P2SC-ROB-WR-109- 20120423 Weekly report #109	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Apr 23 to Sun Apr 29, 2012 02 May 2012 P2SC team David Berghmans	Royal Observatory of Belgium PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP Deputy PI, dan.seaton@sidc.be	http://proba2.sidc.be ++ 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

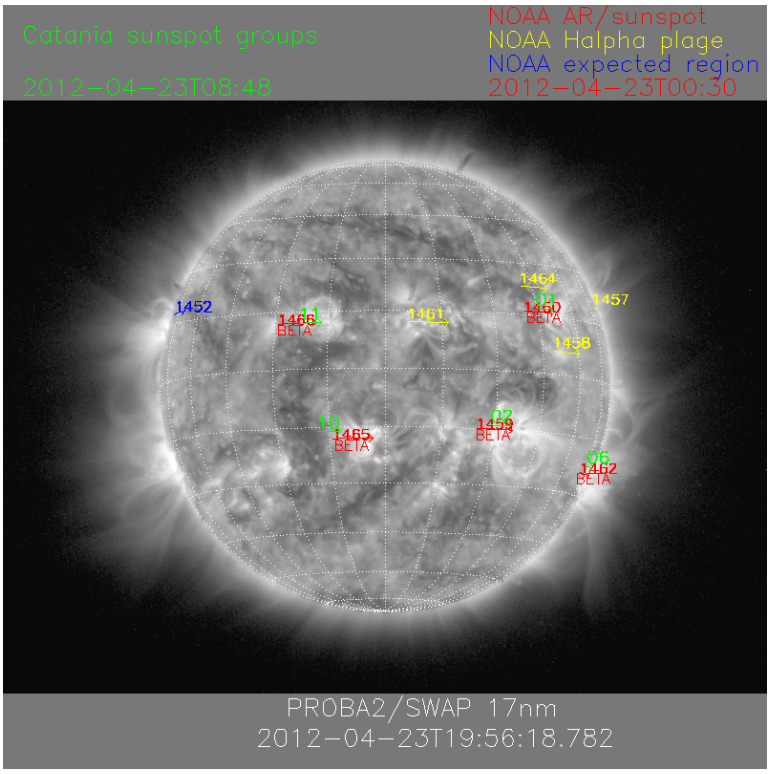
Overview

The level of solar activity this week[1] and associated M- and X-flares (if any):

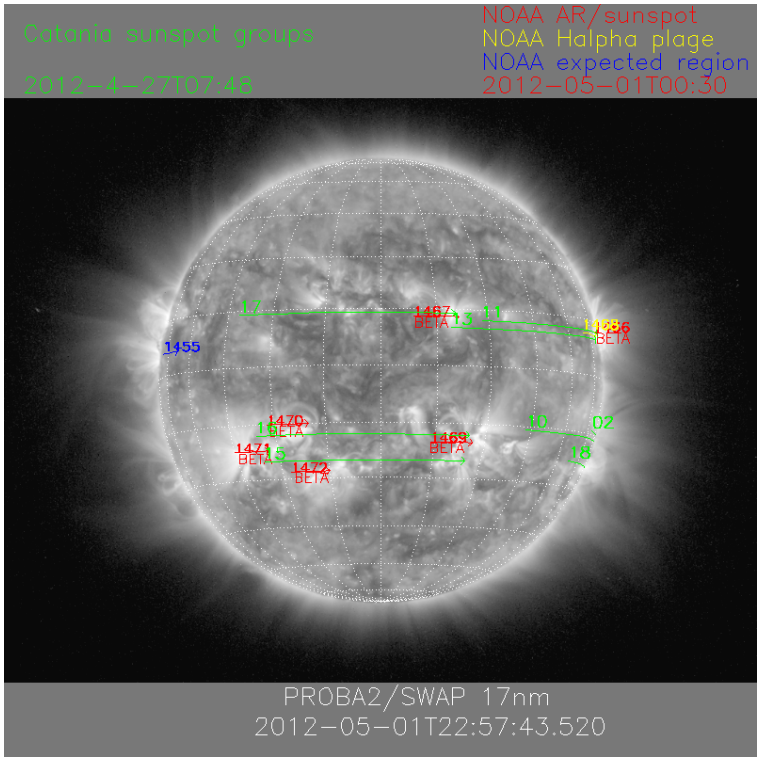
	Monday 23 Apr	Tuesday 24 Apr	Wednesday 25 Apr	Thursday 26 Apr	Friday 27 Apr	Saturday 28 Apr	Sunday 29 Apr
Flaring activity	several C-flares	several C-flares	several C-flares	several C-flares	1 M-flare, several C-flares	several C-flares	several C-flares

[1] See appendix.

The SWAP images of Apr 23 and May 1 are shown below, with annotated active regions.

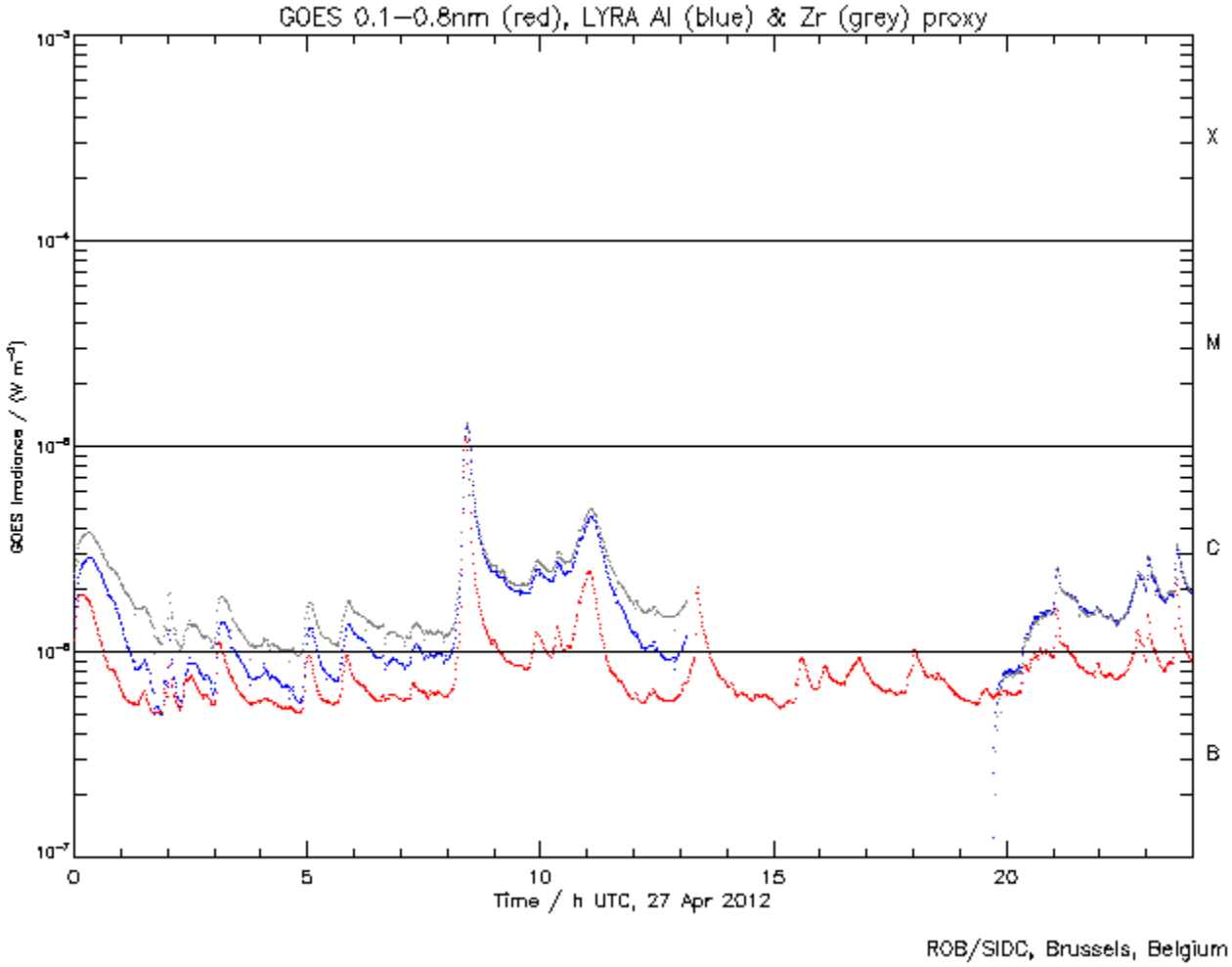


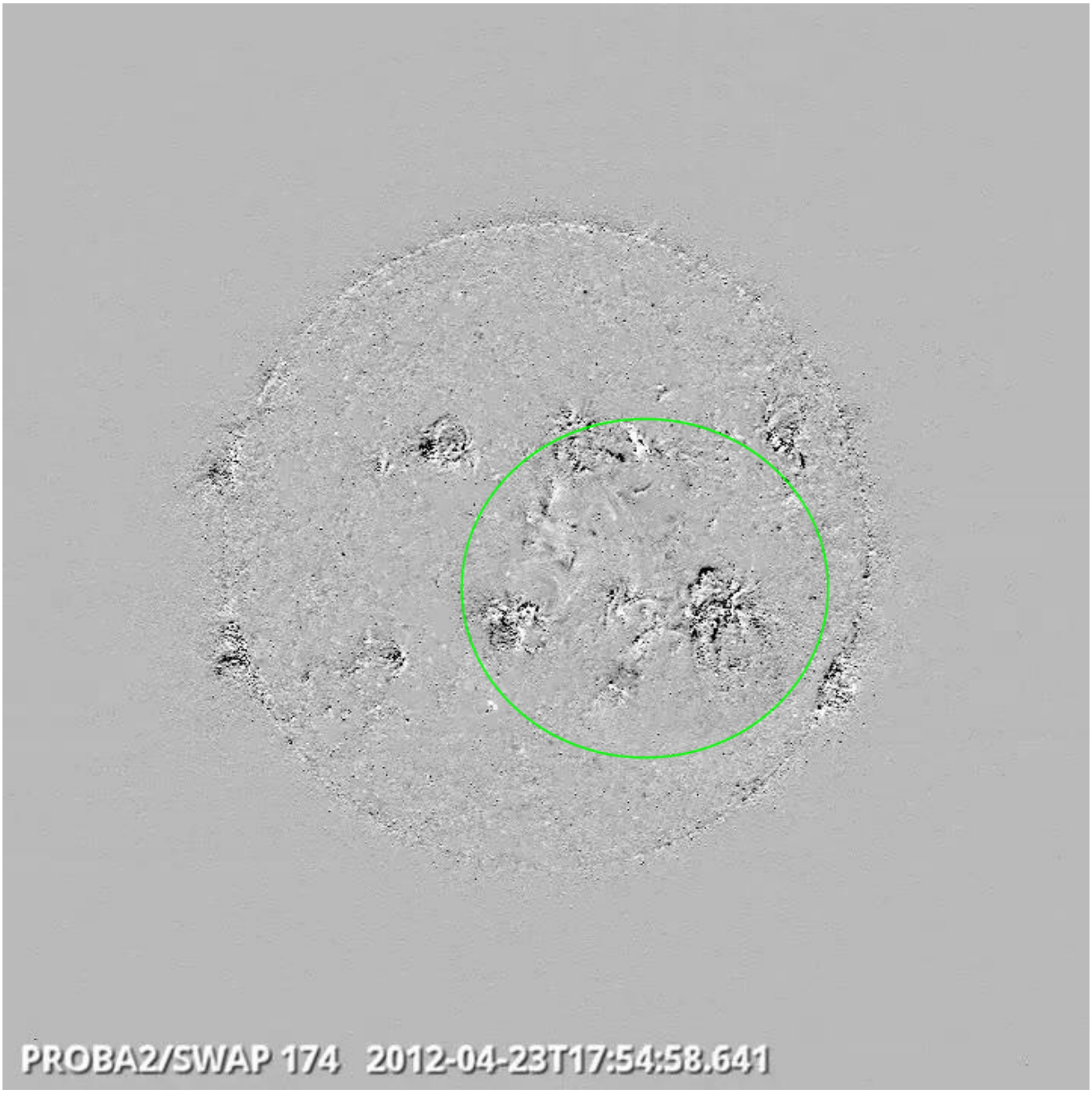
http://sidc.be/html/CmapPage.html



Several interesting phenomena occurred:

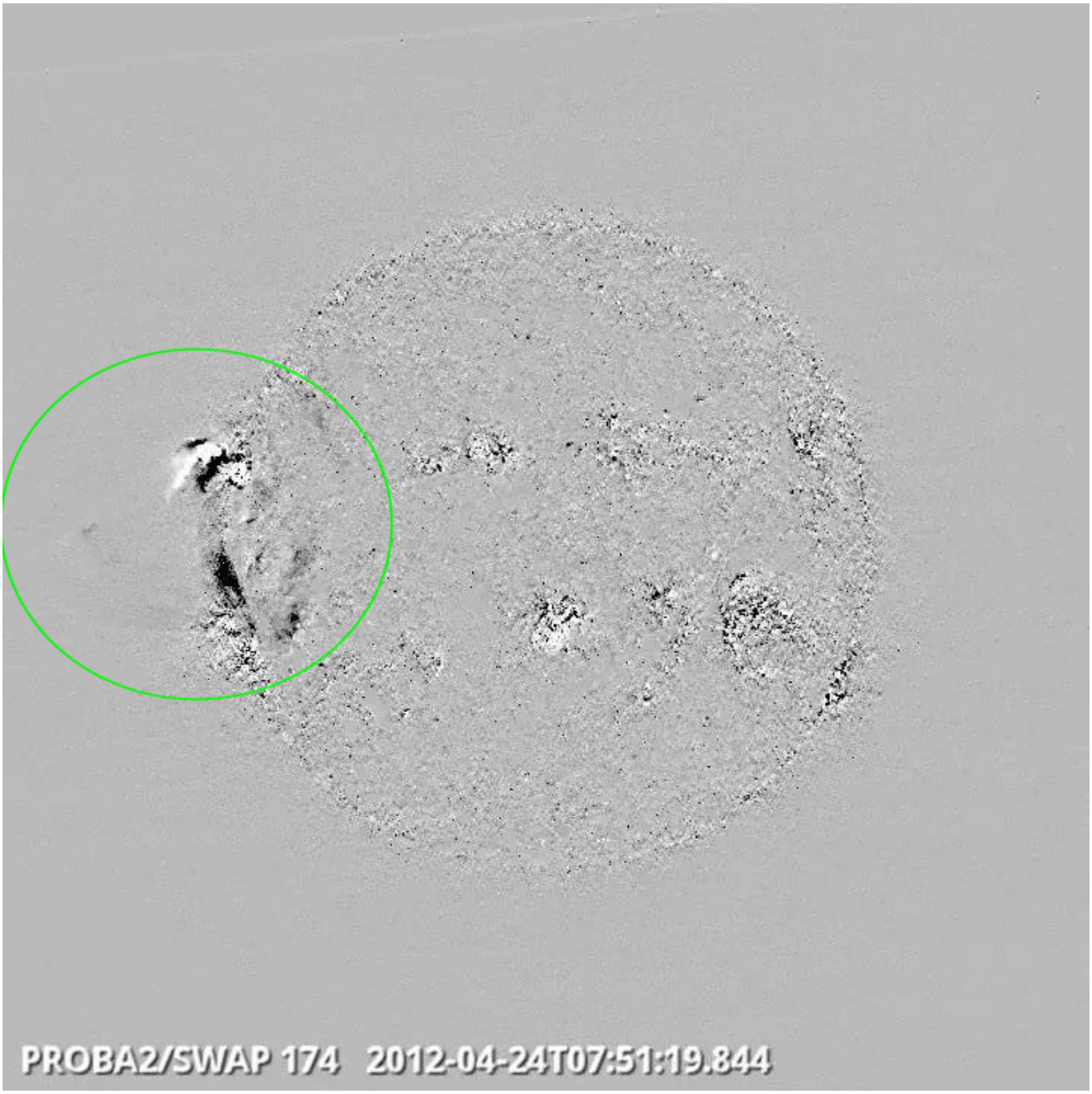
The figure below shows the biggest event of the week: the M-flare on April 27 as seen by LYRA and GOES.





C2 Flare - North Meridian - AR11461, 23/04 @ 17:54 - SWAP difference image - the eruption extended up to the area indicated in green.

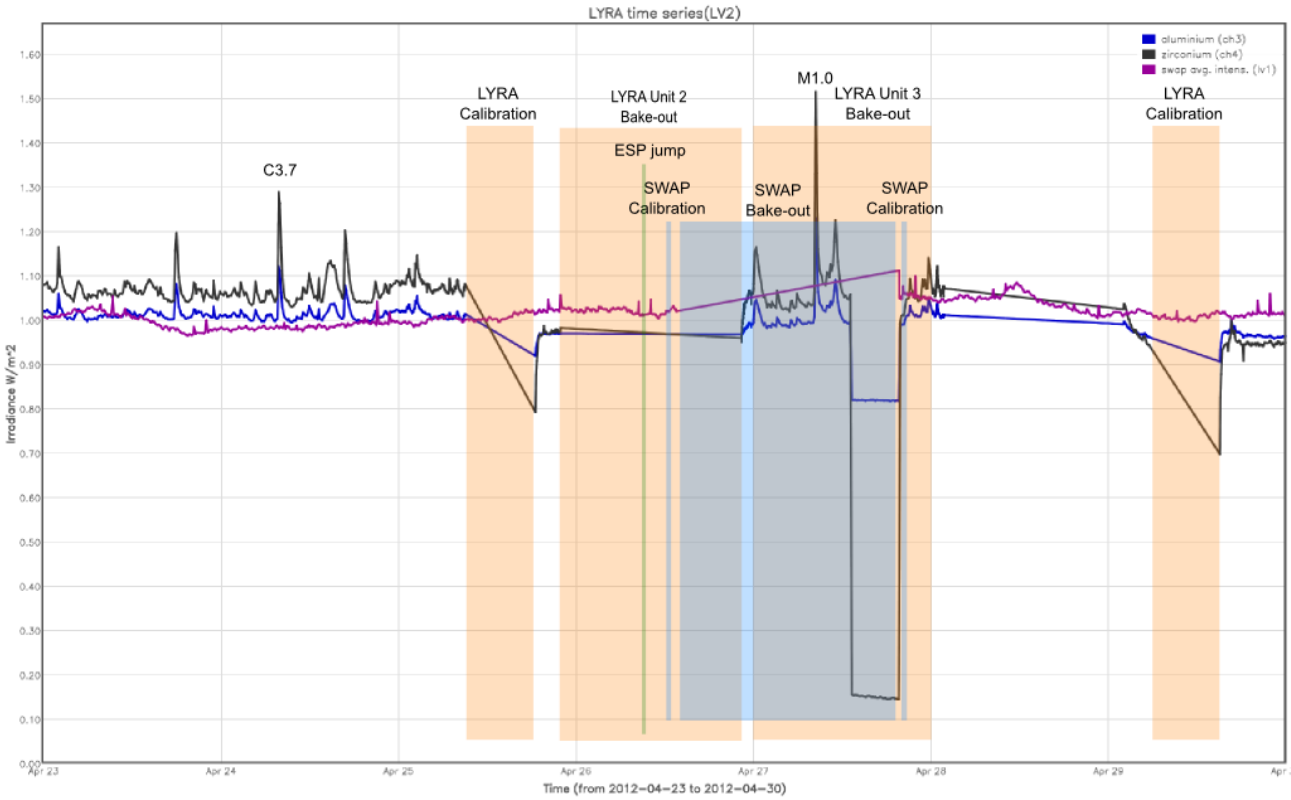
For the movie, click here



C3.7 Flare - East limb - AR11467, 24/04 @ 17:51 - SWAP difference image - the eruption extended up to the area indicated in green.

For the movie, click 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 (solar intensity derived from ‘integrated’ SWAP images)



The blue shaded periods correspond to, from left to right:
- ESP jump on Thursday
- SWAP Calibration
- SWAP Bake-out and dark image taking from Thu 12:35 until Fri 20:00
- SWAP Calibration

The orange shaded periods correspond to, from left to right:
- LYRA Calibration
- LYRA Bake-out on Unit 2
- LYRA Bake-out on Unit 3
- LYRA Calibration

For detailed description of these campaigns, refer to the SWAP and LYRA instrument statuses below.

Scientific campaigns

No scientific campaigns, besides nominal observing, were executed during the period.

Outreach, papers, presentations, etc.

Deadline for the Topical Issue officially closed Wed April 25th. Two papers might come in late.

2. LYRA instrument status

Calibration

Several types of calibrations were embedded in the LYRA bake-out campaign.

IOS & operations

Monday 23 Apr	Tuesday 24 Apr	Wednesday 25 Apr	Thursday 26 Apr	Friday 27 Apr	Saturday 28 Apr	Sunday 29 Apr
Nominal acquisition + daily U3 LYIOS00237	Nominal acquisition + daily U3 LYIOS00238	Nominal acquisition + calibration + Bake-Out LYIOS00238	Nominal acquisition + Bake-Out LYIOS00238	Nominal acquisition + Bake-Out LYIOS00238	Nominal acquisition + Bake-Out LYIOS00238	Nominal acquisition + daily U3 LYIOS00238

This week, a LYRA Bake-out campaign was executed.
The following sequence was started on Tue 24 Apr @ 14:15 and ended on Sun 29 Apr @ 15:00:

- Apr 24 14:15 Warm-up after instrument OFF to increase temperature thresholds
- Apr 25 09:00 Calibration as usual
- Apr 25 18:30 Observe with unit 2 and unit 1 in parallel during 1 orbit (100 minutes)
- Apr 25 20:20 Observe with unit 2 and unit 3 in parallel during 1 orbit (100 minutes)
- Apr 25 22:10 Bake-out of unit 2, continue to observe with unit 2
    - Cover unit 2 is already open
    - Turn heater ab ON in unit 2
    - Turn heater cd ON in unit 2
    - Wait 24 hours
    - Turn heater ab OFF in unit 2
    - Turn heater cd OFF in unit 2
    - Don't close cover unit 2, and continue normal observations
- Apr 26 22:15 Observe with unit 2 and unit 3 in parallel during 1 orbit (100 minutes)
- Apr 27 00:00 Bake-out of unit 3 in parallel with observations with unit 2, and observations with unit 3
    - Cover unit 3 is already open
    - Turn heater ab ON in unit 3
    - Turn heater cd ON in unit 3
    - Wait 24 hours
    - Turn heater ab OFF in unit 3
    - Turn heater cd OFF in unit 3
    - Keep cover 3 open (TBC)
- Apr 28 00:05 Observe with unit 2 and unit 3 in parallel during 1 orbit (100 minutes)
- Apr 28 01:55 Normal observations with unit 2 (24 hours)
- Apr 29 01:55 Observe with unit 2 and unit 1 in parallel during 1 orbit (100 minutes)
- Apr 29 03:45 Observe with unit 2 and unit 3 in parallel during 1 orbit (100 minutes)
- Apr 29 05:35 Calibration as usual
- Apr 29 15:00 Return to normal operations

LYRA detector temperature

LYRA detector 2 temperature fluctuated between 46.6 to 44.3 degrees Celsius under nominal circumstances. During the bake-out, temperatures went up to 53.2.

To be explored
/

3. SWAP instrument status

Calibration

Calibration occurred on Tuesday.

MCPM errors
The number of MCPM recoverable errors increased from 61 to 135.

The number of MCPM unrecoverable errors is still 0.

IOS & operations

Monday 23 Apr	Tuesday 24 Apr	Wednesday 25 Apr	Thursday 26 Apr	Friday 27 Apr	Saturday 28 Apr	Sunday 29 Apr
Nominal acquisition IOS00388 643 images	Nominal acquisition + Calibration IOS00388 602 images	Nominal acquisition + Calibration IOS00388 660 images	Nominal acquisition + ESP + Bake-out IOS00389 398 images	Nominal acquisition + Bake-out IOS00389 386 images	Nominal acquisition IOS00389 603 images	Nominal acquisition IOS00389 645 images

This week, a SWAP bake-out was performed.
This campaign consists of the following steps:

- Ask Redu about one week in advance to start the bake-out in a particular pass.
- Increase the priority of all images during the campaign (priority number = 0)
- Apr 26 12:35 Do a calibration (= 30 minutes) about 40 minutes before that pass
- Go to Sun-centered pointing
- Apr 26 13:30 Take uncompressed images at 1 minute cadence for 10 minutes
- Apr 26 13:40 Set instrument to IDLE just before the pass where Redu will start the bake-out
- Wait until a pass about 24 hours later
- Ask Redu to end the bake-out in that pass
- Apr 27 13:10 At the end of that pass, offpoint completely (i.e. quaternions = 0.02617 0.02617)
- Take uncompressed images at 45 second cadence for 30 minutes
- Apr 27 13:40 Take uncompressed images at 90 second cadence for 2 hours 30 minutes
- Apr 27 16:30 Take uncompressed images at 90 second cadence 20 (instead of 10) second integration period for 3 hours
- Apr 27 19:10 Do a calibration
- Go to Sun-centered pointing
- Apr 27 19:38 Take uncompressed images at 1 minute cadence for 10 minutes
- Apr 27 20:00 Return to normal operations

This sequence was started on Thu 26th @ 12:35 and ended on Fri 27th @ 20:00.

The weekly ESP campaign was performed on Thursday, before the bake-out started.

SWAP detector temperature
The SWAP Cold Finger Temperature fluctuated between -0.8 and -1.9 degrees Celsius, under nominal operations. During bake-out the temperature went up to 42.1 degrees.

To be explored
/

4. PROBA2 Science Center Status

The main operator is Koen Stegen; Erik Pylyser provides support, when needed.

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 7661 to 7722) was nominal, except for:
pass 7695. No files were received for this pass: it was incorrectly planned and coincided with pass 7694.

Data coverage HK

All HK data files (LYRA_AD) have been received, except for:
a gap in the HK data from 2012-04-26 20:39:24 until 21:26:07.

Data coverage SWAP

All SWAP Science data files (BINSWAP) have been received, except for:
passes 7697 through 7701. These passes happened during the SWAP bake-out campaign where no SWAP images were taken, and the on-board image buffer was empty.

Total number of images between 2012 Apr 23 0UT and 2012 Apr 30 0UT: 4023
Highest cadence in this period: 30 seconds
Average cadence in this period: 150.35 seconds
Number of image gaps larger than 300 seconds: 2
Largest data gap: 1410.93 minutes

Largest data gap is nearly 24 hours due to the bake-out campaign.

Data coverage LYRA

All LYRA Science data files (BINLYRA) have been received, except for:
- None.

6. APPENDIX Frequently used acronyms

ADP	Ancillary Data Processor
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
DR	Destructive Readout
DSLP	Dual Segmented Langmuir Probe
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
ICD	Interface Control Document
IIU	Instrument Interface Unit
IOS	Instrument Operations Sheet
LED	Light Emitting Diode
LEO	Low Earth Orbit
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
OBET	On board Elapsed Time
OBSW	On board Software
PE	Proximity Electronics
PGA	Programmable Gain Amplifier
PI	Principal Investigator
P2SC	PROBA2 Science Center
PPT	Pointing, Positioning and Time (software module of P2SC)
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