


P2SC-ROB-WR-679 - 20230327	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Mar 27 to Sun Apr 02, 2023 04 Apr 2023  Laurence Wauters Marie Dominique	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 high** this week.

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

	Monday 27 Mar	Tuesday 28 Mar	Wednesday 29 Mar	Thursday 30 Mar	Friday 31 Mar	Saturday 01 Apr	Sunday 02 Apr
Activity	low	low	high	moderate	low	low	low
Flares	-	-	<b>M1.1,M1.2,X1.2</b>	<b>M5.4</b>	-	-	-

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

## **Solar Activity**

Solar flare activity fluctuated from low to high 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: <https://proba2.oma.be/ssa>

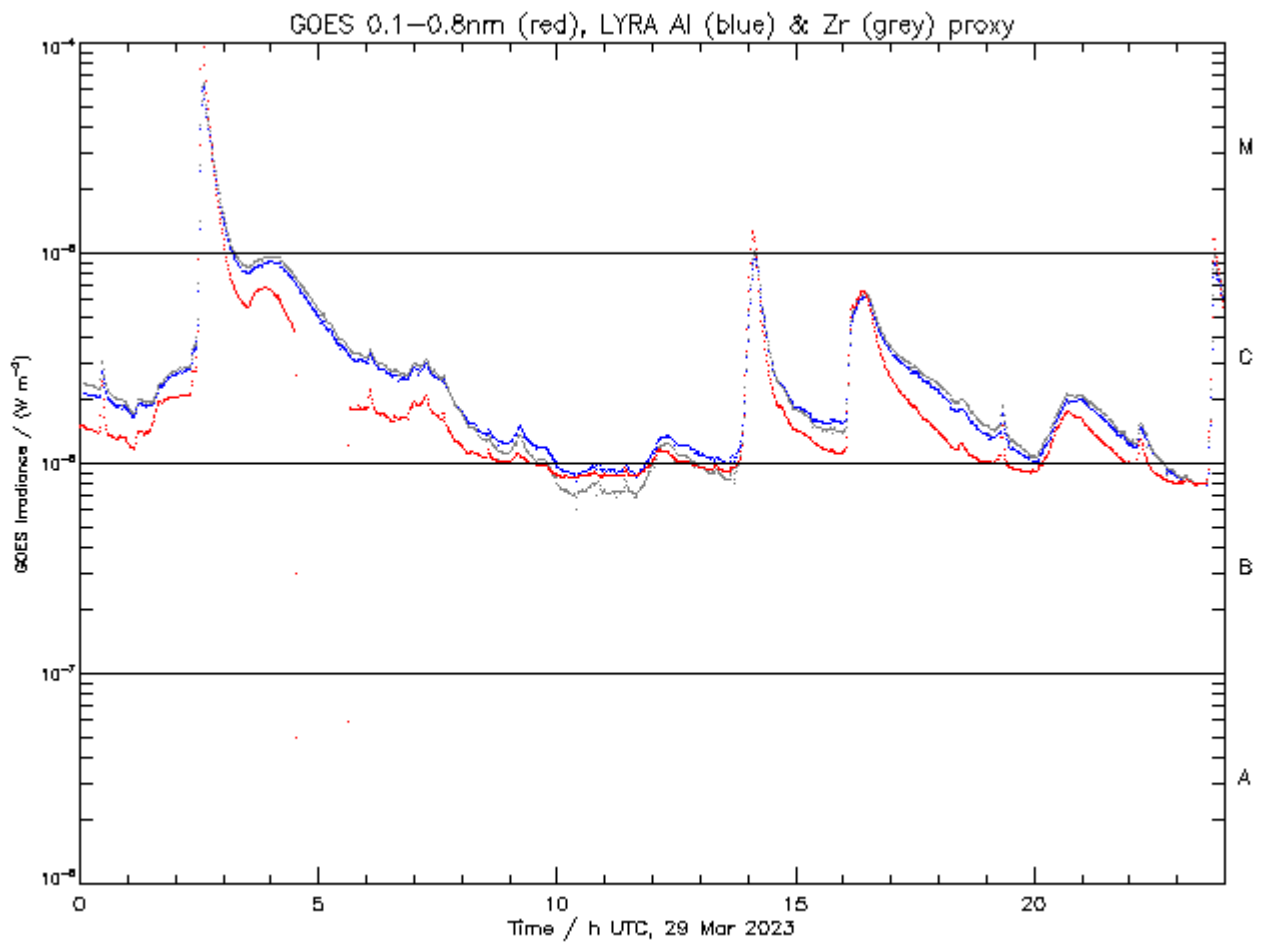
This page also lists the recorded flaring events.

A weekly overview movie can be found [here](#) (SWAP week 679).

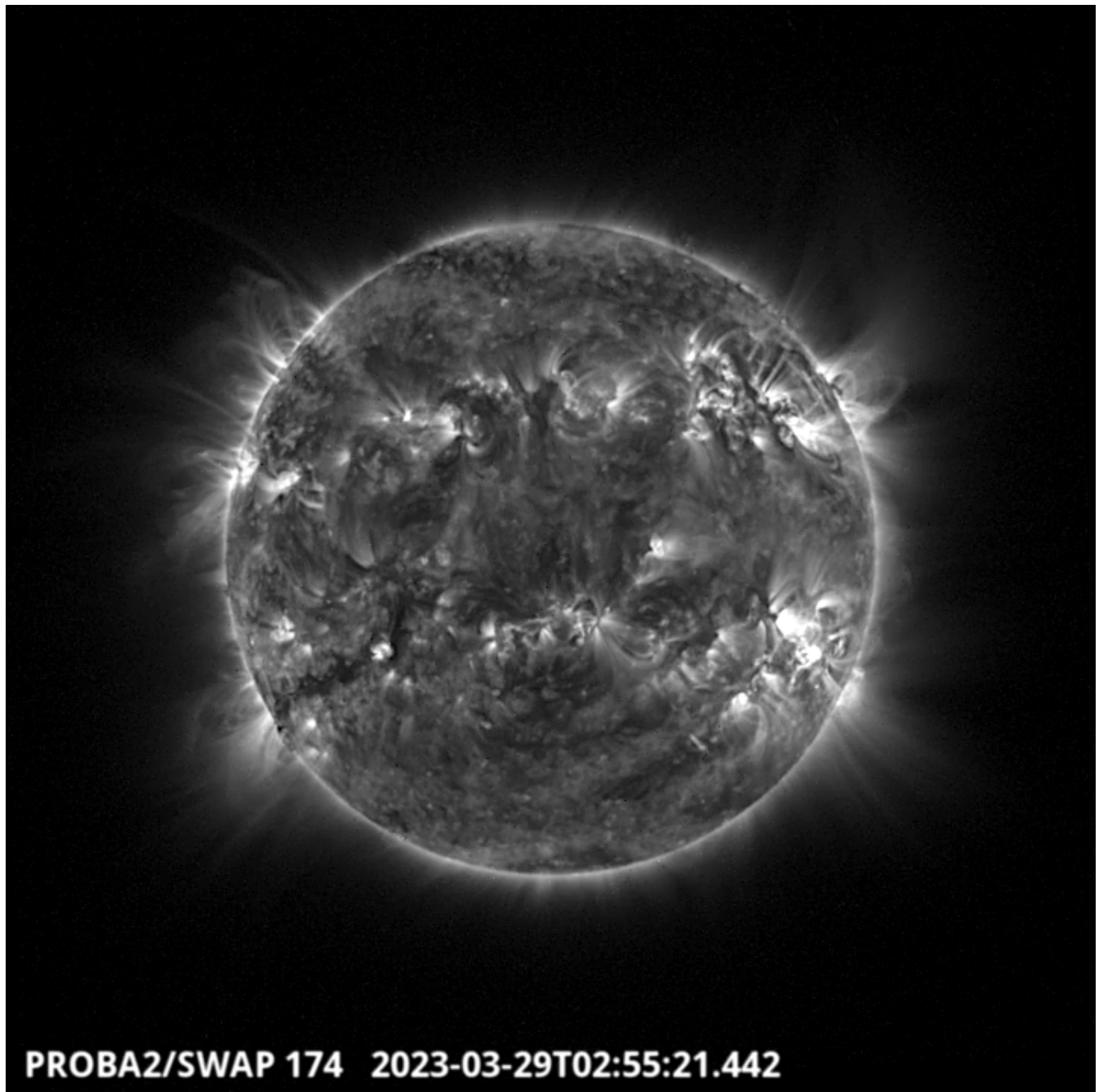
Details about some of this week's events can be found further below.

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

Wednesday Mar 29

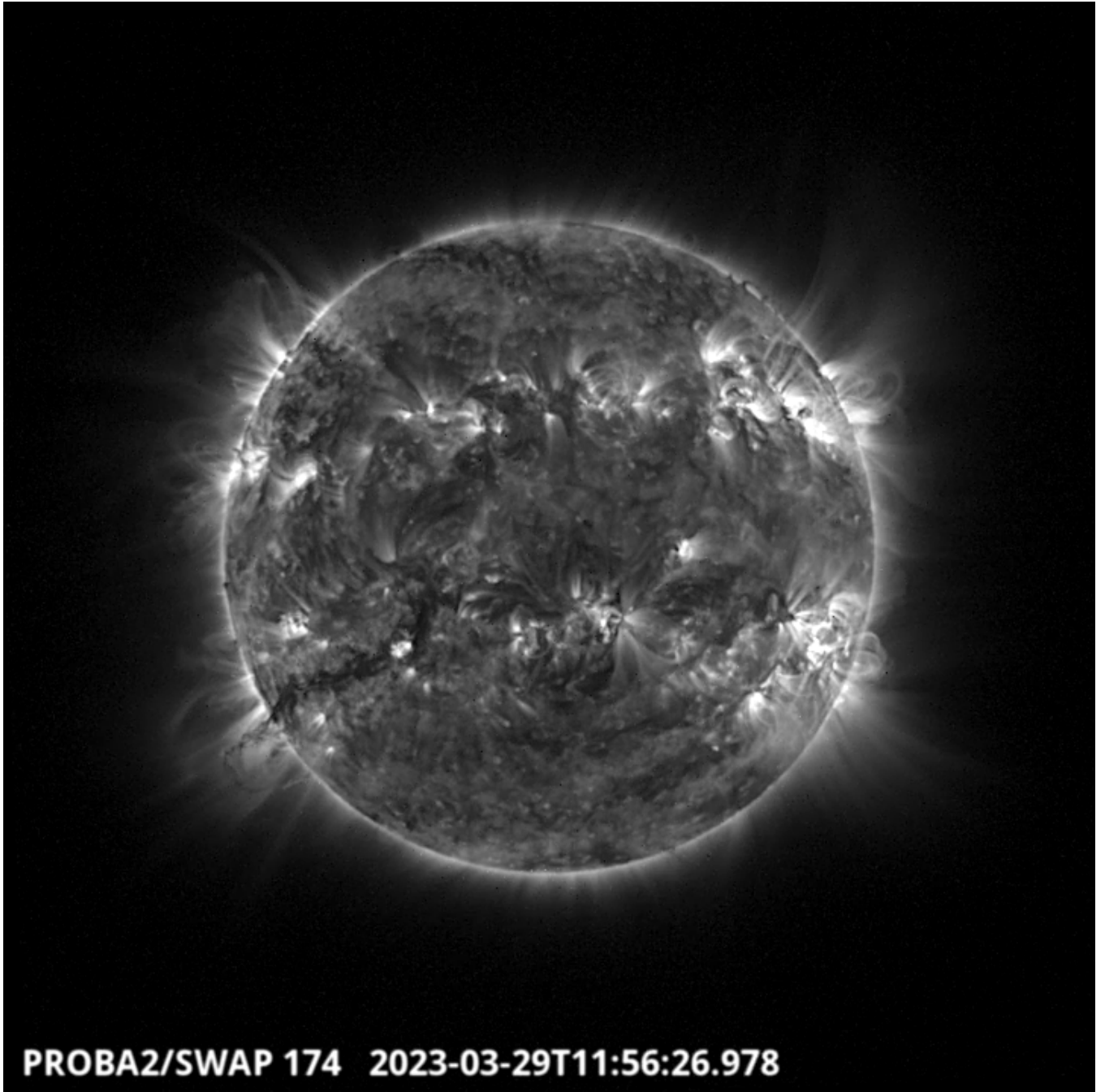


ROB/SIDC, Brussels, Belgium



**A large event in the South Western Hemisphere is visible around 2:55UT on the SWAP image above. It has been classified as a X1.2 flare originated from the active region labeled NOAA 3256. It was the largest flare of the week and it is well visible on LYRA data (above).**

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

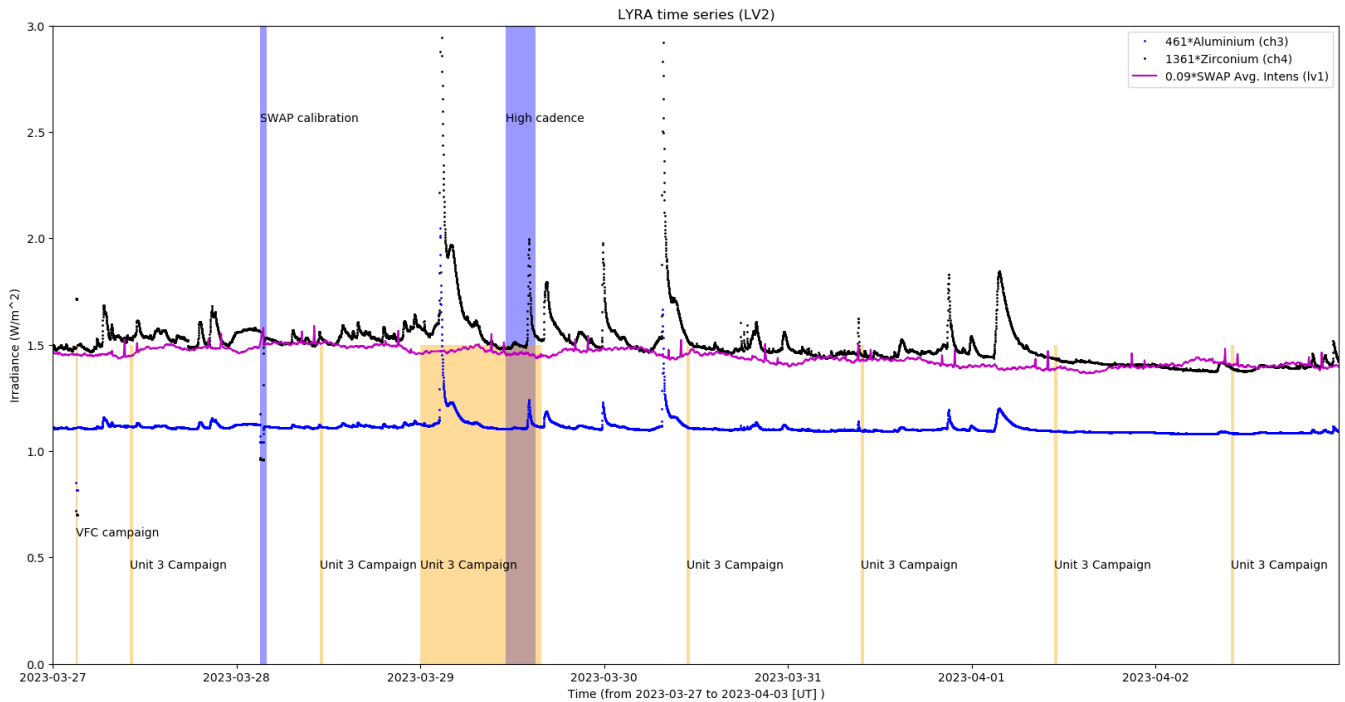


Prominence eruption in the South East Limb of the solar disk around 11:56 UT.  
Find a SWAP movie of the event [here](#).

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 )



### Operations and Calibrations:

The blue shaded periods related to SWAP, correspond to, from left to right:

- Bi-weekly calibration, 2023-Mar-28
- High cadence campaign with SoLO, 2023-Mar-29

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

- Test VFC, 2023-Apr-27
- Daily Unit 3 campaign, 2023-Mar-27
- Daily Unit 3 campaign, 2023-Mar-28
- Unit 1 joint campaign with SoLO and ground stations (including USET at Uccle), 2023-Mar-29
- Daily Unit 3 campaign, 2023-Mar-30
- Daily Unit 3 campaign, 2023-Mar-31
- Daily Unit 3 campaign, 2023-Apr-01
- Daily Unit 3 campaign, 2023-Apr-02

The red shaded periods related to other issues corresponds to:

- None

## 2. LYRA instrument status

### IOS

Start IOS	Mon Mar 27	LYIOS00999
End IOS	Sun Apr 02	LYIOS01000

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 50.74 and 53.29 °C.

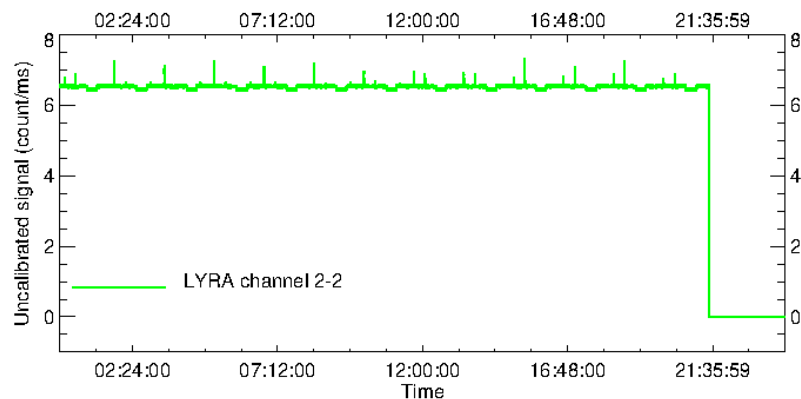
### Malfunction of the channel 2 of the nominal unit

Since January 1 2023, the signal corresponding to the second channel (herzberg) of the nominal unit has dropped to 0. Since that channel was the most degraded, data were anyway not exploitable anymore. However, we have performed a few tests to find the origin of the malfunction.

Those tests consisted in:

- connecting the nominal unit to the backup VFC group,
- connecting unit 3 to the nominal VFC group,
- analyzing the signal of the reference voltages,
- reloading the ASIC.

From those tests, it appears that the nominal second VFC - or the channel multiplexer in front of it - must be broken. We cross-checked with PMOD that continuing using the nominal VFC group despite one of its components being broken was no threat for the instrument. Then confirmed that since the problem was limited to one single VFC/multiplexer, the nominal VFC group could still be used. Nominal observations will therefore still be made with that VFC group.



### 3. SWAP instrument status

#### MCPM errors

The number of MCPM recoverable errors increased from 39876 to 40171.

The number of MCPM unrecoverable errors remained at 3135.

#### IOS

Start IOS	Mon Mar 27	IOS001112
End IOS	Sun Apr 02	IOS001113

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -0.25 and 0.79 °C.



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

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 ) 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 2023 Mar 27 00:00 UT and 2023 Apr 03 00:00 UT: 4481

Highest cadence in this period: 30 seconds

Average cadence in this period: 134.94 seconds

Number of image gaps larger than 300 seconds: 234

Largest data gap: 11.00 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)