


P2SC-ROB-WR-210- 20140331 Weekly report #210	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Mar 31 to April 06, 2014 09 April 2014 Erik Pylyser 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	

1. Science

Solar & Space weather events

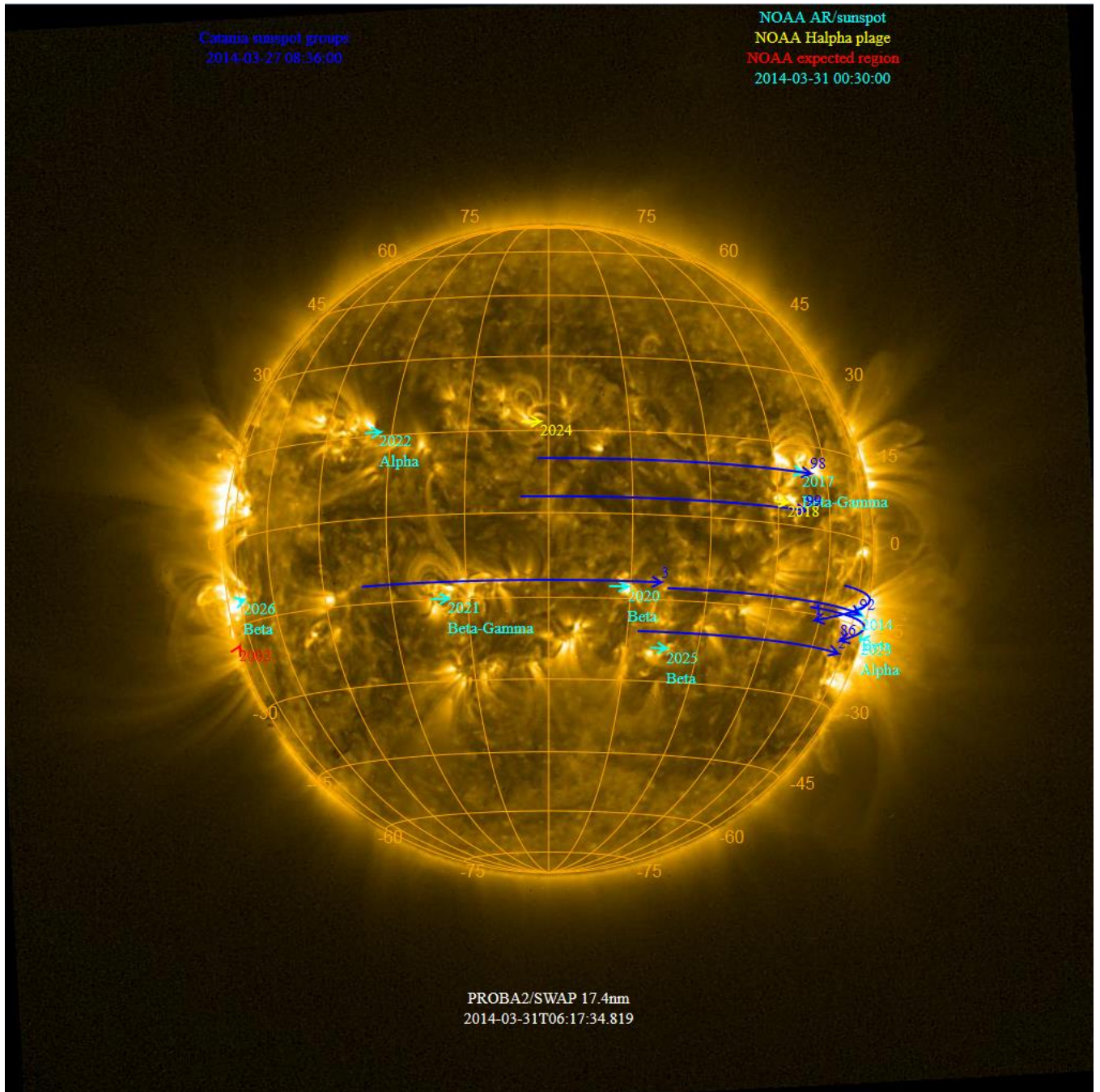
The level of solar activity¹ was **low** to **moderate** this week. Two M-flares were recorded, one on Monday from AR12014 (M1.4), and one on Wednesday from AR 12027 (M6.5).

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

	Monday 31 Mar	Tuesday 01 Apr	Wednesday 02 Apr	Thursday 03 Apr	Friday 04 Apr	Saturday 05 Apr	Sunday 06 Apr
Activity	moderate	low	moderate	low	low	low	low
Flares	M1.4@07:20	-	M6.5@13:18	-	-	-	-

¹ See appendix. All timings are given in UT.

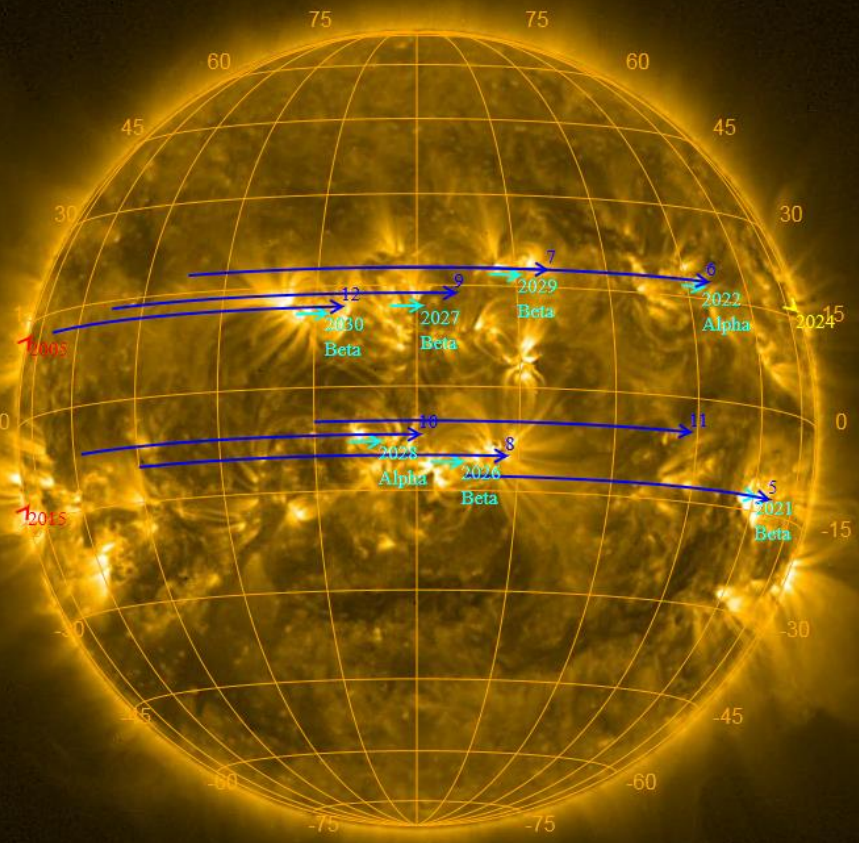
The SWAP images of Mar 31 and April 06 are shown below, with annotated active regions.



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

Catania sunspot groups
2014-04-02 08:30:00

NOAA AR/sunspot
NOAA Alpha plage
NOAA expected region
2014-04-06 00:30:00



PROBA2/SWAP 17.4nm
2014-04-06T08:04:13.829

Solar Activity

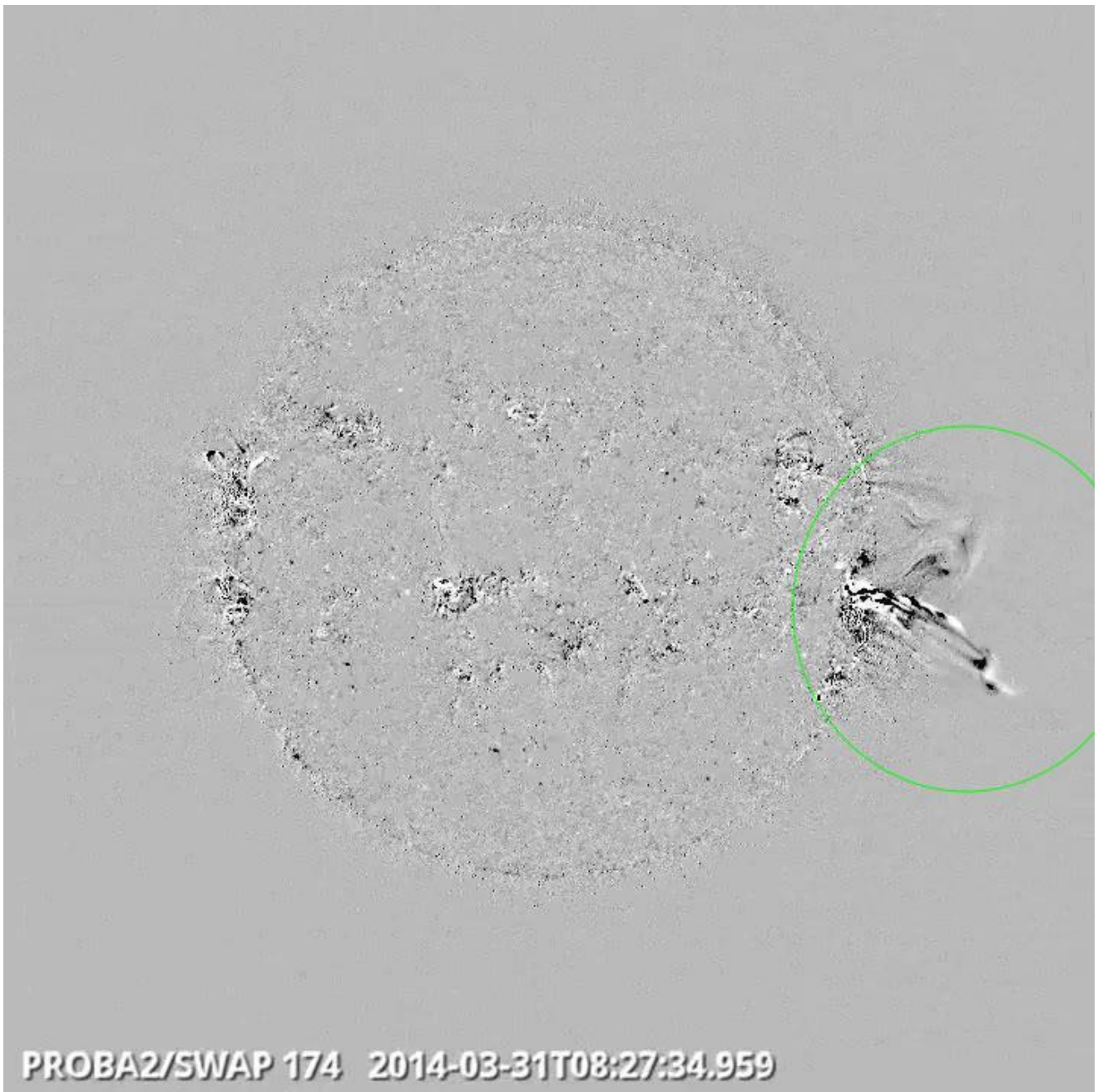
The level of solar activity was **low** to **moderate** this week. Two M-flares were recorded, one on Monday from AR12014 (M1.4), and one on Wednesday from AR 12027 (M6.5).

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](#) (SWAP week 210). Occasionally in this movie, the Sun is not centered due to off-point campaigns (twice).

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

Monday Mar 31st



M1.4 flare Eruption, West limb @ 08:27 - SWAP difference image

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

The expelled material could be followed up to the edge of the SWAP field of view.

Tuesday Apr 1st

A cavity/cusp-like feature can be seen at relatively high altitude above the North Western Limb. The feature is hard to see, but definitely present.

We suggest having a look at the SWAP daily movie [here](#). Note that the Sun is not centered in this movie, because of an off-pointing campaign, lasting the whole day.

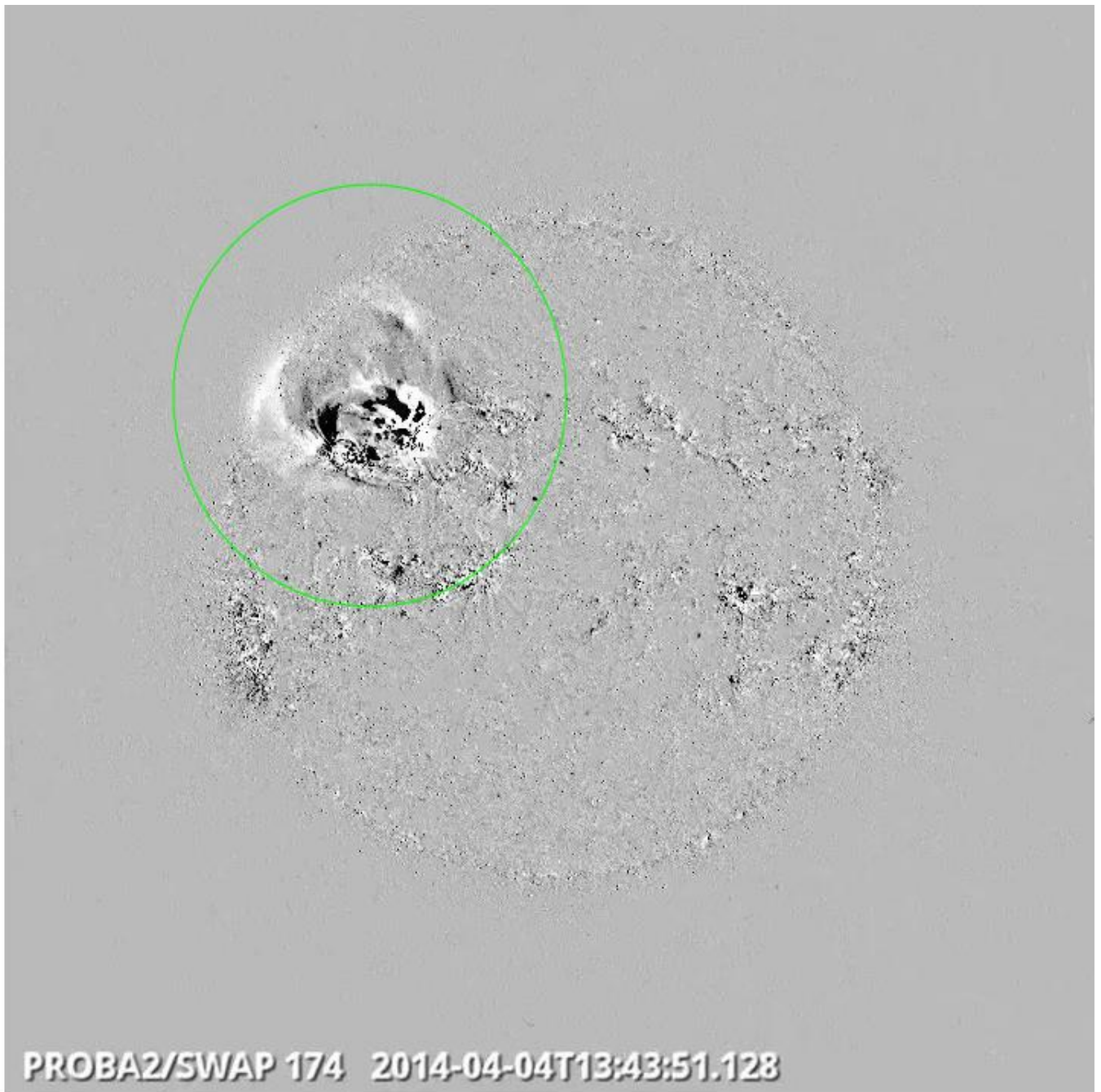
Such features can be seen sporadically, but **not at such a high altitude**.

Wednesday Apr 2nd.



M6.5 flare Eruption, North East Quadrant - AR12027 @ 13:58 - SWAP difference image
Find a movie of the event [here](#) (SWAP difference movie)

Friday April 4th



C8.3 flare Eruption, North East Quadrant - AR12027 @ 13:58 - SWAP difference image

Saturday April 5th

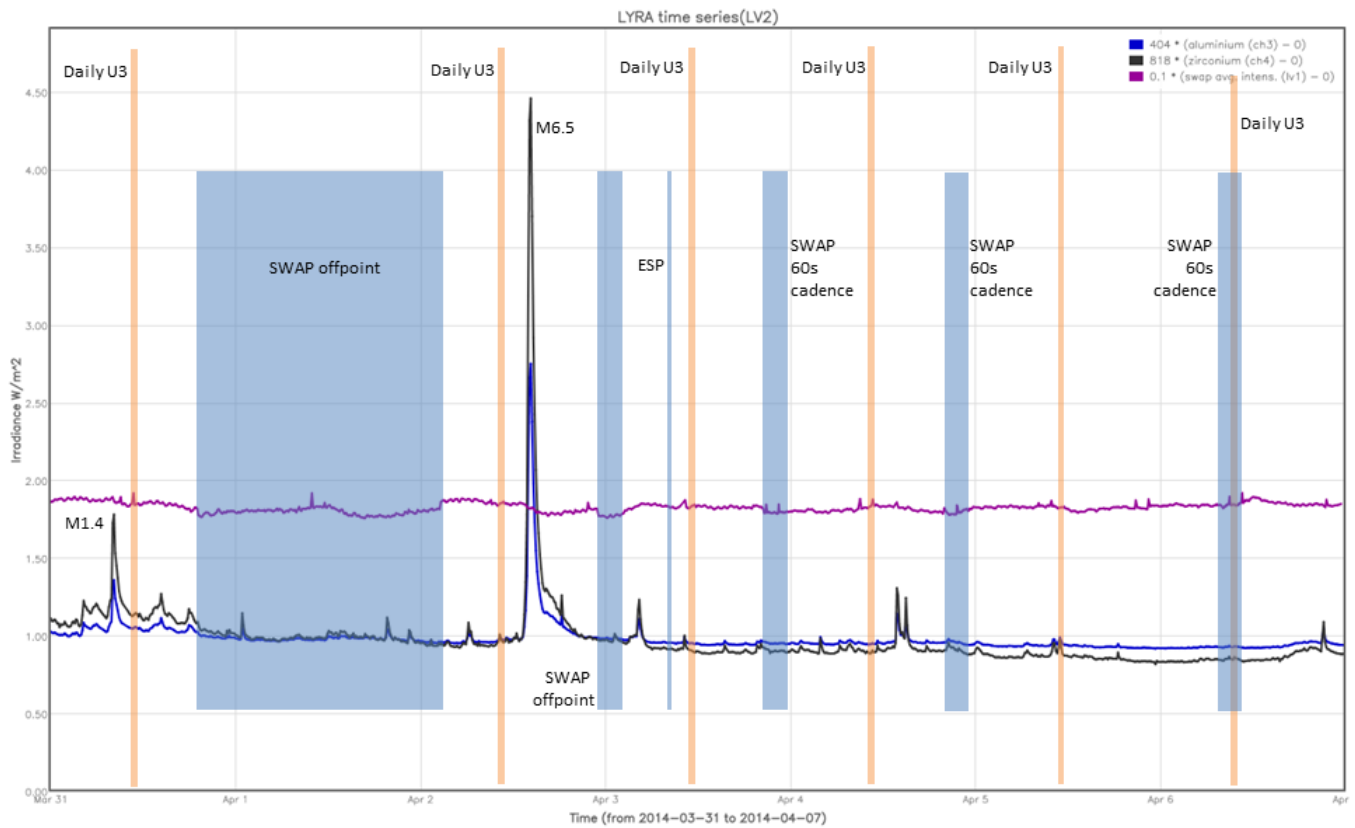


Prominence Eruption, South East Limb @ 13:58 - SWAP difference image

An overview of the weekly LYRA & SWAP data is provided below:

The following curves are visible:

- black: Zirconium Channel LYRA Unit 2
- blue: Aluminum Channel of LYRA Unit 2
- purple: SWAVINT (SWAP Average Intensity; integrated solar intensity per SWAP image pixel)



The (LYRA related) orange shaded periods correspond to, from left to right (see section 2):

- Daily LYRA unit 3 campaign (except on Tuesday)

The (SWAP related) blue shaded periods correspond to, from left to right (see section 3):

- 2 Off-pointing campaigns to solar west, starting on 31/03/2014 and 02/04/2014
- ESP jump on Thursday 03/04
- 3 High cadence campaigns (60s) on 03/04, 04/04, 06/04, for 3.5 hrs a day.

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 Monday 31st, the STCE annual meeting was held on the subject of the PROBA fleet: <http://www.stce.be/annualmeeting/2014/PROBA.php>.

The PROBA2 team was present at this meeting, along with the following people:

https://docs.google.com/spreadsheets/ccc?key=0AjTVXq_lfwjLdG1YcGkxRzYwYXI6T2I6TFU5RmlUbEE&usp=drive_web#gid=0.

Presentations of this meeting can be found here: <https://cloud-asma.oma.be/public.php?service=files&t=4e17f246670aaf1213dba8f2e6585642>.

On April 3rd, the SIDC outreach team went to a secondary school (in Hoogstraten) to organise an event around Solar Activity and Space Weather for the 5th-grade children. This event included elements of the PROBA2 mission and instruments.

Guest Investigator Program

- Christian Bethge has started the last week of his stay at the P2SC. His study subject is 'Combining SWAP and CoMP to study coronal pseudostreamers and their influence on solar wind speeds'.
- The Deborah Baker GI team has joined P2SC, and is "Investigating the nature and extent of large-scale AR loop expansion off-limb". They stay until April 11th. Several specific SWAP campaigns were performed this week in support of their study.

Other Visitors

- None

2. LYRA instrument status

Calibration

No calibration this week.

IOS & operations

Monday 31 Mar	Tuesday 01 Apr	Wednesday 02 Apr	Thursday 03 Apr	Friday 04 Apr	Saturday 05 Apr	Sunday 06 Apr
Nominal acquisition + daily U3	Nominal acquisition	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00388	LYIOS00390	LYIOS00390	LYIOS00390	LYIOS00390	LYIOS00390	LYIOS00390

The following science campaigns were performed by LYRA:

- daily U3 observation campaign, all days except on Tuesday (SWAP off-pointing).

LYRA detector temperature

LYRA detector 2 temperature globally decreased from 48.87 to 48.13 °C, taking into account the daily U3 activation temperature peaks.

3. SWAP instrument status

Calibration

No calibration this week.

MCPM errors

The number of MCPM recoverable errors increased from 17446 to 17649.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 31 Mar	Tuesday 01 Apr	Wednesday 02 Apr	Thursday 03 Apr	Friday 04 Apr	Saturday 05 Apr	Sunday 06 Apr
Nominal acquisition + offpoint West	Nominal acquisition + offpoint West	Nominal acquisition + offpoint West	Nominal acquisition + ESP jump + high cadence (60s)	Nominal acquisition + high cadence (60s)	Nominal acquisition + high cadence (60s)	Nominal acquisition + high cadence (60s)
IOS00508->510 666 images	IOS00510->511 664images	IOS00511->512 657 images	IOS00512->513 755 images	IOS00513 769 images	IOS00513 665 images	IOS00514 592 images

Special operations for SWAP, this week:

- Off-pointing campaign to solar west, for GI team Deb Baker, between:
 - 31/03/2014, 19:00 until 02/04/2014, 02:30.
 - 02/04/2014, 23:30 until 03/04/2014, 02:30.
- ESP jump on Thursday 03/04
- High cadence campaigns (60s) on 03/04, 04/04, 06/04, for 3.5 hrs a day.

SWAP detector temperature

The SWAP Cold Finger Temperature varied between -0.08 and -0.89 °C.

4. PROBA2 Science Center Status

The main operator is Erik Pylyser

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 13773 to 13834) was nominal.

Data coverage HK

All HK data files (LYRA_AD) have been received.

Data coverage SWAP

All SWAP Science data files (BINSWAP) have been received.

The downlink quality of pass 13797 was not very good, 7 images have been lost.

Total number of images between 2014 Mar 31 0UT and 2014 Apr 07 0UT: 4752

Highest cadence in this period: 0 seconds

Average cadence in this period: 127.26 seconds

Number of image gaps larger than 300 seconds: 19

Largest data gap: 32.17 minutes

Data coverage LYRA

All LYRA Science data files (BINLYRA) have been received.

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)