


P2SC-ROB-WR-35 0- 20161205 Weekly report #350	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Dec 05 to Sun Dec 11, 2016 04 Jan 2017  Laurence Wauters Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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## 1. Science

### Solar & Space weather events

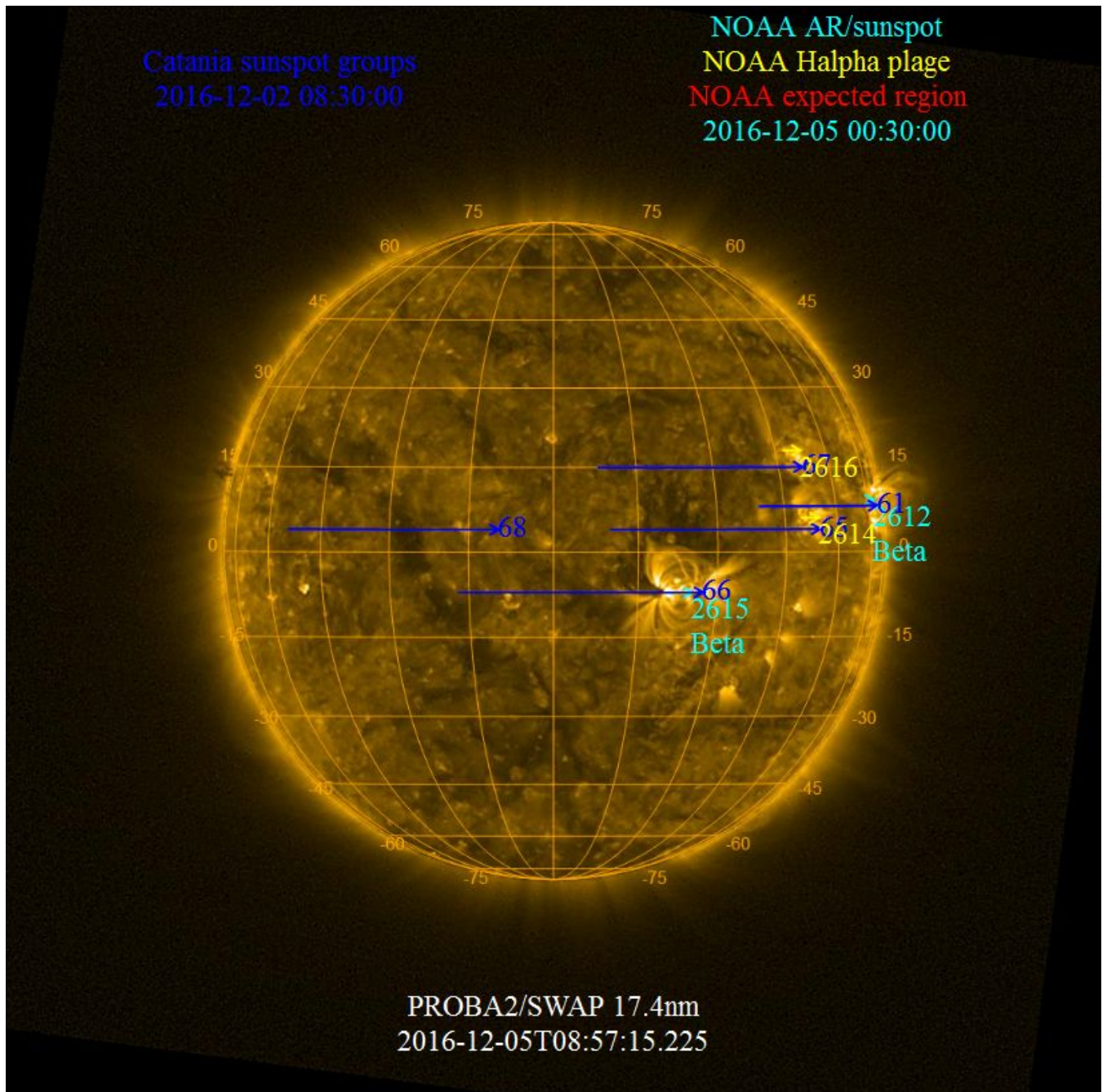
The level of solar activity<sup>1</sup> fluctuated between **very low** and **low** this week.

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

	Monday 05 Dec	Tuesday 06 Dec	Wednesday 07 Dec	Thursday 08 Dec	Friday 09 Dec	Saturday 10 Dec	Sunday 11 Dec
Activity	low	very low	very low	very low	very low	low	very low
Flares	-	-	-	-	-	-	-

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

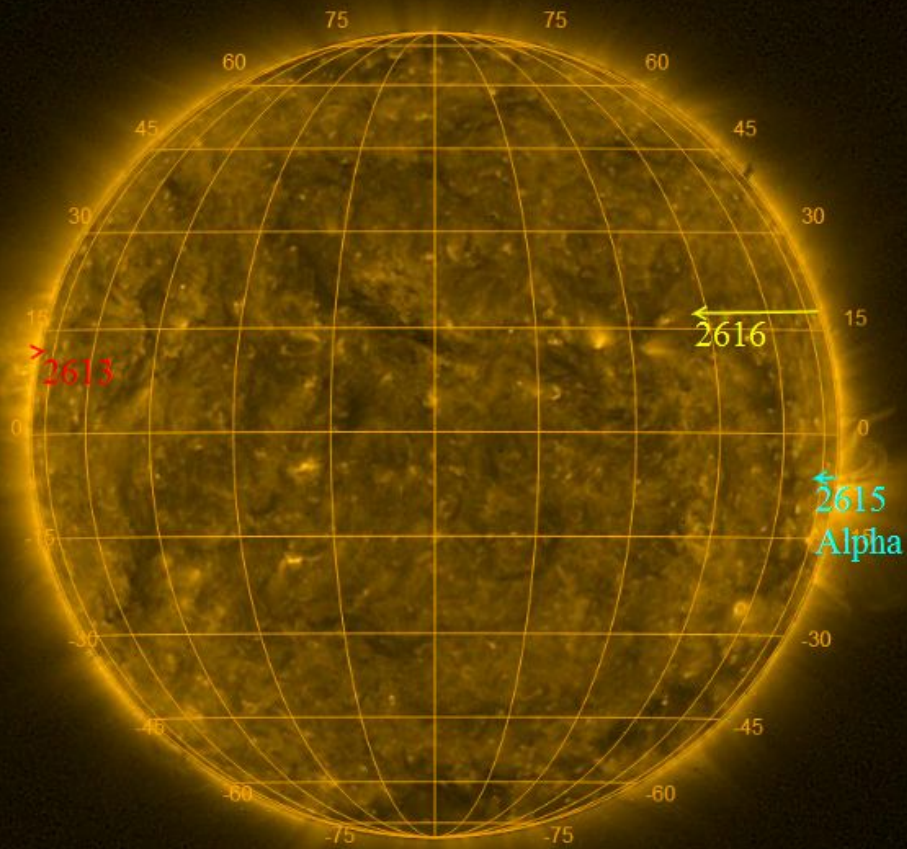
The SWAP images of Dec 05 and Dec 11 are shown below, with annotated active regions.



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

Catania sunspot groups  
No observation

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2016-12-10 00:30:00



PROBA2/SWAP 17.4nm  
2016-12-11T09:18:20.487

## **Solar Activity**

Solar flare activity fluctuated between very low and low 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.

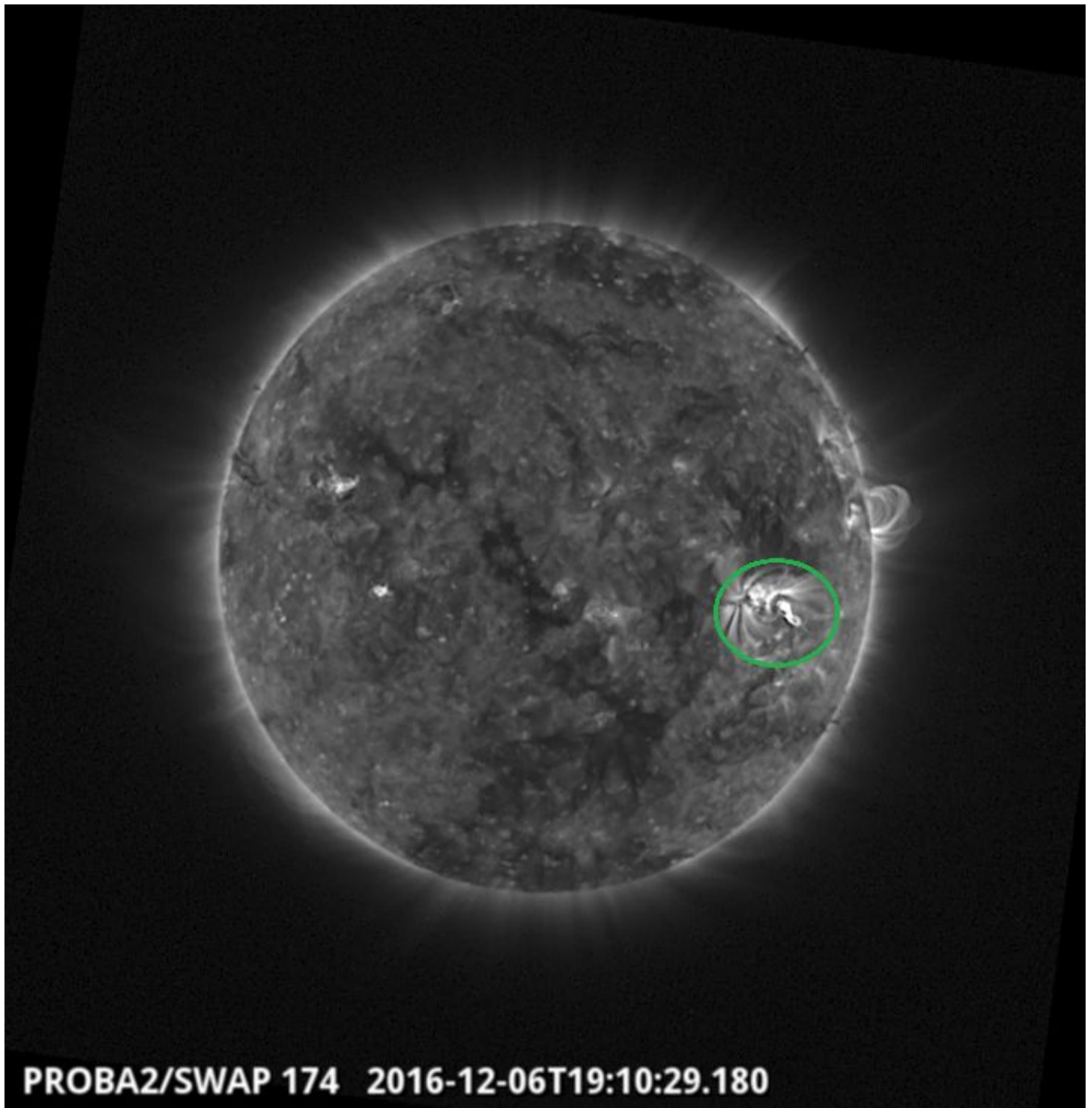
A weekly overview movie can be found [here](#) (SWAP week 350).

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

If any of the linked movies are unavailable they can be found in the P2SC movie repository [here](#)

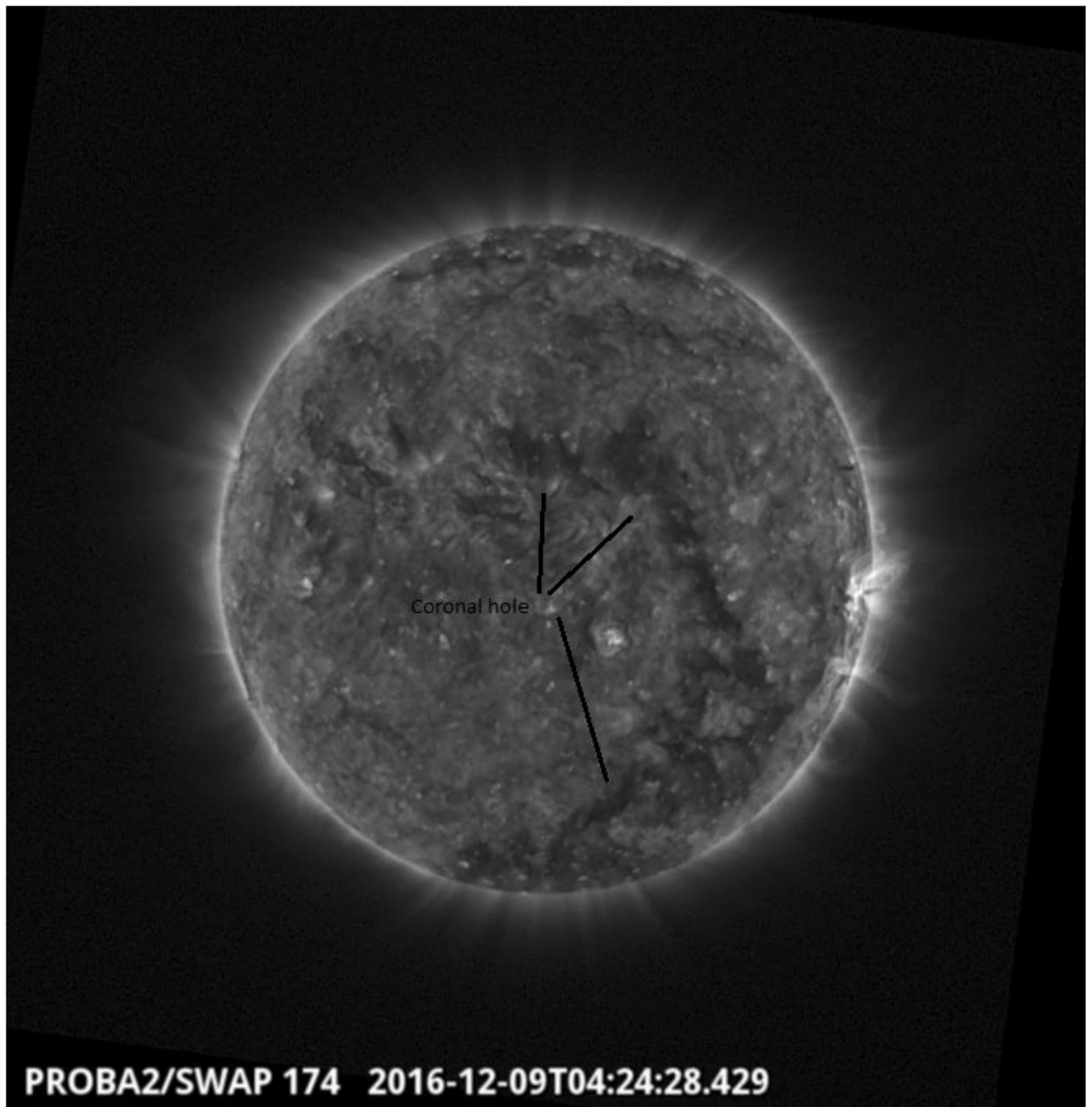


Tuesday Dec 06



On 2016-Dec-06, an eruption was observed by SWAP on the west part of the Sun at 19:10 UT.  
This active region was the most active this week.  
Find a movie of the event [here](#) (SWAP movie)

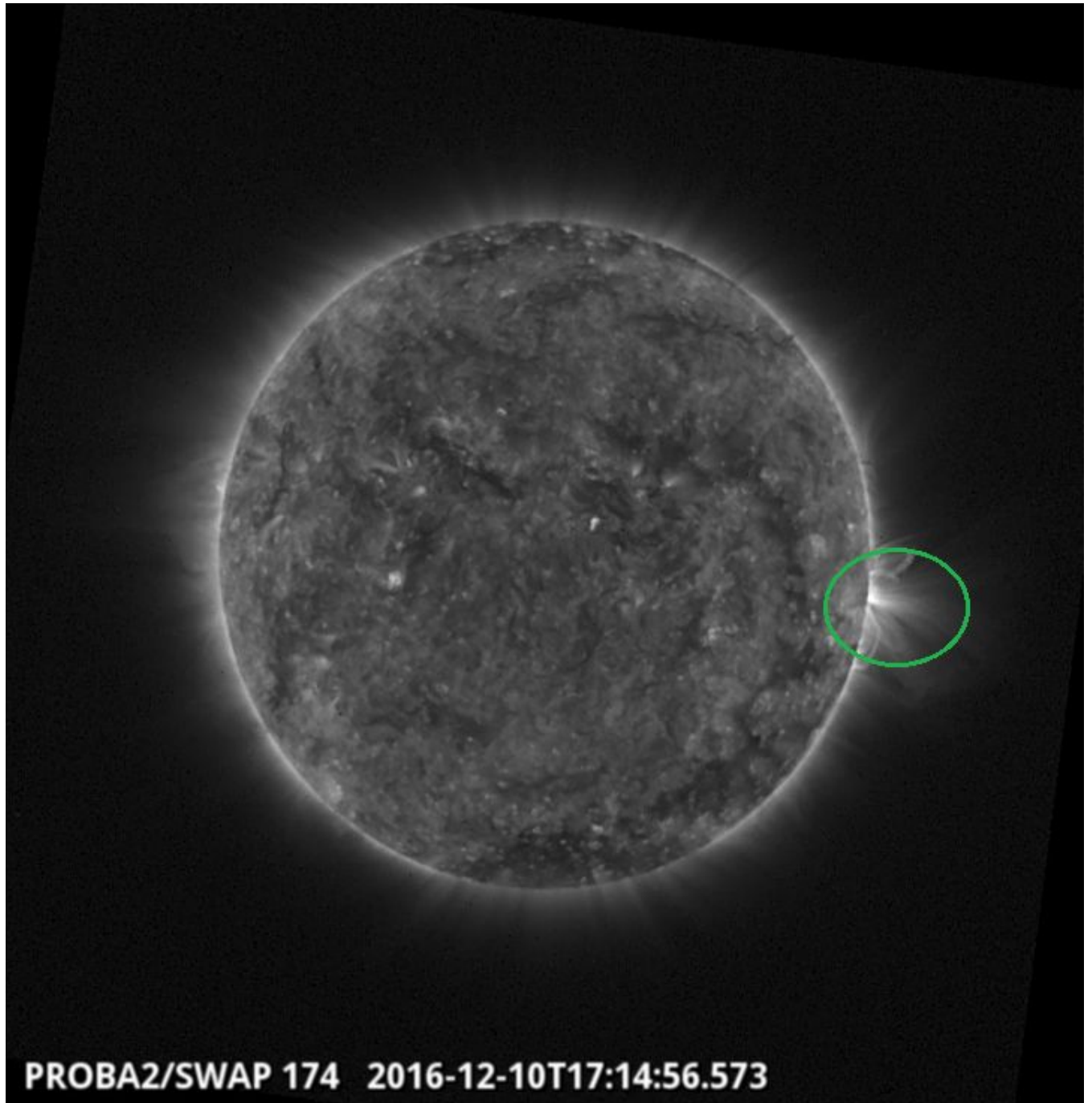
Friday Dec 09



**A coronal hole stretching from the northern hemisphere to the south pole has dominated the solar disk during the whole week.**

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

Saturday Dec 10

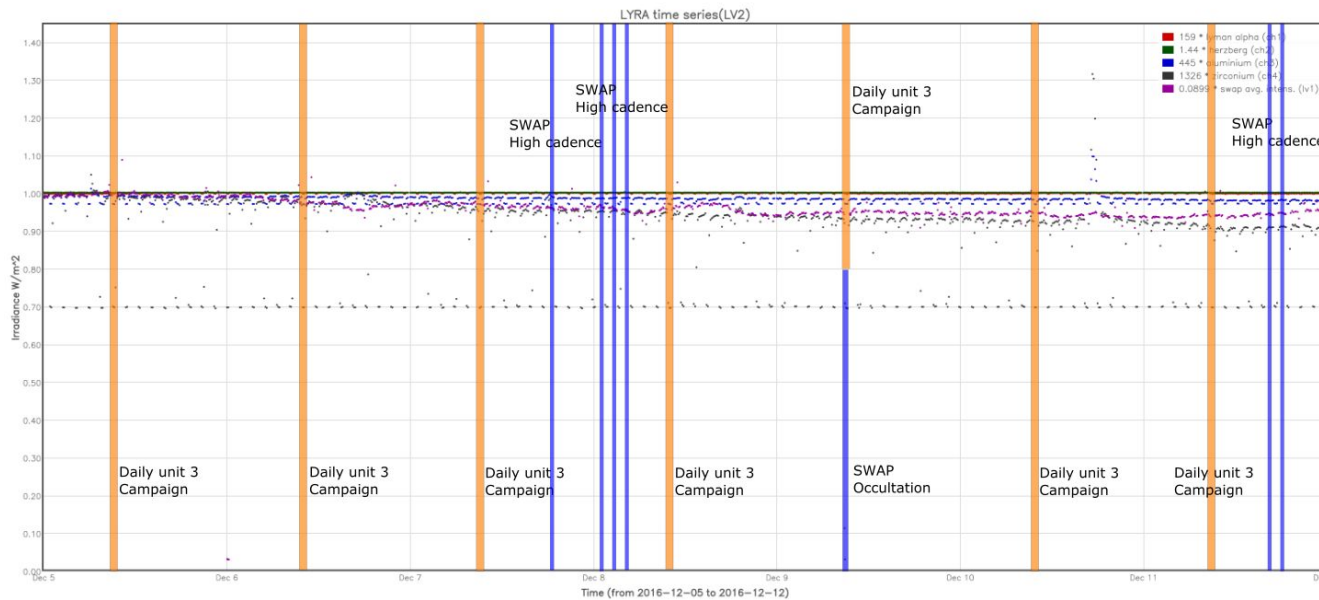


On Dec 10 an eruption was observed on the West Limb at 17:15 UT.  
Find a movie of the event [here](#) (SWAP movie)

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 blue shaded periods correspond to, from left to right:

- High cadence SWAP campaigns for Guest Investigators Farid Goryaev, Denis Rodkin and Vladimir Slemzin, 2016-12-07
- SWAP LYRA parallel occultation, 2016-12-09
- High cadence SWAP campaigns for Guest Investigators Farid Goryaev, Denis Rodkin and Vladimir Slemzin, 2016-12-11

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

- Daily unit 3 campaign, 2016-12-05
- Daily unit 3 campaign, 2016-12-06
- Daily unit 3 campaign, 2016-12-07
- Daily unit 3 campaign, 2016-12-08
- Daily unit 3 campaign, 2016-12-09
- Daily unit 3 campaign, 2016-12-10
- Daily unit 3 campaign, 2016-12-11

The red shaded period corresponds to:

- None



## **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**

- O. Panasenco is visiting the P2SC from 2016 Nov 07 - 2016 Dec 07 to work on Pseudostreamers and their Immediate Environment: Observations and Modeling
- F. Goryaev team is visiting the P2SC from 2016 Nov 21 - 2016 Dec 12 to work on the properties of the inner corona and search of solar wind flows by illumination from backside solar flares.

## 2. LYRA instrument status

### Calibration

Calibration campaign on Wednesday this week.

### IOS & operations

Monday 05 Dec	Tuesday 06 Dec	Wednesday 07 Dec	Thursday 08 Dec	Friday 09 Dec	Saturday 10 Dec	Sunday 11 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
LYIOS00588	LYIOS00588	LYIOS00588	LYIOS00588	LYIOS00589	LYIOS00589	LYIOS00589

The following science campaigns were performed by LYRA:

- Daily unit 3 occultation campaign.

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 40.08 and 42.78 °C.

### 3. SWAP instrument status

#### Calibration

Calibration campaign on Tuesday this week.

#### MCPM errors

The number of MCPM recoverable errors increased from 5597 to 5601 .

The number of MCPM unrecoverable errors remained at 0.

#### IOS & operations

Monday 05 Dec	Tuesday 06 Dec	Wednesday 07 Dec	Thursday 08 Dec	Friday 09 Dec	Saturday 10 Dec	Sunday 11 Dec
Nominal acquisition	Nominal acquisition	Nominal acquisition +GI Campaign	Nominal acquisition +GI Campaign	Nominal acquisition +occultation	Nominal acquisition	Nominal acquisition +GI Campaign
IOS00673 710 images	IOS00673 776 images	IOS00675 750 images	IOS00675 776 images	IOS00675 788 images	IOS00675 744 images	IOS00675 797 images

Special operations for SWAP, this week:

On 2016-12-07/08

- High cadence campaigns for Guest Investigators Farid Goryaev, Denis Rodkin and Vladimir Slemzin (GI Campaign)

On 2016-12-09

- SWAP and LYRA parallel occultation campaign

On 2016-12-11

- High cadence campaigns for Guest Investigators Farid Goryaev, Denis Rodkin and Vladimir Slemzin (GI Campaign)

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -4.73 and -2.73 °C.

#### **4. PROBA2 Science Center Status**

The main operators are Robbe Vansintjan and Laurence Wauters.

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 22524 to 22590) was nominal, except for:

- Pass SVA#22543 (2016-12-07T02:18:52z – 02:32:13z): Lyra data have been re-extracted because the first extraction was not complete due to problem on the internet connection.

### **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 2016 Dec 05 0UT and 2016 Dec 12 0UT: 5241

Highest cadence in this period: 18 seconds

Average cadence in this period: 115.11 seconds

Number of image gaps larger than 300 seconds: 106

Largest data gap: 35.52 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
DAC	Data Acquisition Controller
DBR	Deployment, backup & recovery
DDA	Decommutated data archive
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)