


P2SC-ROB-WR-158-20130401 Weekly report #158	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Apr 01 to Sun Apr 07, 2013 10 Apr 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 activity¹ this week. Only M- and X-flares are mentioned, the most energetic one(s) are presented in **bold**:

	Monday 01 Apr	Tuesday 02 Apr	Wednesday 03 Apr	Thursday 04 Apr	Friday 05 Apr	Saturday 06 Apr	Sunday 07 Apr
Activity	very low	very low	low	low	moderate	low	low
Flares	-	-	-	-	M2.2@17:34	-	-

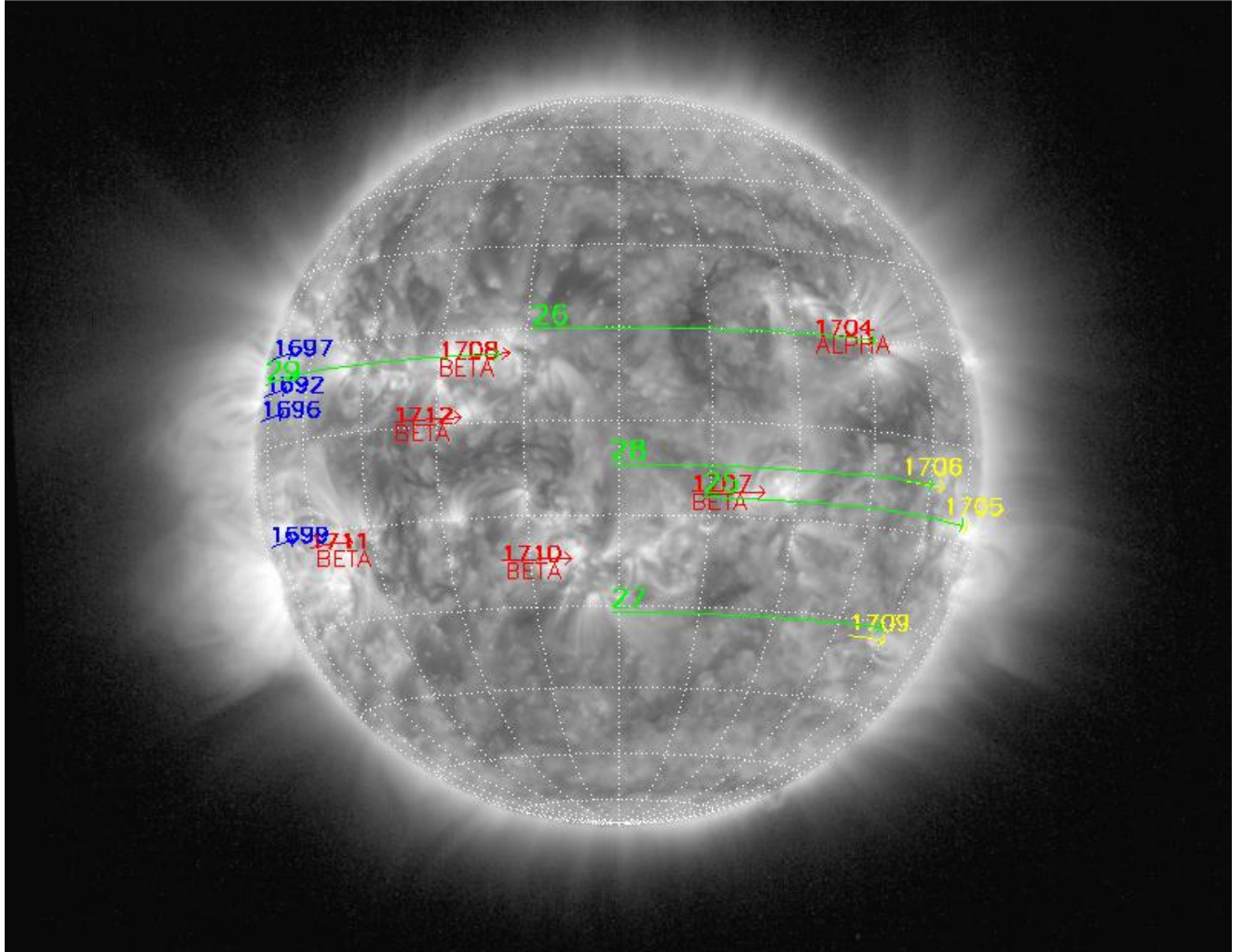
¹ See appendix. All timings are given in UT.

The SWAP images of April 01 and April 07 are shown below, with annotated active regions.

Catania sunspot groups

2013-3-28T08:00

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2013-04-01T00:30



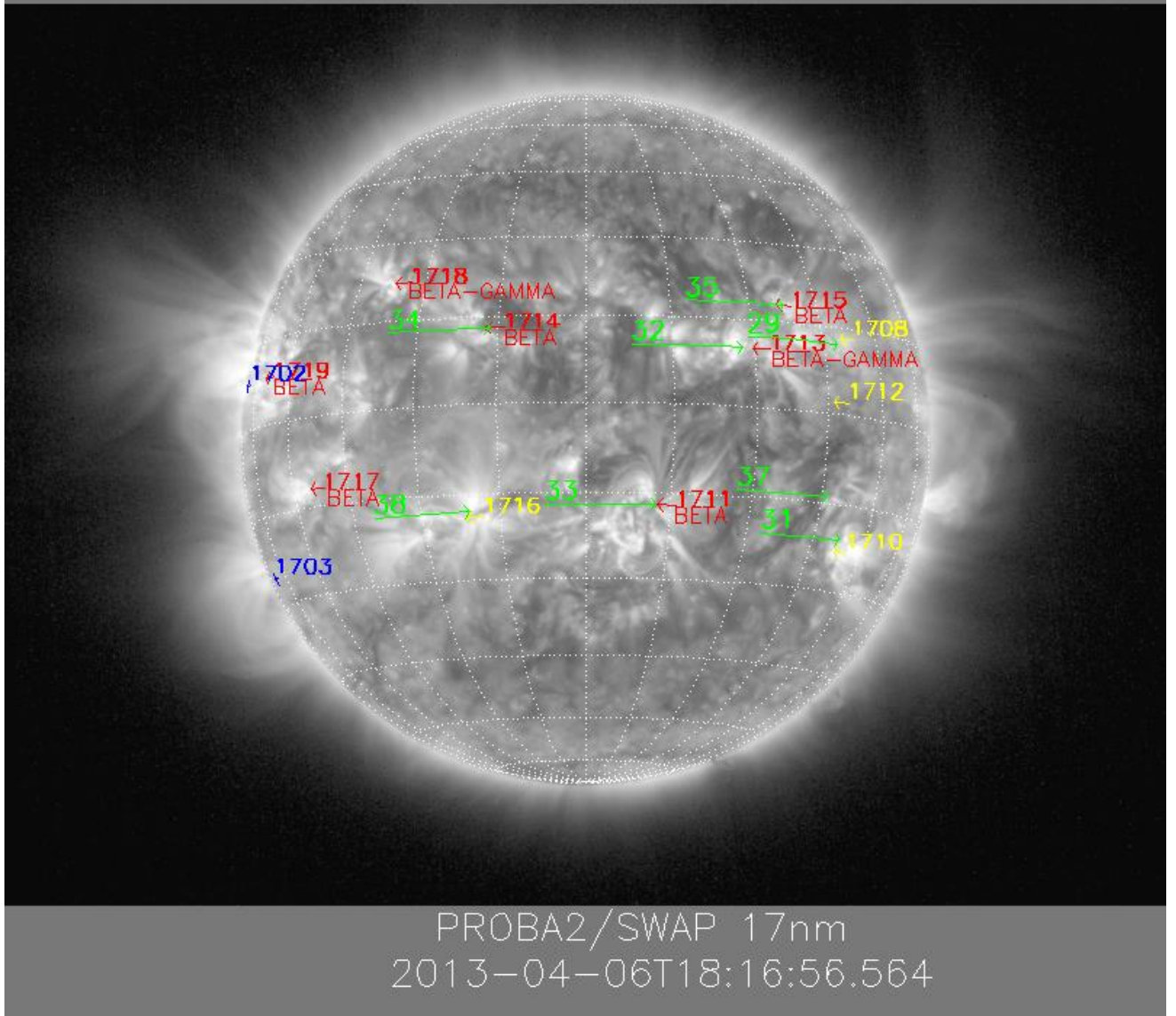
PROBA2/SWAP 17nm
2013-04-01T22:28:39.661

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

Catania sunspot groups

2013-04-05T07:00

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2013-04-07T00:30



Solar Activity

Solar (flaring) activity evolved from **very low** to **low** during the first part of the week. On Friday an M2.2 flare erupted along the East limb, originating from AR 11719. Flaring activity went back to **low** during the week-end.

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](#) (SWAP174/AIA304 combination; HelioViewer.org).

Details about some of the events in this movie can be found further below (limited to SWAP imaging).

During the week, several interesting events occurred, some of which are presented below.

Monday 1st:



**Filament eruptions in the North East quadrant and on South East limb @ 00:35
- SWAP difference image**

Click [here](#) for a SWAP difference movie of this double event; the southern eruption occurs around 01:00 UT.

Thursday 4th:



**Filament eruption in the North West quadrant, close to the West limb @ 08:02
- SWAP difference image**

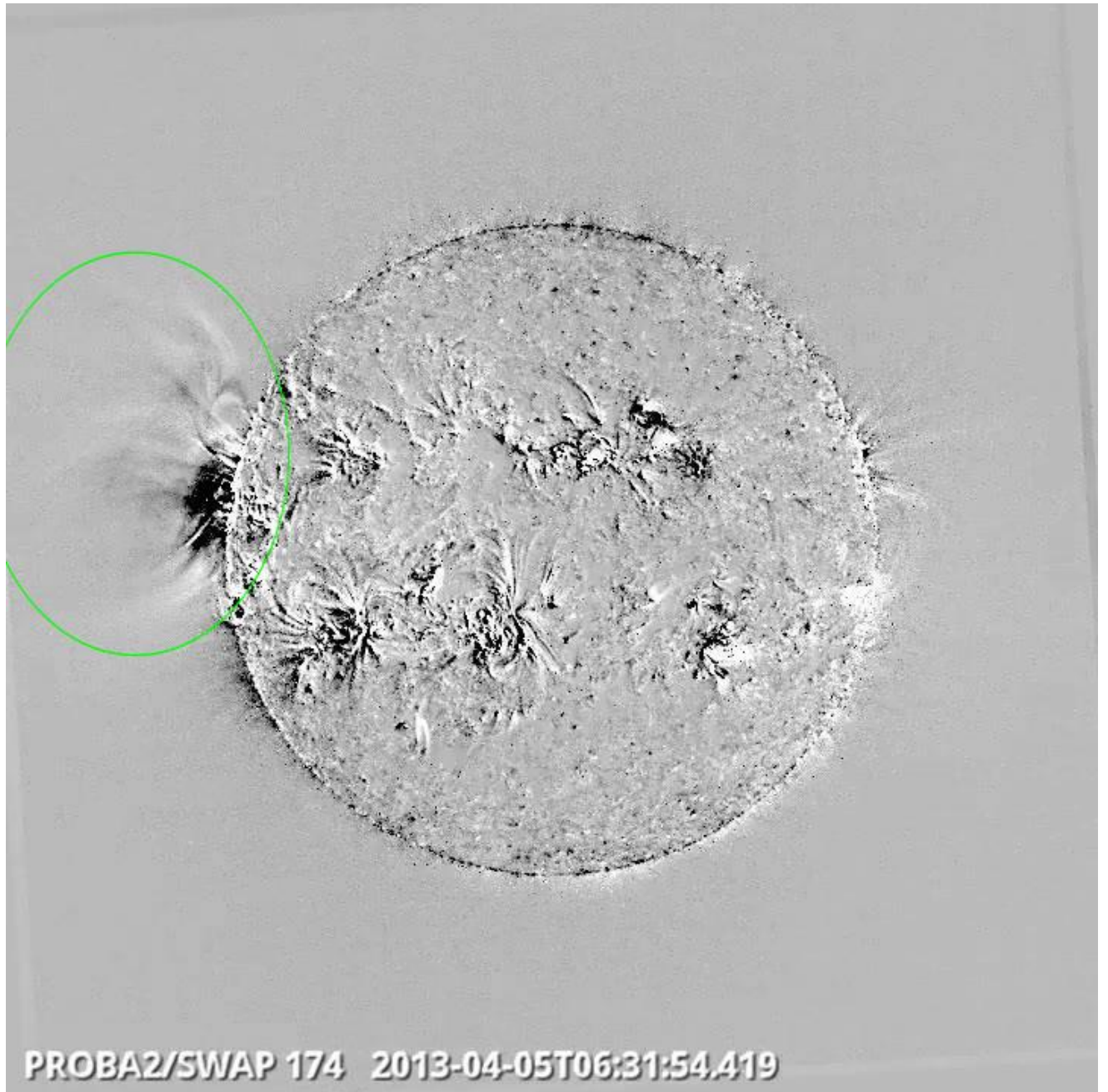
Click [here](#) for a SWAP difference movie of this event.



**Filament eruption in the South West quadrant @ 21:06
- SWAP difference image**

Click [here](#) for a SWAP difference movie of this event.

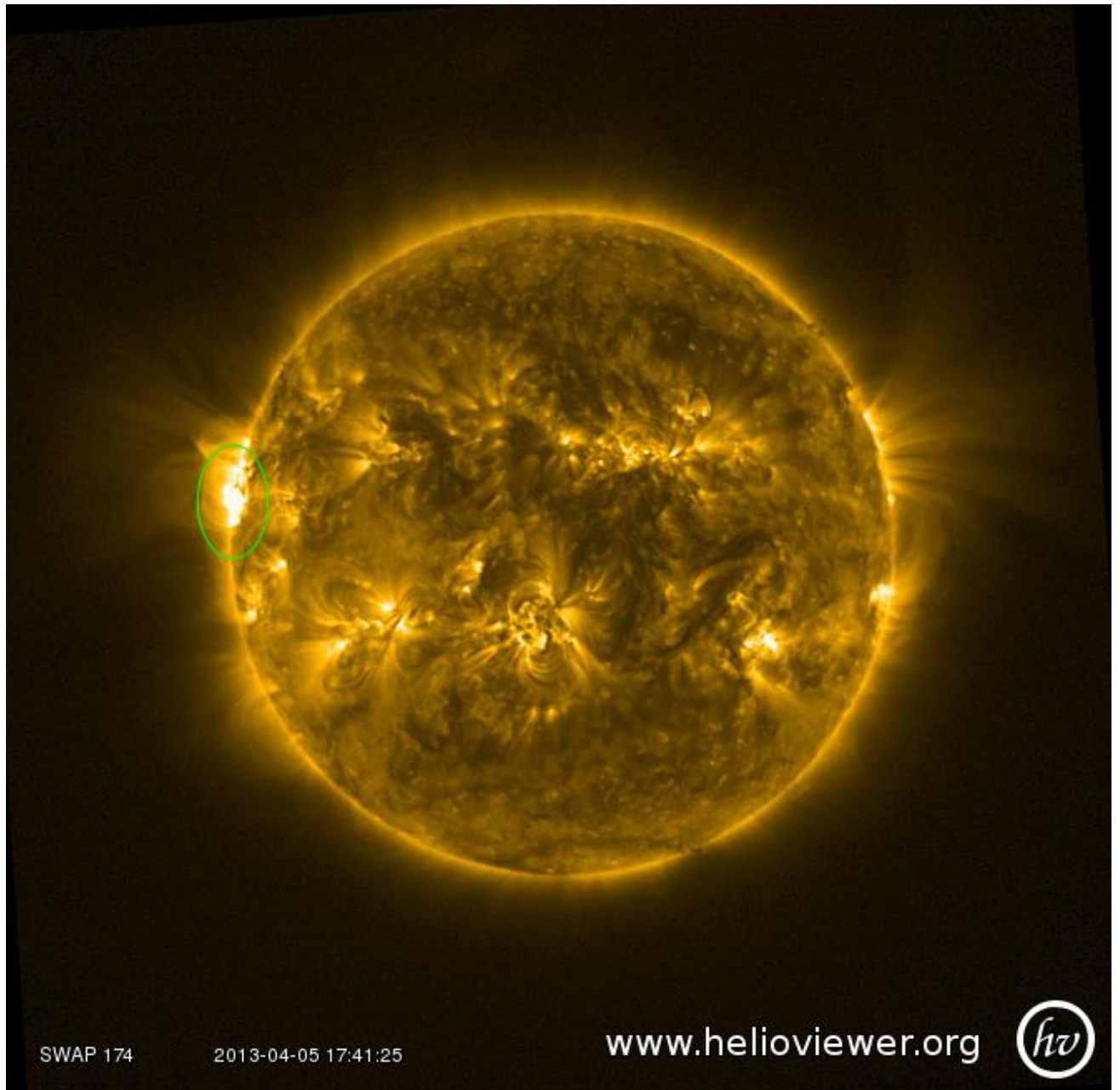
Friday 5th:



**C2.1 flare on the east limb @ 06:31
- SWAP difference image**

Click [here](#) for a HelioViewer movie (AIA 171/304 + SWAP 174) of this event.

At 17:34, an M2.2 flare erupted on the East limb (see below):

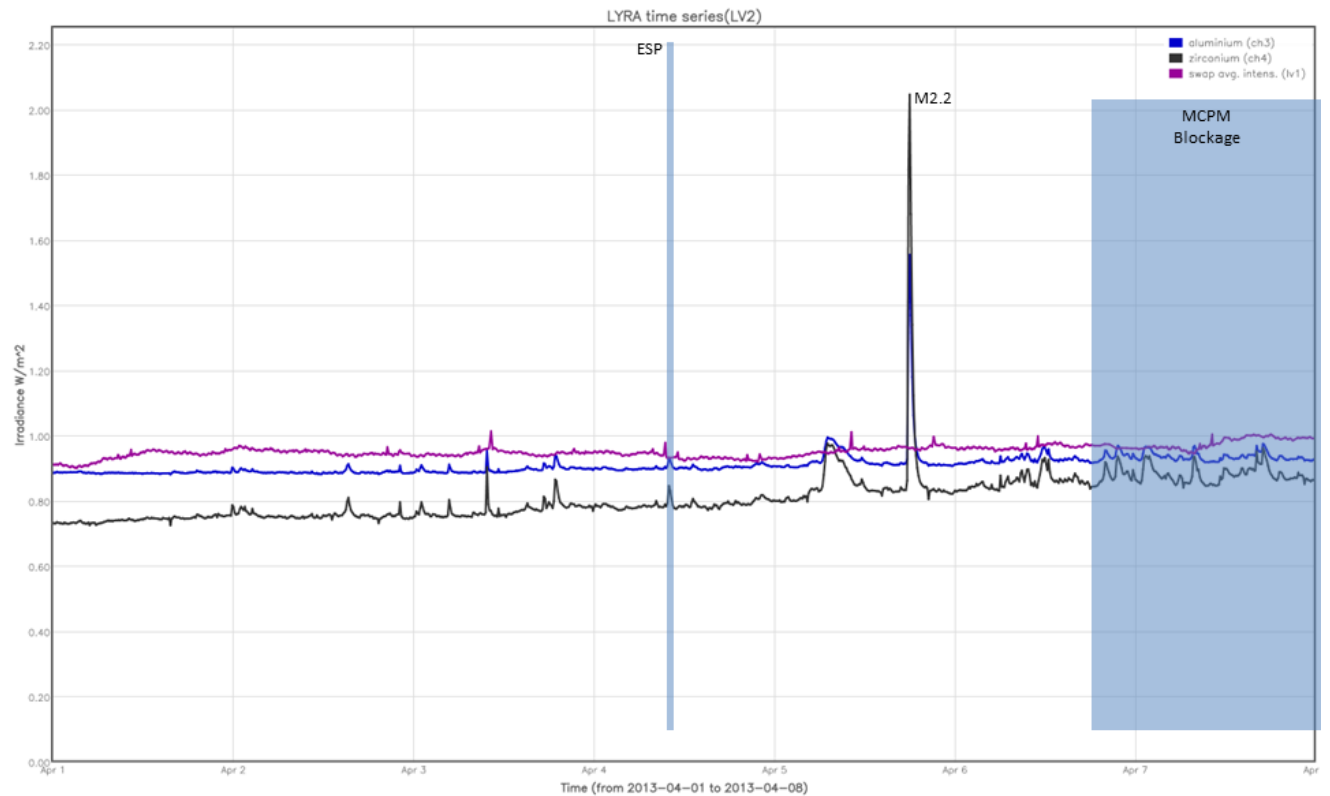


M2.2 flare on the east limb @ 17:41
- SWAP image, colored, from HelioViewer.

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 SWAP related blue shaded periods correspond to, from left to right:

- ESP experiment on Thursday
- MCPM blockage between 06/04/2013; 18:21 to 08/04/2013; 06:18.

The LYRA related orange shaded periods correspond to::

- None

The red shaded period corresponds to:

- None

Outreach, papers, presentations, etc.

- The scientific part of the contents of the "Solar Activity" section above is published in this week's STCE Bulletin (see <http://www.stce.be/newsletter/newsletter.php>)

- 'PROBA2: Mission and Spacecraft Overview'; S. Santandrea et al; Solar Physics, Topical Issue:

PROBA2 - first two years of Solar Observations.

Please also 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.

Guest Investigator Program

- None

2. LYRA instrument status

Calibration

No calibration this week.

IOS & operations

Monday 01 Apr	Tuesday 02 Apr	Wednesday 03 Apr	Thursday 04 Apr	Friday 05 Apr	Saturday 06 Apr	Sunday 07 Apr
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00319	LYIOS00319	LYIOS00319	LYIOS00320	LYIOS00320	LYIOS00320	LYIOS00320

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

LYRA detector temperature

LYRA detector 2 temperature globally varied between 48.2 to 47.3 degrees C, taking into account the daily U3 activation periods; the latter result in a temperature increase of about 0.6 degrees C.

To be explored

- None

3. SWAP instrument status

Calibration

No calibration this week.

MCPM errors

The number of MCPM recoverable errors increased from 7224 to 7281.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 01 Apr	Tuesday 02 Apr	Wednesday 03 Apr	Thursday 04 Apr	Friday 05 Apr	Saturday 06 Apr	Sunday 07 Apr
Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition + ESP	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00460 570 images	IOS00460 606 images	IOS00460 586 images	IOS00461 593 images	IOS00461 577 images	IOS00461 324 images	IOS00461 74 images

Special operations for SWAP, this week:

- ESP jump on Thursday

An MCPM blockage occurred between Saturday 06/04/2013; 18:21 and Monday 08/04/2013; 06:18. A dedicated image storage management concept, implemented on-board, successfully avoided the occurrence of a long SWAP data gap during this period.

Nevertheless, the MCPM blockage resulted in the downlink of fewer images during the week-end, i.e. resulting in a much lower image cadence.

SWAP detector temperature

The SWAP Cold Finger Temperature, globally varied between -0.50 and -1.29 degrees C.

To be explored

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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 10642 to 10700) was nominal, except for:
- None.

Data coverage HK

All HK data files (LYRA_AD) have been received, except for:
- None

Data coverage SWAP

All SWAP Science data files (BINSWAP) have been received, except for:
- BINSWAP_10689 to BINSWAP_10702 (included); this is due to the MCPM blockage.

Total number of images between 2013 Apr 01 0UT and 2013 Apr 08 0UT: 3440

Highest cadence in this period: 130 seconds

Average cadence in this period: 175.66 seconds

Number of image gaps larger than 300 seconds: 174

Largest data gap: 34.33 minutes

The large gap is due to the ESP experiment on Thursday. The high number of image gaps, larger than 300 seconds is due to the MCPM blockage.

Data coverage LYRA

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

- 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)