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| P2SC-ROB-WR-166- 20130527 Weekly report #166 | P2SC Weekly report |  |
| Period covered: Date: Written by: Approved by: | Mon May 27 to Sun Jun 02, 2013 05 June 2013 Erik Pylyser Matthew West | Royal Observatory of Belgium - PROBA2 Science Center |
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1. Science

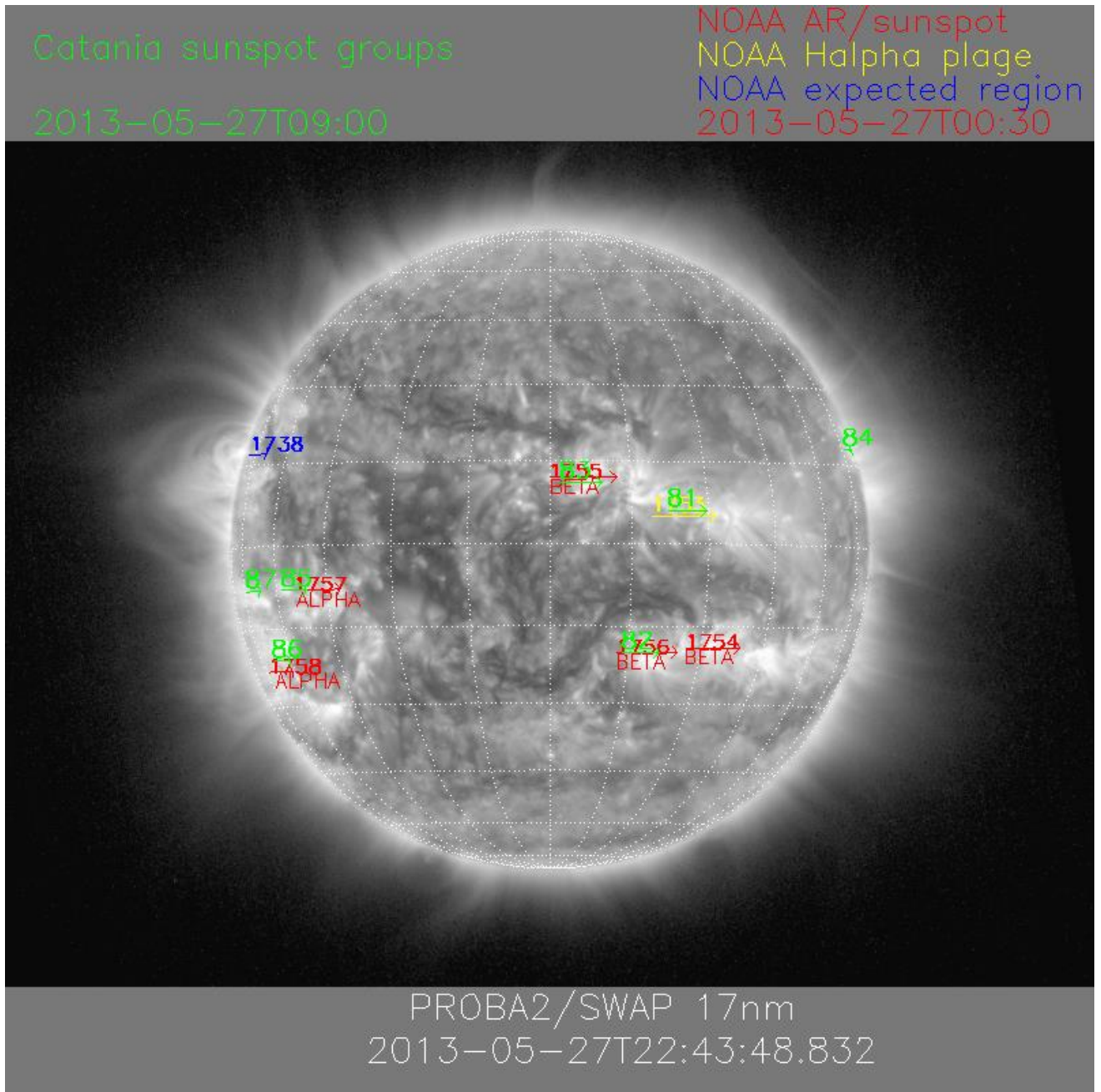
Solar & Space weather events

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

| | Monday 27 May | Tuesday 28 May | Wednesday 29 May | Thursday 30 May | Friday 31 May | Saturday 01 Jun | Sunday 02 Jun |
|----------|------------------|-------------------|---------------------|--------------------|-------------------|--------------------|------------------|
| Activity | very low | very low | low | very low | moderate | very low | low |
| Flares | - | - | - | - | M1.0@19:52 | - | - |

¹ See appendix. All timings are given in UT.

The SWAP images of May 27 and June 02 are shown below, with annotated active regions.

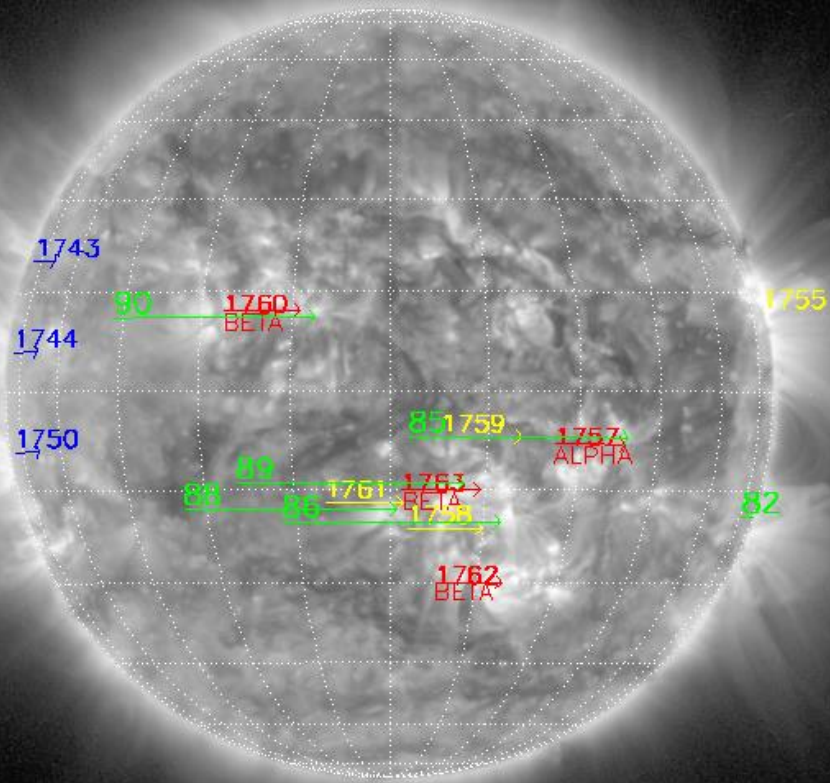


<http://sidc.be/html/CmapPage.html>

Catania sunspot groups

2013-5-31T06:30

NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2013-06-02T00:30



PROBA2/SWAP 17nm
2013-06-02T22:35:37.455

Solar Activity

Solar (flaring) activity was very low to moderate this week. A single M1.0 flare occurred on Friday 31st, from north eastern active region 11760.

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, can be found further below.

Monday 27th:



**Eruption South West quadrant, originating from AR11756 @ 02:21
- SWAP difference image**



Filament Eruption South East limb @ 19:30 - SWAP difference image
Find a movie of this event [here](#) (SWAP difference movie)

Thursday 30th:



Filament Eruption North East limb @ 13:27 - SWAP difference image
Find a movie of this event [here](#) (SWAP difference movie)

Friday 31st

Between 01:00 and 12:00 UT, a beautiful cavity eruption occurred, its effects visible on the solar North Pole. A movie of this event can be seen [here](#).

Some part of this cavity eruption can be discerned above the North Pole in the image below, while another eruption occurs on the south west limb.



Eruption South West limb @ 07:39 - SWAP difference image

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



PROBA2/SWAP 174 2013-05-31T16:23:24.177

Eruption South West limb @ 07:39 - SWAP difference image
Find a movie of this event [here](#) (SWAP difference movie)

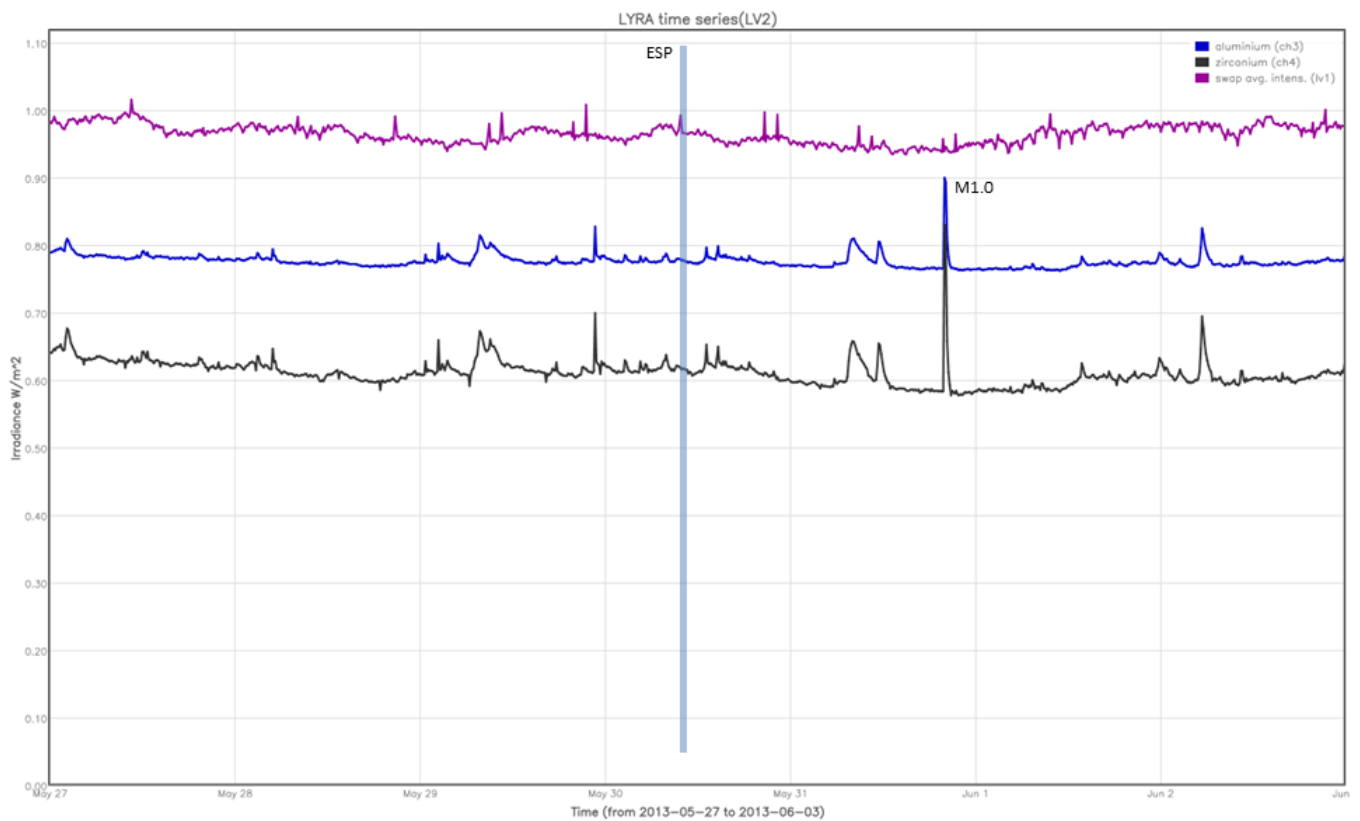


M1.0 flare from AR11760 @ 20:04 - SWAP difference image

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:

- ESP experiment on Thursday

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

- None

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.

Guest Investigator Program

- Nicolas Labrosse and Lindsay Fletcher - one week to work on LYRA.

2. LYRA instrument status

Calibration

No calibration campaign this week.

IOS & operations

| Monday 27 May | Tuesday 28 May | Wednesday 29 May | Thursday 30 May | Friday 31 May | Saturday 01 Jun | Sunday 02 Jun |
|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 | Nominal acquisition + daily U3 |
| LYIOS00332 | LYIOS00332 | LYIOS00332 | LYIOS00332 | LYIOS00332 | LYIOS00333 | LYIOS00333 |

The following science campaigns were performed by LYRA:

- daily U3 observations campaign

LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.50 and 47.27 degrees C, taking into account the daily U3 activation periods; the latter result in a temperature increase of about 0.6 degrees C.

To be explored

- None

3. SWAP instrument status

Calibration

No calibration campaign this week.

MCPM errors

The number of MCPM recoverable errors increased from 7917 to 8160.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

| Monday 27 May | Tuesday 28 May | Wednesday 29 May | Thursday 30 May | Friday 31 May | Saturday 01 Jun | Sunday 02 Jun |
|------------------------|------------------------|------------------------|---------------------------------|------------------------|------------------------|------------------------|
| Nominal acquisition | Nominal acquisition | Nominal acquisition | Nominal acquisition + ESP | Nominal acquisition | Nominal acquisition | Nominal acquisition |
| IOS00466 614 images | IOS00466 627 images | IOS00466 587 images | IOS00466 566 images | IOS00466 609 images | IOS00467 550 images | IOS00467 485 images |

Special operations for SWAP, this week:

- ESP jump on Thursday

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between -1.36 and -0.41 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

27/05/2013: r4776; Accumulate technical debt.

30/05/2013: r4785; Add solar eclipse event type.

31/05/2013: r4786; Handle empty eclipse lists gracefully.

ODP/LY-QLV

28/05/2013: r4778; improve GUI.

5. Data reception & discussions with MOC

Passes

The delivery of the passes for this week (passes 11121 to 11181) 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 27 OUT and 2013 Jun 03 OUT: 4111

Highest cadence in this period: 130 seconds

Average cadence in this period: 147.11 seconds

Number of image gaps larger than 300 seconds: 3

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?)