


P2SC-ROB-WR-020- 20100726 Weekly report #020	P2SC Weekly report	
Period covered: Date: Written by: Released by:	Mon July 26 to Sun August 01 2010 Wed Aug 04 2010 Marie Dominique Anik De Groof	Royal Observatory of Belgium PROBA2 Science Center
To:	LYRA PI, hochedez@sidc.be SWAP PI, david@sidc.be	http://proba2.sidc.be ++ 32 (0) 2 373 0 559
cc:	ROB DIR, ronald@oma.be ESA Redu, Etienne.Tilmans@esa.int ESA D/SRE, Joe.Zender@esa.int ESA D/TEC, Karsten.Strauch@esa.int	

1. Science

Space weather events

Solar activity progressively increased during last week.

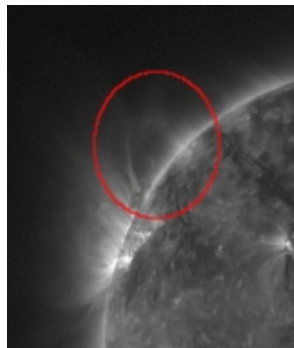
We observed two C flares with Lyra:

- on Jul 27, around 04:30
- on Aug 01, around 09:00

Another C flare was missed on Jul 28, because LYRA covers were closed.

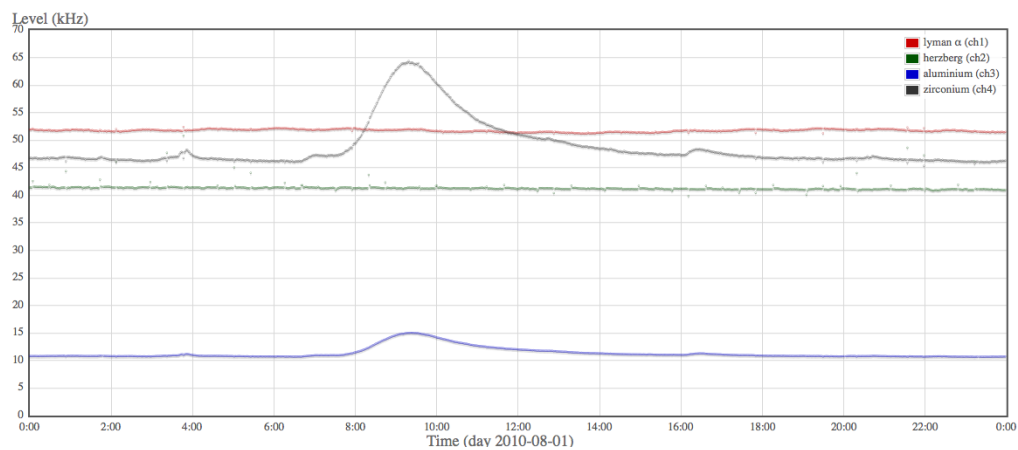
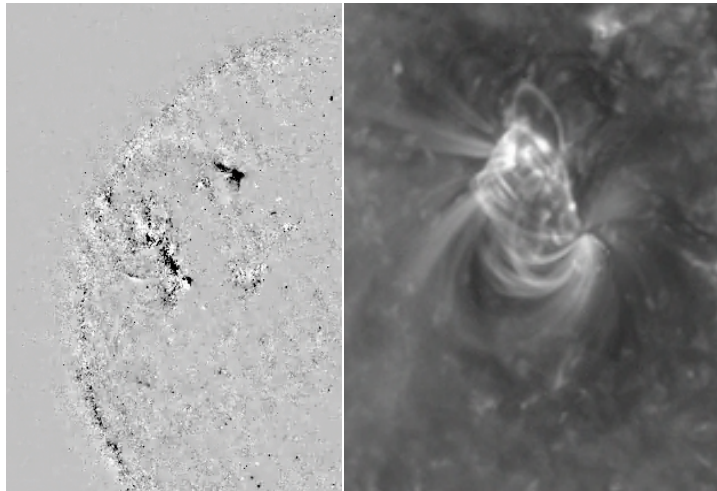
With SWAP, we also observed a few interesting events:

- on Jul 27: there was a small jet in the NE limb at 01:15 and small CME in the same NE limb active region at ~17:30.



- on Jul 29: a filament erupted on the NE limb between 01:00 and 02:30. The plasma could

- be followed upto the limb.
- on Jul 31 between 21 and 23UT, there was a small eruption seen from behind the East limb
- from Jul 30 to Aug 01, the active region in the NE quadrant (AR1092) produced a lot of interesting phenomena:
 - one and even possibly two EIT waves (on Jul 31)
 - large filament eruption with beautiful post-eruption arcades (nicely seen by SDO/AIA, not so clear in SWAP),
 - the C flare already mentioned for LYRA observations,
 - large and clear post flare loops, brightening up first at loop tops and then at loop footpoints
 - these solar evens later caused a geomagnetic storm on Earth which lasted from Aug 3 to 5



Scientific campaigns

No specific scientific campaigns were performed. Several calibration campaigns were executed (see below in specific instrument status).

To be explored

Events from Jul 30 to Aug 01 are worth to be further analyzed and compared to data from other instruments. The filament eruption on Jul 29 can be followed upto the limb.

2. LYRA instrument status

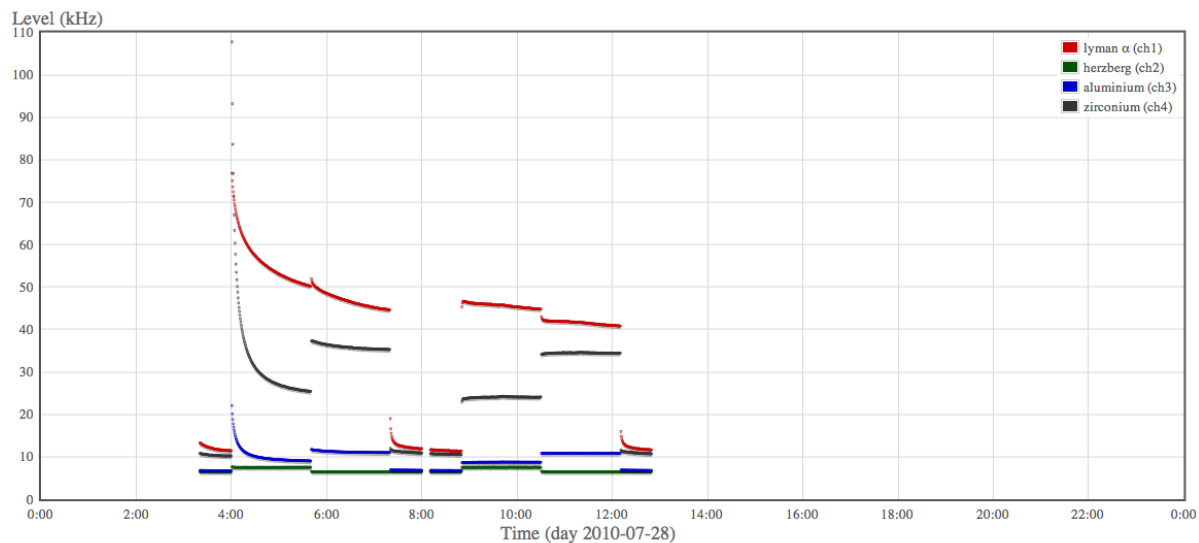
Calibration

A shortened calibration campaign took place on 28 July 2010 from 03:00 to 12:50 UTC.

Intentions: Usual calibration sequence (dark current and LED acquisition with all three units).

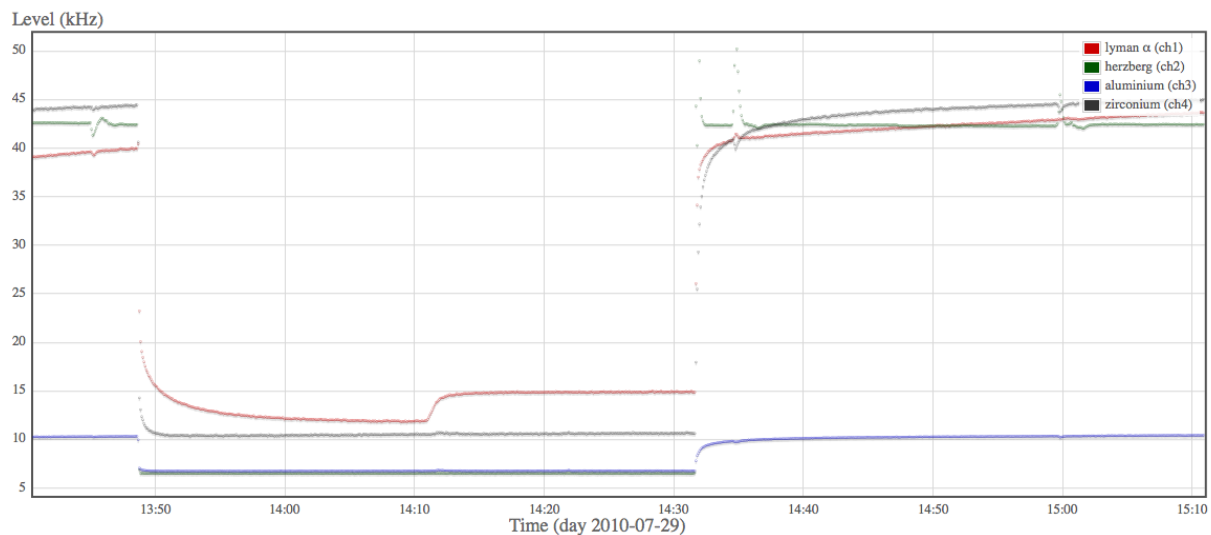
The only difference wrt the usual sequence is that it was shortened a bit (LED signal acquired for 1 orbit instead of 2).

IOS: LYRA_IOS00076



SWAP offpointing campaign on July 29

LYRA acquired stray light during the off-pointing (for SWAP LED campaign - see below). The LAR that occurred in the middle of the campaign had an impact on the signal in the Ly alpha channel. This is to be explored.



IOS & operations

IOS LY00076 commanded the calibration sequence from Jul 28 03:00 to 13:00. At the end of the sequence, while the instrument should have been back to nominal acquisition, cover 2 unexpectedly closed. IOS LY00077 was therefore sent to re-open it on Jul 29, 13:00.

LYRA anomalies

- As mentioned here above, LYRA cover 2 closed unexpectedly on Wednesday Jul 28, at 13:00 after the calibration campaign. It was re-opened after 24h, with IOS 00077.
- On Jul 28, LY HK22 FS went slightly out-of-range (60637 instead of 60621)

To be explored

Straylight measurements during the SWAP offpointing campaign of July 27 (see figure above).

3. SWAP instrument status

MCPM recoverable errors

The number of MCPM recoverable errors increased from 192 to 194 during the reporting period:

* MCPM NB RECOV ER changes at time 2010-07-27T08:21:37.000Z from 192 to 193

* MCPM NB RECOV ER changes at time 2010-07-30T00:21:41.000Z from 193 to 194

The number of MCPM unrecoverable errors is still 0.

IOS & operations

On Tuesday 27 July, an IOS (IOS00148) was sent to decrease the acquisition cadence from 100s to 120s to prevent (too many) images being overwritten onboard.

On Thursday 29 July, SWAP carried out a specific LED calibration campaign:

Period: 29 July 2010 from 13:48 to 14:32 UTC

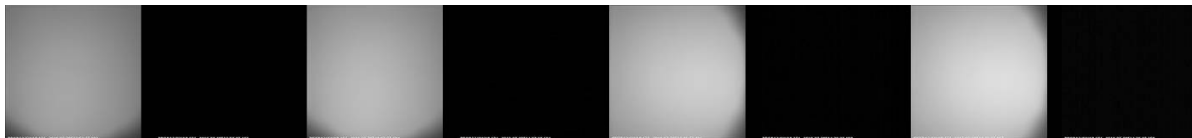
Intentions: It consisted in acquiring successfully 5 images of LEDA and 5 images of dark-current with an integration time of 3, 4, 5 and 6 sec, and an off-pointing of 3°.

IOS: SWAP_IOS00148

Asked by: J.-P. Halain - CSL

Results:

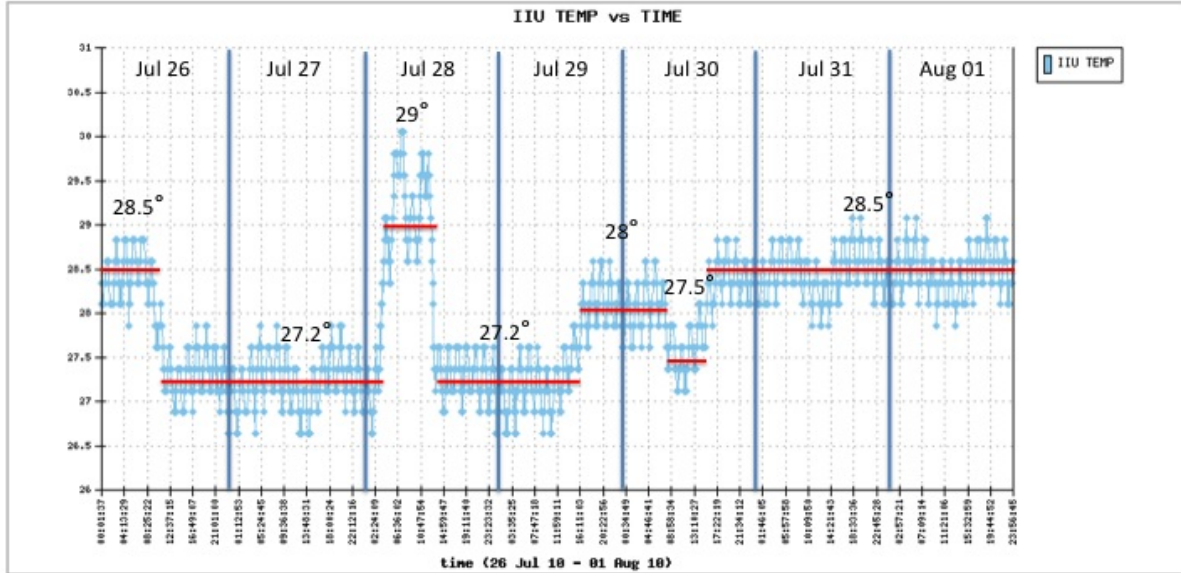
The analysis of the data is on-going. It might be requested that another sequence is acquired, at the beginning of next week.



SWAP detector and IIU temperature

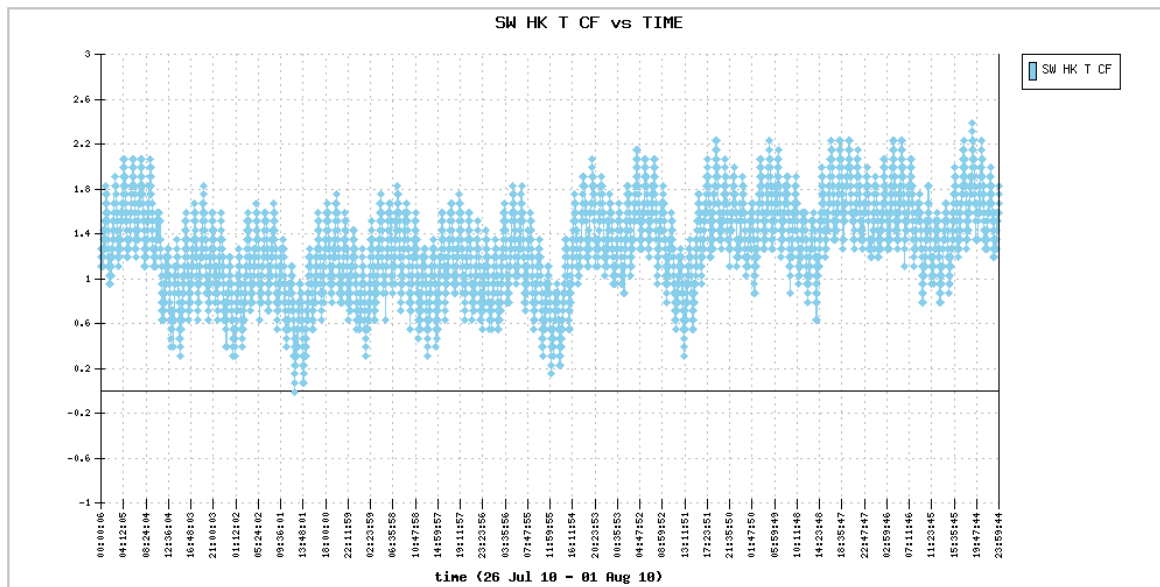
During the week, the IIU temperature went frequently $\sim 1^\circ$ above the normal value (see figure below). The hotter temperatures during the weekend can be associated to the DSLP and TPMU campaigns. The highest peak on July 28 is an effect of the LYRA calibration and the 28degrees on

Thursday was reached because of DSLP acquiring without TPMU.



A

contrario, SWAP temperature curves show little variations



4. PROBA2 Science Center Status

Marie Dominique was operator during this week.

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

No tool was updated on the operational server.

5. Data reception & discussions with MOC

Passes

- Passes 1901 (2010/07/24), 1916 (2010/07/26), were resent (initial packets were incomplete due to a BBE crash)
- Pass 1952 data were missing, creating a gap in the SWAP, LYRA and ancillary data between Jul 29 22:30 and Jul 30 01:57. There were re-extracted and resent, but the gap mostly remained for SWAP and LYRA (only LYRA data from the cycling store from Jul 30 01:48 were recovered).

Data coverage HK

- Data from pass 1952 were initially missing, but the gap was mostly filled after the archive was resent (but probably still contains some small gaps).

Data coverage SWAP

2010/07/26

- Pass 1901 (reprocessed):
 - The 73 SWAP images which were previously sent (on July 24) were duplicated + an extra 28 images provided.
- Pass 1916 (reprocessing):
 - The 49 SWAP images which were sent earlier that day were duplicated + an extra 4 images provided.
- Pass 1921 contained one corrupted packet

2010/07/27

- Pass 1924
 - one SWAP image number is missing
 - It contained corrupted packets
- Pass 1925 contained corrupted packets, among which one first packet => the processing of the whole image failed

2010/07/28

- Pass 1941: one SWAP image number is missing

2010/07/29

- Pass 1943 contains corrupted packets, among which one first packet => the processing of the whole image failed

- Pass 1952: all SWAP data are missing

2010/07/31

- Pass 1961:
 - 1 image missing
 - 1 truncated image
 - 1 image of which 1st packet was corrupted -> failed processing
- Pass 1968: 2 images missing

Some statistics:

Total number of images between 2010072600 and 2010080200: 4375

Highest cadence in this period: 60 seconds

Commanded cadence: 110s (from July 26 to July 27 18:03) - 120s (rest of the week)

Number of image gaps of 220s or 240s (1 out of 3 images missing): 696

Number of image gaps of 360s (2 out of 3 images missing): 3

Larger data gaps: 1 gap of 198.00 minutes due to lost SWAP data of pass 1952

Average cadence in this period: 138.26s -> takes into account big data gap

Average cadence July 26 to July 27 18:03: **120.14s vs commanded 110s**

Average cadence July 27 18:03 to July 29 22:40 (before gap): **145.65s vs commanded 120s**

Average cadence July 30 2:00 to August 1 23:59 (after gap): **139.06s vs commanded 120s**

Summary:

In general, we missed quite some SWAP images this week, primarily due to images being overwritten onboard. As a consequence of the shorter passes over Svalbard (to ensure a stable signal) and a few less passes this week, a cadence of 2 minutes seems hardly feasible. Discussions with MOC are ongoing to optimize the data downloads.

Data coverage LYRA

2010/07/29

- Pass 1952: part of LYRA data are missing

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
IUI	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