P2SC-ROB-WR-159-20130408 Weekly report #159	**P2SC Weekly Report**	
Period covered: Date: Written by: Approved by:	Mon Apr 08 to Sun Apr 14, 2013 17 Apr 2013 Erik Pylyser Matthew West	Royal Observatory of Belgium PROBA2 Science Center
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1. Science

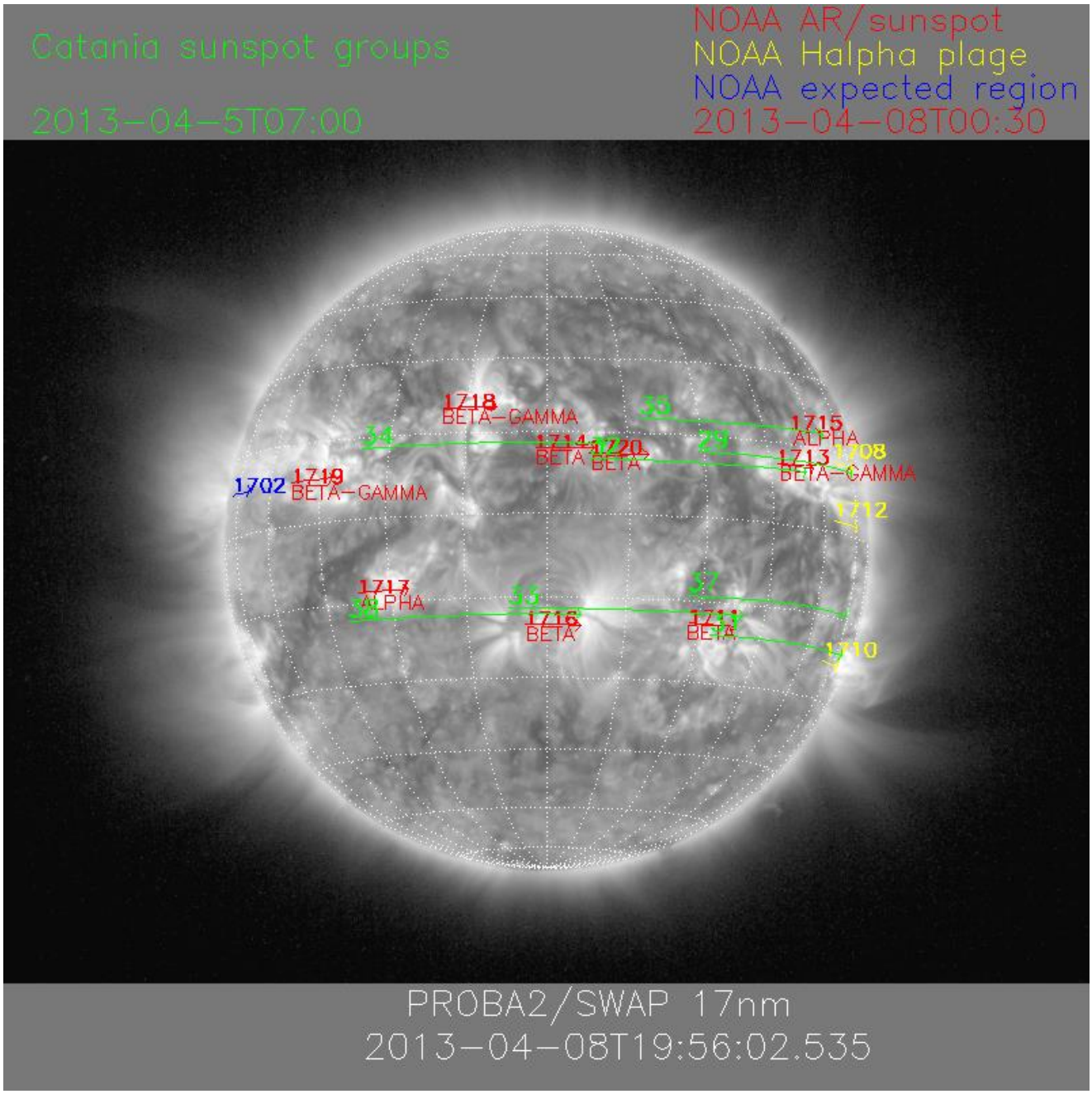
Solar & Space weather events

The level of solar activity[1] this week. Only M- and X-flares are mentioned, the most energetic one(s) are presented in **bold**:

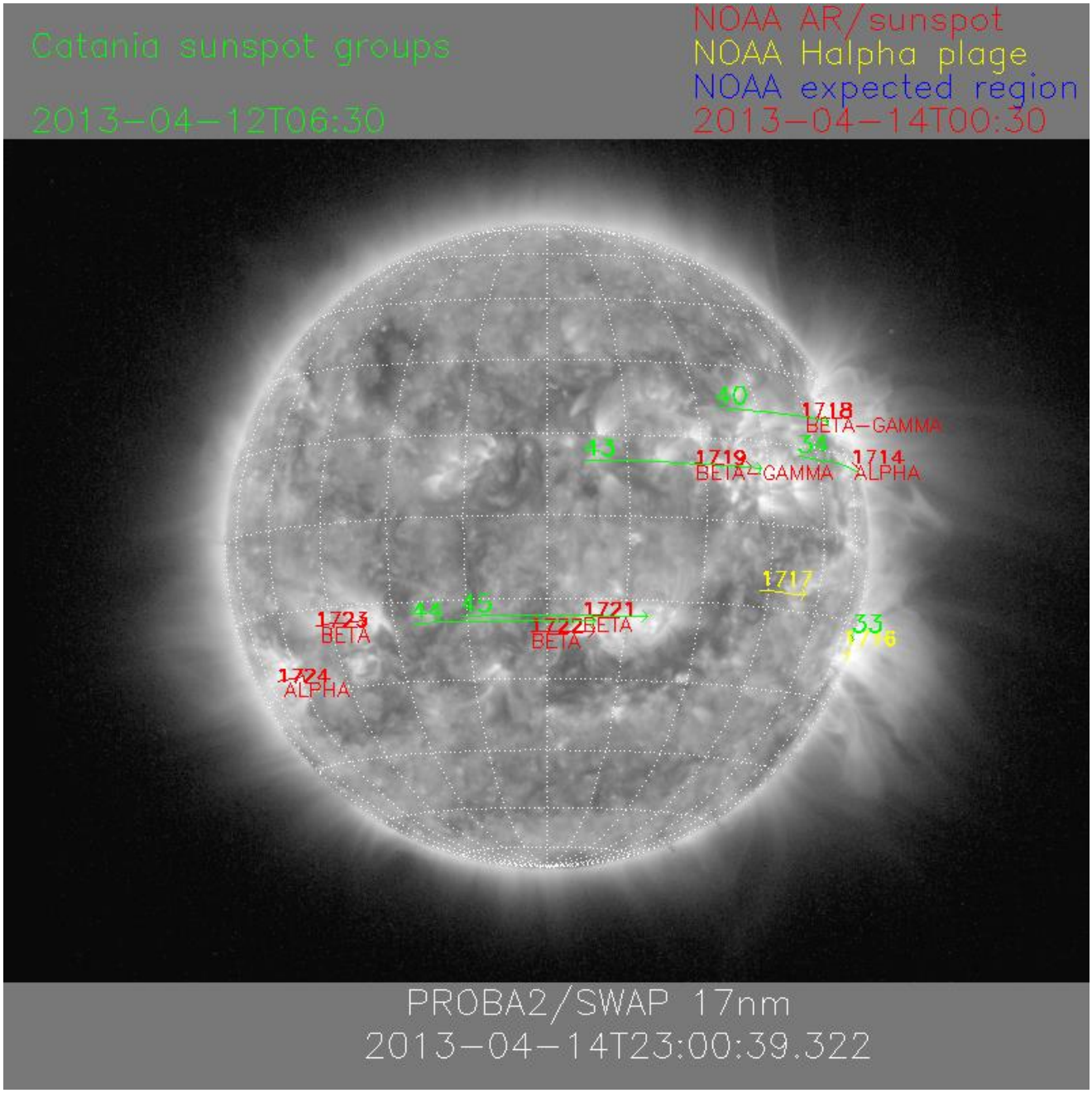
	Monday 08 Apr	Tuesday 09 Apr	Wednesday 10 Apr	Thursday 11 Apr	Friday 12 Apr	Saturday 13 Apr	Sunday 14 Apr
Activity	low	low	low	moderate	moderate	low	low
Flares	-	-	-	**M6.5 @ 06:55**	**M3.3 @ 19:52**	**-**	-

[1] See appendix. All timings are given in UT.

The SWAP images of April 08 and April 14 are shown below, with annotated active regions.



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



Solar Activity

Solar (flaring) activity was **low** at the start of the week, until Thursday, when an M6.5 flare erupted almost on the center of the solar disk (AR 11719). On Friday too, an M3.3 flare erupted from AR 11718. Both days are thus categorized as **moderate** activity. After that flare activity diminished during the week-end, thereby evolving from **low** on Saturday to **very low** 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.

A weekly overview movie can be found here (SWAP174/AIA304 combination; HelioViewer.org).

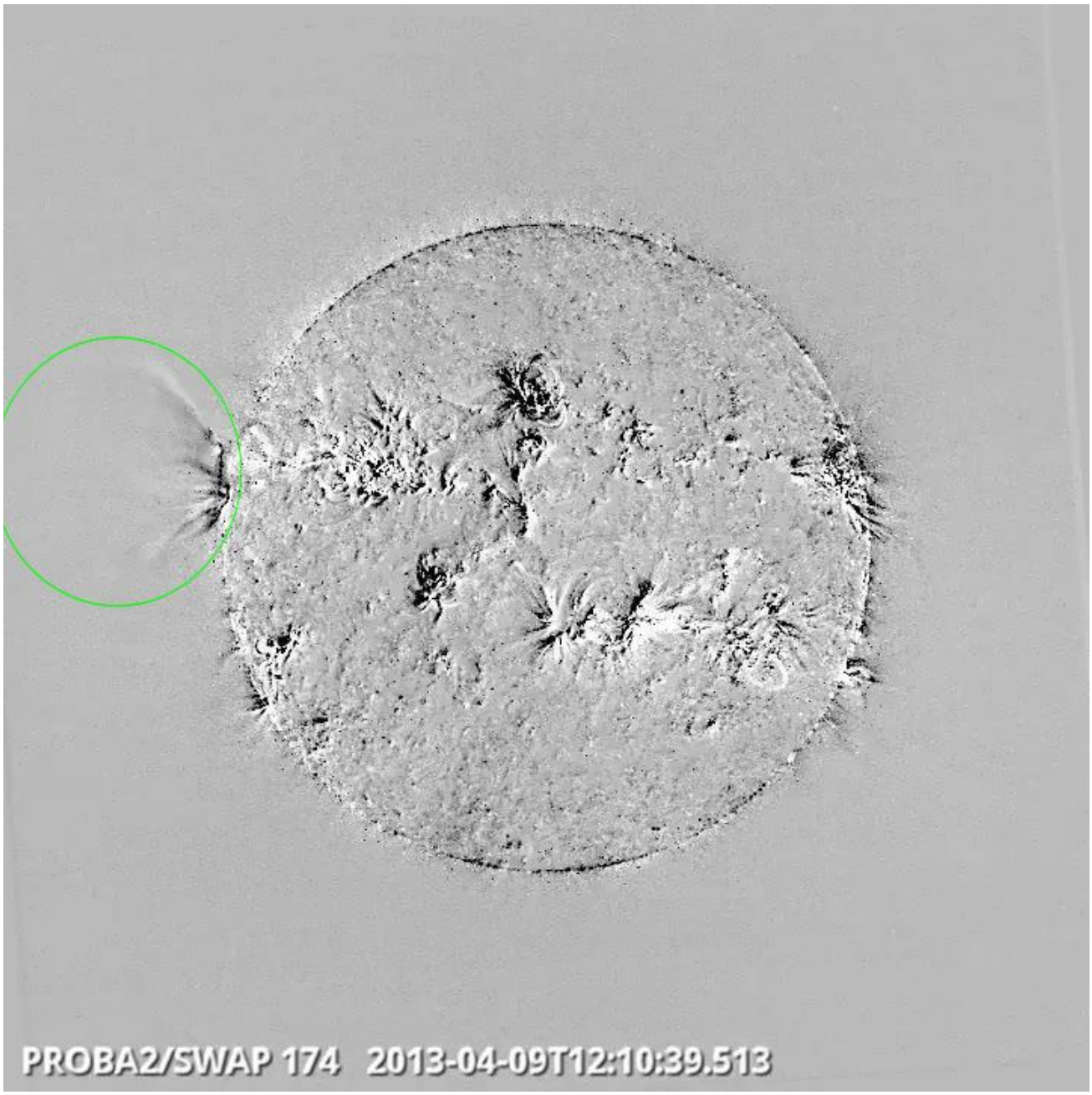
During the week, several interesting events occurred, some of which are presented below.

Monday 8th:

Filament eruption in Northeast quadrant (AR 11718/11719) @ 14:05 - SWAP difference image

For a SWAP difference movie of this event, see here.

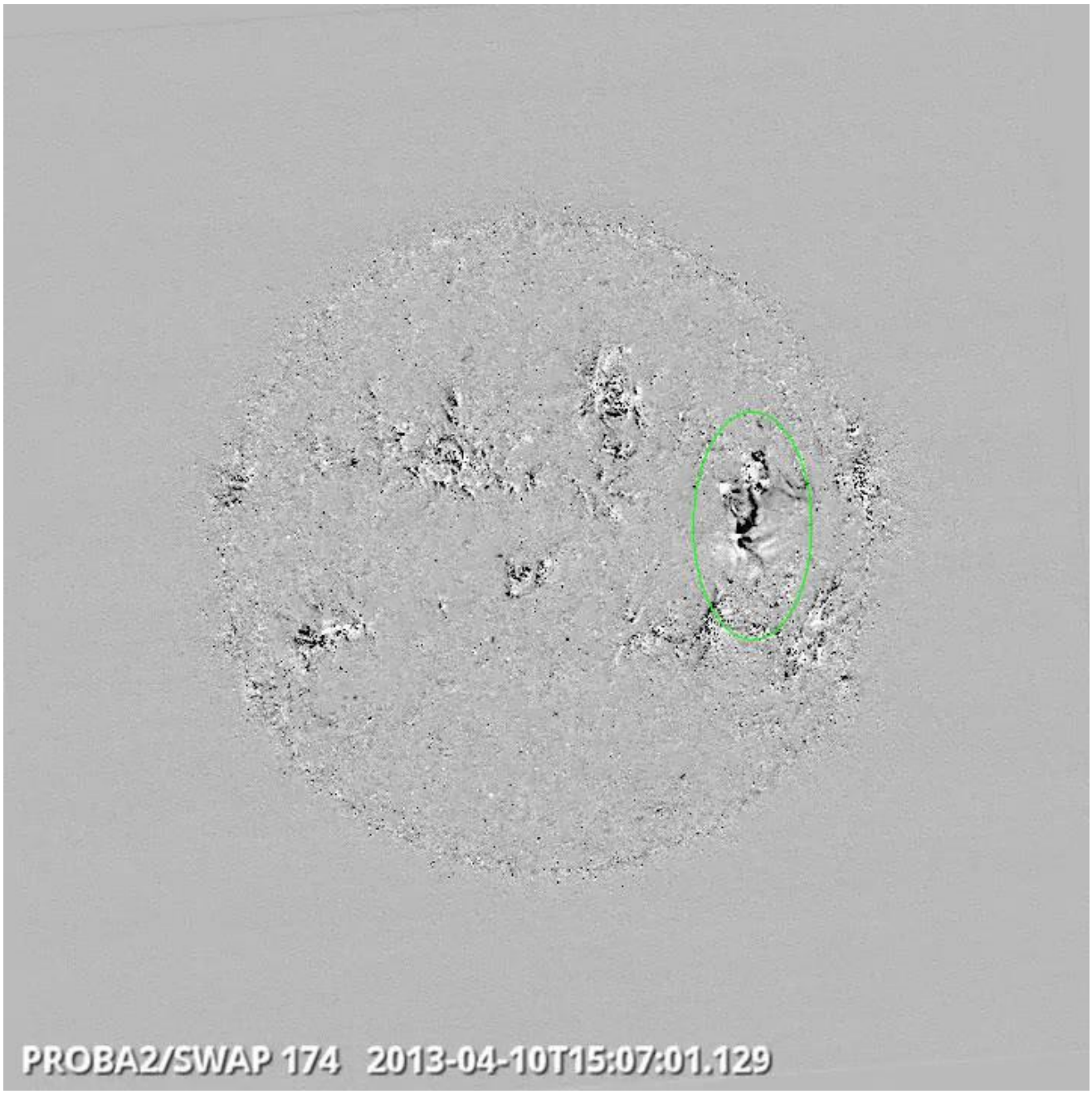
Tuesday 9th:



Eruption on the East Limb @ 12:10
- SWAP difference image

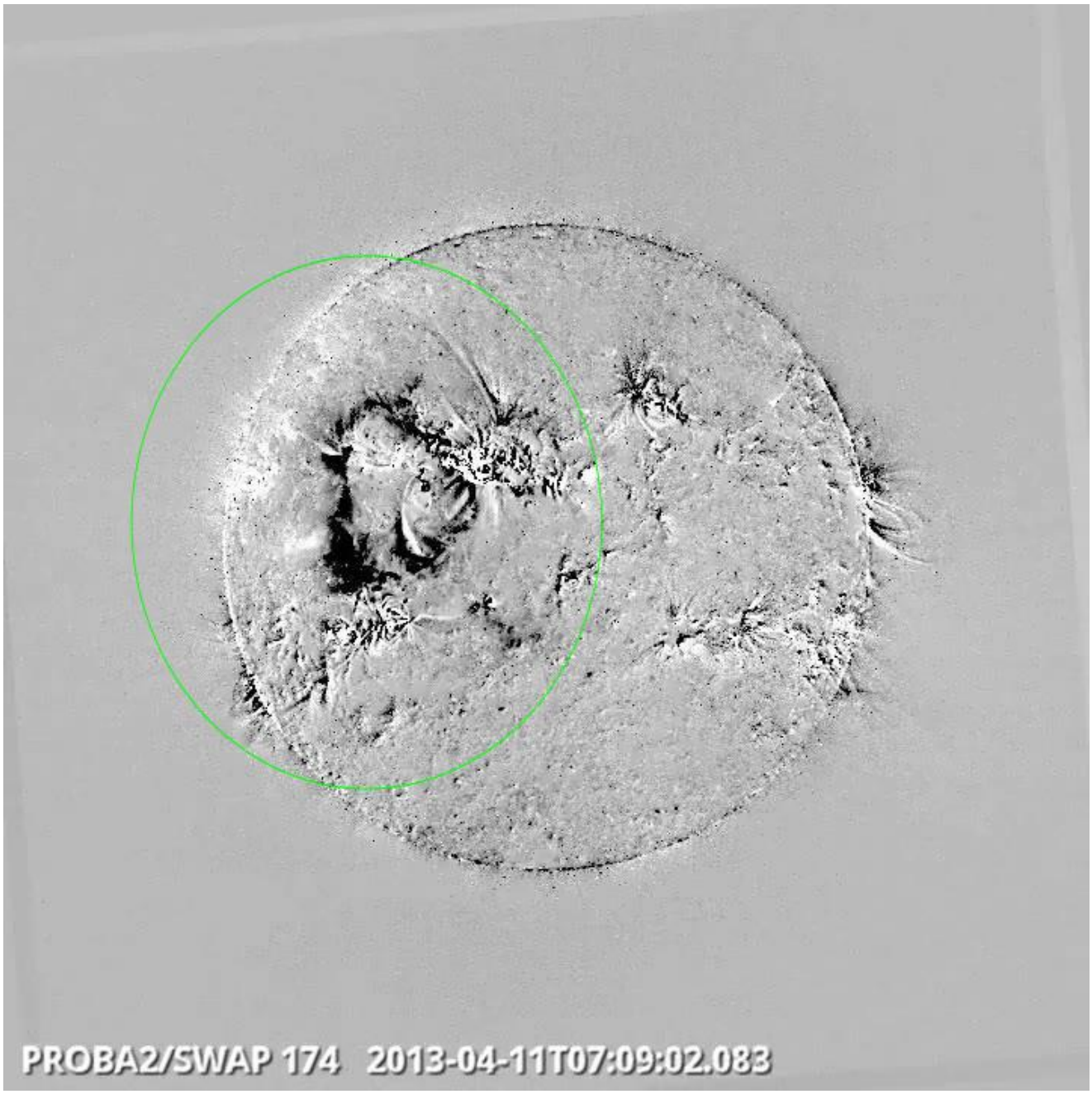
For a SWAP difference movie of this event, see here.

Wednesday 10th:



Eruption starting in the Northwest quadrant @ 15:07
- SWAP difference image

Thursday 11th:

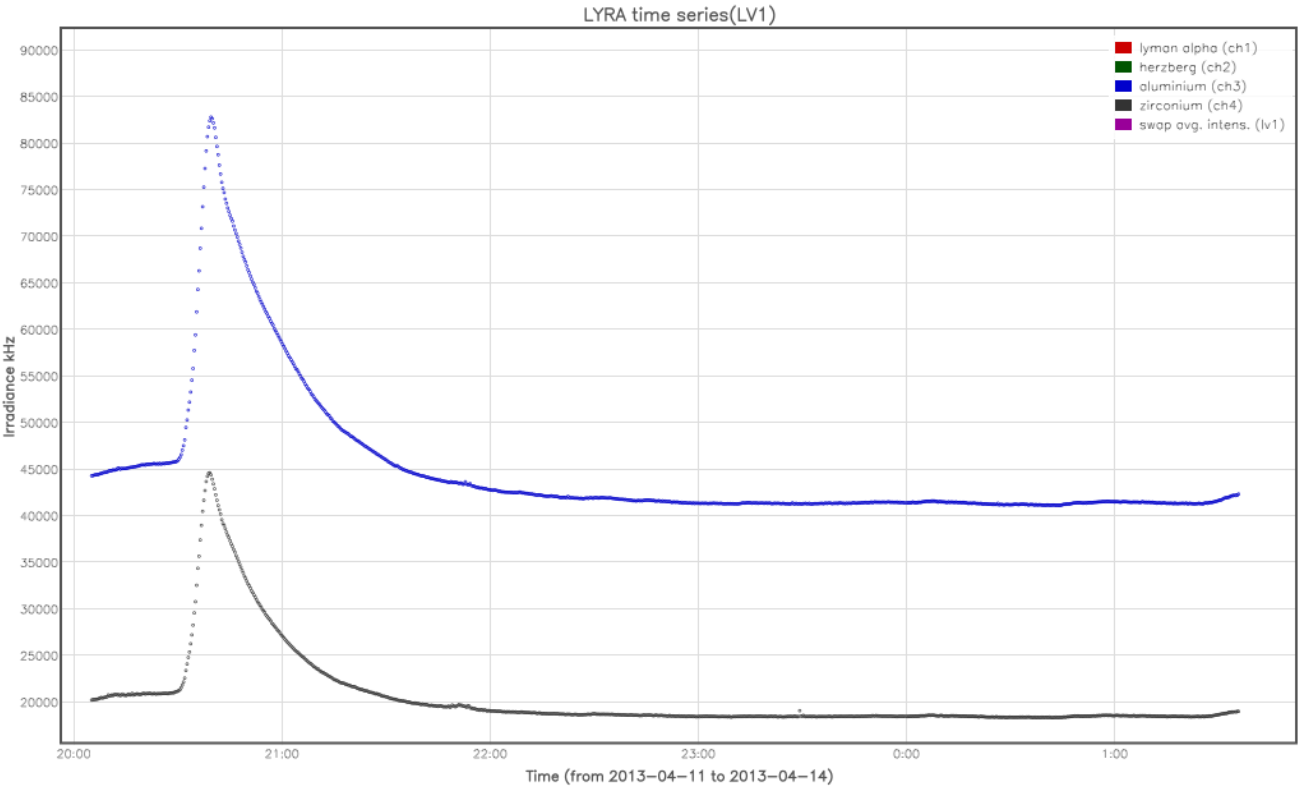


M6.5 flare from AR11719 @ 07:09
- SWAP difference image

For a SWAP difference movie of this event, see here.
For a HelioViewer movie (SWAP/AIA), see here.

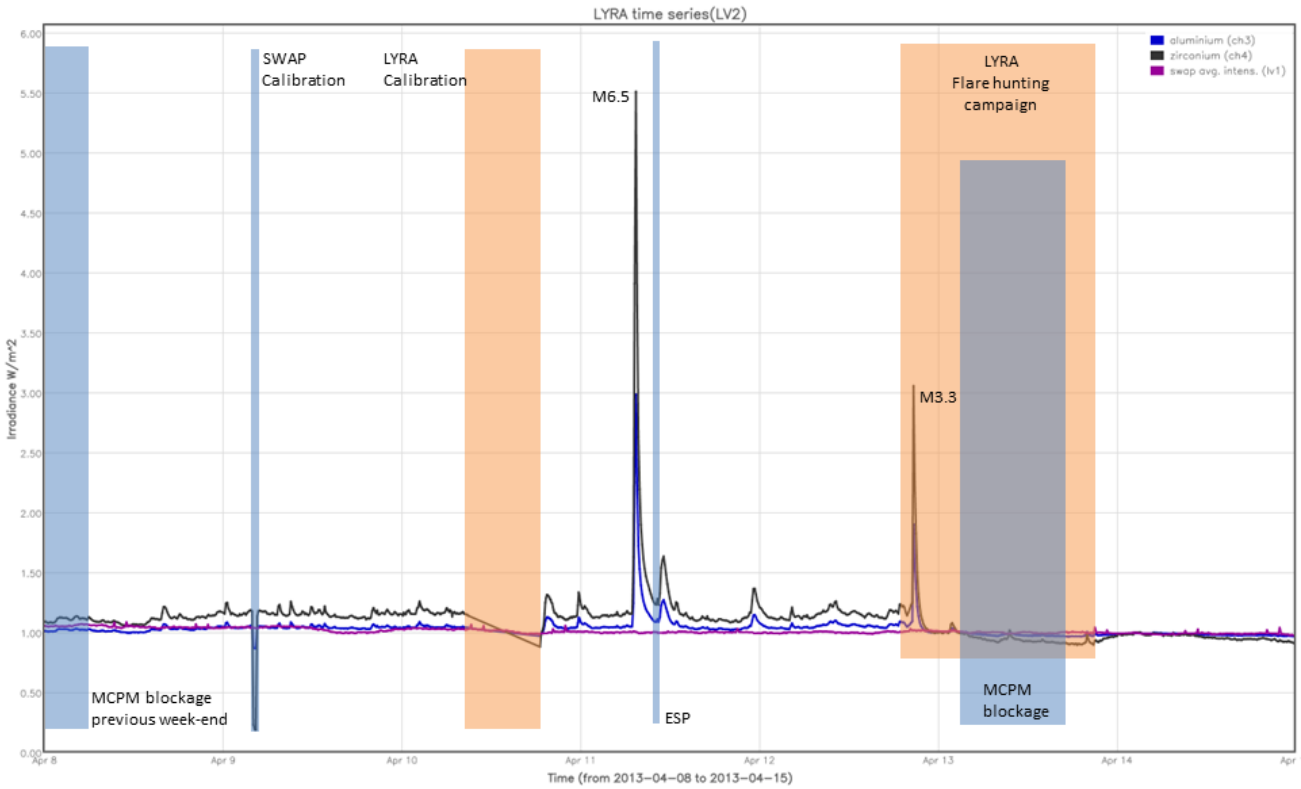
Friday 12th:

A special flare hunting campaign was initiated on Friday evening, based on the forecasts that day. That same evening, the M3.3 flare occurring in AR 11718 was captured successfully by Unit 3, specially opened for that purpose (see plot below).
At the same time SDO-EVE was also running a flare campaign.



For a SWAP174/AIA304 HelioViewer movie of this event, see here (north west quadrant). Note also the North limb prominence eruption during this same period in the 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 (solar intensity derived from 'integrated' SWAP images)



The blue shaded periods correspond to, from left to right:
- MCPM blockage of previous week-end
- SWAP calibration on Tuesday
- ESP experiment on Thursday
- MCPM blockage on Saturday

The orange shaded periods correspond to, from left to right:
- LYRA calibration on Wednesday
- LYRA flare hunting campaign Friday/Saturday

The red shaded period corresponds to:
- None

Outreach, papers, presentations, etc.

- The scientific part of the contents of the "Solar Activity" section above is published in this week's STCE Bulletin (see http://www.stce.be/newsletter/newsletter.php)

- ‘Solar EUV radiometers’, Seminar @ Royal Observatory of Belgium, on 11/04/2013; Don McMullan (Guest Investigator)

- ‘A study of the 3D kinematics of the two prominence eruptions using SWAP and EUVI data’; Matthew West et al.; Presentation @ EGU[2], Vienna; 08/04/2013.

- ’Space Weather Services at Space Pole’; Matthew West; Presentation at STAC Meteorological Conference; Vienna; 09/04/2013

- ‘Space Weather and Particle Effects on the Orbital Environment of PROBA2’; Matthew West et al.; Poster @ EGU; Vienna; 11/04/2013
(Poster)

- ‘Solar EUV irradiance during solar cycle 24 as observed by PROBA2/LYRA and SDO/EVE’; Matthieu Kretschmar et al.; Presentation @ EGU; Vienna; 12/04/2013

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 Program

Two Guest Investigator teams have joined the P2SC for a GI program:

- Andrew Jones & Don McMullin (LYRA); ‘Degradation analysis of SDO-EVE and PROBA-2 LYRA data’; period April 8th - April 19th

- Jason Byrne (SWAP) - ‘Studying the Low-Corona Initiation Phase of CMEs’; period April 8th - 29th.

[2] EGU: European Geosciences Union (General Assembly)

2. LYRA instrument status

Calibration

LYRA calibration on Wednesday.

IOS & operations

Monday 08 Apr	Tuesday 09 Apr	Wednesday 10 Apr	Thursday 11 Apr	Friday 12 Apr	Saturday 13 Apr	Sunday 14 Apr
Nominal acquisition + daily U3 LYIOS00320	Nominal acquisition + daily U3 LYIOS00320	Nominal acquisition + daily U3 + calibration LYIOS00320	Nominal acquisition + daily U3 LYIOS00321	Nominal acquisition + daily U3 + flare hunting LYIOS00321->323	Nominal acquisition + flare hunting LYIOS00323	Nominal acquisition + daily U3 LYIOS00323

The following science campaigns were performed by LYRA:
- daily U3 observations campaign
- flare hunting campaign between Friday 20:05 and Saturday 20:40 - successful capture of the M3.3 flare, Friday night.

LYRA detector temperature

LYRA detector 2 temperature globally varied between 47.0 and 48.0 degrees C, taking into account the daily U3 activation periods; the latter result in a temperature increase of about 0.6 degrees C.
During calibration, the temperature went down to 46.2 degrees.
During the flare hunting campaign, the temperature rose to 49.9 degrees.

To be explored
- None

3. SWAP instrument status

Calibration

SWAP calibration on Tuesday.

MCPM errors

The number of MCPM recoverable errors increased from 7281 to 7357.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 08 Apr	Tuesday 09 Apr	Wednesday 10 Apr	Thursday 11 Apr	Friday 12 Apr	Saturday 13 Apr	Sunday 14 Apr
Nominal acquisition IOS00461 442 images	Nominal acquisition + calibration IOS00461 670 images	Nominal acquisition IOS00462 643 images	Nominal acquisition + ESP IOS00462 583 images	Nominal acquisition IOS00462 508 images	Nominal acquisition IOS00462 438 images	Nominal acquisition IOS00462 472 images

Special operations for SWAP, this week:
- ESP jump on Thursday

An MCPM blockage occurred on Saturday, between 13/04/2013; 03:48 (pass 10747) and 17:23 (pass 10752). REDU solved the issue on the same day, by executing the required recovery procedure
The MCPM blockage resulted in the downlink of fewer images (30% less) on Saturday, but continuous imaging was available.

SWAP detector temperature

The SWAP Cold Finger Temperature, globally varied between -0.40 and -1.43 degrees C.

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 10701 to 10763) was nominal, except for:
- None

Data coverage HK

All HK data files (LYRA_AD) have been received, except for:
- None

Data coverage SWAP

All SWAP Science data files (BINSWAP) have been received, except for:
- BINSWAP_10701 and 10702 on Monday (consequence of MCPM blockage of previous week-end)
- BINSWAP_10748, 10749, 10750, 10751 on Saturdary (consequence of MCPM blockage)

Total number of images between 2013 Apr 08 0UT and 2013 Apr 15 0UT: 3808
Highest cadence in this period: 30 seconds
Average cadence in this period: 158.78 seconds
Number of image gaps larger than 300 seconds: 73
Largest data gap: 34.33 minutes

The large gap is due to the ESP experiment on Thursday. The larger number of image gaps is due to the MCPM blockages listed above.

Data coverage LYRA

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

- 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)