


P2SC-ROB-WR-202- 20140203 Weekly report #202	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Feb 03 to Sun Feb 09, 2014 21 Feb 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

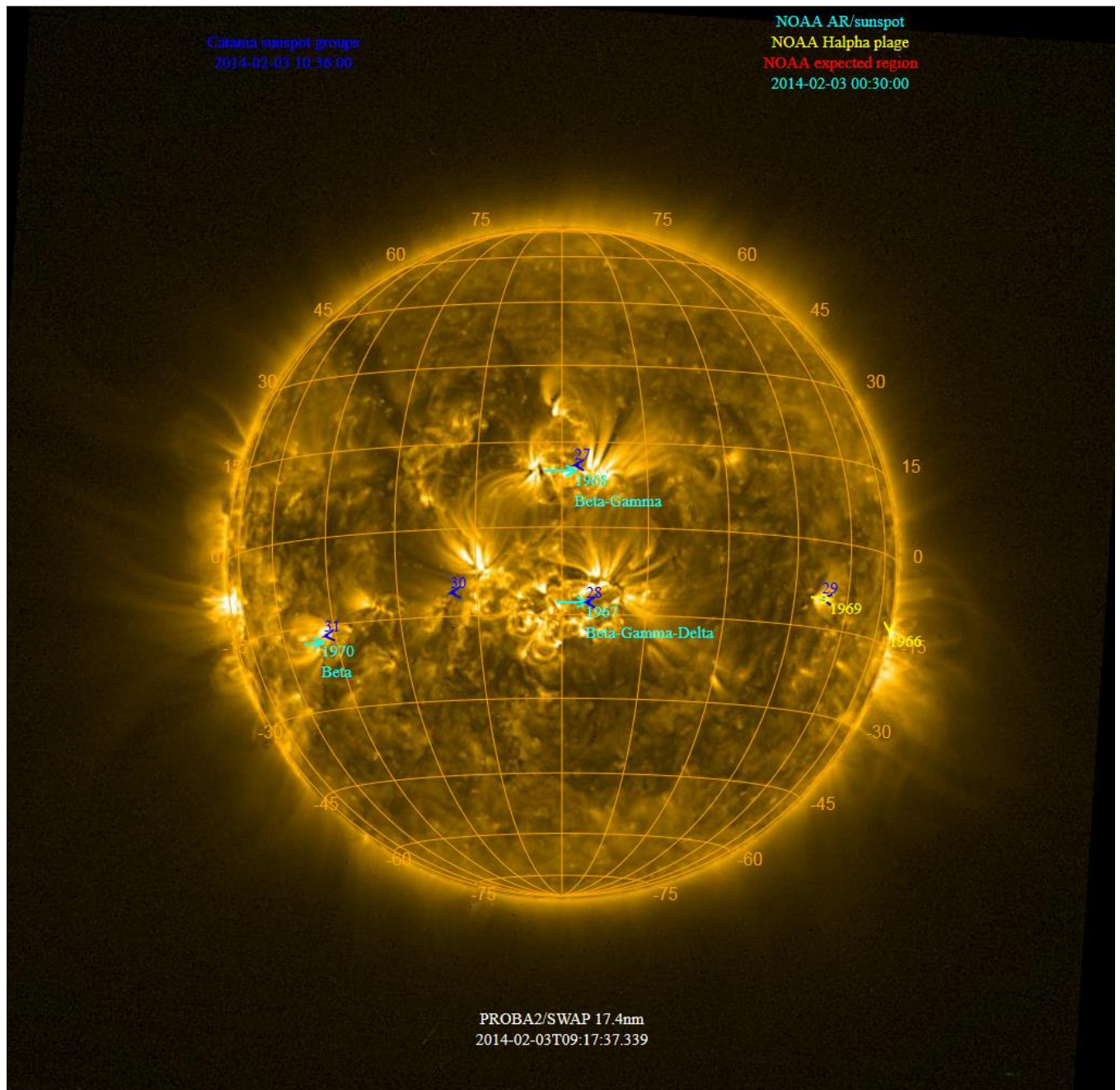
The level of solar activity¹ was **moderate** this week, except for Monday and Saturday. 9 M-level flares were counted. As during last week most of the flaring activity originated in AR11967 and AR11968.

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

	Monday 03 Feb	Tuesday 04 Feb	Wednesday 05 Feb	Thursday 06 Feb	Friday 07 Feb	Saturday 08 Feb	Sunday 09 Feb
Activity	low	moderate	moderate	moderate	moderate	low	moderate
Flares	(C9.0)	M3.8 @ 01:16 M5.2 @ 03:57 M1.4 @ 09:38 M1.5 @ 15:25	M1.3 @ 16:11	M1.5 @ 22:50	M2.0 @ 04:47 M1.9 @ 10:25	(C8.6)	M1.0 @ 15:40

¹ See appendix. All timings are given in UT.

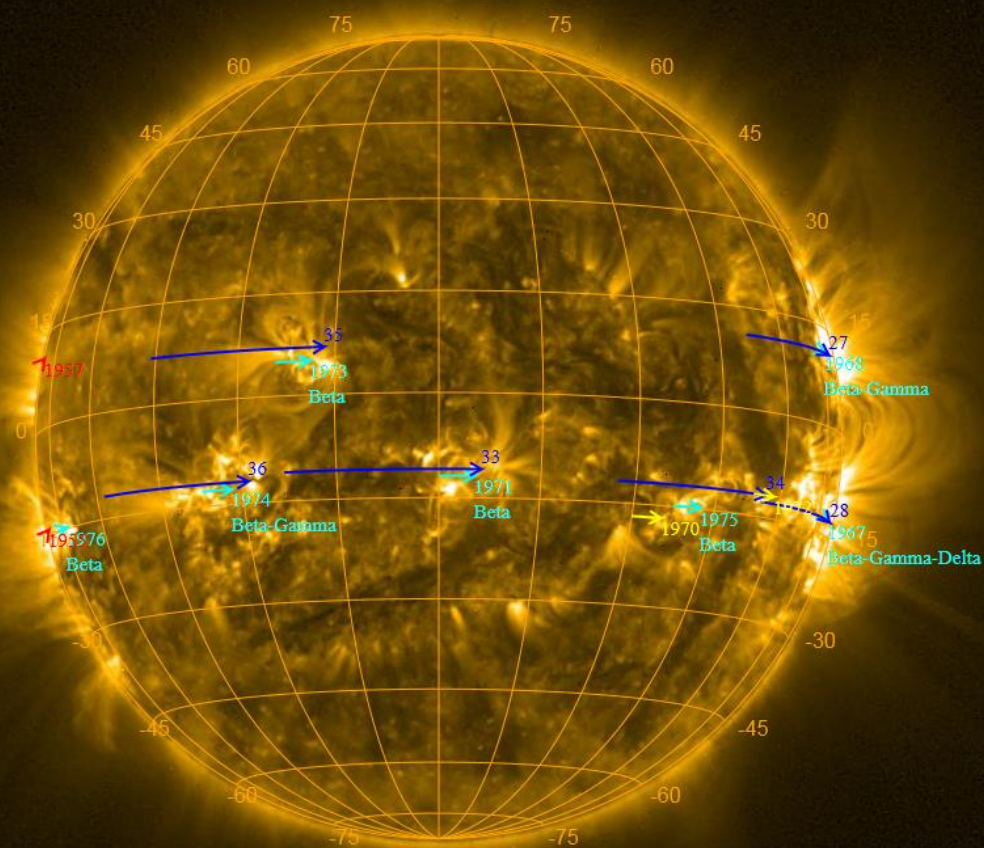
The SWAP images of Feb 03 and Feb 09 are shown below, with annotated active regions.



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

Catania sunspot groups
2014-02-07 09:00:00

NOAA AR/sunspot
NOAA Alpha plage
NOAA expected region
2014-02-09 00:30:00



PROBA2/SWAP 17.4nm
2014-02-09T09:05:59.443

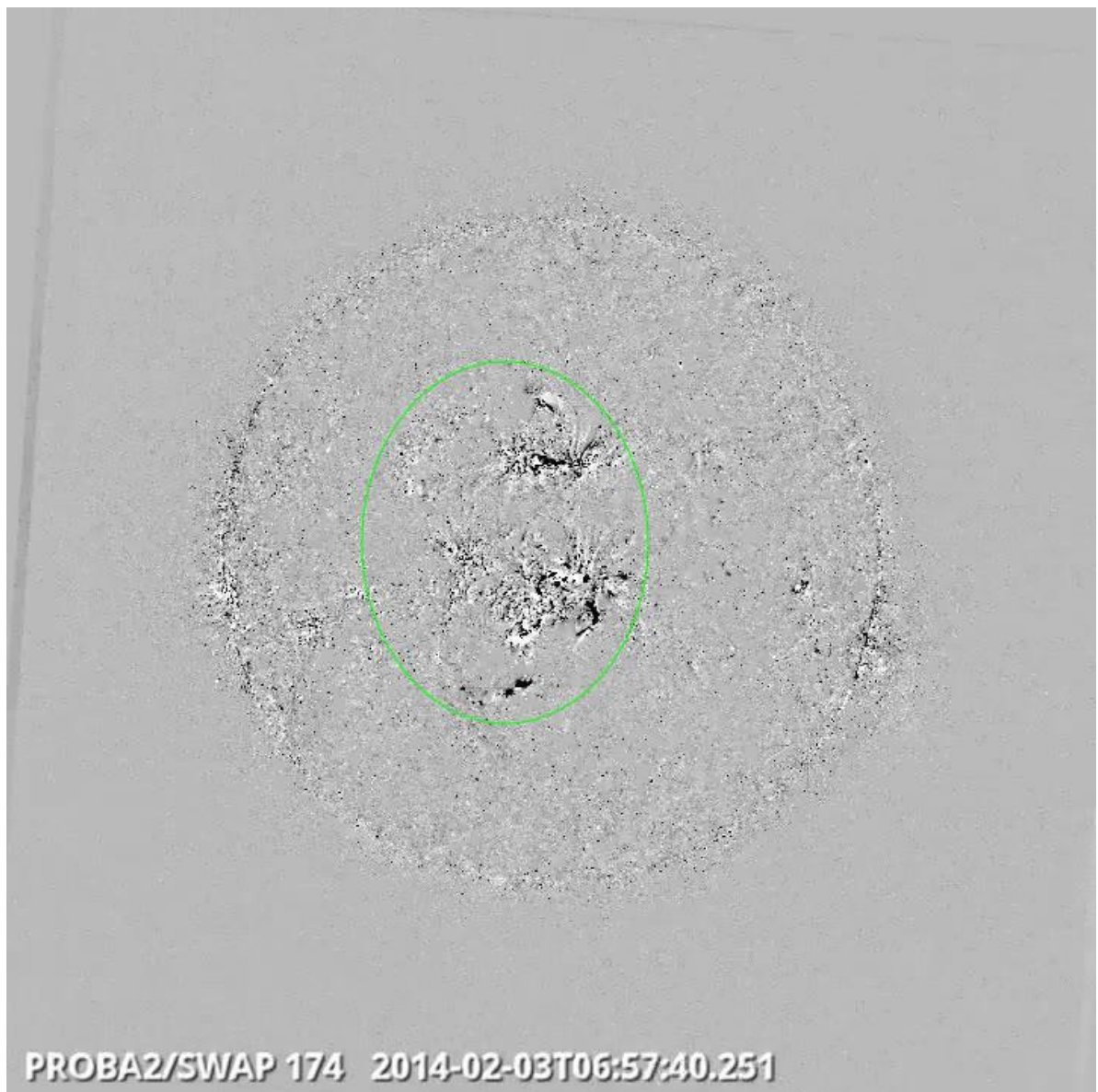
Solar Activity

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 202).

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

Monday Feb 03:



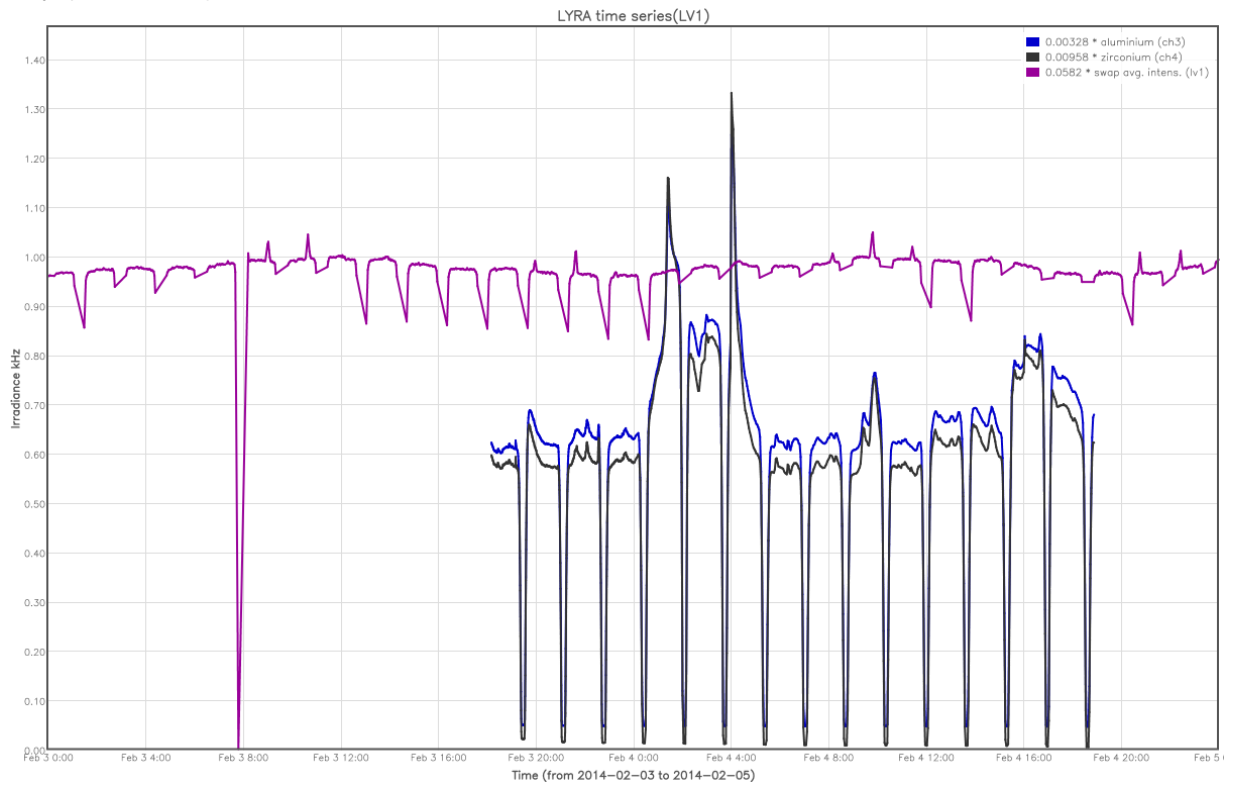
Eruption and magnetic activity in the center of the solar disk, involving both North and South regions @ 06:57 - SWAP difference image

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

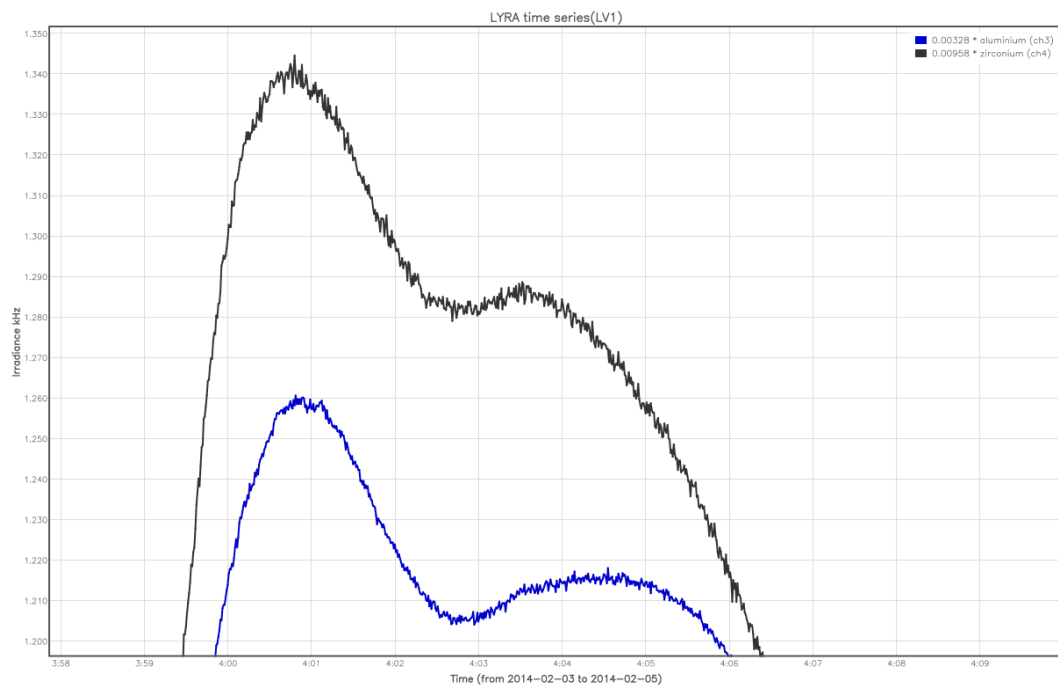
Tuesday Feb 06:

On Monday evening, a 24hr flare hunting campaign with LYRA Unit 3 (in parallel with Unit 2) was launched, based upon a prevision of strong(er) flaring activity.

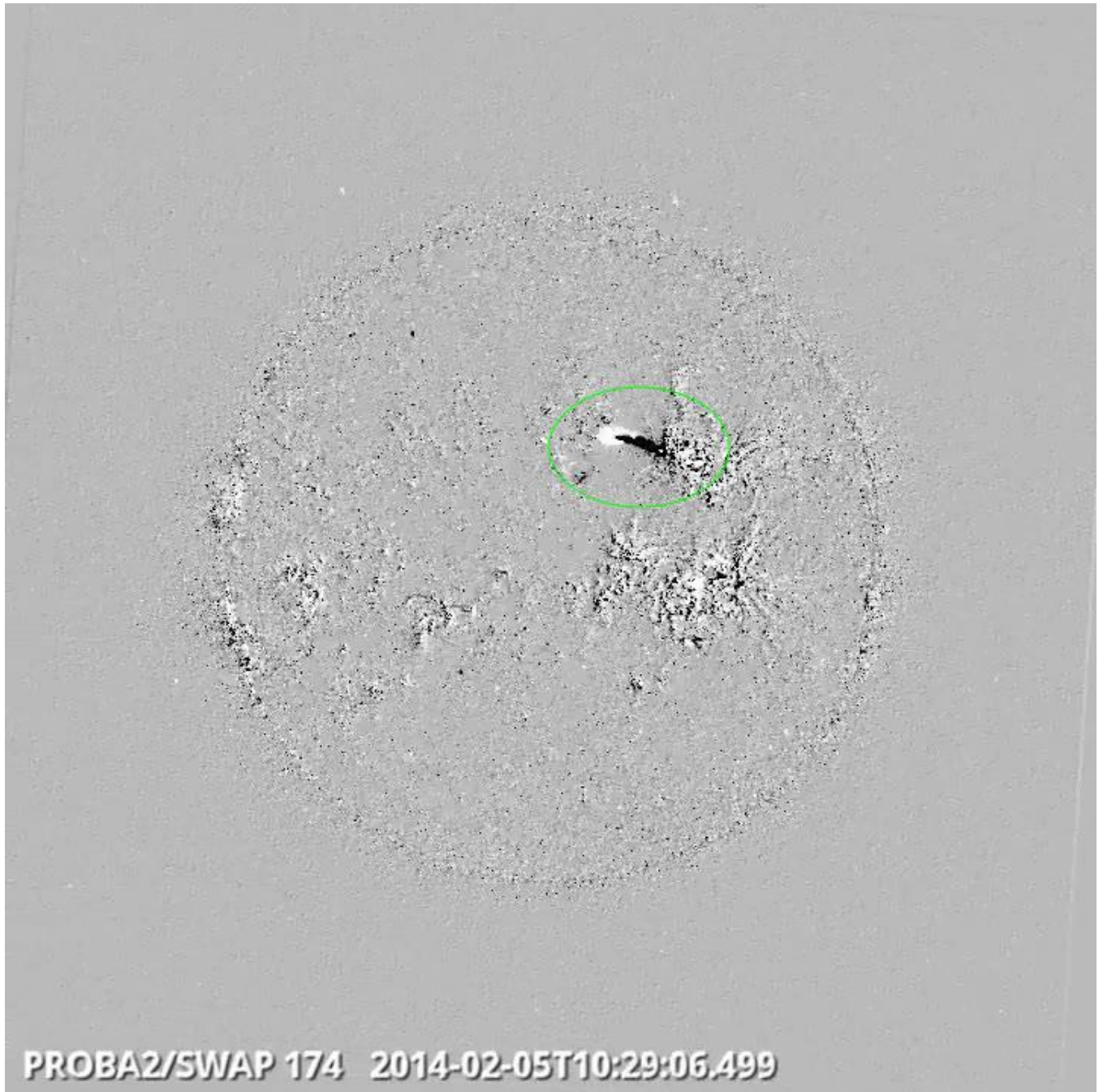
This campaign was successful: LYRA U3 captured two M-flares (M3.8 and M5.2), early morning on Tuesday (see below).



This is the maximum of the M5.2 flare:



Wednesday Feb 05:



Eruption in North West Quadrant @ 10:29 - SWAP difference image

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

Thursday Feb 06:



Prominence Eruption on the Southeast limb @ 04:45 - SWAP difference image
Find a movie of the event [here](#) (SWAP difference movie)

Saturday Feb 08:



Prominence Eruption on the East limb @ 07:29 - SWAP difference image

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

Sunday Feb 09:



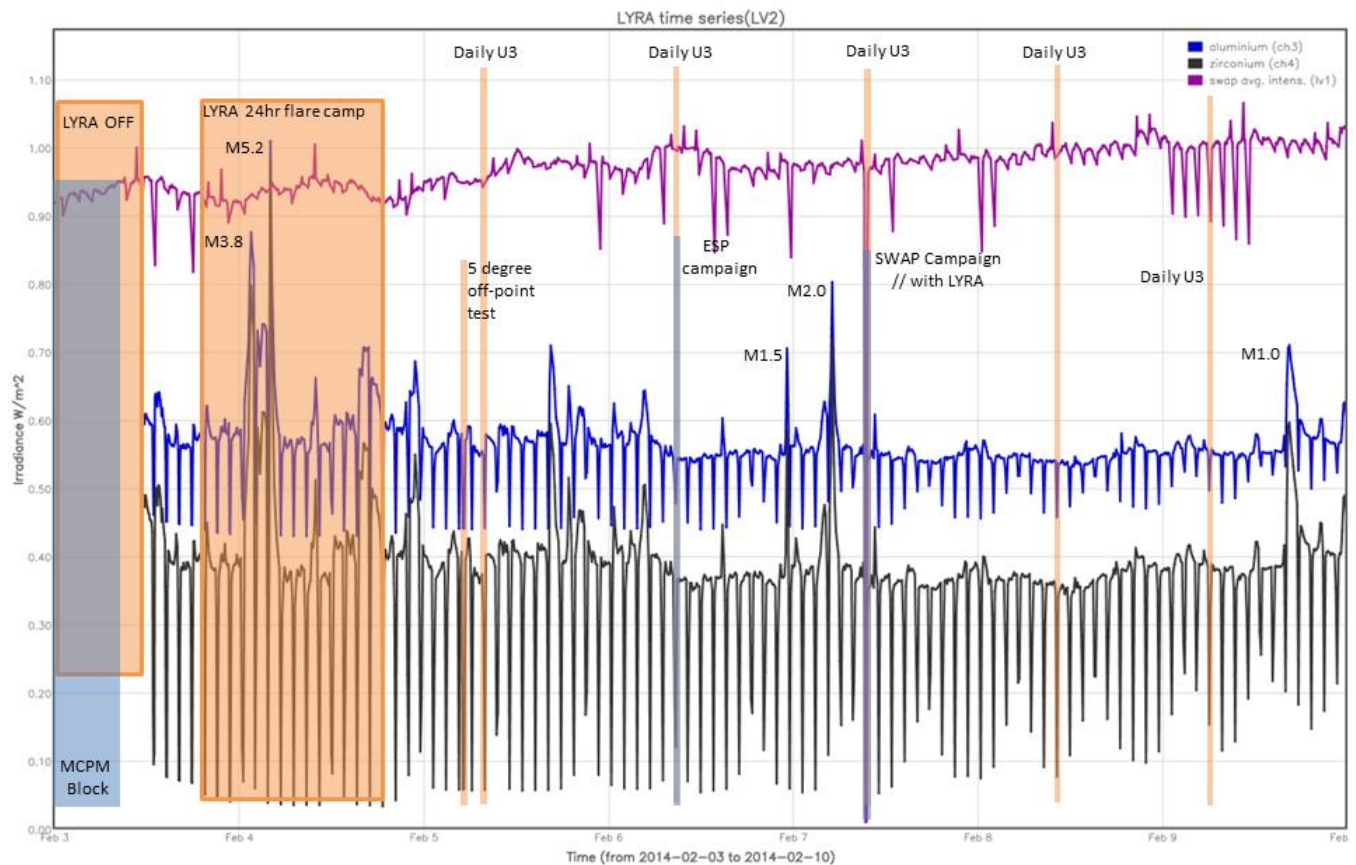
Eruption in the Southeast Quadrant @ 12:07 - SWAP difference image

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

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

- LYRA OFF, until Monday 11:39 (see Weekly Report 201)
- 5 degree off-point test
- Daily LYRA unit 3 occultation campaign, 5 times during the week
- LYRA 24 hour flare hunting campaign, starting on Monday 18:00.

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

- MCPM blockage (no data download), until 09:58 on Monday (see Weekly Report 201)
- SWAP campaign in parallel with LYRA on Friday

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.

Guest Investigator Program

- None

2. LYRA instrument status

Calibration

No calibration this week.

IOS & operations

Monday 03 Feb	Tuesday 04 Feb	Wednesday 05 Feb	Thursday 06 Feb	Friday 07 Feb	Saturday 08 Feb	Sunday 09 Feb
Back to Nominal acquisition + 24 hr flare hunt LYIOS00371 - > 372 -> 373	Nominal acquisition + 24hr flare hunt LYIOS00373	Nominal acquisition + daily U3 LYIOS00373	Nominal acquisition + daily U3 LYIOS00373	Nominal acquisition + daily U3 LYIOS00373	Nominal acquisition + daily U3 LYIOS00373	Nominal acquisition + daily U3 LYIOS00373

The following science campaigns were performed by LYRA:

- daily U3 observations campaign
- 24h-flare hunting campaign starting on Monday 18:00.

On Monday, LYRA was re-activated after the (automated) safety switch off of the previous week-end (see weekly report 201). Since solar activity was high, a 24h flare hunting campaign was started at 18:00 on Monday. This campaign was successful in capturing an M5.2 and M3.8 flare.

On Wednesday a test campaign was executed, to allow PROBA2 to off-point beyond its usual 3 degrees. It was off-pointed to 5 degrees for 15 minutes in order to allow for a better black current quality. The test was concluded to be successful and a full 'big offpoint' campaign is planned to be executed in the next week(s).

LYRA detector temperature

LYRA detector 2 temperature globally varied between 47 °C (at the time of re-activation of LYRA) and 54 °C (at the end of the 24hr flare hunting campaign), taking into account the daily U3 activation periods.

To be explored

- None

3. SWAP instrument status

Calibration

No calibration this week.

MCPM errors

The number of MCPM recoverable errors increased from 15866 to 16104.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 03 Feb	Tuesday 04 Feb	Wednesday 05 Feb	Thursday 06 Feb	Friday 07 Feb	Saturday 08 Feb	Sunday 09 Feb
MCPM unblock (REDU) + Nominal acquisition + daily uncomp. orbit	Nominal acquisition + daily uncomp. orbit	Nominal acquisition + daily uncomp. orbit	Nominal acquisition + ESP + daily uncomp. orbit	Nominal acquisition + parallel occultation + daily uncomp. orbit	Nominal acquisition + daily uncomp. orbit	Nominal acquisition + daily uncomp. orbit
IOS00498 604 images	IOS00499 607 images	IOS00499 620 images	IOS00500 626 images	IOS00500 637 images	IOS00500 516 images	IOS00500 530 images

Special operations for SWAP, this week:

- ESP campaign on Thursday
- Parallel occultation campaign with LYRA
- One orbit of uncompressed images per day

SWAP image downloading resumed at 09:58 on Monday, after an MCPM blockage which had occurred around Sunday midnight.

In order to fill the on-board buffer better (at times the buffer was empty after a downlink), a daily (one-orbit) campaign of uncompressed images were taken.

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 2.24 and 3.65 °C.

To be explored

- None

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 13288 to 13347) 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, except for:

- BINSWAP_13288 and BINSWAP_13289 (on-board MCPM blockage 22).
- BINSWAP_13290 was incomplete (on-board MCPM blockage 22)

This event did not result in a data gap, but a lower cadence during the blockage period.

Total number of images between 2014 Feb 03 0UT and 2014 Feb 10 0UT: 4140

Highest cadence in this period: 29 seconds

Average cadence in this period: 146.09 seconds

Number of image gaps larger than 300 seconds: 102

Largest data gap: 31.83 minutes

Data coverage LYRA

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

- BINLYRA_13288 -> BINLYRA_13291 (due to on-board LYRA Switch OFF).

The LYRA switch OFF period resulted in a LYRA data gap from Friday 31/01/2014; 20:08 until Monday 03/02/2014; 11:38.

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)