P2SC-ROB-WR-191- 20131118 Weekly report #191	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Nov 18 to Sun Nov 24, 2013 27 Nov 2013 Robbe Vansintjan 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

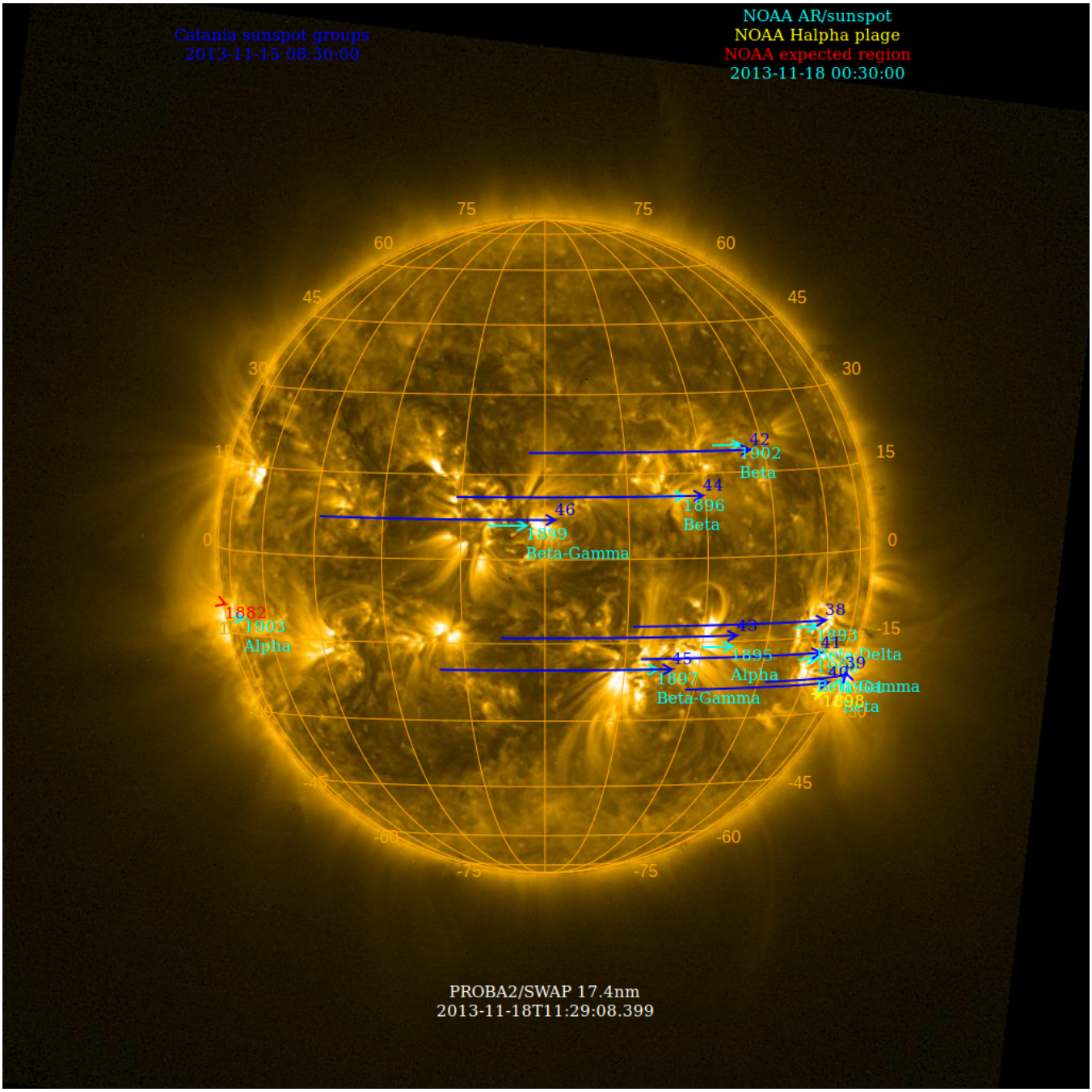
The level of solar activity[1] fluctuated between **low** and **high** this week.

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

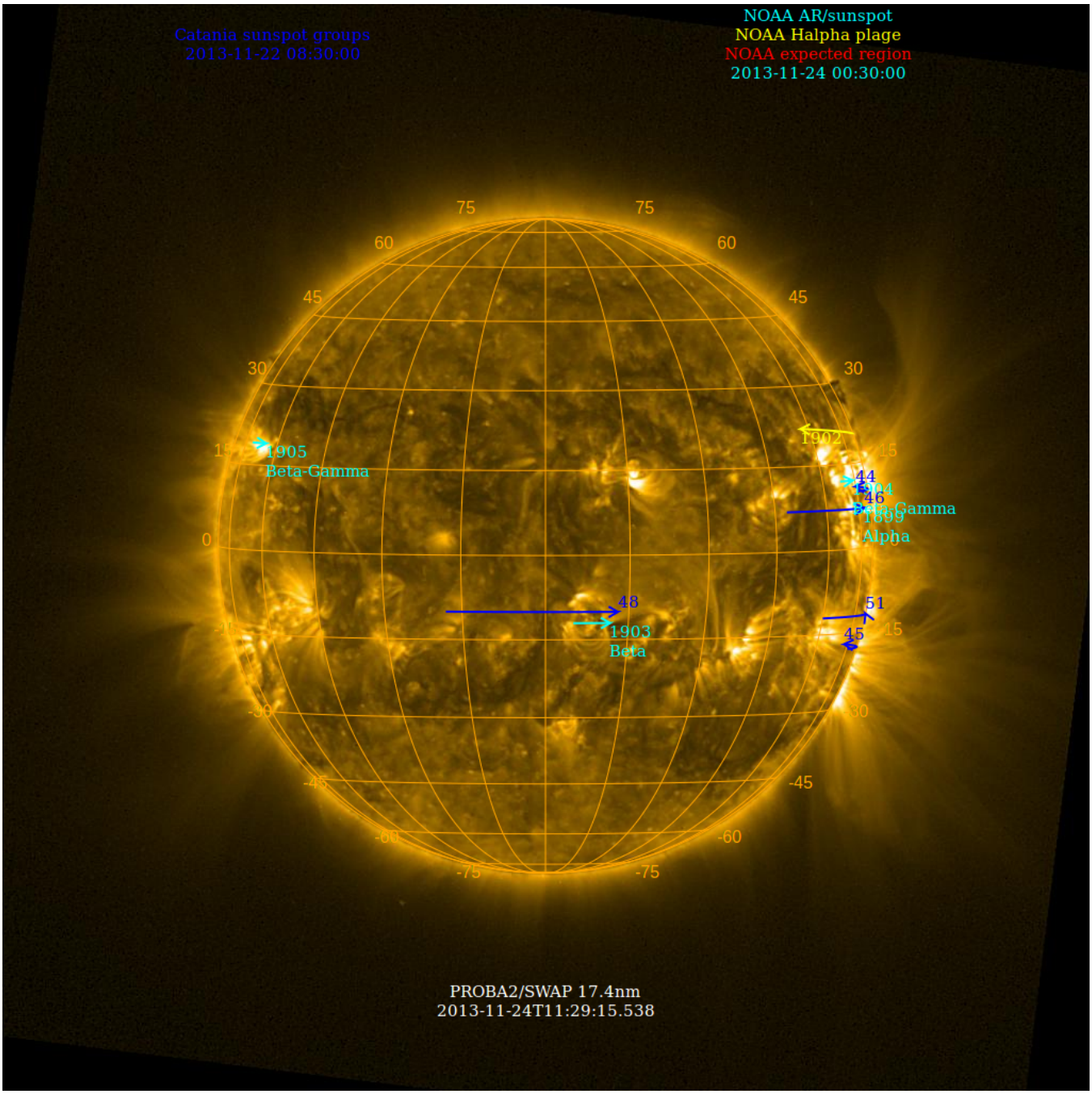
	Monday 18 Nov	Tuesday 19 Nov	Wednesday 20 Nov	Thursday 21 Nov	Friday 22 Nov	Saturday 23 Nov	Sunday 24 Nov
Activity	low	high	low	moderate	low	moderate	low
Flares	-	**X1.0@10:26**	-	**M1.2@11:11**	-	**M1.0@12:57** **M1.1@02:32**	-

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

The SWAP images of Nov 18 and Nov 24 are shown below, with annotated active regions.



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

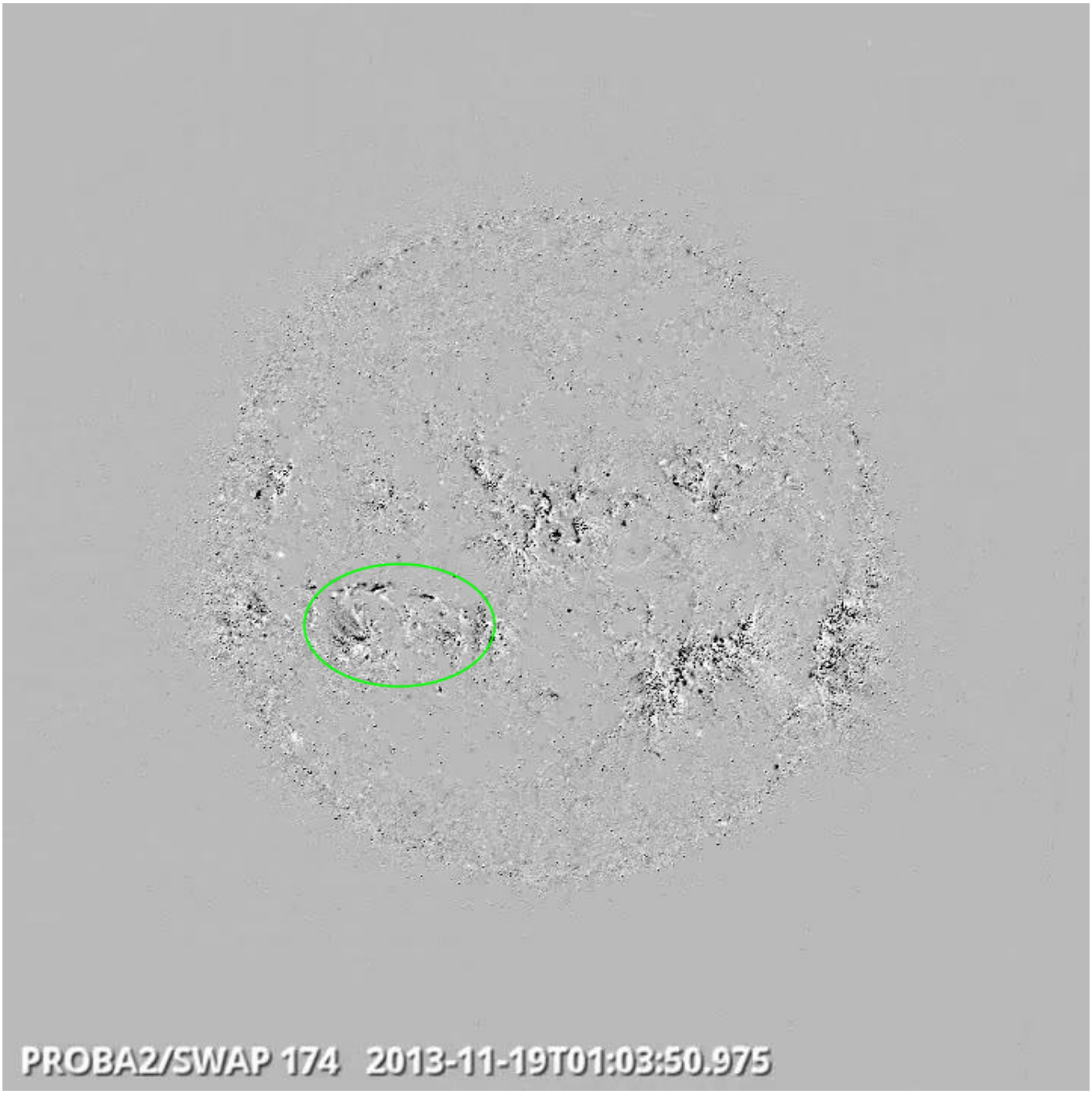

Catania sunspot groups
2013-11-22 08:30:00
NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2013-11-24 00:30:00
75
75
60
60
45
45
30
30
15
15
0
0
-15
-30
-45
-60
-75
1905
Beta-Gamma
1902
44
46
Gamma
Alpha
48
1903
Beta
51
45
PROBA2/SWAP 17.4nm
2013-11-24T11:29:15.538

Solar Activity
Solar flare activity fluctuated between low and high during the week.
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.

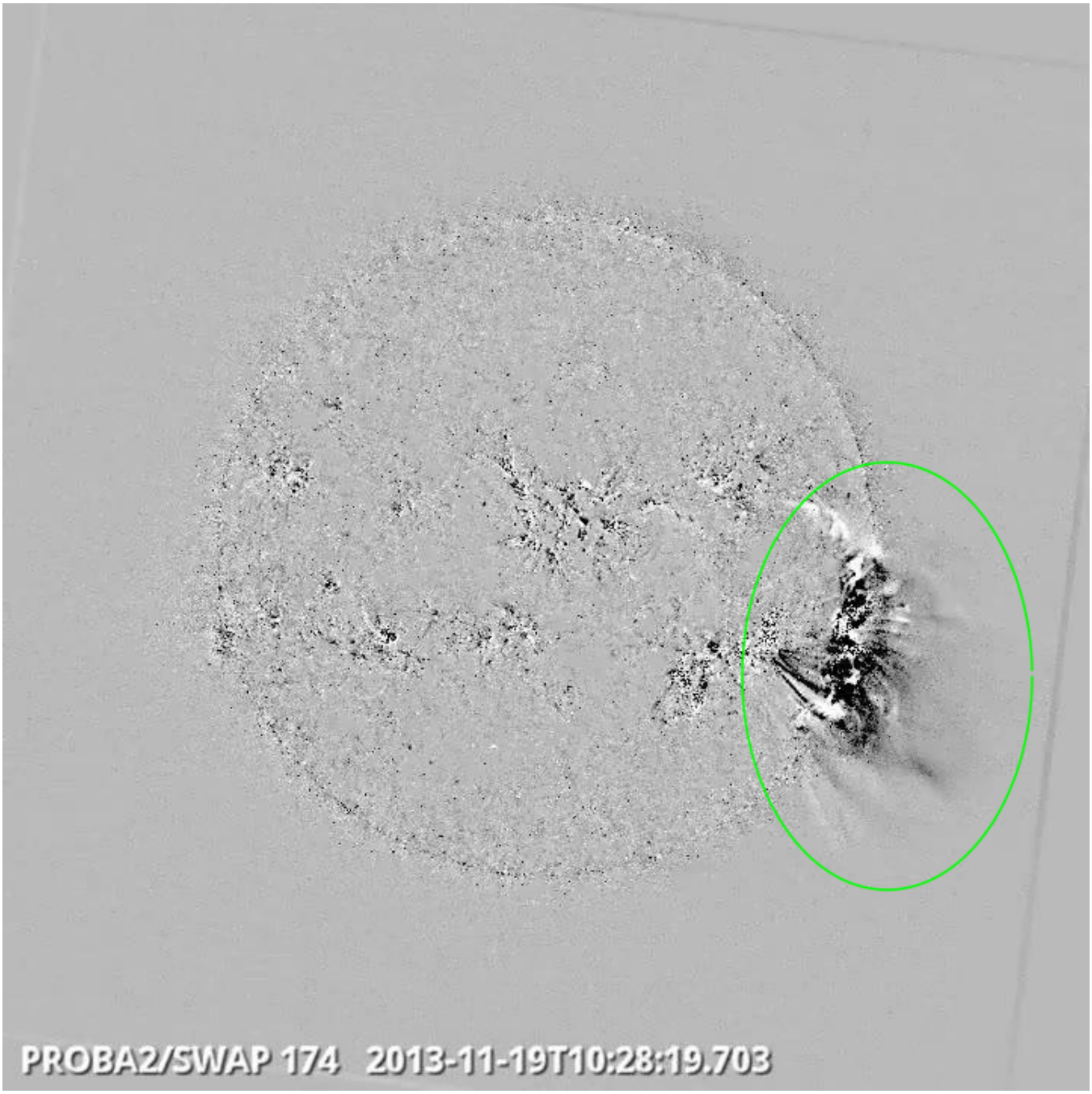
A weekly overview movie can be found here (SWAP week 191).

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

Tuesday Nov 19:



Flow on South East Quad @ 01:03 - SWAP difference image
Find a movie of the event **here** (SWAP difference movie)



Eruption on South West Limb @ 10:28 - SWAP difference image

Find a movie of the event **here** (SWAP difference movie)

Thursday Nov 21:

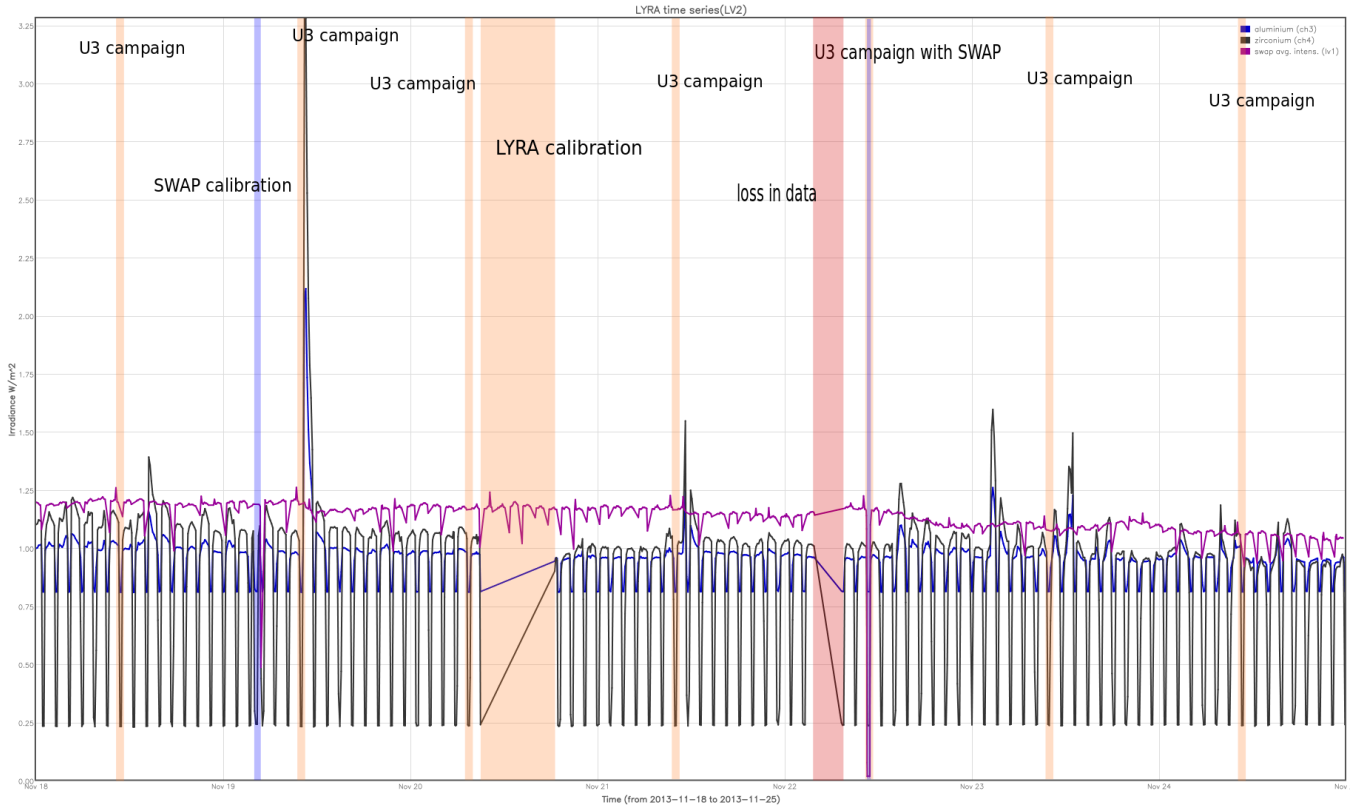
Eruption on West Limb @ 11:08 - SWAP difference image
Find a movie of the event **here** (SWAP difference movie)

Friday Nov 22:

Eruption on West Limb @ 14:38 - 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:

- SWAP calibration
- LYRA unit 3 campaign in combination with SWAP

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

- Unit 3 campaign, three times
- LYRA calibration
- Unit 3 campaign, four times

The red shaded period corresponds to:

- Loss in data due to downlink scheduling error

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).

- SWAP image featured on the Astronomy picture of the day November 11.
- SWAP images published in *The Cosmos, Fourth Edition,* Pasachoff & Filipenko, (University Astronomy textbook)
- European Space Weather Week 10:
    - Proba2 fair
    - Proba2 splinter session.
    - SOLID splinter session: “How can PROBA2/LYRA contribute to the SOLID project”
    - Data Products Session: “PROBA2 a Space Weather Monitor”

Guest Investigator Program

- Vida Zigma currently visiting on the GI program. Working with MD. Use a model with LYRA data to determine the ionisation increase in the ionosphere during flares.

2. LYRA instrument status

Calibration

No calibration this week.

IOS & operations

Monday 18 Nov	Tuesday 19 Nov	Wednesday 20 Nov	Thursday 21 Nov	Friday 22 Nov	Saturday 23 Nov	Sunday 24 Nov
Nominal acquisition + daily U3 LYIOS00351	Nominal acquisition + daily U3 LYIOS00353	Nominal acquisition + daily U3 + calibration LYIOS00353	Nominal acquisition + daily U3 LYIOS00353	Nominal acquisition + daily U3 LYIOS00353	Nominal acquisition + daily U3 LYIOS00353	Nominal acquisition + daily U3 LYIOS00353

The following science campaigns were performed by LYRA:

- daily U3 observations campaign
- calibration

LYRA detector temperature

LYRA detector 2 temperature globally varied between 40.7 and 43.7 °C, taking into account the daily U3 activation periods; the latter result in a temperature increase of about 0.6 °C.

To be explored

- None

3. SWAP instrument status

Calibration

No calibration this week.

MCPM errors

The number of MCPM recoverable errors increased from 14030 to 14187.
The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 18 Nov	Tuesday 19 Nov	Wednesday 20 Nov	Thursday 21 Nov	Friday 22 Nov	Saturday 23 Nov	Sunday 24 Nov
Nominal acquisition IOS00484 575 images	Nominal acquisition + calibration IOS00485 593 images	Nominal acquisition IOS00485 571 images	Nominal acquisition IOS00485 568 images	Nominal acquisition + occultation campaign IOS00485 530 images	Nominal acquisition IOS00486 582 images	Nominal acquisition IOS00486 563 images

Special operations for SWAP, this week:

- calibration
- combined SWAP LYRA occultation campaign

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -3.79 and -1.8 °C.

To be explored

- None

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 12628 to 12689) was nominal, except for:

- 12665

Data coverage HK

All HK data files (LYRA_AD) have been received, except:

- 12665

Data coverage SWAP

All SWAP Science data files (BINSWAP) have been received, except:

- 12665

Total number of images between 2013 Nov 18 0UT and 2013 Nov 25 0UT: 3982
Highest cadence in this period: 30 seconds
Average cadence in this period: 151.59 seconds
Number of image gaps larger than 300 seconds: 99
Largest data gap: 227.20 minutes

The data gap was caused by the downlink scheduling error indicated by the red band in the weekly overview plot at the end of section one.

Data coverage LYRA

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

- 12665

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)