P2SC-ROB-WR-021-2010082 Weekly report #021	**P2SC Weekly report**	
Period covered: Date: Written by: Released by:	Mon Aug 2 to Sun Aug 8 2010 Mon August 9 2010 Anik De Groof Marie Dominique	Royal Observatory of Belgium PROBA2 Science Center
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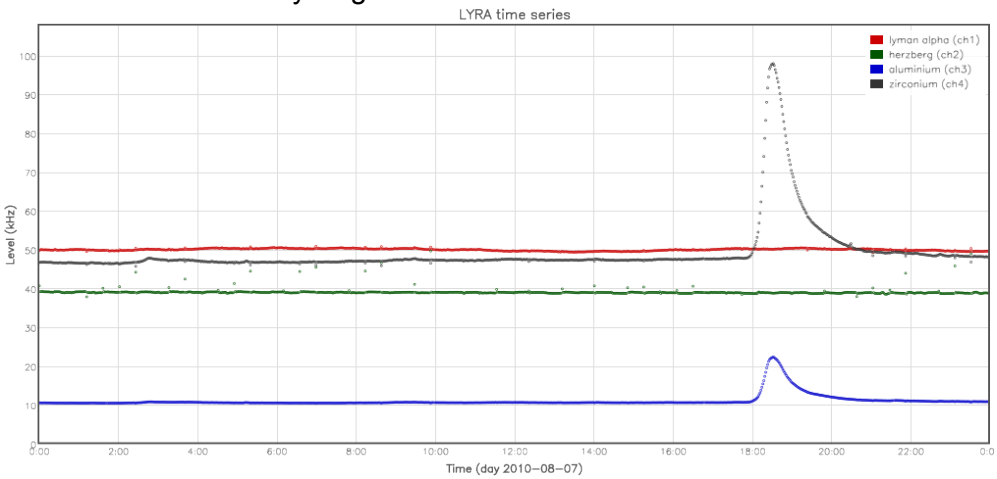
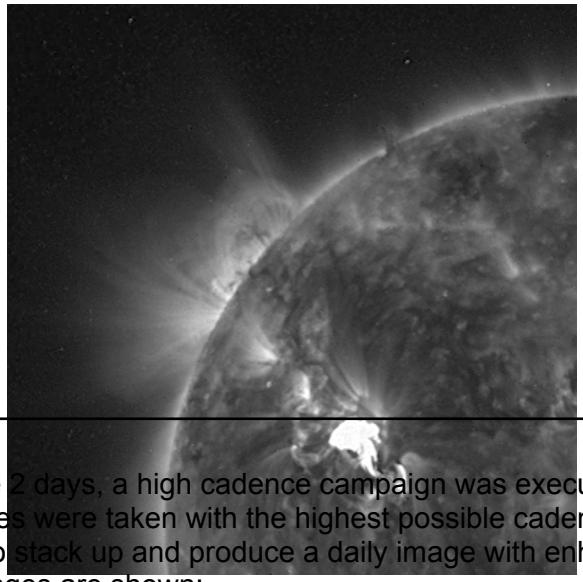
1. Science

Solar & Space weather events
This week, active regions 1092 and 1093 caused a lot of activity on the solar disk. AR 1092 had produced a series of CMEs (directly and indirectly by triggering filament eruptions in the northern hemisphere) and the effects of this solar activity on Earth was felt in the beginning of the week.

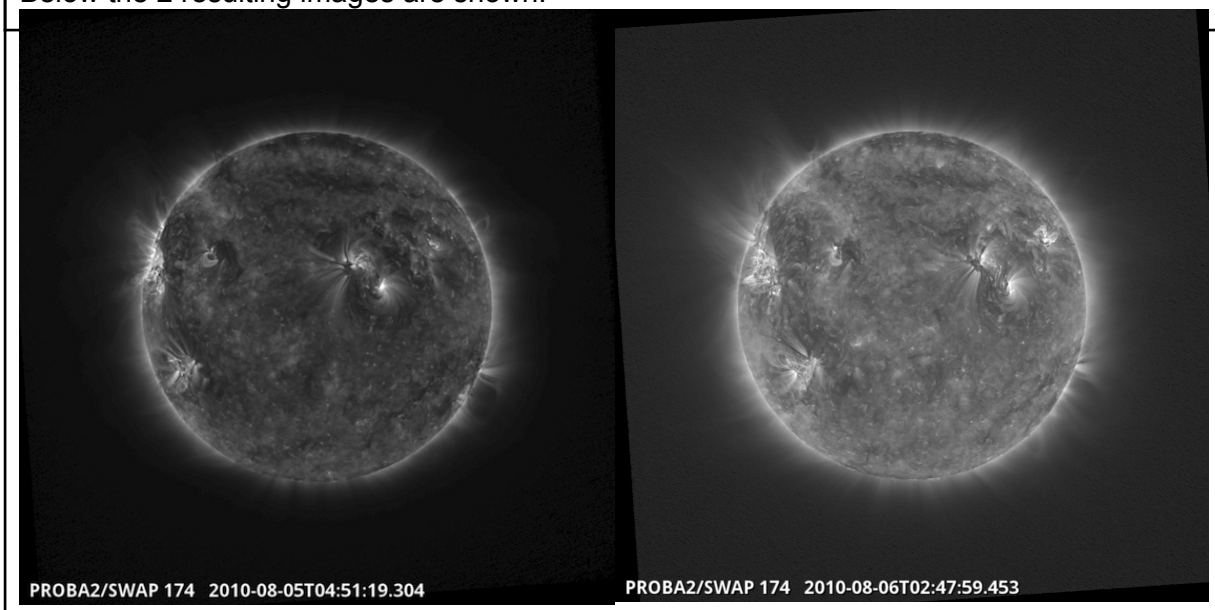
During the rest of the week, a lot of activity was going on around these regions, with as highlight the M-flare on Saturday August 7 around 18UT:





Scientific campaigns

August 5-6: During these 2 days, a high cadence campaign was executed where respectively 10s images and 5s images were taken with the highest possible cadence (20s and 15s resp.). The images were used to stack up and produce a daily image with enhanced signal to noise. Below the 2 resulting images are shown:



August 6: Triggered by the fact that a filament on the NE limb was likely to erupt, an off-pointing campaign was commanded to monitor with SWAP the NE off-limb region. The solar disk was shifted to the lower right of the FOV but stayed completely visible. Unfortunately, the filament did not lift off in the end.

Outreach, papers, presentations, etc.

To be explored

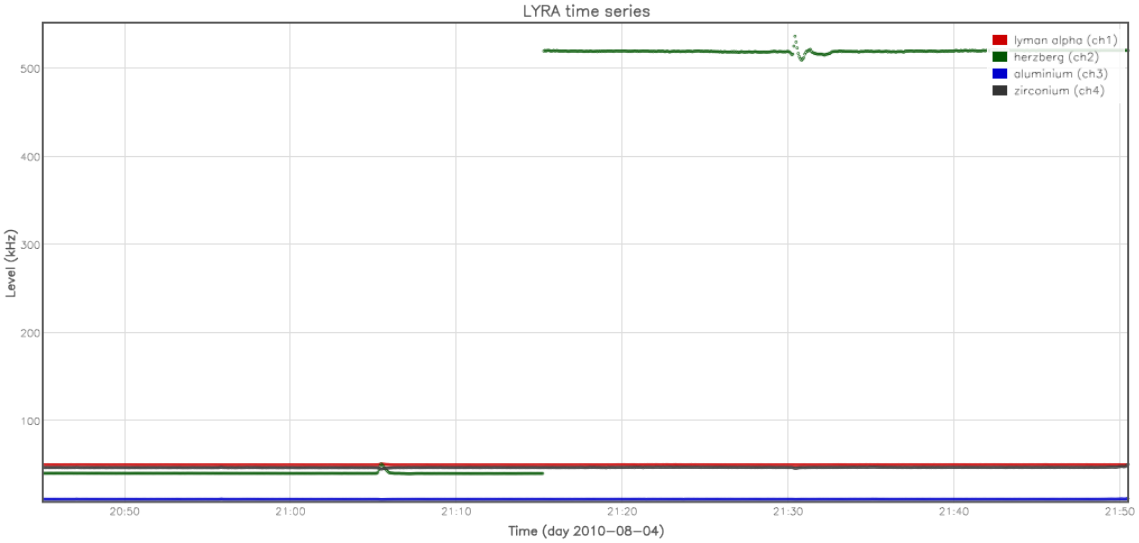
2. LYRA instrument status

Calibration

No calibration campaign was executed this week.

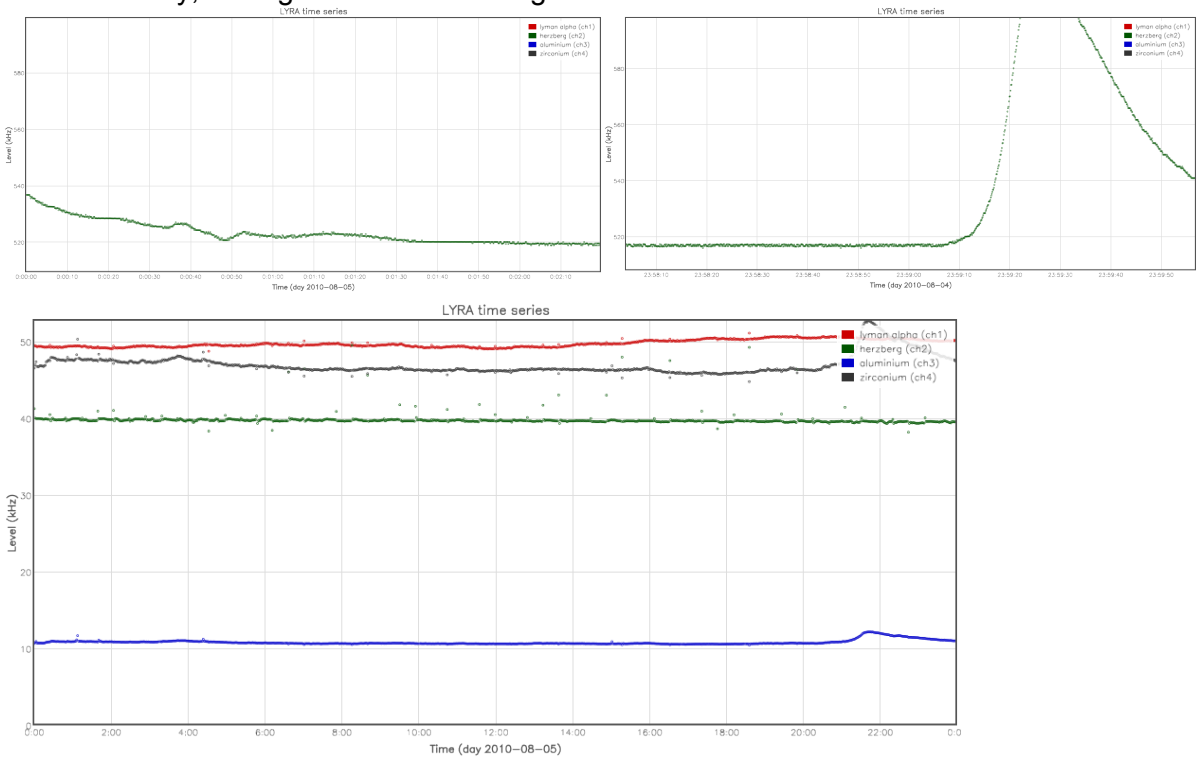
Anomalies

On August 4, at 21:15:15UT, the signal in the Herzberg channel of unit 2 increased with a factor 13 (from 40 to 520kHz). The other channels were not affected.



The reason for this anomaly is not yet known, although a single event upset could be the reason. No VFC calibration was going on at the time of the jump.
This situation stayed unchanged for almost 2 days, until August 6. Between 8UT and 9UT, 2 ASIC reloads were commanded via TC and this solved the problem: the Herzberg signal went back to its original level.

The jump in signal seems to be due to an amplification of the signal (a change of gain?) as illustrated by the following 3 images. In the first 2 plots, the effect of a LAR is shown around midnight on Aug 5: the jump in signal is clearly enhanced by a factor >10 as well. In the second plot, all 4 channels are shown on August 5, with the Herzberg signal divided by factor 13. In this way, the signals show their original behaviour.



IOS & operations

No IOSs have been sent for LYRA this week.
LYRA was acquiring the whole week with unit 2 and at 50ms cadence.

To be explored

3. SWAP instrument status

MCPM recoverable errors
increased from 194 to 195 on August 4 at 09:21:47UT.
The number of MCPM unrecoverable errors is still 0.

IOS & operations
SWAP was doing nominal operations most of the week, with 120s cadence. Despite the somewhat lower cadence, images were often overwritten in the onboard buffer.

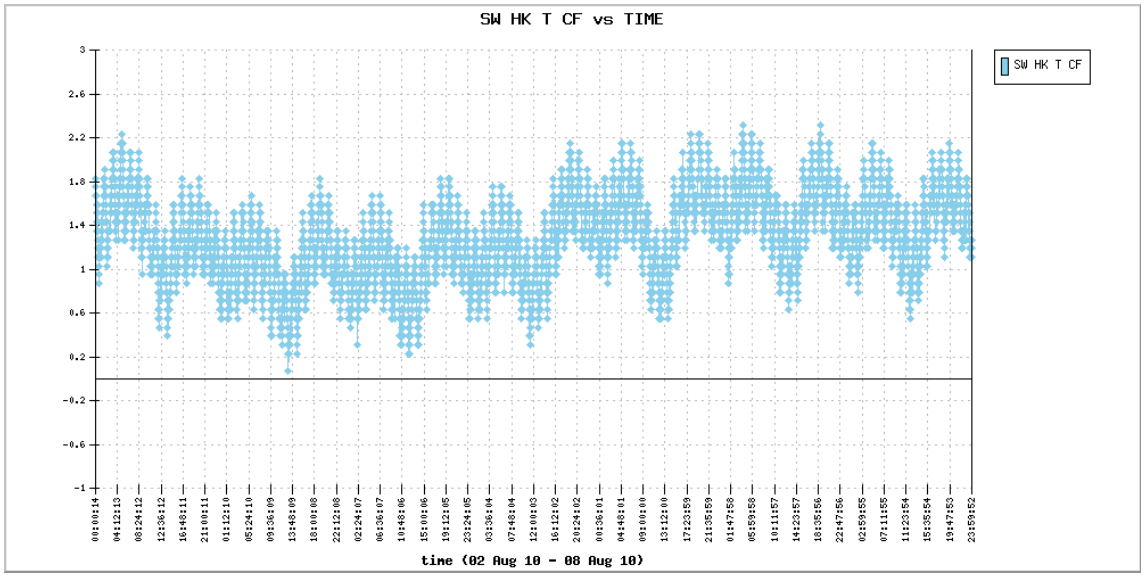
Campaigns:
- August 3: SWAP calibration campaign with LEDs (IOS00149)
- August 5-6: SWAP high cadence campaigns (see scientific campaigns above): IOS00150 to IOS00152
- August 6: SWAP off-pointing campaign (see scientific campaigns above): IOS00153
- August 7: SWAP off-pointing campaign: IOS00154. This IOS did not get onboard with the following error in the MOC upload report:

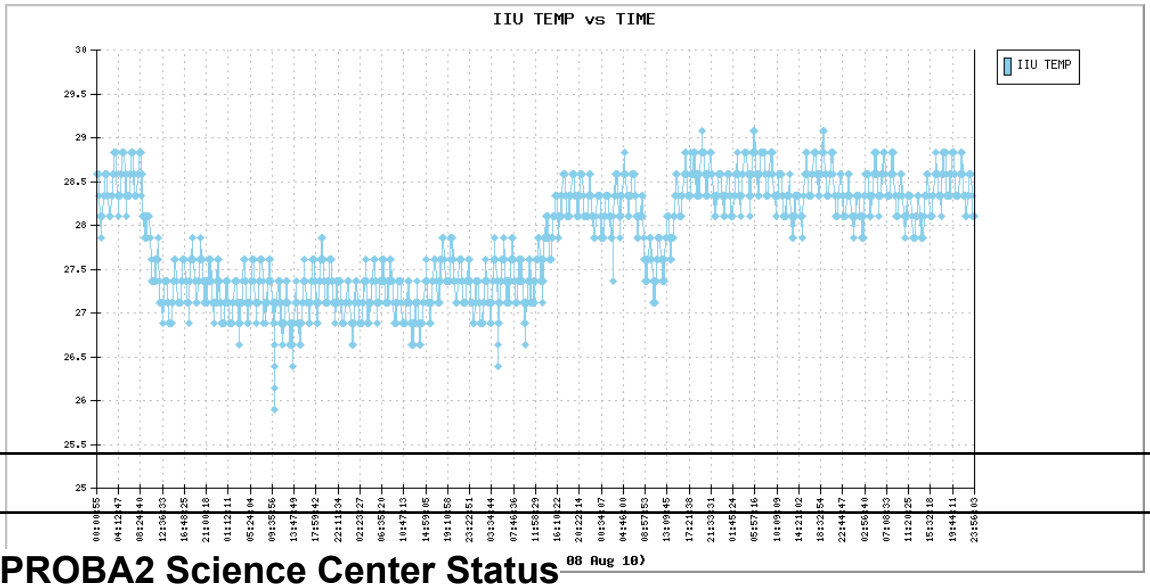
> *First TC processed : tcsend SWHDSRDP executiontime 2010.219.18.29.59.000000 userrequestid 154*
> *Last TC processed : tcsend SWHDETPA executiontime 2010.220.00.00.00.000000 userrequestid 154 {SW_NB_DP 3} {SW_IN_DP 0} {SW_I_TIM 10} {FI_ROW 0} {LA_ROW 1023} {FI_COL 0} {LA_COL 1023} {PGA_GAIN 0} {FOFFP_D1 0.0} {FOFFP_D2 0.0} {SW_REBIN 0} {GR_AS_PN 250} {ACQ_PERI 120} {SW_IN_DP 1} {SW_I_TIM 10} {FI_ROW 0} {LA_ROW 1023} {FI_COL 0} {LA_COL 1023} {PGA_GAIN 0} {FOFFP_D1 0.0} {FOFFP_D2 0.0} {SW_REBIN 0} {GR_AS_PN 251} {ACQ_PERI 120} {SW_IN_DP 2} {SW_I_TIM 10} {FI_ROW 0} {LA_ROW 1023} {FI_COL 0} {LA_COL 1023} {PGA_GAIN 0} {FOFFP_D1 0.0} {FOFFP_D2 0.0} {SW_REBIN 0} {GR_AS_PN 252} {ACQ_PERI 120}*
> *Last TC uploaded : None*
> *First TC failed : tcsend SWHDSRDP executiontime 2010.219.18.29.59.000000 userrequestid 154*
> *Number of TC successfully uploaded : 0*
> *Number of TC failed to upload : 4*
>
> *STACK_TIME_ERROR : the new stack time, 2010-08-07 18:29:00, cannot be uploaded before the next pass. A minimum delay of 5 minutes shall be available.*

The reason for this failure was given by the MOC:

“At the beginning of pass RED3#2030 @ 2010-08-07T18:22:05z, the BBE4 was rebooted without taking care to subscribe afterwards. The consequence is the control could not uplink the IOS#154.
As the first command of the IOS#154 was scheduled soon after the pass (at 18:29:59z) and well before the next U/D pass, the procedure triggered the "STACK_TIME_ERROR". “

SWAP detector and IIU temperature
The SWAP Cold Finger Temperature fluctuated between 0 and 2 degrees Celsius.
Effects were seen of DSLP & TPMU acquisitions, both in the CF temperature as in the IIU temperature.





4. PROBA2 Science Center Status

Anik De Groof was operator during this week.

The LYRA EDG was operated manually. Tests are ongoing with the new version of LYEDG.

SWAP daily movies were also created manually. New software was used which improved the quality and especially stability of the movies a lot. Large Angle Rotations are predicted by the PPT and the images taken around those times are automatically removed from the daily movies. Some blurry images are still present due to momentum off-loading and jitter in general. Also images taken during off-pointing maneuvers can still show up blurred.

Some LYRA data from the beginning of the mission (January) were reprocessed on August 4-5.

The following tools were updated on the operational server:

Software name	Update	Date	Comment
SW_MPG	r3473-3476	Aug 2-4	The blurriness detector, which was sensitive to changes in solar activity, has been replaced

			by a prediction of LARs and the removal of the images during the LAR.
~~ADP~~	~~r3467~~	~~Aug 3~~	~~To guarantee the copying of the AD tar file to~~ failed/ in case of an unsuccessful exit of the script
SWBSDG	r3469	Aug 5	Fix bug that could cause p2sw_prep to crash when the /name_chk keyword was not set
LY-QLV	r3494	Aug 6	LY-QLV can now plot data ranging over multiple FITS files.

5. Data reception & discussions with MOC

Passes

- 3 Image numbers are missing in pass 1979 & 1 truncated image: BINSWAP20100801044953000012189 6PROCESSED
- 7 Image numbers are missing in pass 1997
- 4 Image numbers are missing in pass 2030 & 1 corrupt image: BINSWAP20100807124444000012522 5PROCESSED - Corrupted first packet -> packet 2030 has been resent and now does not show any problematic figures anymore
- 1 Image number is missing in pass 2033 & 1 truncated image: BINSWAP20100808023245000012546 0PROCESSED - JPEG data truncated

Data coverage HK

No gaps.

Data coverage SWAP

Despite the somewhat lower commanded cadence of 120s, images were often overwritten in the onboard buffer of the MCPM. This was probably due to shorter Svalbard passes. In addition, 2 high cadence campaigns were planned for half an hour or shorter (20s and 15s cadence resp.).
The overall data coverage was affected by this and so the **average cadence we got was 2 minutes 45seconds.** On the other hand, there were no data gaps bigger than 6 minutes.

Statistics for complete week:

Total number of images between 2010080200 and 2010080900: 4096
Highest cadence in this period: 15 seconds
Nominal cadence in this period: 120 seconds
Average cadence in this period: 147.61 seconds
Number of image gaps larger than 300 seconds: 7
Largest data gap: 6.00 minutes

Data coverage LYRA

All LYRA data are complete.

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
