


P2SC-ROB-WR-297 - 20151130 Weekly report #297	<b>P2SC Weekly report</b>	
Period covered: Date:  Written by: Approved by:	Mon Nov 30 to Sun Dec 06, 2015 09 Dec 2015  Katrien Bonte Matthew West	Royal Observatory of Belgium  - PROBA2 Science Center
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## 1. Science

### Solar & Space weather events

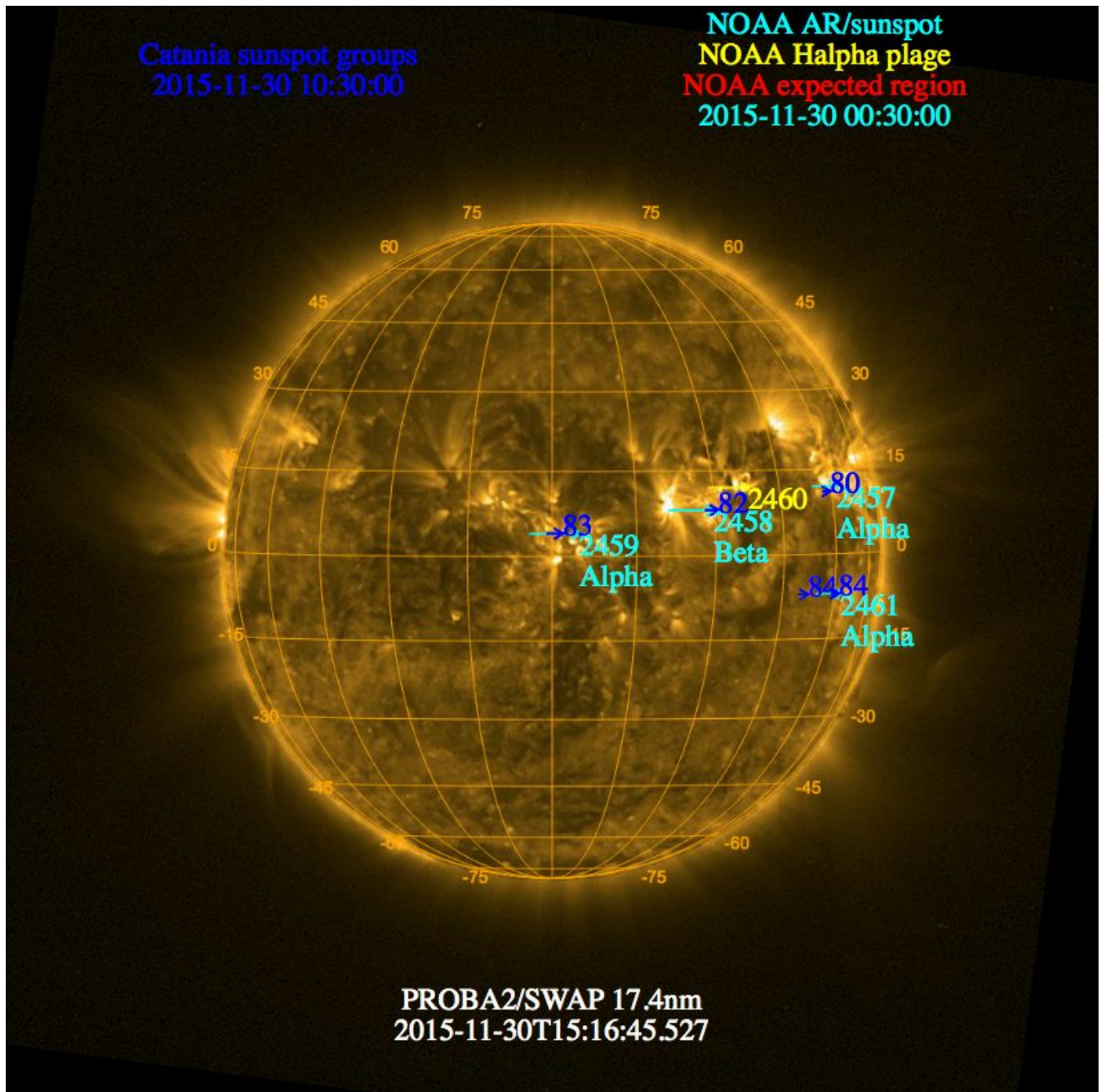
The level of solar activity<sup>1</sup> was **low** this week.

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

	Monday 30 Nov	Tuesday 01 Dec	Wednesday 02 Dec	Thursday 03 Dec	Friday 04 Dec	Saturday 05 Dec	Sunday 06 Dec
Activity	low	low	low	low	low	low	low
Flares	-	-	-	-	-	-	-

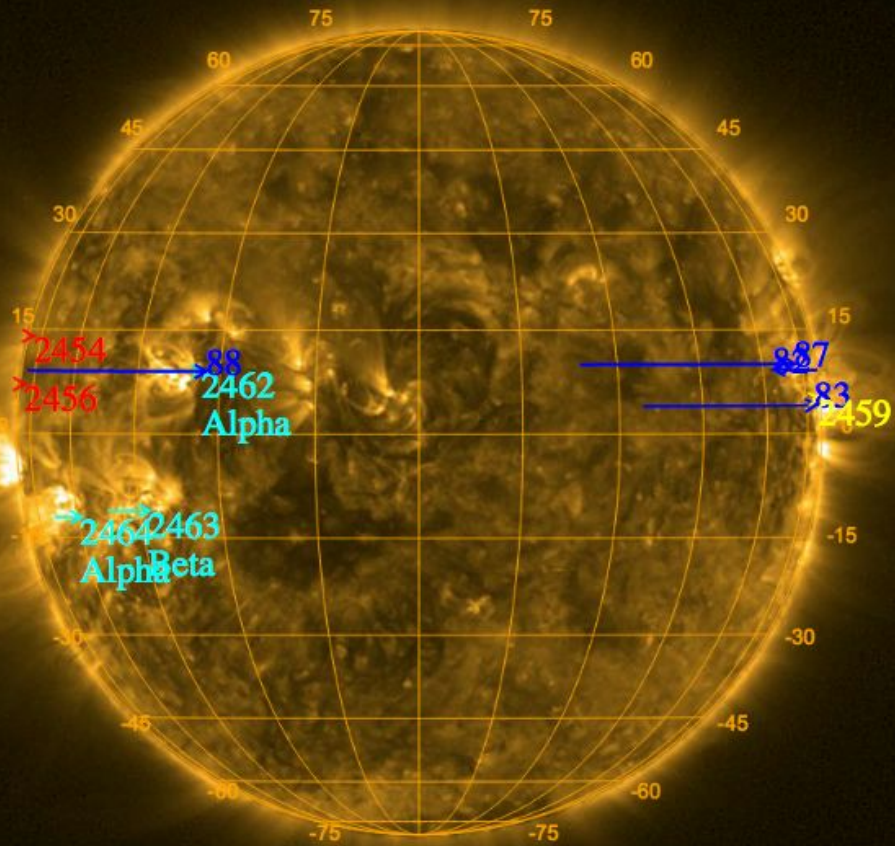
<sup>1</sup> See appendix. All timings are given in UT.

SWAP images from Nov 30 and Dec 06 are shown below, with annotated active regions.



Catania sunspot groups  
2015-12-03 09:00:00

NOAA AR/sunspot  
NOAA Halpha plage  
NOAA expected region  
2015-12-06 00:30:00



PROBA2/SWAP 17.4nm  
2015-12-06T15:18:12.746



## Solar Activity

Solar flare activity was low this 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 297).

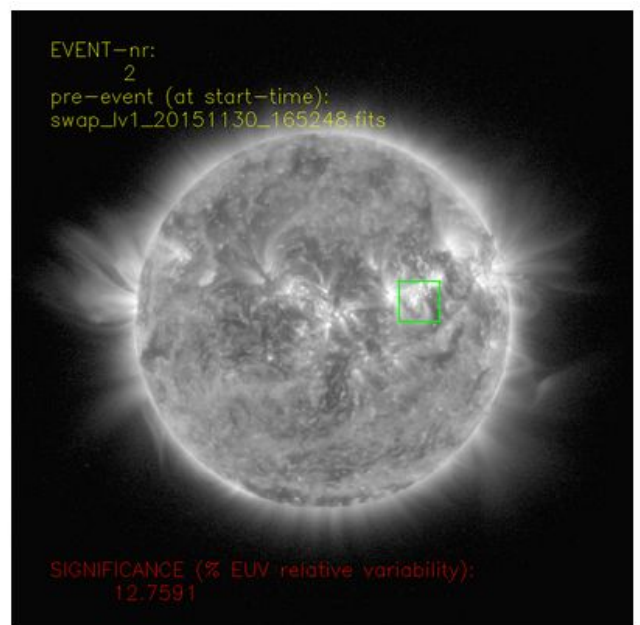
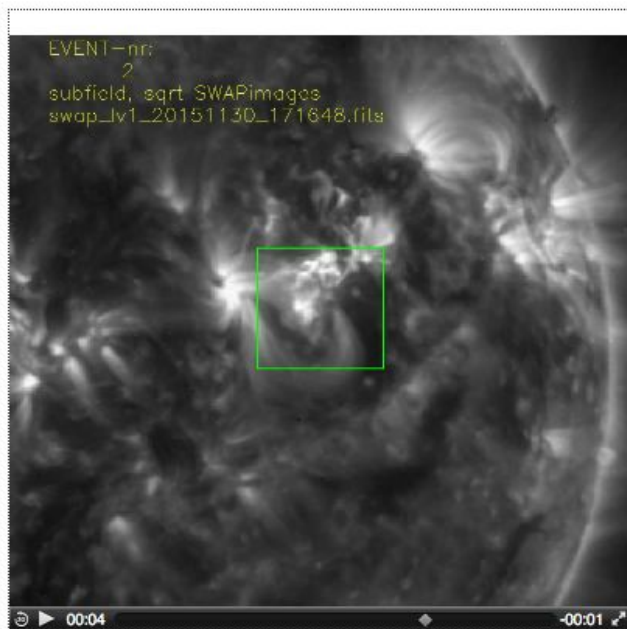
The week's activity was dominated by two Active Regions. At the beginning of the week, AR 2458 produced a series of C-class flares until it disappeared behind the West limb. In the second half of the week, AR 2463 was most active, also producing a series C-class flares.

Below we provide SWAP images showing some nice examples of C-class flares from the active regions mentioned above. The annotated snapshots are produced by the Solar Feature Automated Search Tool (SoFAST). This tool detects dynamic solar events in EUV images from SWAP in near real-time. The snapshots illustrate the location of the flare on the solar disk (right) and a zoomed image (left).

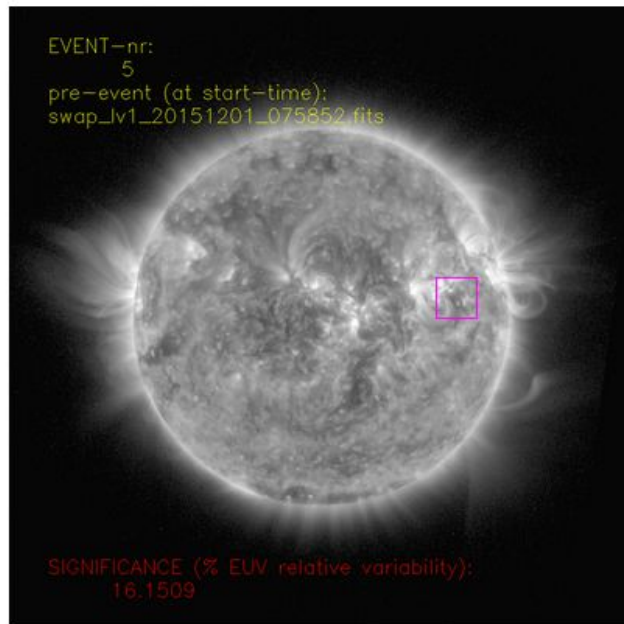
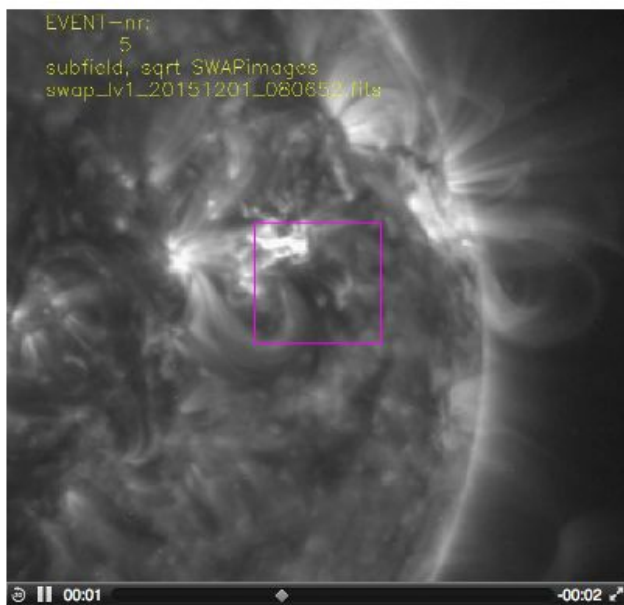
The complete SoFAST online event list and additional plots are available at: <http://www.sidc.be/sofast>.

2015-Nov-30, AR 2458:

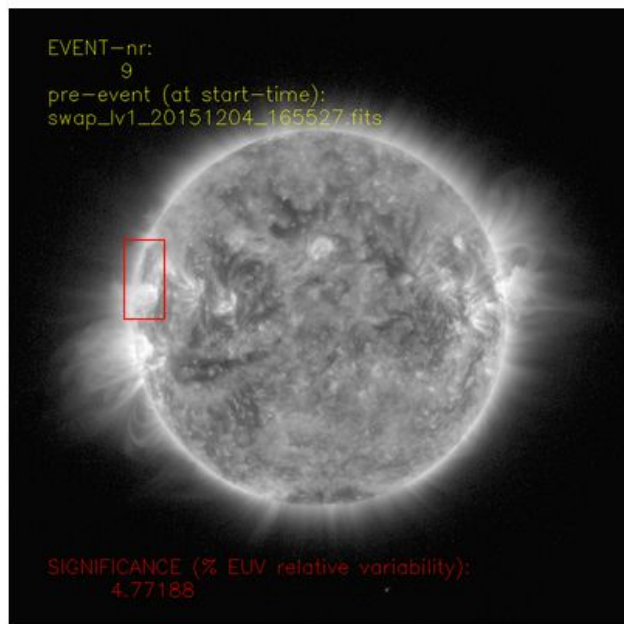
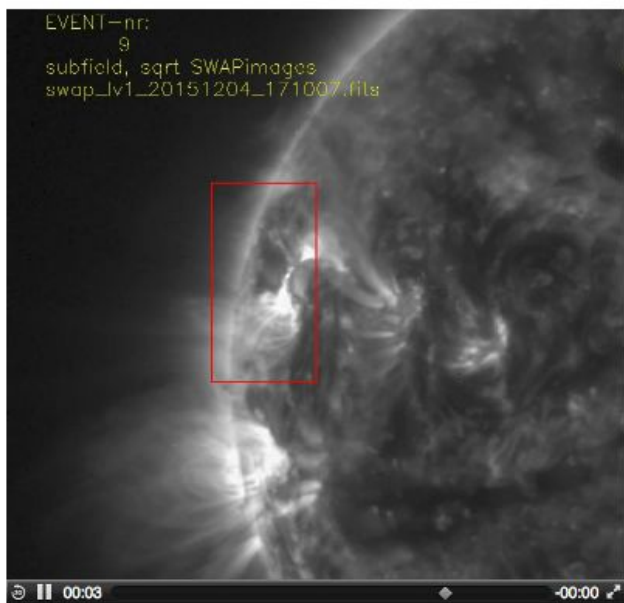
**C1.0 peaking around 17:06 UT**



2015-Dec-01, AR 2458:  
**C3.6 peaking around 08:10 UT**



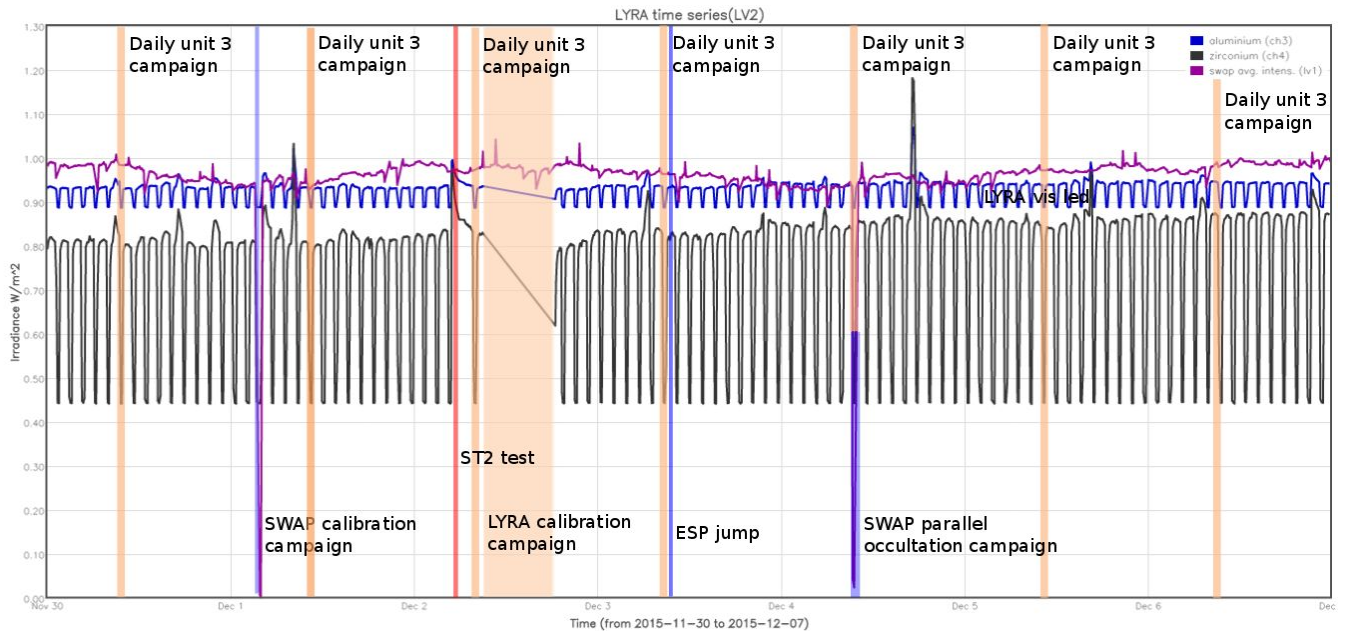
2015-Dec-04, AR 2463:  
**C4.0 peaking around 17:10 UT**



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 on 2015-Dec-01
- SWAP monthly ESP experiment on 2015-Dec-03
- SWAP/LYRA parallel occultation campaign on 2015-Dec-04

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

- LYRA daily unit 3 occultation campaign on 2015-Nov-30
- LYRA daily unit 3 occultation campaign on 2015-Dec-01
- LYRA daily unit 3 occultation campaign on 2015-Dec-02
- LYRA long calibration on 2015-Dec-02
- LYRA daily unit 3 occultation campaign on 2015-Dec-03
- LYRA daily unit 3 occultation campaign on 2015-Dec-04
- LYRA daily unit 3 occultation campaign on 2015-Dec-05
- LYRA daily unit 3 occultation campaign on 2015-Dec-06

The red shaded period corresponds to:

- SWAP and LYRA datagap due to Star Tracker 2 test (both instruments were commanded to IDLE mode)

### **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**

- P. Bryans continued his research at the Royal Observatory of Belgium, using SWAP data: “Studying the Origins of the Fast Solar Wind.”

## 2. LYRA instrument status

### Calibration

Calibration campaign on Wednesday this week.

### IOS & operations

Monday 30 Nov	Tuesday 01 Dec	Wednesday 02 Dec	Thursday 03 Dec	Friday 04 Dec	Saturday 05 Dec	Sunday 06 Dec
Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + IDLE+ daily U3 + calibration	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3	Nominal acquisition + daily U3
LYIOS00512	LYIOS00513	LYIOS00513	LYIOS00513	LYIOS00514	LYIOS00514	LYIOS00514

Special operations for LYRA this week:

- daily U3 observation campaigns
- IDLE mode for ST2 test on 2015-Dec-02
- long calibration on 2015-Dec-02

### LYRA detector temperature

LYRA detector 2 temperature globally varied between 39.74 and 43.11 °C.



### 3. SWAP instrument status

#### Calibration

Calibration campaign on Tuesday this week.

#### MCPM errors

The number of MCPM recoverable errors increased from 1054 to 1058.

The number of MCPM unrecoverable errors remained at 0.

#### IOS & operations

Monday 30 Nov	Tuesday 01 Dec	Wednesday 02 Dec	Thursday 03 Dec	Friday 04 Dec	Saturday 05 Dec	Sunday 06 Dec
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition + IDLE	Nominal acquisition + ESP jump	Nominal acquisition + occultation campaign	Nominal acquisition	Nominal acquisition
IOS00610 677 images	IOS00611 759 images	IOS00611 692 images	IOS00611 654 images	IOS00612 755 images	IOS00612 678 images	IOS00612 694 images

Special operations for SWAP this week:

- bi-weekly calibration on 2015-12-01
- IDLE mode for ST2 test on 2015-12-02
- monthly ESP experiment on 2015-12-03
- parallel occultation campaign on 2015-12-04

#### SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -5.6 and -2.33 °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 19141 to 19206) 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 2015 Nov 30 0UT and 2015 Dec 07 0UT: 4909

Highest cadence in this period: 0 seconds

Average cadence in this period: 123.22 seconds

Number of image gaps larger than 300 seconds: 105

Largest data gap: 36.88 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
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)