


P2SC-ROB-WR-300 - 20151221 Weekly report #300	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Dec 21 to Sun Dec 27, 2015 13 Jan 2015  Robbe Vansintjan Matthew West	Royal Observatory of Belgium  - PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP PI, david.berghmans@sidc.be	<a href="http://proba2.sidc.be">http://proba2.sidc.be</a> ++ 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

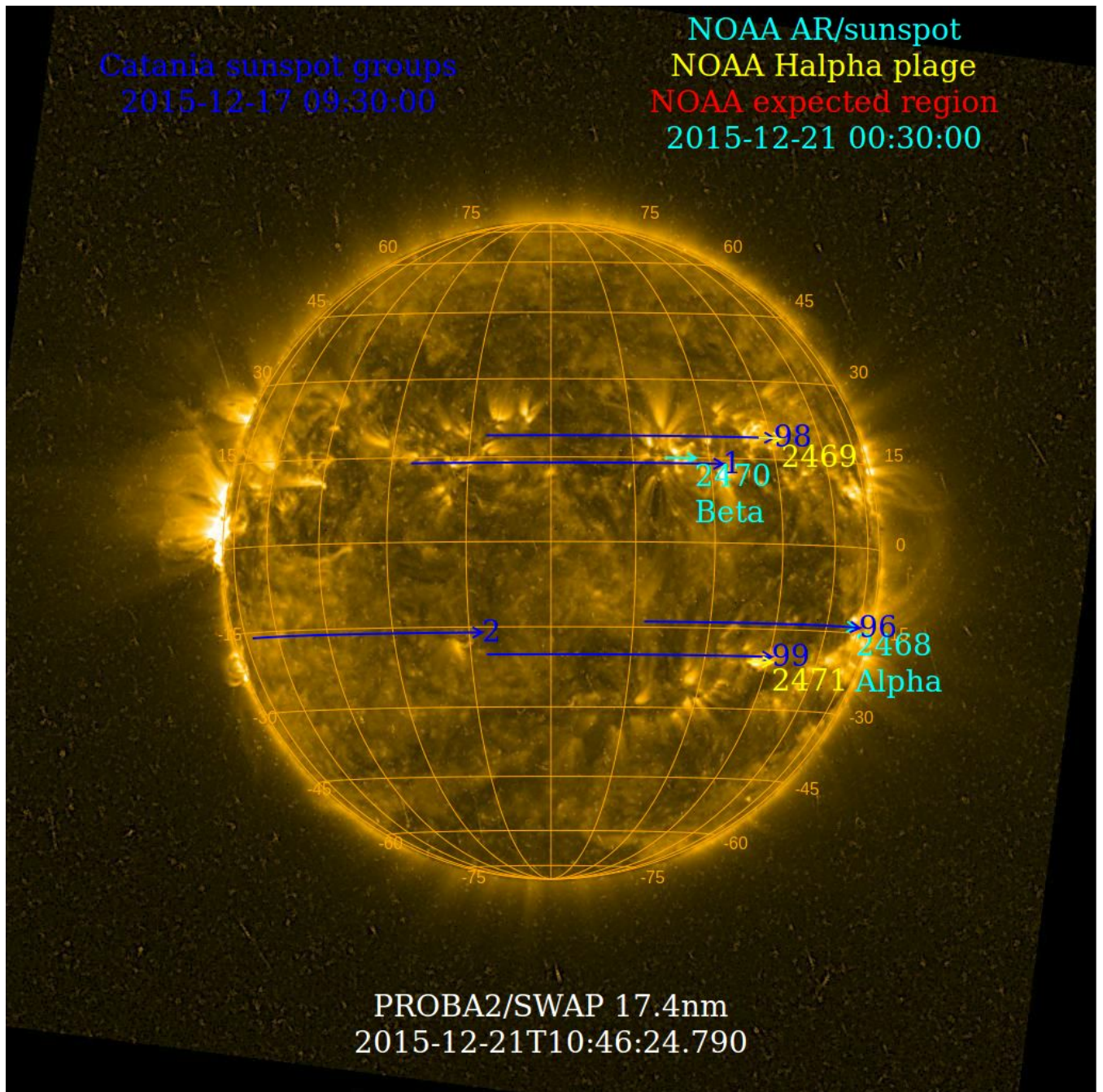
The level of solar activity<sup>1</sup> fluctuated between **low** and **moderate** this week.

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

	Monday 21 Dec	Tuesday 22 Dec	Wednesday 23 Dec	Thursday 24 Dec	Friday 25 Dec	Saturday 26 Dec	Sunday 27 Dec
Activity	moderate	moderate	moderate	moderate	low	low	low
Flares	<b>M1.1@10:19</b> <b>M2.8@01:03</b>	<b>M1.6@03:34</b>	<b>M4.7@00:40</b>	<b>M1.1@02:12</b>	-	-	-

<sup>1</sup> See appendix. All timings are given in UT.

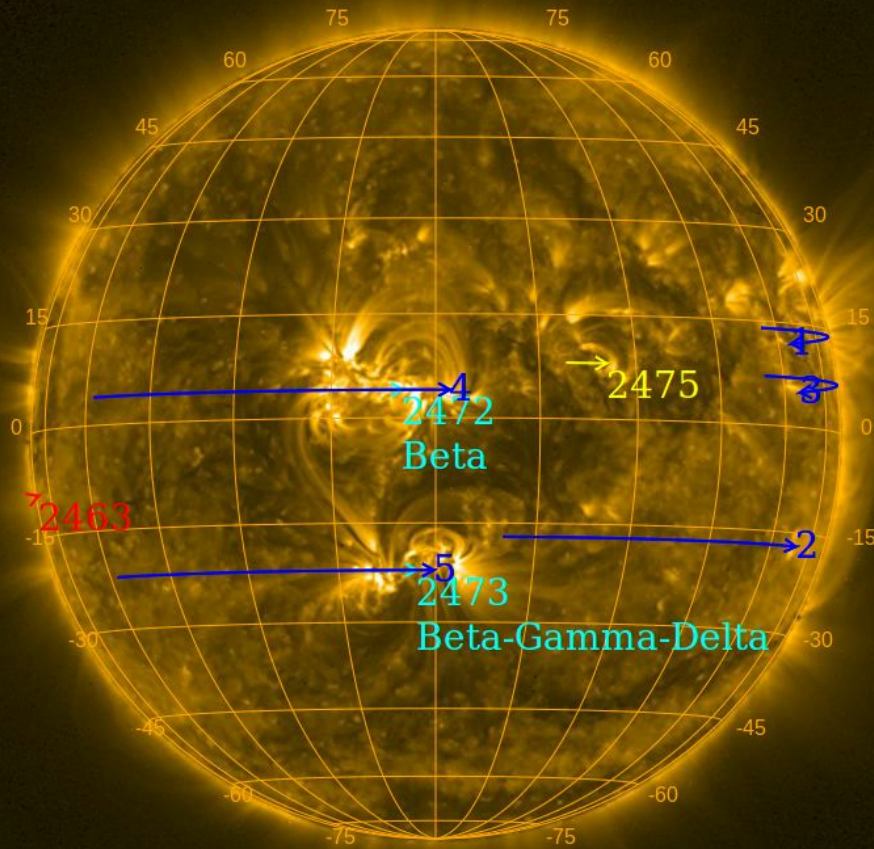
The SWAP images of Dec 21 and Dec 27 are shown below, with annotated active regions.



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

Catania sunspot groups  
2015-12-23 08:48:00

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2015-12-27 00:30:00



PROBA2/SWAP 17.4nm  
2015-12-27T10:47:53.527

## **Solar Activity**

Solar flare activity fluctuated between low and moderate during the week.

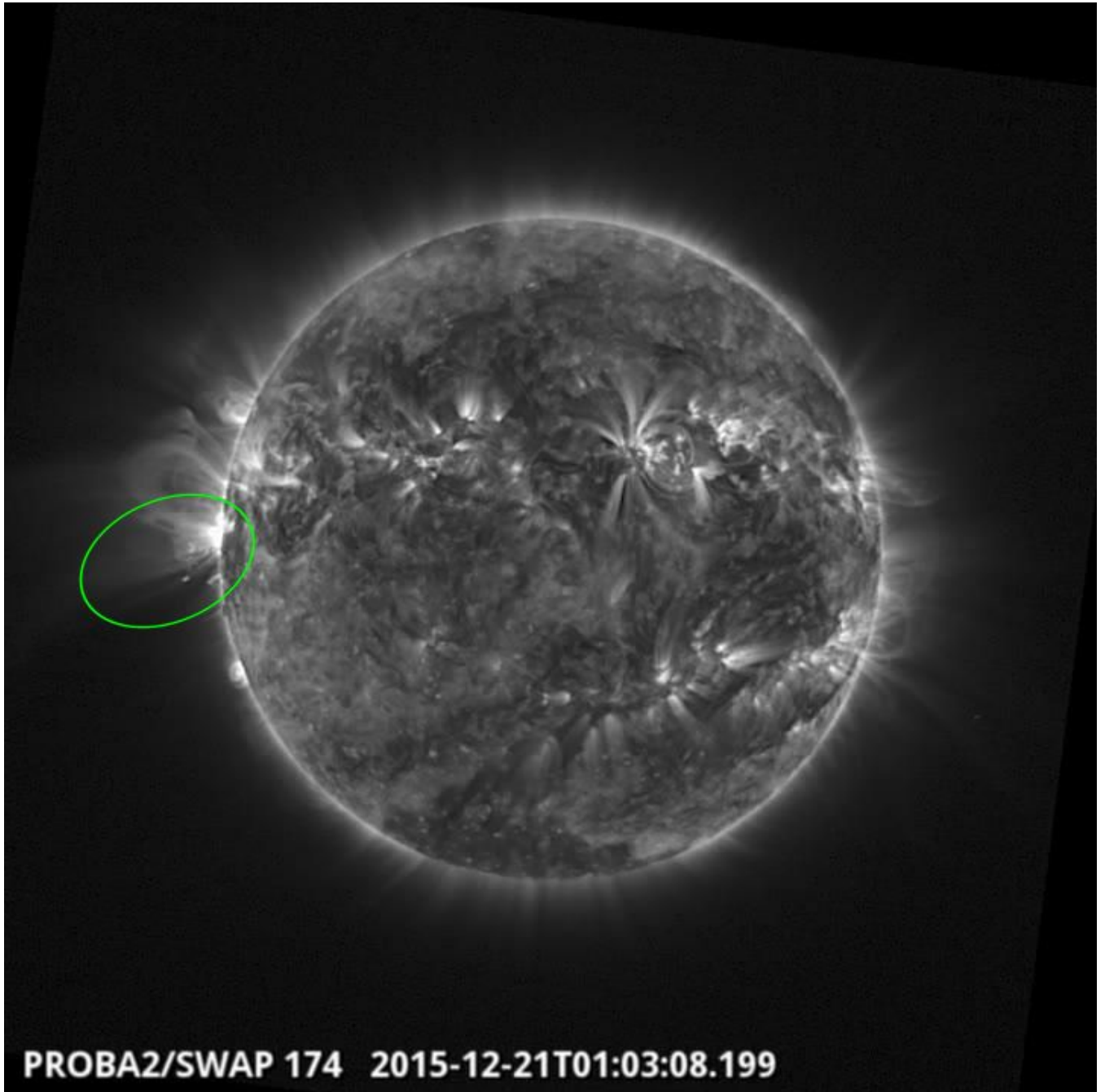
In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: <http://proba2.oma.be/ssa>

This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 300).

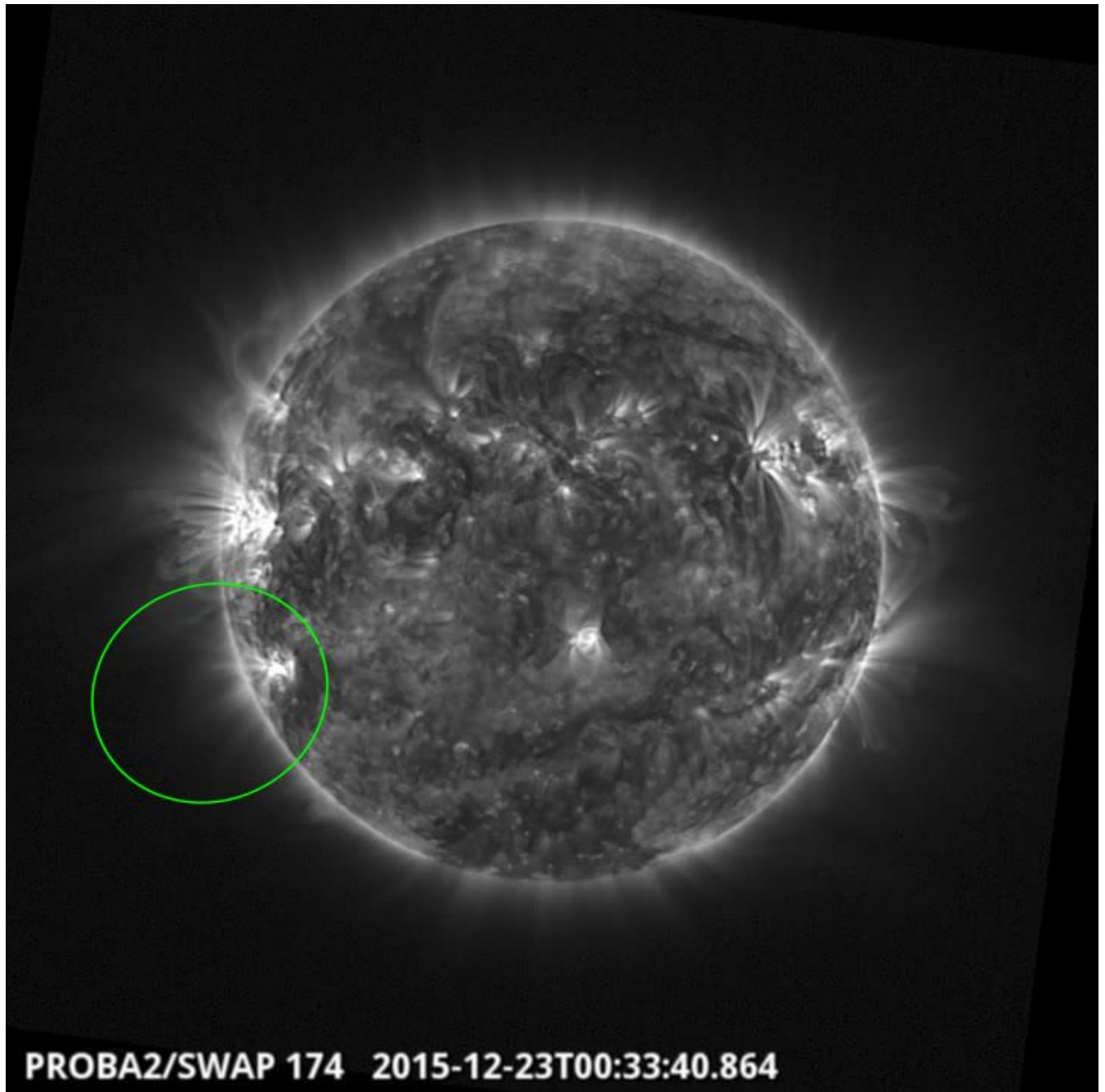
Details about some of this week's events, can be found further below.

Monday Dec 21

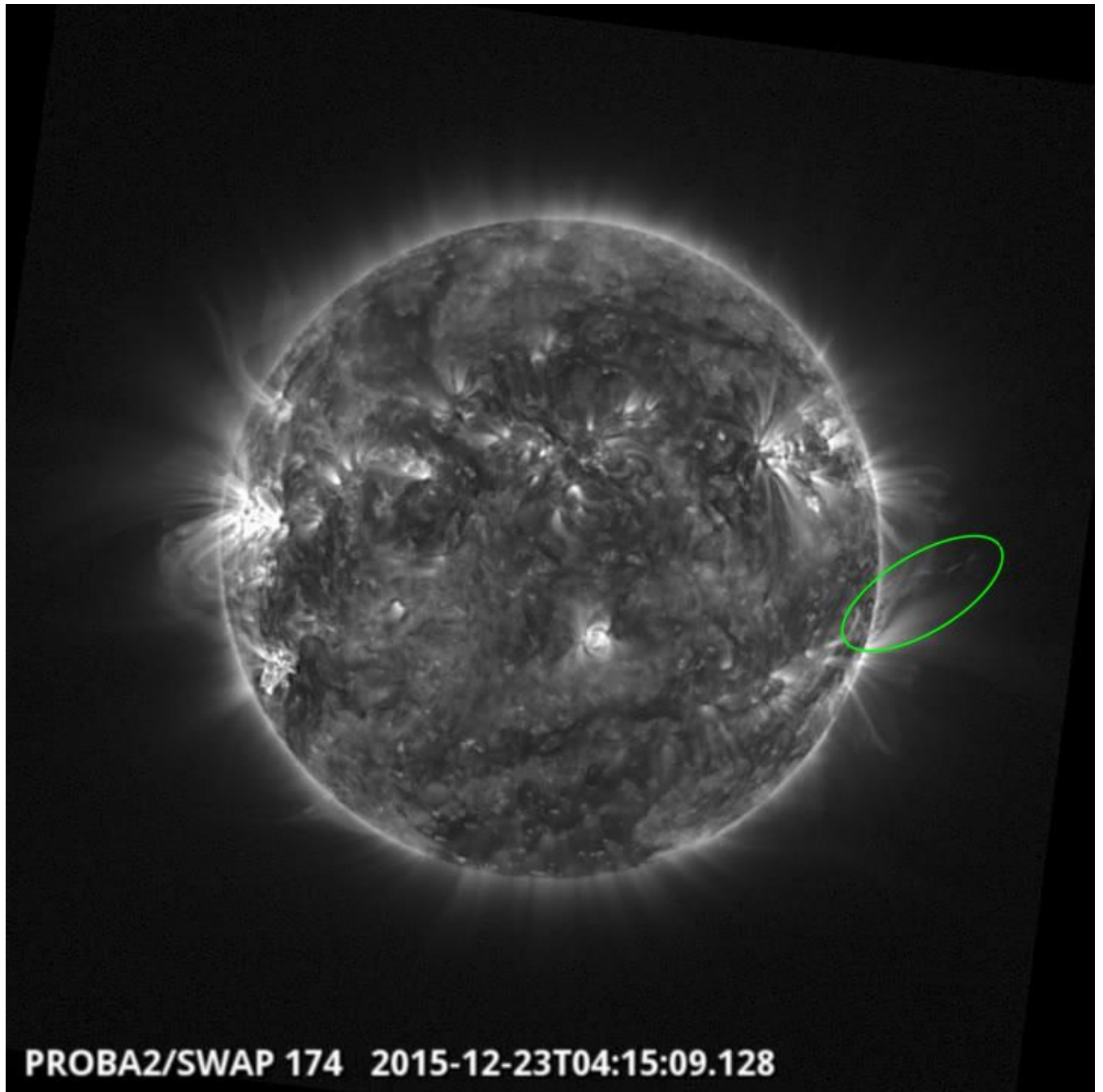


Eruption on the east limb @ 01:03 - SWAP image  
Find a movie of the events [here](#) (SWAP movie)

Wednesday Dec 23



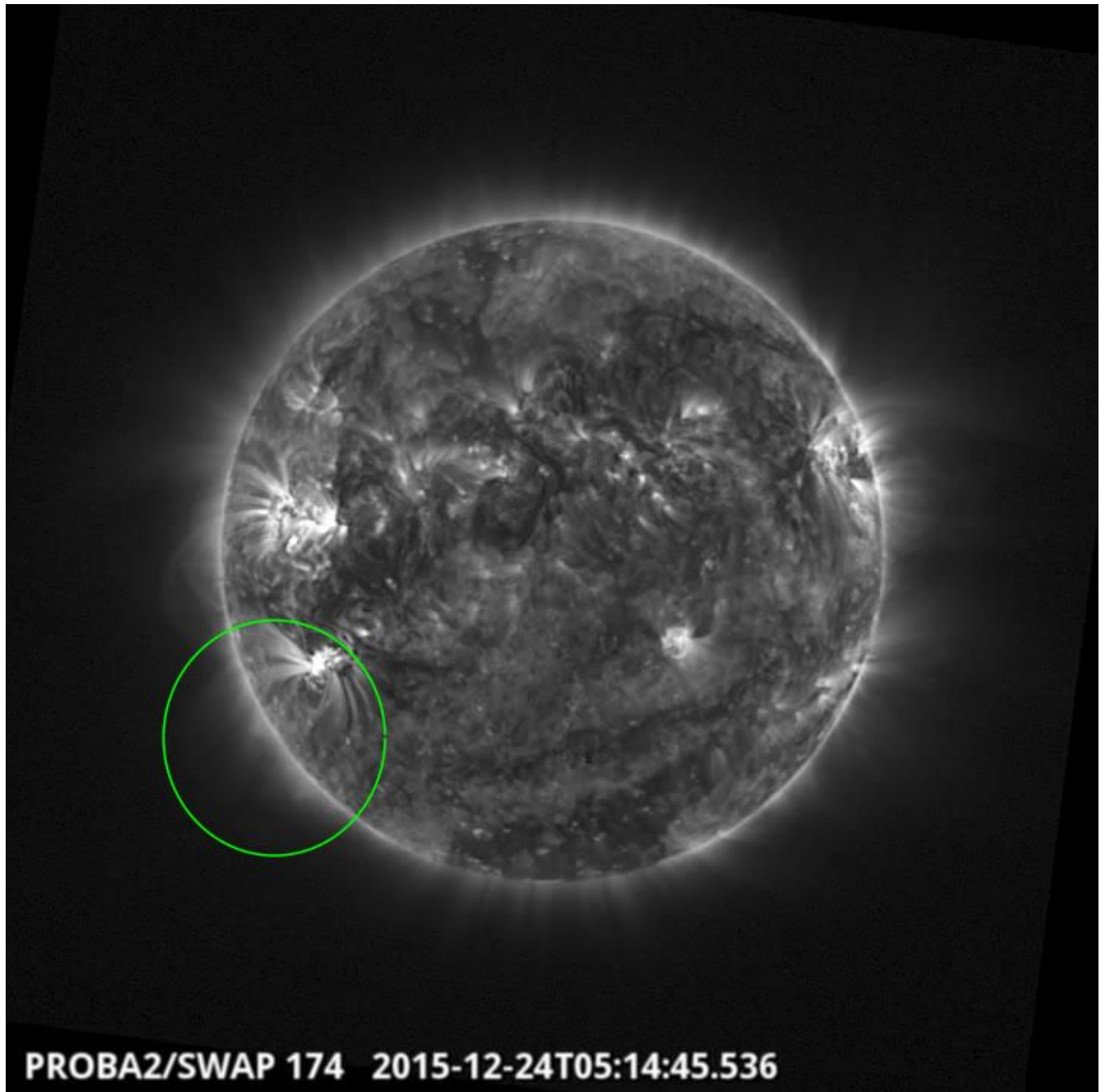
Eruption on the east limb @ 00:33 - SWAP image  
Find a movie of the event [here](#) (SWAP movie)



**PROBA2/SWAP 174 2015-12-23T04:15:09.128**

**Eruption on the west limb @ 04:15 - SWAP image**  
Find a movie of the event [here](#) (SWAP movie)

Thursday Dec 24



**PROBA2/SWAP 174 2015-12-24T05:14:45.536**

**Eruption on the southeast quadrant @ 05:14 - SWAP image**

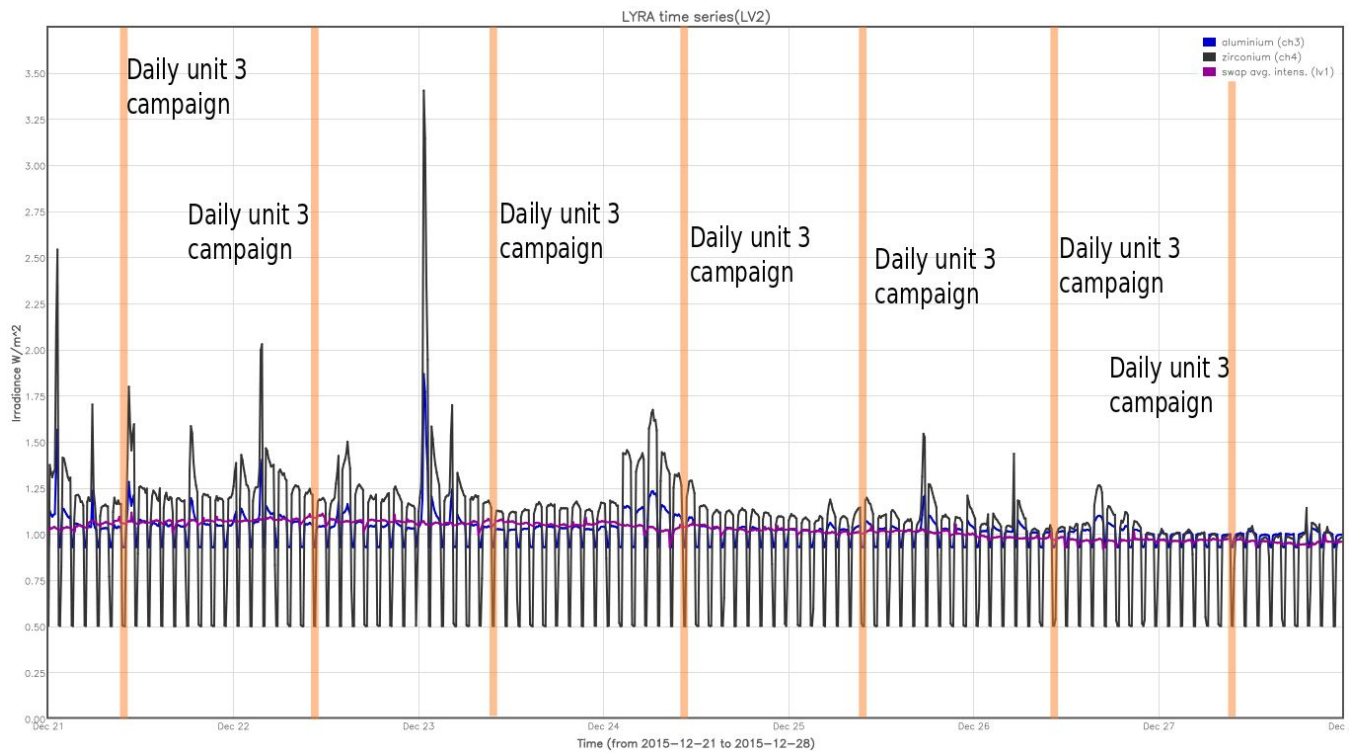
Find a movie of the event [here](#) (SWAP movie)



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:

- Daily unit 3 campaign, 2015-Dec-21
- Daily unit 3 campaign, 2015-Dec-22
- Daily unit 3 campaign, 2015-Dec-23
- Daily unit 3 campaign, 2015-Dec-24
- Daily unit 3 campaign, 2015-Dec-25
- Daily unit 3 campaign, 2015-Dec-26
- Daily unit 3 campaign, 2015-Dec-27

## **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>).

## **Guest Investigator Program**

- None

## 2. LYRA instrument status

### Calibration

No calibration this week.

### IOS & operations

Monday 21 Dec	Tuesday 22 Dec	Wednesday 23 Dec	Thursday 24 Dec	Friday 25 Dec	Saturday 26 Dec	Sunday 27 Dec
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
LYIOS00516	LYIOS00516	LYIOS00517	LYIOS00518	LYIOS00518	LYIOS00518	LYIOS00518

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 39.6 and 42.4 °C.

### 3. SWAP instrument status

#### Calibration

No calibration this week.

#### MCPM errors

The number of MCPM recoverable errors remained at 1092.

The number of MCPM unrecoverable errors remained at 0.

#### IOS & operations

Monday 21 Dec	Tuesday 22 Dec	Wednesday 23 Dec	Thursday 24 Dec	Friday 25 Dec	Saturday 26 Dec	Sunday 27 Dec
Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00615 696 images	IOS00616 675 images	IOS00616 754 images	IOS00617 734 images	IOS00617 713 images	IOS00617 673 images	IOS00617 691 images

Special operations for SWAP, this week:

- None

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -4.7 and -2.7 °C.

#### **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 19333 to 19395) was nominal, except for:

- None.

### **Data coverage HK**

All HK data files (LYRA\_AD) have been received, except:

- None.

### **Data coverage SWAP**

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

- None.

Total number of images between 2015 Dec 21 00:00 UT and 2015 Dec 28 00:00 UT: 4936

Highest cadence in this period: 80 seconds

Average cadence in this period: 122.47 seconds

Number of image gaps larger than 300 seconds: 108

Largest data gap: 33.43 minutes

### **Data coverage LYRA**

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

- 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
SoFAST	Solar Feature Automated Search Tool
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)