P2SC-ROB-WR-129-20120910 Weekly report #129	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Sep 10 to Sun Sep 16, 2012 19 Sep 2012 Erik Pylyser David Berghmans	Royal Observatory of Belgium PROBA2 Science Center
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1. Science

Solar & Space weather events

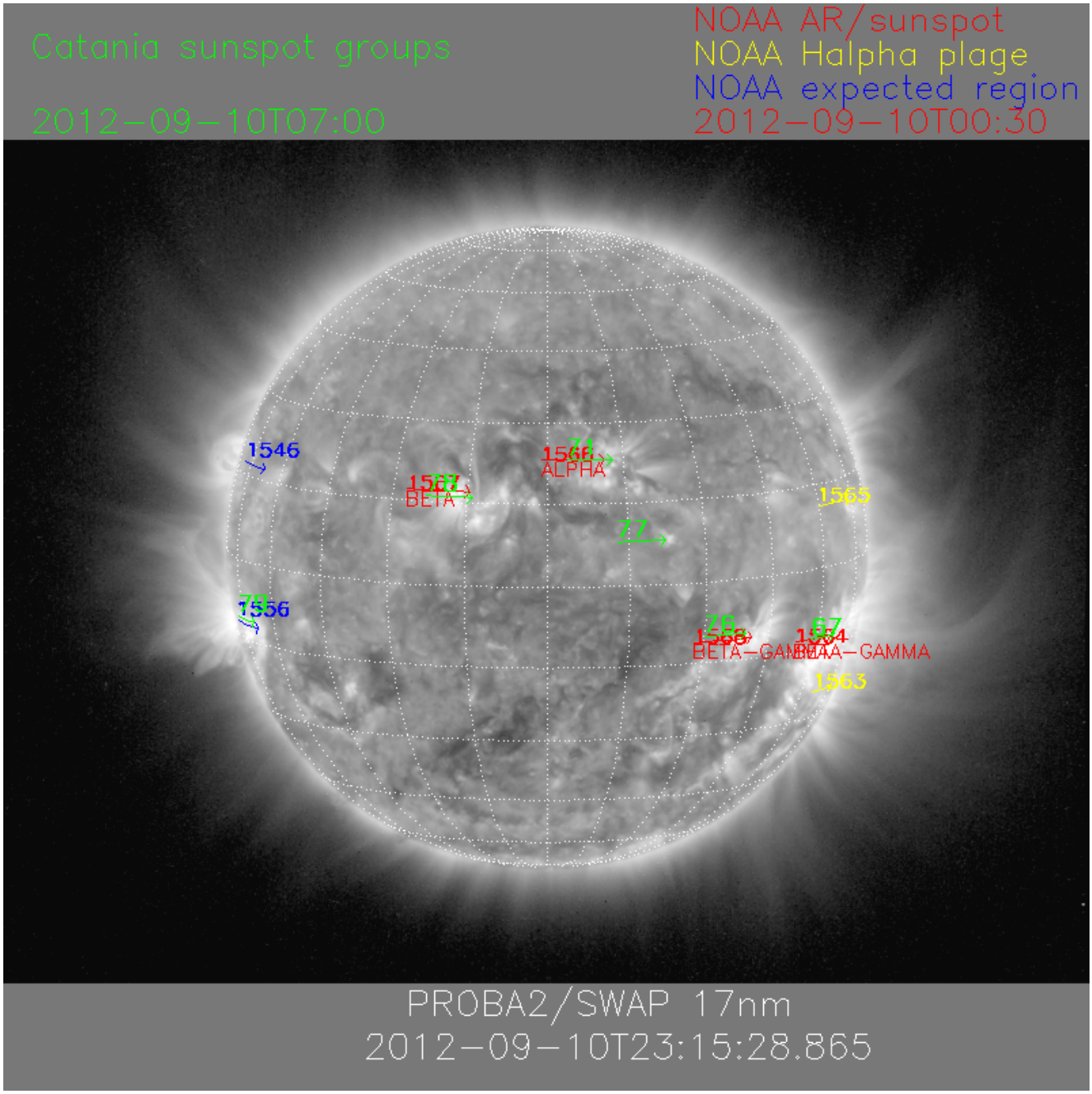
Overview

The level of solar activity[1] this week and associated M- and X-flares:

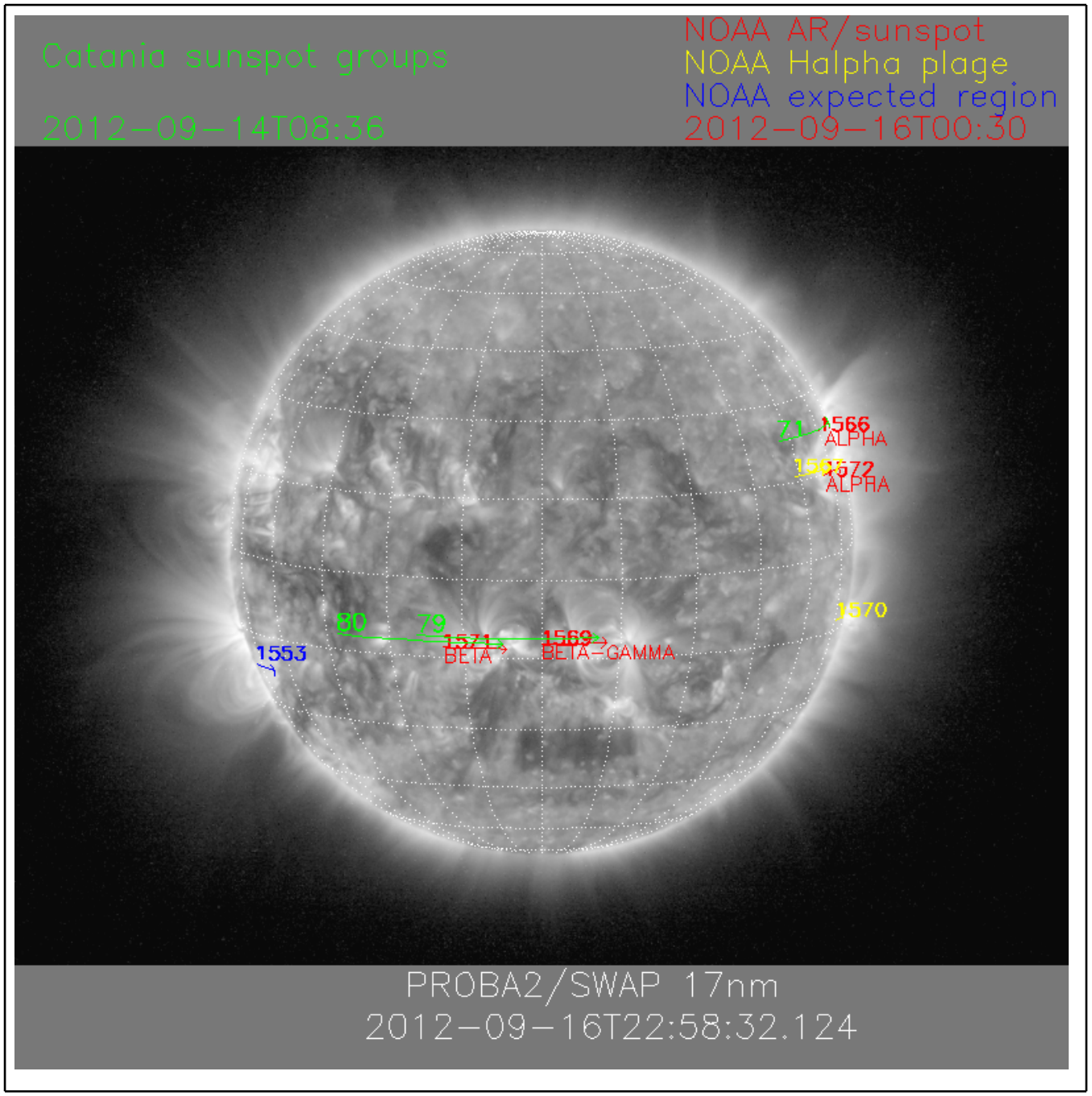
	Monday 10 Sep	Tuesday 11 Sep	Wednesday 12 Sep	Thursday 13 Sep	Friday 14 Sep	Saturday 15 Sep	Sunday 16 Sep
Activity	low	low	low	low	very low	very low	very low (none)
Flares	-	-	-	-	-	-	-

[1] See appendix. All timings are given in UT.

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



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


Catania sunspot groups
2012-09-14T08:36
NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2012-09-16T00:30
71
1566
ALPHA
1572
ALPHA
1570
80
79
1571
BETA
1569
BETA-GAMMA
1553
PROBA2/SWAP 17nm
2012-09-16T22:58:32.124

Solar Activity
This week, the Sun's activity level was *Low*, evolving to *Very Low* during the last 3 days of the 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.

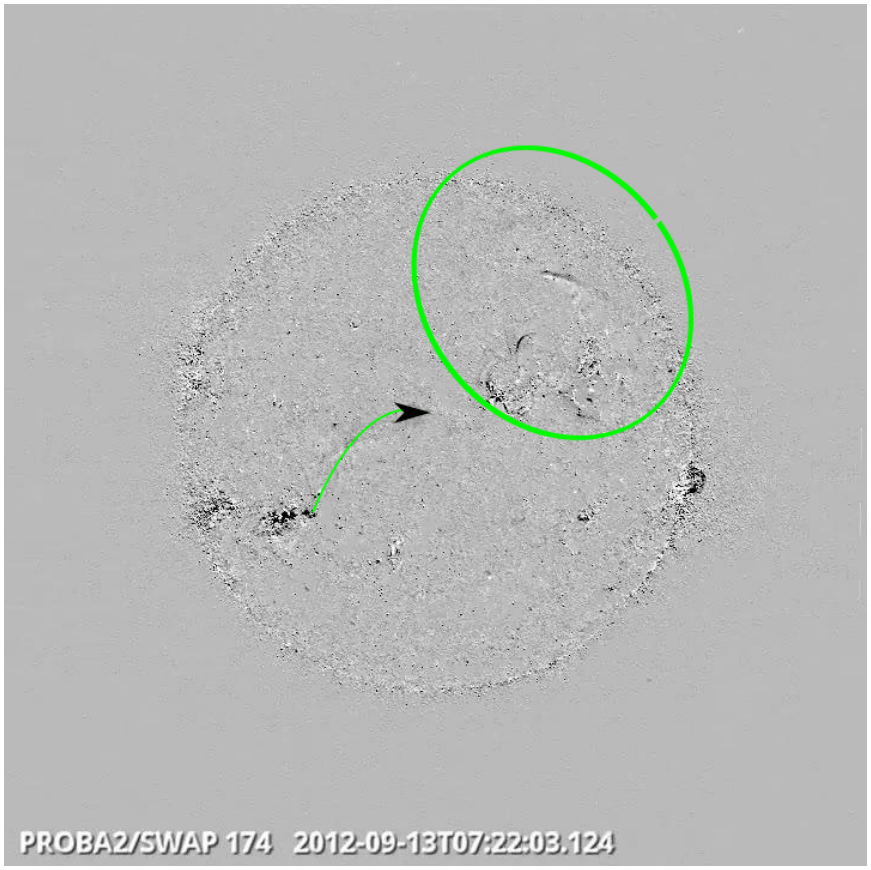
On September 10th, an eruption from AR 11567 is prominent in the daily difference movie (see image below).

At approximately the same time of this above eruption, one can slightly distinguish the start of a prominence eruption close to the Southern Pole - in Western direction, some of its ejected material moving along magnetic field lines towards AR 11563. Below is a picture showing the end phase of the eruption, where material is dumped along the magnetic field lines. This eruption starts to be visible around 10:08. SWAP movies can be found here (difference movie) and here (normal movie).

At other energy levels, this prominence eruption is more spectacular (see Helioviewer.org SDO/AIA/304 at the aforementioned time).

On Thursday 13th, two events can be observed in the early morning (UT).
In the North West quadrant, a filament located between AR 11566 and 11567 erupts around 06:13 (see pictures below and movie here).
The picture below, left is the SWAP difference image while the eruption is on-going. On the right, the same can be seen in H-alpha (picture extracted from this GONG movie). In SDO/AIA/304 (see Helioviewer.org), this erupting filament can be seen to move over more than half the Sun's surface before dissipating.

While the above eruption is on-going (see the North West quadrant below), around 07:13, in the South East quadrant, an eruption (C1.8 flare) in AR 11569 blows material away towards a non-active location (with opposite polarity) close to the center of the disk, right above the equator (see pictures below and movies here).

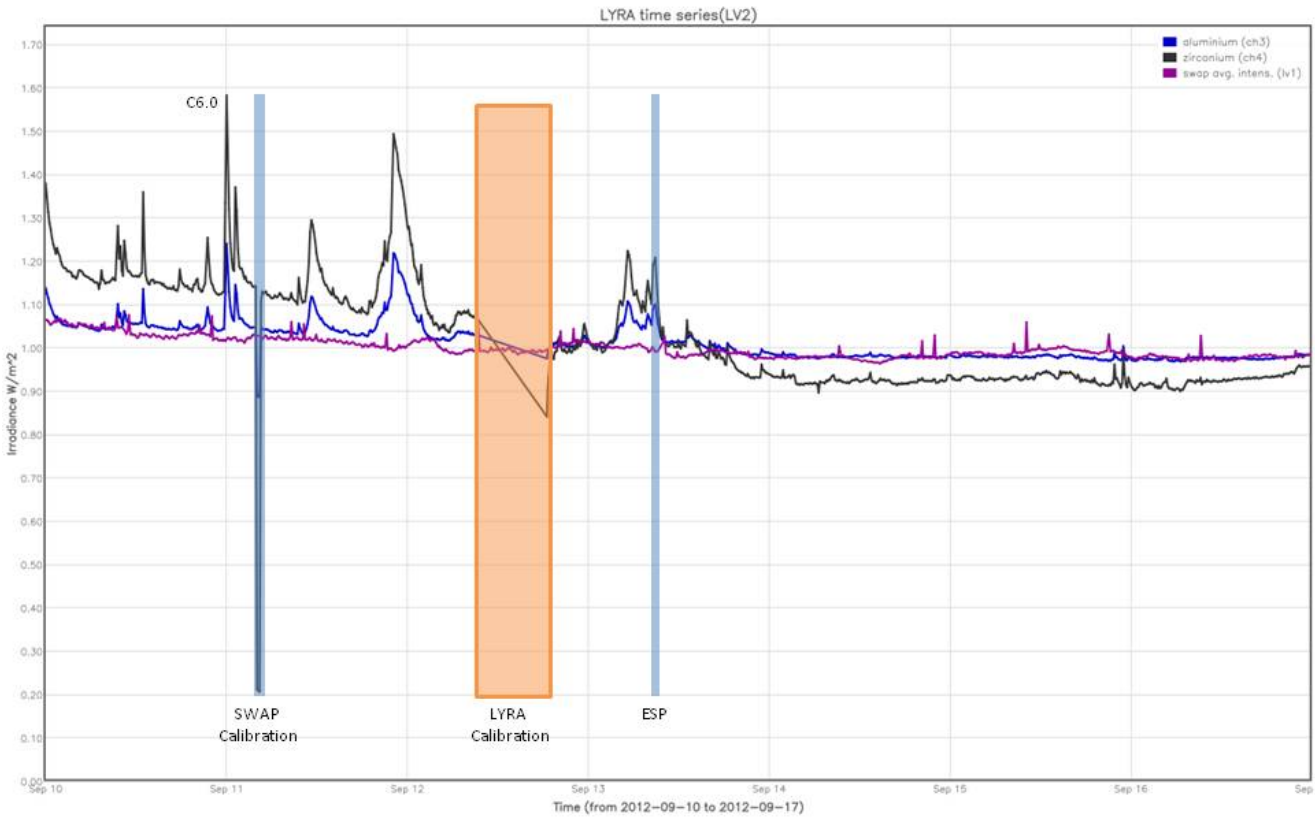


Such material exchange between AR 11569 and its ‘connection’ in the North happened several times during the day.

On Saturday 15th, a prominence eruption occurred on the North West limb, starting at 22:53 (see SWAP difference picture below):

On Sunday 16th, around 4:00 UT, material is being transferred along field lines from AR 11573 to a non-active region north of it (see SWAP difference picture below):

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: SWAVINT (solar intensity derived from ‘integrated’ SWAP images)



The blue shaded periods correspond to, from left to right:
- SWAP calibration
- ESP experiment on Thursday

The orange shaded periods correspond to, from left to right:
- LYRA calibration

The red shaded period corresponds to:
- None

Outreach, papers, presentations, etc.

- Specific interesting science topics (from section 1 above) are published in the weekly STCE bulletin.

- "PROBA2/SWAP observations of the large-scale, long-term evolution of the EUV corona", A. De Groof, D. Seaton, D. Berghmans; Talk at the 5th Solar Observer Workshop; Bruges, Belgium.

- "SoFast: Automated Flare Detection with the SWAP EUV Imager", K. Bonte, D. Berghmans, A. De Groof, S. Poedts; Poster at the 5th Solar Observer Workshop; Bruges, Belgium.

- "An analytical model for asymmetric magnetic reconnection during coronal eruption", D. Seaton, et al. Poster at the 5th Solar Observer Workshop; Bruges, Belgium.

- “Could Solar Orbiter observe Quasi-Periodic Pulsations during flares?” Dolla, L.; Poster at the 5th Solar Observer Workshop; Bruges, Belgium.

- “Multi-spacecraft analysis and modeling of a solar eruption on August 14, 2010”; D'Huys, E; Seaton, D; Poedts, S.; Poster at the 5th Solar Observer Workshop; Bruges, Belgium.

- Articles and posters presented at the ***5th Solar Observer Workshop*** in Bruges can/will be found here: http://proba2.oma.be/Presentations/20120910_SolarOrbiter5/

2. LYRA instrument status

Calibration

LYRA calibration on Wednesday.

IOS & operations

Monday 10 Sep	Tuesday 11 Sep	Wednesday 12 Sep	Thursday 13 Sep	Friday 14 Sep	Saturday 15 Sep	Sunday 16 Sep
Nominal acquisition + daily U3 LYIOS00267	Nominal acquisition + daily U3 LYIOS00268	Nominal acquisition + daily U3 + calibration LYIOS00268	Nominal acquisition + daily U3 LYIOS00268	Nominal acquisition + daily U3 LYIOS00268	Nominal acquisition+ daily U3 LYIOS00268	Nominal acquisition+ daily U3 LYIOS00268

- Except for the daily U3 campaign, no particular science campaigns this week.

LYRA detector temperature

LYRA detector 2 temperature fluctuated between 46.5 and 47.3 degrees (including the daily U3 activation periods). During calibration, temperature decreased to 45.0 degrees.

To be explored

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3. SWAP instrument status

Calibration

SWAP calibration on Tuesday.

MCPM errors

The number of MCPM recoverable errors increased from 3264 to 3457.

The number of MCPM unrecoverable errors is still 0.

IOS & operations

Monday 10 Sep	Tuesday 11 Sep	Wednesday 12 Sep	Thursday 13 Sep	Friday 14 Sep	Saturday 15 Sep	Sunday 16 Sep
Nominal acquisition IOS00412 543 images	Nominal acquisition + Calibration IOS00412 645 images	Nominal acquisition IOS00412 557 images	Nominal acquisition + ESP IOS00413 650 images	Nominal acquisition IOS00413 665 images	Nominal acquisition IOS00413 590 images	Nominal acquisition IOS00413 528 images

No special operations for SWAP, this week.

SWAP detector temperature

The SWAP Cold Finger Temperature fluctuated between - 0.72 and - 1.36 degrees Celsius, under nominal operations. During LYRA calibration, temperature increased to -0.49 degrees.

LAR delays were missed on the following occasions:
- none
causing each time a temporary increase of temperature of an estimated 0.6-0.7 degrees.

To be explored

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4. PROBA2 Science Center Status

The main operator is Koen Stegen.

The following changes were made to the P2SC:

13/09/2012: r4556 - Accelerate LYTMR.

5. Data reception & discussions with MOC

Passes

The delivery of the passes for this week (passes 8904 to 8962) 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 Sep 10 0UT and 2012 Sep 17 0UT: 4194
Highest cadence in this period: 30 seconds
Average cadence in this period: 144.22 seconds
Number of image gaps larger than 300 seconds: 2
Largest data gap: 34.33 minutes

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

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?)