P2SC-ROB-WR-273 - 20150615 Weekly report #273	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Jun 15 to Sun Jun 21, 2015 25 Jun 2015 Katrien Bonte Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP PI, dseaton@sidc.be	http://proba2.sidc.be ++ 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	

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1. Science

Solar & Space weather events

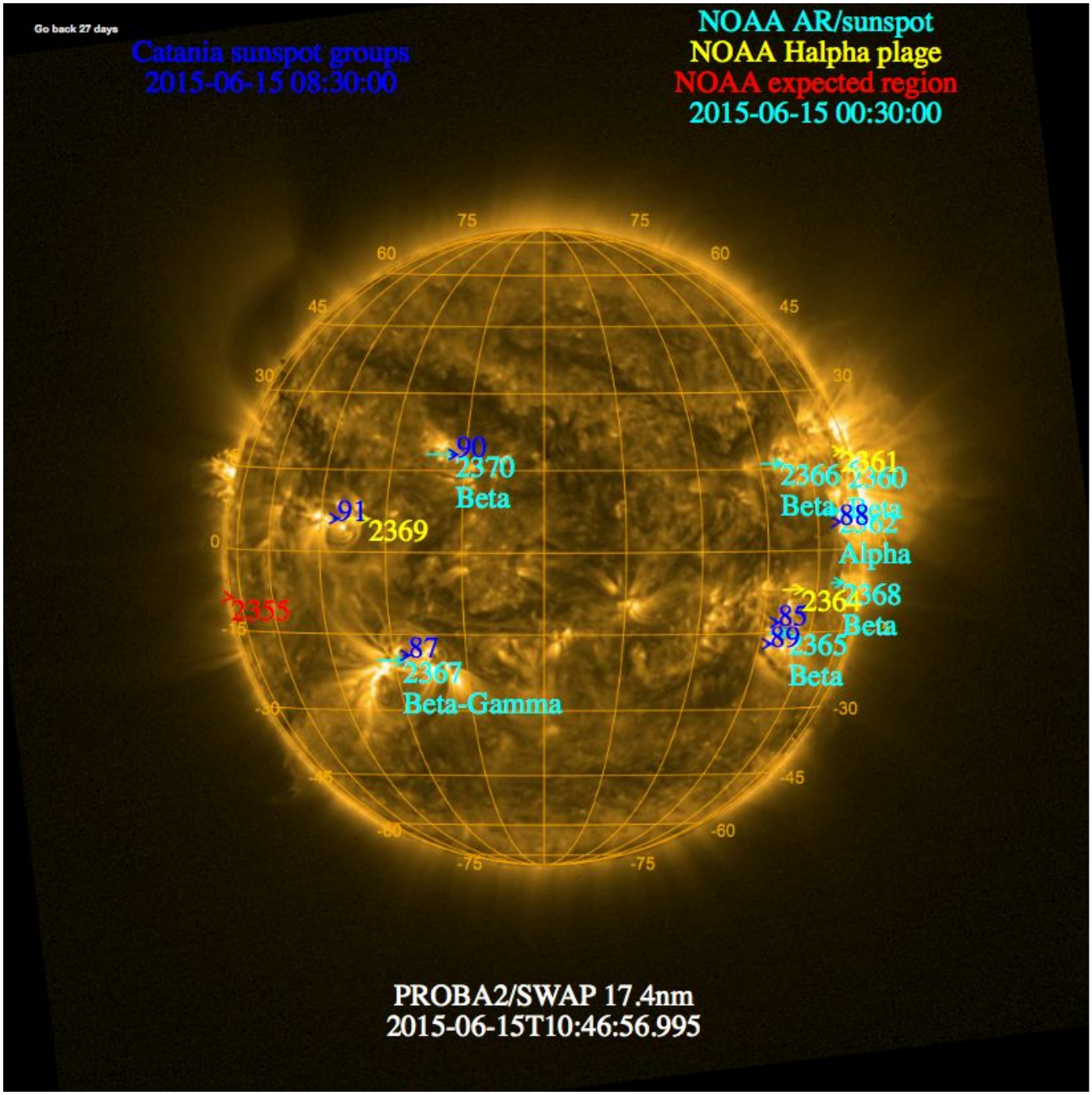
The level of solar activity[1] fluctuated between **low** and **moderate** this week.

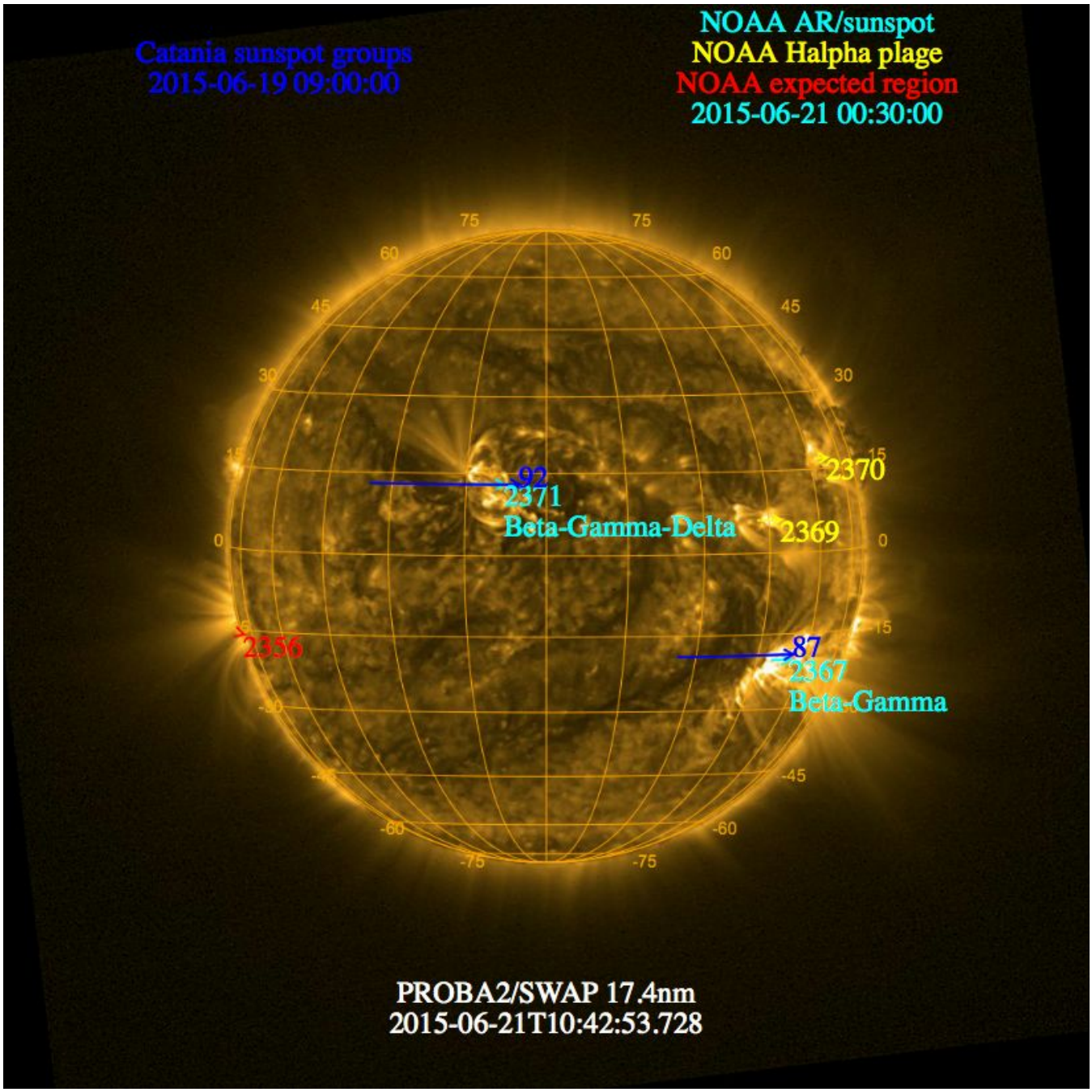
Only M- and X-flares are mentioned, the most energetic one(s) per day are presented in **bold**:

	Monday 15 Jun	Tuesday 16 Jun	Wednesday 17 Jun	Thursday 18 Jun	Friday 19 Jun	Saturday 20 Jun	Sunday 21 Jun
Activity	low	low	low	moderate	low	moderate	moderate
Flares	-	-	-	**M1.2 @01h27** **M3.0 @17h36**	-	**M1.0 @06h48**	**M2.0@01h42** **M2.6@02h36** **M3.8@09h44** **M1.1@18h20**

[1] See appendix. All timings are given in UT.

The SWAP images of 2015 Jun 15 and 2015 Jun 21 are shown below, with annotated active regions.




Catania sunspot groups
2015-06-19 09:00:00
NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2015-06-21 00:30:00
92
2371
Beta-Gamma-Delta
2370
2369
2356
87
2367
Beta-Gamma
PROBA2/SWAP 17.4nm
2015-06-21T10:42:53.728

Solar Activity

Solar flare activity ranged from low to moderate during the week.

To view this weeks activity in more detail, we suggest you visit the following website: http://proba2.oma.be/ssa, from which all the daily (normal and difference) movies of the Sun can be accessed. This page also lists the recorded flaring events.

A weekly overview movie can be found here (SWAP week 273).

Details about some of this week's events:

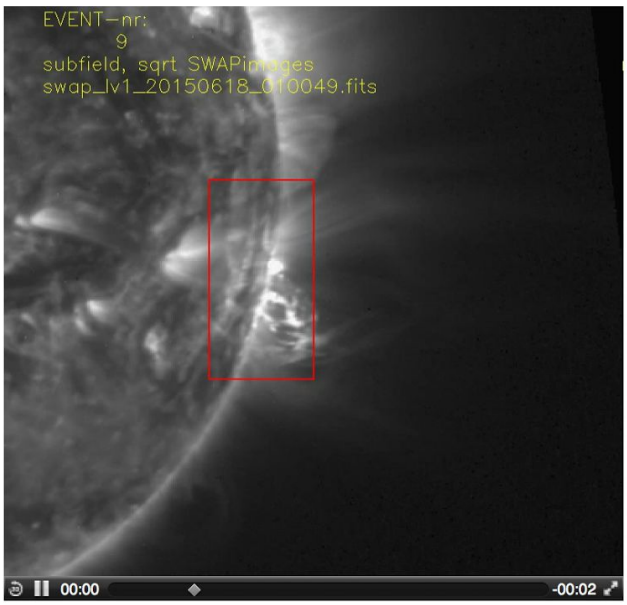
The Sun showed little signs of solar activity early in the week. At 01:27 UT on June 18th AR 2365 produced an M1.2 just off of the West limb. At 17:36 UT on June 18th a newly emerged AR 2371 produced a strong M3.0 flare (following a series of C-flares earlier in the week). The flare was associated with a partial-halo CME.

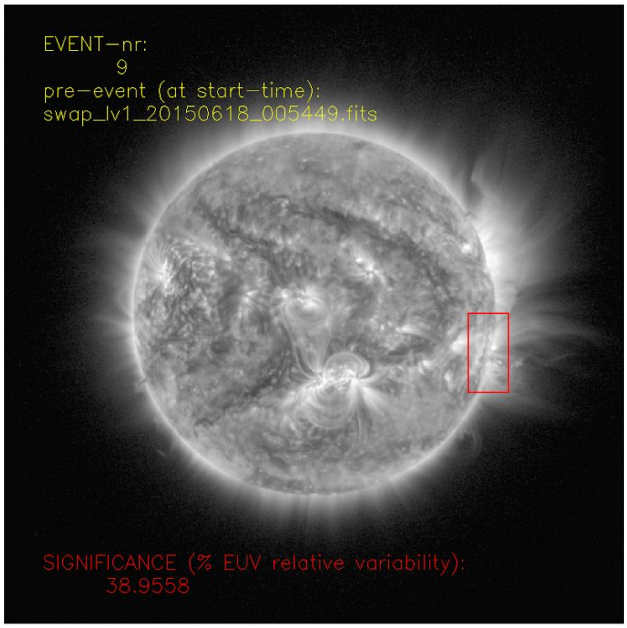
On June 21st, AR 2371 produced two M-class flares in quick succession (M2.0/M2.6). One of these events produced an Earth-directed full halo CME. However, due to the temporal proximity of the flares it is difficult to a determine which was responsible. Also on June 21st at 09:44 UT, AR 2367, just off the West limb, produced the strongest flare of the week (M3.8).

Below we provide SWAP images of each of the M-flares. 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 near real-time. More info on SoFAST can be found here: http://www.sidc.be/sofast. We also include an irradiance figure of the double flare event produced on June 21st. The curve was produced by LYRA data, which can also be found on the above mentioned ssa website.

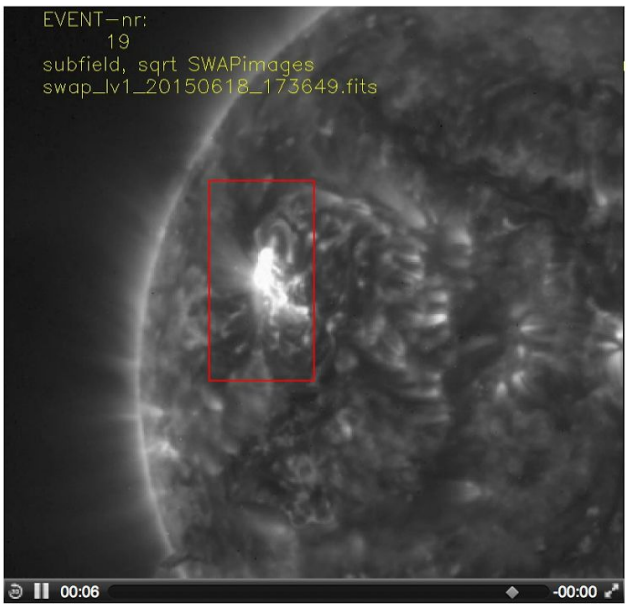
Thursday Jun 18:

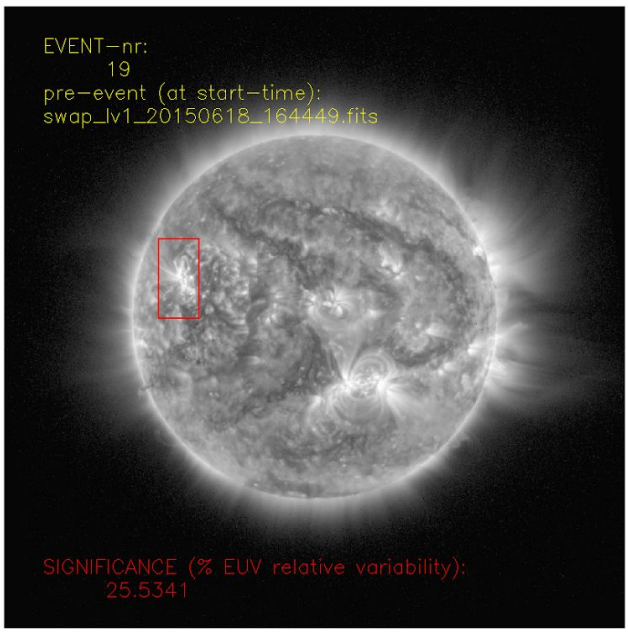
M1.2 flare peaking around 01h27





M3.0 flare peaking around 17h36

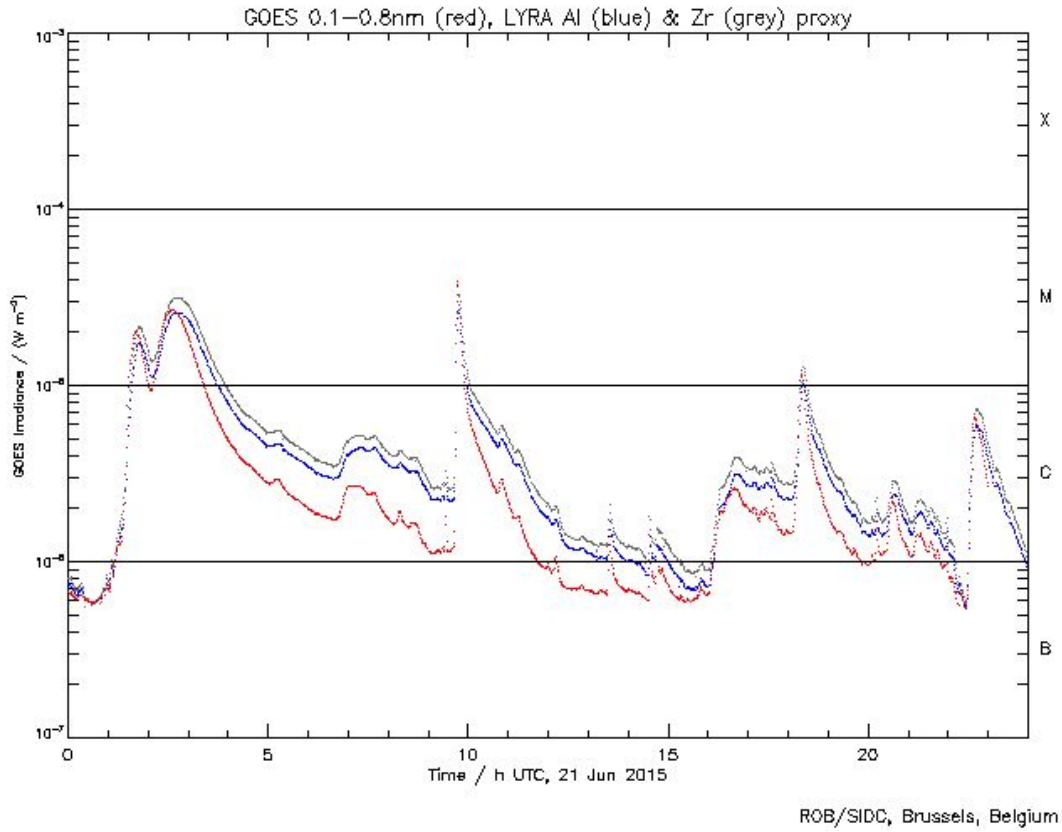


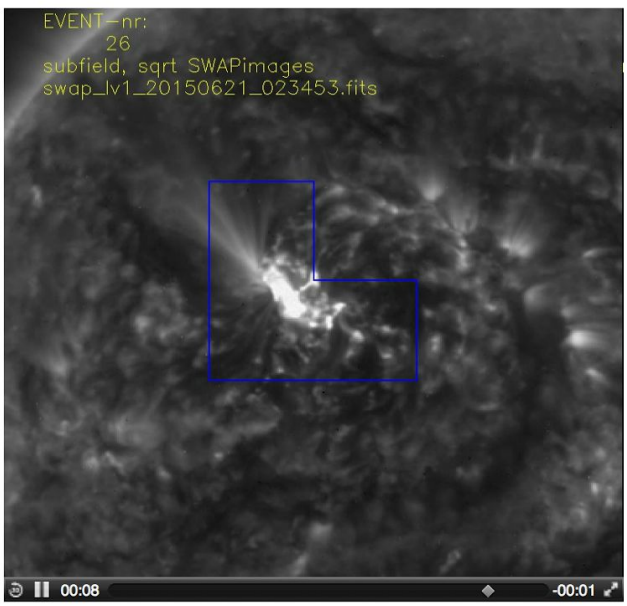


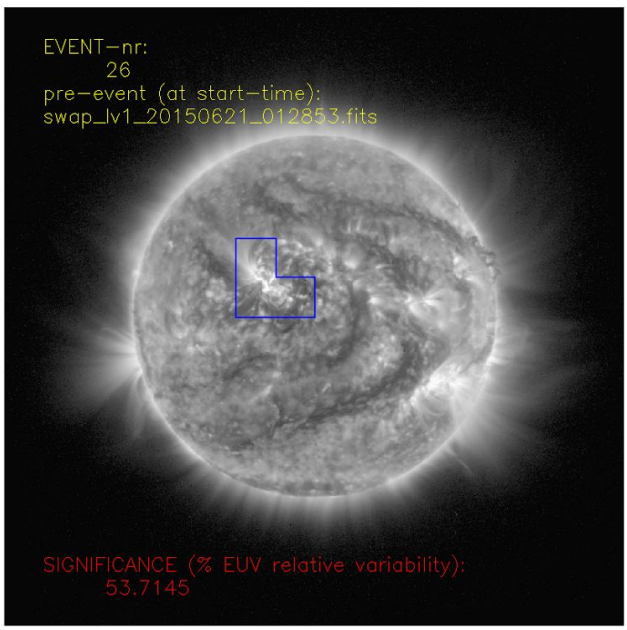
Sunday Jun 21: (double peaking flare)

M2.0 flare peaking around 01h42

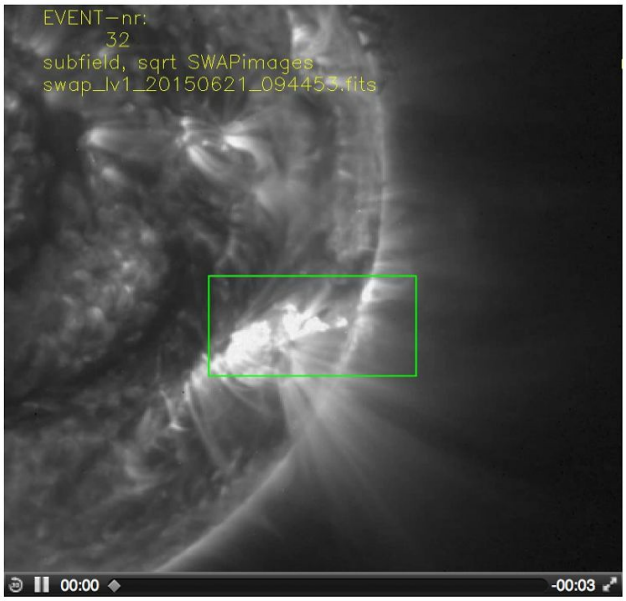
M2.6 flare peaking around 02h36

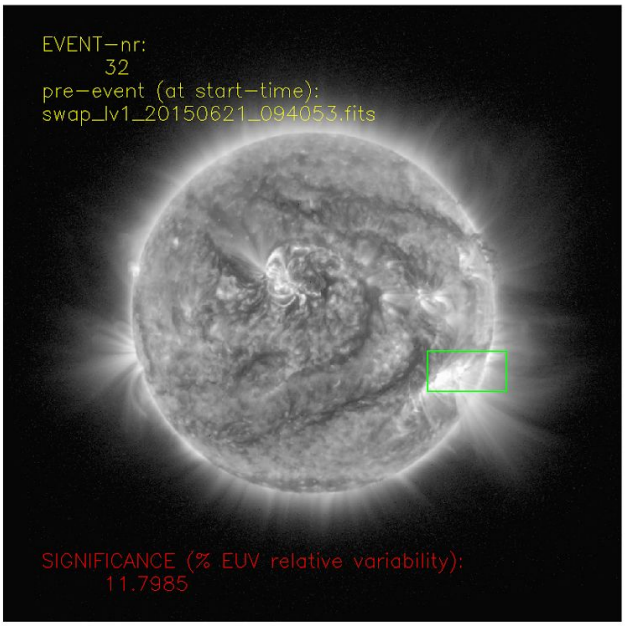




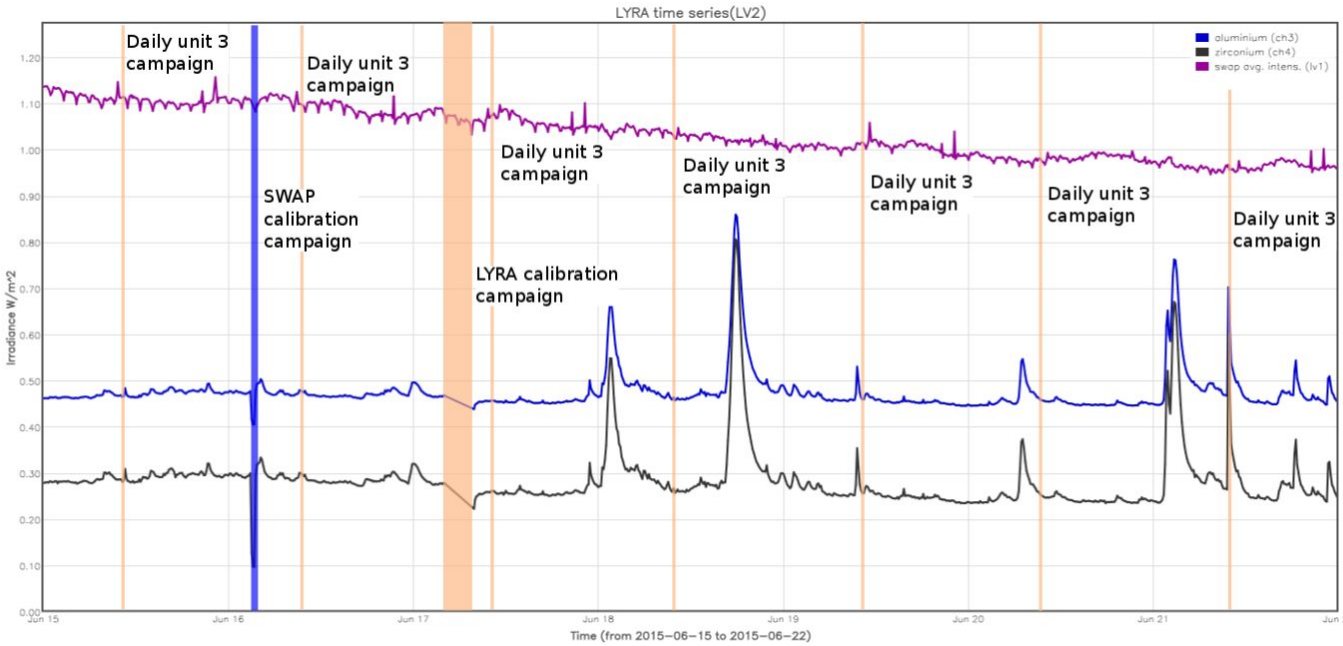


M3.8 flare peaking around 09h44





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:

- SWAP bi-weekly calibration campaign on 2015-06-16

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

- LYRA daily U3 campaigns on 2015-06-15
- LYRA daily U3 campaigns on 2015-06-16
- LYRA short bi-weekly calibration on 2015-06-17
- LYRA daily U3 campaigns on 2015-06-17
- LYRA daily U3 campaigns on 2015-06-18
- LYRA daily U3 campaigns on 2015-06-19
- LYRA daily U3 campaigns on 2015-06-20
- LYRA daily U3 campaigns on 2015-06-21

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

- None

2. LYRA instrument status

Calibration

Calibration campaign on Wednesday this week.

IOS & operations

Monday 15 Jun	Tuesday 16 Jun	Wednesday 17 Jun	Thursday 18 Jun	Friday 19 Jun	Saturday 20 Jun	Sunday 21 Jun
Nominal acquisition + daily U3 LYIOS00477	Nominal acquisition + daily U3 LYIOS00477	Nominal acquisition + daily U3 + calibration LYIOS00477	Nominal acquisition + daily U3 LYIOS00477	Nominal acquisition + daily U3 LYIOS00478	Nominal acquisition + daily U3 LYIOS00478	Nominal acquisition + daily U3 LYIOS00478

The following science campaigns were performed by LYRA:

- daily U3 observations campaign
- bi-weekly calibration on 2015-06-17

LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.01 and 48.14 °C.

3. SWAP instrument status

Calibration

Calibration campaign on 16-06-2015.

MCPM errors

The number of MCPM recoverable errors increased from 87 to 88.
The number of MCPM unrecoverable errors remained 0.

IOS & operations

Monday 15 Jun	Tuesday 16 Jun	Wednesday 17 Jun	Thursday 18 Jun	Friday 19 Jun	Saturday 20 Jun	Sunday 21 Jun
Nominal acquisition IOS00586 547 images	Nominal acquisition + calibration IOS00586 632 images	Nominal acquisition IOS00586 641 images	Nominal acquisition IOS00586 646 images	Nominal acquisition IOS00586 642 images	Nominal acquisition IOS00586 635 images	Nominal acquisition IOS00586 576 images

Special operations for SWAP, this week:

- calibration on 2015-06-16

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -0.97 and -0.009 °C.

4. PROBA2 Science Center Status

The main operator is Katrien Bonte.

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 17658 to 17717) 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 2015 Jun 15 0UT and 2015 Jun 22 0UT: 4319
Highest cadence in this period: 18 seconds
Average cadence in this period: 140.01 seconds
Number of image gaps larger than 300 seconds: 119
Largest data gap: 12.00 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
SoFAST	Solar Feature Automated Search Tool
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)