


P2SC-ROB-WR-377 - 20170612 Weekly report #377	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Jun 12 to Sun Jun 18, 2017 19 Jun 2017 Jennifer O'Hara Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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1. Science

Solar & Space weather events

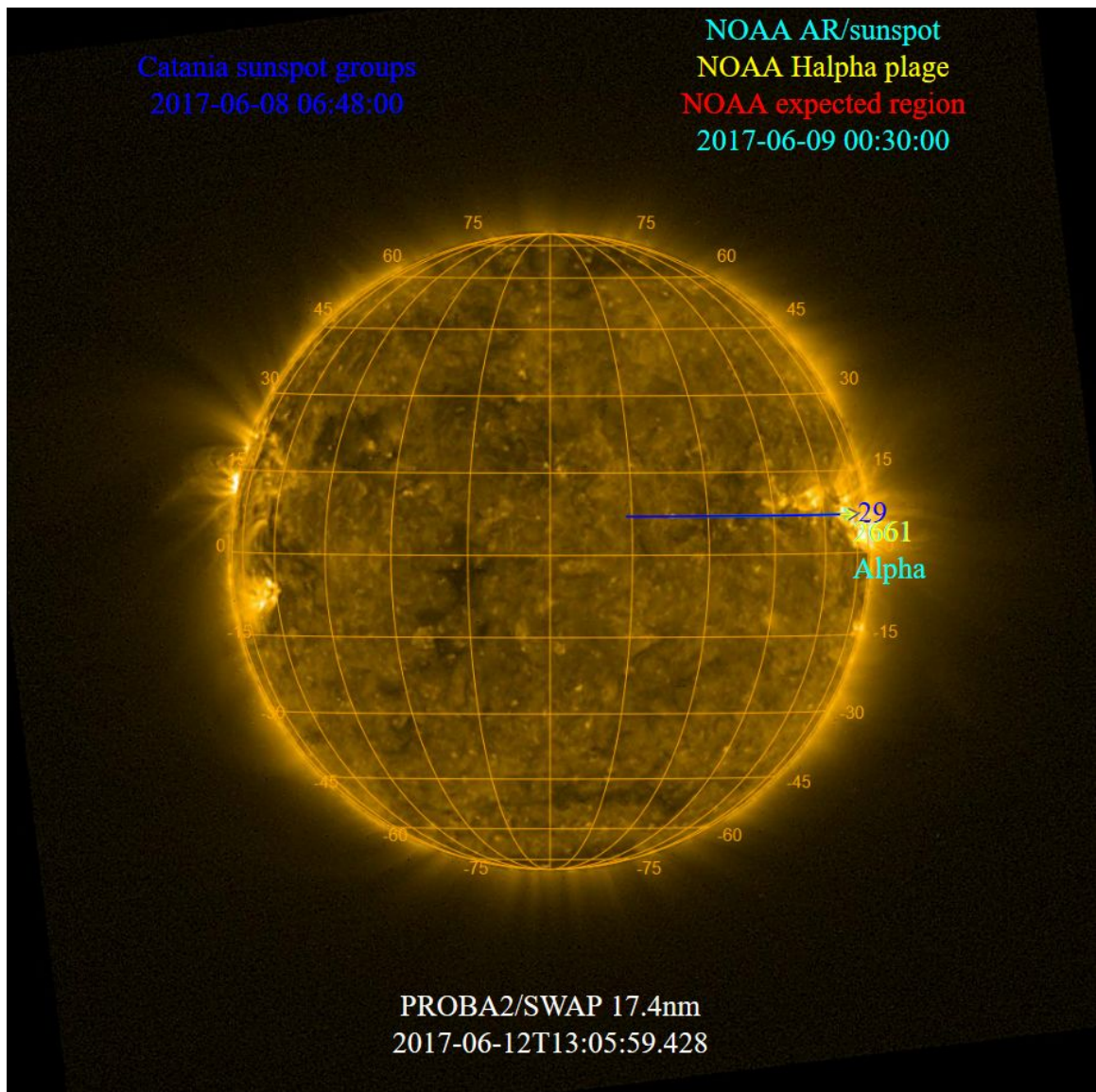
The level of solar activity¹ remained **very low** this week.

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

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

¹ See appendix. All timings are given in UT.

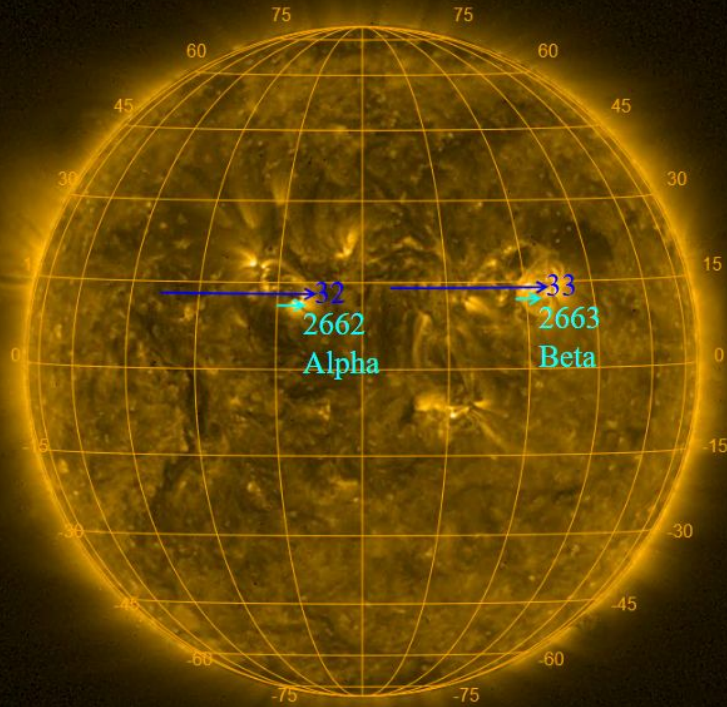
The SWAP images of Jun 12 and Jun 18 are shown below, with annotated active regions.



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

Catania sunspot groups
2017-06-16 07:18:00

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2017-06-18 00:30:00



PROBA2/SWAP 17.4nm
2017-06-18T08:07:27.083

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>

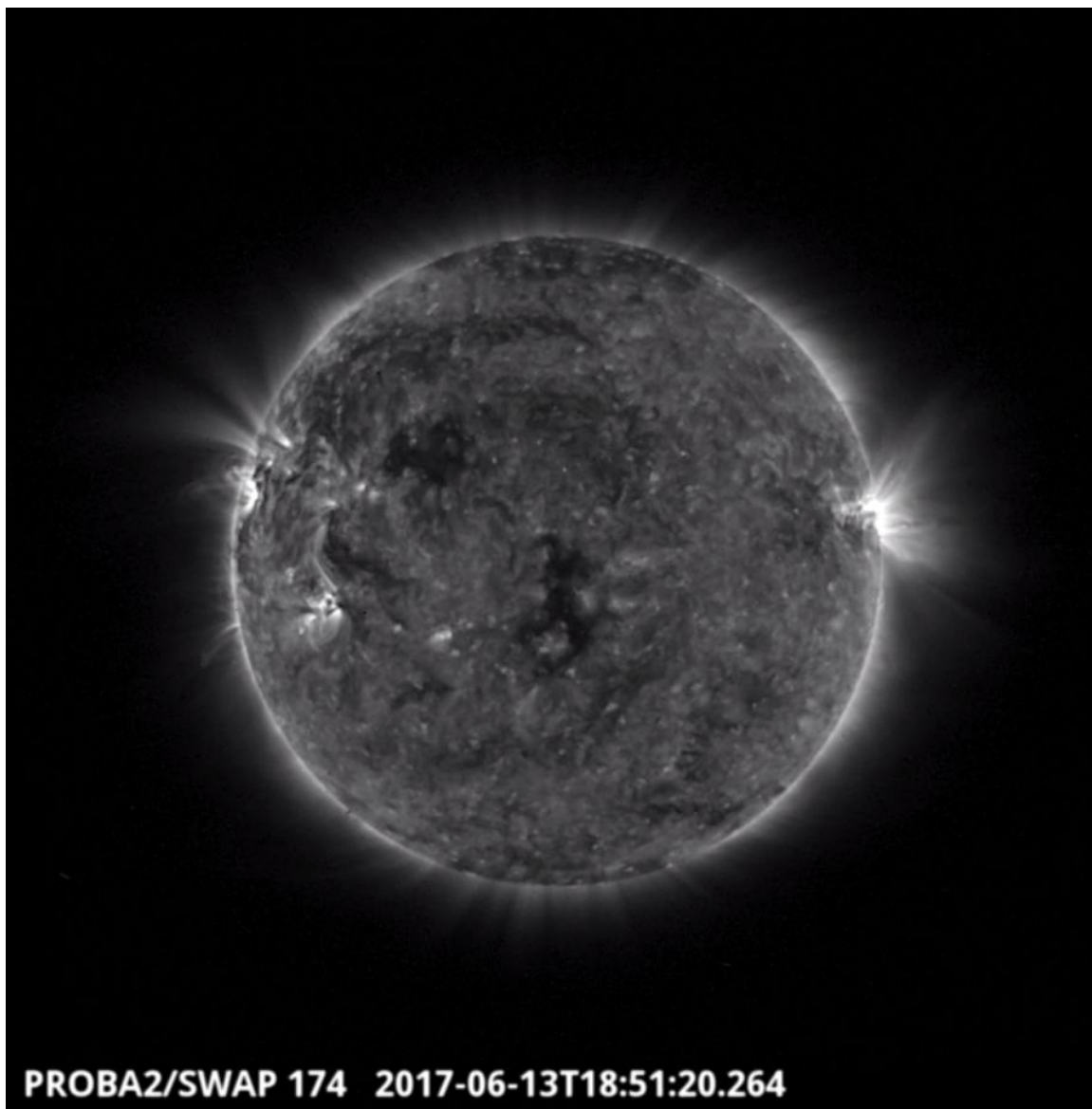
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 377).

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 Jun 13

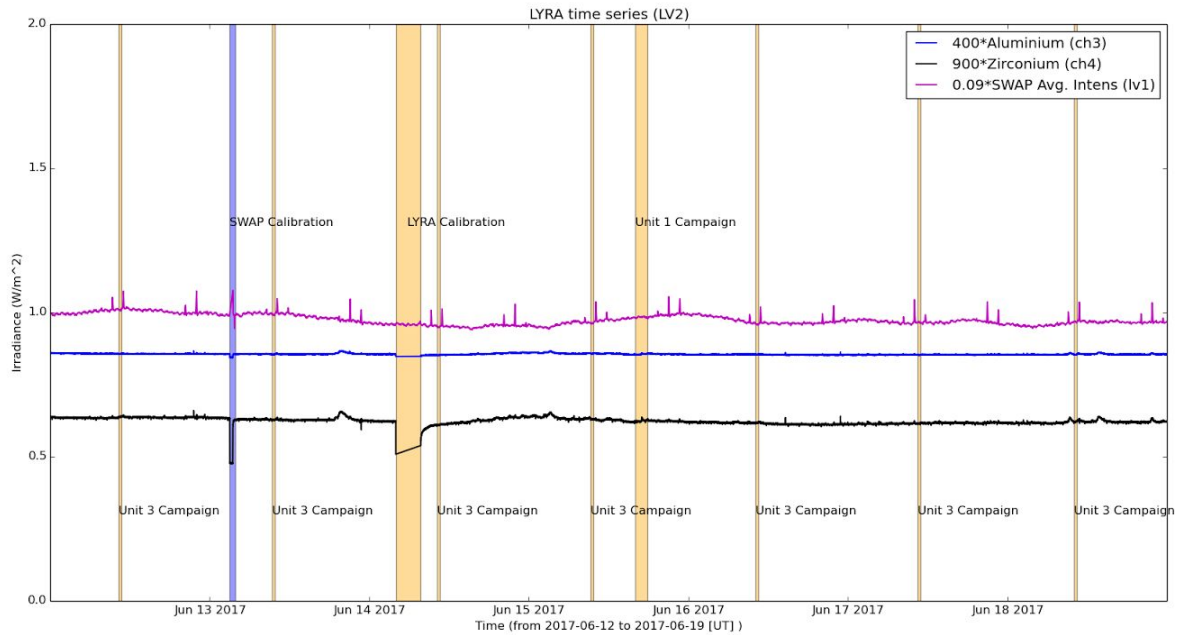


The largest flare of the week (B3.8) occurred on 2017-Jun-13 on the western limb, from NOAA active region 2661, and is shown in the SWAP image above at 18:51 UT.
Find a movie of the event [here](#) (SWAP movie)

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 related to SWAP, correspond to, from left to right:

- bi-weekly calibration, 2017-Jun-13

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

- Daily unit 3 campaign, 2017-Jun-12
- Daily unit 3 campaign, 2017-Jun-13
- bi-weekly Calibration, 2017-Jun-14
- Daily unit 3 campaign, 2017-Jun-14
- Daily unit 3 campaign, 2017-Jun-15
- Monthly unit 1 campaign, 2017-Jun-15
- Daily unit 3 campaign, 2017-Jun-16
- Daily unit 3 campaign, 2017-Jun-17
- Daily unit 3 campaign, 2017-Jun-18

The red shaded periods related to other issues correspond to:

- None

Outreach, papers, presentations, etc.

D'Huys et al. Published a paper entitled: "Solar signatures and eruption mechanism of the August 14, 2010 coronal mass ejection (CME)", in this paper D'Huys et al. reported on a wide-angled coronal mass ejection (CME) seen on 2010-Aug-14. This solar eruption originated from a destabilized filament that connected two active regions and the unwinding of this filament gave the eruption an untwisting motion that drew the attention of many observers. The authors use the wide field of view of SWAP to trace the kinematic evolution of the filament at different heights and times, in particular they highlight different points of the filament and trace the evolution of the individual points, they also use the SWP observations to construct a height-time plot. The event was associated with a C4.4 class flare, which is surprisingly small to be associated with such a large CME. The authors use this to illustrate the need to include all eruption signatures in event analyses in order to obtain a complete picture of a solar eruption and assess its possible space weather impact.

Alzate et al. published a paper entitled: "Identification of Low Coronal Sources of "Stealth" Coronal Mass Ejections Using New Image Processing Techniques". In his paper the authors assess a set of 40 stealth (no lower coronal signatures; LCS) CMEs identified from a study by D'Huys et al using the SWAP instrument on PROBA2 and STEREO. The authors use new image processing techniques applied to high-cadence, multi-instrument sets of images, spanning the onset and propagation time of each of these CMEs to search for possible LCS. These include AIA (SDO), SWAP (PROBA2), EUI (STEREO) and LASCO (SoHO). In their work the authors conclude that all 40 events in their study are associated with some form of LCS. They concluded that stealth CMEs arise from observational and processing limitations.

Seaton et al. published a paper entitled: "Observations of the Formation, Development, and Structure of a Current Sheet in an Eruptive Solar Flare". Although the paper does not use SWAP observations in this publication due to the passbands being incompatible for the study, IDL routines developed for SWAP data were used and referenced throughout to help smooth the data.

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

Calibration campaign on Wednesday this week.

IOS & operations

Monday 12 Jun	Tuesday 13 Jun	Wednesday 14 Jun	Thursday 15 Jun	Friday 16 Jun	Saturday 17 Jun	Sunday 18 Jun
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3 + calibration	Nominal acquisition + daily U3 + monthly U1	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00624	LYIOS00624	LYIOS00624	LYIOS00625	LYIOS00625	LYIOS00625	LYIOS00625

The following science campaigns were performed by LYRA:

- Daily U3 observations campaign

On 2017-Jun-14

- Bi-weekly calibration campaign

On 2017-Jun-15

- Monthly U1 observation campaign

LYRA detector temperature

LYRA detector 2 temperature globally varied between 44.22 and 48.92 °C.

3. SWAP instrument status

Calibration

Calibration campaign on Tuesday this week.

MCPM errors

The number of MCPM recoverable errors increased from 10117 to 10287.

The number of MCPM unrecoverable errors remained at 0.

IOS & operations

Monday 12 Jun	Tuesday 13 Jun	Wednesday 14 Jun	Thursday 15 Jun	Friday 16 Jun	Saturday 17 Jun	Sunday 18 Jun
Nominal acquisition	Nominal acquisition + Calibration	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00706 607 images	IOS00706 659 images	IOS00706 690 images	IOS00706 689 images	IOS00706 673 images	IOS00706 650 images	IOS00706 609 images

Special operations for SWAP, this week:

On 2017-Jun-13

- Bi-weekly calibration campaign

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.29 and 0.07 °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 24298 to 24362) 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 Jun 12 00:00 UT and 2017 Jun 19 00:00 UT: 4644

Highest cadence in this period: 30 seconds

Average cadence in this period: 130.23 seconds

Number of image gaps larger than 300 seconds: 157

Largest data gap: 16.50 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)