


P2SC-ROB-WR-165- 20130520 Weekly report #165	P2SC Weekly report	
Period covered: Date: Written by: Approved by:	Mon May 20 to Sun May 26, 2013 03 June 2013 Erik Pylyser Matthew West	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 3730559
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

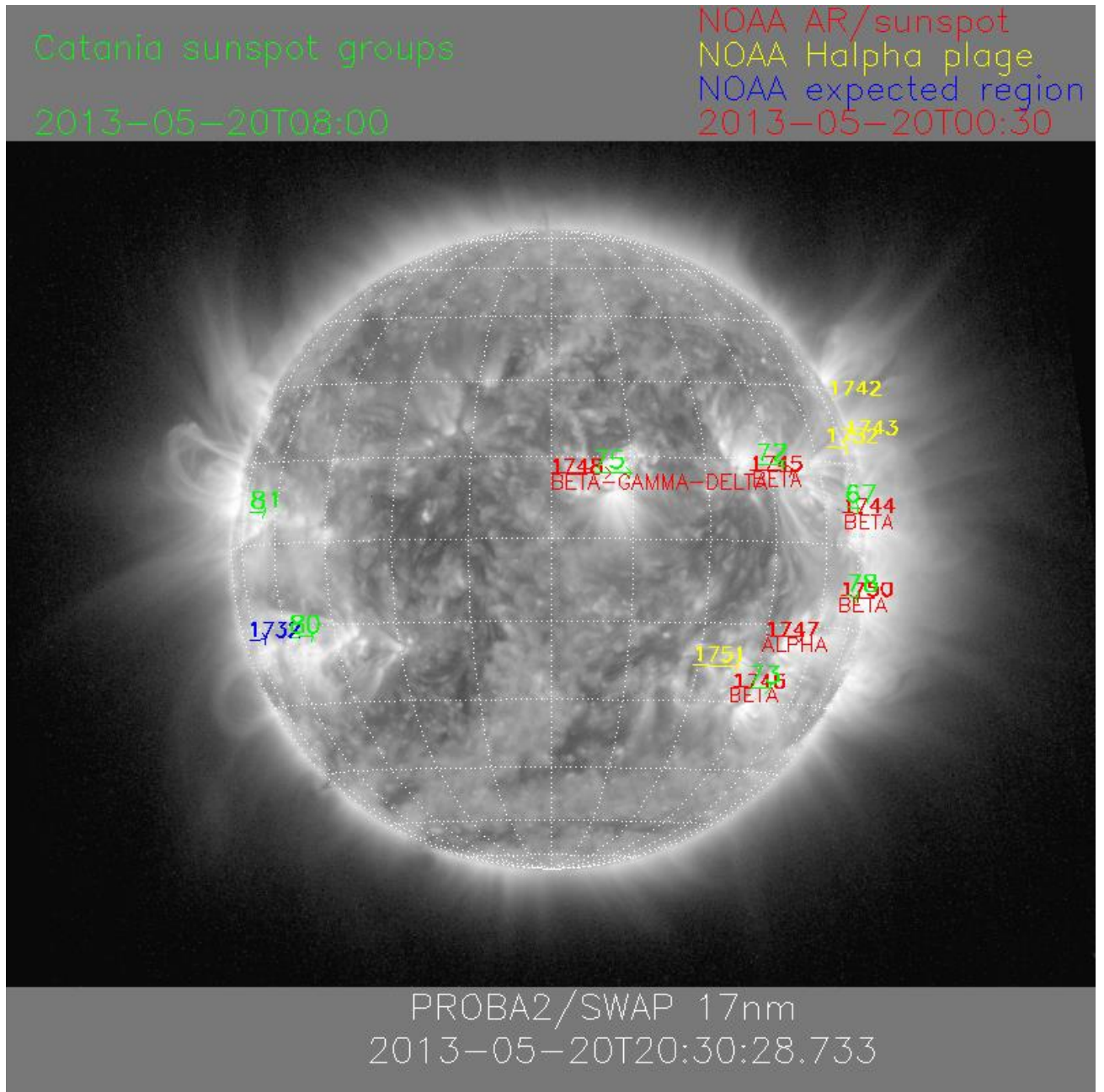
Solar & Space weather events

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

	Monday 20 May	Tuesday 21 May	Wednesday 22 May	Thursday 23 May	Friday 24 May	Saturday 25 May	Sunday 26 May
Activity	moderate	low	moderate	low	low	low	low
Flares	M1.7@05:16	-	M5.0@13:08	-	-	-	-

¹ See appendix. All timings are given in UT.

The SWAP images of May 20 and May 26 are shown below, with annotated active regions.

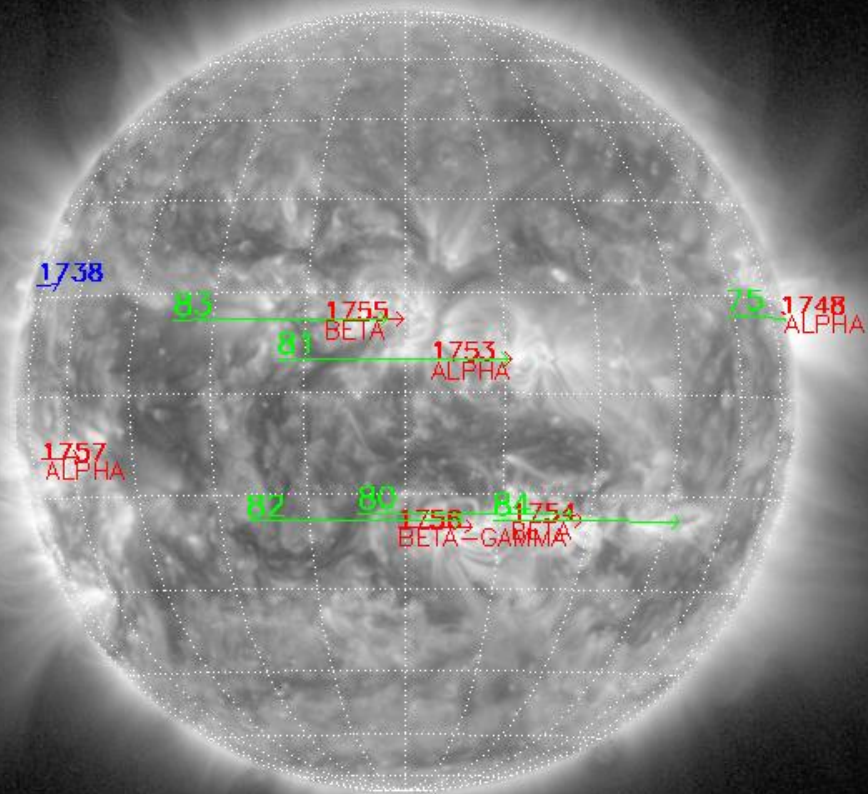


<http://sidc.be/html/CmapPage.html>

Catania sunspot groups

2013-05-24T08:06

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2013-05-26T00:30



PROBA2/SWAP 17nm
2013-05-26T21:55:17.392

Solar Activity

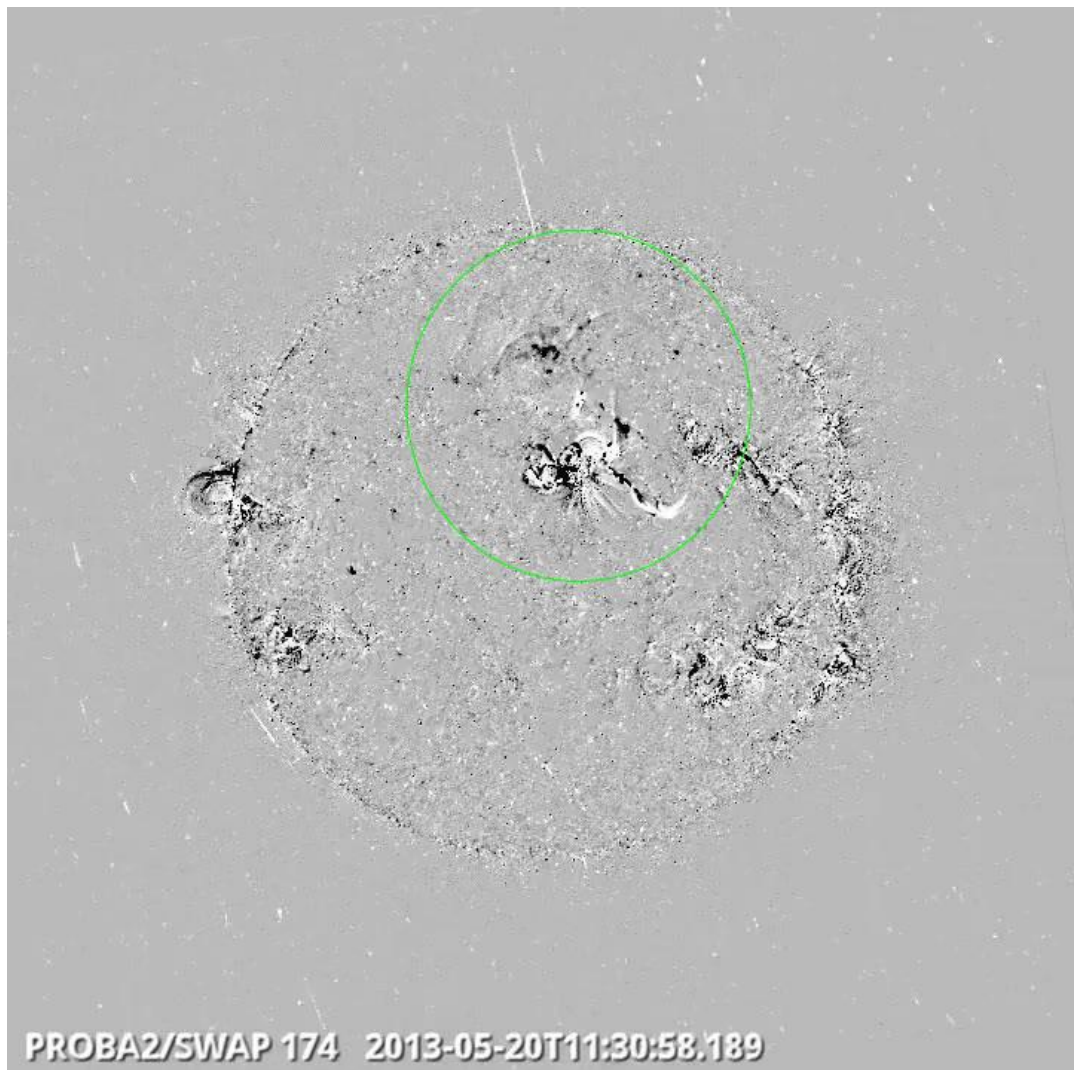
Solar (flaring) activity was low to moderate with 2 M-flares earlier in the week. Especially AR11748 showed activity throughout the week by interacting with AR11745 and an inactive region located north of it.

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.

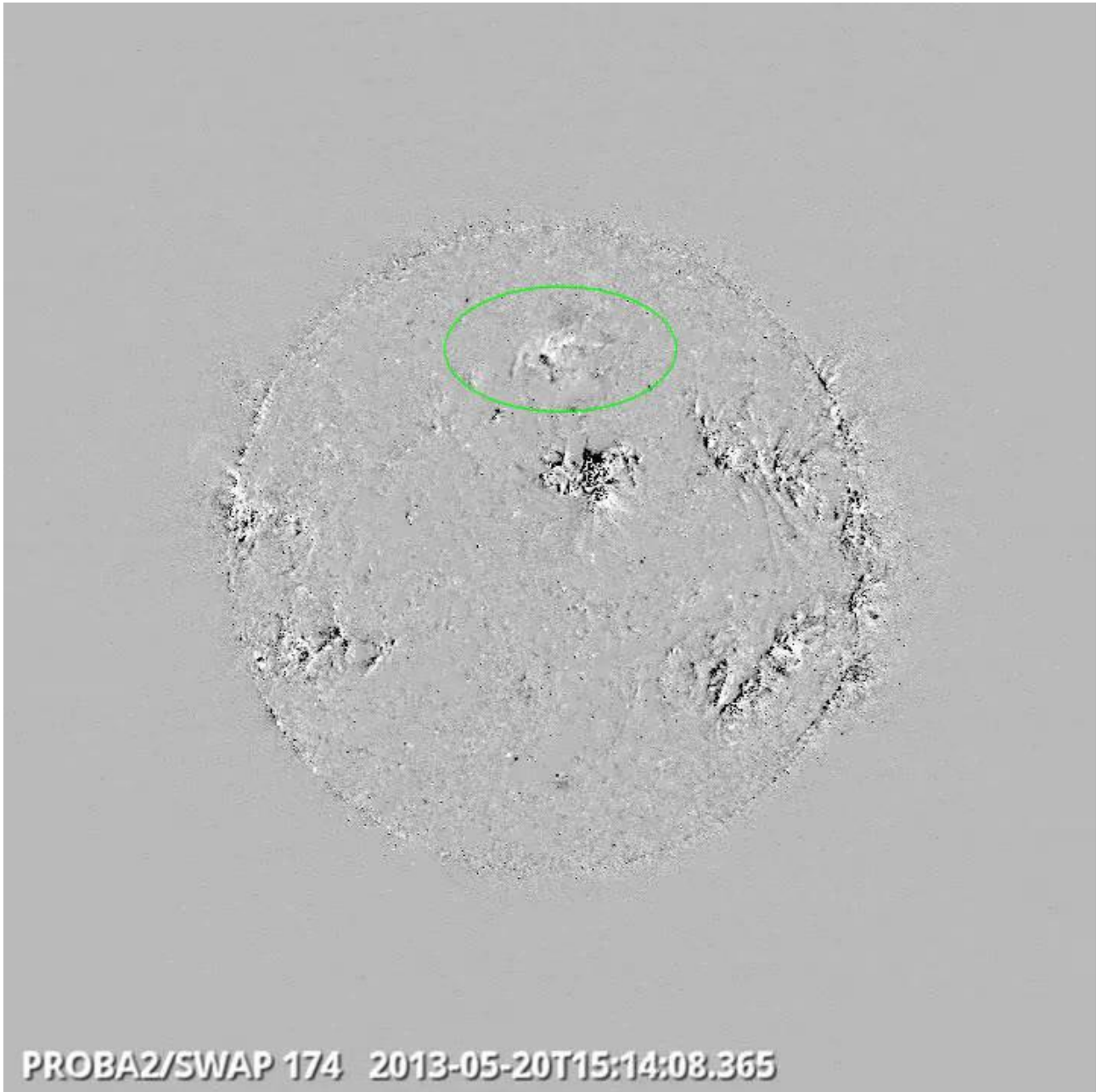
A weekly overview movie can be found [here](#) (SWAP174/AIA304 combination; HelioViewer.org).

Details about some of this week's events, in particular of AR11748's activity, can be found further below.

Monday 20th:



Filament Eruption north center, originating from AR11748 @ 11:30 - SWAP difference image
Find a movie of this event [here](#) (SWAP difference movie)



Filament Eruption in the higher north @ 15:14 - SWAP difference image

Tuesday 21st:



Eruption north center, originating from AR11748 @ 06:24 - SWAP difference image
Find a movie of this event [here](#) (SWAP difference movie)

Wednesday 22nd:

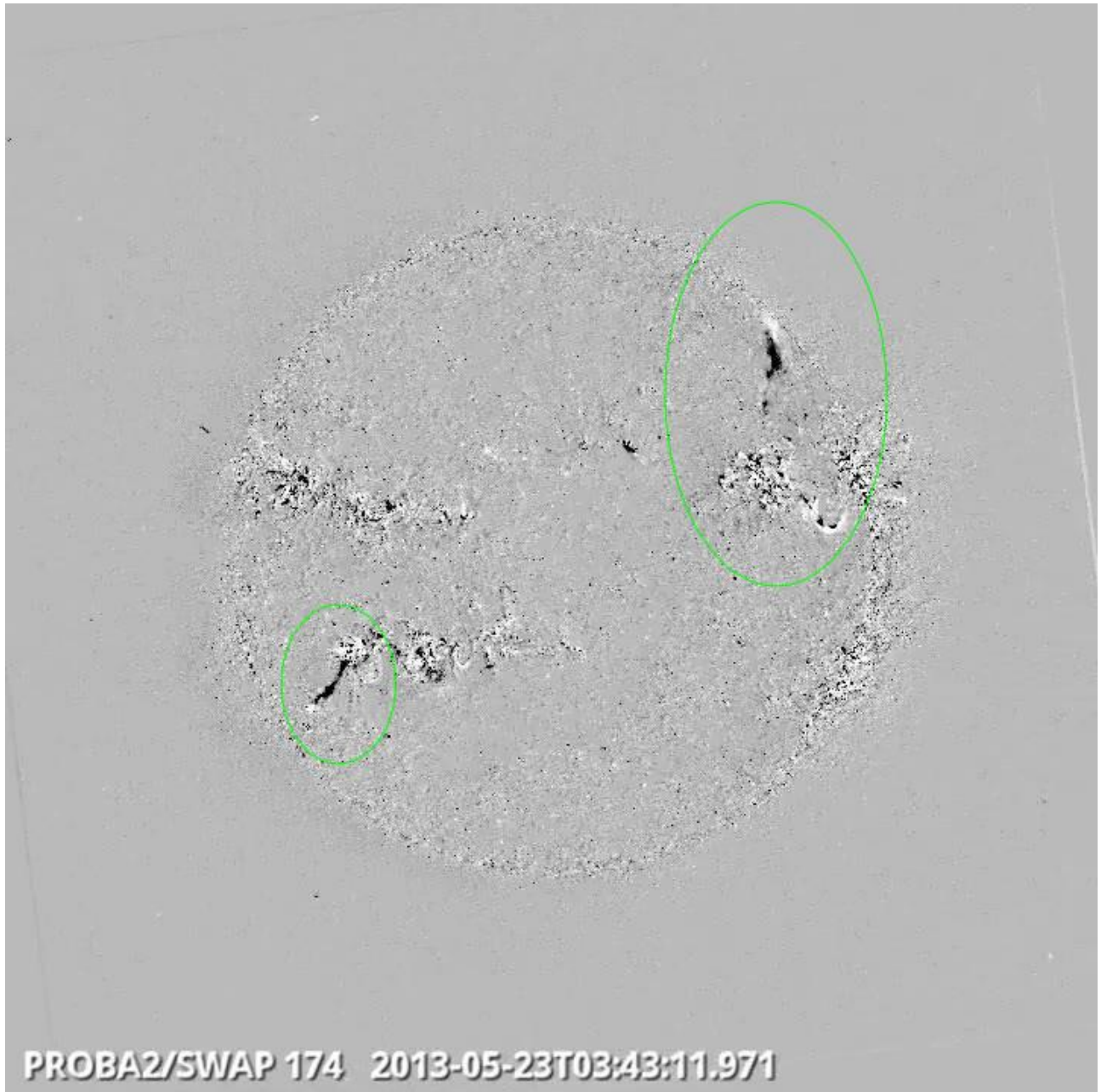


Eruption west limb @ 13:12 - SWAP difference image

Find a movie of this event [here](#) (SWAP difference movie)

Note in this movie that there is a 'feeding' from AR11748 towards AR 11745. This results in 2 eruptions originating from 11745, culminating in an M5 flare which seems to occur in 11745.

Thursday 23rd:



**Eruption north west quadrant (AR11748) + small eruption south east quadrant @ 03:43
- SWAP difference image**

Find a movie of this event [here](#) (SWAP difference movie)



Eruption north west quadrant (AR11748) @ 15:59 - SWAP difference image

Find a movie of this event [here](#) (SWAP difference movie)

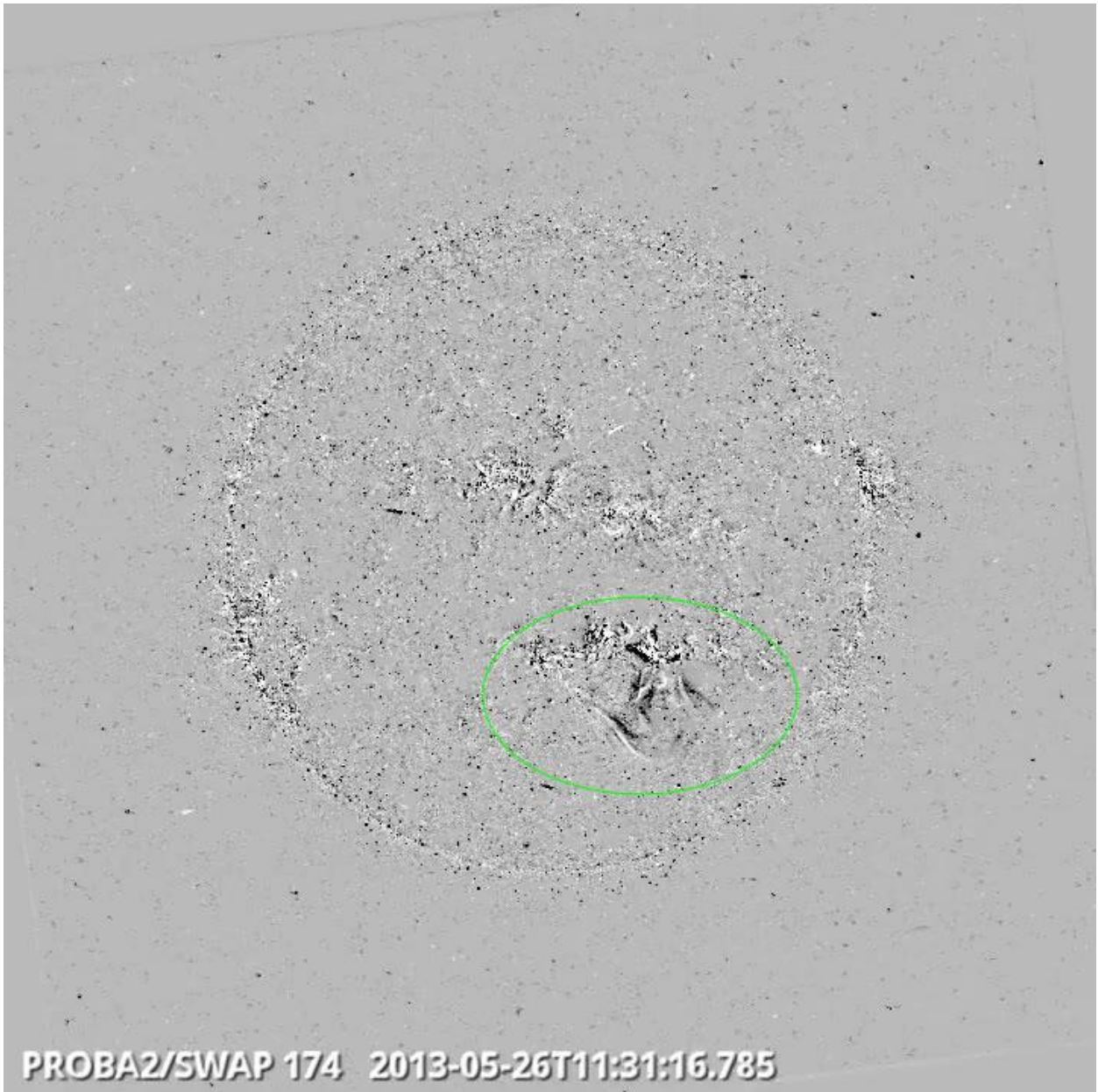
In this movie, several events can be seen:

- eruption from AR11748, extending northwards, followed by
- filament eruption on the NW limb, followed by
- an eruption in AR 11753, near the center of the disk.

Taking an overview of the whole week, AR11748 can be seen to interact and be connected with 2 regions:

- AR11745, from which several eruptions can be seen after an interaction with 11748,
- an inactive region north of it, to which it seems to be connected through a filament or a loop.

Sunday 26th:

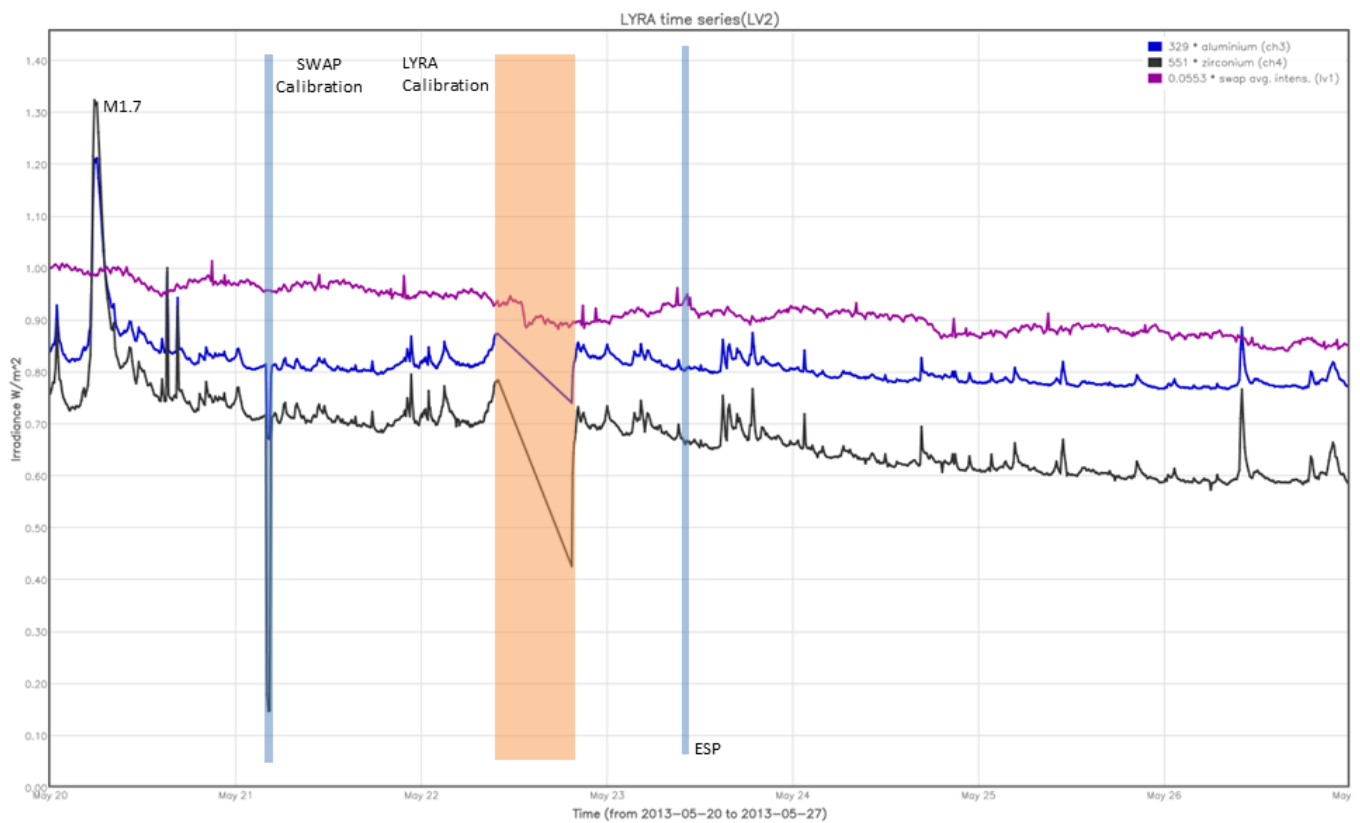


Eruption south east quadrant AR11756 @ 11:31 - SWAP difference image

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
- ESP experiment on Thursday

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

- LYRA calibration on Tuesday

The red shaded period corresponds to:

- None

An M5.0 flare occurred on Wednesday during the LYRA calibration campaign. This flare was thus not recorded.

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.

Guest Investigator Program

- None

2. LYRA instrument status

Calibration

LYRA calibration campaign on Wednesday.

IOS & operations

Monday 20 May	Tuesday 21 May	Wednesday 22 May	Thursday 23 May	Friday 24 May	Saturday 25 May	Sunday 26 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
LYIOS00332	LYIOS00332	LYIOS00332	LYIOS00332	LYIOS00332	LYIOS00332	LYIOS00332

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.45 and 47.43 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, temperature lowered to 45.71.

To be explored

- None

3. SWAP instrument status

Calibration

SWAP calibration campaign on Tuesday.

MCPM errors

The number of MCPM recoverable errors increased from 7788 to 7917.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 20 May	Tuesday 21 May	Wednesday 22 May	Thursday 23 May	Friday 24 May	Saturday 25 May	Sunday 26 May
Nominal acquisition	Nominal acquisition + calibration	Nominal acquisition	Nominal acquisition + ESP	Nominal acquisition	Nominal acquisition	Nominal acquisition
IOS00466 542 images	IOS00466 681 images	IOS00466 566 images	IOS00466 575 images	IOS00466 635 images	IOS00466 591 images	IOS00466 506 images

Special operations for SWAP, this week:

- ESP jump on Thursday

SWAP detector temperature

The SWAP Cold Finger Temperature, globally varied between -1.29 and -0.35 degrees C.

To be explored

- None

4. PROBA2 Science Center Status

The main operator is Koen Stegen.

The following changes were made to the P2SC:

LY-TAF

21/05/2013: r4769; First installation of the LY-TAF tool.

LMAT-UI

21/05/2013: r4772; Add LYTAF tool to LMAT-UI.

5. Data reception & discussions with MOC

Passes

The delivery of the passes for this week (passes 11060 to 11121) 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 2013 May 20 0UT and 2013 May 27 0UT: 4284

Highest cadence in this period: 30 seconds

Average cadence in this period: 141.19 seconds

Number of image gaps larger than 300 seconds: 1

Largest data gap: 34.33 minutes

The largest gap is due to the ESP campaign on Thursday.

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
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?)