


P2SC-ROB-WR-201-20140127 Weekly report #201	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Jan 27 to Sun Feb 02, 2014 12 Feb 2014 Erik Pylyser Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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1. Science

Solar & Space weather events

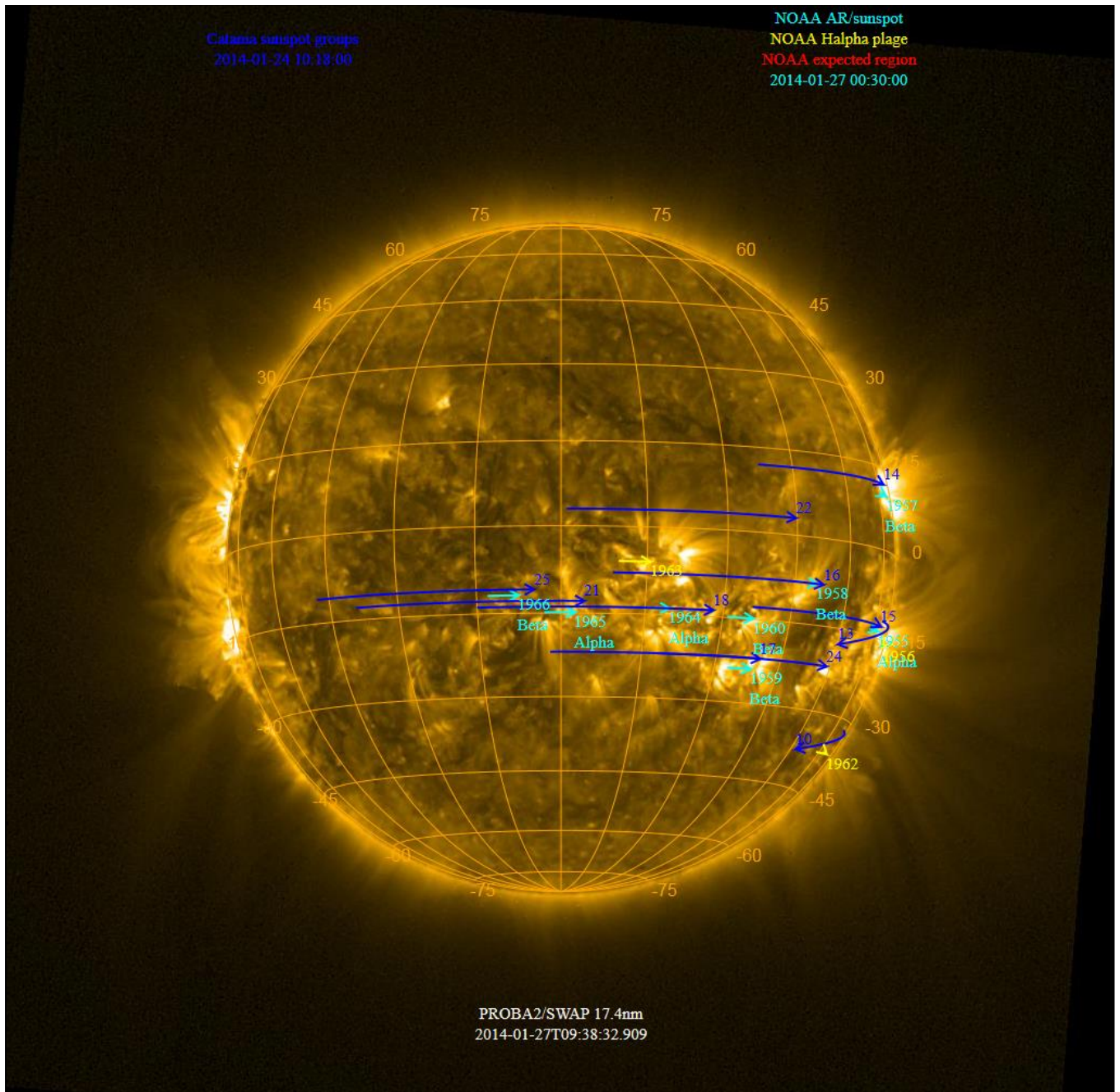
The level of solar activity¹ was **moderate** this week, except for Wednesday (flare: C9.0 max). 24 M-level flares were counted. Most M-flares and a lot of C-flares originated in AR11967, and a few in AR11968. Both active regions emerged around the east limb on Monday. By the end of the week, activity in AR11968 became largely equivalent to AR11967.

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

	Monday 27 Jan	Tuesday 28 Jan	Wednesday 29 Jan	Thursday 30 Jan	Friday 31 Jan	Saturday 01 Feb	Sunday 02 Feb
Activity	moderate	moderate	low	moderate	moderate	moderate	moderate
Flares	M1.0 @ 01:05 M1.1 @ 02:02 M4.9 @ 22:05	M1.5 @ 04:02 M3.6 @ 07:25 M1.4 @ 11:34 M1.3 @ 12:33 M1.3 @ 12:38 M3.5 @ 15:24 M4.9 @ 19:00 M2.6 @ 22:04	(C9.0)	M2.1 @ 06:33 M1.1 @ 07:54 M6.6 @ 15:48	M1.1 @ 15:32	M1.0 @ 01:19 M3.0 @ 07:14	M2.6 @ 06:24 M3.2 @ 07:17 M4.4 @ 09:24 M1.3 @ 14:01 M1.0 @ 16:24 M3.1 @ 18:05 M1.3 @ 21:24

¹ See appendix. All timings are given in UT.

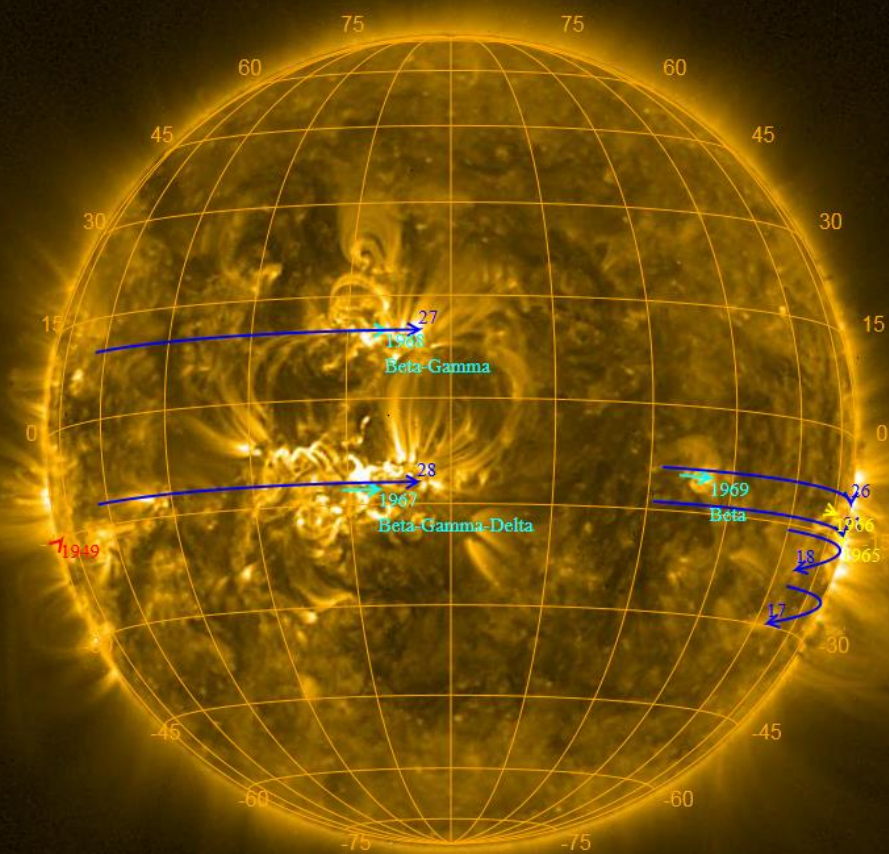
The SWAP images of Jan 27 and Feb 02 are shown below, with annotated active regions.



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

Catania sunspot groups
2014-01-29 09:36:00

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



PROBA2/SWAP 17.4nm
2014-02-02T09:36:03.899

Solar Activity

Solar flare activity was moderate during the week, with a 'lower' Wednesday.

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 201).

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

Given the number of M-flares this week, only the most energetic/spectacular will be addressed below.

For viewing the other events, please refer to the daily movies accessible via the website mentioned above.

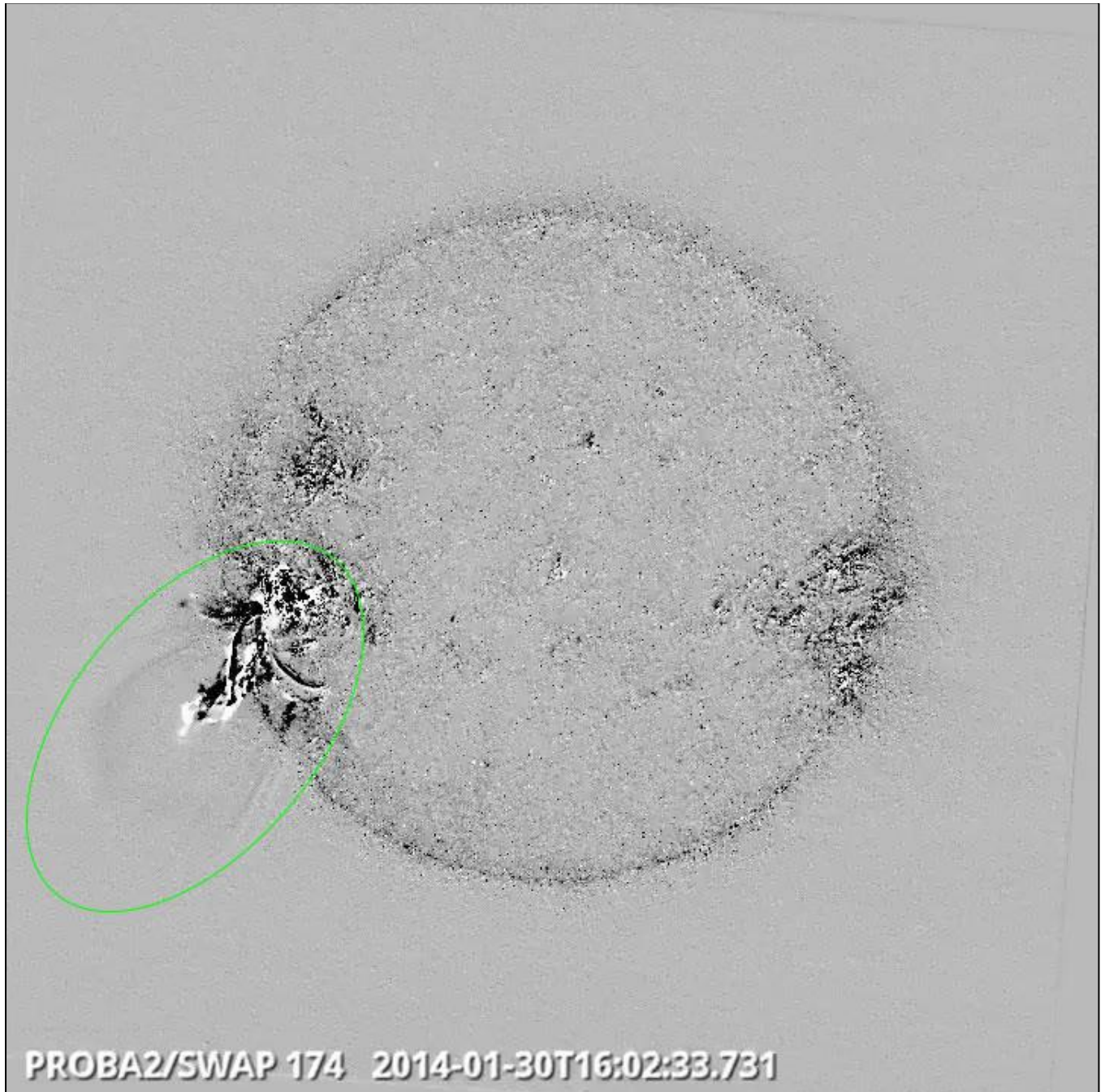
Wednesday Jan 29:



Large eruption in the Western Hemisphere, involving both North and South regions @ 01:25 - SWAP difference image

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

Thursday Jan 30:

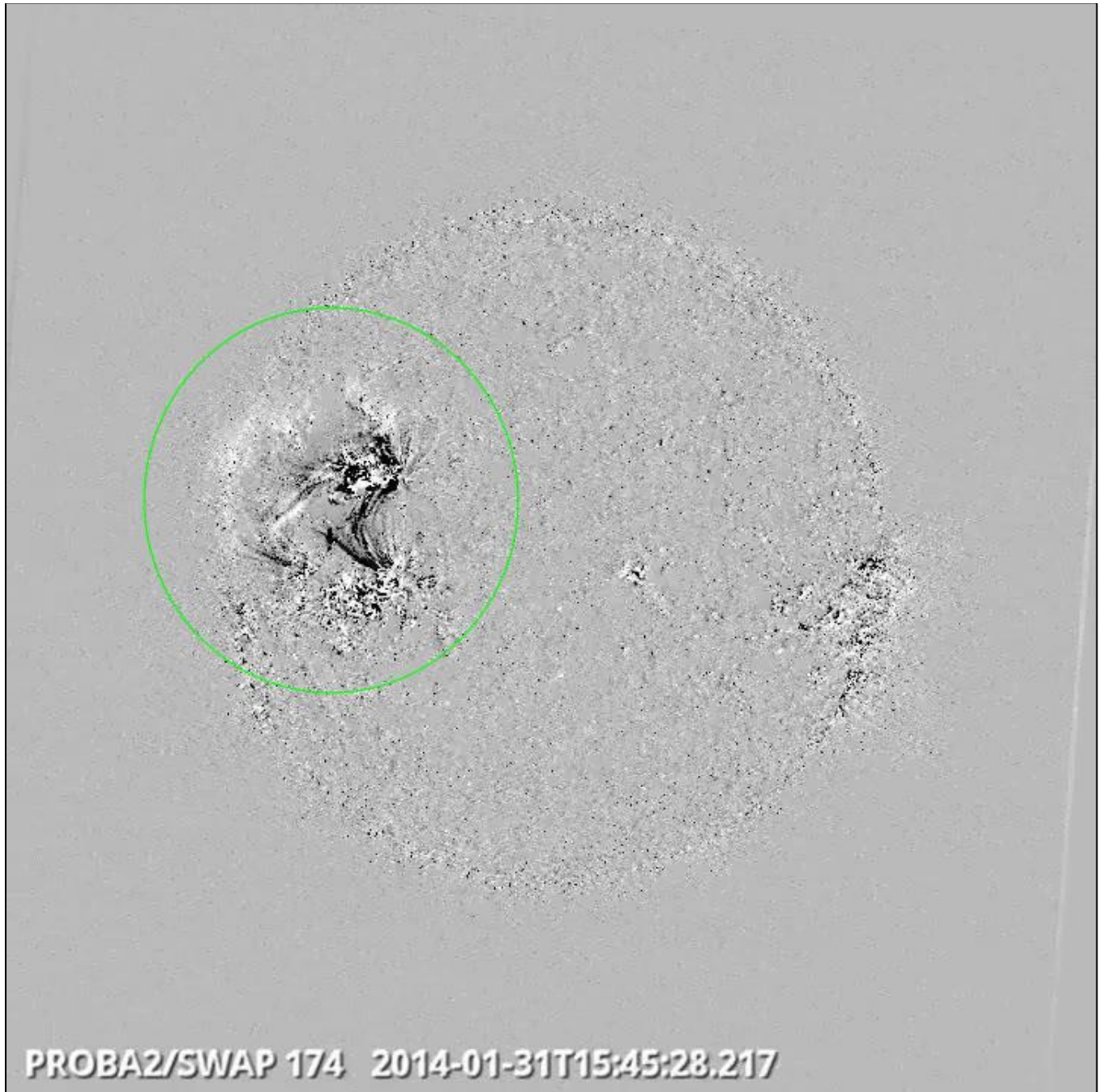


M6.6 flare close to the (South) East limb - AR 11967 @ 16:00 - SWAP difference image

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

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

Friday Jan 31:

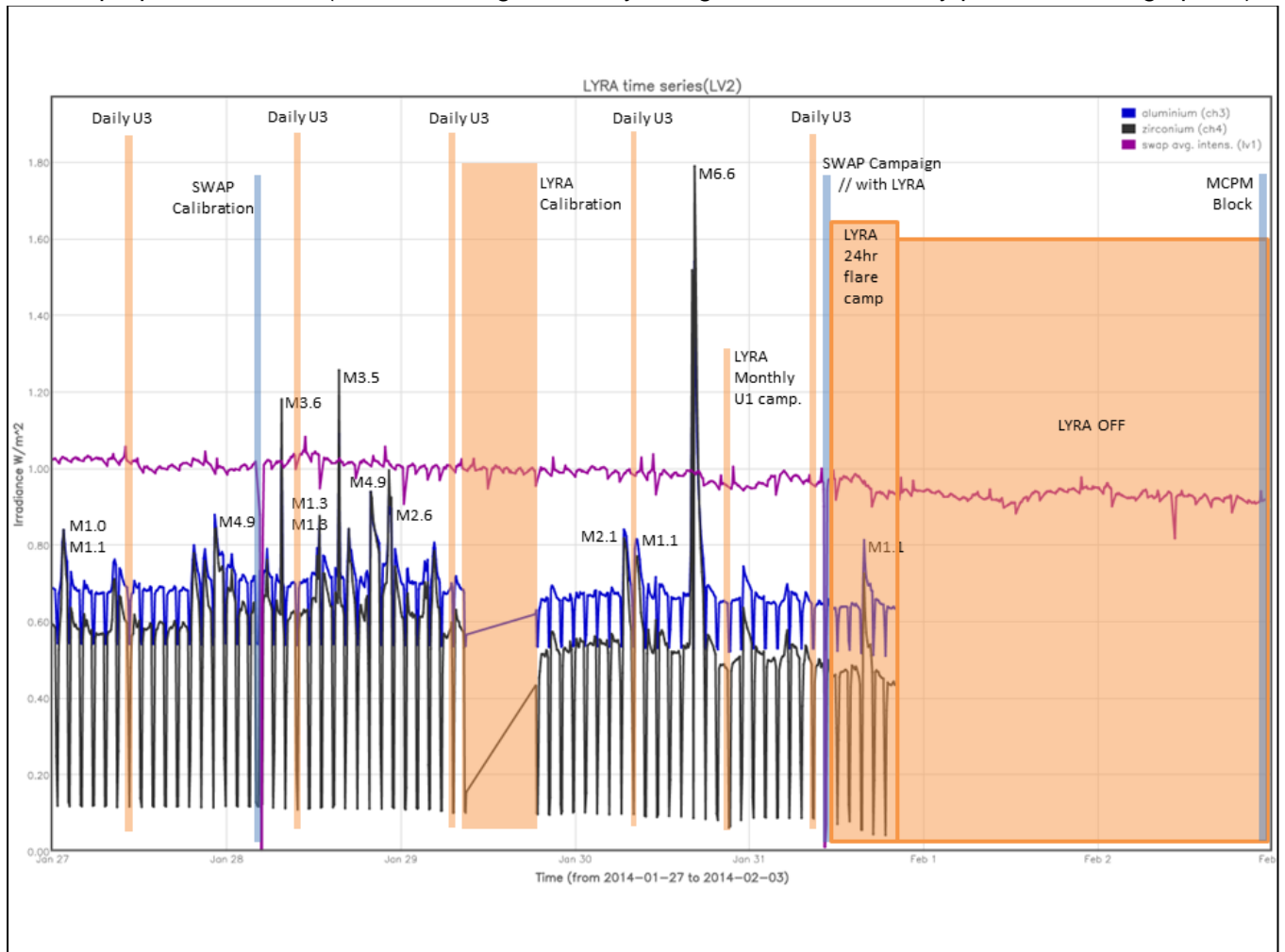


M1.1 Flare Eastern hemisphere - AR11967 & 11968 @ 15:45 - SWAP difference image
Find a movie of the event [here](#) (SWAP difference movie)

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

- SWAP Calibration on Tuesday
- SWAP campaign in parallel with LYRA on Friday
- MCPM blockage (no data download) late in the evening on Sunday

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

- Daily LYRA unit 3 occultation campaign, 5 times
- LYRA Calibration on Wednesday
- LYRA 24 hour flare hunting campaign, starting on Friday 14:00
- LYRA (automated) switch OFF on Friday evening 20:08, due to a too high temperature parameter.

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>).

Vaibhav Pant left. He was working on CME detection with CACTus-like algorithms for new datasets.

Guest Investigator Program

- None

2. LYRA instrument status

Calibration

Calibration on Wednesday.

IOS & operations

Monday 27 Jan	Tuesday 28 Jan	Wednesday 29 Jan	Thursday 30 Jan	Friday 31 Jan	Saturday 01 Feb	Sunday 02 Feb
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3 + calibration	Nominal acquisition + daily U3 + monthly U1	Nominal acquisition + daily U3 + 24hr flare hunting; LYRA auto-OFF at 20:08.	LYRA OFF, no acquisition	LYRA OFF, no acquisition
LYIOS00368	LYIOS00369	LYIOS00369	LYIOS00369	LYIOS00369 - >370	LYIOS00370	LYIOS00371

The following science campaigns were performed by LYRA:

- daily U3 observations campaign (interrupted during the week-end)
- monthly U1 observations campaign
- 24-flare hunting campaign on Friday

While LYRA was performing the 24 hour flare hunting campaign on Friday, a safety (temperature) parameter exceeded a maximum value and on-board automation switched LYRA to OFF. Thereby COV2 and COV3 remained OPEN until Monday 03 Feb.

No data was gathered during the LYRA OFF period. The latter resulted in a LYRA data gap from Friday 31/01/2014; 20:08 until Monday 03/02/2014; 11:38.

This event occurred due to a combination of 'hot season', i.e. when LYRA is usually hotter due to the orbital configuration, and the 24-hour flare hunting campaign (both U2 and U3 are ON), which increases temperature significantly.

For some LYRA temperature parameters on-board, the maximum temperature value which cannot be exceeded had already been increased, but not for all. Action was taken (via REDU) to increase the other on-board maximum values to 55 degrees instead of 50, thereby eliminating the risk of unplanned LYRA deactivation.

LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.3 and 53.7 °C (the latter temperature at the time of automated switch OFF of LYRA), taking into account the daily U3 activation periods.

To be explored

- None

3. SWAP instrument status

Calibration

Calibration on Tuesday.

MCPM errors

The number of MCPM recoverable errors increased from 15726 to 15866.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 27 Jan	Tuesday 28 Jan	Wednesday 29 Jan	Thursday 30 Jan	Friday 31 Jan	Saturday 01 Feb	Sunday 02 Feb
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition	Nominal acquisition	Nominal acquisition + parallel occultation	Nominal acquisition	Nominal acquisition + MCPM block
IOS00497 582 images	IOS00498 634 images	IOS00498 586 images	IOS00498 603 images	IOS00498 637 images	IOS00498 609 images	IOS00498 439 images

Special operations for SWAP, this week:

- Parallel occultation campaign with LYRA

SWAP image downloading blocked on Sunday evening, 23:38 UT. REDU responded with the usual contingency procedure on Monday morning. On-board data acquisition re-started at 09:58 UT. This event did not impact the continuity of the SWAP data, thanks to an appropriate on-board handling of the data storage.

This was the 22nd occurrence of this event.

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 0 and 3.4 °C.

To be explored

- None

4. PROBA2 Science Center Status

The main operator is Robbe Vansintjan.

The following changes were made to the P2SC:

PTI/SW-PTI/SW-translatelIOS

- 03/02/2014: r5043

5. Data reception & discussions with MOC

Passes

The delivery of the passes for this week (passes 13226 to 13287) 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.

Total number of images between 2014 Jan 27 0UT and 2014 Feb 03 0UT: 4090

Highest cadence in this period: 29 seconds

Average cadence in this period: 147.86 seconds

Number of image gaps larger than 300 seconds: 101

Largest data gap: 26.63 minutes

Data coverage LYRA

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

- BINLYRA_11269 -> BINLYRA_11290 (due to LYRA Switch OFF).

The latter 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)