P2SC-ROB-WR-035-20101108 Weekly report #035	**P2SC Weekly report**	
Period covered: Date: Written by: Released by:	Mon Nov 08 to Sun Nov 15 2010 Sun Nov 15 2010 David Berghmans Carlos Cabanas	Royal Observatory of Belgium PROBA2 Science Center
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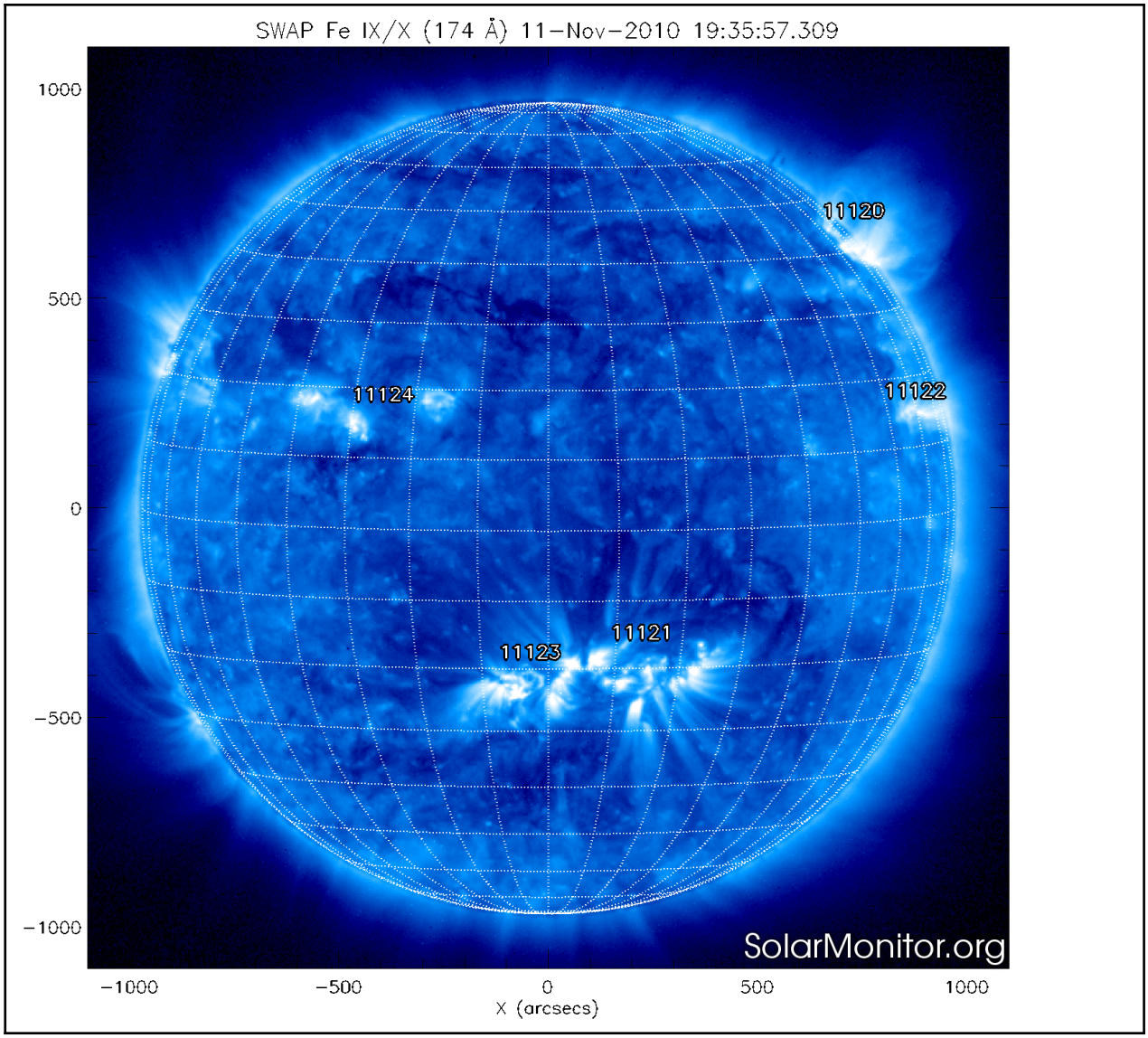
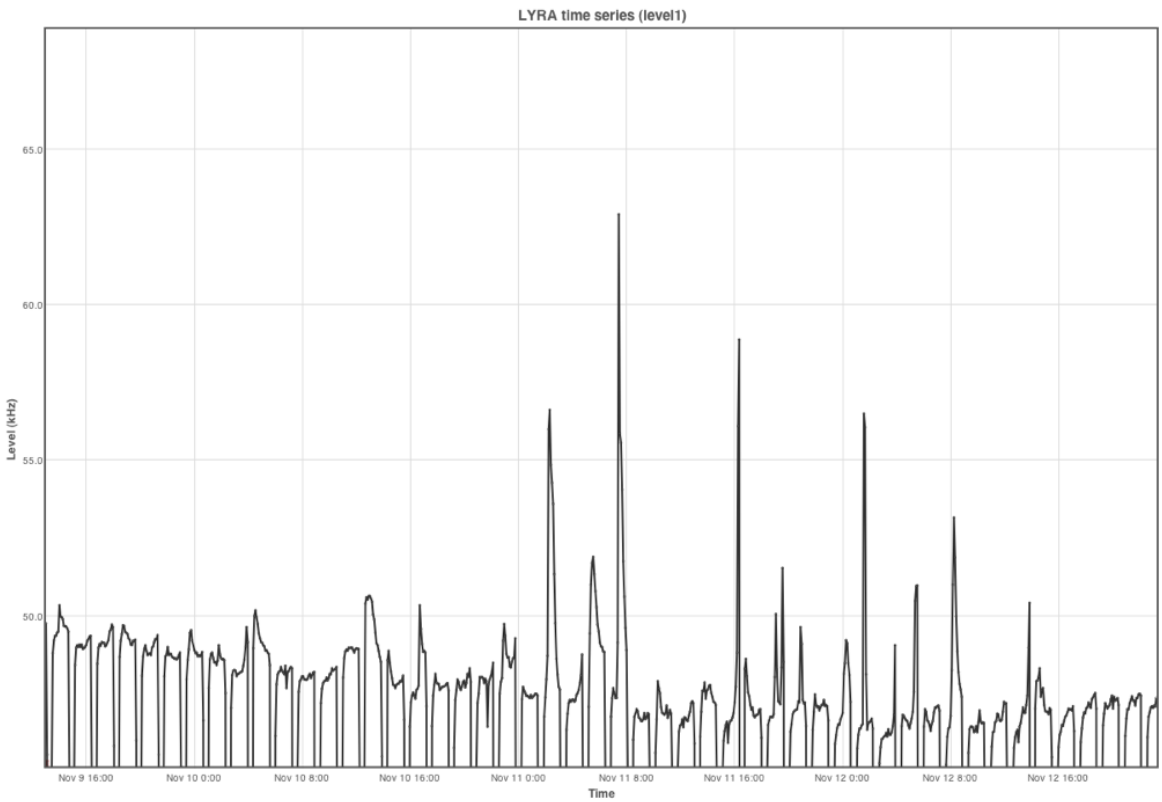
1. Science

Solar & Space weather events

After the active previous period, the present week started quiet with nothing more than small B-flaring activity on Nov 8 and Nov 9. The main active region was NOAA 11121 in the southern hemisphere which from Nov 11 onward was trailed by NOAA 11123. This triggered a number of C-flares up till mid Nov 12.

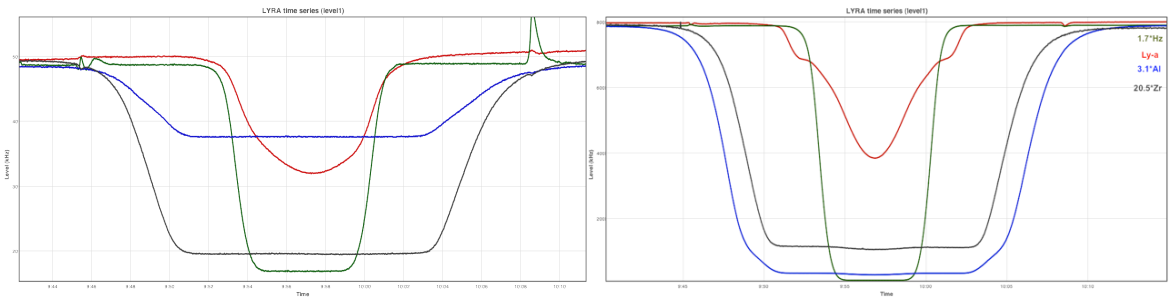

SWAP Fe IX/X (174 Å) 11-Nov-2010 19:35:57.309
1000
500
0
−500
−1000
11120
11124
11122
11121
11123
SolarMonitor.org
−1000
−500
0
500
1000
X (arcsecs)



Start of the visible eclipse season
The visible eclipses started on November 10.

Scientific campaigns

The LYRA occultation campaign was planned on November 8, 9 and 10 (later dates were cancelled). It consisted of high-cadence LYRA acquisition in both unit 2 and unit 3 during the first few full eclipses. The occultation campaign on Nov 8 failed (see below), but those on Nov 9 and 10 were successful. Below some profiles for Nov 9.



Left is unit 3, right in unit 2.The Lyman-alpha channel in Unit3 has a higher responsivity for longer wavelengths, well into the visible and infrared, therefore the curve below the "knee" stretches further, even further than the Herzberg channel. This is a property of the Silicon detector, as opposed to the diamond detectors. The Lyman-alpha channel in Unit2 has a "tail", i.e. it takes a while to go down from its higher level; this is typical for the MSM detectors. Physical interpretation is upcoming.

Outreach, papers, presentations, etc.

Vladimir Slemzin (SWAP GI) presented results on Monday Nov 8 and Wednesday Nov 11 for the P2SC team.

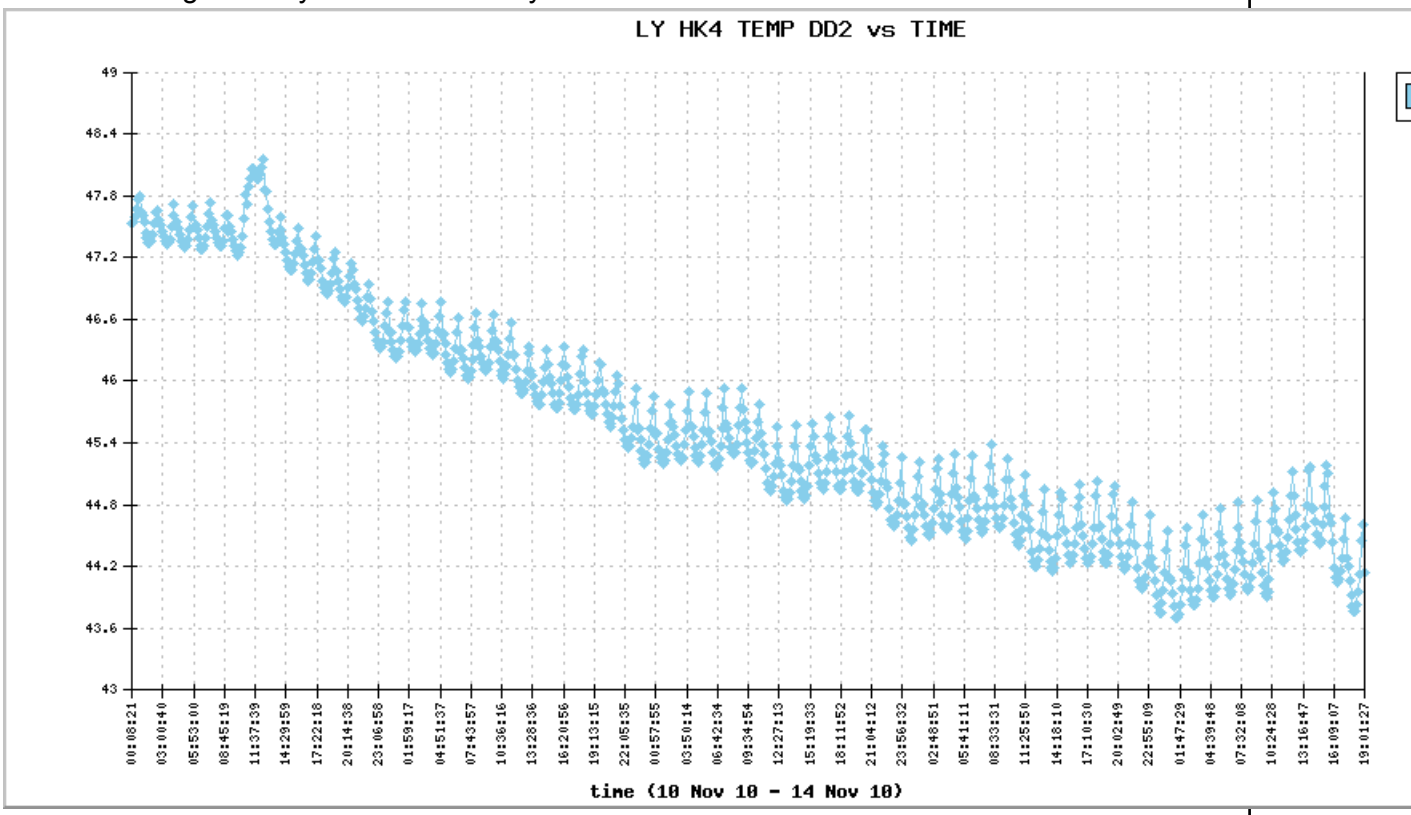
2. LYRA instrument status

Calibration
No LYRA calibration sequence was scheduled this week.

IOS & operations

During the two unit occultation campaign on Monday morning, LYRA temperatures went over the alert threshold (50C) and therefore the instrument automatically switched off at 11:00:19. Redu increased the threshold temperatures to 55C and made LYRA again available in pass 2392. LYRA IOS 110 scheduled to switch LYRA back on from Nov 8 17:46 onwards and planned two two-unit-occultation campaigns on Tuesday Nov 09 AM and Wednesday Nov 10 AM that went fine (see above).

As a consequence of the start of the visible eclipse season, the LYRA temperatures started to come down significantly from Wednesday onwards:



To be explored

Anomaly: Stuck in VFC calibration mode

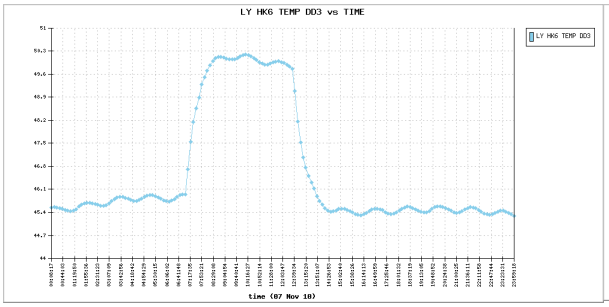
- occurence: happened on 2010 Nov 8 23:30 till 2010 Nov 9 05:03
- symptoms: LYRA quick look viewer shows last data point in unit 2 at 23h30m20.55s. Then there is a big data gap, next data point is at 05h03m50.55s. The length of the

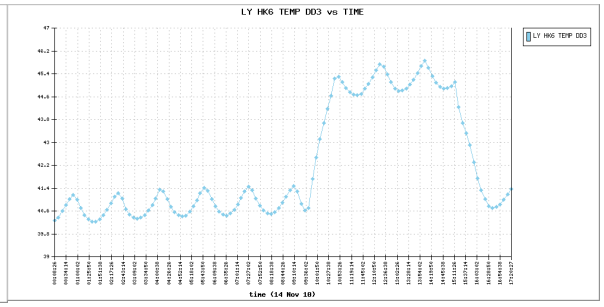
data gap is 5h33m30s.

- <u>context:</u> There were no onboard software events, or problems with the delivery of the BINLYRA files. There were no LMAT problems with the processing of the BINLYRA files. There was no solar event, or large angle rotation with an obvious influence. When we came out of the data gap we were in EUV eclipse (hence the sharp rise in Al and Zr) but this seems unrelated to the problem.
- <u>commanding situation:</u> LYRA was commanded [IOS00110] in "acquisition 50ms unit_2 off 200000 off 0". According to the PTI, 200 000 is in units of 100ms, so we have a VFC calibration every 5h33m20s.
- <u>analysis:</u>
  - A VFC calibration started at 23:30:20.726. The last head2 data point is actually at 23:30:20.672.
  - This start of the VFC calibration is expected as the previous VFC calibration (17:45:46-17:57:00, triggered by switch on commanded by [IOS00110]) ended precisely 20 000s before (5h33m20s)
  - The 2.5V VFC calibration should have ended 10s later at 23:30:30.726. It did, as expected, but LYRA did not switch back to nominal acquisition. The reason for this is unknown.
  - Instead, a new 0V calibration started which lasted from 23:30:30 till the next scheduled VFC calibration at 23:30:20.726 + 5h33m20s = 5:03:40. It exited from there correctly.

Mysterious HK6 DD3 temperature jumps

LYRA TEMP DD3 made a funny jump on Nov 14. A similar thing also happened last Sunday, but not in the weeks before. (see graphs below).





There does not seem to be any correlation with other temperature sensors or Techno-Demo-currents. In both cases LY HK13 CUR28V also made a similar jump.

3. SWAP instrument status

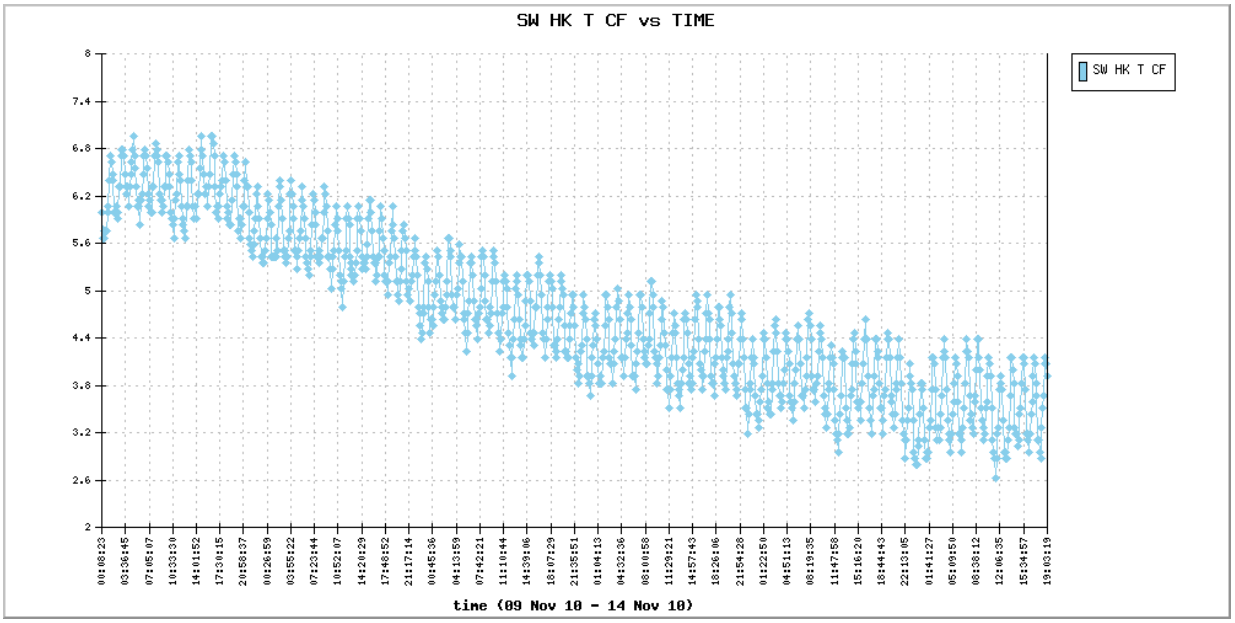
MCPM errors

The number of MCPM errors remained unchanged (recoverable: 208, unrecoverable:0).

IOS & operations

SWAP has been nominally imaging throughout the period making use of the automated eclipse skipping mechanism implemented at P2SC. The nominal imaging cadence was 100s. The eclipse of Nov 10 10:33-10:57 was not skipped for support to the LYRA occultation campaign. IOS 202 was uploaded on Nov 9 to schedule automated eclipse skipping up till Monday Nov 15.

SWAP detector and IIU temperature
As a consequence of the start of the visible eclipse season, the LYRA temperatures started to come down significantly from Wednesday onwards:



4. PROBA2 Science Center Status

D. Berghmans was operator during this week. SWAP daily movies were created manually.
No tools were updated on the operational server.

5. Data reception & discussions with MOC

Passes
The science and housekeeping data files of the Svalbard passes 2937 and 2939 were not immediately transferred (blockage at MOC) but received on Monday.

Data coverage HK
Complete.

Data coverage SWAP

- BINSWAP_2940: BINSWAP20101113174717000019204 9PROCESSED, BINSWAP20101113164357000019205 2PROCESSED - Packet CRC does not validate

  Total number of images between 2010 Nov 08 0UT and 2010 Nov 15 0UT: 4551
  Highest cadence in this period: 100 seconds
  Average cadence in this period: 132.68 seconds
  Number of image gaps larger than 300 seconds: 100 (all eclipse gaps)
  Largest data gap: 52.52 minutes (eclipse + ESP test)

Data coverage LYRA

- Nov 08: data gap between 11:00 and 17:57 (LYRA off because too hot) and from 23:30 onwards (stuck in VFC calibration)
- Nov 09: data gap from midnight till 05:02 (stuck in VFC calibration).

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