


P2SC-ROB-WR-733 - 20240408	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon Apr 08 to Sun Apr 14, 2024 17 Apr 2024 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 activity¹ fluctuated between **low and moderate** this week.

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

	Monday 8 Apr	Tuesday 9 Apr	Wednesday 10 Apr	Thursday 11 Apr	Friday 12 Apr	Saturday 13 Apr	Sunday 14 Apr
Activity	low	low	low	moderate	low	moderate	moderate
Flares	-	-	-	M5.4	-	M2.4	M4.3

¹ See appendix. All timings are given in UT.

Solar Activity

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

This page also lists the recorded flaring events.

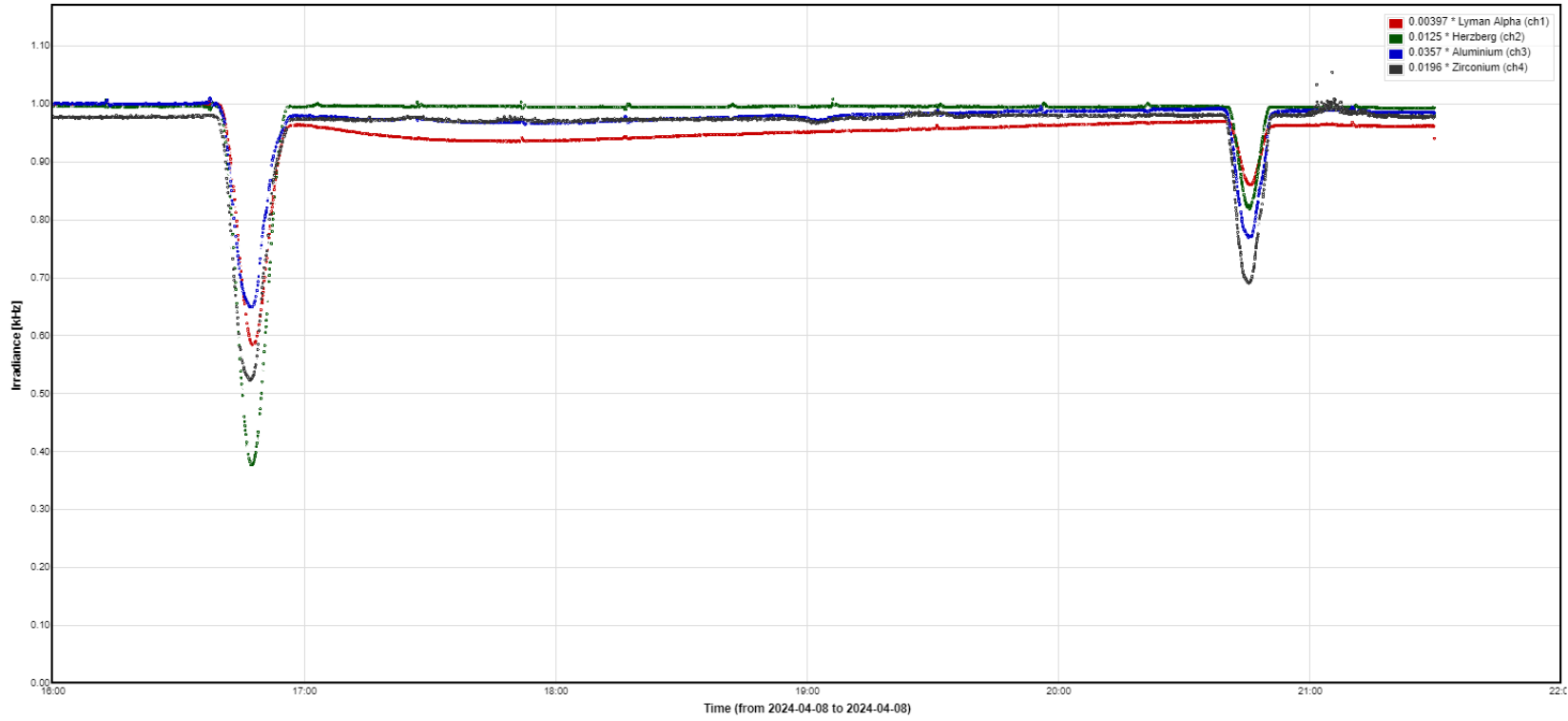
A weekly overview movie can be found [here](#)(SWAP week 733).

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](#)

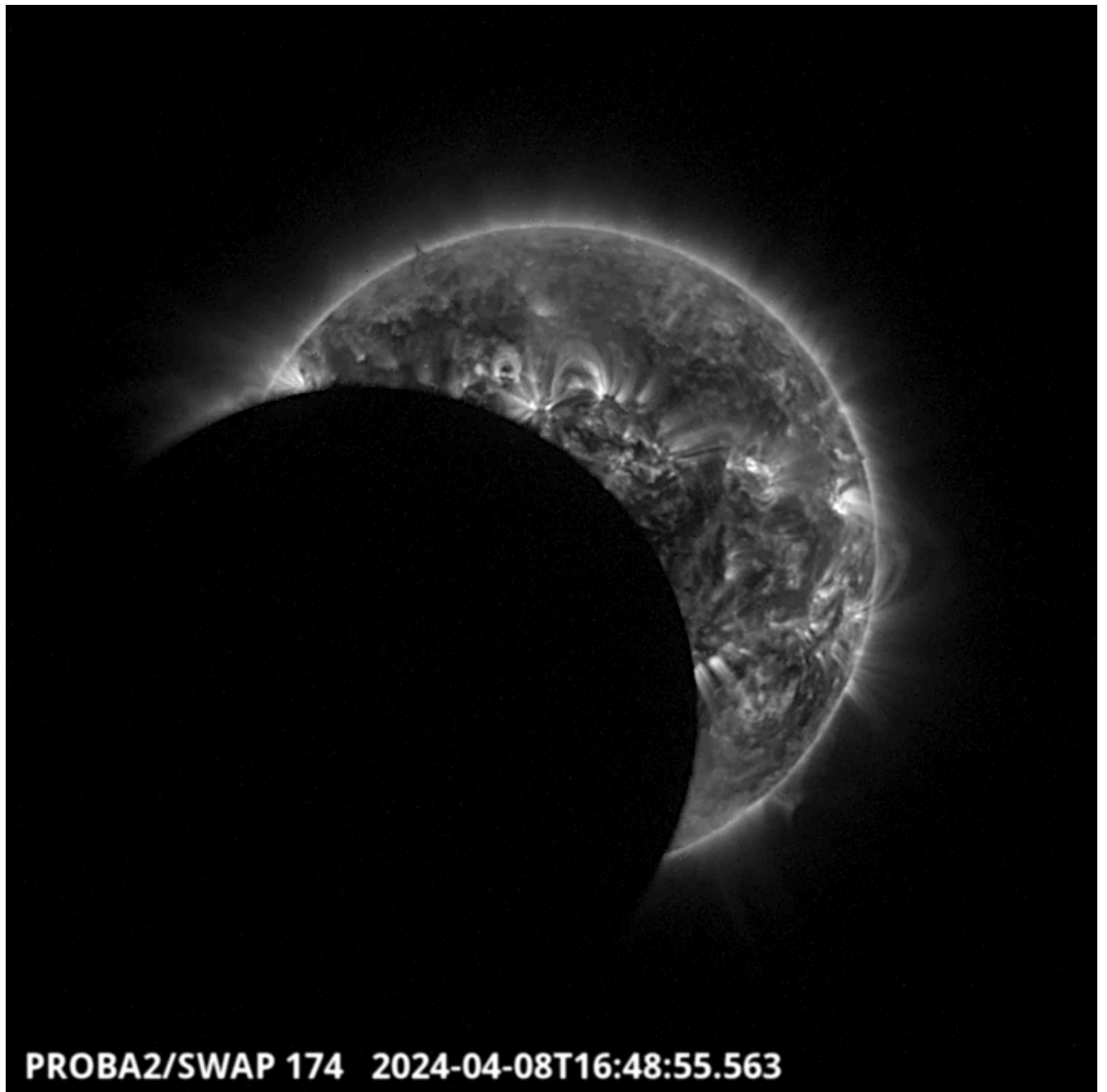
Monday Apr 08

LYRA Time Series (LV1)



Channels

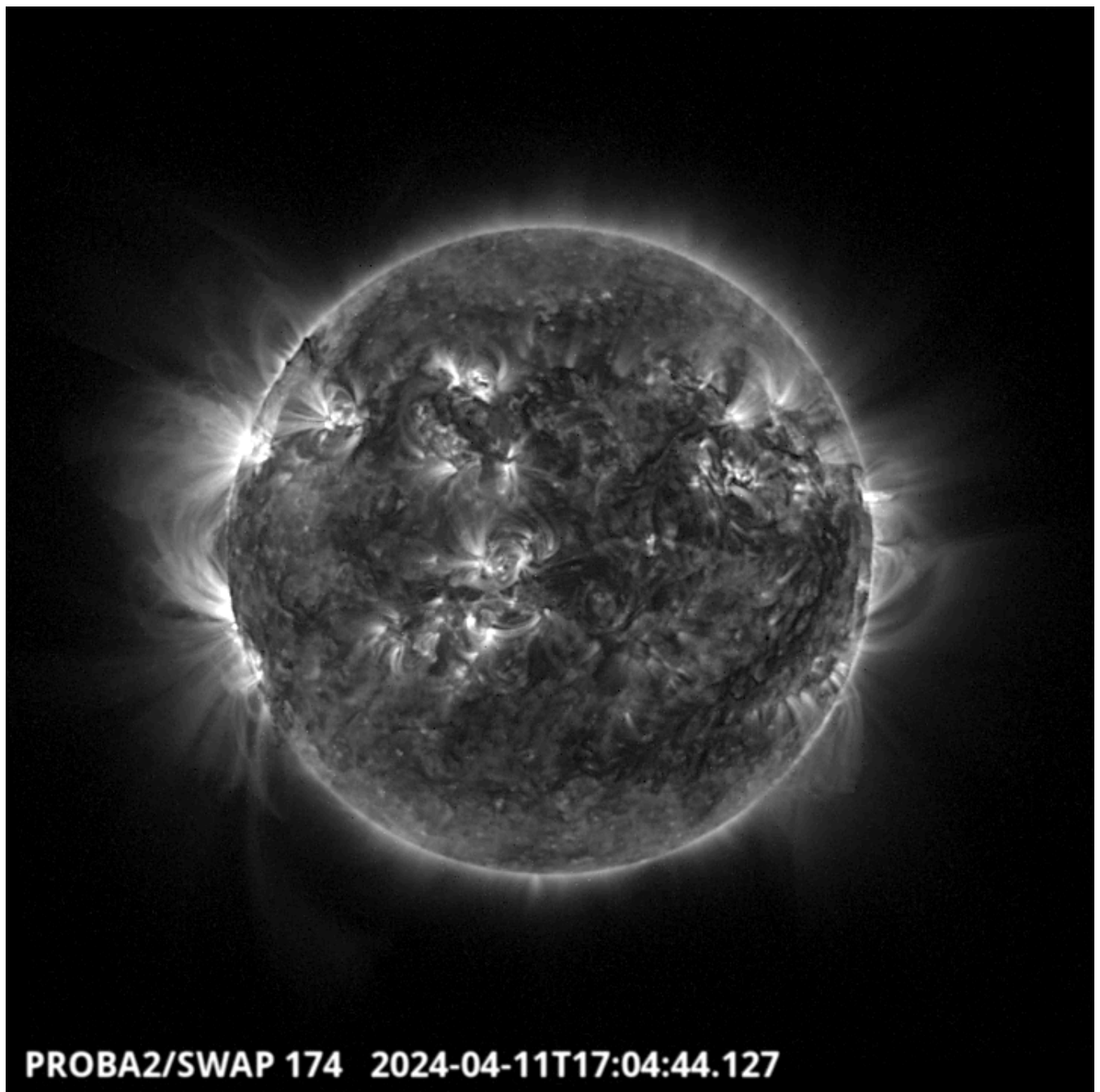
- Lyman Alpha (ch1)
 $y' = 0.00397 \cdot (y - 0)$
- Herzberg (ch2)
 $y' = 0.0125 \cdot (y - 0)$
- Aluminium (ch3)
 $y' = 0.0357 \cdot (y - 0)$
- Zirconium (ch4)
 $y' = 0.0196 \cdot (y - 0)$
- SWAP Avg. Intens. (lv1)



On April 8, there was a total eclipse visible from a big part of the American continent. From PROBA2, the eclipse was only partial. However, the spacecraft was crossing twice the eclipse zone: around 16:50 and 20:50 UT. LYRA curves show the irradiance drop caused by the occultation of the Sun by the Moon in each of its channels.

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

Thursday Apr 11



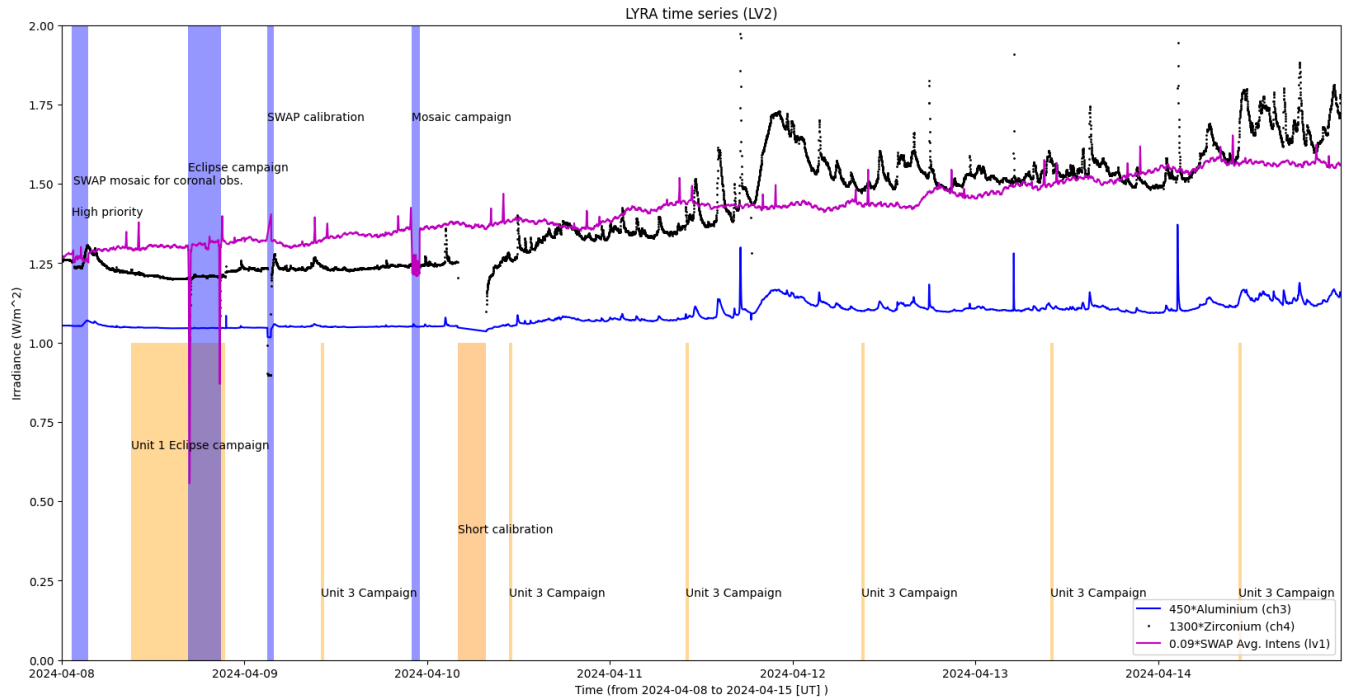
The strongest flare of this week is a M5.4. The source of the flare was just behind the Sun's northeastern limb.

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:

- High priority images, usual 110s cadence, 2024-Apr-08, between 01:15-01:30 UT
- SWAP mosaic for corona observation just before eclipse, 2024-Apr-08, between 01:30-03:30 UT
- High cadence (15s) eclipse campaign, 2024-Apr-08, between 16:36-17:02, 18:50-19:16:30, 20:34-20:55 UT
- Bi-weekly calibration, 2024-Apr-09
- Mosaic campaign, 2024-Apr-09

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

- Daily Unit 3 campaign, 2024-Apr-08
- Eclipse campaign, unit 1 open, 2024-Apr-08
- Daily Unit 3 campaign, 2024-Apr-09
- Short calibration, 2024-Apr-10
- Daily Unit 3 campaign, 2024-Apr-10
- Daily Unit 3 campaign, 2024-Apr-11
- Daily Unit 3 campaign, 2024-Apr-12
- Daily Unit 3 campaign, 2024-Apr-13
- Daily Unit 3 campaign, 2024-Apr-14

The red shaded periods related to other issues corresponds to:

- None

2. LYRA instrument status

IOS

Start IOS	Mon Apr 08 2024	LYIOS01072
End IOS	Sun Apr 14 2024	LYIOS01073

LYRA detector temperature

LYRA detector 2 temperature globally varied between 48.76 and 53.07 °C.

3. SWAP instrument status

MCPM errors

The number of MCPM recoverable errors increased from 55971 to 56467

The number of MCPM unrecoverable errors remained at 3135.

IOS

Start IOS	Mon Apr 08 2024	IOS01195
End IOS	Sun Apr 14 2024	IOS01196

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -0.65 and 0.31°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 46867 to 46929) 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 2024 Apr 08 00:00 UT and 2024 Apr 15 00:00 UT: 4646

Highest cadence in this period: 17 seconds

Average cadence in this period: 130.16 seconds

Number of image gaps larger than 300 seconds: 212

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)