P2SC-ROB-WR-027-20100913 Weekly report #27	**P2SC Weekly report**	
Period covered: Date: Written by: Released by:	Mon Sept 13 to Sun Sept 19 2010 Tue Sept 21 2010 David Berghmans Joe Zender	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

Solar & Space weather events

Solar activity was very low during the week. A new active region, NOAA AR 1108 began its transit on the East limb of the Sun on September 16th and produced a C1.3 flare on Sept. 17th at 01:22 UT(peak time). No further significant flaring activity was observed until the end of the week.
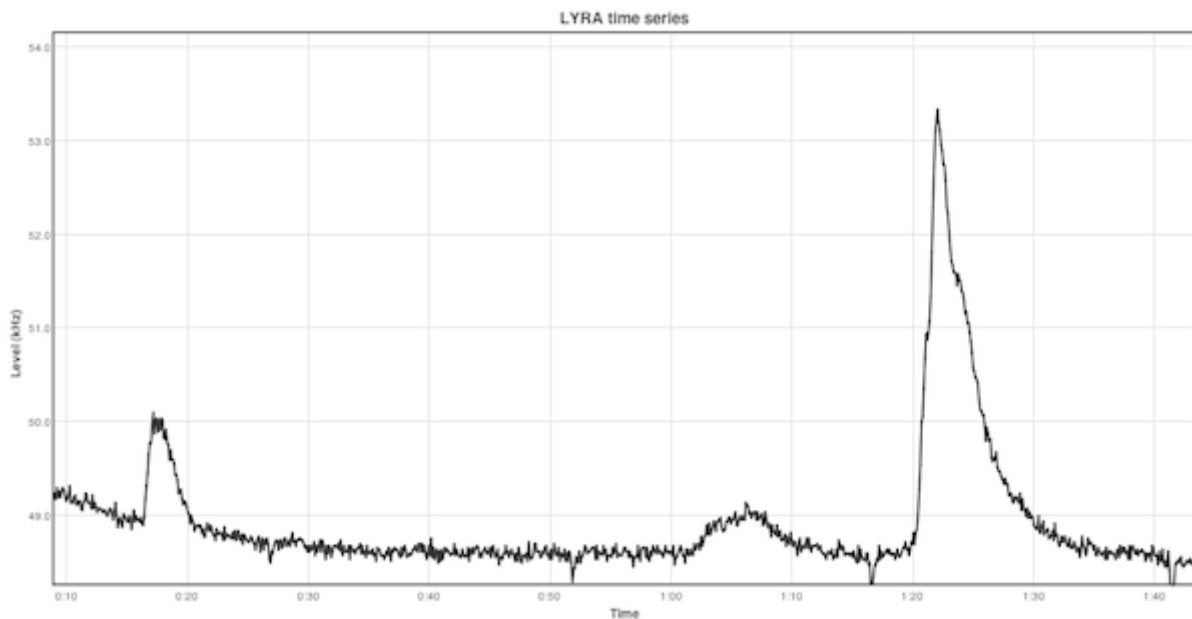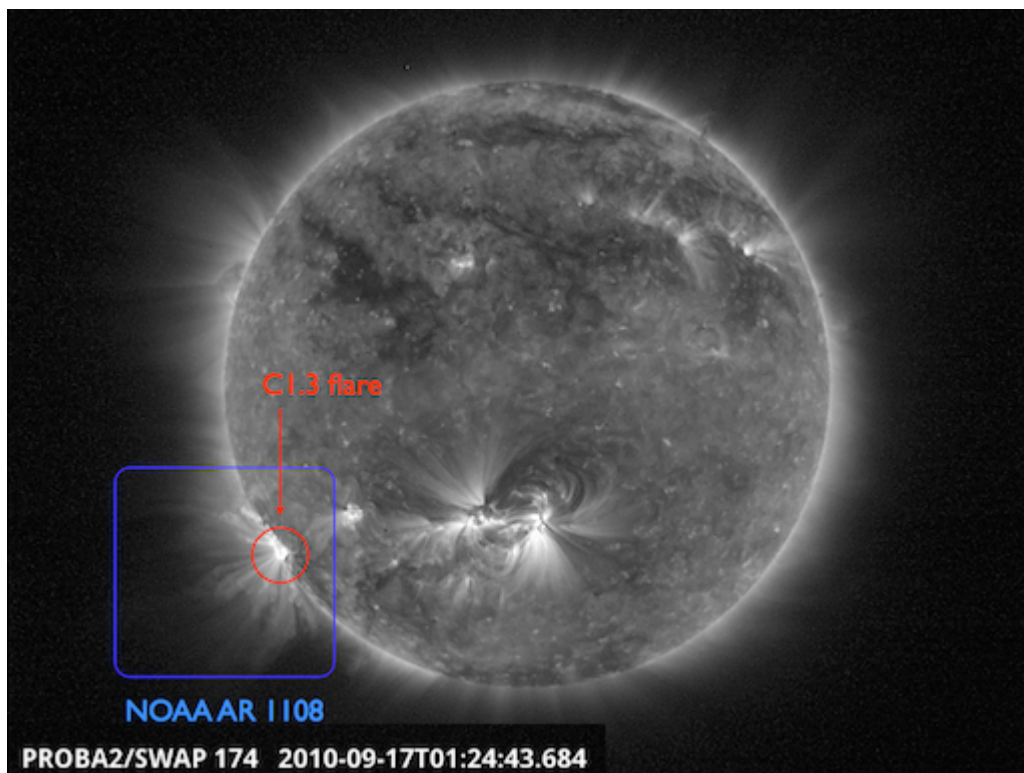
The LYRA Zirconium channel early on Sept 17, showing the C1.3 flare peaking at 01:22 UT, preceded by two precursors including a B5.7 flare peaking at 00:17 UT.

Geomagnetic activity remained at quiet levels during the whole week. There was a brief period of active conditions at planetary levels (Kp=4) on September 15th (0-3 UT) which might be due to the crossing of a sector boundary.

Scientific campaigns

In support of the PROBA2 guest investigators Dipankar Banerjee and Krishna Prasad, we run a polar plume study on September 14 (see IOS00173) which off-pointed as to bring the North Pole in the center of the field of view:

PROBA2/SWAP 174   2010-09-14T02:19:39.878
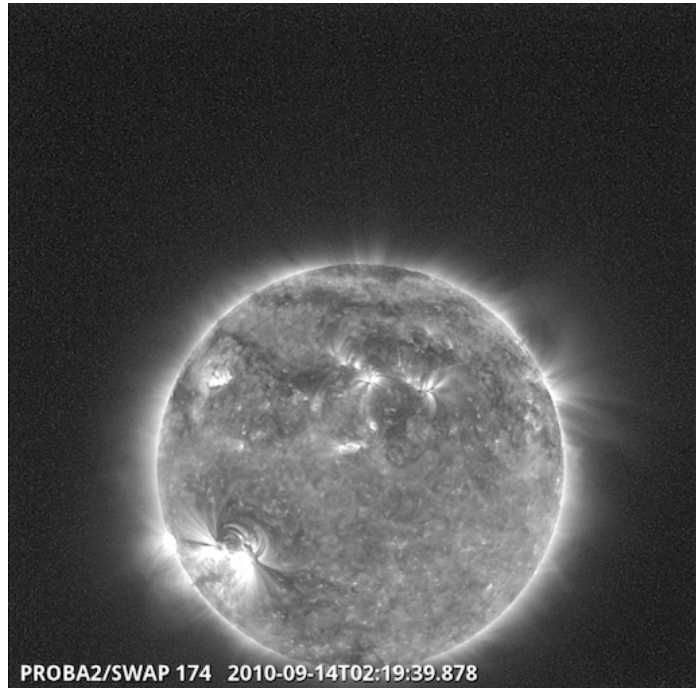
Outreach, papers, presentations, etc.

Oral presentation at http://www.sipwork.org/sipworkV/ :
"3D reconstruction of the 13 April 2010 prominence eruption using SWAP and EUVI data"
by M. Mierla, D.B. Seaton, D. Berghmans, G. Stenborg

Several SWAP and LYRA abstracts were submitted for the ESWW7 conference in November (http://sidc.be/esww7/). These include:

- "Fine structure of the solar inner corona and its relationship with coronal streams"
  Lead author: Vladimir Slemzin
- "Impact of the particle environment on SWAP and LYRA data"
  Lead author: Marie Dominique
- "Multispacecraft observations of 3 and 8 April 2010 Coronal Mass Ejections"
  Lead author: Marilena Mierla
- "Solar Irradiance variations of an active region observed with SWAP and LYRA"
  Lead author: Ingolf Dammasch
- "Temporal and frequence variations of flares observed by LYRA onboard of PROBA2"
  Lead author: Joe Zender
- "SWAP and LYRA onboard PROBA2, new EUV instruments for space weather monitoring"
  Lead author: Anik De Groof
- "A Three-Dimensional SWAP-STEREO Reconstruction of a Mass-Loading Type Eruption"
  Lead author: Dan Seaton

It was pointed out that the LYRA instrument is mentioned in the recent Nature paper http://www.nature.com/nphys/journal/v6/n9/full/nphys1741.html
written by several LYRA co-authors.

To be explored
The SDO operational agenda is now available at
https://www.lmsal.com/~zoe/SDO/SDOcalendar.html
It remains to be explored on how we can adjust the SWAP and LYRA planning in accordance
(eg special coverage of SDO eclipse seasons)

2. LYRA instrument status

Calibration
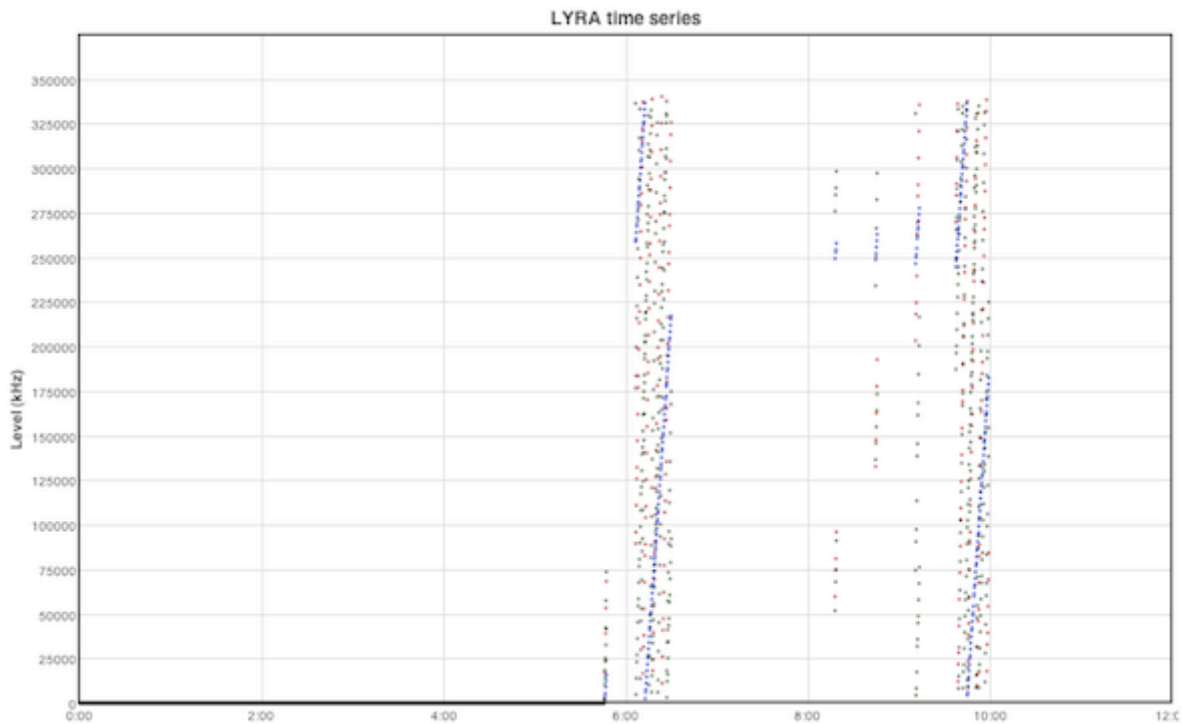No LYRA calibration was performed during the week.

IOS & operations
No LYRA IOS was uploaded during the weekend.

To be explored
LYRA data showed anomalous values on Friday Sept 17.

LYRA time series

At the time of this writing the cause was still uncertain but it seemed the input BINLYRA files
were anomalous: several complete BINLYRA.tar files did not find any single timepair.

3. SWAP instrument status

MCPM errors
The MCPM recoverable errors increased from 198 to 199 in between the housekeeping gap
from September 17T20:12 and 23:12. The number of MCPM unrecoverable errors is still 0.

IOS & operations

The following SWAP instrument operations sheets (IOS) were submitted:

IOS00172: Calibration Campaign (Sept 14 10:00-11:00)
IOS00173: Polar plume study (Sept 14 02:00-05:00), Calibration Campaign
IOS00174: SWAP coverage of SDO eclipse periods (~06:20 every day Sept 17-20)
IOS00175: addition of table_acquisition to IOS00174 for Sept 20.

SWAP detector and IIU temperature
The SWAP Cold Finger Temperature fluctuated strongly during the period under the influence of Flight Mode, Anti Flight Mode campaings and switching on/off the Alcatel GPS. The sudden jump on September 13, 13:00 UT remains unexplained but is simultaneous with the switching on of the Bepi Colombo Star Tracker experiment. The following gradual rise from 2C to 2.5C is also unexplained but is perhaps only apparant and due to a slightly enhanced temperature as a consequence of a DSLP/TMPU sequence.
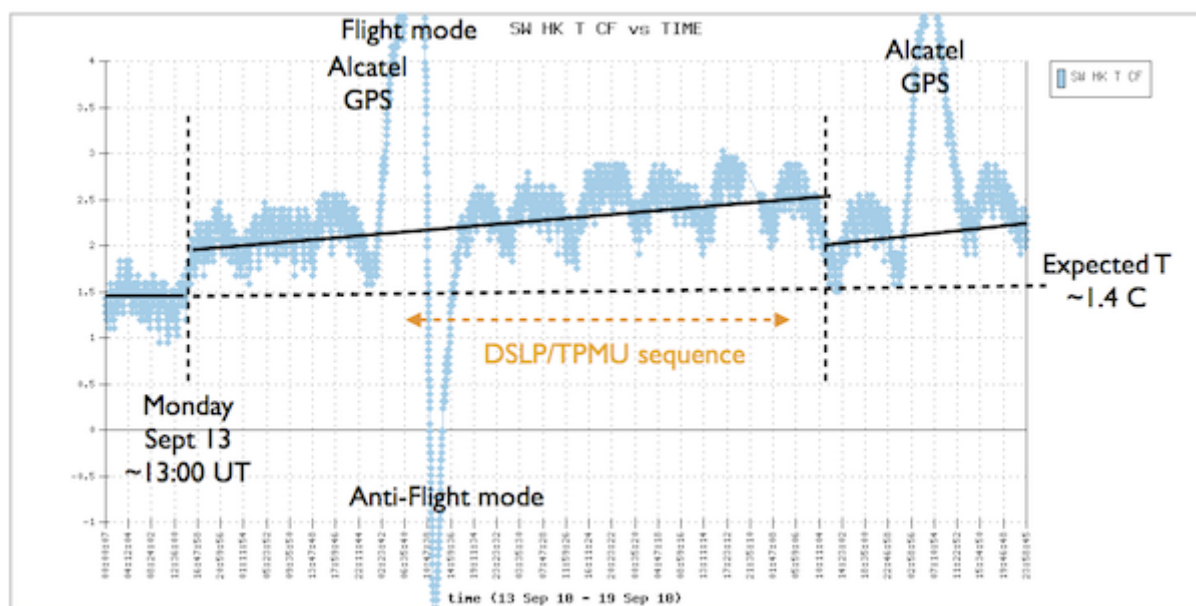
To be explored
The commands given in IOS00174 failed because it contained only table_configuration commands and no table_acquisition commands in between. We presumed the instrument would keep its table acquisition mode, now reading the new table configuration settings.
This was not true as the table_configuration command is not only setting the new parameters but also disabling the READING_DETECTION_PARAMETERS. It is back enabled at the time a table_acquisition command is given. As a consequence, the new parameters were not read and SWAP kept on imaging in the nominal mode with the usual settings.

What remains to be explored is why only the priority numbers, set from ground, were no longer taken into account. As a consequence, all images over the weekend were taken with lowest priority. Images being overwritten in the buffer then cause gaps of several hours in the solar monitoring.
One additional parameter (seen in image metadata) that changes at the time the detection parameters are no longer read is OBS_MODE: it switches from "Variable off-pointing" to "Sun centered". Does this mean the instrument is no longer in table acquisition but rather in specific acquisition??

4. PROBA2 Science Center Status

David Berghmans was operator during this week.

The LYRA pipeline ran automatically till Friday 17th when a problem was discovered in the incoming data. Therefore the pipeline was halted while the problem was being studied over the weekend and into the next week.

For each day, SWAP daily movies were repeatedly created manually until all data was received (typically in the next day).

The following tools were updated on the operational server:

Software name	Update	Date	Comment
SWTMR	3678	Sept 14, 2010	fully use the FITS conventions for pixel addresses

5. Data reception & discussions with MOC

General
- Flight Mode and anti-flight Mode were tested on Jan 15 with the instruments on. See MOC report for details.
- Following warnings by the PP_PROC software, several unchronological sequences in the pass planning files were found and reported. The MOC changed the software such that this should not happen again.
- Additional housekeeping parameters are now received by the P2SC to better track temperature evolutions of the instruments, these are: ALC GPS CURR CAL, BST CURR CAL, DSS CURR CAL, FSXCCM CURR CAL, PLASMA CURR CAL, SUN CURR CAL. It is now up to P2SC to see which parameters correlate with the instrument temperatures.

Data coverage HK
Housekeeping data was complete during the period except a gap between 2010-09-17T20:12:43.000Z and 2010-09-17T23:11:13.000Z. The MOC confirmed that this was due to an ENERTEC unlock during Svalbard pass#2412.

Data coverage SWAP
Statistics for complete week:
Gap of 700 seconds, just before image BINSWAP20100917063637000151414PROCESSED in BINSWAP_2408_SVA1_2010.09.17T13.54.59.tar
Gap of 6100 seconds, just before imageBINSWAP20100917085457000151437PROCESSED in BINSWAP_2409_RED3_2010.09.17T17.23.12.tar
Gap of 2400 seconds, just before imageBINSWAP20100917103137000151472PROCESSED in BINSWAP_2410_RED3_2010.09.17T18.53.55.tar
Gap of 1400 seconds, just before imageBINSWAP20100917120956000151518PROCESSED in BINSWAP_2411_RED3_2010.09.17T20.35.13.tar
Gap of 5000 seconds, just before imageBINSWAP20100917151636000151581PROCESSED

in BINSWAP_2412_SVA1_2010.09.17T23.44.57.tar

Gap of 6500 seconds, just before imageBINSWAP201009171704560000151584PROCESSED in BINSWAP_2412_SVA1_2010.09.17T23.44.57.tar

Gap of 1600 seconds, just before imageBINSWAP201009171833170000151622PROCESSED in BINSWAP_2413_SVA1_2010.09.18T03.12.37.tar

Gap of 4400 seconds, just before imageBINSWAP201009180434580000151940PROCESSED in BINSWAP_2417_SVA1_2010.09.18T13.05.12.tar

Gap of 5700 seconds, just before imageBINSWAP201009180753180000152003PROCESSED in BINSWAP_2418_SVA1_2010.09.18T16.27.58.tar

Gap of 1900 seconds, just before imageBINSWAP201009181251390000152164PROCESSED in BINSWAP_2420_SVA1_2010.09.18T21.27.57.tar

Gap of 2500 seconds, just before imageBINSWAP201009181604590000152256PROCESSED in BINSWAP_2421_SVA1_2010.09.19T00.42.19.tar

Gap of 800 seconds, just before image BINSWAP201009181921390000152367PROCESSED in BINSWAP_2422_SVA1_2010.09.19T03.57.55.tar

Gap of 2200 seconds, just before imageBINSWAP201009190203190000152587PROCESSED in BINSWAP_2425_SVA1_2010.09.19T10.35.02.tar

Gap of 6700 seconds, just before imageBINSWAP201009190523200000152641PROCESSED in BINSWAP_2426_SVA1_2010.09.19T13.56.14.tar

Gap of 5600 seconds, just before imageBINSWAP201009190853200000152712PROCESSED in BINSWAP_2427_RED3_2010.09.19T17.18.50.tar

Gap of 2300 seconds, just before imageBINSWAP201009191040000000152758PROCESSED in BINSWAP_2428_RED3_2010.09.19T18.52.54.tar

Gap of 3700 seconds, just before imageBINSWAP201009191515000000152887PROCESSED in BINSWAP_2430_SVA1_2010.09.19T23.57.47.tar

Gap of 1200 seconds, just before imageBINSWAP201009191830010000152993PROCESSED in BINSWAP_2431_SVA1_2010.09.20T03.09.49.tar

total number of images from that time period: 4762

highest cadence in this time period: 30 seconds

average cadence in this time period: 127.00 seconds

number of image gaps larger than 350 seconds: 18

largest data gap: 111.67 minutes

Data coverage LYRA

LYRA data was complete up till September 17 05:45. More data came in afterwards, except BINLYRA_2412 which is missing, but was unusable (TBC) due to onboard problem which is still under investigation at the time of this writing.

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