


P2SC-ROB-WR-369 - 20170417 Weekly report #369	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Apr 17 to Sun Apr 23, 2017 24 Apr 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 activity<sup>1</sup> fluctuated between **very low** and **low** this week.

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

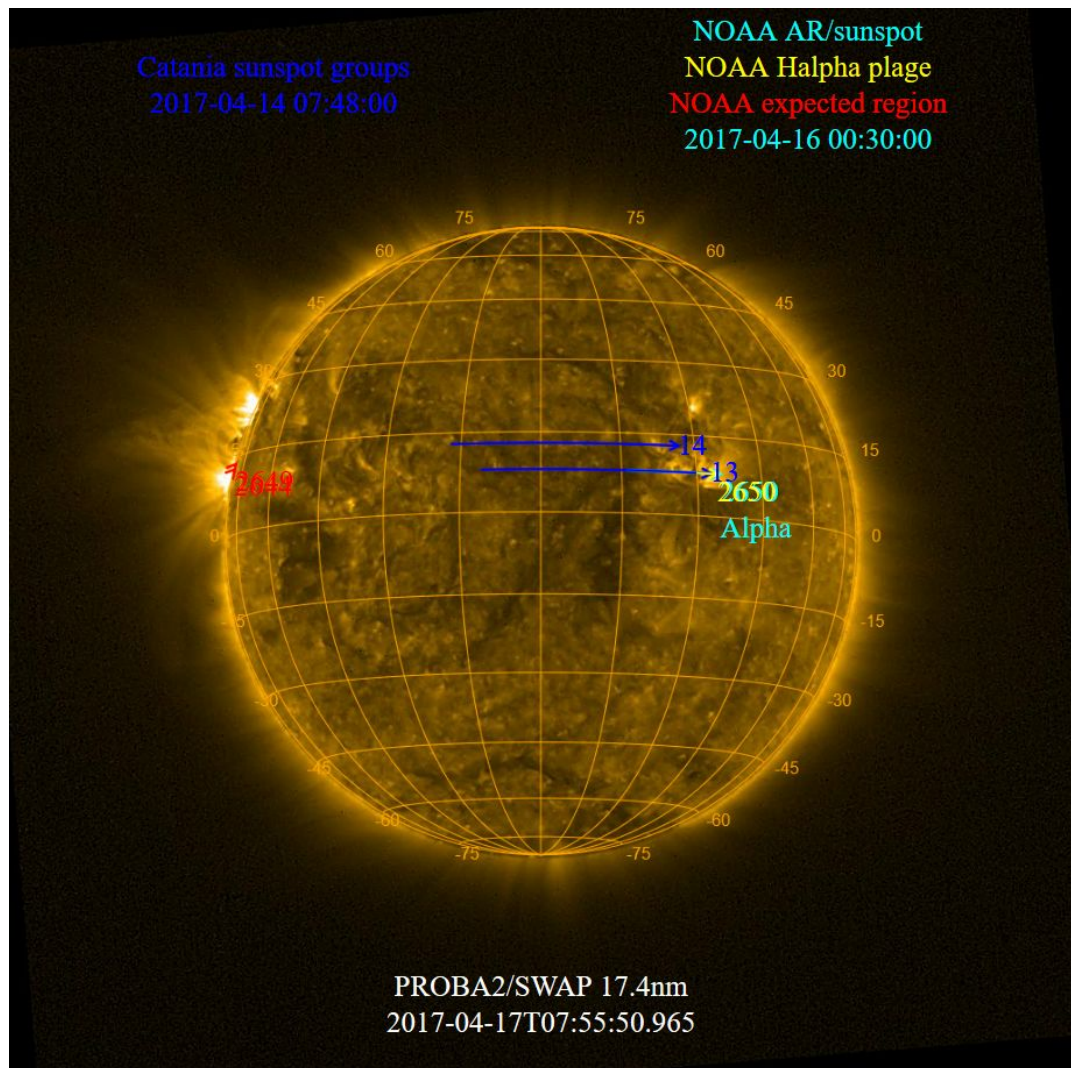
	Monday 17 Apr	Tuesday 18 Apr	Wednesday 19 Apr	Thursday 20 Apr	Friday 21 Apr	Saturday 22 Apr	Sunday 23 Apr
Activity	low	low	very low	very low	very low	very low	very low
Flares	-	-	-	-	-	-	-

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



The SWAP images of Apr 17 and Apr 23 are shown below, with annotated active regions.

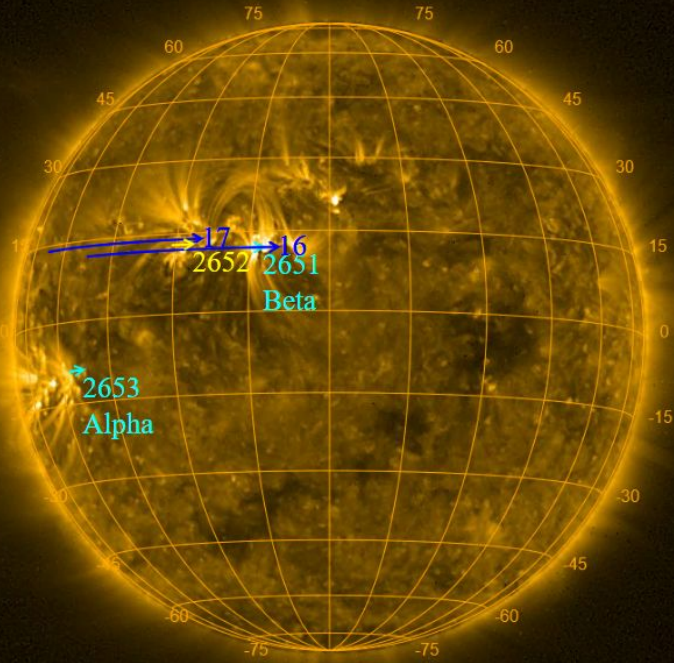


<http://sidc.be/soteria/soteria.php>



Catania sunspot groups  
2017-04-20 10:00:00

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2017-04-23 00:30:00



PROBA2/SWAP 17.4nm  
2017-04-23T07:58:16.979



## **Solar Activity**

Solar flare activity fluctuated between very low and 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 369).

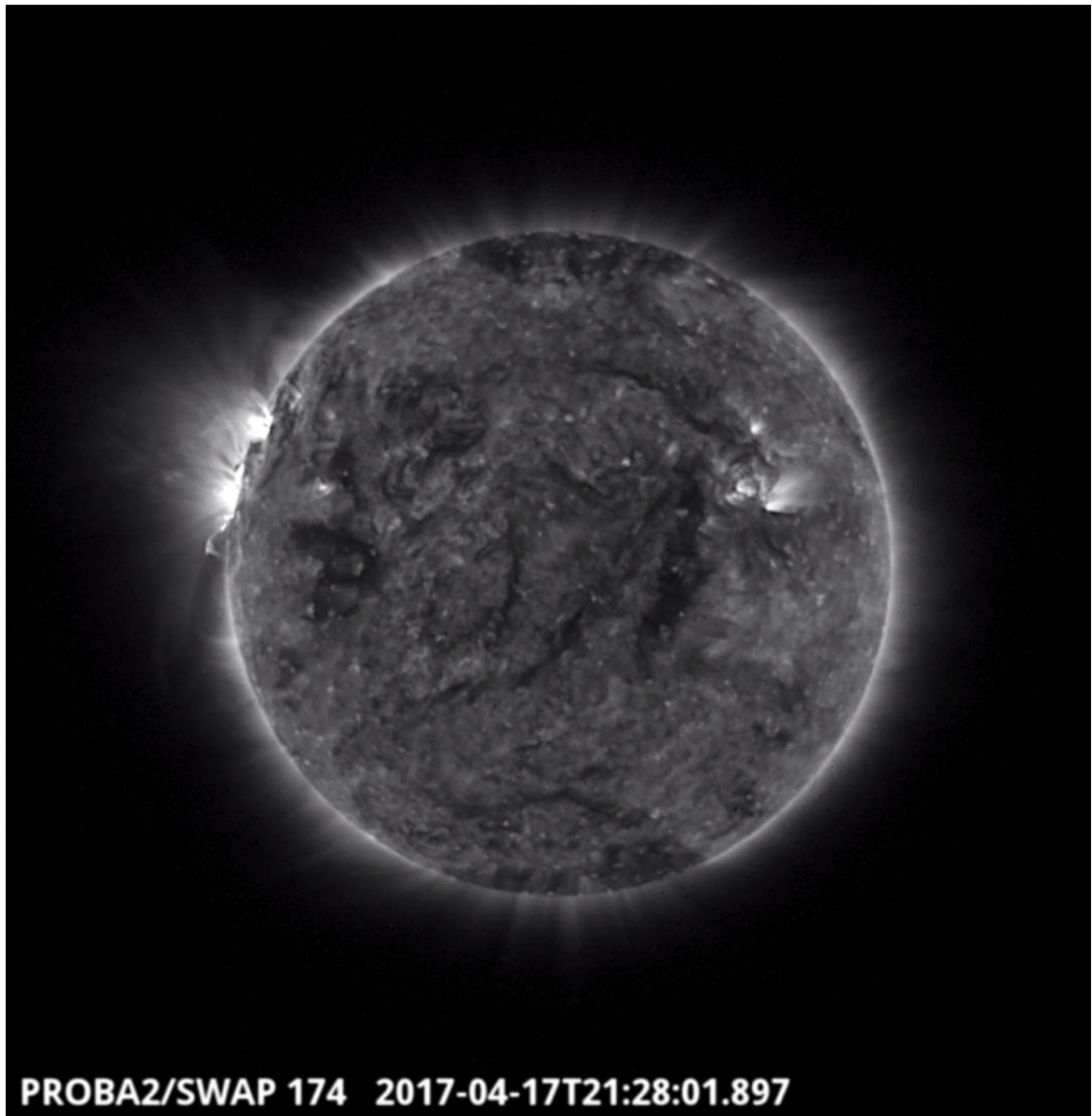
Details about some of this week's events, can be found further below.

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





Monday Apr 17

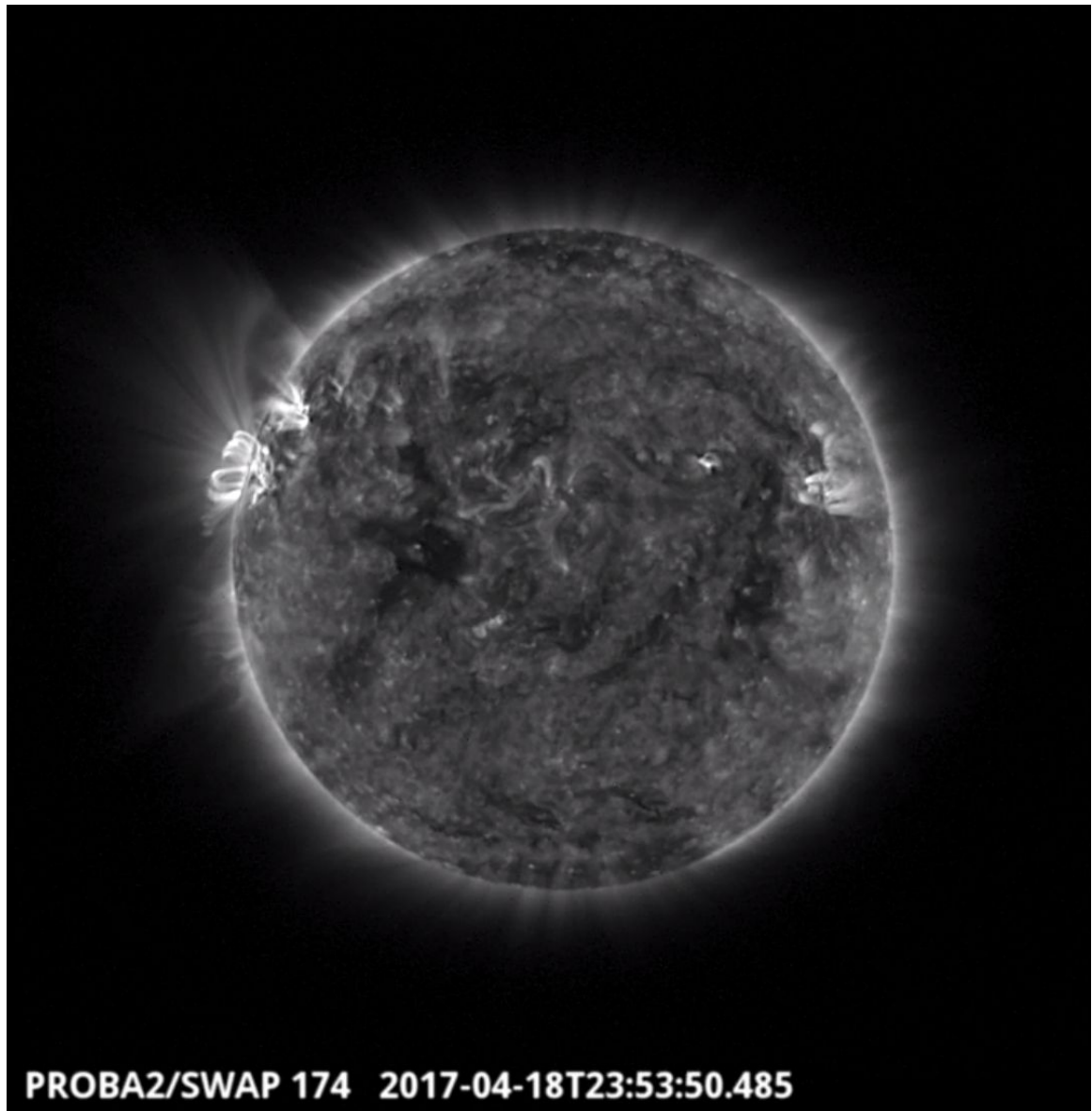


**Active region NOAA 2651 began to appear over the east limb of the Sun at the start of the week and was associated with multiple B- and C-class flares. SWAP observed an eruption associated with a B7.5 flare shown here on the east limb at 21:28 UT on 17-Apr-2017.**

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



Tuesday Apr 18



Two CMEs from active region NOAA 2651 occurred on 18-Apr-2017 towards the eastern limb of the Sun. The post eruptive flare loops associated with the second eruption are shown here at 23:53 UT.

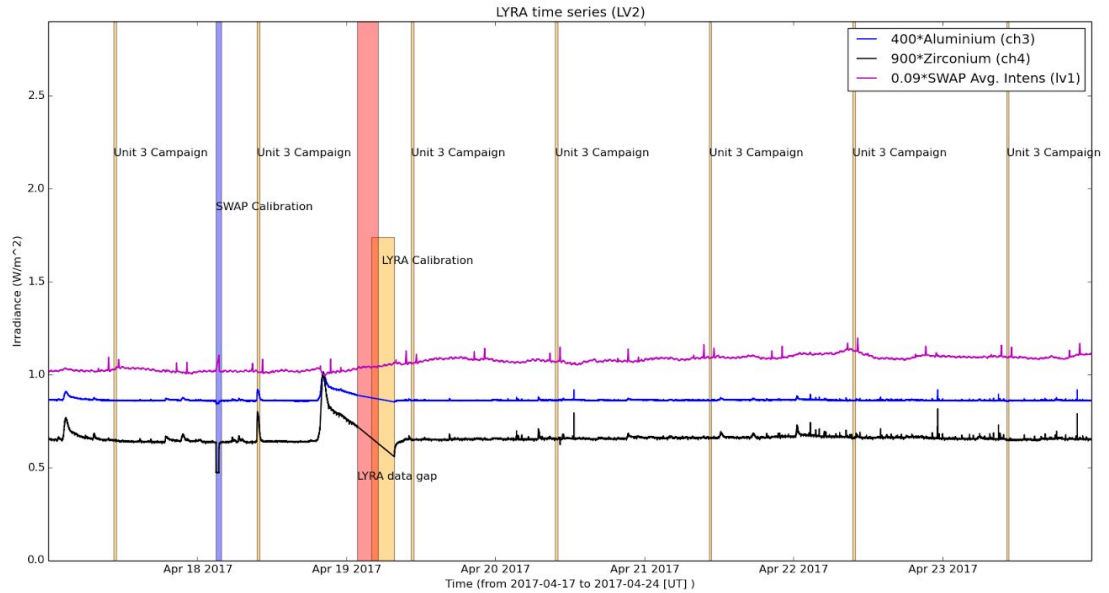
Find a movie of the event [here](#) (SWAP movie)



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 correspond to, from left to right:

- SWAP bi-weekly calibration, 2017-Apr-18

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

- Daily unit 3 campaign, 2017-Apr-17
- Daily unit 3 campaign, 2017-Apr-18
- LYRA bi-weekly Calibration, 2017-Apr-19
- Daily unit 3 campaign, 2017-Apr-19
- Daily unit 3 campaign, 2017-Apr-20
- Daily unit 3 campaign, 2017-Apr-21
- Daily unit 3 campaign, 2017-Apr-22
- Daily unit 3 campaign, 2017-Apr-23

The red shaded period corresponds to:

- LYRA data gap, 2017-Apr-19



## **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**

- Dr Miho Janvier visited between 19-Apr-2017 and 21-Apr-2017 to begin her work on her proposed topic of “The evolution of flux ropes and their accompanying filament/prominence during eruptive flares.”
- Dr Michael Kirk is visiting the PROBA2 Science Centre from 18-Apr-2017 to 01-May-2017 and is interested in “A Targeted Analysis of the Link Between Filament Eruptions, Lower Coronal EUV Features, and CMEs With PROBA2 SWAP.”





## 2. LYRA instrument status

### Calibration

Calibration campaign on Wednesday this week.

### IOS & operations

Monday 17 Apr	Tuesday 18 Apr	Wednesday 19 Apr	Thursday 20 Apr	Friday 21 Apr	Saturday 22 Apr	Sunday 23 Apr
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3 + calibration	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00612	LYIOS00612	LYIOS00613 LYIOS00614	LYIOS00614	LYIOS00614 LYIOS00615	LYIOS00615	LYIOS00615

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.77 and 49.44 °C.



### 3. SWAP instrument status

#### Calibration

Calibration campaign on Tuesday this week.

#### MCPM errors

The number of MCPM recoverable errors increased from 8552 to 8724.

The number of MCPM unrecoverable errors remained at 0.

#### IOS & operations

Monday 17 Apr	Tuesday 18 Apr	Wednesday 19 Apr	Thursday 20 Apr	Friday 21 Apr	Saturday 22 Apr	Sunday 23 Apr
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00700 579 images	IOS00700 607 images	IOS00700 647 images	IOS00700 693 images	IOS00700 688 images	IOS00700 694 images	IOS00700 684 images

Special operations for SWAP, this week:

- None

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.29 and -0.17 °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 23775 to 23838) 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 Apr 17 00:00 UT and 2017 Apr 24 00:00 UT: 4717

Highest cadence in this period: 30 seconds

Average cadence in this period: 128.22 seconds

Number of image gaps larger than 300 seconds: 136

Largest data gap: 16.50 minutes

### Data coverage LYRA

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

- BINLYRA\_23794\_RED3\_2017.04.19T05.28.31.tar was probably corrupted during the downlink. Currently the LYTMR software can't deal with this and resulted in a data gap between approximately 01:45 and 05:05 UT on 19-Apr-2017.





## 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)

