


P2SC-ROB-WR-177- 20130812 Weekly report #177	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon August 12 to Sun August 18, 2013 21 Aug 2013  Erik Pylyser Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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## 1. Science

### Solar & Space weather events

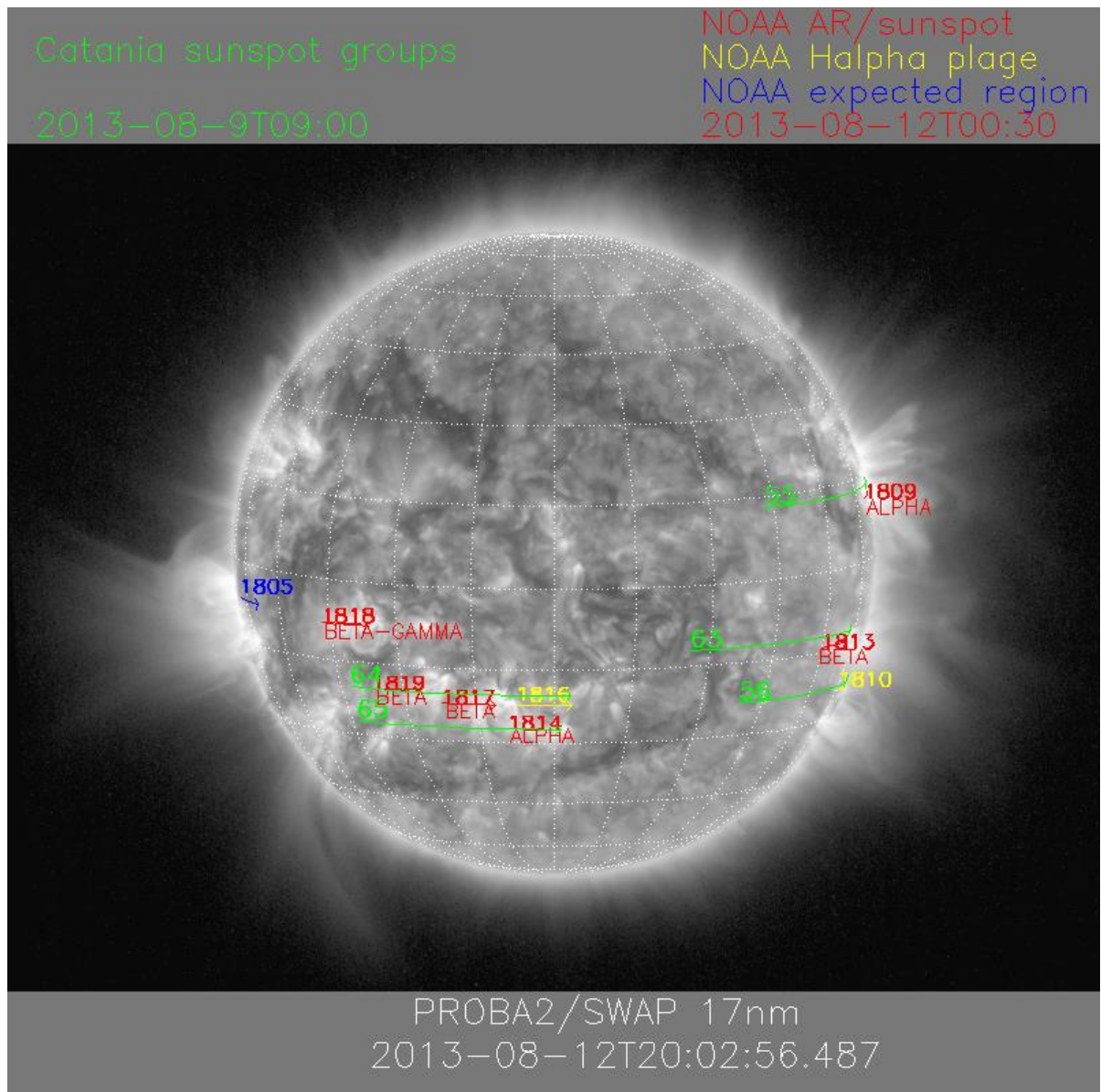
The level of solar activity<sup>1</sup> this week varied between **low and moderate** this week.

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

	Monday 12 Aug	Tuesday 13 Aug	Wednesday 14 Aug	Thursday 15 Aug	Friday 16 Aug	Saturday 17 Aug	Sunday 18 Aug
Activity	moderate	low	low	low	low	moderate	low
Flares	<b>M1.5 @ 10:41</b>	-	-	-	-	<b>M3.3 @ 18:24</b> <b>M1.4 @ 19:33</b>	-

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

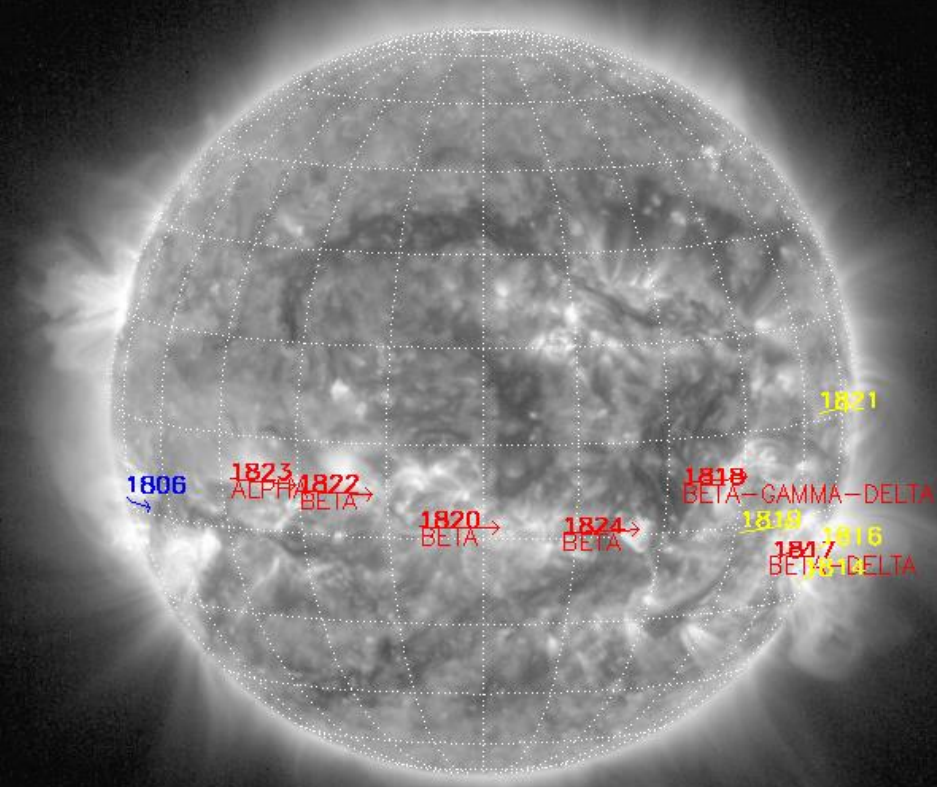
The SWAP images of August 12 and Aug 18 are shown below, with annotated active regions.



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

No recent Catania data available

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2013-08-18T00:30



PROBA2/SWAP 17nm  
2013-08-18T23:07:43.267

## **Solar Activity**

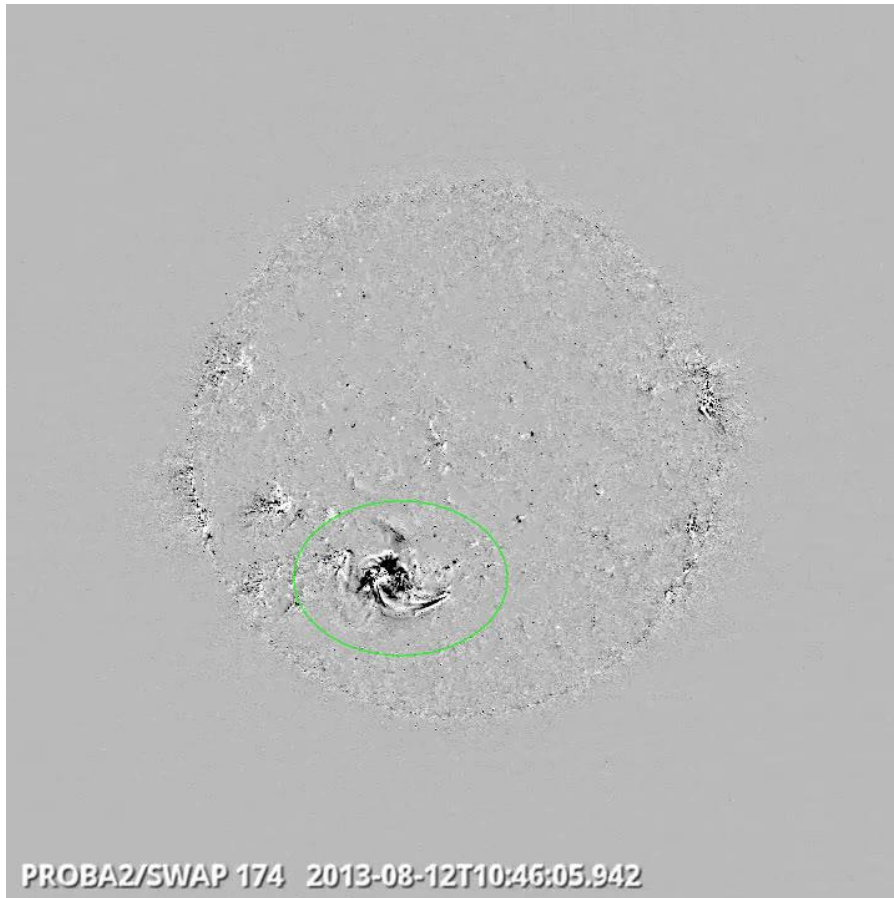
Solar (flaring) activity varied between low and moderate during the week. Three M-level flares were recorded. One of them (on Monday) originated from AR 11817, the other two (a dual eruption) from AR 11818.

In order to view the activity of this week in more detail, we suggest going 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.

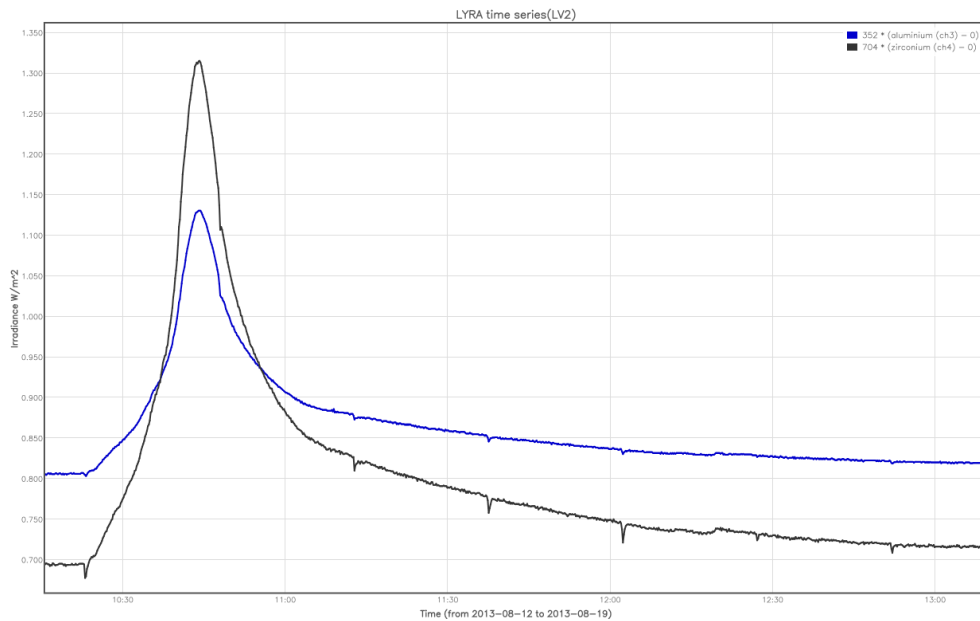
A weekly overview movie can be found [here](#) (SWAP174; HelioViewer.org).

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

Monday August 12th:



**M1.5 flare eruption in South East Quadrant @ 10:46 - SWAP difference image**  
Find a movie of the event [here](#) (SWAP difference movie)



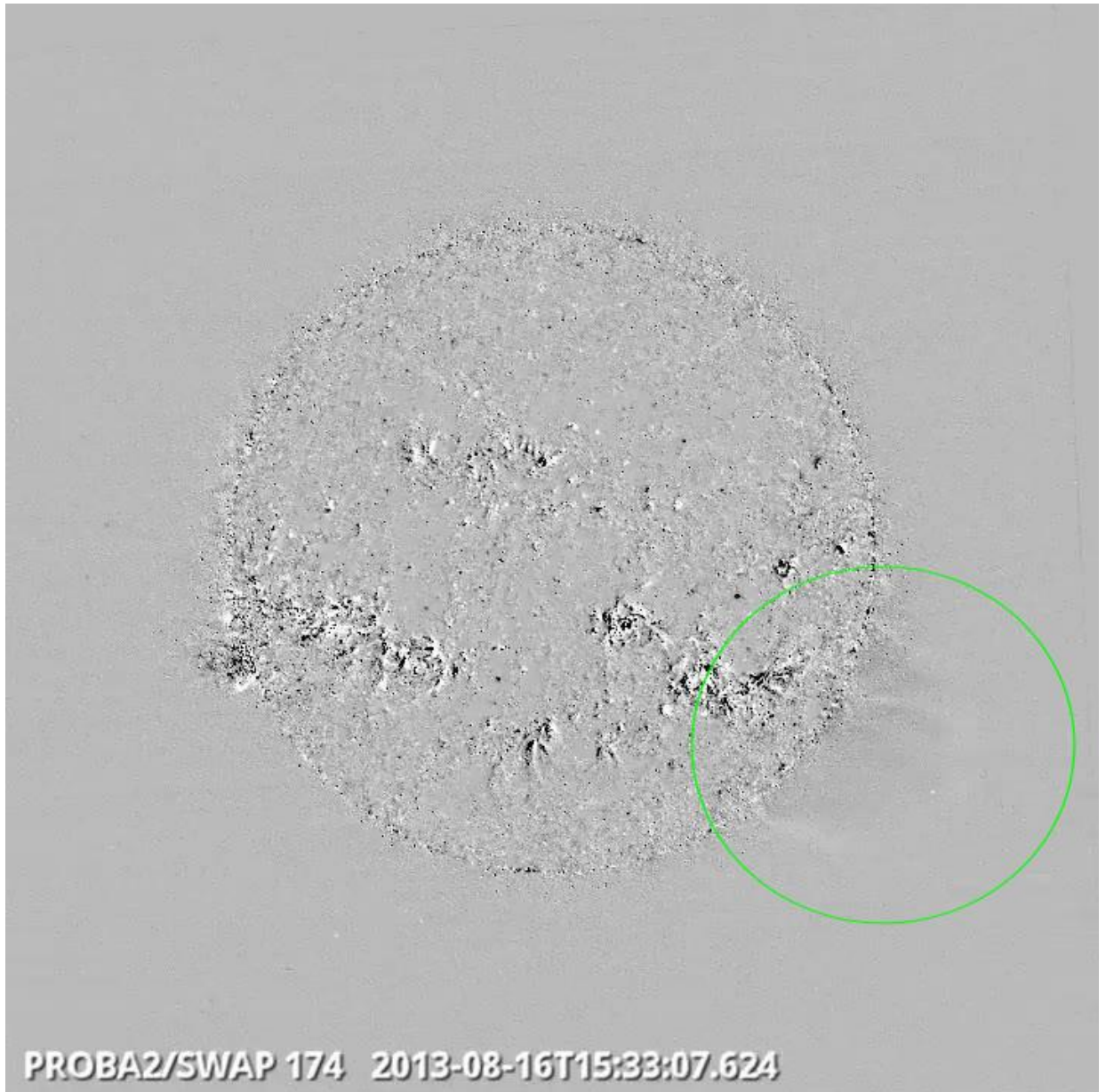
**The LYRA curves of the M1.5 Eruption**  
(black: zirconium; blue: aluminium)

Wednesday August 14th:



**Prominence eruption in South West Quadrant @ 21:33 - SWAP difference image**  
Find a movie of the event [here](#) (SWAP difference movie)

Friday August 16th:



PROBA2/SWAP 174 2013-08-16T15:33:07.624

**Prominence eruption in South West Quadrant @ 15:33 - SWAP difference image**  
Find a movie of the event [here](#) (SWAP difference movie)

Saturday August 17th:



**Big Prominence Eruption in North East Quadrant @ 00:58 - SWAP difference image**

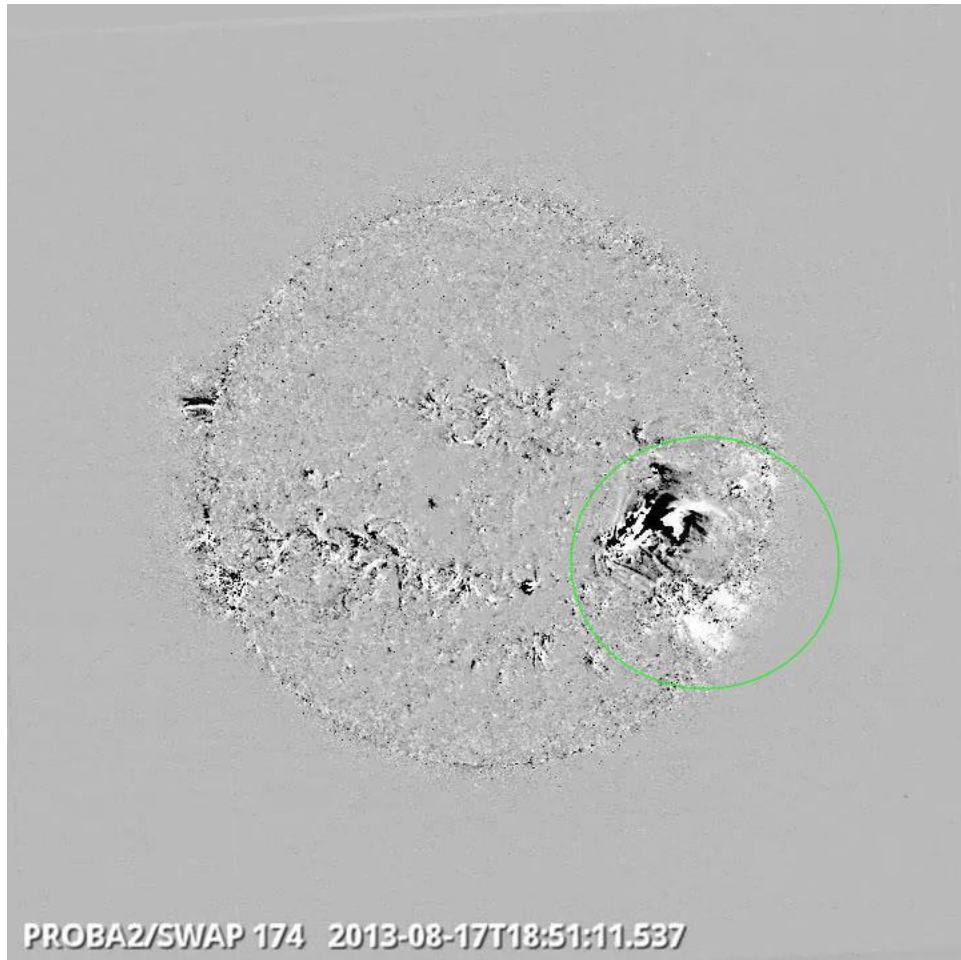
Find a movie of the event [here](#) (SWAP difference movie)



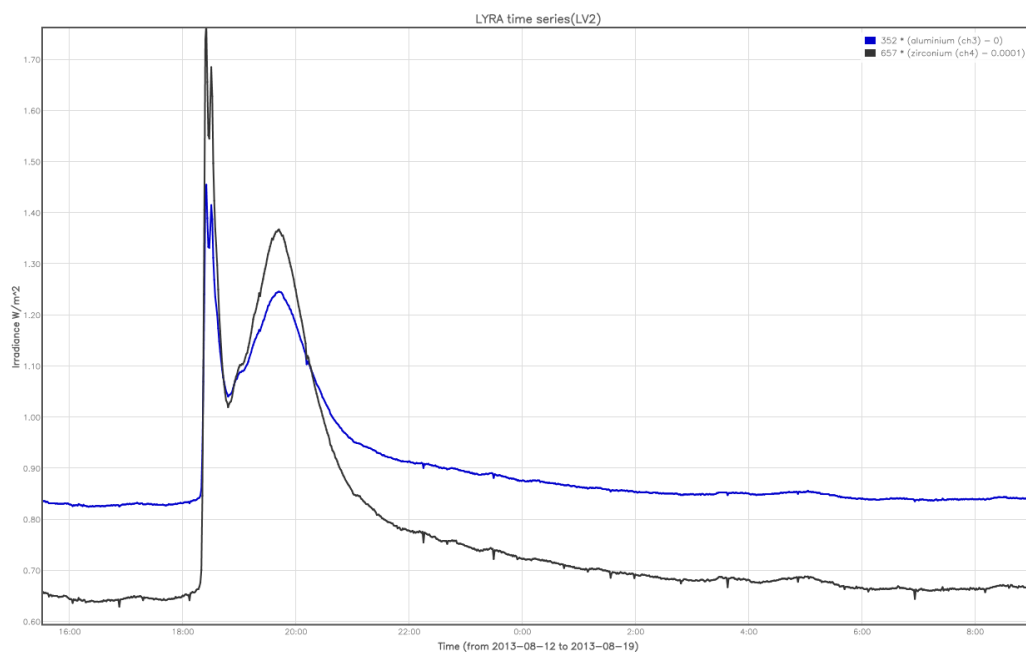
**Prominence Eruption on North East Limb @ 13:13 - SWAP difference image**

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





**M3.3 + M1.4 Flare Eruptions in South West Quadrant @ 18:51 - SWAP difference image**  
Find a movie of the event [here](#) (SWAP difference movie)

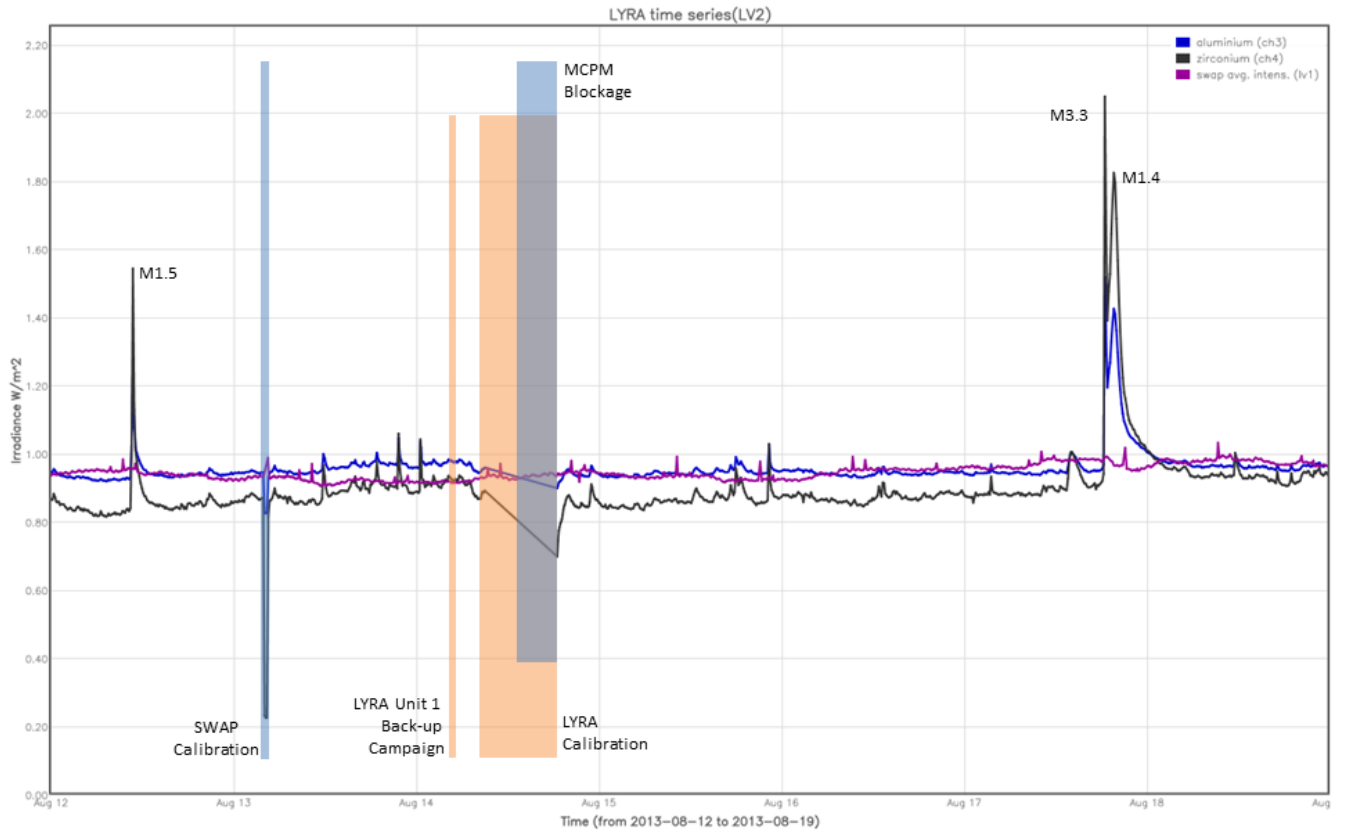


**The LYRA curves of the M3.3 + M1.4 Eruption**  
(black: zirconium; blue: aluminium)

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

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

- LYRA calibration on Wednesday
- LYRA Unit 1 backup campaign

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>).

Intervention by Koen Stegen for 'Quel Temps', an RTBF program on the french speaking 'national' television. PROBA2 is mentioned several times in the context of its support for Space Weather ([http://www.rtbf.be/video/detail\\_quel-temps?id=1845703](http://www.rtbf.be/video/detail_quel-temps?id=1845703))

## **Guest Investigator Program**

- None

## 2. LYRA instrument status

### Calibration

LYRA calibration on Wednesday.

### IOS & operations

Monday 12 Aug	Tuesday 13 Aug	Wednesday 14 Aug	Thursday 15 Aug	Friday 16 Aug	Saturday 17 Aug	Sunday 18 Aug
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3 + calibration + U1 back-up	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00337	LYIOS00337	LYIOS00337	LYIOS00338	LYIOS00338	LYIOS00338	LYIOS00338

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.7 and 48.0 degrees C, taking into account the daily U3 activation periods; the latter result in a temperature increase of about 0.6 degrees C. During calibration, temperature decreased to 45.2 degrees.

### To be explored

- None

### 3. SWAP instrument status

#### Calibration

SWAP calibration on Tuesday.

#### MCPM errors

The number of MCPM recoverable errors increased from 10698 to 10949.

The number of MCPM unrecoverable errors remained at 1127.

#### IOS & operations

Monday 12 Aug	Tuesday 13 Aug	Wednesday 14 Aug	Thursday 15 Aug	Friday 16 Aug	Saturday 17 Aug	Sunday 18 Aug
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00473 513 images	IOS00473 600 images	IOS00473 618 images	IOS00474 602 images	IOS00474 588 images	IOS00474 592 images	IOS00474 531 images

Special operations for SWAP, this week:

- None

On Wednesday 14th, an MCPM blockage occurred. This anomaly was resolved by REDU during pass 11806 (18:17:10). The first packet was received at 18:19:54. As a consequence SWAP data expected during pass 11805 was not received.

Shortly after this event, at 2 occasions (i.e. around 19:40 and 21:20), LAR delays were not implemented.

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.60 and -0.70 degrees C.

Due to 2 missing LAR delays on Wed 14th (see above), SWAP's temperature rose to around 0.0 degrees at two occasions.

#### 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 11784 to 11842) was nominal, except for:

- pass 11805 (BINSWAP\_11805 not received; on-board cause).

### **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:

- pass 11805, due to the MCPM blockage on Wed 14th.

Total number of images between 2013 Aug 12 0UT and 2013 Aug 19 0UT: 4061

Highest cadence in this period: 30 seconds

Average cadence in this period: 148.95 seconds

Number of image gaps larger than 300 seconds: 1

Largest data gap: 6.50 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)