


P2SC-ROB-WR-239 - 20141020 Weekly report #239	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Oct 20 to Sun Oct 26, 2014 30 Oct 2014  Katrien Bonte Matthew West	Royal Observatory of Belgium  - PROBA2 Science Center
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## 1. Science

### Solar & Space weather events

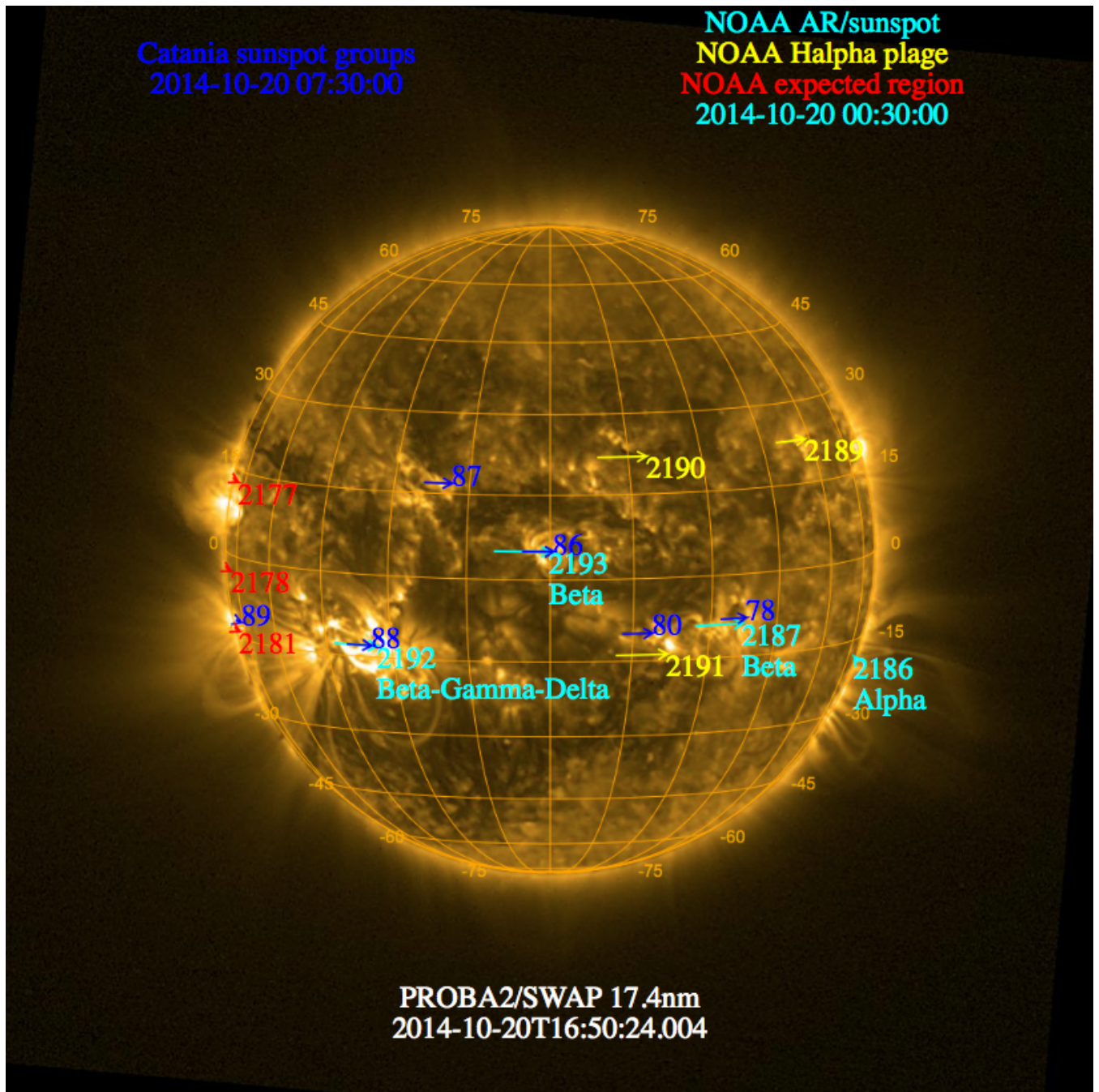
The level of solar activity<sup>1</sup> fluctuated between **moderate** and **high** this week.

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

	Monday 20 Oct	Tuesday 21 Oct	Wednesday 22 Oct	Thursday 23 Oct	Friday 24 Oct	Saturday 25 Oct	Sunday 26 Oct
Activity	moderate	moderate	high	moderate	high	high	high
Flares	M1.2@22h55 M1.7@20h04 M1.4@19h02 M4.5@16h37 M3.9@09h11	M1.2@13h38	M1.4@15h57 X1.6@14h28 M2.7@05h17 M8.7@01h59	M1.1@09h50	X3.1@21h41 M4.0@07h48	X1.0@17h08	M2.4@20h21 M1.9@18h49 M4.2@18h15 M1.0@17h17 X2.0@10h56

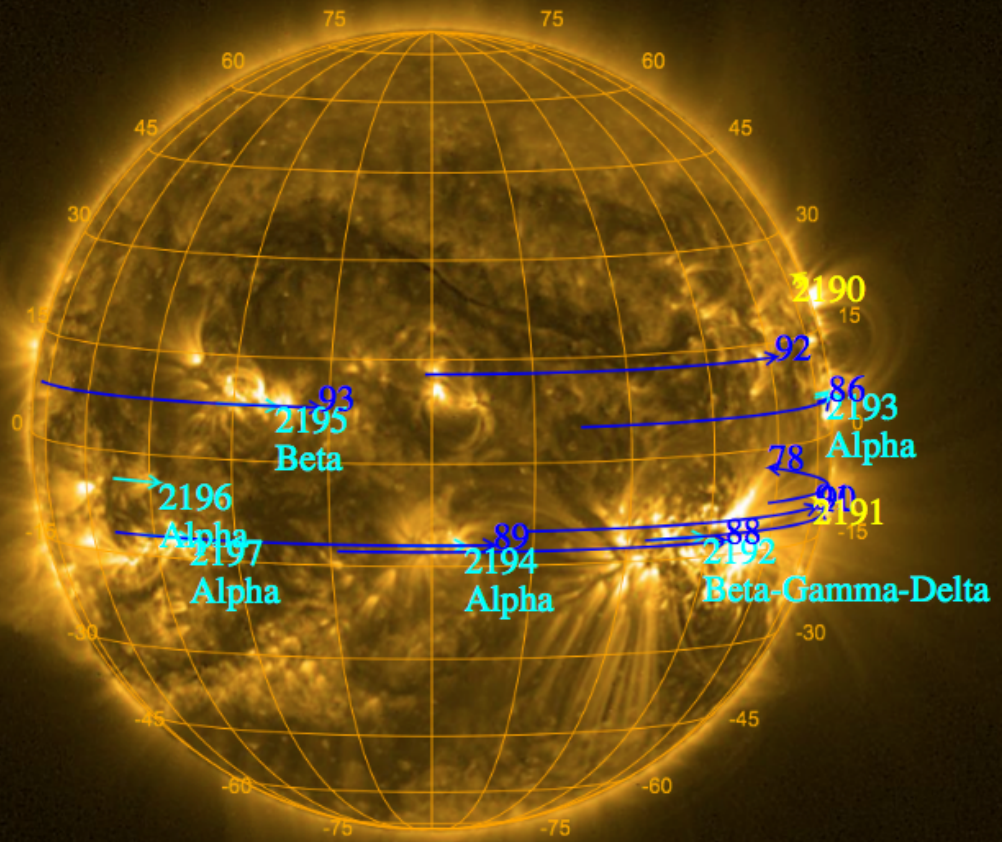
<sup>1</sup> See appendix. All timings are given in UT.

The SWAP images of Oct 20 and Oct 26 are shown below, with annotated active regions.



Catania sunspot groups  
2014-10-22 08:30:00

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2014-10-26 00:30:00



PROBA2/SWAP 17.4nm  
2014-10-26T16:54:43.077

## Solar Activity

Solar flare activity fluctuated between moderate 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.

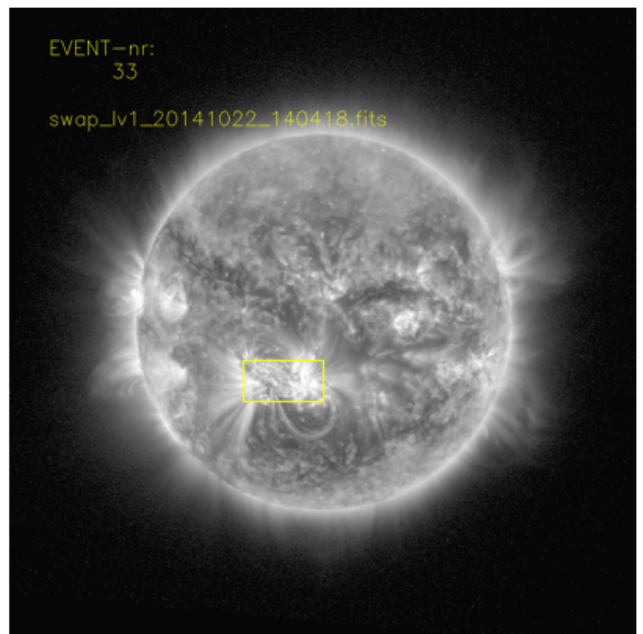
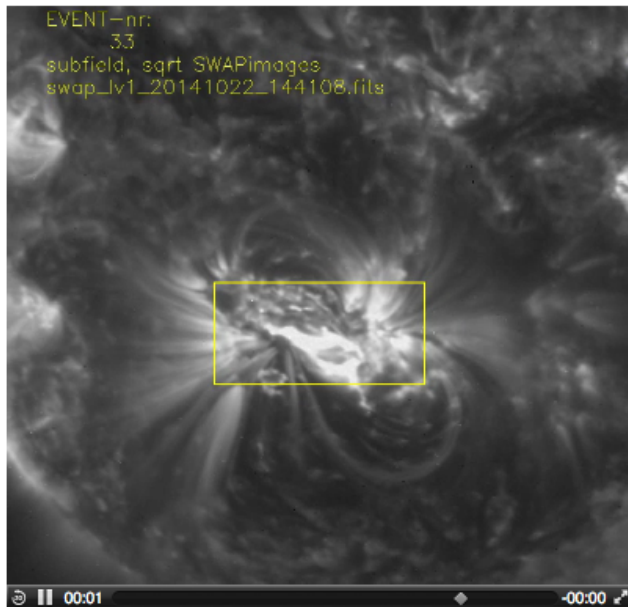
A weekly overview movie can be found [here](#) (SWAP week 239).

Details about some of this week's events:

One of the largest groups of sunspots (NOAA AR 2192) appeared on the solar disk as seen from Earth, and produced many flaring events this week. Below we provide SWAP images of times when the strongest flares occurred. These annotated snapshots are produced by the Solar Feature Automated Search Tool (SoFAST). This tool detects dynamic solar events in EUV images from SWAP in real-time. More info on <http://www.sidc.be/sofast>.

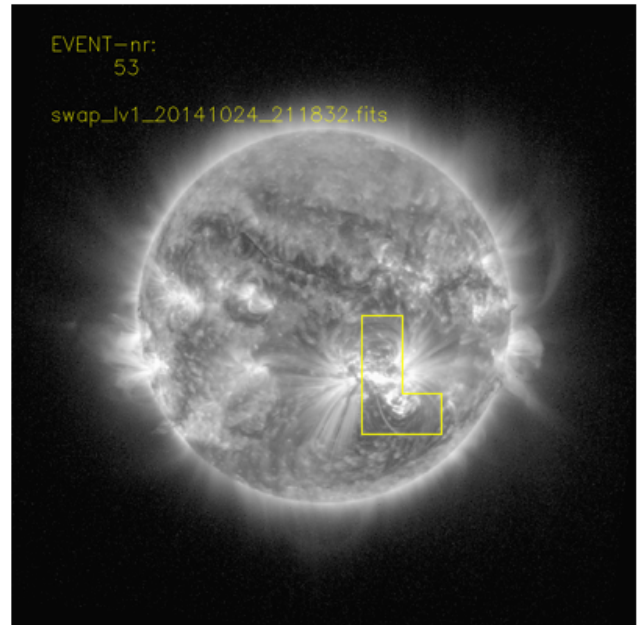
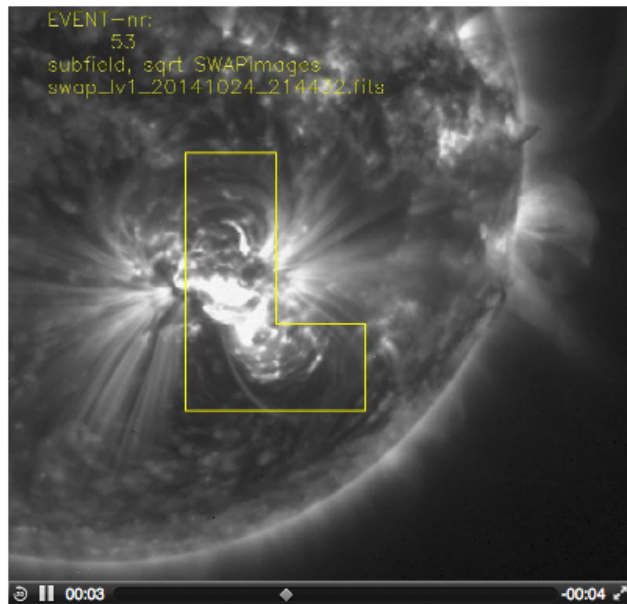
Wednesday Oct 22:

**X1.6 peaking around 14h28**



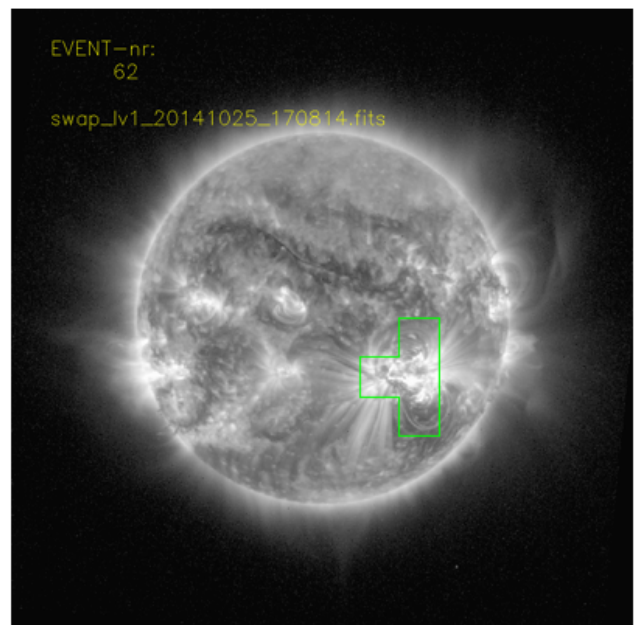
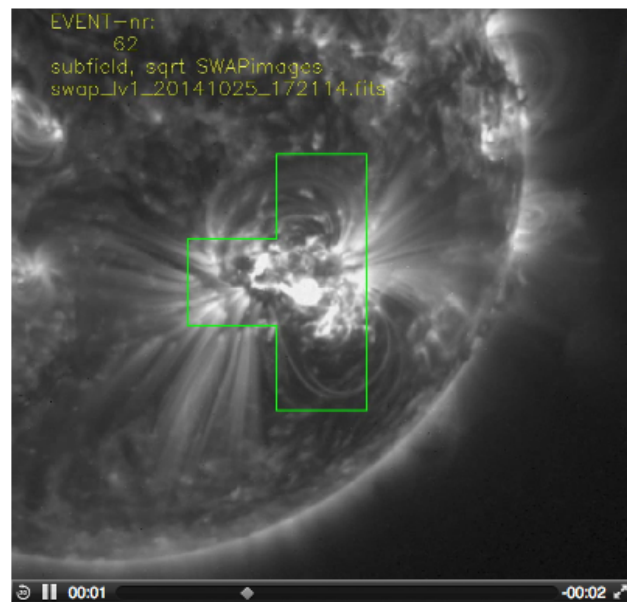
Friday Oct 24

**X3.1 peaking around 21h41**



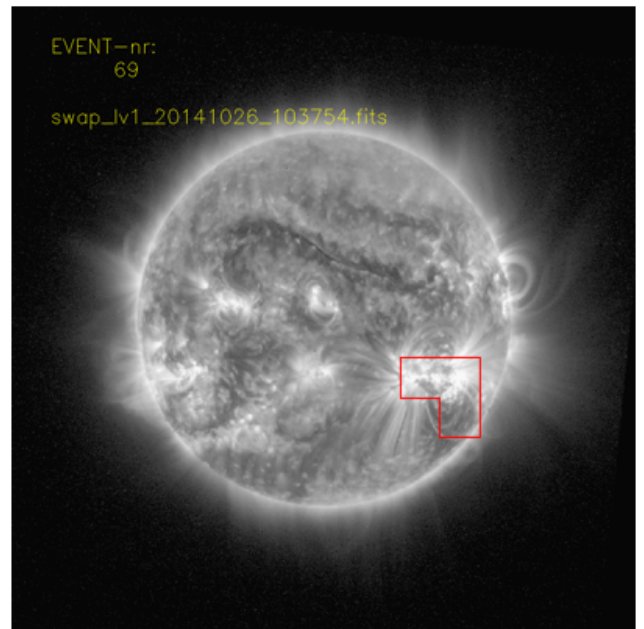
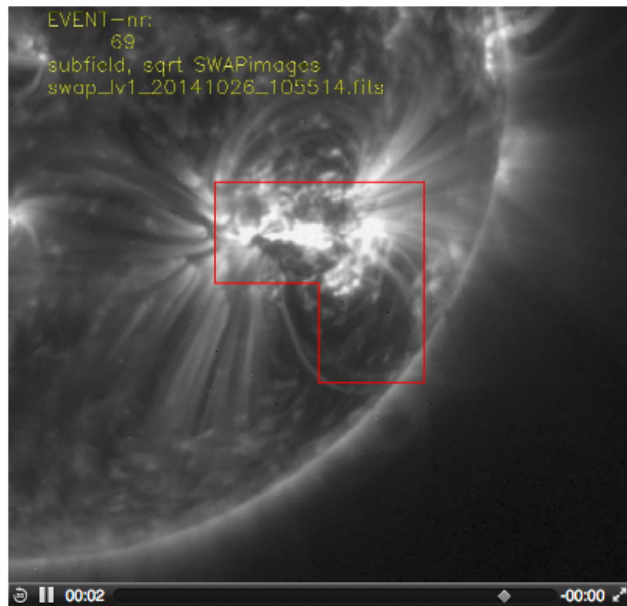
Saturday Oct 25

**X1.0 peaking around 17h08**



Sunday Oct 26

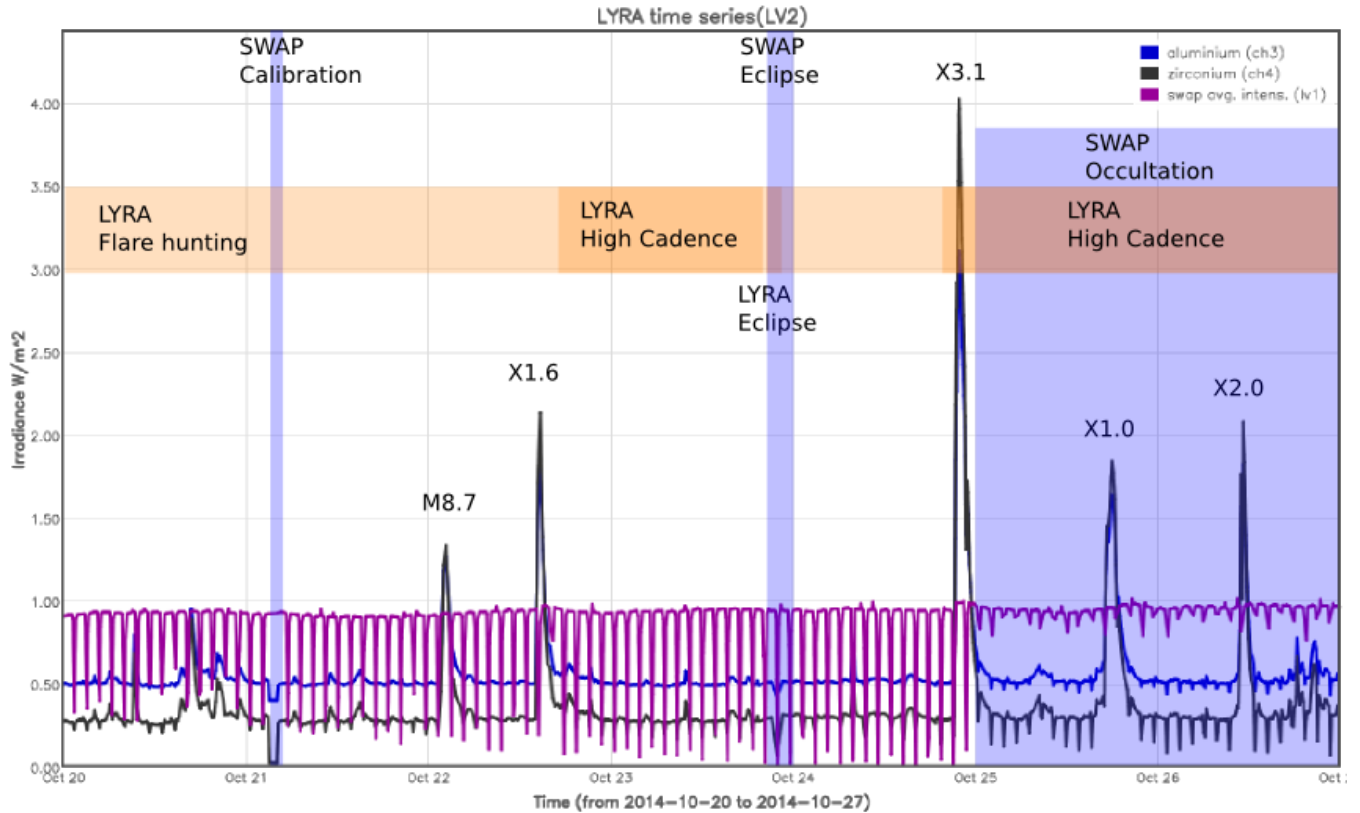
X2.0 peaking around 10h56



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:

- Extended biweekly SWAP calibration campaign on Oct 21
- SWAP eclipse campaign on Oct 23
- Start of SWAP occultation jumps from Oct 25

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

- LYRA flare hunting campaign as from Oct 19 evening
- LYRA 100Hz high cadence campaign Oct 22
- LYRA eclipse campaign on Oct 23
- LYRA 100Hz high cadence campaign Oct 24 - Oct 27

The red shaded period corresponds to:

- None

Activity level periods are indicated per day by horizontal arrows.

## **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>).

On the partial eclipse that occurred Oct 23, a news item has been published through the p2sc website. See <http://proba2.oma.be/Eclipse2014>

## **Guest Investigator Program**

- None



## 2. LYRA instrument status

### Calibration

No calibration campaign this week.

### IOS & operations

Monday 20 Oct	Tuesday 21 Oct	Wednesday 22 Oct	Thursday 23 Oct	Friday 24 Oct	Saturday 25 Oct	Sunday 26 Oct
Nominal acquisition + flare hunting	Nominal acquisition + flare hunting	Nominal acquisition + flare hunting + high cadence	Nominal acquisition + flare hunting + eclipse	Nominal acquisition + flare hunting + high cadence	Nominal acquisition + flare hunting + high cadence	Nominal acquisition + flare hunting + high cadence
LYIOS00424 LYIOS00425	LYIOS00426	LYIOS00426 LYIOS00427	LYIOS00427 LYIOS00428	LYIOS00428 LYIOS00429	LYIOS00429	LYIOS00429

The following science campaigns were performed by LYRA:

- LYRA flare hunting campaign as from Oct 19 evening
- LYRA 100Hz high cadence campaign Oct 22
- LYRA eclipse campaign on Oct 23
- LYRA 100Hz high cadence campaign Oct 24 - Oct 27

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 51.38 and 53.73 °C, taking into account the daily U3 activation periods.

### 3. SWAP instrument status

#### Calibration

Calibration campaign on Tuesday this week.

#### MCPM errors

The number of MCPM recoverable errors increased from 22900 to 23122.

The number of MCPM unrecoverable errors increased from 1733 to 1901.

#### IOS & operations

Monday 20 Oct	Tuesday 21 Oct	Wednesday 22 Oct	Thursday 23 Oct	Friday 24 Oct	Saturday 25 Oct	Sunday 26 Oct
Nominal acquisition	Nominal acquisition + biweekly	Nominal acquisition	Nominal acquisition + eclipse	Nominal acquisition	Nominal acquisition + start occultation jumps	Nominal acquisition
IOS00539	IOS00540	IOS00540	IOS00540 IOS00541	IOS00541	IOS00542	IOS00542
518 images	540 images	609 images	710 images	664 images	533 images	539 images

Special operations for SWAP, this week:

- Extended biweekly SWAP calibration campaign on Oct 21
- SWAP eclipse campaign on Oct 23
- Start of SWAP occultation jumps from Oct 25

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 0.7 and 3.1 °C.

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

The main operator is Robbe Vansintjan.

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 15548 to 15610) 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 2014 Oct 20 0UT and 2014 Oct 27 0UT: 4113

Highest cadence in this period: 0 seconds

Average cadence in this period: 147.03 seconds

Number of image gaps larger than 300 seconds: 34

Largest data gap: 53.03 minutes

Cause: The data gap is caused due to erroneous commanding related to the extended SWAP calibration campaign.

### 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)