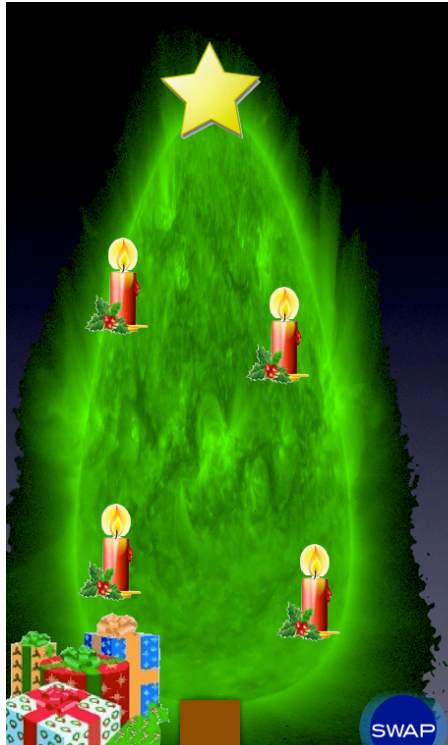


P2SC-ROB-WR-091-20111212 Weekly report #091	P2SC Weekly report	
Period covered: Date: Written by: Released by:	Mon Dec 12 to Sun Dec 18 2011 Dec 20, 2011 David Berghmans David Berghmans	Royal Observatory of Belgium PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP PI, david@sidc.be	http://proba2.sidc.be ++ 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	

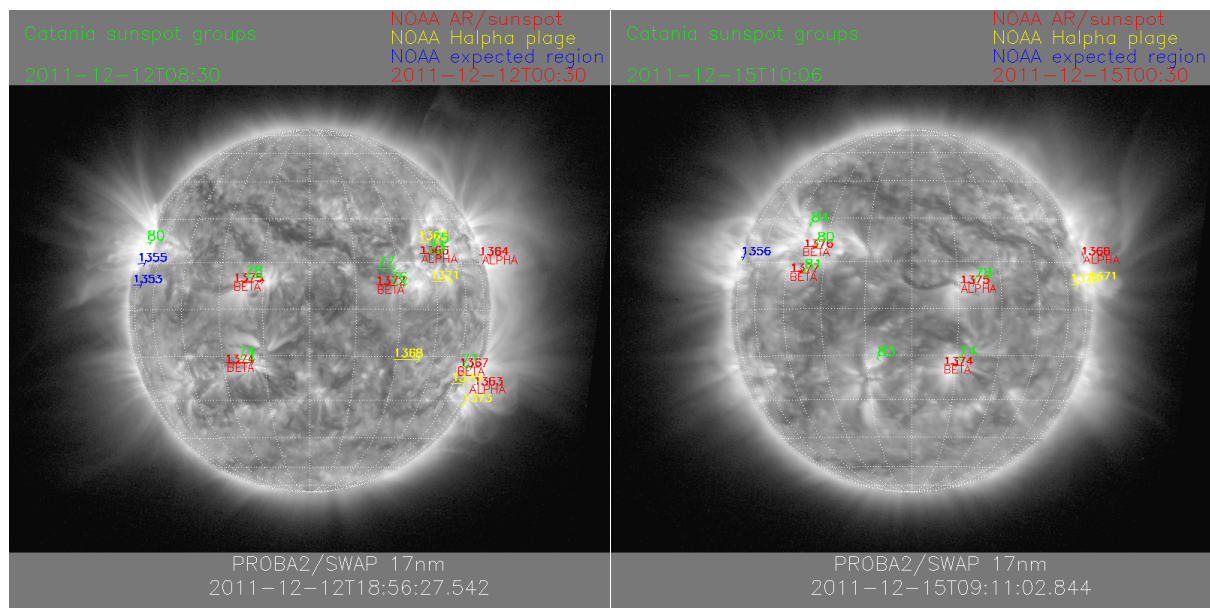
 Every Christmas tree can be a star!	Wishing you many lovely PROBA2 successess in 2012!
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1. Science

Solar & Space weather events

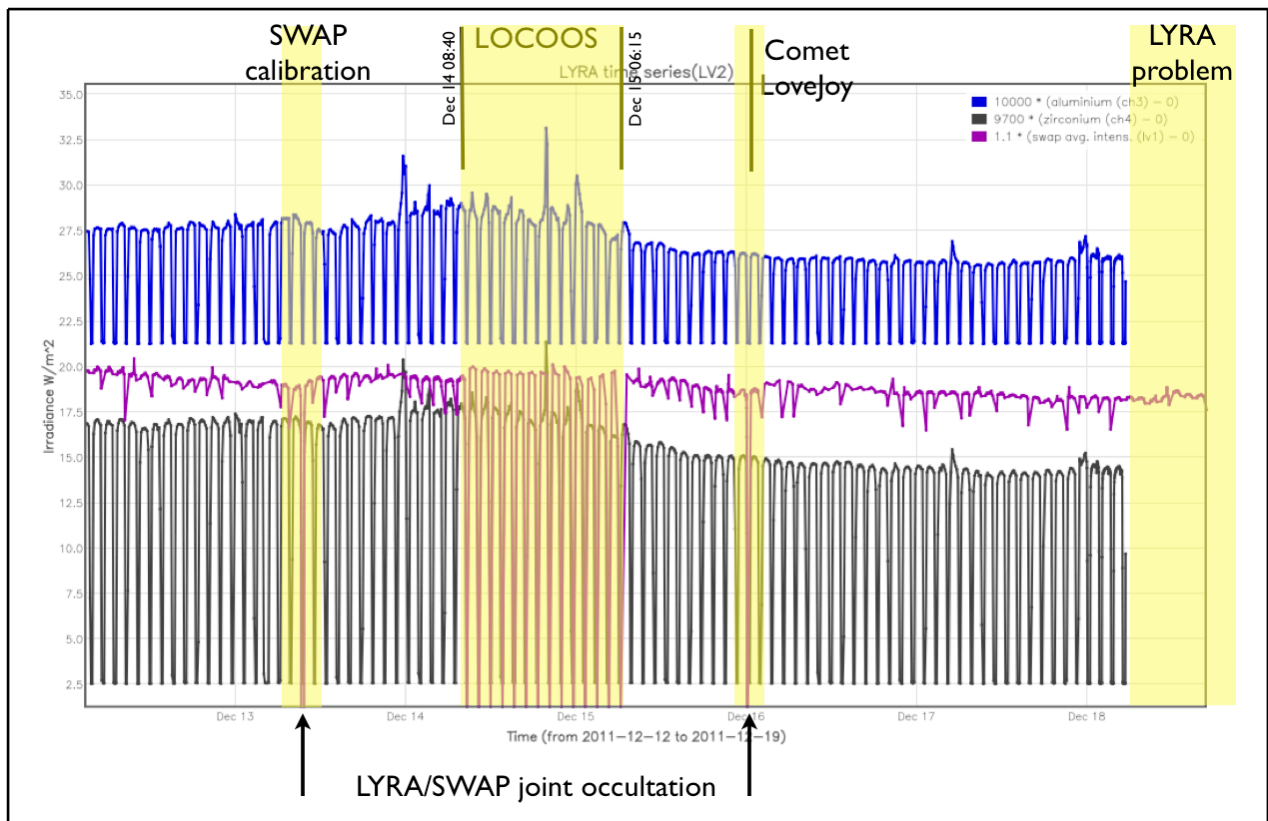
Overview

SWAP images of Monday Dec 12 and Thursday Dec 15 are shown below, with annotated NOAA active regions and Catania Sunspot groups.



Solar conditions were fairly quiet during this week, with only simple (alpha, beta) active regions on the disk. At the beginning of the week (a returning) Active Region NOAA 11376 (Catania 80) rotated on the east limb on the disk, which caused the background GOES X-ray flux to rise above C.0 level on 14 Dec. This caused several C-flares on this day. During the other days of this week the sun was fairly quiet with a small C-flare now and then.

In the following graph we show the weekly overview of LYRA Al/Zr signals and SWAP average intensity (SWAVINT in purple). The vertical scale has been expanded to diminish the overlap of the 3 curves. In yellow, we show from left to right, the time range corresponding to the SWAP calibration, the LOCOOS campaign, the passage of comet Lovejoy through the SWAP field of view and finally the onset of the LYRA cover problem. Also two joint LYRA/SWAP occultation campaigns are indicated (for all details see below). In addition, LYRA did a daily occultation campaign (not indicated on the graph).



Specific events

- SWAP calibration (see below)
- LOCOOS campaign
- Passage of Comet Lovejoy midnight Dec 15/16 (predictions: http://proba2.nicula.net/lovejoy_predict.mov)
- LYRA cover problem Dec 16 (see below)

Outreach, papers, presentations, etc.

- Guest investigator David Long (MSSL) was visiting this week.
- The work of Guest investigator R. Kariyappa ("Preliminary Results on Irradiance Measurements from LYRA and SWAP") has been accepted for publication in "Advances in Astronomy"

The SWAP observations of Comet Lovejoy were advertized on

- ROB spaceweather website: <http://sidc.be/news/143/welcome.html>
- NRL Comet observations website: http://sungrazer.nrl.navy.mil/index.php?p=news/birthday_comet "Great work, PROBA team -- you don't get anywhere near as much praise and publicity as you should!"
- Belgian press <http://www.gva.be/nieuws/wetenschap/aid1100818/belgische-satelliet-registreert-scheervlucht-komeet-langs-zon.aspx>
- NASA Science http://science.nasa.gov/science-news/science-at-nasa/2011/16dec_cometlovejoy/
- ESA News: http://www.esa.int/SPECIALS/Technology/SEMPAJBX9WG_0.html

To be explored

Why *did* we see a comet in the EUV? And what are the tail wiggles supposed to be?

2. LYRA instrument status

Calibration

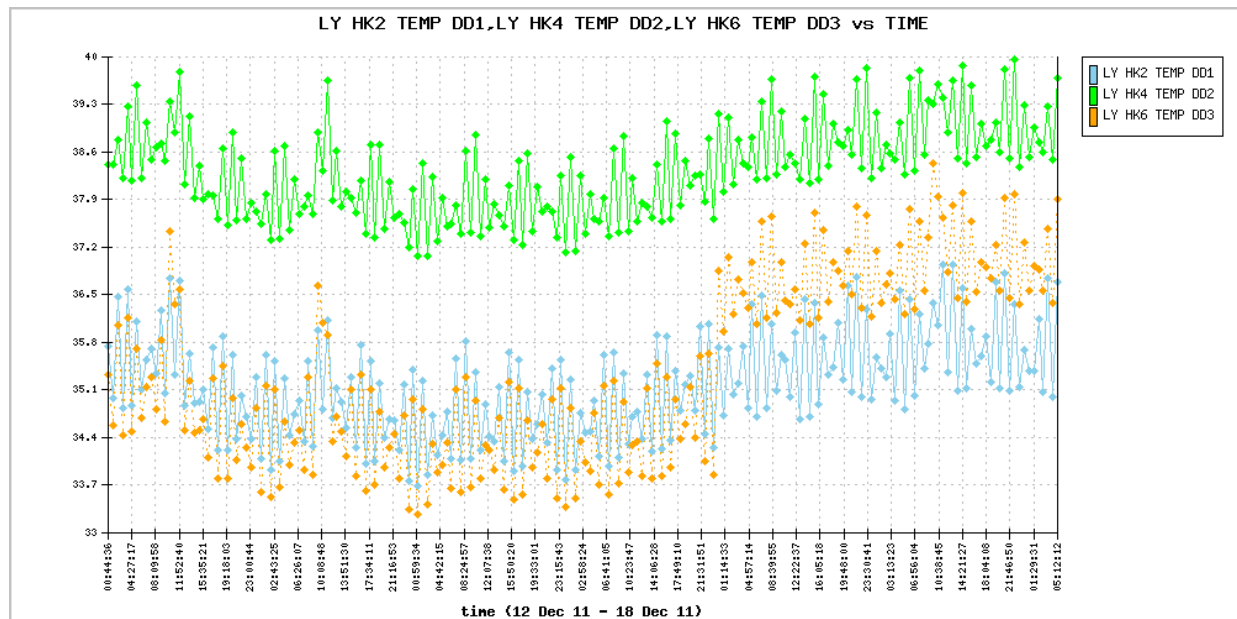
There was no LYRA calibration campaign during the week.

IOS & operations

Monday Dec 12	Tuesday Dec 13	Wednesday Dec 14	Thursday Dec 15	Friday Dec 16	Saturday Dec 17	Sunday Dec 18
Nominal acquisition + unit 3 occultations	Nominal acquisition + unit 3 occultations	Nominal acquisition + unit 3 occultations	Nominal acquisition + unit 3 occultations	Nominal acquisition + unit 3 occultations	Nominal acquisition + unit 3 occultations	Nominal acquisition + unit 3 occultations
LYIOS 203	LYIOS 203	LYIOS 203	LYIOS 204	LYIOS 205	LYIOS 205	LYIOS 208

LYRA detector temperature

The LYRA detector 2 temperature (nominal unit) fluctuated between 37.2C and 40C degrees Celsius. The effects is seen of opening of door 3 (orange) in the second half of the week.



To be explored

LYRA door anomaly:

- On Friday 16, the "close cover3" TC at the end of the comet campaign was not successful (due time 00:10:30). Unit3 remained open, but not acquiring, which means that the "acquisition" command supposed to be released after the failing "close cover" at 00:15 was successful.
- Consequently to this failure, LYIOS00205 was sent to close cover 3 at 13:45 and to schedule the next occultation campaigns. For any reason, this "close cover" TC failed as well and unit 3 remained open and not acquiring. Now, the occultation campaign of Saturday (same IOS) took place, but with again a failing "close cover" TC at the end of the campaign.

- On Saturday 17, I sent LYIOS00207 with, this time, a "warm-up" at 18:00 and an acquisition TC in there to try closing cover 3 and switch it on. The idea was that, in case the cover would be broken, unit3 would at least be acquiring and the data would not be lost. If everything went well, unit3 cover would close, and unit3 would be acquiring dark current, which is no problem. Nevertheless, the upload of the IOS failed (pass 6545) and the situation remained unchanged.
- Realizing that, I resent a similar IOS (LYIOS00208) in which the warm-up TC was scheduled at 05:30 on Sunday 18. The upload was successful, and the warm-up command took place, but for any unknown reason, it led to a closing of covers 2 and 3, and the opening of cover 1 (which is definitely not what was commanded). Soon after, an event was released on-board and the instrument switched to "off".:
 - 2011-12-18T05:36:11 19 ERROR LOW 273
 - EVT_LYRA_PROBLEM_DURING_MODE_SWITCHING 0103
 - 2011-12-18T05:36:11 19 NORMAL PROGRESS 272 EVT_LYRA_SWITCH_MODE 00
- (to be continued in next weeks report)

3. SWAP instrument status

Calibration

Weekly extended calibration performed on Tuesday Dec 13

MCPM errors

increased from 1480 to 1485 this week. The number of MCPM unrecoverable errors is still 0.

IOS & operations

In order to save CPU performance during the LOCOOS campaign, SWAP image processing was stopped by Redu TC on Dec. 14 08:40z. SWAP image processing was restarted by ROB IOS on Dec 15 at 06:20z. In between, SWAP RAW image download was enabled from Dec. 14 pass 6516 starting at 11:51z. to Dec. 15 pass 6524 starting at 05:49z. Note that these same RAW images were downloaded a second time as processed images when data processing was enabled again.

Monday Dec 12	Tuesday Dec 13	Wednesday Dec 14	Thursday Dec 15	Friday Dec 16	Saturday Dec 17	Sunday Dec 18
Nominal acquisition + occultation jumping	Calibration + Nominal acquisition + occultation jumping	LOCOOS campaign	Nominal acquisition + occultation jumping	Lovejoy comet + Nominal acquisition + occultation jumping	Nominal acquisition + occultation jumping	Nominal acquisition + occultation jumping
IOS00348 616 mages	IOS00349 825 mages	IOS00351 223 mages	IOS00352 337 mages	IOS00352 487 mages	IOS00352 709 mages	IOS00352 681 mages

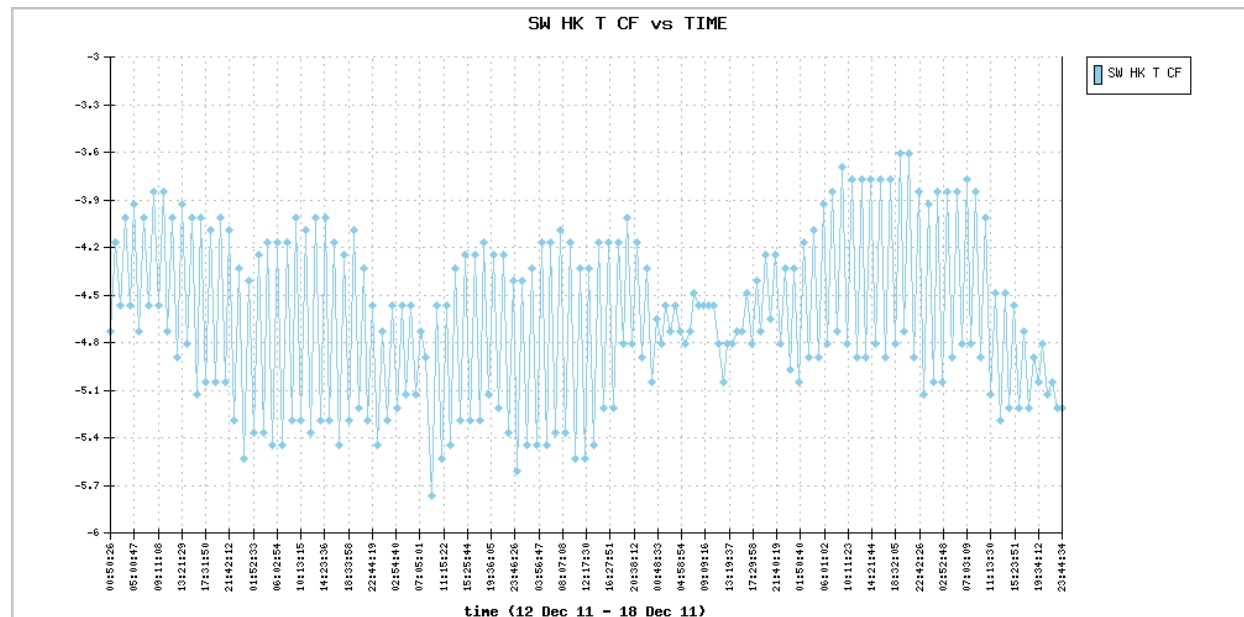
Occultation jumps occur during every orbit.

On Tuesdays SWAP images the entry & exit of one particular occultation in parallel with LYRA,

exceptional this was also done during the Lovejoy comet campaign on Friday.

SWAP detector temperature

The SWAP Cold Finger Temperature fluctuated between -3.6C and -5.7C.



To be explored

/

4. PROBA2 Science Center Status

The operations were shared this week between Marie Dominique (LYRA aspects), Koen Stegen (P2SC pipelines) and David Berghmans (SWAP aspects).

No tools were updated on the servers.

5. Data reception & discussions with MOC

Passes

In general the data reception this week was good.

Data coverage HK

The HK data were complete this week.

Data coverage SWAP

Statistics for complete week:

Total number of images between 2011 Dec 12 00T and 2011 Dec 19 00T: 3878

Highest cadence in this period: 0 seconds

Average cadence in this period: 155.96 seconds

Number of image gaps larger than 300 seconds: 177
Largest data gap: 31.45 minutes

The occultation interruptions are now on the order of 31 minutes and account for 86 of the above 177 data gaps. Most other data gaps correspond to the reduced image cadence during the LOCOOS campaign. The low total number of images is explained by the fact that images were downloaded uncompressed during both the LOCOOS campaign and the Lovejoy comet campaign, leaving less telemetry for other images.

Data coverage LYRA

The LYRA data is complete except for a data gap after Sunday Dec 18 05:30UT (up till Monday Dec 19 >18:00UT), due to cover closing problem described above.

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
DSLIP	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
SWAVINT	SWAP AVerage INTensity
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