


P2SC-ROB-WR-163- 20130506 Weekly report #163	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon May 06 to Sun May 12, 2013 17 May 2013 Erik Pylyser Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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1. Science

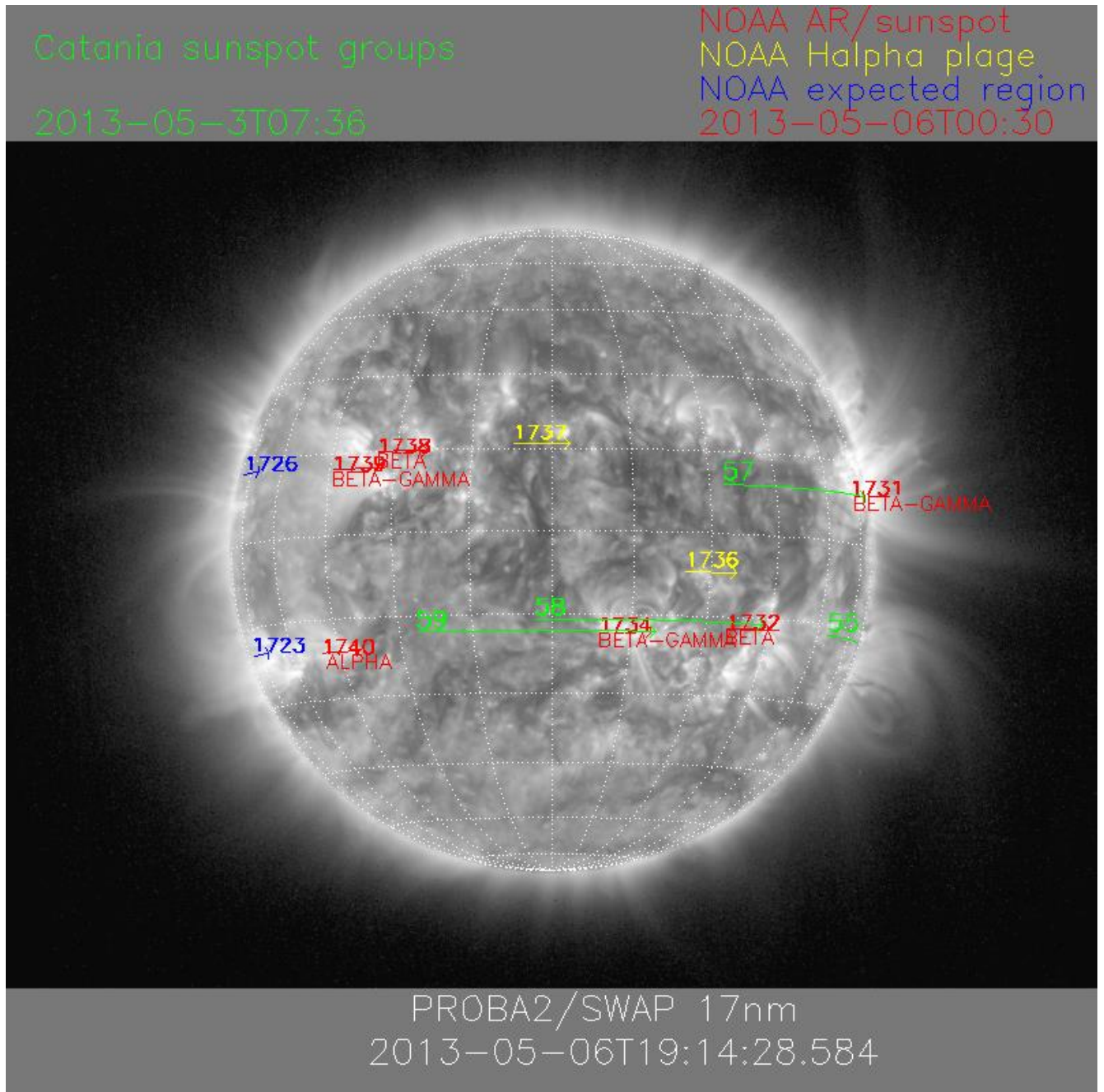
Solar & Space weather events

The level of solar activity¹ this week. Only M- and X-flares are mentioned, the most energetic one(s) are presented in **bold**:

	Monday 06 May	Tuesday 07 May	Wednesday 08 May	Thursday 09 May	Friday 10 May	Saturday 11 May	Sunday 12 May
Activity	low	low	low	low	moderate	low	moderate
Flares	-	-	-	-	M3.9 @ 00:44 M1.3 @ 12:37	-	M1.9 @ 20:17 M1.2 @ 22:37

¹ See appendix. All timings are given in UT.

The SWAP images of May 06 and May 12 are shown below, with annotated active regions.

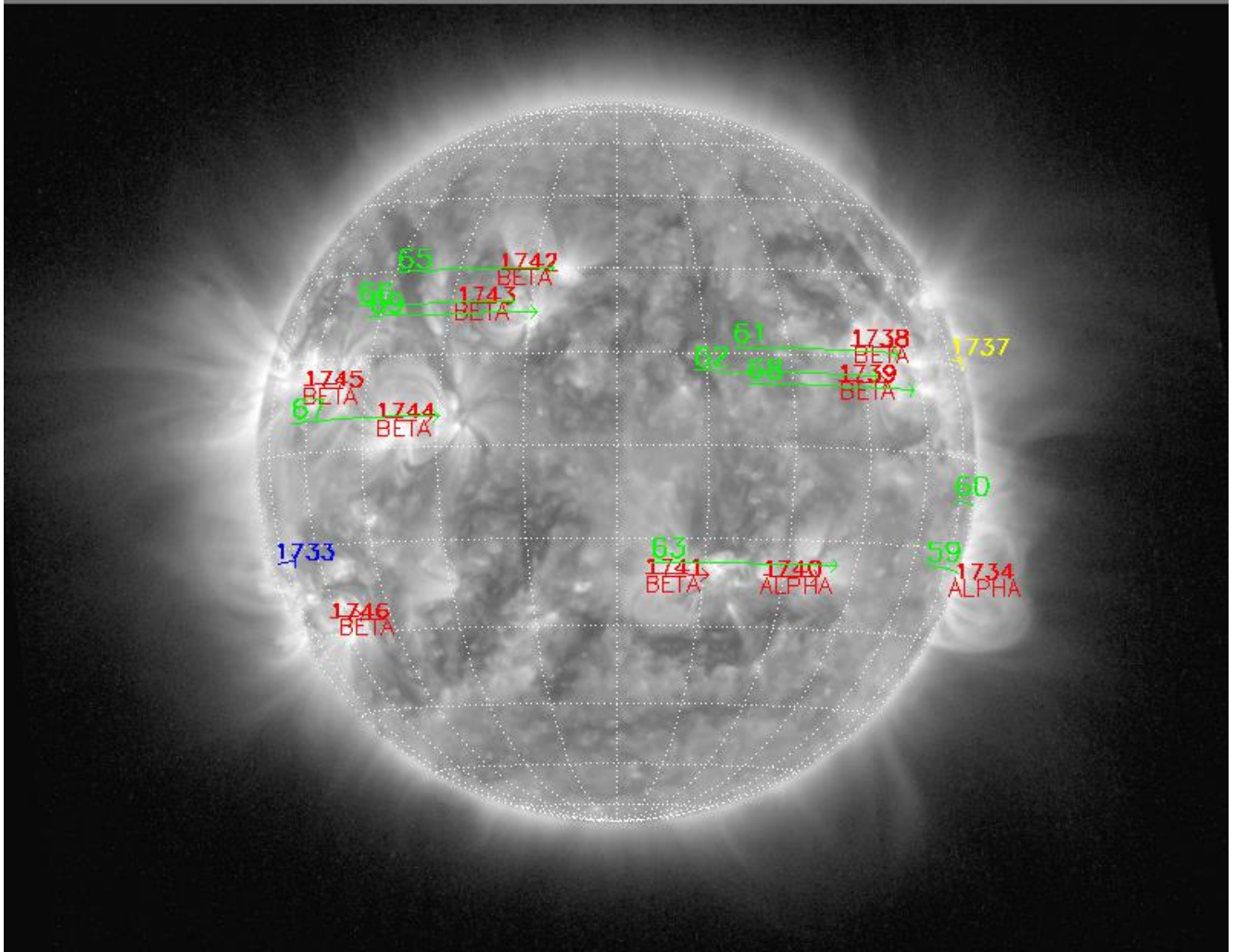


<http://sidc.be/html/CmapPage.html>

Catania sunspot groups

2013-05-10T05:30

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2013-05-12T00:30



PROBA2/SWAP 17nm
2013-05-12T20:28:17.226

Solar Activity

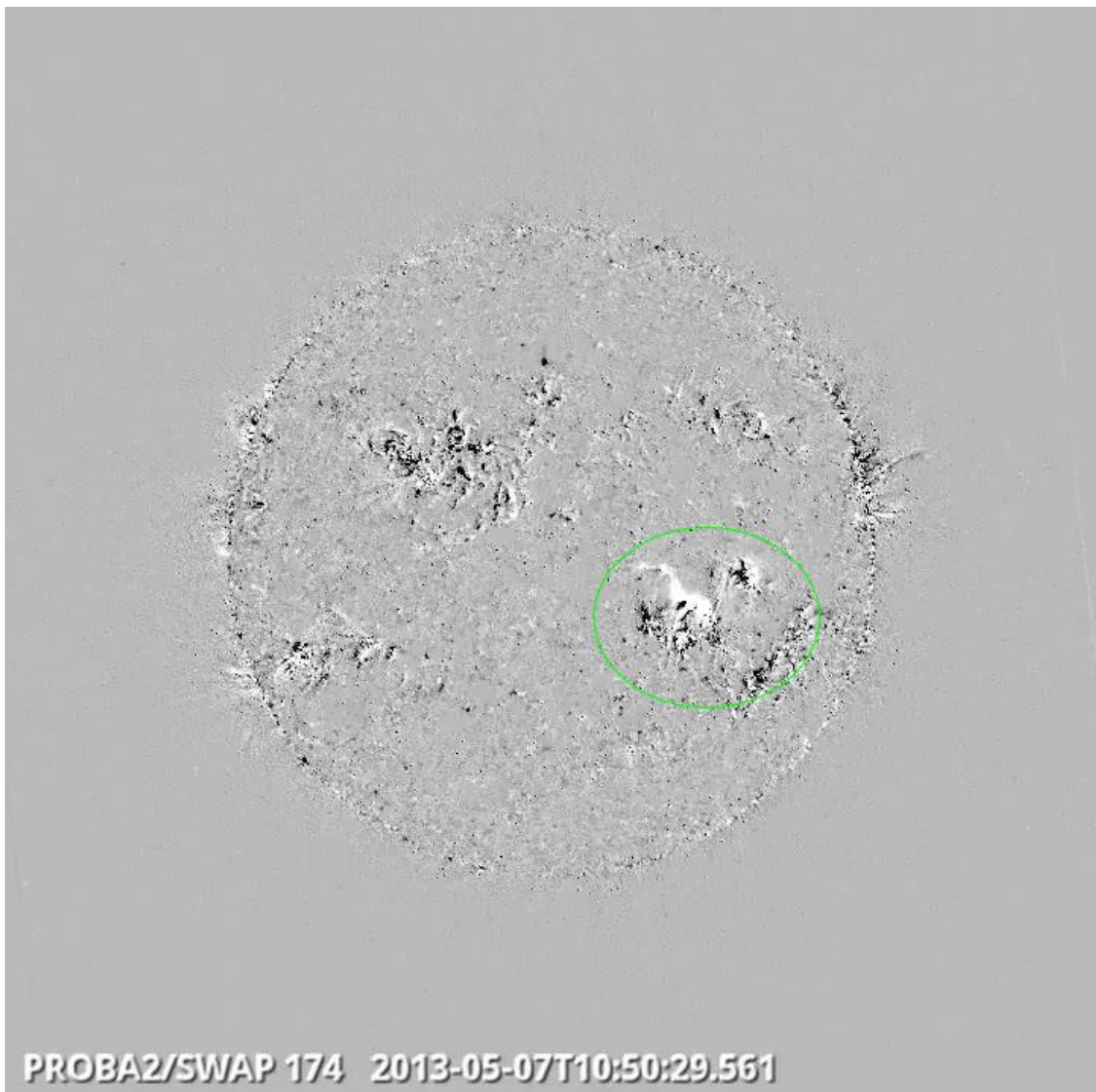
Solar (flaring) was about at the same level as last week: again with (quite) some C-level flaring every day, with activity increasing towards the end of the week, including 4 M-flares in the last 3 days.

In order to view the activity of this week in more detail, we suggest going 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). Note the occurrence of a number of eclipses in the night of Thursday 9th to Friday 10th.

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

Tuesday 07th:



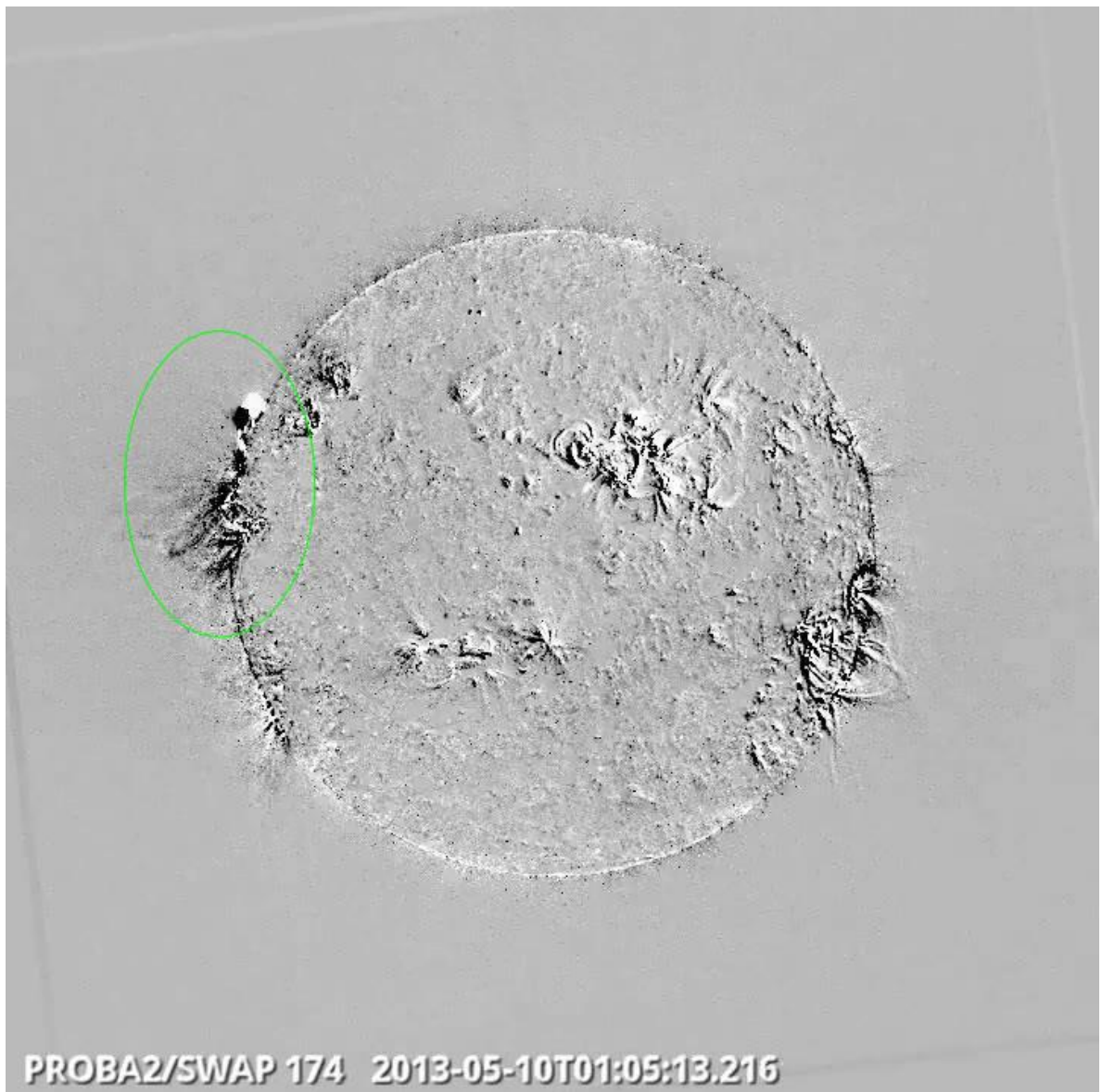
Eruption in the South West Quadrant @ 10:50 - SWAP difference image

Thursday 09th:

Two events:

1. [prominence eruption](#): during a large part of the day, activity along the SW limb can be seen, until the prominence erupts (see also the start of the next movie)
2. [eclipses](#): 3 eclipses can be seen, one of which grazes the solar surface. The three eclipses are preceded by a big prominence eruption on the South West limb (see end of the previous movie).

Friday 10th:



M3.9 flare behind the East limb @ 01:05 - SWAP difference image

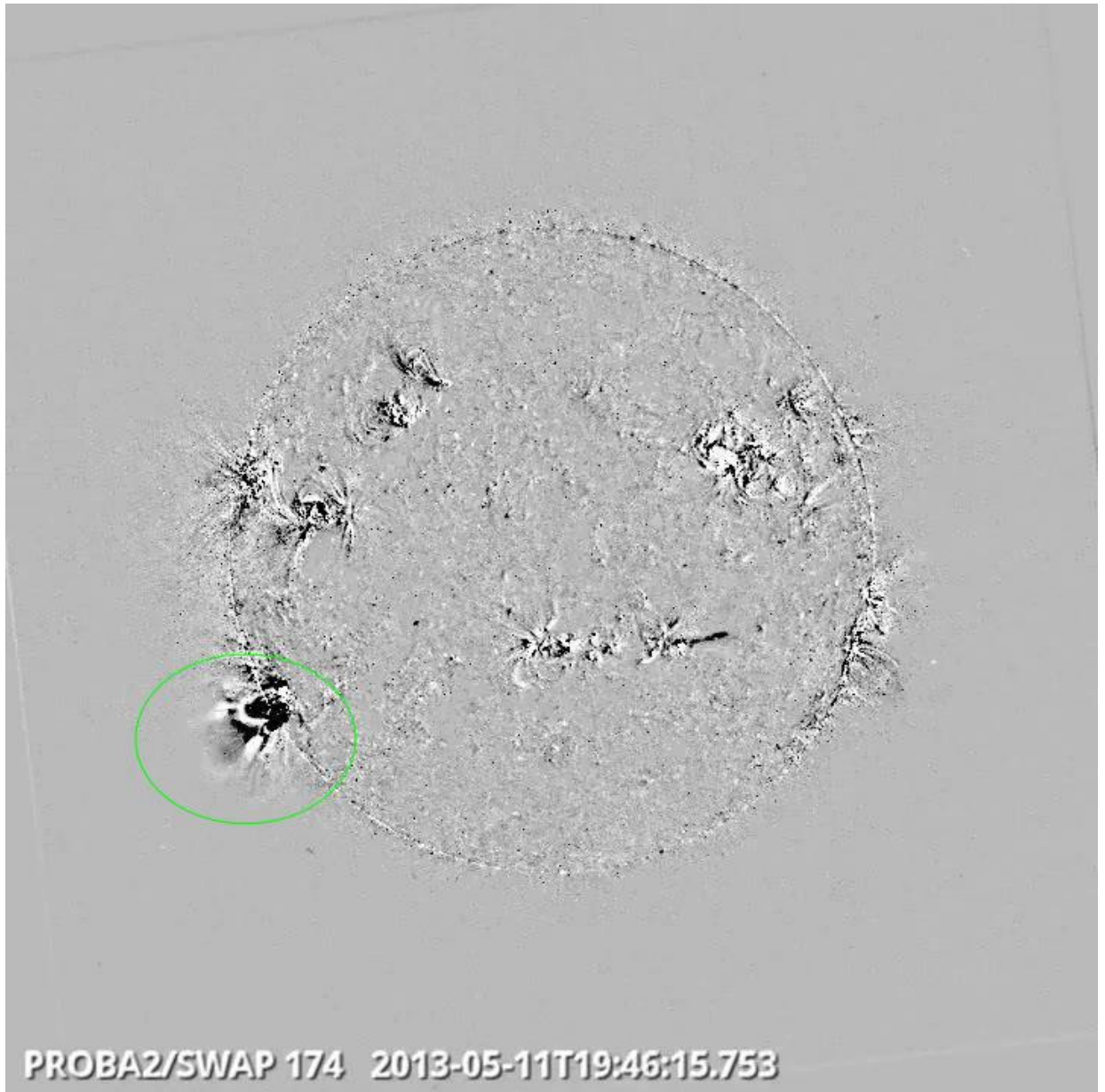


C2.5 flare in the North West quadrant @ 16:41 - SWAP difference image

Saturday 11th:



Filament eruption in the North West quadrant @ 23:27 - SWAP difference image
Find a movie of this event [here](#) (SWAP174 & SDO AIA 304 composite)



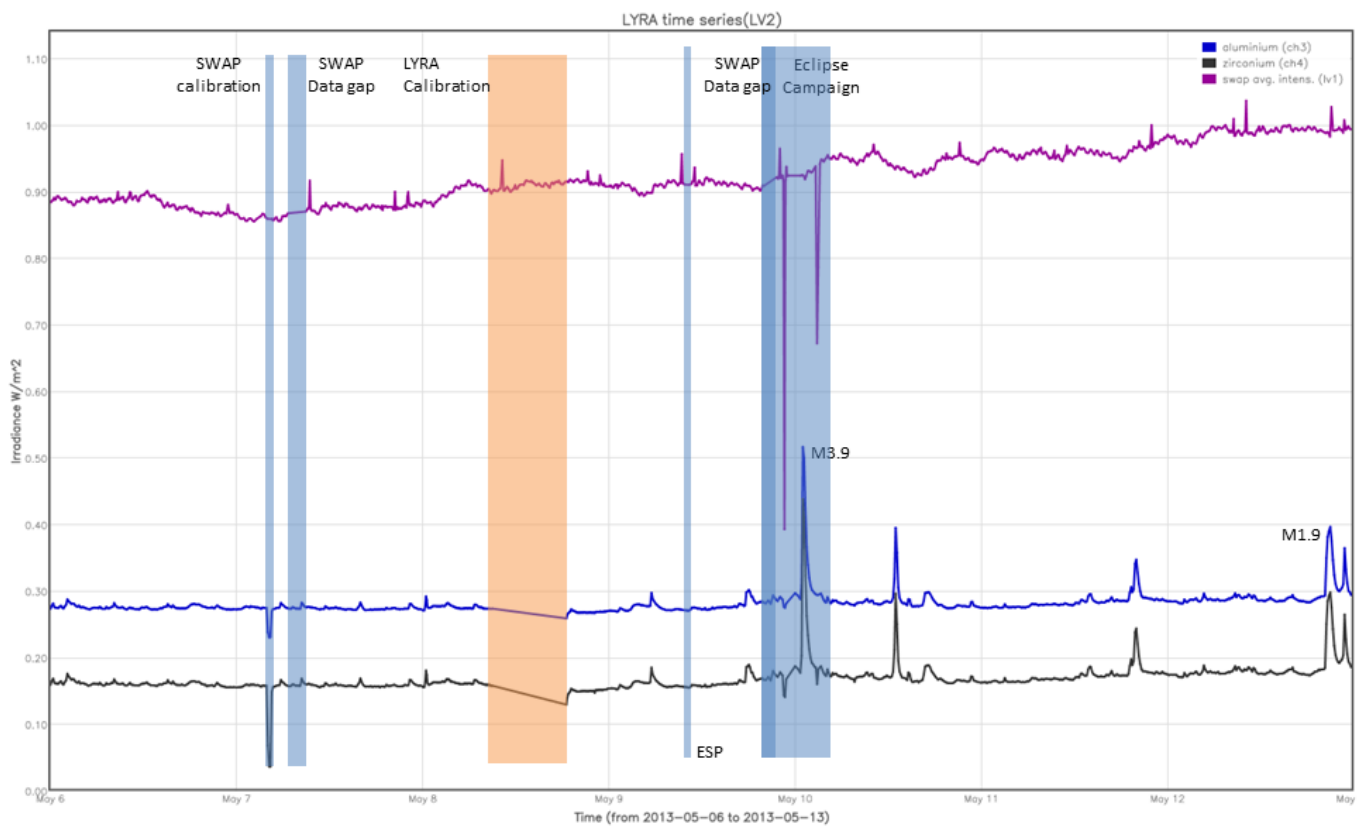
PROBA2/SWAP 174 2013-05-11T19:46:15.753

C8.6 flare eruption on the South East limb @ 19:46 - SWAP difference image

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:

- SWAP calibration on Tuesday
- SWAP data gap on Wednesday
- ESP experiment on Thursday
- Eclipse campaign Thursday and Friday, including a SWAP data gap.

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

- LYRA calibration

The red shaded period corresponds to:

- None

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 Solar Physics topical issue on the Proba 2 solar instruments SWAP & LYRA was issued:

<http://rd.springer.com/journal/11207/286/1/page/1>

“Oscillatory behavior in the corona”; Calabro et al., Solar Physics, Volume 286, Issue 2, pp.405-415

<http://adsabs.harvard.edu/abs/2013SoPh..286..405C>

“Temperature Response of the 171 Å Passband of the SWAP Imager on PROBA2, with a Comparison to TRACE, SOHO, STEREO, and SDO”; Raftery et al.; Solar Physics, Volume 286, Issue 1, pp.111-124; <http://adsabs.harvard.edu/doi/10.1007/s11207-013-0266-z>

Guest Investigator Program

- None

2. LYRA instrument status

Calibration

Bi-weekly LYRA calibration campaign on Wednesday 8th.

IOS & operations

Monday 06 May	Tuesday 07 May	Wednesday 08 May	Thursday 09 May	Friday 10 May	Saturday 11 May	Sunday 12 May
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
LYIOS00327	LYIOS00327	LYIOS00327	LYIOS00328	LYIOS00328	LYIOS00328	LYIOS00328

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.3 and 47.5 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 on Wednesday, temperature dropped to 45.5 degrees; during the eclipse campaign to 45.8 degrees.

To be explored

- None

3. SWAP instrument status

Calibration

Bi-weekly SWAP calibration campaign on Tuesday 7th.

MCPM errors

The number of MCPM recoverable errors increased from 7580 to 7659.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 06 May	Tuesday 07 May	Wednesday 08 May	Thursday 09 May	Friday 10 May	Saturday 11 May	Sunday 12 May
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition	Nominal acquisition + ESP + eclipse	Nominal acquisition + eclipse	Nominal acquisition	Nominal acquisition
IOS00464 400 images	IOS00464 446 images	IOS00464 651 images	IOS00465 459 images	IOS00465 644 images	IOS00465 511 images	IOS00465 529 images

Special operations for SWAP, this week:

- ESP jump on Thursday
- Specific observations for the eclipse campaign during the night of May 09 and 10.

SWAP detector temperature

The SWAP Cold Finger Temperature, globally varied between -1.45 and -0.58 degrees C. During the eclipse campaign in the night of Thu 09 to Fri 10th, temperature dropped to -1.60 degrees.

To be explored

- None.

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 10943 to 10998) was nominal, except for:

- Passes 10972 and 10974. Some data was recuperated at a later stage.

Data coverage HK

All HK data files (LYRA_AD) have been received, except for:

- LYRA_AD_10972.

About 2 hours of HK data was lost on May 7th, due to the launch of Proba V. The length between 2 consecutive Proba 2 passes that day exceeded 10 hours (and thereby surpassed the on-board storage capacity for HK).

Some HK data was lost during the eclipse campaign (pass 10972).

Data coverage SWAP

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

- BINSWAP_10972 and 10974.

About 2 hours of SWAP data was lost due to the loss of HK data on the day of Proba V launch (May 7th).

Total number of images between 2013 May 06 0UT and 2013 May 13 0UT: 3669

Highest cadence in this period: 30 seconds

Average cadence in this period: 164.83 seconds

Number of image gaps larger than 300 seconds: 107

Largest data gap: 54.17 minutes

Data coverage LYRA

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

- BINLYRA_10972 and 10974. Data from pass 10974 was recuperated later on - in BINLYRA_10977.

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.

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?)