


P2SC-ROB-WR-308 - 20160215 Weekly report #308	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Feb 15 to Sun Feb 21, 2016 24 Feb 2016 Katrien Bonte Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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1. Science

Solar & Space weather events

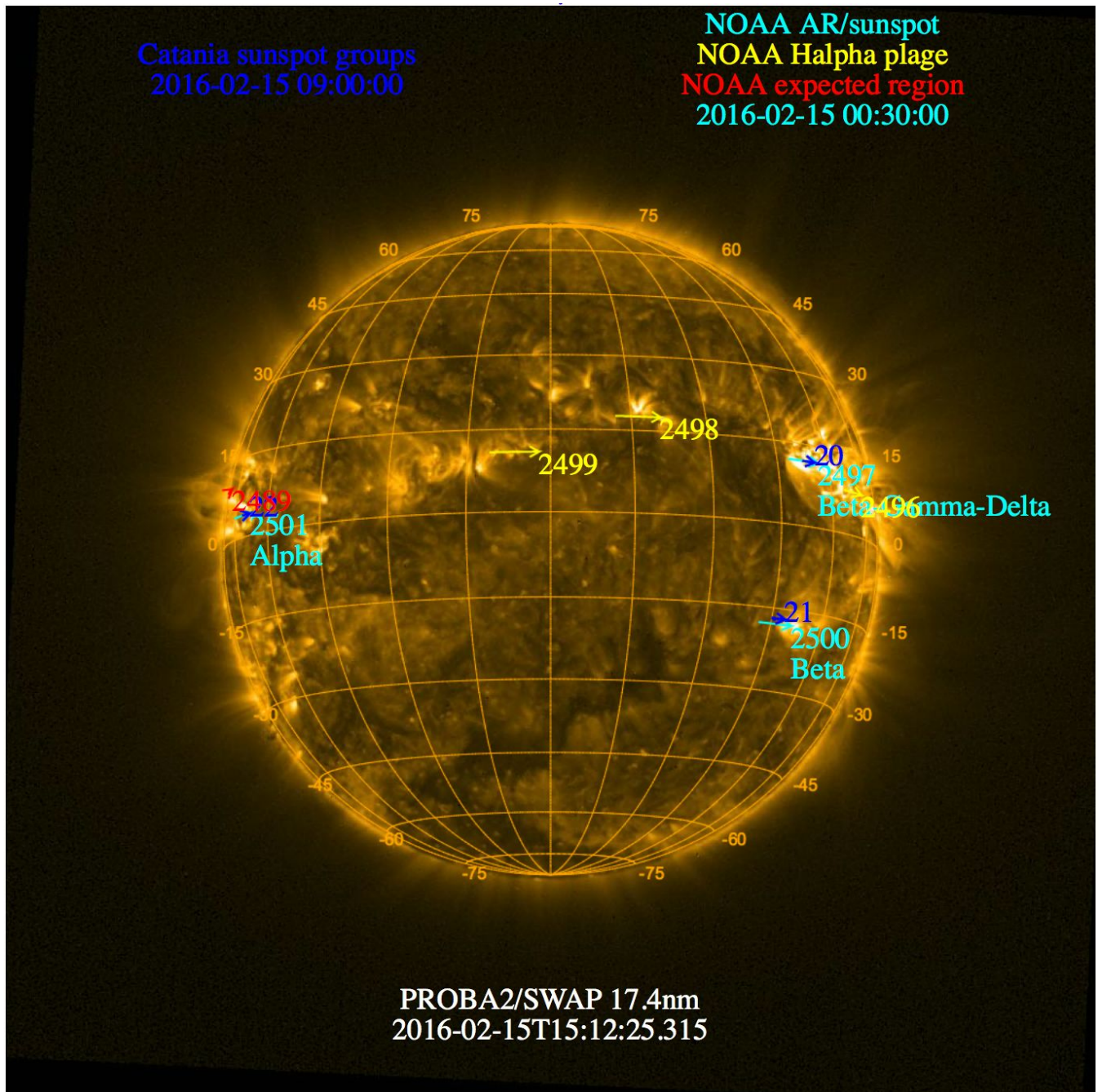
The level of solar activity¹ fluctuated between **very low** and **moderate** this week.

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

	Monday 15 Feb	Tuesday 16 Feb	Wednesday 17 Feb	Thursday 18 Feb	Friday 19 Feb	Saturday 20 Feb	Sunday 21 Feb
Activity	moderate	low	low	low	low	very low	very low
Flares	M1.1@11:00	-	-	-	-	-	-

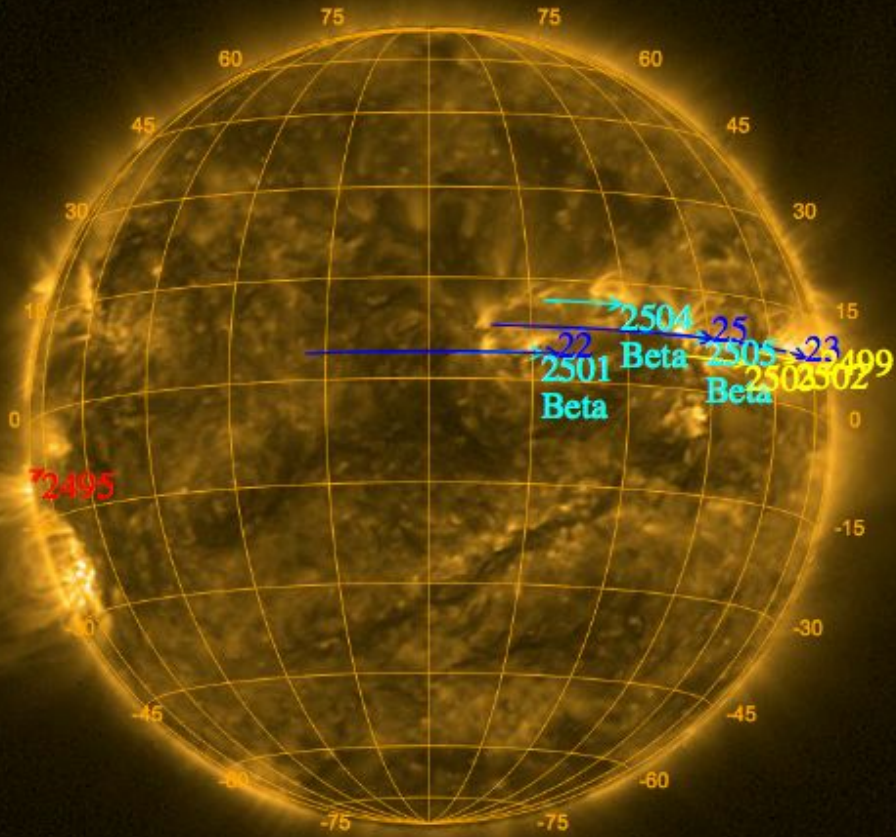
¹ See appendix. All timings are given in UT.

The SWAP images of Feb 15 and Feb 21 are shown below, with annotated active regions.



Catania sunspot groups
2016-02-19 08:48:00

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2016-02-21 00:30:00



PROBA2/SWAP 17.4nm
2016-02-21T20:54:29.977

Solar Activity

Solar flare activity fluctuated between very low and moderate 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 308).

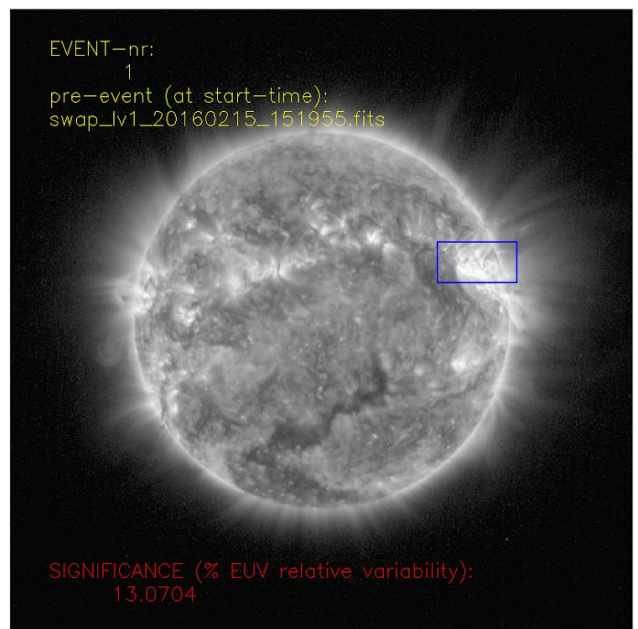
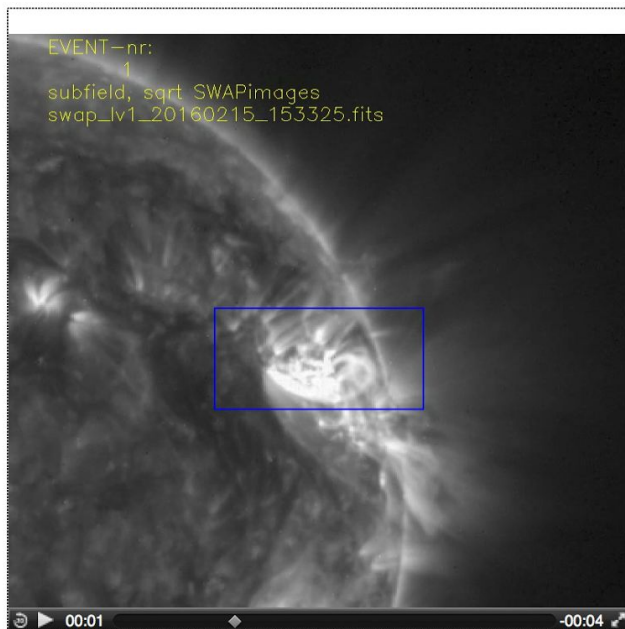
NOAA Active Region (AR) 2497 was the most productive one, producing 46 C-class flares and 1 M-class flare during this week. The M-class flare occurred on 2016-Feb-15 with its peak around 11:00 UT. The PROBA2 satellite was in occultation at that time.

The Solar Feature Automated Search Tool (SoFAST) is used to detect dynamic solar events in SWAP EUV images in near real-time, when data is available. An example of a C3.3 class flare is shown below, the snapshots illustrate the location of the flare on the solar disk (right) and a zoomed image (left).

The complete SoFAST online event list and additional plots are available at: <http://www.sidc.be/sofast>.

2016-Feb-15, AR 2497:

C3.3 class flare peaking around 15:04 UT

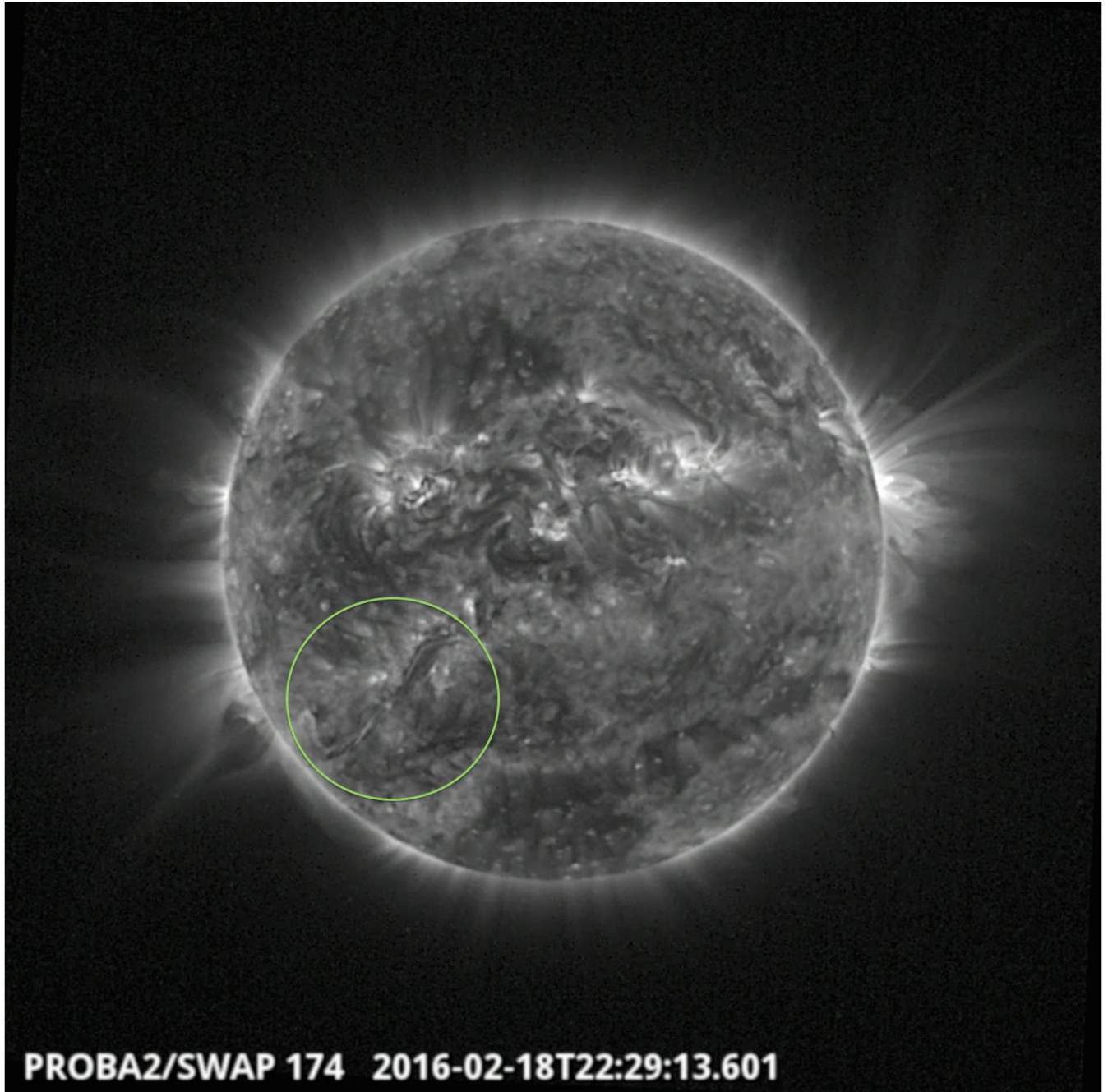


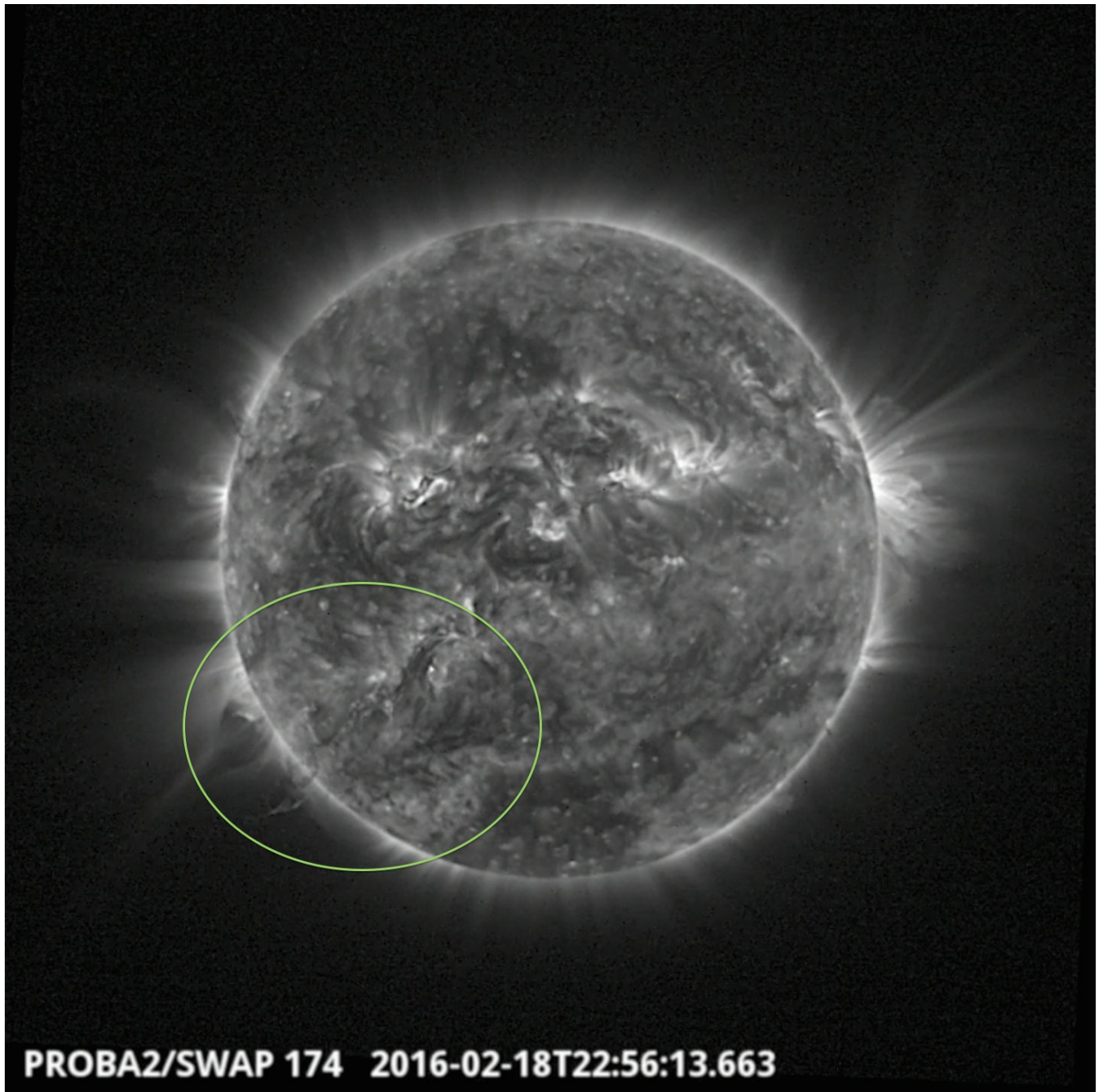
Find a movie of the events [here](#) (SWAP daily movie)

2016-Feb-18:

Filament eruption on South-East quadrant, around 22:30 UT.

On 2016-Feb-18 SWAP observed an impressive filament eruption around 22:30 UT. Below we provide annotated SWAP images before and after the event.



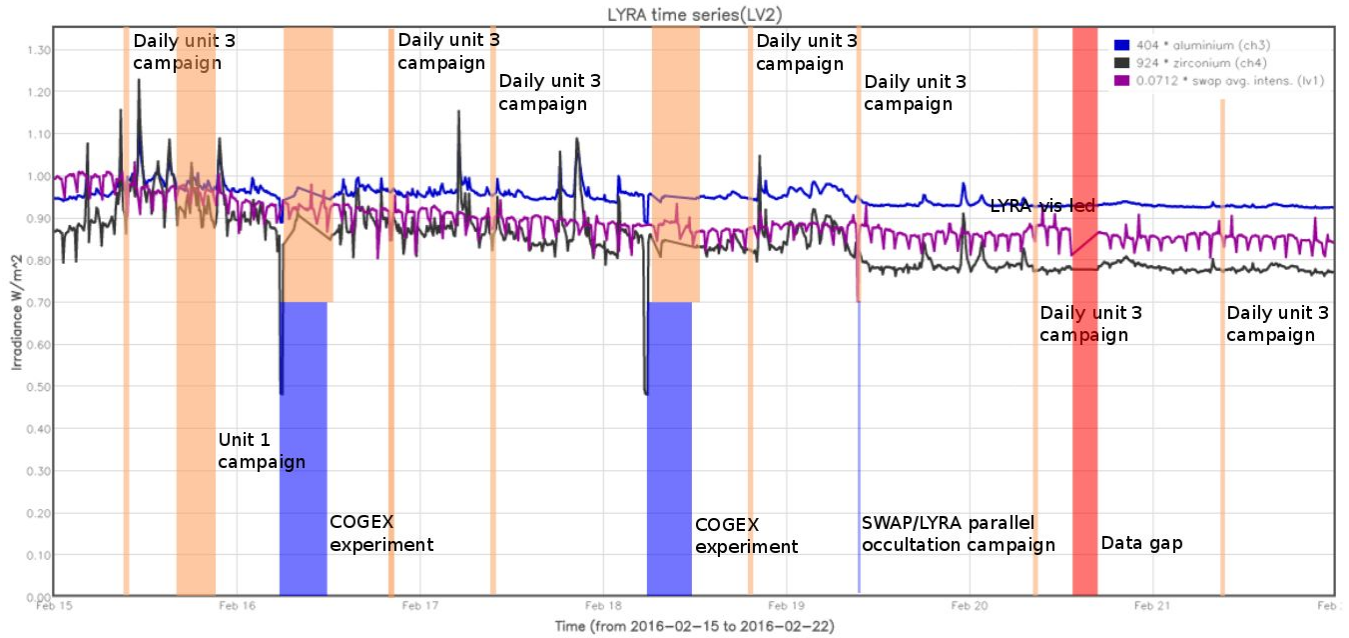


Find a movie of the event [here](#) (SWAP daily movie)

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:

- SWAP campaign for COGEX experiment on 2016-Feb-16
- SWAP campaign for COGEX experiment on 2016-Feb-18
- SWAP/LYRA parallel occultation campaign on 2016-Feb-19

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

- LYRA daily unit 3 occultation campaign on 2016-Feb-15
- Extended monthly unit 1 campaign on 2016-Feb-15
- LYRA campaign for COGEX experiment on 2016-Feb-16
- LYRA daily unit 3 occultation campaign on 2016-Feb-16
- LYRA daily unit 3 occultation campaign on 2016-Feb-17
- LYRA campaign for COGEX experiment on 2016-Feb-18
- LYRA daily unit 3 occultation campaign on 2016-Feb-18
- SWAP/LYRA parallel occultation campaign on 2016-Feb-19
- LYRA daily unit 3 occultation campaign on 2016-Feb-20
- LYRA daily unit 3 occultation campaign on 2016-Feb-21

The red shaded period corresponds to:

- SWAP and LYRA data gap on 2016-Feb-20. (No data has been recorded).

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

- L. Feng & J. Plowman are visiting ROB from 2016-Feb-15 until 2016-Mar-15 on the PROBA2 GI program, working with SWAP data for doing research on:
 - Morphology and Evolution of Three-dimensional CMEs and Coronal Waves.
 - Searching for EIT waves in coordinated SWAP and white-light observations.

2. LYRA instrument status

Calibration

Calibration campaign on Monday this week.

IOS & operations

Monday 15 Feb	Tuesday 16 Feb	Wednesday 17 Feb	Thursday 18 Feb	Friday 19 Feb	Saturday 20 Feb	Sunday 21 Feb
Nominal acquisition + daily U3 + calibration	Nominal acquisition + COGEX experiment + daily U3	Nominal acquisition + daily U3	Nominal acquisition + COGEX experiment + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00526	LYIOS00526	LYIOS00526	LYIOS00526 -> LYIOS00527	LYIOS00527	LYIOS00528	LYIOS00528

Special operations for LYRA this week:

- Daily U3 occultation campaigns

On 2016-Feb-15

- Extended monthly U1 campaign

On 2016-02-16

- Calibration before COGEX experiment
- IDLE mode for COGEX experiment
- Covers closed during 1 orbit after COGEX experiment (U2+U1 dark current measurement)
- Calibration after COGEX experiment

On 2016-02-18

- Calibration before COGEX experiment
- IDLE mode for COGEX experiment
- Covers closed during 1 orbit after COGEX experiment (U2+U1 dark current measurement)
- Calibration after COGEX experiment

LYRA detector temperature

LYRA detector 2 temperature globally varied between 49.9 and 54.9 °C.

3. SWAP instrument status

Calibration

No calibration campaign this week.

MCPM errors

The number of MCPM recoverable errors increased from 1507 to 1582..

The number of MCPM unrecoverable errors remained 0.

IOS & operations

Monday 15 Feb	Tuesday 16 Feb	Wednesday 17 Feb	Thursday 18 Feb	Friday 19 Feb	Saturday 20 Feb	Sunday 21 Feb
Nominal acquisition	Nominal acquisition + COGEX experiment	Nominal acquisition	Nominal acquisition + COGEX experiment	Nominal acquisition + parallel occultation campaign	Nominal acquisition	Nominal acquisition
IOS00627 653 images	IOS00627 691 images	IOS00627 659 images	IOS00629 776 images	IOS00630 653 images	IOS00630 492 images	IOS00630 558 images

Special operations for SWAP this week:

On 2016-02-16

- Calibration before COGEX experiment
- High cadence imaging before COGEX experiment
- IDLE mode for COGEX experiment
- Calibration after COGEX experiment
- High cadence imaging after COGEX experiment

On 2016-02-18

- Calibration before COGEX experiment
- High cadence imaging before COGEX experiment
- IDLE mode for COGEX experiment
- Calibration after COGEX experiment
- High cadence imaging after COGEX experiment

On 2016-Feb-19

- SWAP/LYRA parallel occultation campaign on 2016-02-19

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 0.15 and 6.31 °C.

4. PROBA2 Science Center Status

The main operator is Katrien Bonte.

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 19841 to 19905) was nominal, except for:

- 19893. No data has been recorded for the Svalbard downlink pass 19893 (from 2016-02-20T16:38:34 to 16:50:36) due to a failure of the BBE5 unit.

Data coverage HK

All HK data files (LYRA_AD) have been received, except:

- 19893.

Data coverage SWAP

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

- 19893.

Total number of images between 2016 Feb 15 00:00 UT and 2016 Feb 22 00:00 UT: 4482

Highest cadence in this period: 29 seconds

Average cadence in this period: 134.95 seconds

Number of image gaps larger than 300 seconds: 130

Largest data gap: 208.98 minutes

Data coverage LYRA

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

- 19893

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
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)