


P2SC-ROB-WR-137- 20121105 Weekly report #137	<b>P2SC Weekly report</b>	
Period covered: Date: Written by: Approved by:	Mon Nov 05 to Sun Nov 11, 2012 21 Nov 2012 Erik Pylyser David Berghmans	Royal Observatory of Belgium PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP Deputy PI, dan.seaton@sidc.be	<a href="http://proba2.sidc.be">http://proba2.sidc.be</a> ++ 32 (0) 2 373 0 559
cc:	ROB DIR, ronald@oma.be ESA Redu, Etienne.Tilmans@esa.int ESA D/SRE, Joe.Zender@esa.int ESA D/TEC, Stefano.Santandrea@esa.int	

## 1. Science

### Solar & Space weather events

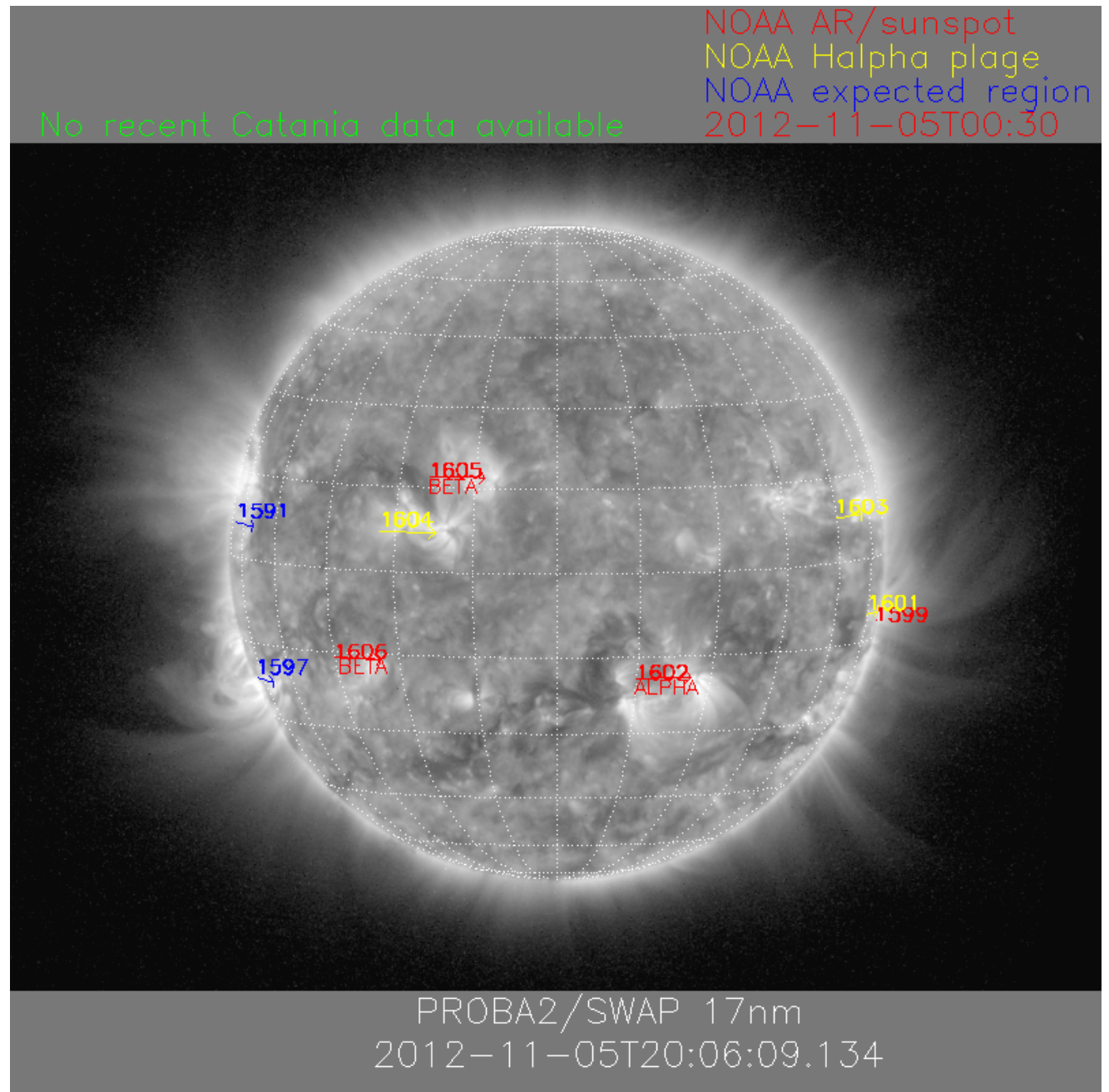
#### Overview

The level of solar activity<sup>1</sup> this week and associated M- and X-flares:

	Monday 05 Nov	Tuesday 06 Nov	Wednesday 07 Nov	Thursday 08 Nov	Friday 09 Nov	Saturday 10 Nov	Sunday 11 Nov
Activity	low	very low	very low	moderate	low	low	moderate
Flares		-	-	M1.7@02:08	-	-	M1.0@02:11

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

The SWAP images of Nov 05 and Nov 11 are shown below, with annotated active regions.

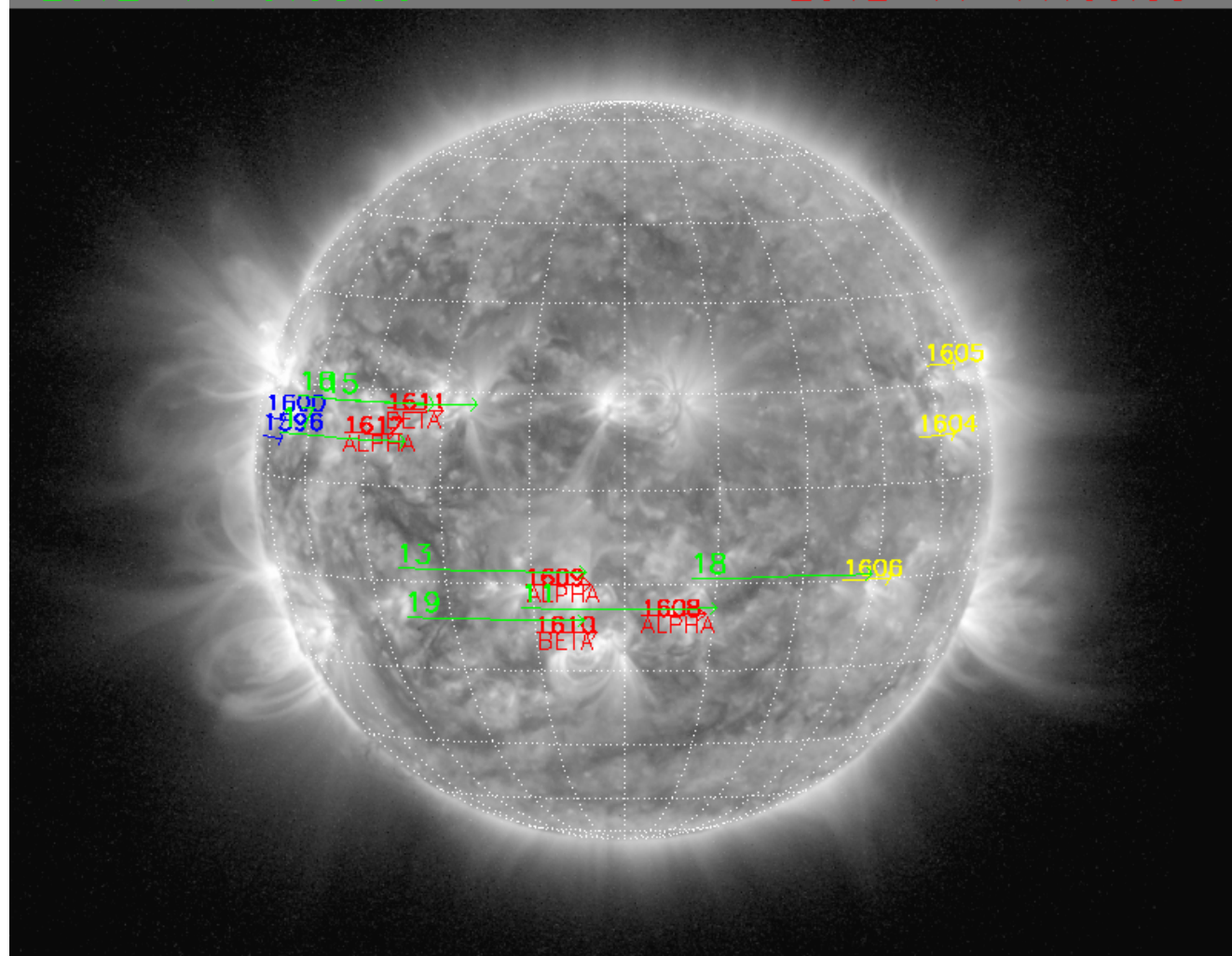


<http://sidc.be/html/CmapPage.html>

Catania sunspot groups

2012-11-9T08:30

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2012-11-11T00:30

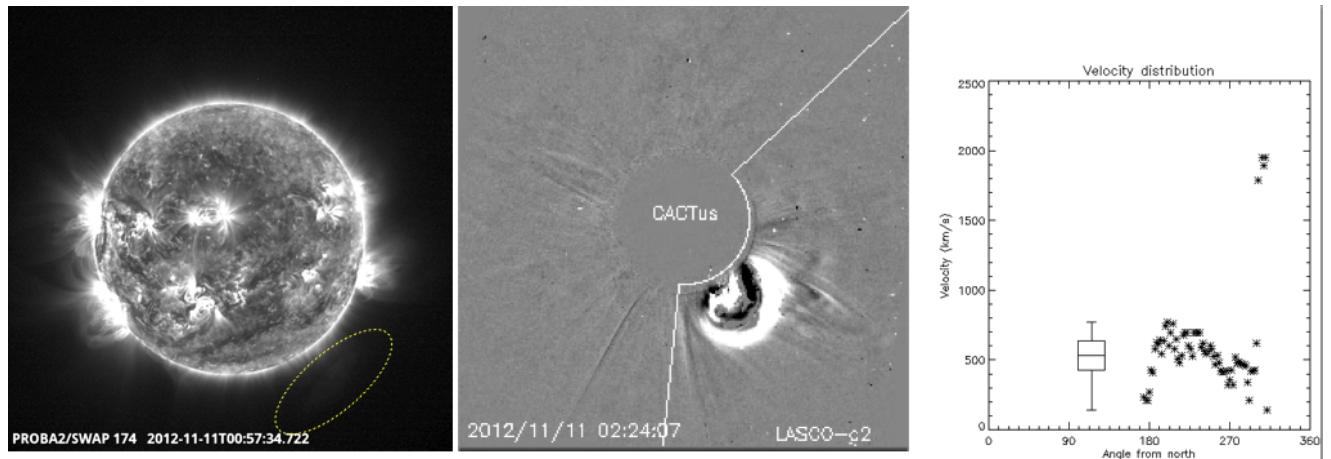


PROBA2/SWAP 17nm  
2012-11-11T19:54:43.833

## Solar Activity

This week, solar activity went through \*low\*, \*very low\* and \*moderate levels\*. Two low level M flares occurred on Thursday and on Sunday.

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.



An interesting off-limb eruption occurred early Nov 11. The (back-sided) eruption was seen developing by SWAP in perhaps 20 images and was visible up till the edge of the SWAP field of view. Also CACTus detected the event well. For all these reasons, the event would be a good candidate for testing CME detection in SWAP images.

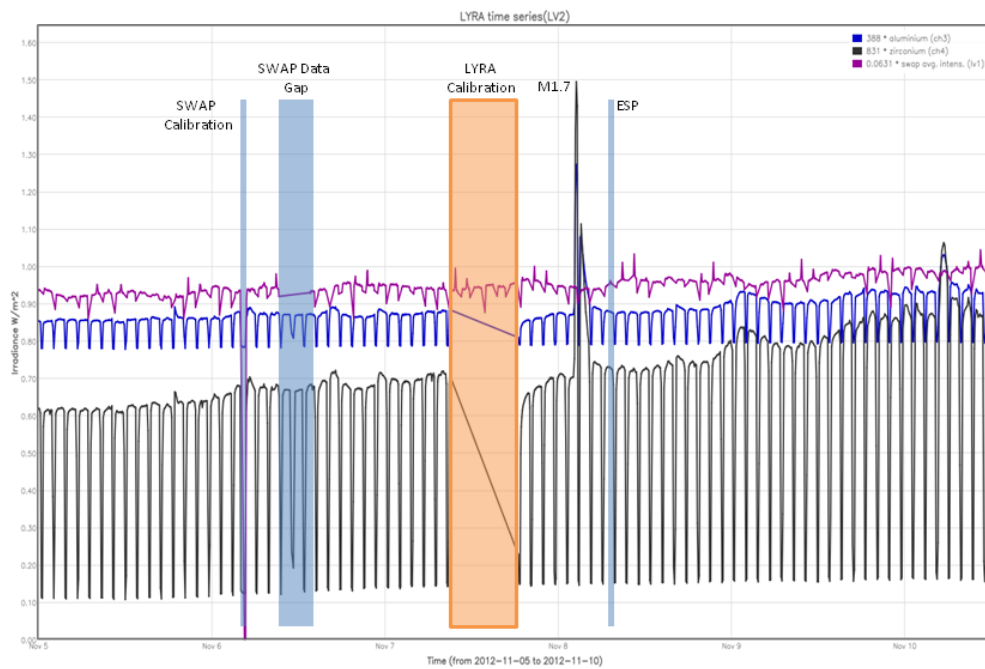
An overview of the weekly LYRA & SWAP data is provided below:

The following curves are visible:

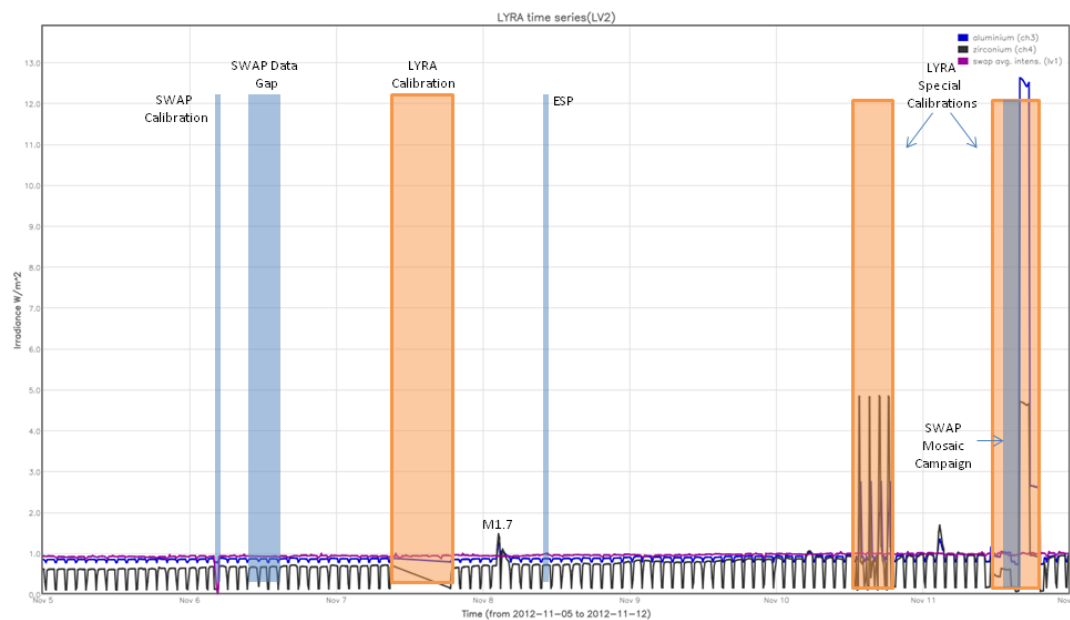
- black: Zirconium Channel LYRA Unit 2
- blue: Aluminium Channel of LYRA Unit 2
- purple: WAVINT (solar intensity derived from 'integrated' SWAP images)

Due to a (temporary) malfunction in the processing of special calibration data (i.e. the special calibrations executed on Saturday and Sunday), the usual data overview contains also calibration data (see figure 2). Therefore, the overview is being presented in two separate figures:

- figure one in the usual way (only until Saturday noon only and presenting pure science data) and
- figure two presenting the complete week overview including the calibration data (for info only).



**Figure 1: From Monday to Saturday noon**



**Figure 2: Full week overview (containing - erroneously - calibration data)**

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

- SWAP calibration on Tuesday
- SWAP data gap on Tuesday
- ESP experiment on Thursday
- mosaic campaign on Sunday 11th of November

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

- LYRA standard calibration on Tuesday
- LYRA special calibration on Saturday
- LYRA special calibration on Sunday

The red shaded period corresponds to:

- None

### **Outreach, papers, presentations, etc.**

During this week, the European Space Weather Week 9 took place.

The PROBA2 team organised a splinter session:

PROBA2 LYRA/SWAP - Status of the instruments and scientific achievements after three years in orbit, M. Dominique, D. Berghmans

#### Posters presented:

‘Space Situational Awareness Services offered by PROBA2’

Bonte, Katrien; Dammasch, Ingolf; Verstringe, Freek; Berghmans, David; De Groof, Anik; Dominique, Marie; Kretzschmar, Matthieu; Nicula, Bogdan; Pylyser, Erik; Seaton, Dan; Stegen, Koen

‘Initiation Mechanisms for coronal mass ejections without distinct coronal signatures’

D’Huys, Elke; Seaton, Dan; Poedts, Stefaan; Bonte, Katrien; Berghmans, David

‘Space Weather and Particle Effects on the Orbital Environment of PROBA2’

Seaton, Daniel; Dominique, Marie; Berghmans, David; Nicula, Bogdan; Pylyser, Erik; Stegen, Koen; De Keyser, Johan

‘Status of Degradation Onboard PROBA2’

Dominique, Marie; Seaton, Dan; Dammasch, Ingolf; BenMoussa, Ali; Stegen, Koen; Pylyser, Erik

Please also 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.

### **Guest Investigator Programme**

- None

## 2. LYRA instrument status

### Calibration

Bi-weekly calibration on Wednesday.

Two specific calibration campaigns were performed on Saturday and Sunday (see below).

### IOS & operations

Monday 05 Nov	Tuesday 06 Nov	Wednesday 07 Nov	Thursday 08 Nov	Friday 09 Nov	Saturday 10 Nov	Sunday 11 Nov
Nominal acquisition + daily U3  LYIOS00280	Nominal acquisition + daily U3  LYIOS00281	Nominal acquisition + daily U3 + standard calibration  LYIOS00281 -> 282	Nominal acquisition + daily U3  LYIOS00282	Nominal acquisition + daily U3  LYIOS00282	Nominal acquisition+ daily U3 + special calibration  LYIOS00282 - > 283	Nominal acquisition+ daily U3 + special calibration  LYIOS00283

- Except for the daily U3 campaign, no particular science campaigns this week. This campaign was not executed on Sunday (due to a special calibration campaign).

- There were 3 calibrations performed this week:

- standard (bi-weekly) calibration on Wednesday Nov 7th
- special calibration on Saturday Nov 10th
- special calibration on Sunday Nov 11th

Part of the data of the bi-weekly calibration was lost in pass 9402 (see section 5 below).

### LYRA detector temperature

LYRA detector 2 temperature fluctuated between 50.8 and 44.5 degrees under nominal operations, including the daily U3 activation periods. The latter results in a temperature increase of about 0.4 degrees.

The special calibration campaigns resulted in temperatures down to 43.2 degrees C.

### To be explored

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### 3. SWAP instrument status

#### Calibration

Calibration performed on Tuesday.

#### MCPM errors

The number of MCPM recoverable errors increased from 4772 to 5002.

The number of MCPM unrecoverable errors remained at 1127.

#### IOS & operations

Monday 05 Nov	Tuesday 06 Nov	Wednesday 07 Nov	Thursday 08 Nov	Friday 09 Nov	Saturday 10 Nov	Sunday 11 Nov
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition	Nominal acquisition + ESP	Nominal acquisition	Nominal acquisition	Nominal acquisition + mosaic
IOS00422 527 images	IOS00422 581 images	IOS00423 587 images	IOS00423 583 images	IOS00423 584 images	IOS00423 596 images	IOS00424 556 images

Special operations for SWAP, this week:

- Occultation jumps, every orbit
- ESP jump on Thursday
- mosaic campaign on Sunday 11th of November

#### SWAP detector temperature

The SWAP Cold Finger Temperature, under nominal operations, increased generally, fluctuating between 0.4 and 2.9 degrees Celsius.

LAR delays were missed on the following occasions:

- None
- causing each time a temporary increase of temperature of an estimated 0.6-0.7 degrees.

#### To be explored

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## 4. PROBA2 Science Center Status

The main operator is Koen Stegen.

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 9390 to 9448) was nominal, except for:

- Pass 9402 - HK, SWAP, LYRA data lost
- Pass 9422 - data re-extracted by REDU and received by P2SC.
- Pass 9432, 9433, 9434, 9435: data received a day later by P2SC.

### Data coverage HK

All HK data files (LYRA\_AD) have been received, except for:

- Pass 9402 data

### Data coverage SWAP

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

- Pass 9402 data

Total number of images between 2012 Nov 05 0UT and 2012 Nov 12 0UT: 4016

Highest cadence in this period: 30 seconds

Average cadence in this period: 150.61 seconds

Number of image gaps larger than 300 seconds: 122

Largest data gap: 34.65 minutes

The large gap is due to the ESP experiment on Thursday.

The number of (smaller) gaps is due to the implementation of the SWAP occultation jumps.

### Data coverage LYRA

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

- Pass 9402 data

## 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
EIT	Extreme ultraviolet Imaging Telescope
FITS	Flexible Image Transport System
FOV	Field Of View FPA Focal Plane Assembly
FPGA	Field Programmable Gate Arrays
GPS	Global Positioning System
HAS	High Accuracy Star tracker
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)
MCMPM	Mass Memory, Compression and Packetisation Module
MOC	Mission Operation Center
NDR	Non Destructive Readout
OBET	On board Elapsed Time
OBSW	On board Software
PE	Proximity Electronics
PI	Principal Investigator
P2SC	PROBA2 Science Center
ROB	Royal Observatory of Belgium
SAA	South Atlantic Anomaly
SEU	Single Event Upset
SOHO	Solar and Heliospheric Observatory
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

## **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)
- (+ extreme?)