


P2SC-ROB-WR-364 - 20170313 Weekly report #364	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Mar 13 to Sun Mar 19, 2017 22 Mar 2017  Laurence Wauters Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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## 1. Science

### Solar & Space weather events

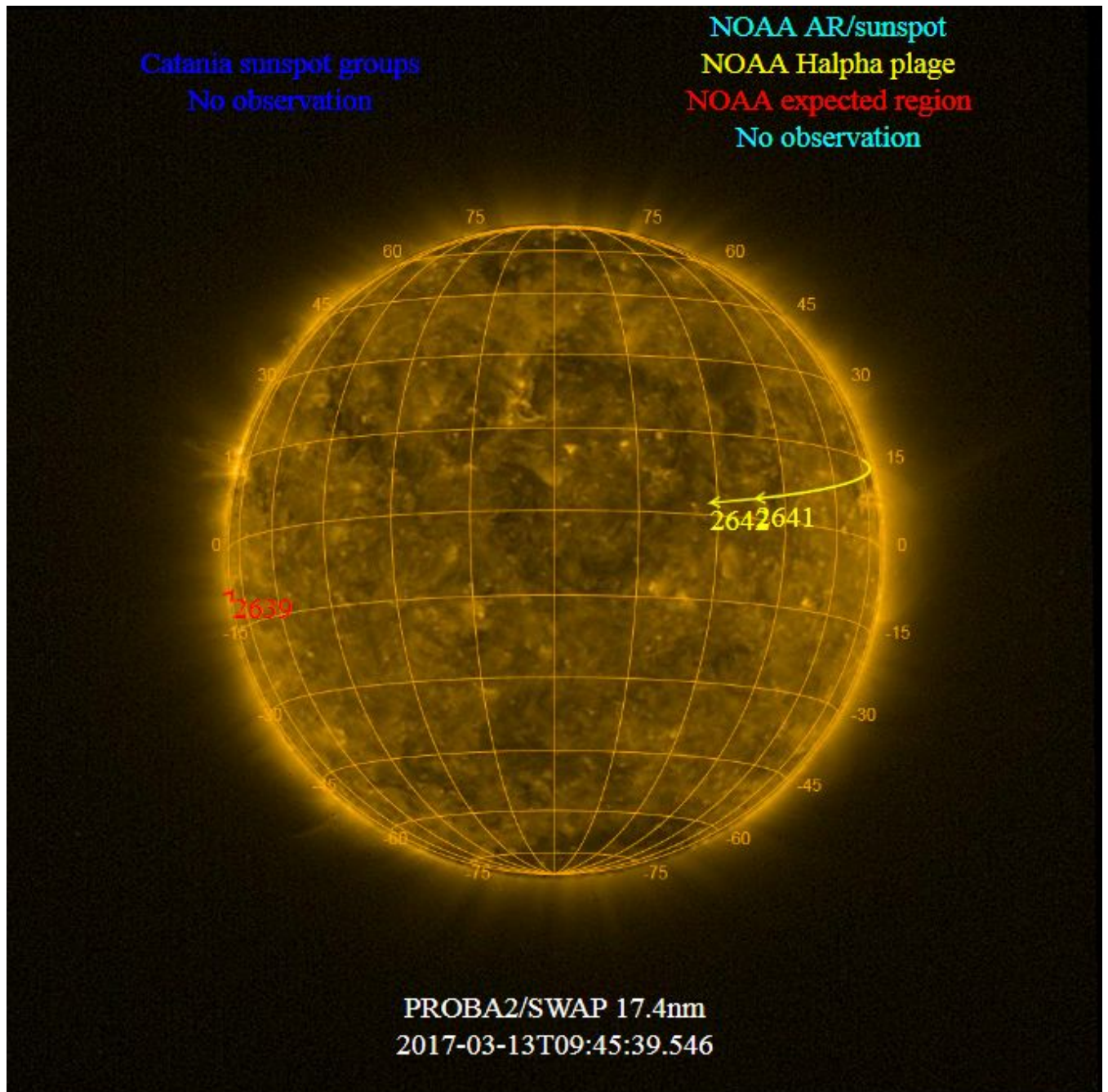
The level of solar activity<sup>1</sup> fluctuated between **low and very low** this week.

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

	Monday 13 Mar	Tuesday 14 Mar	Wednesday 15 Mar	Thursday 16 Mar	Friday 17 Mar	Saturday 18 Mar	Sunday 19 Mar
Activity	low	very low	very low	low	low	low	low
Flares	-	-	-	-	-	-	-

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

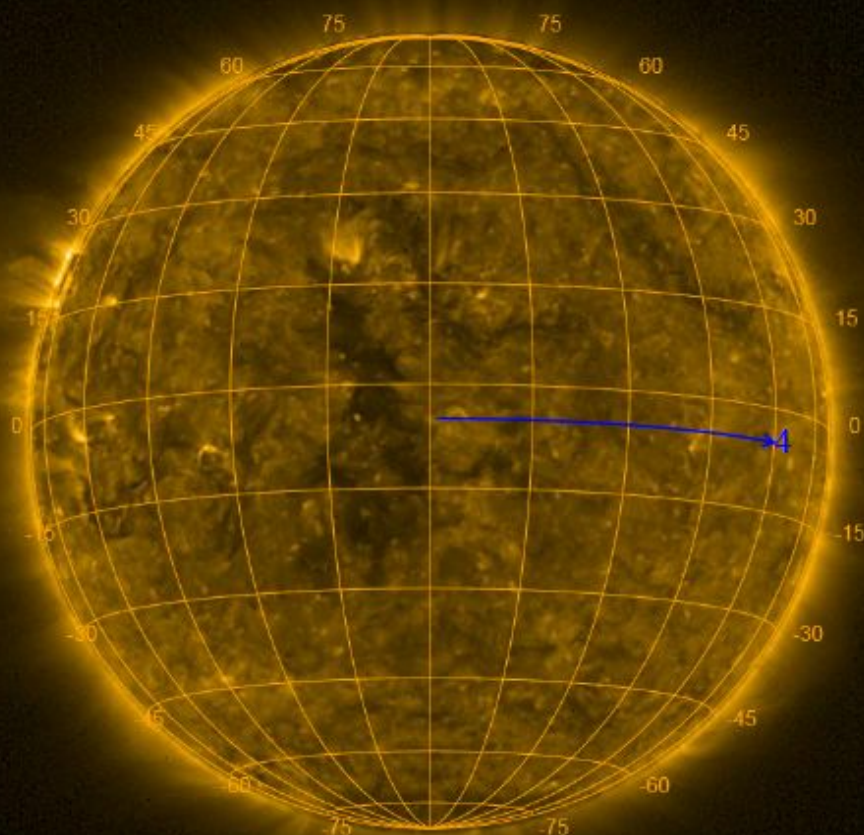
The SWAP images of Mar 13 and Mar 19 are shown below, with annotated active regions.



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

Catania sunspot groups  
2017-03-15 09:30:00

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
No observation



PROBA2/SWAP 17.4nm  
2017-03-19T09:46:18.820

## **Solar Activity**

Solar flare activity fluctuated between low to 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>

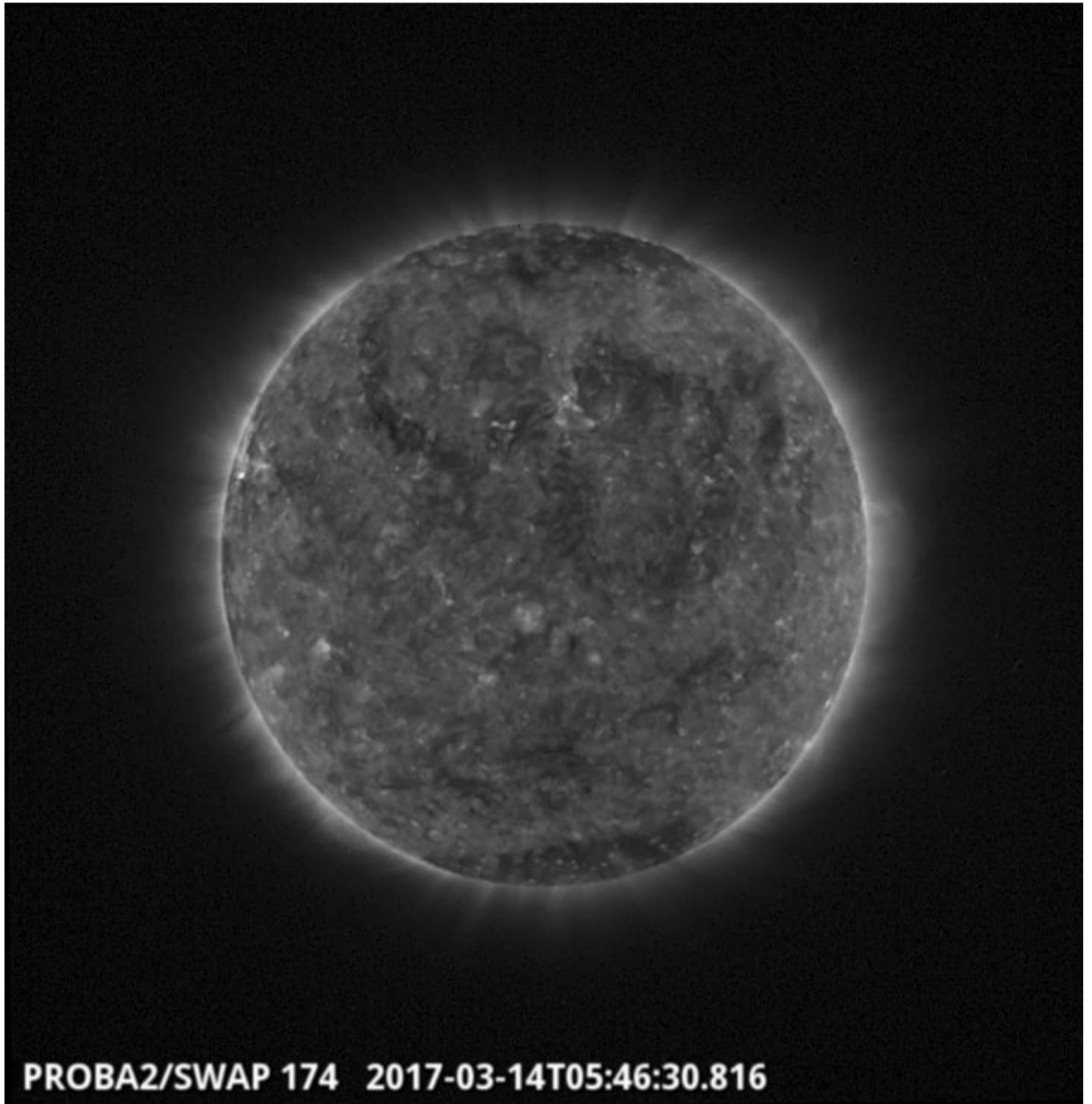
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 364).

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

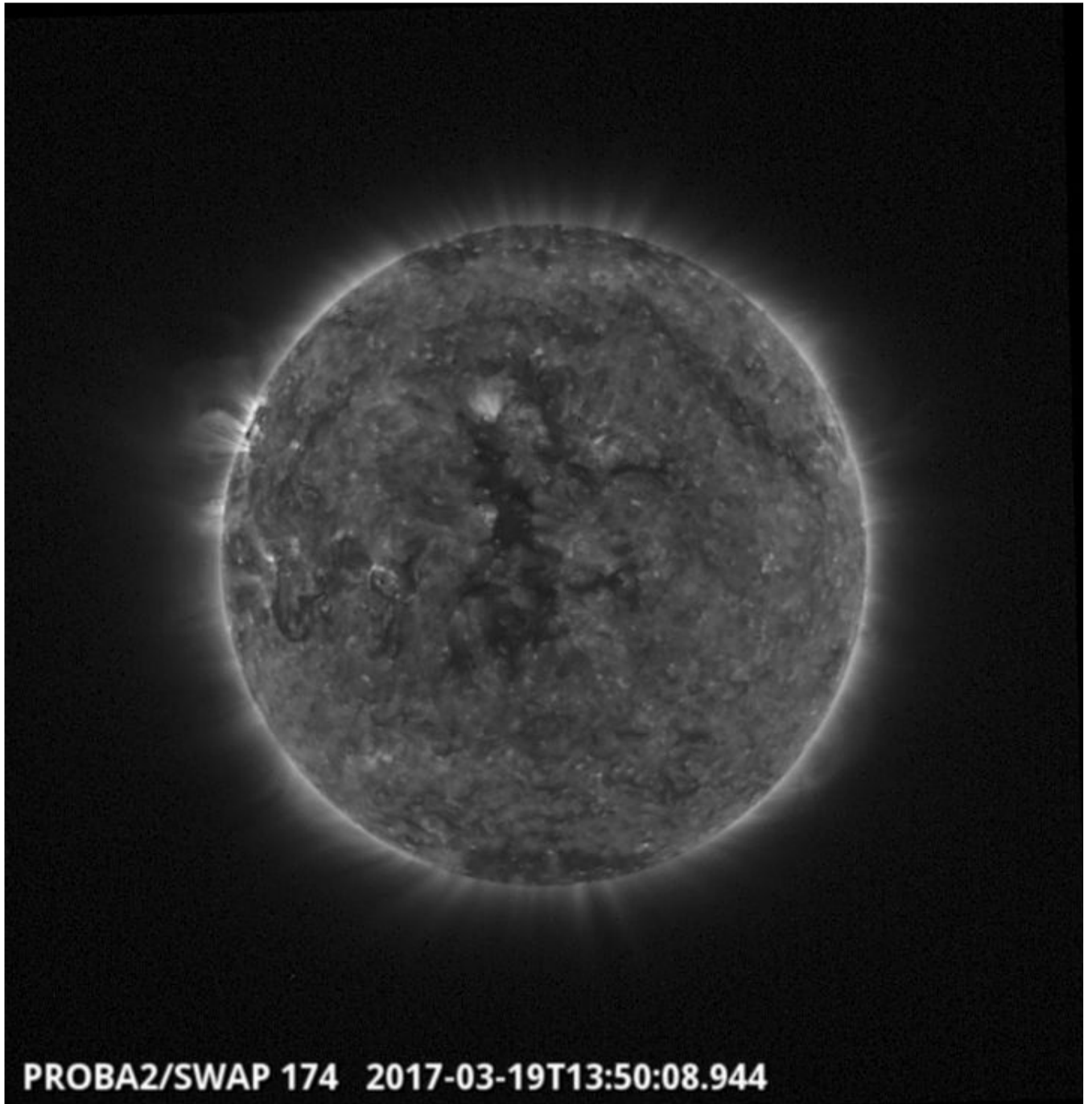
If any of the linked movies are unavailable they can be found in the P2SC movie repository [here](#)

Thursday March 14



The largest flare of the week was a B2.5, peaking at 05:46 UT on the East Limb.  
Find a movie of the event [here](#) (SWAP movie)

Sunday March 19



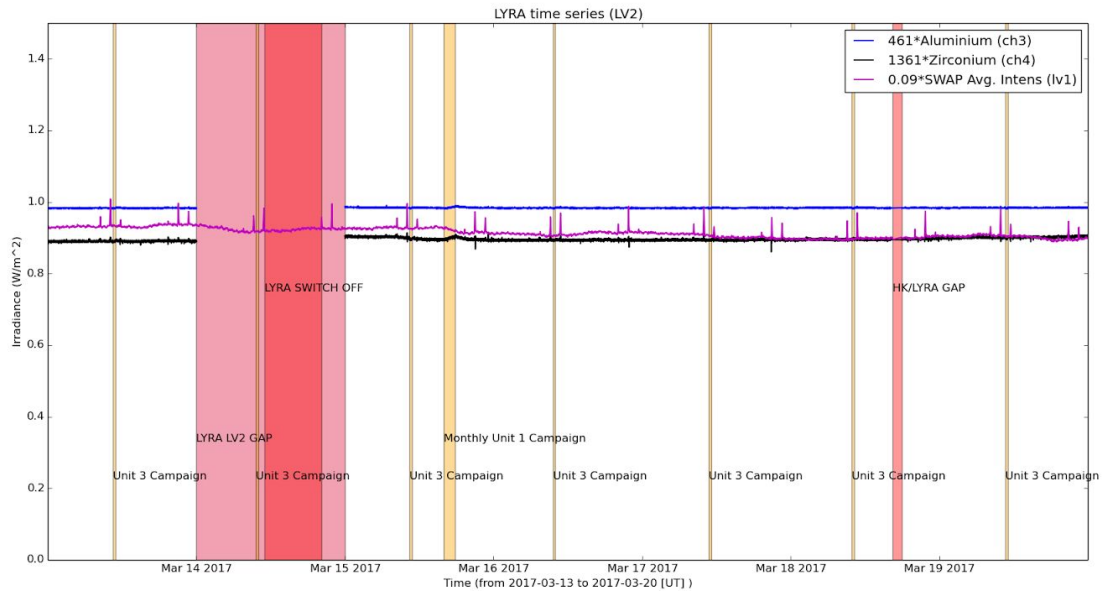
A large coronal hole passed over the solar disk, on 2013-Mar-19 it was located near the disk centre

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:

- None

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

- LYRA Daily unit 3 campaign, 2017-Mar-13
- LYRA Daily unit 3 campaign, 2017-Mar-14
- LYRA Daily unit 3 campaign, 2017-Mar-15
- LYRA Monthly Unit 1 campaign, 2017-Mar-15
- LYRA Daily unit 3 campaign, 2017-Mar-16
- LYRA Daily unit 3 campaign, 2017-Mar-17
- LYRA Daily unit 3 campaign, 2017-Mar-18
- LYRA Daily unit 3 campaign, 2017-Mar-19

The red shaded period corresponds to:

- LYRA SWITCH off mode, 2017-Mar-14
- HK and LYRA data Gap, 2017-Mar-18
- No level2 and level3 LYRA data on March 14 (in light red) due to large LYRA HK gap.

## **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**

- Guest Investigator Edward Thiemann returned to the P2SC to continue his studies “Inversion of LYRA Occultations with the Onion Peel Method.”
- Guest Investigator Larissa Krista returned to the P2SC “The structural and footpoint evolution of CMEs.”



## 2. LYRA instrument status

### Calibration

None

### IOS & operations

Monday 13 Mar	Tuesday 14 Mar	Wednesday 15 Mar	Thursday 16 Mar	Friday 17 Mar	Saturday 18 Mar	Sunday 19 Mar
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3+ Monthly Unit 1 Campaign	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00604	LYIOS00604 & LYIOS00605	LYIOS00605	LYIOS00605	LYIOS00606	LYIOS00606	LYIOS00606

The following science campaigns were performed by LYRA:

- daily U3 observations campaign
- Monthly U1 Campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 42.27 and 52.23 °C.

### 3. SWAP instrument status

#### Calibration

None

#### MCPM errors

The number of MCPM recoverable errors increased from 7619 to 7813 .

The number of MCPM unrecoverable errors remained at 0.

#### IOS & operations

Monday 13 Mar	Tuesday 14 Mar	Wednesday 15 Mar	Thursday 16 Mar	Friday 17 Mar	Saturday 18 Mar	Sunday 19 Mar
Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00692 684 images	IOS00692 701 images	IOS00692 683 images	IOS00692 704 images	IOS00693 681 images	IOS00693 703 images	IOS00693 687 images

Special operations for SWAP, this week:

- None

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -0.01 and 1.27 °C.

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

The main operator is 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 23447 to 23513) was nominal, except for:

- Pass 23462,23463,23464 on March 14
- Pass 23501 on March 18. (The commands for the stores dump for the pass #23501 were not uploaded which produced HK/LYRA gap from 2017-03-18T16:25 to 18:00)

### Data coverage HK

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

- None.
- HK gap from 2017-03-18T16:25 to 2017-03-18T18:00

### Data coverage SWAP

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

- None.

Total number of images between 2017 Mar 13 OUT and 2017 Mar 20 OUT: 4917

Highest cadence in this period: 0 seconds

Average cadence in this period: 123.00 seconds

Number of image gaps larger than 300 seconds: 97

Largest data gap: 9.17 minutes

### Data coverage LYRA

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

- Pass 23462,23463,23464 (LYRA switch off mode at 2017-03-14T10:59:18 due to LYRA voltages out of limits (9 Volt).
- Pass 23501

## 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)