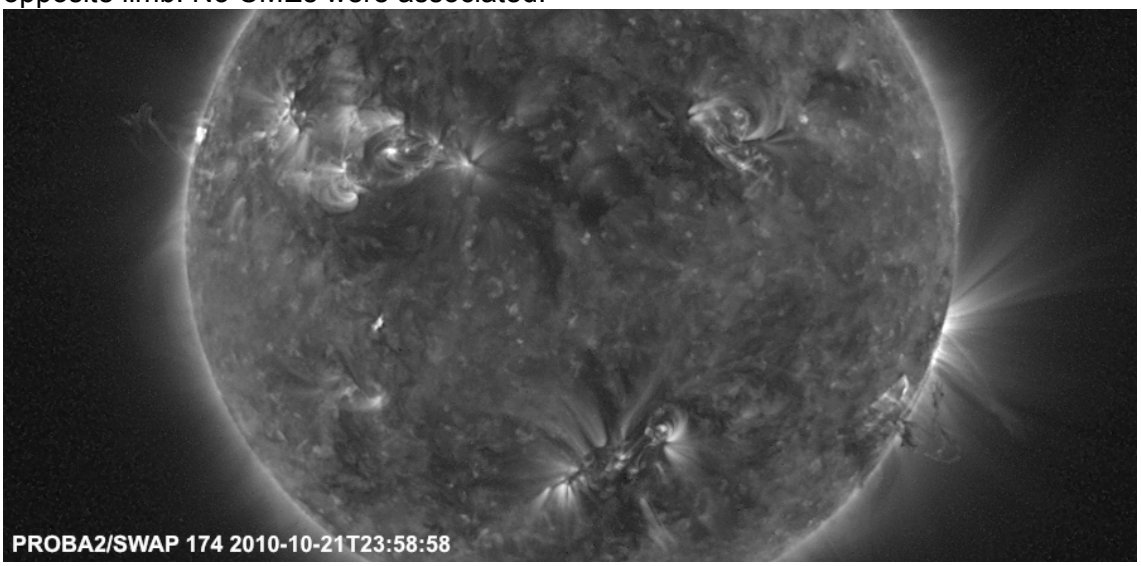
Solar & Space weather events

It was a relatively quiet week on the Sun.

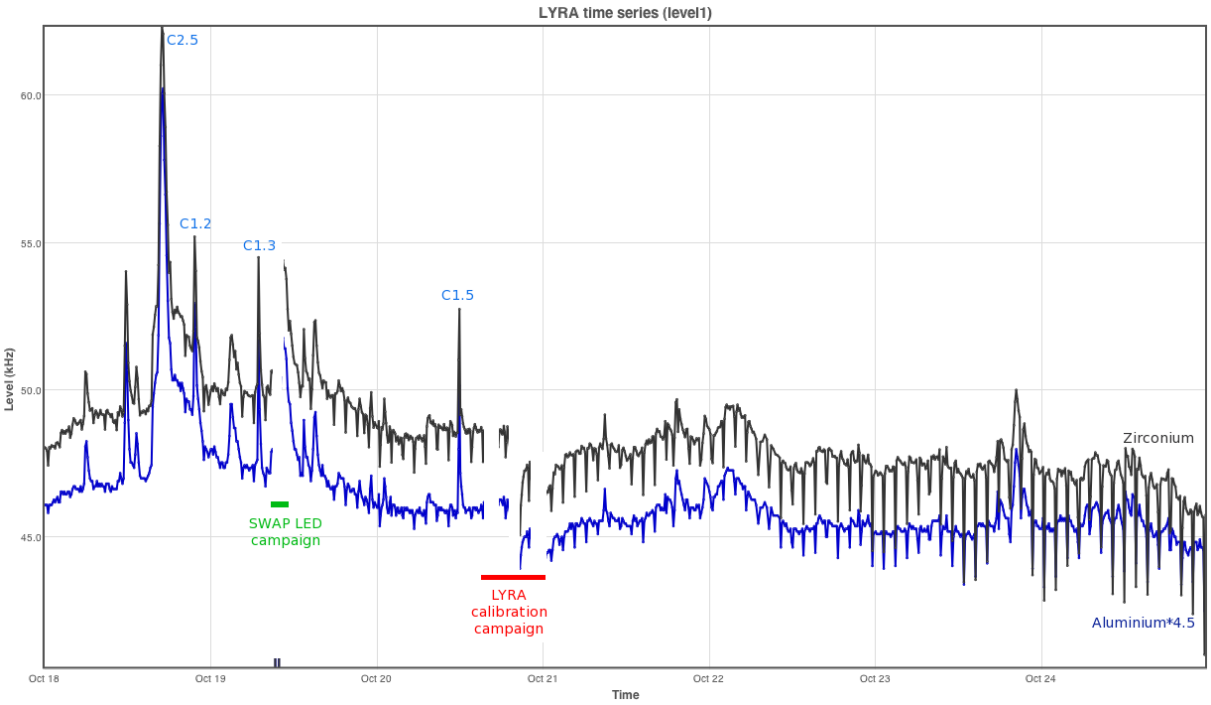


Most solar activity took place in Active Region 11112, during the first half of this week. Plenty of B-flares and five C1 and C2 flares were produced spread over Monday, Tuesday and Wednesday Oct 18-20. The long filament stretched over the active region got activated

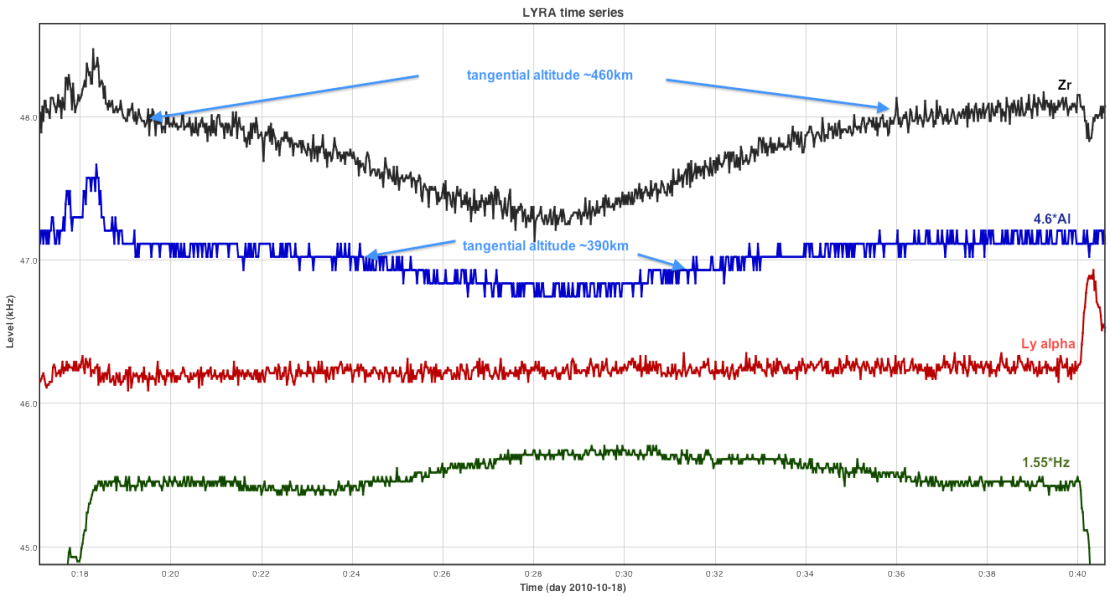
on Wednesday and partially erupted off-limb (most plasma fell back to the solar surface) on Thursday Oct 21 around midnight. At the same time a small eruption took place on the opposite limb. No CMEs were associated.



At the time AR 11112 disappeared behind the Western limb, ARs 11117 and 11118 took over but only produced some micro-activity and associated B-flares.
LYRA overview of the week:



As clear from the growing dips in the Al and Zr signals, those wavelengths sense the first ~~occultations by the Earth's atmosphere. No drop in signal is seen in Hz and Ly alpha yet.~~



Scientific campaigns

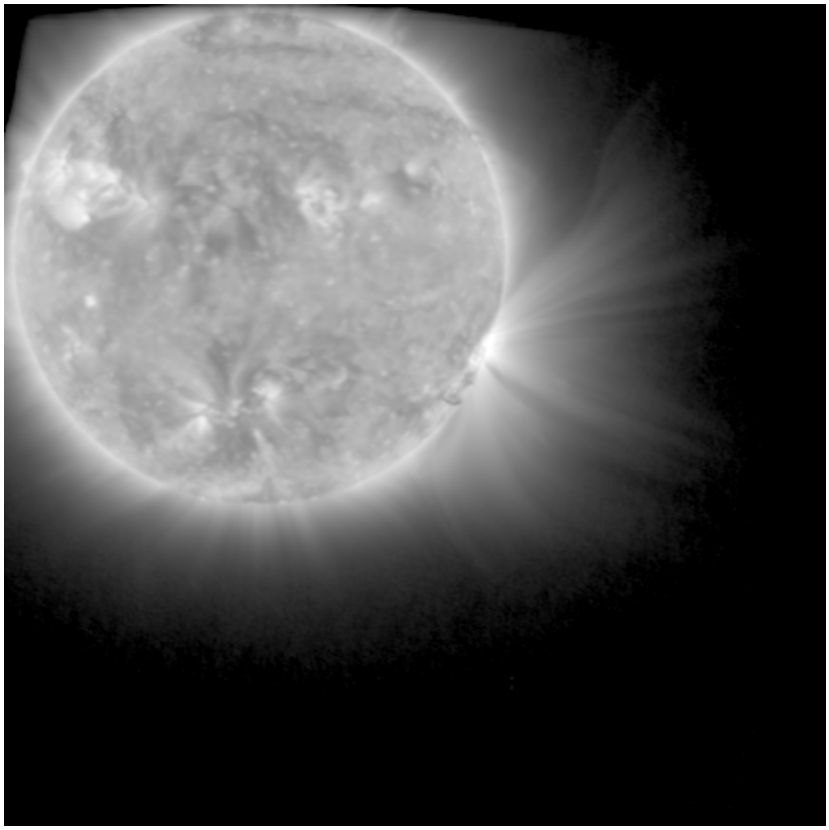
On Wednesday 20 and Thursday 21 Oct, scientific SWAP campaigns took place which were requested by Vladimir Slemzin and co-workers, Guest Investigator for SWAP (will visit us in Nov 2010).

AR 11112 was observed in high cadence off-limb by pointing 10 arcmins to the South West. This AR was observed earlier in a Hinode Observation campaign to search for oscillations in the ray-like structures originating from the AR. Now that it is on the limb, SWAP offpointed data are used to track any oscillations and study the source of the solar wind in the ray-like structures off-limb.

Oct 20 1UT- IOS00190: 309 images were acquired at 30s cadence with 10s integration time, skipping LARs. 307 were successfully downloaded and processed.

Oct 21 00:35UT - IOS00191: 267 images were acquired at 30s cadence with 10s integration time, skipping LARs. 264 were successfully downloaded and processed.

~~This was the result for Oct 21:~~



For SWAP, we can conclude that during quiet days on the Sun (and even with a hot detector as these days), we observe solar signal to beyond the nominal SWAP FOV. When the Sun gets more active, and in particular during bright eruptions, we expect to see coronal structures much further out in the what-we-call “SWAP exclusivity zone”, the zone were no other EUV instrument can observe.

Outreach, papers, presentations, etc.

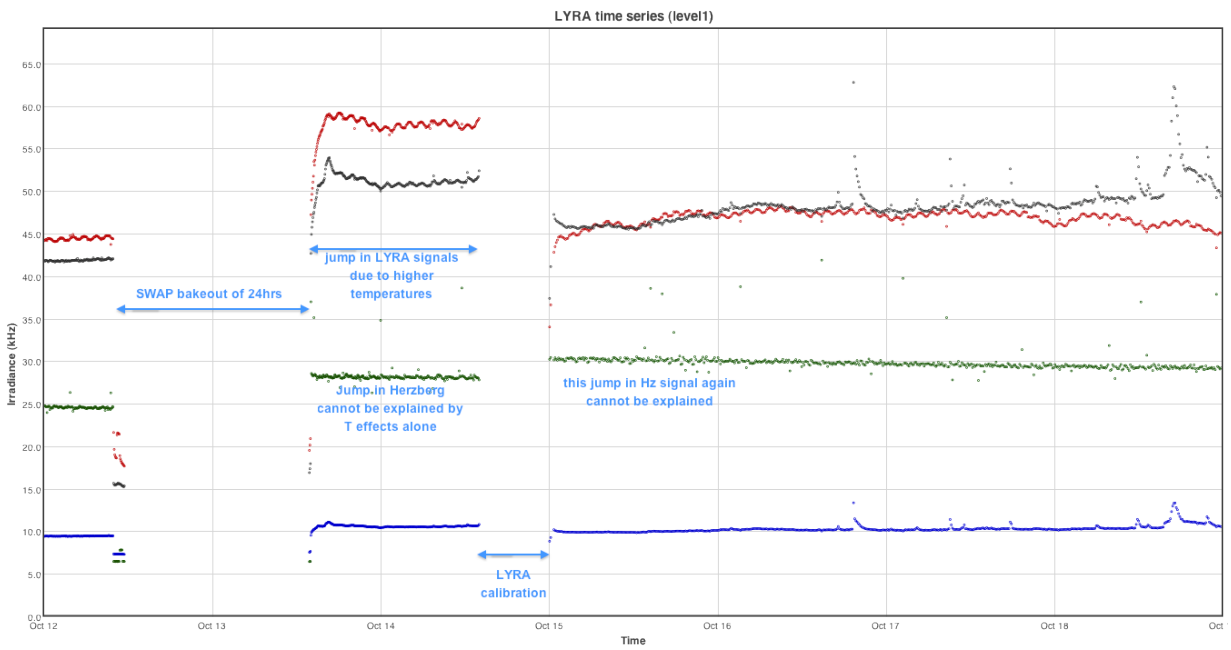
- Anik De Groof gave a presentation at the “Volkssterrenwacht Urania” on October 19 entitled “PROBA2: ontwikkeling, lancering en wetenschappelijke exploitatie”
- Christophe Marque and David Berghmans welcomed a group of radio amateurs at the Royal Observatory. David gave an introductory presentation on PROBA2, SWAP and LYRA.
- Dr. Yulia Shugay and Dr. Kariyappa are still visiting us as Guest Investigators for SWAP and LYRA respectively.

To be explored

2. LYRA instrument status

Calibration

There was no usual LYRA calibration scheduled this week but we did perform a special calibration campaign on Wed Oct 20 to check the effect on the Herzberg signal.
After the nominal calibration campaigns, the Hz channel often shows a jump in signal, like was the case last week on Oct 14.

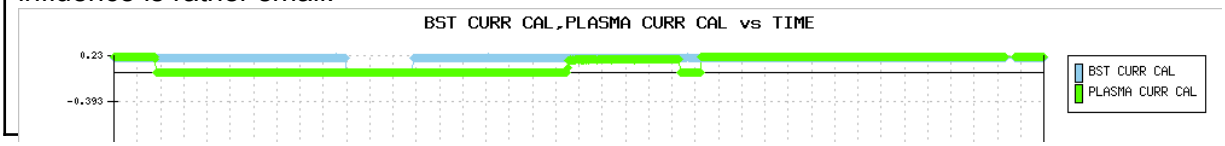


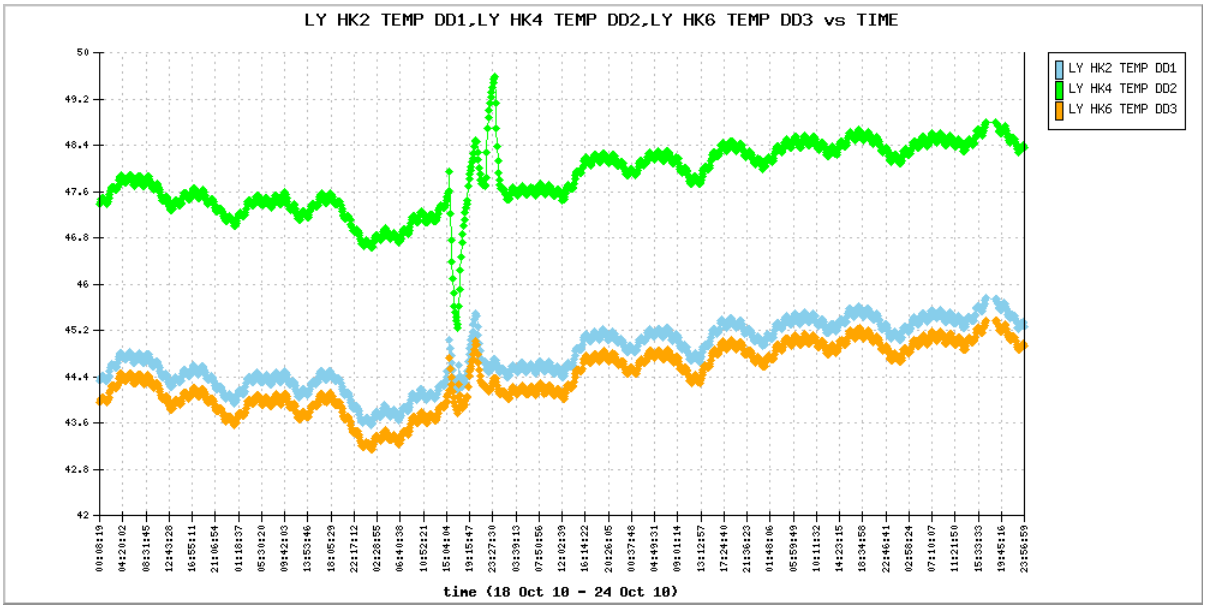
The reason for those jumps is not yet understood. ASIC reloads often help to get the signal back to normal but not always. 3 ASIC reloads performed on Oct 18 did not have any influence, neither the following sequence:
The campaign which was tested on Oct 20 consisted of 5 parts, each lasting for 1 orbit, taken with unit 2 at 50ms:

- dark current acquisition
- normal acquisition
- VIS LED with covers open
- normal acquisition
- UV LED with covers open

IOS & operations
LYIOS00093: schedule special calibration campaign mentioned above

LYRA detector temperature
LYRA detector temperature of the acquiring unit 2 were above 46degrees the whole week. On Oct 19-20, a test was performed to study the effect of BCST power consumption on LYRA and SWAP temperatures. The LYRA detector temperatures are indeed affected but the influence is rather small:





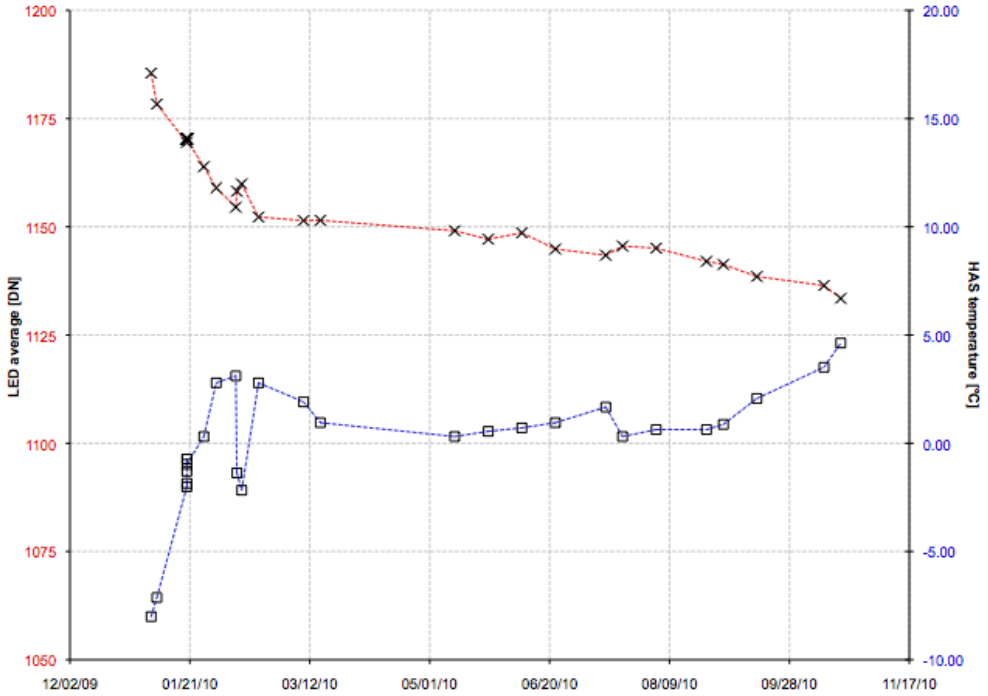
The large temperature variations on Wednesday are due to the LYRA LEDs switching on/off during calibration.

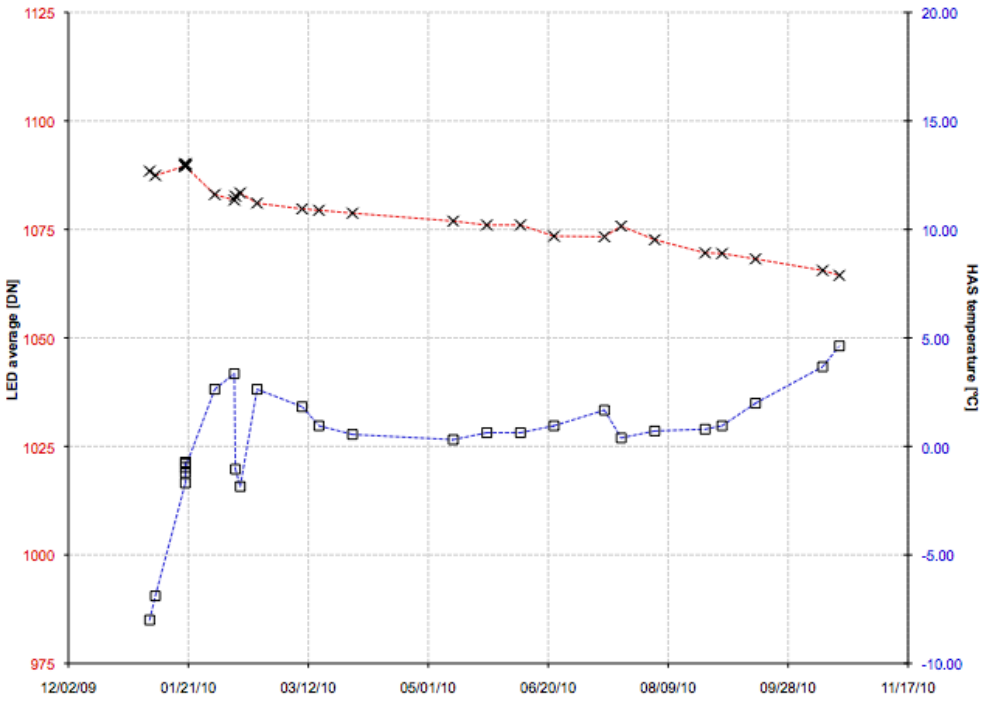
To be explored
More analysis is needed on the effect of LYRA calibrations on Hz.

3. SWAP instrument status

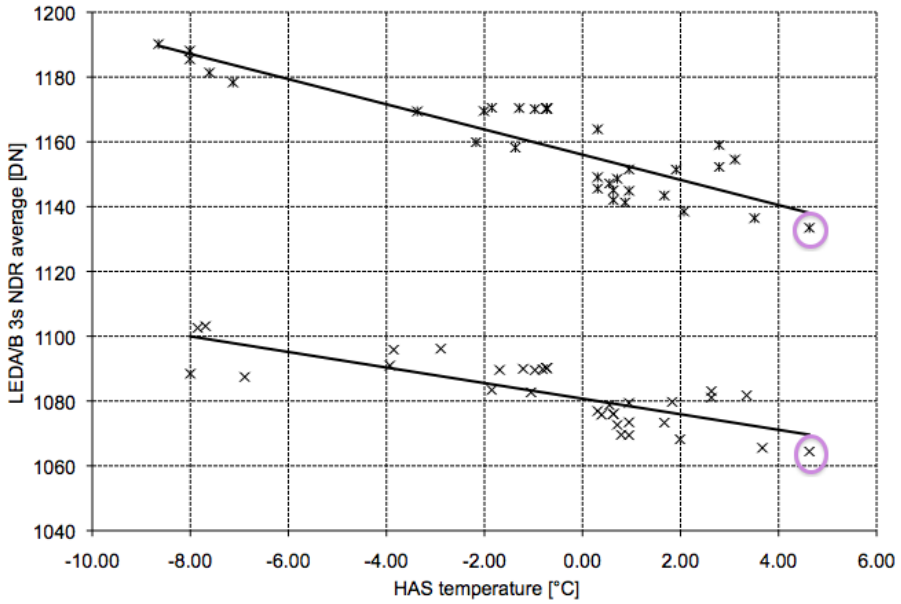
MCPM recoverable errors
did not increase and stayed fixed at 203 this week.
The number of MCPM unrecoverable errors is still 0.

Calibration
A SWAP LED and dark campaign was performed on Tuesday Oct 19. The updated LED averages over time are shown below for LED A (top figure) and LED B (bottom figure) - temperature evolution is shown in blue:





The change in LED averages can still be explained purely by the temperature evolution, as shown in the plot below where LED averages are plotted against temperature. The newly added datapoints are highlighted by the purple circles.



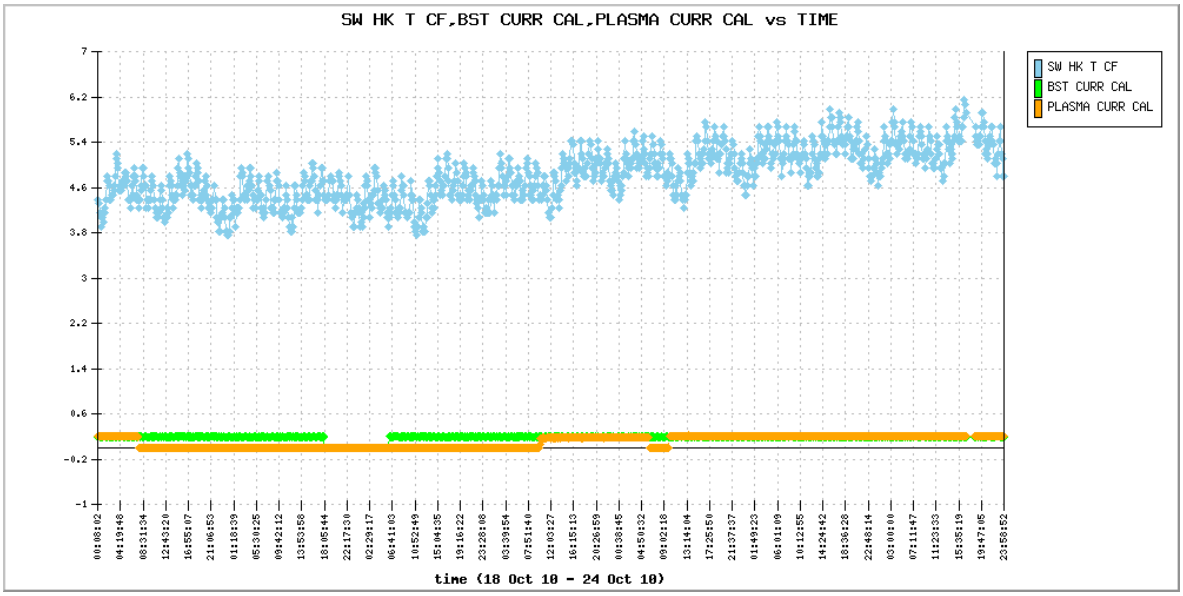
We do not have a clear evidence that the SWAP bakeout change anything in the overall SWAP response.

IOS & operations

- IOS00189 - Oct 18-19: SWAP cadence increased to 100s + SWAP LED campaign
- IOS00190 - Oct 20: first out of 2 offpointing campaigns for Guest Investigator Slemzin (see Science section above)
- IOS00191 - Oct 21: second out of 2 offpointing campaigns for Guest Investigator Slemzin (see Science section above)
- IOS00192 - Oct 22: SWAP support for ESP test

SWAP detector temperature

The SWAP Cold Finger Temperature fluctuated between ~4.2 and 5.3 degrees Celsius. Probably this is primarily due to a seasonal effect (Earth and PROBA2 closest to the Sun in winter time), combined with instruments switching on/off.
A test was done this week to find out the effect of BCST switching on/off. We can conclude it only has only a marginal effect on the temperatures (mainly seen in LYRA detector temperatures).



4. PROBA2 Science Center Status

Anik De Groof was operator during this week.

SWAP daily movies were created manually.

No tools were updated on the operational server this week.

5. Data reception & discussions with MOC

Passes
During the following passes, one or more SWAP images got truncated, was corrupted or lost:
Pass 2702 (1 truncated),
Pass 2706 (missing, truncated and corrupted images),
Pass 2711 (missing, truncated and corrupted images),
Pass 2731 (all SWAP data lost due to failure in BBE recording),
Pass 2743 (few missing and truncated images),
Pass 2752 (some SWAP images (at least 16) and all HK data lost due to interference of PROBA2 antennas above Redu)

Data coverage HK
HK data are complete except a gap from 17UT to 18:30UT on Sunday Oct 24 (data lost in pass 2752).

Data coverage SWAP
The overall data coverage was good this week. The largest data gap (32 mins) was planned for an ESP test. All 28 other data gaps are 6 minutes (i.e 1 out of 3 images missing) and primarily due to missed pass 2731.
The statistics for this week are affected by the 2 high-cadence campaigns performed on Oct 20 and 21 (~570 images at 30s cadence) and the ESP test:

Total number of images between 2010 Oct 18 0UT and 2010 Oct 25 0UT: 5085
Highest cadence in this period: 29 seconds

Average cadence in this period: 118.94 seconds
Number of image gaps larger than 300 seconds: 29
Largest data gap: 32.00 minutes

Data coverage LYRA
There were no gaps in the LYRA FITS files this week.

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