


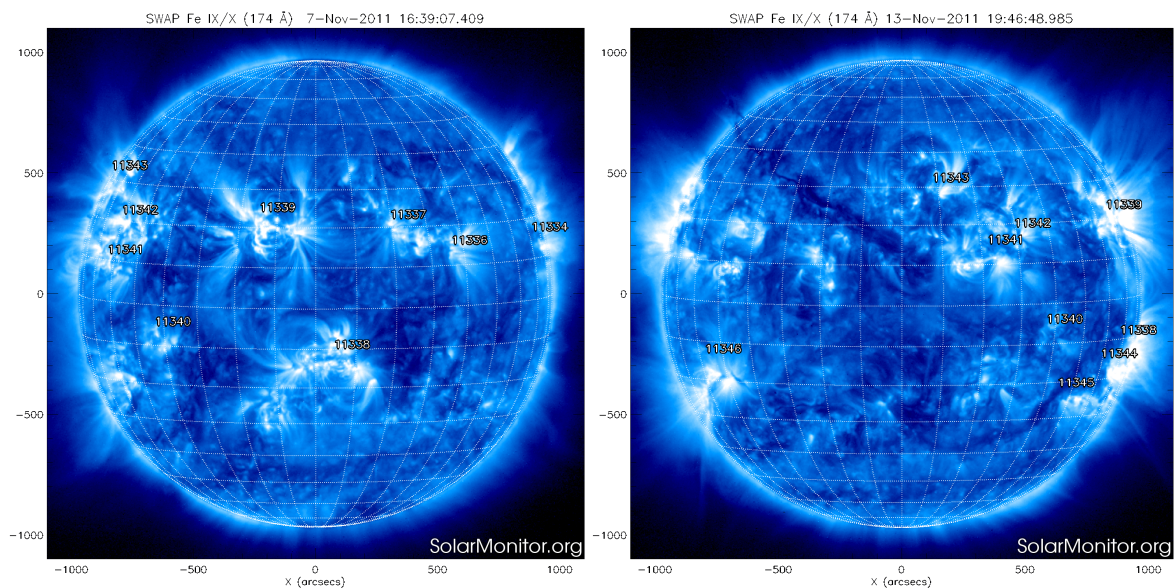
P2SC-ROB-WR-086-20111107 Weekly report #086	P2SC Weekly report	
Period covered: Date: Written by: Released by:	Mon Nov 07 to Sun Nov 13, 2011 30 Nov 2011 Erik Pylyser David Berghmans	Royal Observatory of Belgium PROBA2 Science Center
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1. Science

Solar & Space weather events

Overview

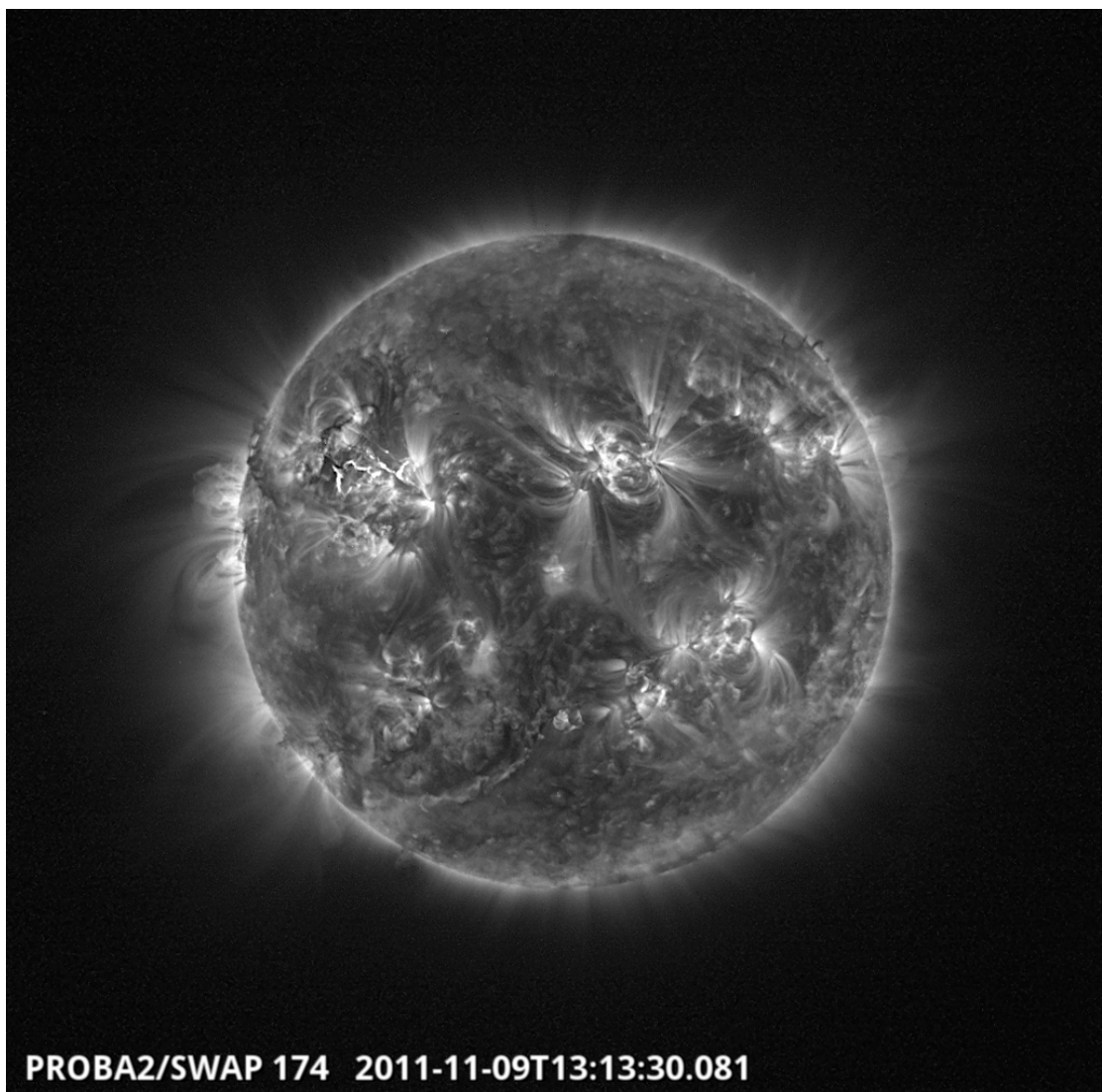
The SWAP images of November 07 and November 13 are shown below, with annotated active regions:



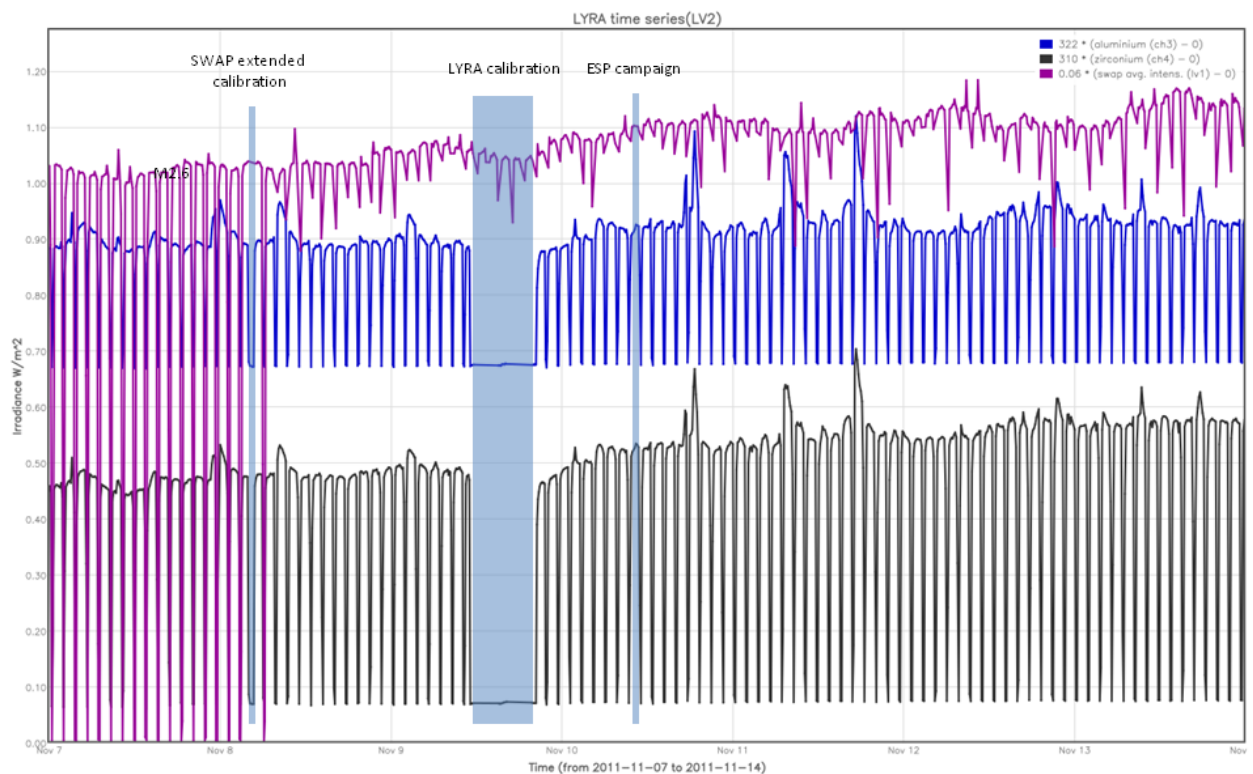
No less than 17 sunspot groups were detected during this week. Solar activity level was MEDIUM the whole week. Lots of C-flare occurrences. These were produced by NOAA ARs 1339, 1341, 1344, and 1347.

The strongest flare observed during the week was the M1.1 flare peaking at 13:35 UT in NOAA AR 1342 on November 9. It was accompanied by a type II radio burst observed by Humain, and resulted in the eruption of a CME. Its speed was around 1000 km/s. The CME-driven shock arrived at the Earth on November 12th.

This flare was not observed by LYRA (it was in calibration phase), but nicely visible in the SWAP images and movie (northern hemisphere, halfway to the East limb)



Another, partial halo CME was first visible in the LASCO C2 field of view at 11:36 UT on November 8. It had the angular width of around 120 degrees and speed around 500 km/s. The CME source region was situated at the west limb (Catania number 27, NOAA AR 1334). This CME was most probably the driver of the shock detected by ACE on November 1.



Above we show the weekly overview of LYRA Al/Zr signals and SWAP average intensity (SWAVINT in purple). SWAVINT as well as the LYRA channels exhibit luminosity dips, due to the occultation season. From November 8th on, SWAVINT reflects the SWAP occultation imaging jumps, i.e. no images are taken during occultation periods. The blue areas indicate, from left to right, the weekly SWAP calibration campaign (on Tue), the LYRA bi-weekly calibration campaign (on Wed) and the weekly ESP campaign/jump, respectively.

Scientific campaigns

This week, the daily occultation campaign of LYRA has started.

The aim is to focus on one particular occultation every day, to capture the evolution of illumination while sunlight is being absorbed by the atmosphere (in and out of occultation). This is done by activating channel 3 during a daily chosen occultation.

In a first step, this is done for 2 weeks, only during work-days. If all goes well, week-ends and holidays will be included in the campaign.

On a bi-weekly occasion, such a one-day campaign is also executed using channel 1, in addition to the channel 3 campaign.

All campaigns this week were executed successfully.

Outreach, papers, presentations, etc.

/TBD.

To be explored

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2. LYRA instrument status

Calibration

Calibration was performed successfully on 09/11.

IOS & operations

Monday 07 Nov	Tuesday 08 Nov	Wednesday 09 Nov	Thursday 10 Nov	Friday 11 Nov	Saturday 12 Nov	Sunday 13 Nov
Nominal acquisition + occultation	Nominal acquisition + occultation	Nominal acquisition + occultation + occultation	Nominal acquisition + occultation	Nominal acquisition + occultation	Nominal acquisition + occultation	Nominal acquisition + occultation
LYIOS00199	LYIOS00199	LYIOS00199	LYIOS00199	LYIOS00199	LYIOS00199	LYIOS00199

LYRA detector temperature

The LYRA detector 2 temperature (nominal unit) decreased in a fluctuating manner between 50.1 - on Monday and 43 degrees Celsius - on Sunday, during nominal operations.

To be explored

For 11/11/11, P2SC DCVC discovered irregularities in the context of the daily LYRA occultation campaign, conflicts between the on-board HK w.r.t. POW ON HD3 and POW ON VFC2 and the commanded status. The science data indicates that, at least on-board, the status was as commanded. To be investigated why DCVC came with errors.

3. SWAP instrument status

Calibration Weekly extended LED calibration campaign executed on 8 November.						
MCPM recoverable errors Increased from 1032 to 1186 this week. The number of MCPM unrecoverable errors is still 0.						
IOS & operations						
Monday 07 Nov	Tuesday 08 Nov	Wednesday 09 Nov	Thursday 10 Nov	Friday 11 Nov	Saturday 12 Nov	Sunday 13 Nov
Nominal acquisition 110s cadence	Nominal acquisition + LED calibration + start occult. jumps	Nominal acquisition + occultation	Nominal acquisition + ESP campaign + occultation	Nominal acquisition + occultation	Nominal acquisition + occultation	Nominal acquisition + occultation
IOS00341 757 images	IOS00342 639 images	IOS00342 592 images	IOS00343 586 images	IOS00343 584 images	IOS00343 596 images	IOS00343 580 images
The occultation season having started, first test commands were issued to ‘jump over’ the occultation periods occurring every orbit. After preliminary tests on Mon/Tue, this commanding is done for every orbit, successfully.						
SWAP detector temperature The SWAP Cold Finger Temperature decreased - in a fluctuating manner - between 2.5 and -1.8 degrees Celsius.						
To be explored /						

4. PROBA2 Science Center Status

Erik Pylyser, David Berghmans and Koen Stegen were operator during this week.

During the whole week, the nominal processing of incoming data was perturbed by the parallel re-processing of SWAP data. These perturbations are due to the use of the same physical machine for both types of processes, thereby hitting the limits of the I/O processes of the machine and longer duration processing and associated errors, in particular database locking.

While generating automated IOSs, for the SWAP occultation jumps, we encountered the problem that we could not enter more than 100 rows in the table meant to be uploaded to the on-board table. Indeed, every occultation period generates one single row in this table. The on-ground (TBC) system does not allow the generation of tables with more than 100 rows. P2SC generates an error, before the IOS can be issued to Redu. This limits the number of occultation jump commands that can be prepared in 1 go, to a period of 6.5 days approximately.

No tools were updated on the operational server.

5. Data reception & discussions with MOC

Passes All data were received.
Data coverage HK The HK data were complete this week.
Data coverage SWAP All data was received. Statistics for complete week: <i>Total number of images between 2011 Nov 07 00UT and 2011 Nov 14 00UT: 4334</i> <i>Highest cadence in this period: 30 seconds</i> <i>Average cadence in this period: 139.56 seconds</i> <i>Number of image gaps larger than 300 seconds: 86</i> <i>Largest data gap: 29.00 minutes</i> The data gap of 29 min was commanded to allow for an ESP test.
Data coverage LYRA The LYRA data were complete this week.

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