


P2SC-ROB-WR-186- 20131014 Weekly report #186	<b>P2SC Weekly report</b>	
Period covered: Issue date:  Written by: Approved by:	Mon Oct 14 to Sun Oct 20, 2013 23 Oct 2013  Robbe Vansintjan Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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## 1. Science

### Solar & Space weather events

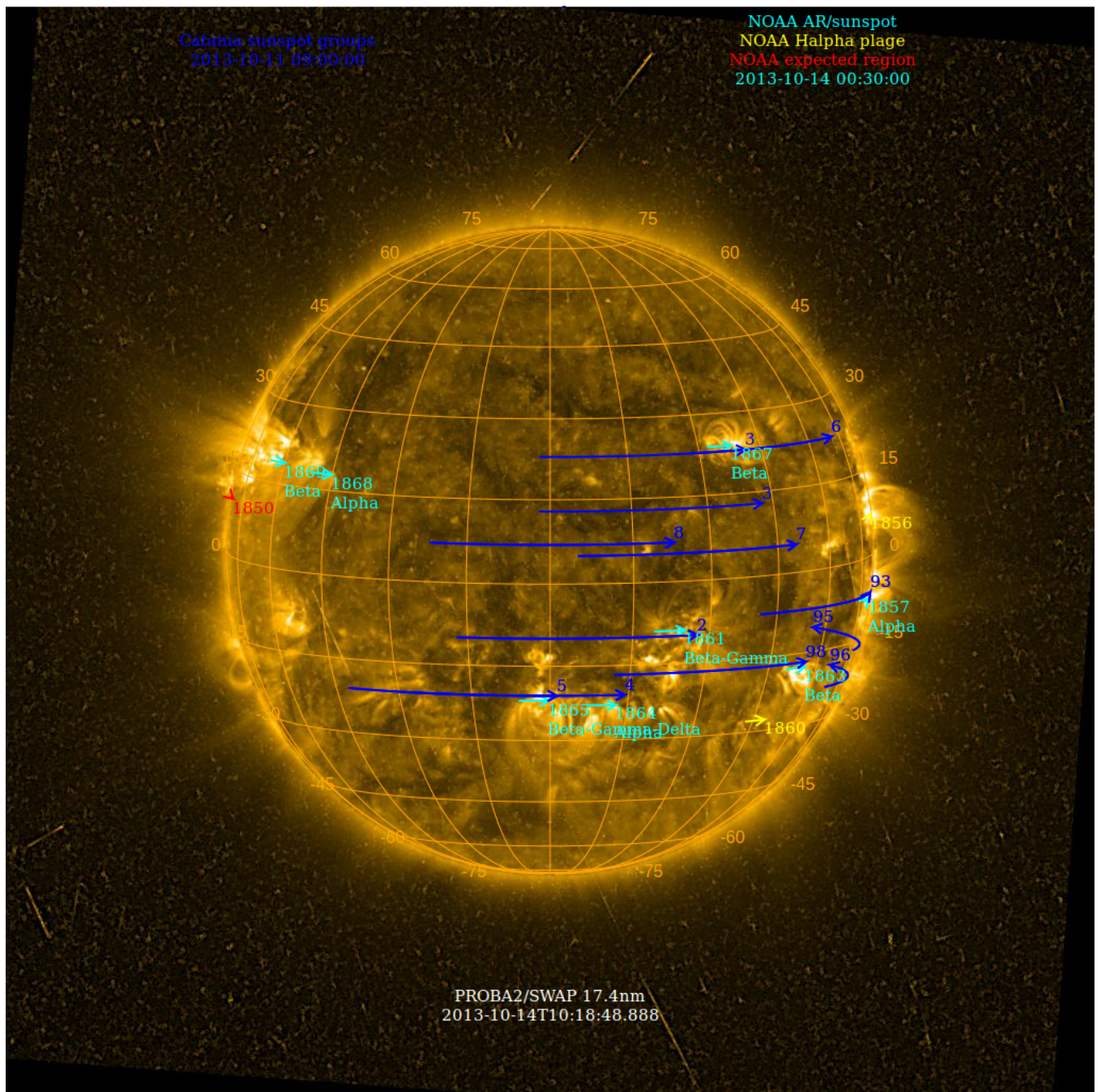
The level of solar activity<sup>1</sup> fluctuated between **low** and **moderate** this week.

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

	Monday 14 Oct	Tuesday 15 Oct	Wednesday 16 Oct	Thursday 17 Oct	Friday 18 Oct	Saturday 19 Oct	Sunday 20 Oct
Activity	low	moderate	low	moderate	low	low	low
Flares	-	<b>M1.8@08:38</b> <b>M1.3@23:36</b>	-	<b>M1.2@15:41</b>	-	-	-

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

The SWAP images of Oct 14 and Oct 20 are shown below, with annotated active regions.

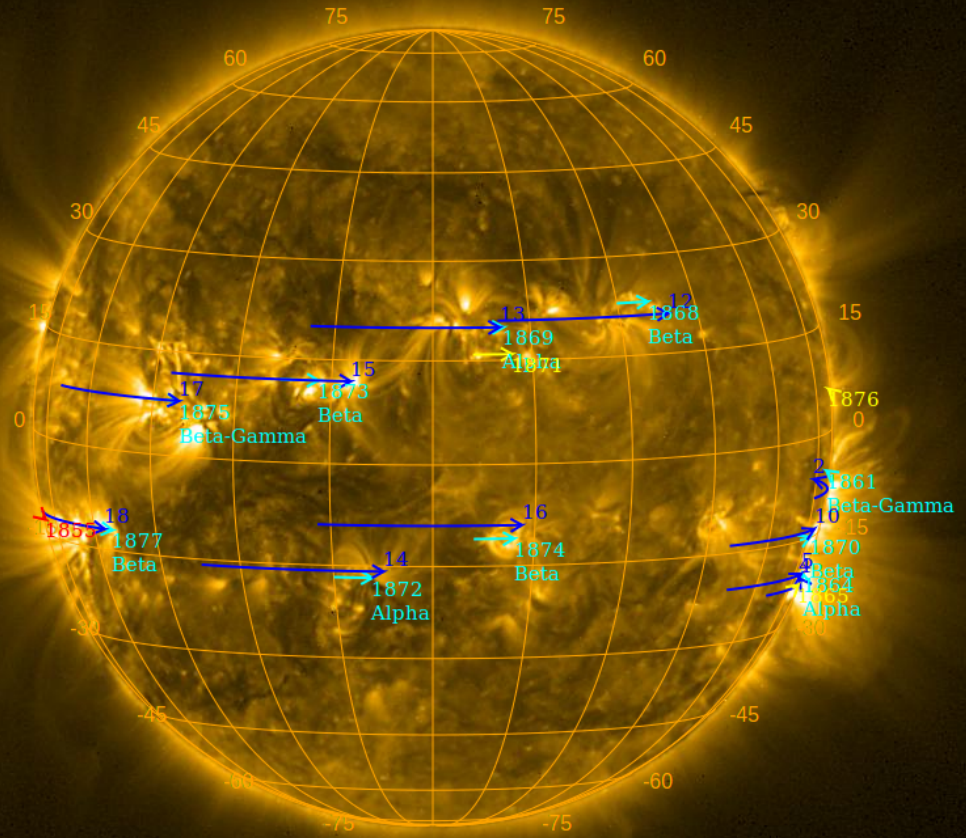


<http://sidc.be/soteria/soteria.php>



Catania sunspot groups  
2013-10-18 09:00:00

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2013-10-20 00:30:00



PROBA2/SWAP 17.4nm  
2013-10-20T10:22:34.760

### **Solar Activity**

Solar flare activity fluctuated between low and moderate 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 186).

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

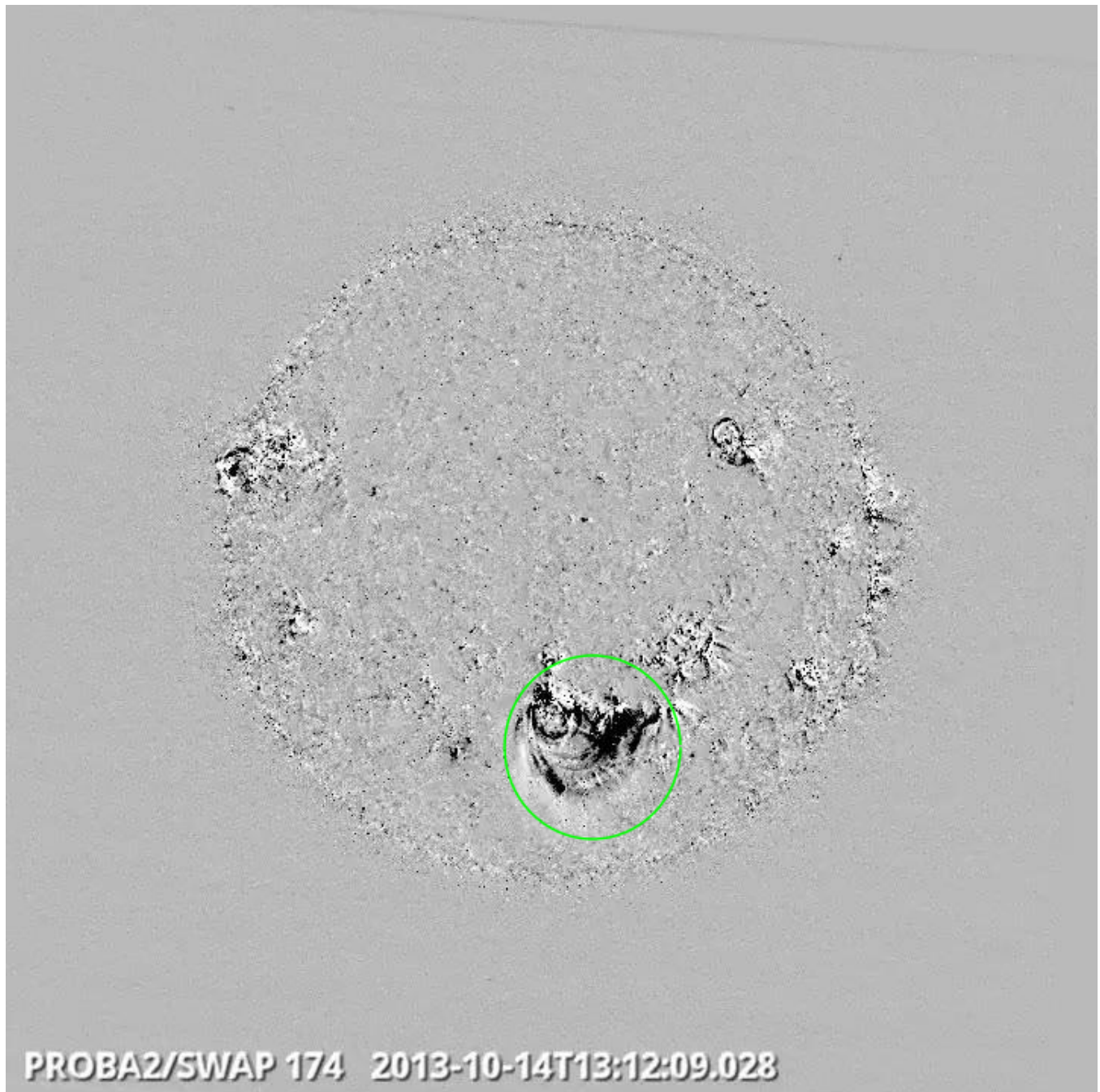
Monday Oct 14





**Eruption on the east limb @ 03:29 - SWAP difference image**

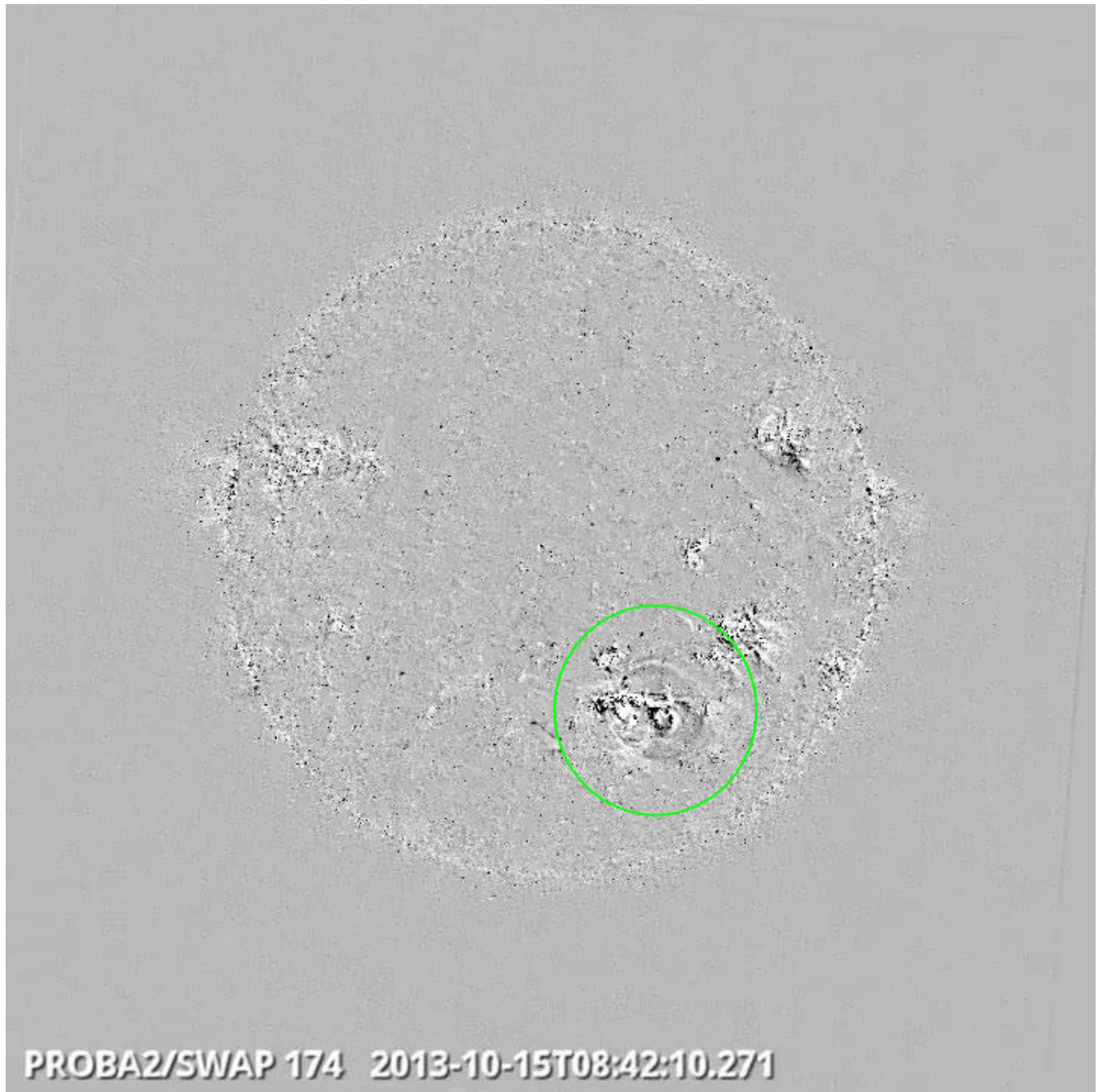
Find a movie of the events [here](#) (SWAP difference movie)



**Eruption on the south western quadrant @ 13:12 - SWAP difference image**

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

Tuesday Oct 15



**Possible EUV wave on the south western quadrant @ 08:42 - SWAP difference image**  
Find a movie of the events [here](#) (SWAP difference movie)

Sunday Oct 20



**Large expanding loop on the north western limb @ 06:00 - SWAP difference image**  
Find a movie of the events [here](#) (SWAP difference movie)





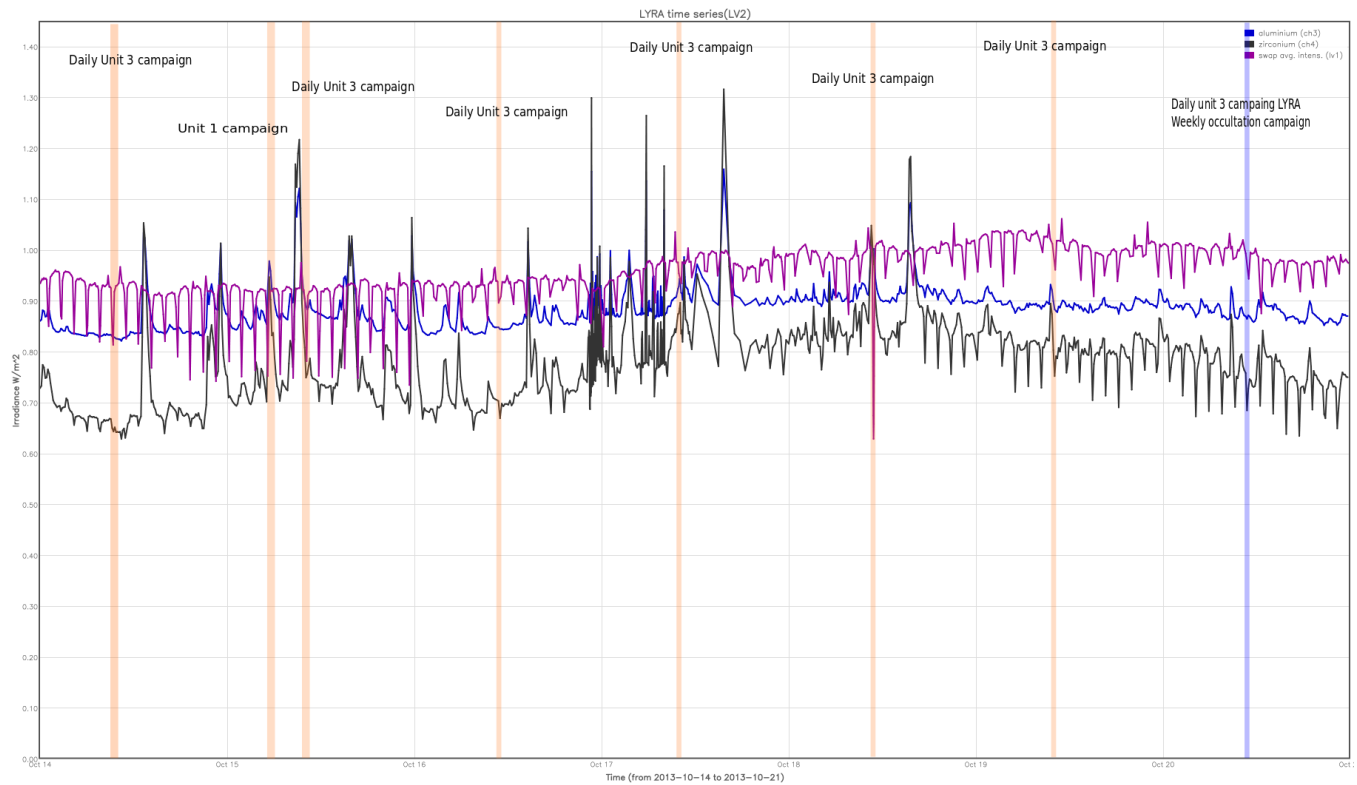
**Eruption on the north weste quadrant @ 08:54 - SWAP difference image**  
Find a movie of the events [here](#) (SWAP difference movie)



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, from left to right:

- Weekly occultation campaign

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

- Daily unit 3 campaign
- Unit 1 campaign
- Daily unit 3 campaign times six

## **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>).

Seaton *et al.* 2013: "SWAP Observations of the Long-Term, Large-Scale Evolution of the EUV Solar Corona" *APJ*. [ADS Link](#)

A presentation and tour was given to artist Philip Schuette to give him inspiration for future artworks.

## **Guest Investigator Program**

- None



## 2. LYRA instrument status

### Calibration

No calibration this week.

### IOS & operations

Monday 14 Oct	Tuesday 15 Oct	Wednesday 16 Oct	Thursday 17 Oct	Friday 18 Oct	Saturday 19 Oct	Sunday 20 Oct
Nominal acquisition + daily U3  LYIOS00343	Nominal acquisition + daily U3 + U1 backup campaign  LYIOS00343 -> LYIOS00344	Nominal acquisition + daily U3  LYIOS00344	Nominal acquisition + daily U3  LYIOS00344	Nominal acquisition + daily U3  LYIOS00344 -> LYIOS00345	Nominal acquisition + daily U3  LYIOS00345	Nominal acquisition + daily U3  LYIOS00345

The following science campaigns were performed by LYRA:

- daily Unit 3 observations campaign
- Unit 1 backup campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 49.4 and 51 °C, taking into account the daily U3 activation periods; the latter result in a temperature increase of about 0.6 °C.

### To be explored

- None

### 3. SWAP instrument status

#### Calibration

No calibration this week.

#### MCPM errors

The number of MCPM recoverable errors increased from 13034 to 13184.

The number of MCPM unrecoverable errors remained at 1127.

#### IOS & operations

Monday 14 Oct	Tuesday 15 Oct	Wednesday 16 Oct	Thursday 17 Oct	Friday 18 Oct	Saturday 19 Oct	Sunday 20 Oct
Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition + weekly occultation
IOS00477 558 images	IOS00477 -> IOS00478 665 images	IOS00478 520 images	IOS00478 514 images	IOS00478 626 images	IOS00478 572 images	IOS00478 568 images

Special operations for SWAP, this week:

- weekly occultation campaign

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 1.13 and 2.24 °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 12324 to 12383) was nominal, except for:

- 12354
- 12355

These passes were originally scheduled, but were skipped. No data were delivered during either pass. The only impact on PROBA2 operations was a slight reduction in SWAP telemetry and, therefore, overall cadence.

### 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:

- 12354
- 12355.

Total number of images between 2013 Oct 14 0UT and 2013 Oct 21 0UT: 4023

Highest cadence in this period: 30 seconds

Average cadence in this period: 150.24 seconds

Number of image gaps larger than 300 seconds: 73

Largest data gap: 17:01.2 minutes

### Data coverage LYRA

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

- 12354
- 12355



## 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)