


P2SC-ROB-WR-189- 20131104 Weekly report #189	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Nov 04 to Sun Nov 10, 2013 13 Nov 2013  Robbe Vansintjan Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP PI, dseaton@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, Juha-Pekka.Luntama@esa.int	

## 1. Science

### Solar & Space weather events

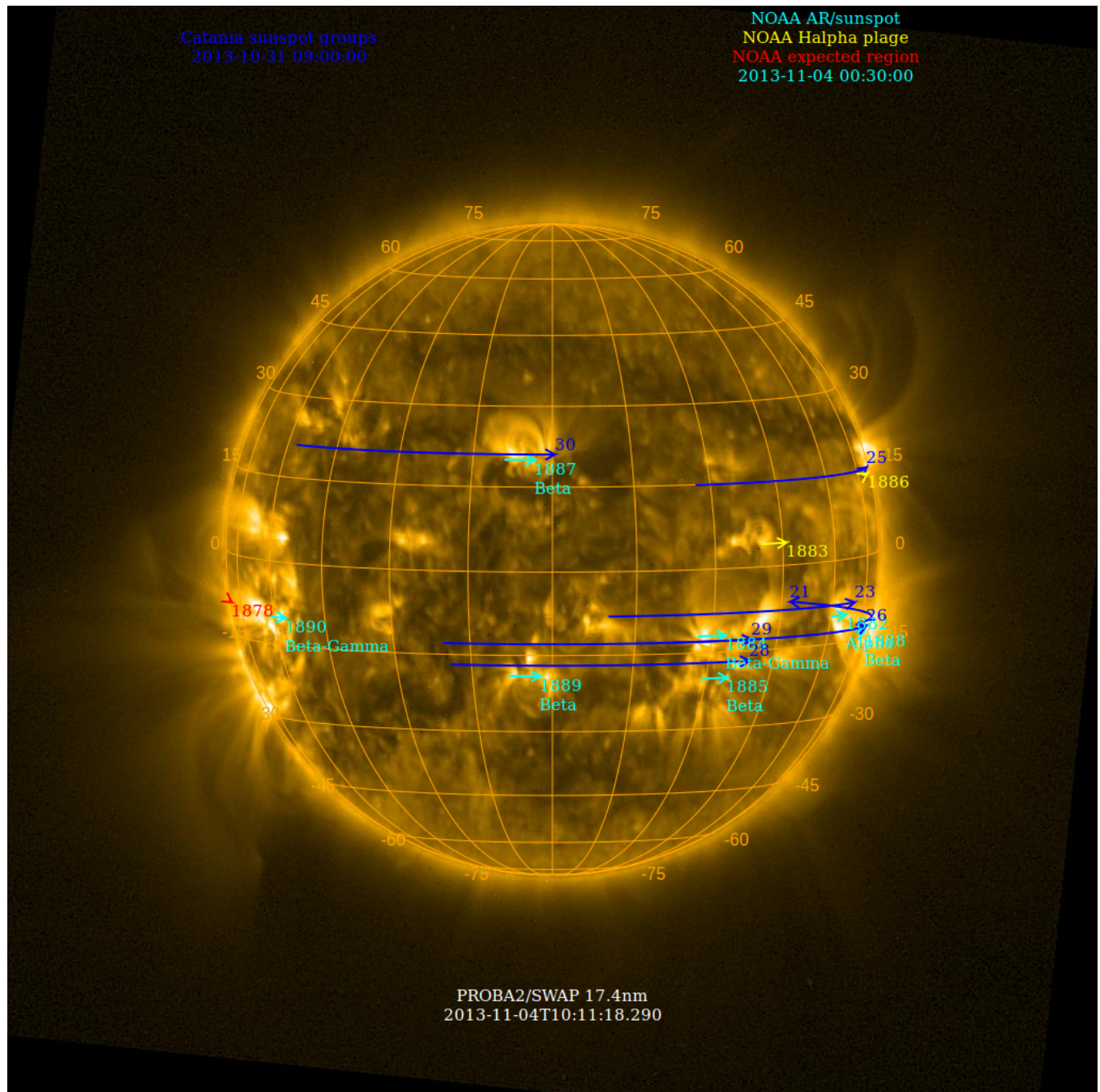
The level of solar activity<sup>1</sup> fluctuated between **low** and **high** this week.

Only M- and X-flares are mentioned, the most energetic one(s) per day are presented in **bold**:

	Monday 04 Nov	Tuesday 05 Nov	Wednesday 06 Nov	Thursday 07 Nov	Friday 08 Nov	Saturday 09 Nov	Sunday 10 Nov
Activity	low	high	moderate	moderate	high	low	high
Flares	-	<b>X3.3@22:12</b> <b>M1.0@18:13</b> <b>M2.5@08:18</b>	<b>M3.1@13:46</b>	<b>M2.4@14:25</b> <b>M2.3@03:40</b> <b>M1.8@00:02</b>	<b>M2.3@09:28</b> <b>X1.1@04:26</b>	-	<b>X1.1@05:14</b>

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

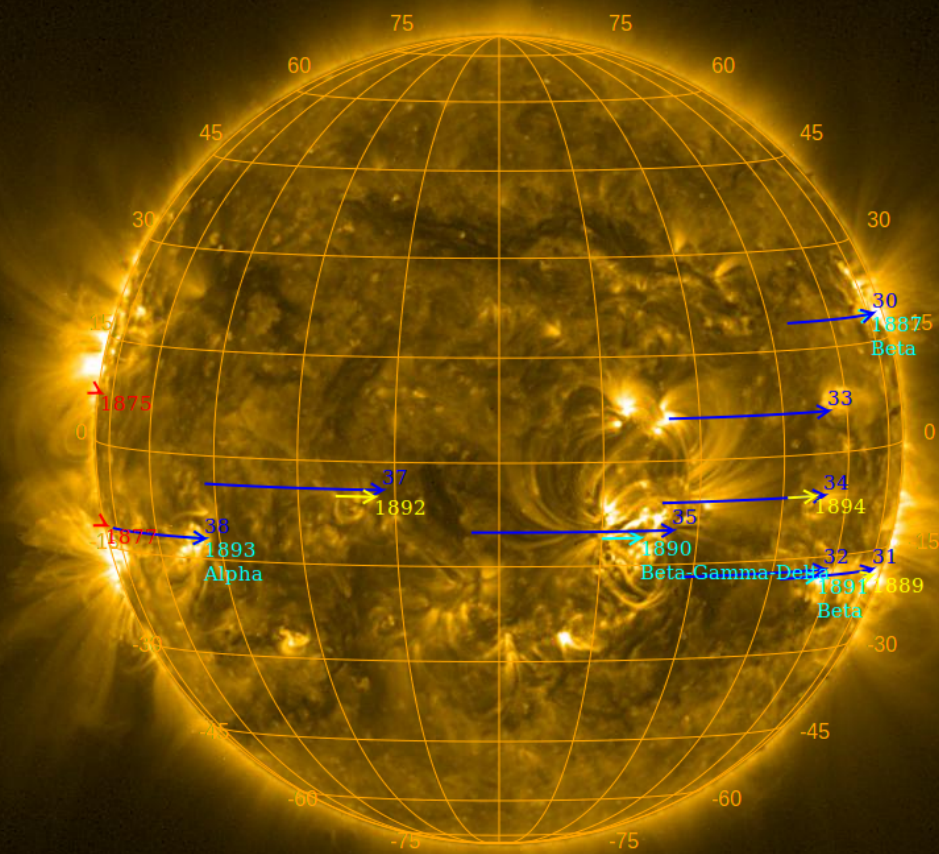
The SWAP images of Nov 04 and Nov 10 are shown below, with annotated active regions.



<http://sidc.be/soteria/soteria.php>

Catania sunspot groups  
2013-11-08 09:00:00

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2013-11-10 00:30:00



PROBA2/SWAP 17.4nm  
2013-11-10T10:12:16.086

### **Solar Activity**

Solar flare activity fluctuated between low and high during 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](#) (SWAP week 189).

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



Tuesday Nov 05



**Eruption on south west quad @ 06:02 - SWAP difference image**  
Find a movie of the event [here](#) (SWAP difference movie)



**X-flare and EIT-wave on south east limb @ 22:30 - SWAP difference image**

Find a movie of the event [here](#) (SWAP difference movie)

Find a movie of the event [here](#) (SWAP movie)

Wednesday Nov 06



**Eruption on south east quad @ 14:07 - SWAP difference image**

Find a movie of the event [here](#) (SWAP difference movie)

Find a movie of the event [here](#) (SWAPmovie)





PROBA2/SWAP 174 2013-11-06T23:55:53.170

**Eruption on west Limb @ 23:55 - SWAP difference image**

Find a movie of the event [here](#) (SWAP difference movie)



Sunday Nov 10

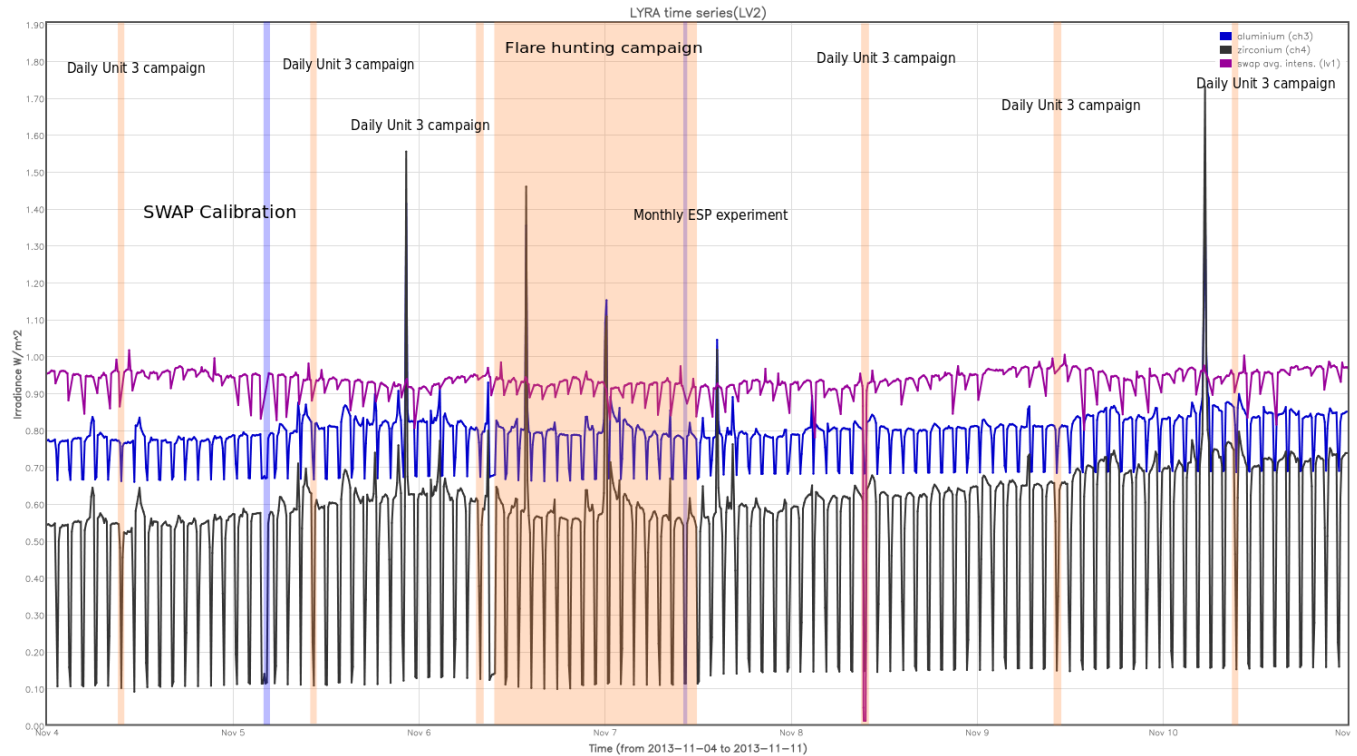


**Eruption on south east quad @ 05:17 - SWAP difference image**  
Find a movie of the event [here](#) (SWAP difference movie)

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 (SWAP Average Intensity; integrated solar intensity per SWAP image pixel )



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

- Calibration
- Monthly ESP experiment

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

- Daily unit 3 campaigns, 3 times
- Flare hunting campaign
- Daily unit 3 campaign, 3 times

**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>).

**Guest Investigator Program**

- Vida Zigma currently visiting on the GI program. Working with MD. Use a model with LYRA data to determine the ionisation increase in the ionosphere during flares.



## 2. LYRA instrument status

### Calibration

No calibration this week.

### IOS & operations

Monday 04 Nov	Tuesday 05 Nov	Wednesday 06 Nov	Thursday 07 Nov	Friday 08 Nov	Saturday 09 Nov	Sunday 10 Nov
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3 + flare hunting campaign	Nominal acquisition + flare hunting campaign	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00348	LYIOS00348 -> LYIOS00349	LYIOS00349	LYIOS00350	LYIOS00350	LYIOS00350	LYIOS00350

The following science campaigns were performed by LYRA:

- daily U3 observations campaign
- flare hunting campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 44.8 and 51.8 °C, taking into account the daily U3 activation periods and flare hunting campaign; the former resulted in a temperature increase of about 0.6 °C and the later in a temperature increase of 1.9°C.

### To be explored

- None

### 3. SWAP instrument status

#### Calibration

No calibration this week.

#### MCPM errors

The number of MCPM recoverable errors increased from 13570 to 13809.

The number of MCPM unrecoverable errors remained at 1127.

#### IOS & operations

Monday 04 Nov	Tuesday 05 Nov	Wednesday 06 Nov	Thursday 07 Nov	Friday 08 Nov	Saturday 09 Nov	Sunday 10 Nov
Nominal acquisition	Nominal acquisition + callibraion	Nominal acquisition	Nominal acquisition + ESP experiment	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00480 607 images	IOS00480 617 images	IOS00480 603 images	IOS00481 570 images	IOS00481 643 images	IOS00481 581 images	IOS00481 594 images

Special operations for SWAP, this week:

- calibration
- ESP experiment

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.4 and 2.9 °C.

#### To be explored

- None

#### **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 12511 to 12569) 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 Nov 04 OUT and 2013 Nov 11 OUT: 4215

Highest cadence in this period: 0 seconds

Average cadence in this period: 143.49 seconds

Number of image gaps larger than 300 seconds: 102

Largest data gap: 31.83 minutes

### **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)