


P2SC-ROB-WR-351 - 20161212 Weekly report #351	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Dec 12 to Sun Dec 18, 2016 05 Jan 2017  Laurence Wauters Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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## 1. Science

### Solar & Space weather events

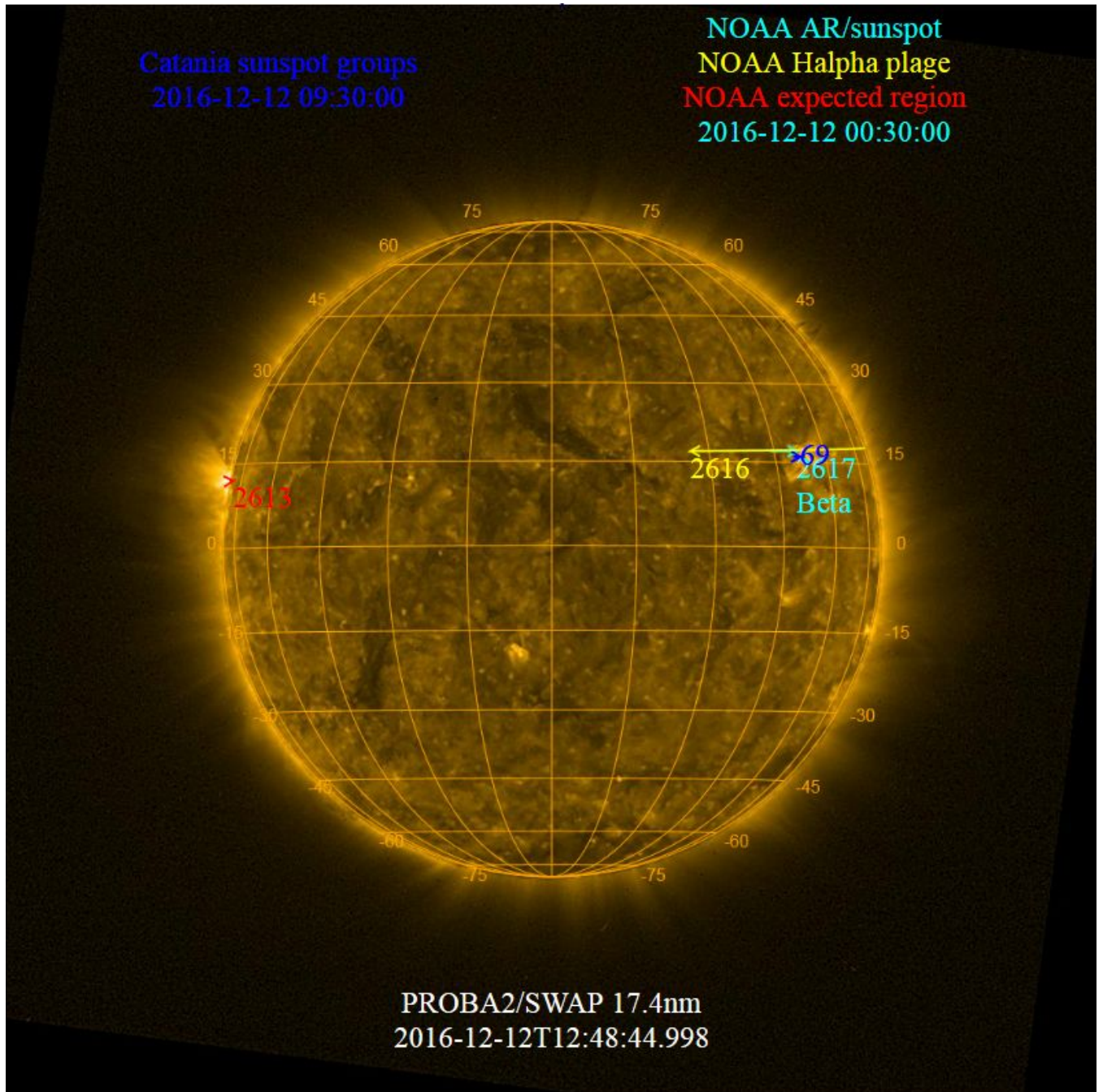
The level of solar activity<sup>1</sup> was very low this week.

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

	Monday 12 Dec	Tuesday 13 Dec	Wednesday 14 Dec	Thursday 15 Dec	Friday 16 Dec	Saturday 17 Dec	Sunday 18 Dec
Activity	very low	very low	very low	very low	very low	very low	very low
Flares	-	-	-	-	-	-	-

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

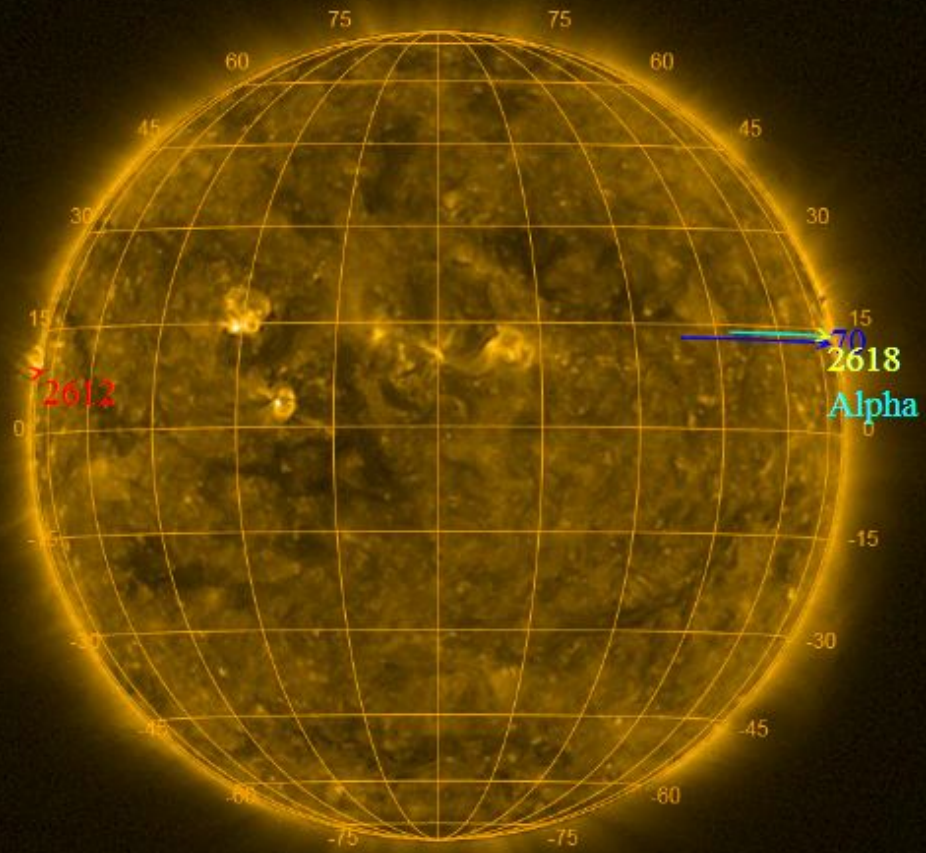
The SWAP images of Dec 12 and Dec 18 are shown below, with annotated active regions.



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

Catania sunspot groups  
2016-12-15 10:06:00

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2016-12-16 00:30:00



PROBA2/SWAP 17.4nm  
2016-12-18T12:35:47.137

## **Solar Activity**

Solar flare activity has been very low throughout 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.

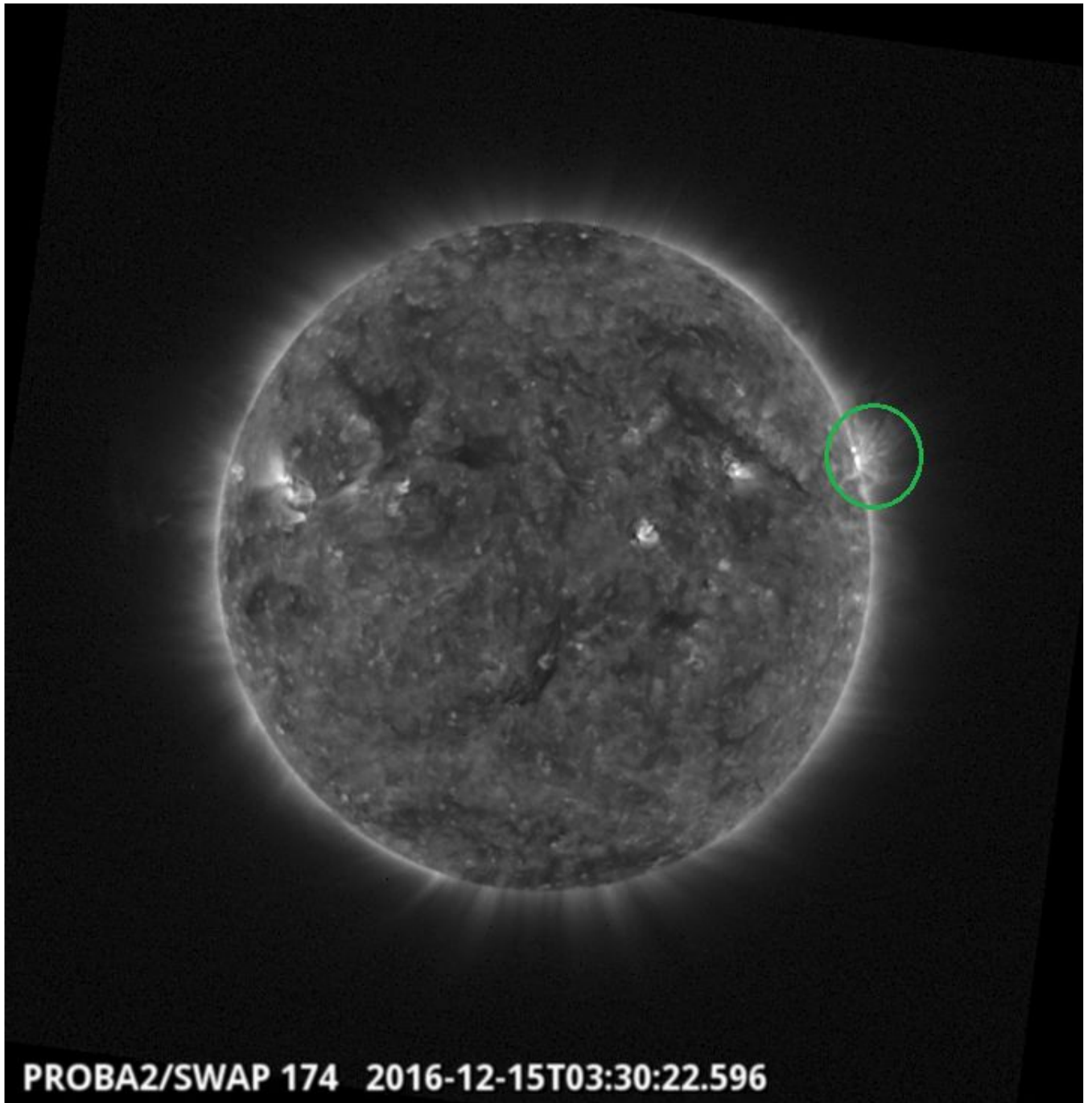
A weekly overview movie can be found [here](#) (SWAP week 351).

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](#)

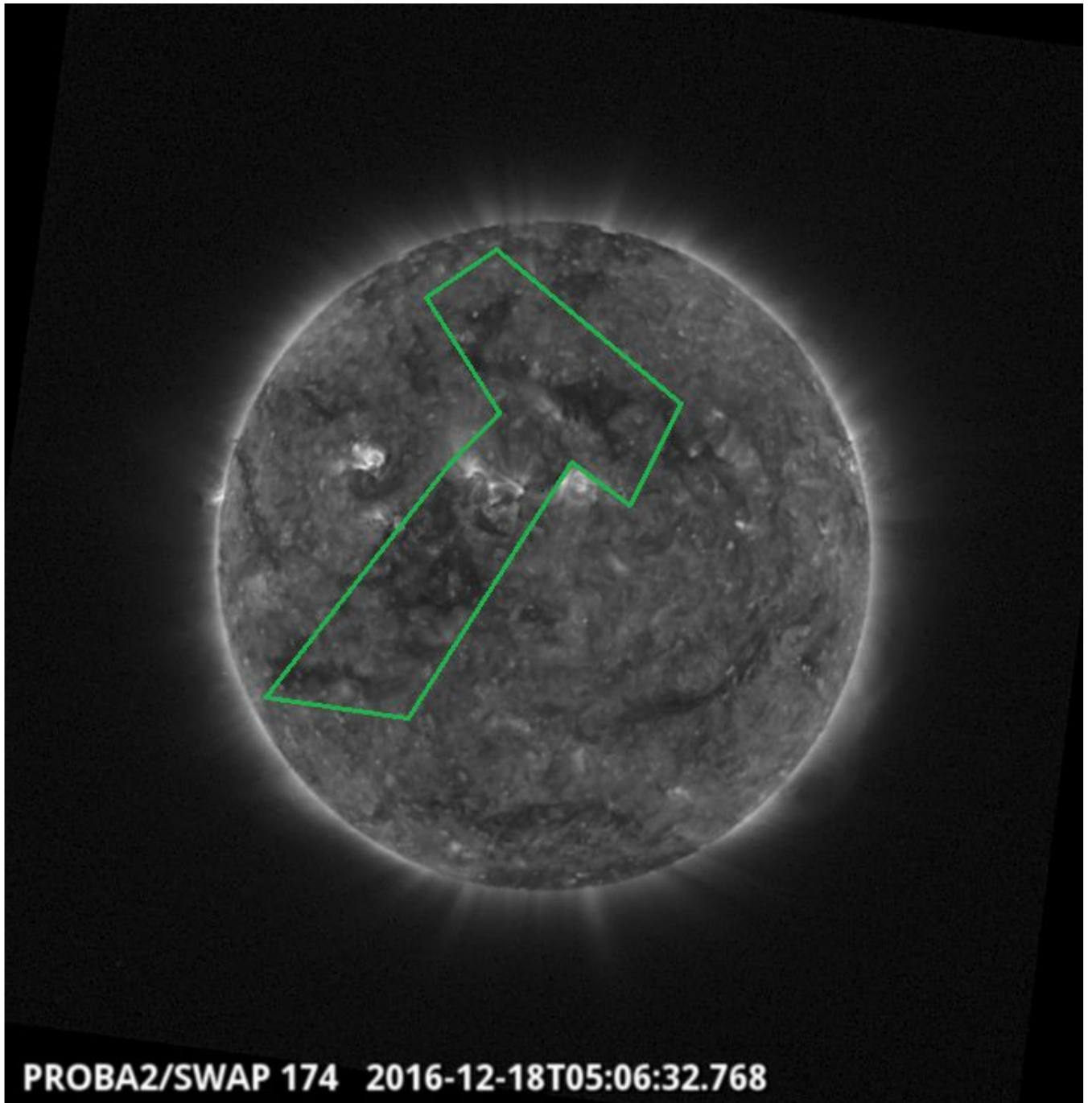


Thursday Dec 15



An eruption occurred on the North West Limb at 03:30 UT on December 15th.  
Find a movie of the event [here](#) (SWAP movie)

Sunday Dec 18



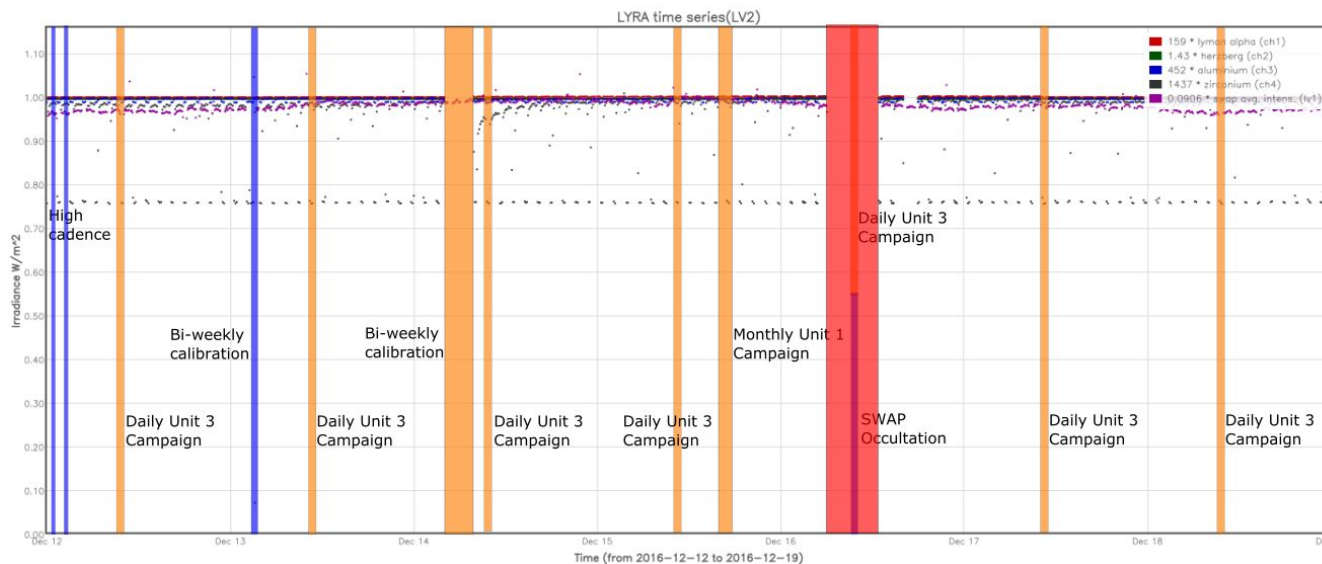
**A coronal hole stretching from the north pole to south of the equator has dominated the solar disk since Dec 14. This is clearly seen on 2016-Dec-18.**

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 campaigns for Guest Investigators Farid Goryaev, Denis Rodkin and Vladimir Slemzin, 2016-12-12
- Bi-weekly calibration, 2016-12-13
- SWAP LYRA parallel occultation, 2016-12-16

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

- Daily unit 3 campaign, 2016-12-12
- Daily unit 3 campaign, 2016-12-13
- Bi-weekly calibration, 2016-12-14
- Daily unit 3 campaign, 2016-12-14
- Daily unit 3 campaign, 2016-12-15
- Monthly Unit 1 Campaign, 2016-12-15
- Daily unit 3 campaign, 2016-12-16
- Daily unit 3 campaign, 2016-12-17
- Daily unit 3 campaign, 2016-12-18

The red shaded period corresponds to:

- LYRA, SWAP and Housekeeping data gap between 05:59 and 12:50 UT due to no data recording for passes #22632 and #22633.

## **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>).

PROBA2 observations were discussed several times at the AGU meeting in SF, USA, these included

SWAP observations were heavily discussed in an oral presentation by MJ West at the AGU meeting, SF, USA on Thursday, 15 December 2016 14:40 - 14:55 in a talk titled: "SWAP Observations of Post Flare Giant Arches and Evidence of Run-Away Reconnection"

SWAP observations were discussed in an poster presentation by M Kirk at the AGU meeting, SF, USA on Monday, 12 December 2016 08:00 - 12:20 in a presentation titled: "Identifying Long-term Oscillations in Polar Coronal Holes"

## **Guest Investigator Program**

- 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 12 Dec	Tuesday 13 Dec	Wednesday 14 Dec	Thursday 15 Dec	Friday 16 Dec	Saturday 17 Dec	Sunday 18 Dec
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3+ Bi weekly calibration	Nominal acquisition + daily U3 + Monthly Unit 1 Campaign	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00589	LYIOS00589	LYIOS00589	LYIOS00589	LYIOS00590	LYIOS00590	LYIOS00590

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

On 2016-Dec 14

- Bi weekly calibration campaign

On 2016-Dec 15

- Monthly Unit 1 campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 38.63 and 43.06°C.

### 3. SWAP instrument status

#### Calibration

Calibration campaign on Tuesday this week.

#### MCPM errors

The number of MCPM recoverable errors increased from 5601 and 5603.

The number of MCPM unrecoverable errors remained at 0.

#### IOS & operations

Monday 12 Dec	Tuesday 13 Dec	Wednesday 14 Dec	Thursday 15 Dec	Friday 16 Dec	Saturday 17 Dec	Sunday 18 Dec
Nominal acquisition GI campaigns	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition +Occultation	Nominal acquisition	Nominal acquisition
IOS00675 776 images	IOS00675 726 images	IOS00675 800 images	IOS00675 712 images	IOS00676 644 images	IOS00676 722 images	IOS00676 746 images

Special operations for SWAP, this week:

On 2016-12-12

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

On 2016-12-13

- Bi-weekly calibration

On 2016-12-16

- SWAP and LYRA parallel occultation campaign

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -5.05 and -2.73 °C.

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

The main operator is 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 22591 to 22657) was nominal, except for:

- #22632 (2016-12-16T09:29:08) and #22633 2016-12-16T12:50:35: These 2 passes were changed from Up-Down link, to Down link only, and the move was not taken into account in the KSAT system. Therefore, the signal was received but no data has been recorded.

### Data coverage HK

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

- SVA #22632 and #22633 (Were received, but not recorded).

### Data coverage SWAP

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

- SVA #22632 and #22633 (Were received, but not recorded).

Total number of images between 2016 Dec 12 0UT and 2016 Dec 19 0UT: 5126

Highest cadence in this period: 30 seconds

Average cadence in this period: 117.89 seconds

Number of image gaps larger than 300 seconds: 105

Largest data gap: 57.75 minutes

### Data coverage LYRA

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

- SVA #22632 and #22633

## 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)