


P2SC-ROB-WR-385 - 20170807 Weekly report #385	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Aug 07 to Sun Aug 13, 2017 16 Aug 2017  Jennifer O'Hara 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> remained **very low** this week.

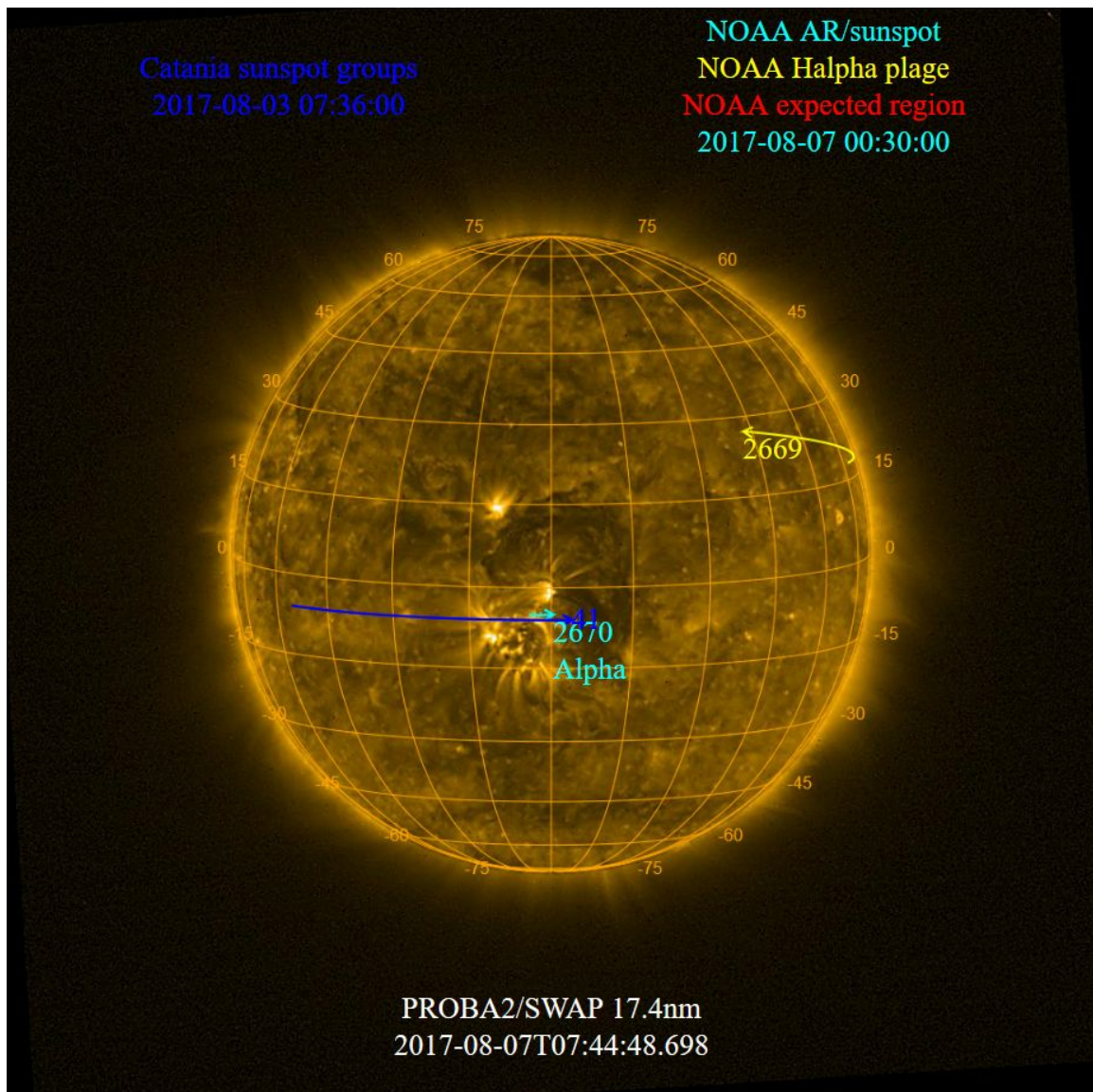
Only M- and X-flares are mentioned, the most energetic one(s) per day are presented in **bold**:

	Monday 07 Aug	Tuesday 08 Aug	Wednesday 09 Aug	Thursday 10 Aug	Friday 11 Aug	Saturday 12 Aug	Sunday 13 Aug
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.

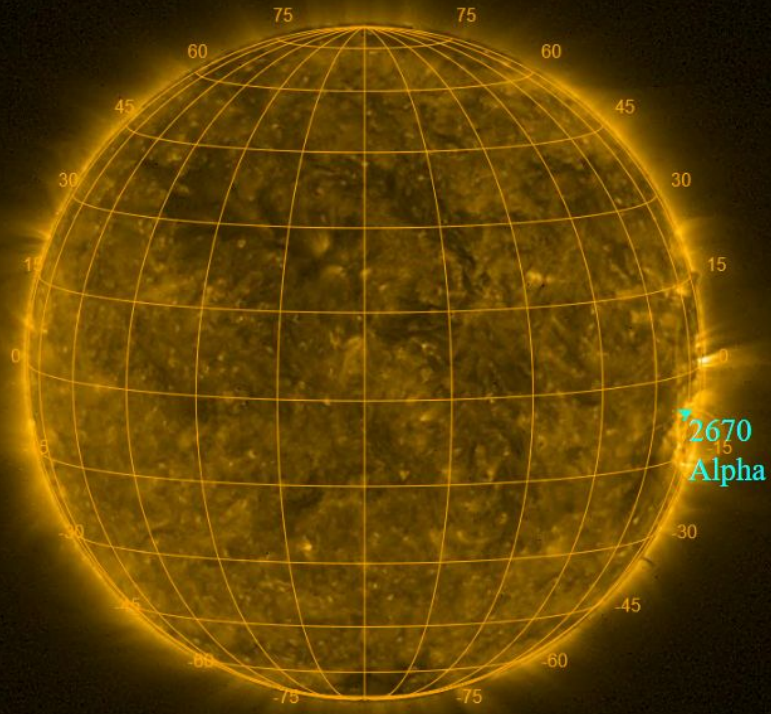
The SWAP images of Aug 07 and Aug 13 are shown below, with annotated active regions.



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

Catania sunspot groups  
No observation

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2017-08-13 00:30:00



PROBA2/SWAP 17.4nm  
2017-08-13T07:39:57.533

## **Solar Activity**

Solar flare activity remained very 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.

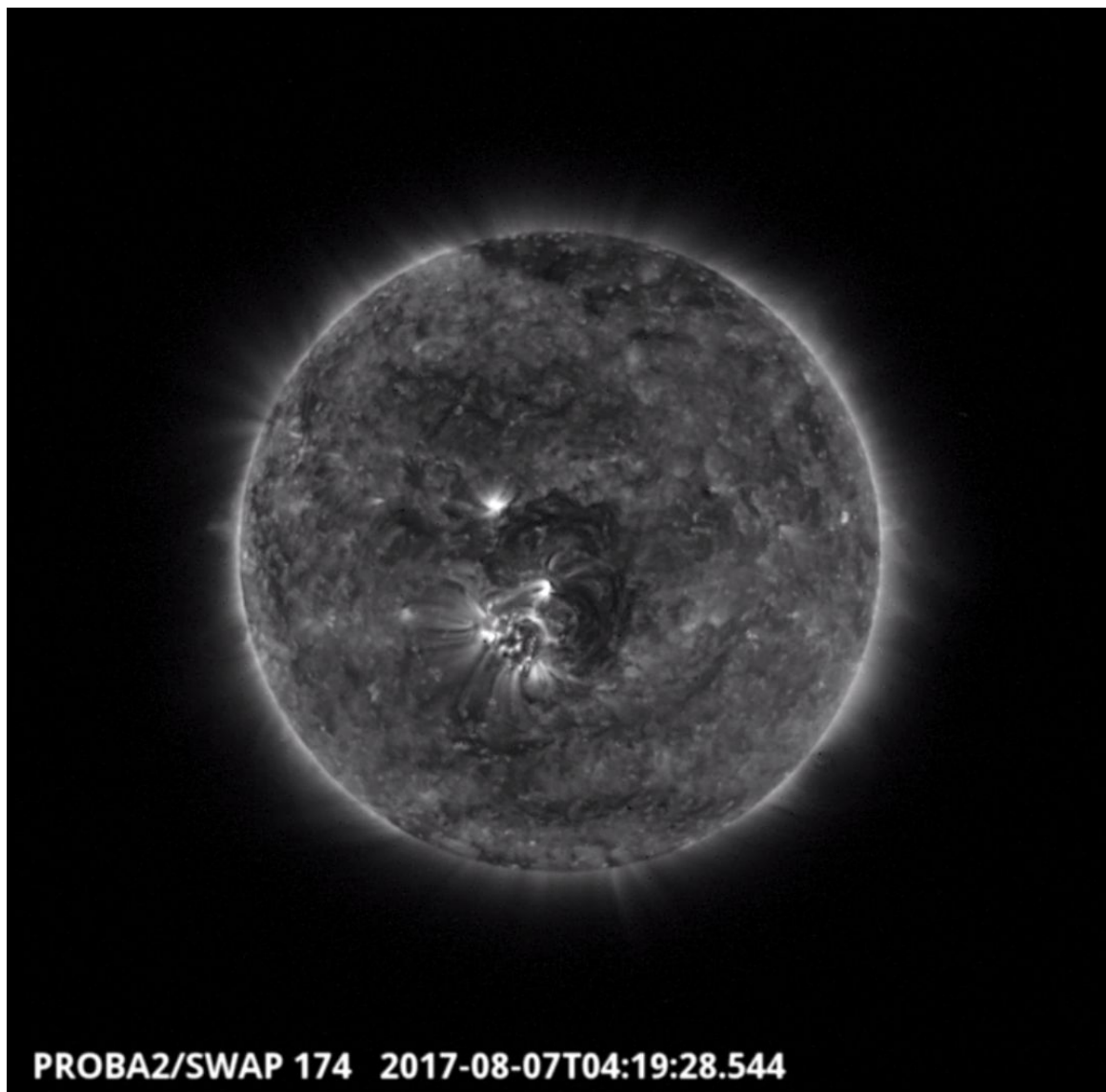
A weekly overview movie can be found [here](#) (SWAP week 385).

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](#)



Monday Aug 07



**NOAA active region 2670 was situated in the centre of the disc from the beginning of the week. Although there were no flares observed from this or any other region during the week, SWAP did observe a small eruption from AR2670 on 2017-Aug-07 towards the south-east at 04:19 UT in the image above.**

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

Sunday Aug 13



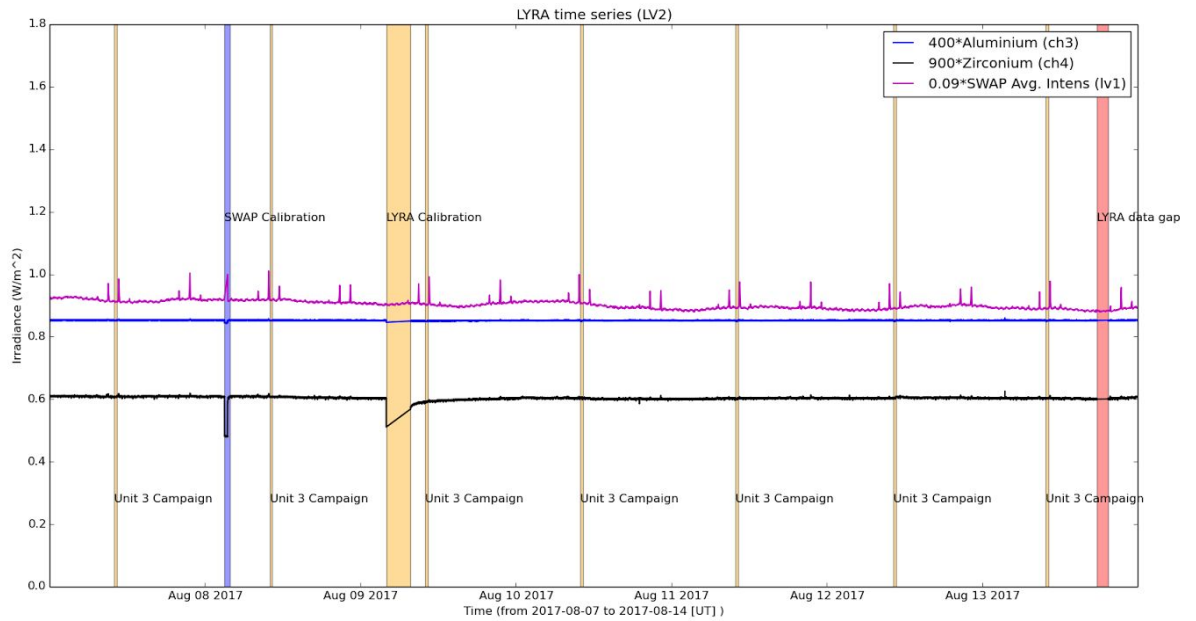
**By the end of the week on 2017-Aug-13 there were no active regions visible on the solar disk, however, bright loops associated with AR2671 are just beginning to appear on the eastern limb of the Sun at 23:44 UT, shown in the SWAP image above.**

Find a movie of the events [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 related to SWAP, correspond to, from left to right:

- Bi-weekly calibration, 2017-Aug-08

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

- Daily unit 3 campaign, 2017-Aug-07
- Daily unit 3 campaign, 2017-Aug-08
- Bi-weekly calibration, 2017-Aug-09
- Daily unit 3 campaign, 2017-Aug-09
- Daily unit 3 campaign, 2017-Aug-10
- Daily unit 3 campaign, 2017-Aug-11
- Daily unit 3 campaign, 2017-Aug-12
- Daily unit 3 campaign, 2017-Aug-13

The red shaded periods related to other issues corresponds to:

- LYRA data gap due to a corrupted packet, 2017-Aug-13

## **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>).

In preparation for the total eclipse occurring next week, an ESA article displaying a previous eclipse campaign of SWAP from 2016-Feb-26 was published:

[http://m.esa.int/spaceinimages/Images/2017/08/A\\_partial\\_solar\\_eclipse\\_seen\\_from\\_space](http://m.esa.int/spaceinimages/Images/2017/08/A_partial_solar_eclipse_seen_from_space)

There was 1 paper published in the last week, entitled: “Multi-instrument observations of the solar eclipse on 20 March 2015 and its effects on the ionosphere over Belgium and Europe” by S. Stankov et al. The paper focussed on the solar eclipse observed on 20 March 2015, performing a multi instrument analysis. SWAP and LYRA observations of the eclipse were presented in their own section (2.2) and again in the results section (5). For the paper, SWAP performed an off-point campaign during the eclipse, approximately 1 h before the eclipse and continuing until 1.5 h after the end of the eclipse. The resulting images were assembled into two high dynamic ranges, wide-field mosaic images, which reveal the EUV coronal structure to about two solar radii. Because EUV images reveal only the corona at specific temperatures, comparing these mosaics to ground-based images of the eclipse in white light provides a useful diagnostic of the temperature structure of the extended corona at the time of the eclipse. LYRA observations highlighted the limb darkening effect.

The paper can be found here:

[https://www.swsc-journal.org/articles/swsc/full\\_html/2017/01/swsc160032/swsc160032.html](https://www.swsc-journal.org/articles/swsc/full_html/2017/01/swsc160032/swsc160032.html)

## **Guest Investigator Program**

- None



## 2. LYRA instrument status

### Calibration

Calibration campaign on Wednesday this week.

### IOS & operations

Monday 07 Aug	Tuesday 08 Aug	Wednesday 09 Aug	Thursday 10 Aug	Friday 11 Aug	Saturday 12 Aug	Sunday 13 Aug
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3 + calibration	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00633	LYIOS00633	LYIOS00633	LYIOS00633	LYIOS00634	LYIOS00634	LYIOS00634

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

On 2017-Aug-09

- Bi-weekly short calibration campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 47.76 and 49.67 °C.

### 3. SWAP instrument status

#### Calibration

Calibration campaign on Tuesday this week.

#### MCPM errors

The number of MCPM recoverable errors increased from 11286 to 11434.

The number of MCPM unrecoverable errors remained at 0.

#### IOS & operations

Monday 07 Aug	Tuesday 08 Aug	Wednesday 09 Aug	Thursday 10 Aug	Friday 11 Aug	Saturday 12 Aug	Sunday 13 Aug
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00712 696 images	IOS00712 722 images	IOS00712 702 images	IOS00712 698 images	IOS00712 697 images	IOS00712 659 images	IOS00712 606 images

Special operations for SWAP, this week:

On 2017-Aug-08

- Bi-weekly calibration campaign

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.45 and -0.49 °C.

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

The main operator is Jennifer O'Hara.

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 24820 to 24882) 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 2017 Aug 07 0UT and 2017 Aug 14 0UT: 4819

Highest cadence in this period: 0 seconds

Average cadence in this period: 125.50 seconds

Number of image gaps larger than 300 seconds: 118

Largest data gap: 9.17 minutes

### Data coverage LYRA

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

- BINLYRA\_24881\_RED3\_2017.08.14T12.10.47.tar was slightly corrupted and caused a data gap between 17:43 and 19:26 UT due to processing issues.

## 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)