


P2SC-ROB-WR-142-20121210 Weekly report #142	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Dec 10 to Sun Dec 16, 2012 17 Dec 2012 Erik Pylyser David Berghmans	Royal Observatory of Belgium PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP Deputy PI, dan.seaton@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, Stefano.Santandrea@esa.int	

1. Science

Solar & Space weather events

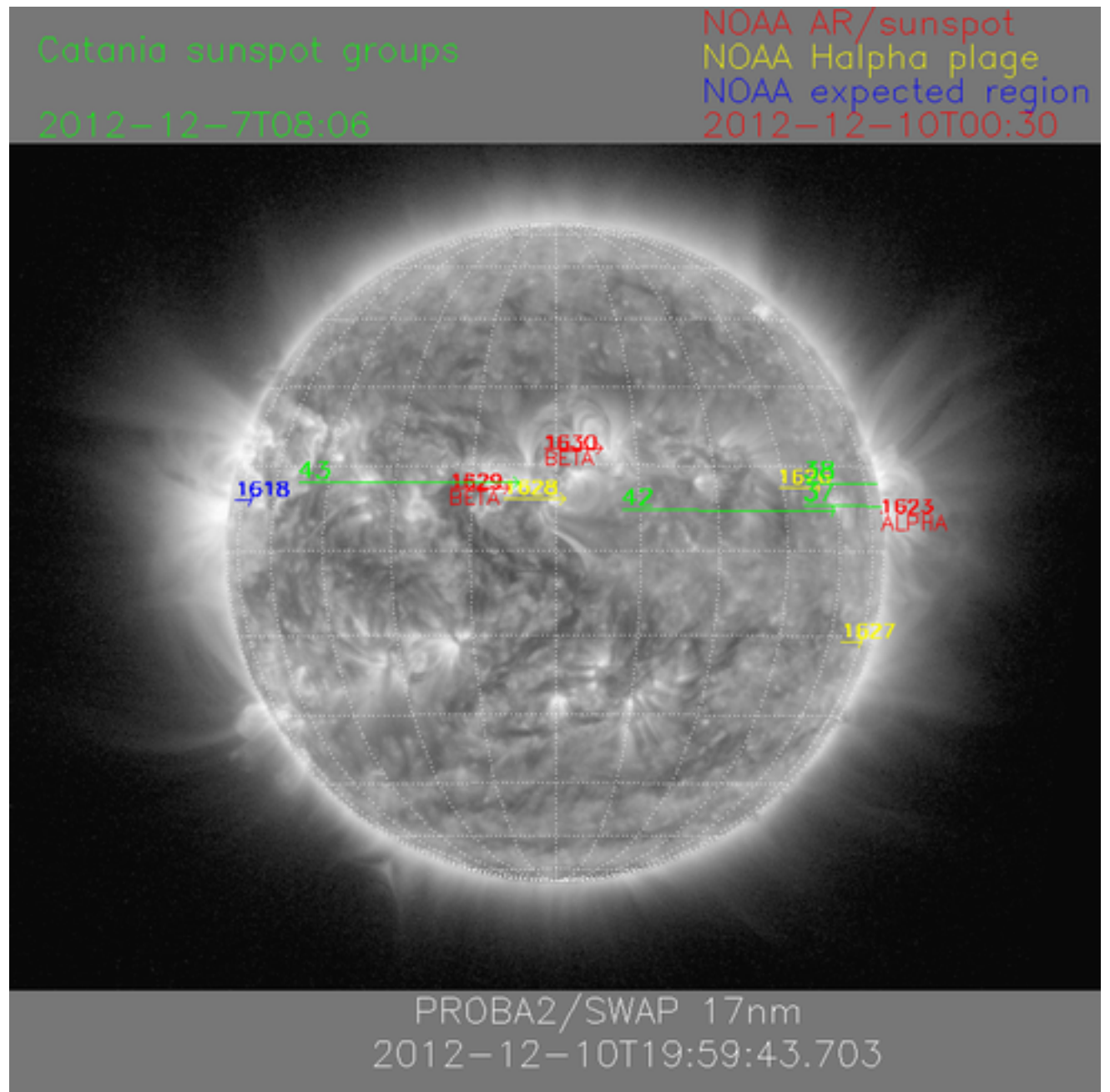
Overview

The level of solar activity¹ this week. Only M- and X-flares are mentioned:

	Monday 10 Dec	Tuesday 11 Dec	Wednesday 12 Dec	Thursday 13 Dec	Friday 14 Dec	Saturday 15 Dec	Sunday 16 Dec
Activity	low	very low	low	low	low	low	low
Flares	-	-	-	-	-	-	-

¹ See appendix. All timings are given in UT.

The SWAP images of Dec 10 and Dec 16 are shown below, with annotated active regions.

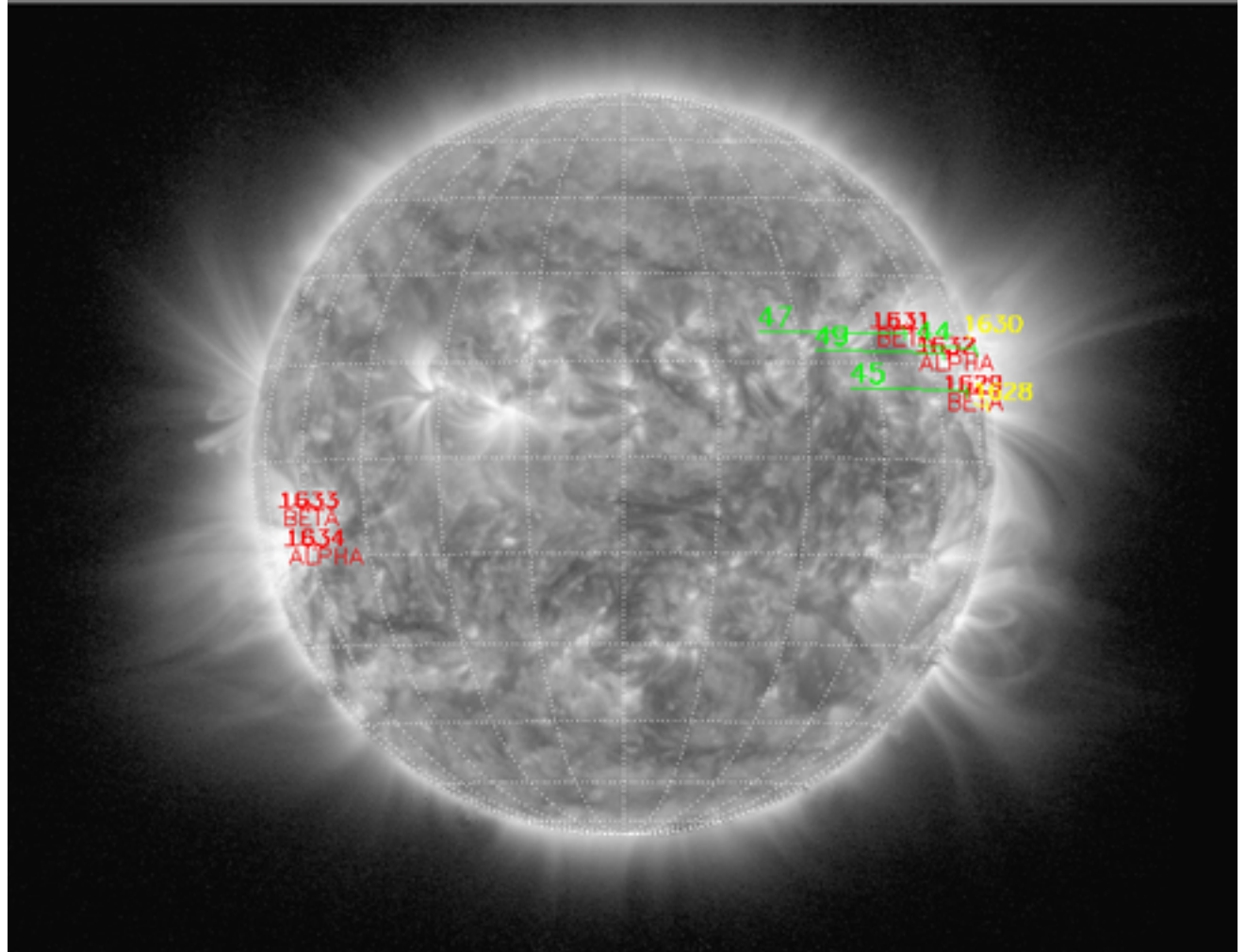


<http://sidc.be/html/CmapPage.html>

Catania sunspot groups

2012-12-14T09:48

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2012-12-16T00:30



PROBA2/SWAP 17nm
2012-12-16T19:49:29.572

Solar Activity

It was - again - a very calm week on the Sun. 7 C-level flares were recorded during the whole week.

In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: <http://proba2.oma.be/ssa>. This page also lists the recorded flaring events.

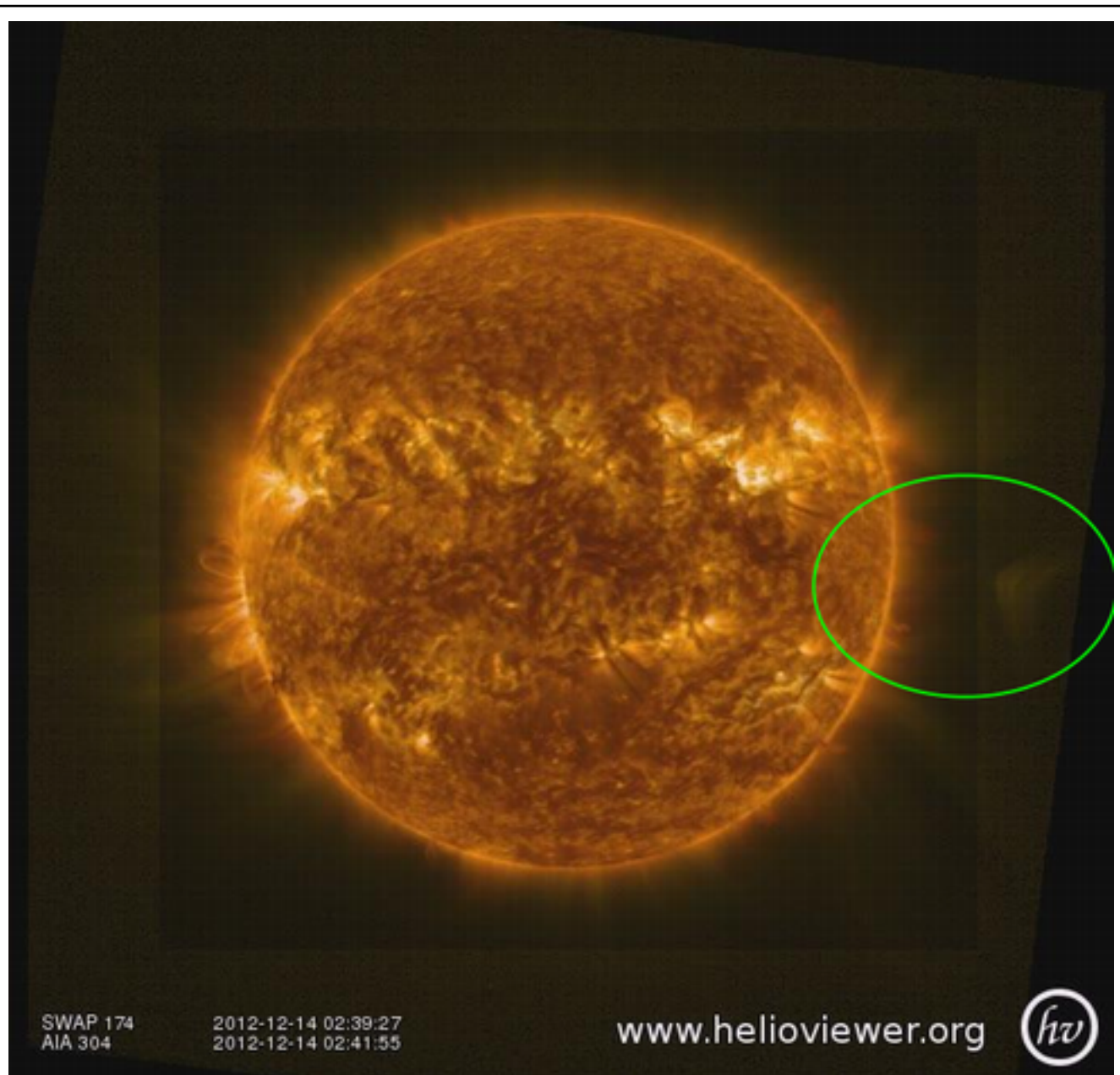
Despite the low level of flaring activity, several interesting events occurred. A movie with this week's prominence activities can be found [here](#).

Some of them are presented below:

1. C5.7 eruption 'on disk', together with an eruption on the NNW limb, very shortly followed by another eruption on the SE limb
2. Complex prominence eruption on the West limb during the night of 13 to 14 December.
3. Barely visible by SWAP: prominence eruption on the 14th, starting around 08:00 (spectacular in AIA/304)



C5.7 flare eruption 'on disk', eruption on the NNW limb, followed by an eruption on the SE limb (the latter is not visible on this picture, but see movie [here](#))



**A complex prominence eruption on the West limb
(helioviewer image; SWAP/174 & AIA/304 combination).
The large FoV of SWAP shows how far the expelled material can be followed.**

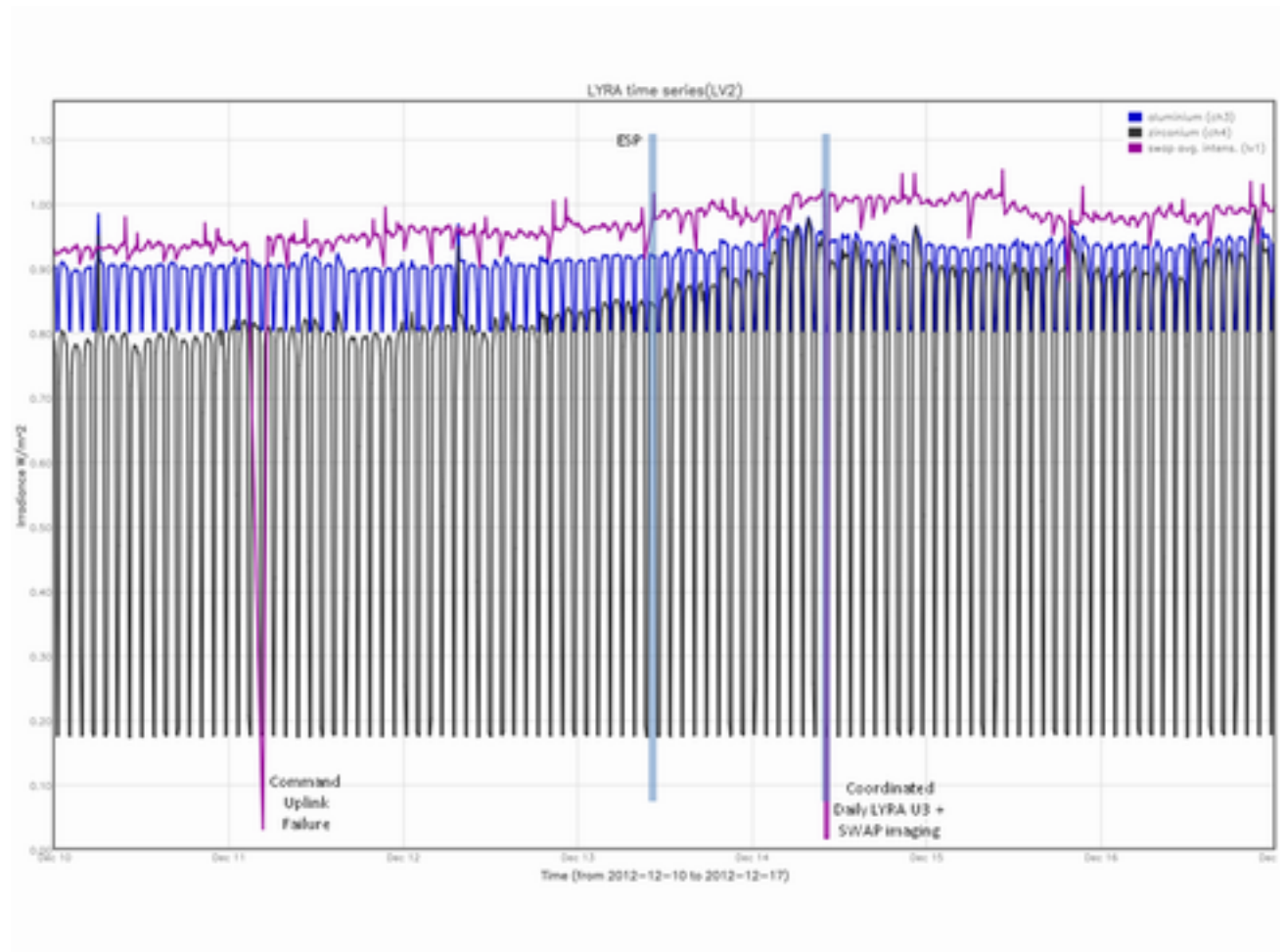
A movie of the above event can be found [here](#).

Barely visible with SWAP, a large prominence erupted on Dec 14, around 08:00, North East quadrant.

An overview of the weekly LYRA & SWAP data is provided below:

The following curves are visible:

- black: Zirconium Channel LYRA Unit 2
- blue: Aluminium Channel of LYRA Unit 2
- purple: WAVINT (solar intensity derived from 'integrated' SWAP images)



One single command out of 253 commands failed to get uplinked in time on a pass on Monday evening, explaining the dip in WAVINT on Tuesday morning (dark image). The result was an unintentional decrease in SWAP observation cadence.

The blue shaded periods correspond to, from left to right:

- ESP experiment on Thursday
- Coordinated imaging campaign with LYRA daily U3 campaign on Friday.

The orange shaded periods correspond to, from left to right:

- None

The red shaded period corresponds to:

- None

Outreach, papers, presentations, etc.

- None

Please also consult <http://proba2.oma.be/science/publications> for a list of interesting articles using SWAP & LYRA data, as well as a link to the complete article list.

Guest Investigator Programme

- None

2. LYRA instrument status

Calibration

No LYRA calibration this week.

IOS & operations

Monday 10 Dec	Tuesday 11 Dec	Wednesday 12 Dec	Thursday 13 Dec	Friday 14 Dec	Saturday 15 Dec	Sunday 16 Dec
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00292	LYIOS00293	LYIOS00293	LYIOS00293	LYIOS00293	LYIOS00294	LYIOS00294

The following science campaigns were performed by LYRA:

- the daily U3 campaign.

LYRA detector temperature

LYRA detector 2 temperature fluctuated between 41.2 and 38.7 degrees C, including the daily U3 activation periods. The latter result in a temperature increase of about 0.4 degrees.

To be explored

/

3. SWAP instrument status

Calibration

No SWAP calibration this week.

MCPM errors

The number of MCPM recoverable errors increased from 5449 to 5497.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 10 Dec	Tuesday 11 Dec	Wednesday 12 Dec	Thursday 13 Dec	Friday 14 Dec	Saturday 15 Dec	Sunday 16 Dec
Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition + ESP	Nominal acquisition + SWAP/LYRA coordination	Nominal acquisition	Nominal acquisition
IOS00432 548 images	IOS00433 515 images	IOS00433 547 images	IOS00433 547 images	IOS00433 602 images	IOS00434 562 images	IOS00434 547 images

Special operations for SWAP, this week:

- Occultation jumps
- ESP jump
- Coordinated imaging campaign with LYRA daily U3 campaign on Friday.

SWAP detector temperature

The SWAP Cold Finger Temperature, under nominal operations, increased generally, fluctuating between - 3.2 and - 4.8 degrees Celsius.

To be explored

/

4. PROBA2 Science Center Status

The main operator is Koen Stegen.

The following changes were made to the P2SC:

- None

5. Data reception & discussions with MOC

Passes

The delivery of the passes for this week (passes 9687 to 9744) was nominal, except for:

- None

Data coverage HK

All HK data files (LYRA_AD) have been received, except for:

- None

Data coverage SWAP

All SWAP Science data files (BINSWAP) have been received, except for:

- None

Total number of images between 2012 Dec 10 0UT and 2012 Dec 17 0UT: 3868

Highest cadence in this period: 29 seconds

Average cadence in this period: 156.36 seconds

Number of image gaps larger than 300 seconds: 106

Largest data gap: 31.83 minutes

The large gap is due to the ESP experiment on Thursday.

The number of (smaller) gaps is due to the implementation of the SWAP occultation jumps.

Data coverage LYRA

All LYRA Science data files (BINLYRA) have been received, except for:

- None

6. APPENDIX Frequently used acronyms

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
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
IOS	Instrument Operations Sheet
LED	Light Emitting Diode
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
PI	Principal Investigator
P2SC	PROBA2 Science Center
ROB	Royal Observatory of Belgium
SAA	South Atlantic Anomaly
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
TC	Telecommand
UTC	Coordinated Universal Time
UV	Ultraviolet

7. APPENDIX Solar Activity Definitions

In the science section we use the following solar activity standards.

The standard scale for solar activity is:

- very low (almost no flares, only B)
- low (a few C flares)
- moderate (many C flares and at least an M flare)
- high (several M flares and an X flare)
- very high (continuous background of C flares, numerous M flares, more than one X flare)
- (+ extreme?)