


P2SC-ROB-WR-171 - 20130701 Weekly report #171	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Jul 01 to Sun Jul 07, 2013 10 July 2013  Matthew West, Laurel Rachmeler Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP Deputy PI, dan.seaton@sidc.be	<a href="http://proba2.sidc.be">http://proba2.sidc.be</a> ++ 32 (0) 2 3730559
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

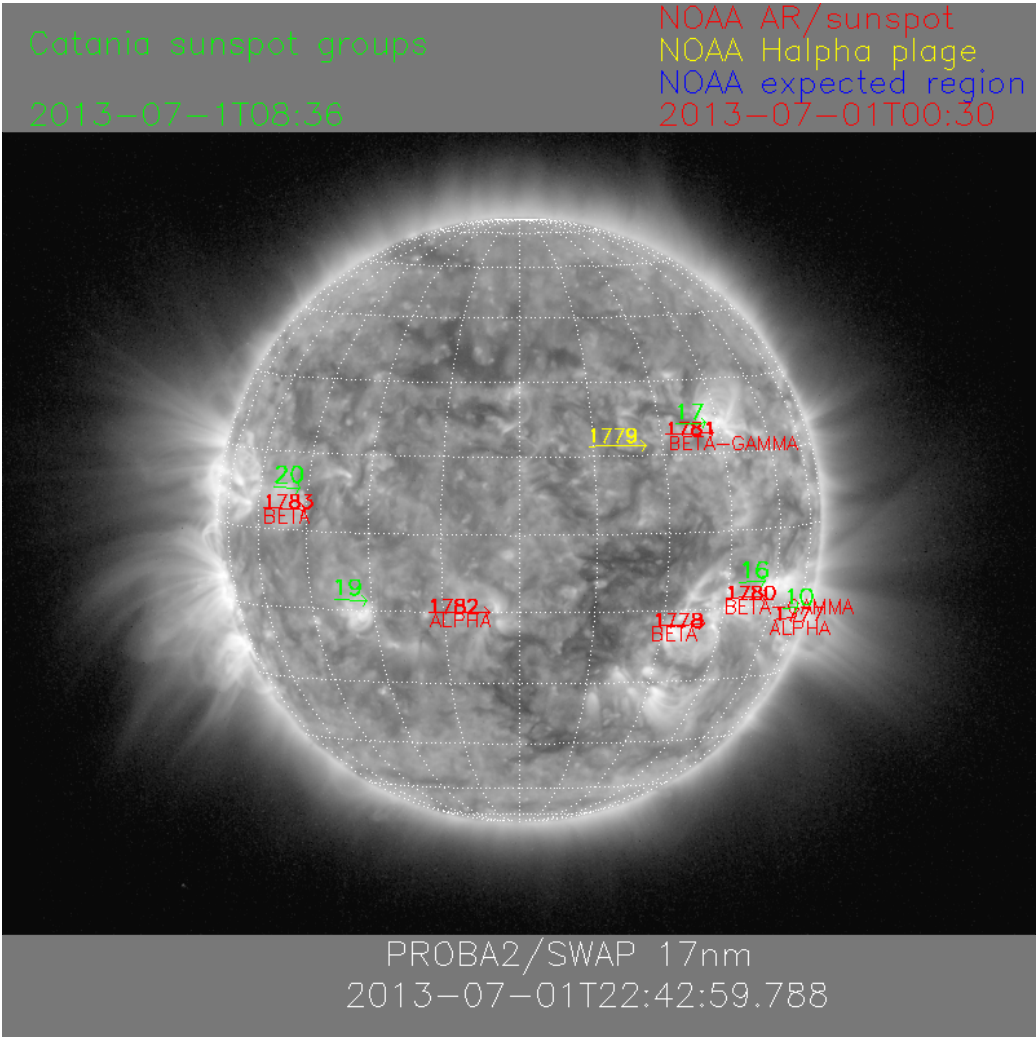
### Solar & Space weather events

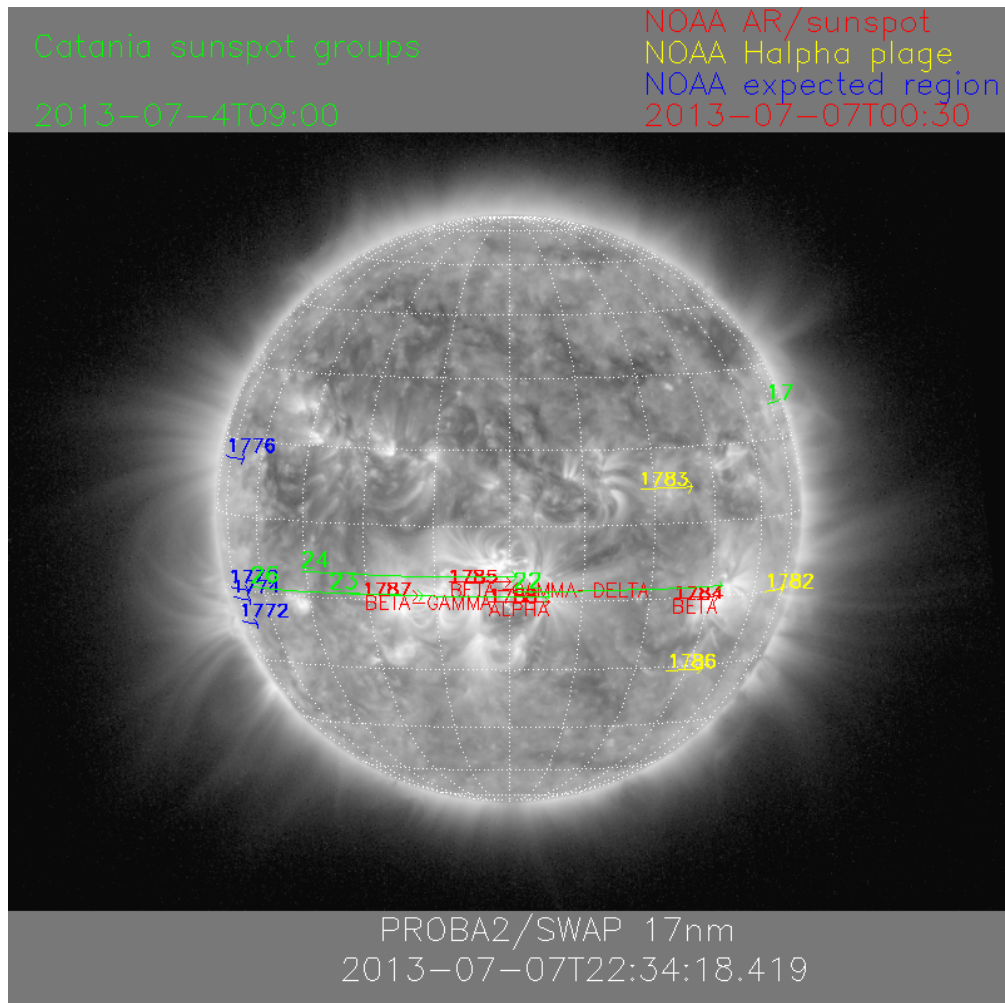
The level of solar activity<sup>1</sup> this week was **very low** to **moderate**. Only M- and X-flares are mentioned, the most energetic one(s) per day are presented in **bold**:

	Monday 01 Jul	Tuesday 02 Jul	Wednesday 03 Jul	Thursday 04 Jul	Friday 05 Jul	Saturday 06 Jul	Sunday 07 Jul
Activity	very low	low	moderate	low	low	low	low
Flares	-	-	<b>M1.5 @ 7:08</b>	-	-	-	-

<sup>1</sup> See appendix. All timings are given in UT.

The SWAP images of July 01 and July 07 are shown below, with annotated active regions.





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

### Solar Activity

Solar (flaring) activity was low to moderate this week. A new set of sunspot groups emerged around the East limb, and were relatively active with many small flares and frequent localized flows. Several CMEs originated from these active regions. Most of the larger-scale activity, such as the one M-class flare (M1.5 @ 7:08 on Wednesday from AR 11787) occurred around the middle of the week.

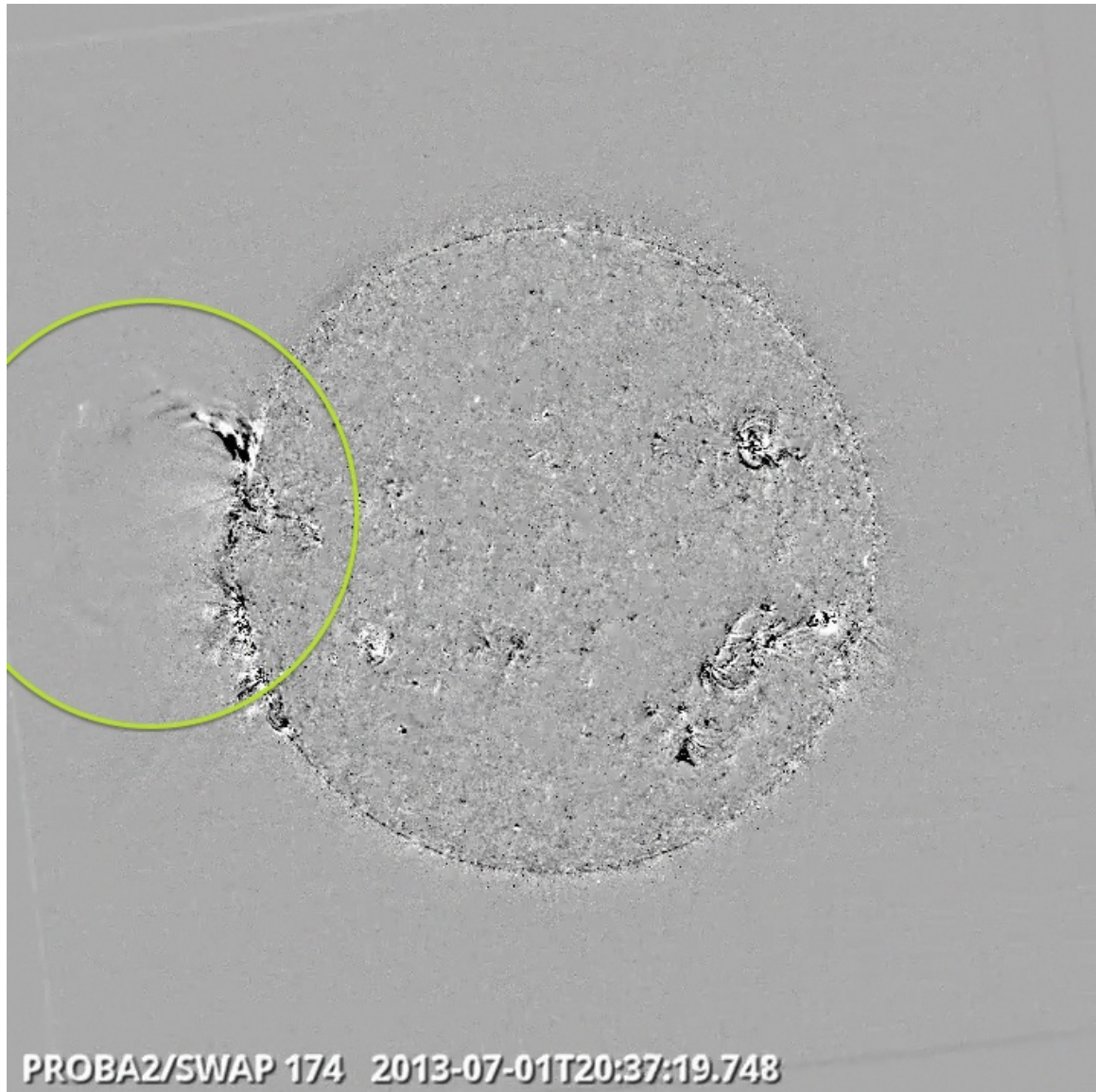
In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: <http://proba2.oma.be/ssa>. This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP174/AIA304 combination; HelioViewer.org).

Details about some of this week's events, can be found further below.

Monday July 1st:

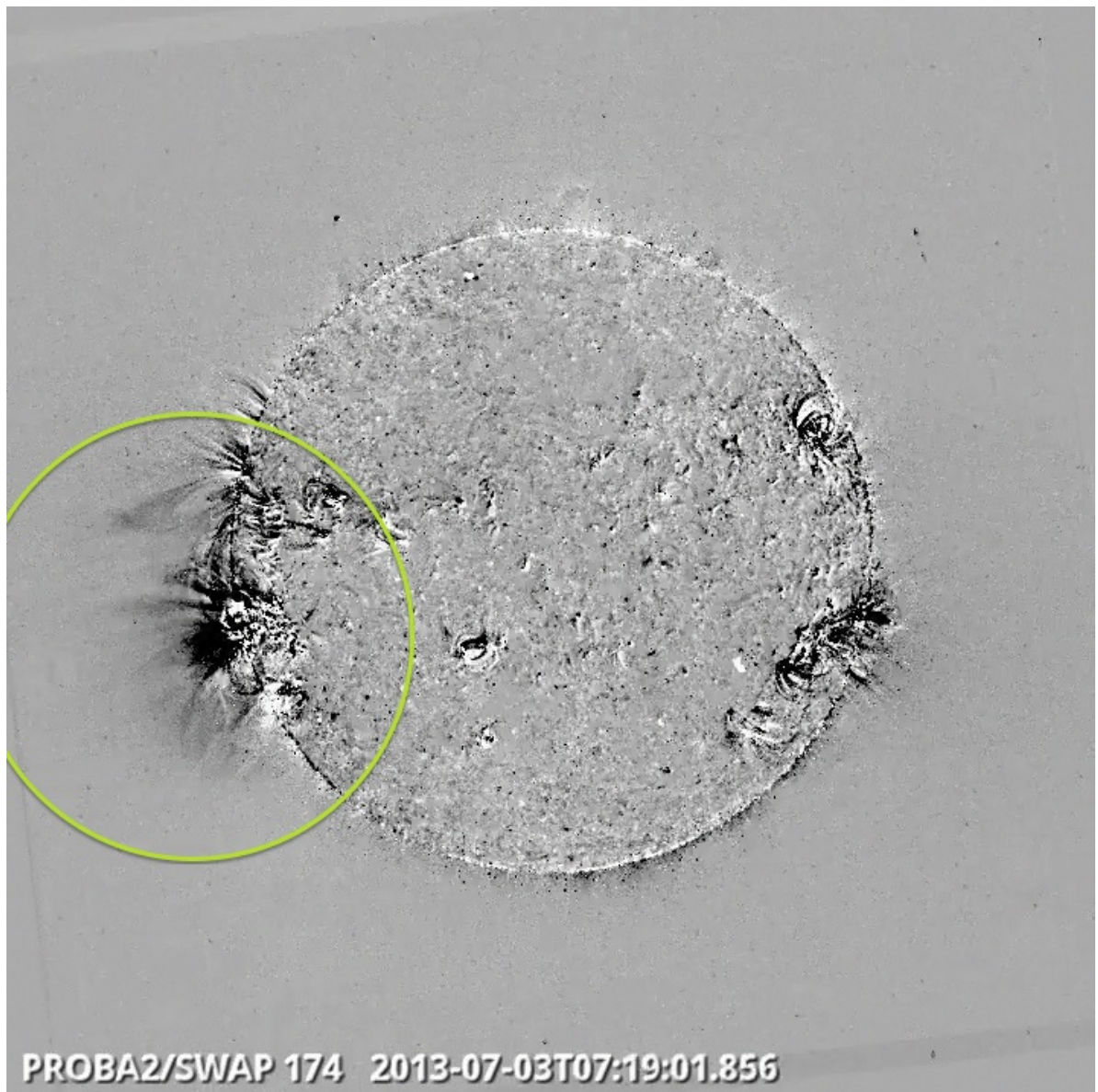
There was a very nice prominence eruption from the East limb that could be seen out to the edge of the SWAP FOV. A clear partial halo CME was seen in LASCO data from this event.



**Prominence Eruption East limb @ 20:37 - SWAP difference image**



Wednesday July 3rd:

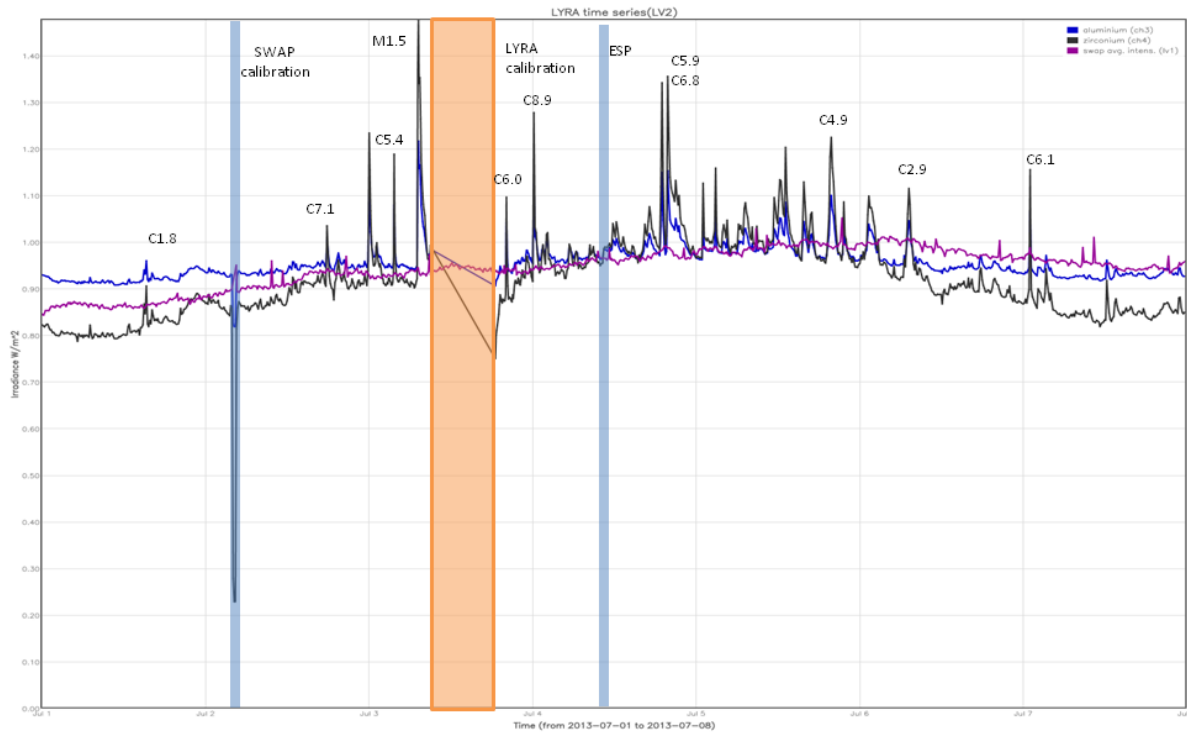


**M1.5 flare and eruption East limb @ 07:17 - SWAP difference image**

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 on Tuesday
- ESP experiment on Thursday

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

- LYRA Calibration on Wednesday

The red shaded period corresponds to:

- None

## **Outreach, papers, presentations, etc.**

Please 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.

The science section of this weekly report is also published in the weekly STCE newsletter (<http://www.stce.be/newsletter/newsletter.php>).

Muzhou Lu (Former GI) at Williams College, in the US presented PROBA2 images at an art exhibition.

## **Guest Investigator Program**

The fourth call for the GI program went out this week. Adverts were submitted to newsletters: Solar News, UKSP Newsletter, MIST. Web pages; UKSP, ESA and mailing lists; SHINE, eHeroes, CHARM, swap lyra Internally, Degradation team, EVE team (AIA). As well as to several individuals.

- Nandita Srivastava (SWAP/LYRA) - Role of eruptive filaments/prominences in initiation and propagation of CMEs in heliosphere using SWAP & LYRA Observations: (from June 20 to July 23).
- Farid Goryaev (SWAP) - Study of EUV emission of the inner corona and its modeling using the PROBA2/SWAP and Hinode/EIS data (from July 01 to July 15).

## 2. LYRA instrument status

### Calibration

LYRA calibration on Wednesday.

### IOS & operations

Monday 01 Jul	Tuesday 02 Jul	Wednesday 03 Jul	Thursday 04 Jul	Friday 05 Jul	Saturday 06 Jul	Sunday 07 Jul
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3 + calibration	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00335	LYIOS00335	LYIOS00335	LYIOS00335	LYIOS00335	LYIOS00335	LYIOS00335

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.88 and 46.88 degrees C, taking into account the daily U3 activation periods; the latter result in a temperature increase of about 0.0 degrees C.

### To be explored

- None



### 3. SWAP instrument status

#### Calibration

SWAP calibration on Tuesday.

#### MCPM errors

The number of MCPM recoverable errors increased from 9171 to 9415.

The number of MCPM unrecoverable errors remained at 1127.

#### IOS & operations

Monday 01 Jul	Tuesday 02 Jul	Wednesday 03 Jul	Thursday 04 Jul	Friday 05 Jul	Saturday 06 Jul	Sunday 07 Jul
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition	Nominal acquisition + ESP	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00469 540 images	IOS00469 624 images	IOS00469 614 images	IOS00469 595 images	IOS00469 558 images	IOS00469 598 images	IOS00469 505 images

Special operations for SWAP, this week:

- ESP jump on Thursday

#### SWAP detector temperature

The SWAP Cold Finger Temperature, globally varied between -1.51 and -0.51 degrees C.

#### To be explored

- None

## **4. PROBA2 Science Center Status**

The main operator is Koen Stegen.

Due to a (known, and very specific) LYTMR data path, BINLYRA\_11292 was not processed. This caused a data gap between Saturday 15/06 22:56 and Sunday 16/06 02:12. Once an improved data path is used, a re-run will make all these data available.

The following changes were made to the P2SC:

### **LY-TAF**

- 13/06/2013: r4826; Add recovery event type.
- 13/06/2013: r4828; Add Temp > 50 event type.

## **5. Data reception & discussions with MOC**

### **Passes**

The delivery of the passes for this week (passes 11424 to 11482) was nominal, except for:

- None

### **Data coverage HK**

All HK data files (LYRA\_AD) have been received, except:

- None

### **Data coverage SWAP**

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

- None

Total number of images between 2013 Jul 01 0UT and 2013 Jul 08 0UT: 4034

Highest cadence in this period: 30 seconds

Average cadence in this period: 149.94 seconds

Number of image gaps larger than 300 seconds: 2

Largest data gap: 34.33 minutes

The largest gap is due to the ESP campaign on Thursday.

### **Data coverage LYRA**

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

- 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
ESP	Experimental Solar Panel
FITS	Flexible Image Transport System
FOV	Field Of View FPA Focal Plane Assembly
FPGA	Field Programmable Gate Arrays
GPS	Global Positioning System
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
OBSW	On board Software
PI	Principal Investigator
P2SC	PROBA2 Science Center
ROB	Royal Observatory of Belgium
SAA	South Atlantic Anomaly
SEU	Single Event Upset
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
VFC	Voltage to Frequency Converter

## 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?)