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| P2SC-ROB-WR-068-20110704<br>Weekly report #068 | **P2SC Weekly report** | |
| Period covered:<br>Date:<br>Written by:<br>Released by: | Mon July 04 to Sun Jul 10 2011<br>2011/07/11<br>M. Dominique<br>M. Dominique | Royal Observatory of Belgium<br>PROBA2 Science Center |
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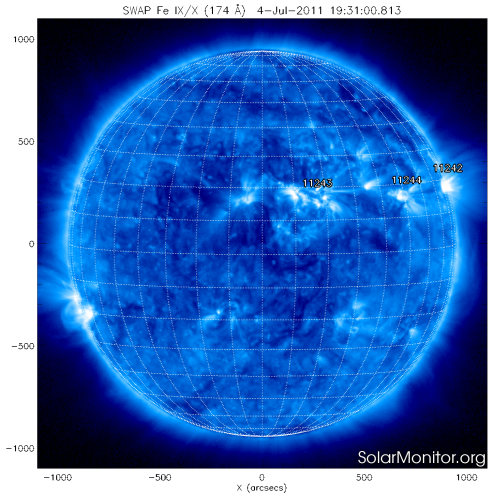
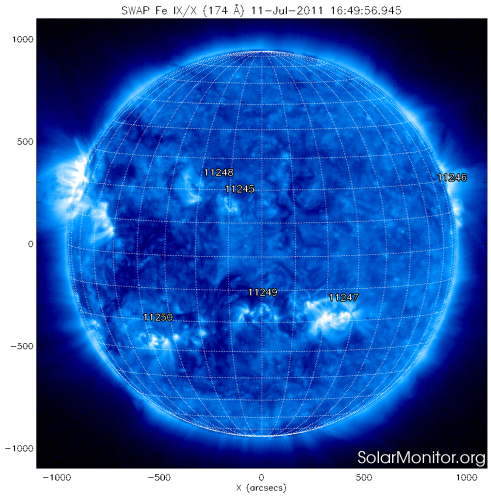
## 1. Science

**Solar & Space weather events**

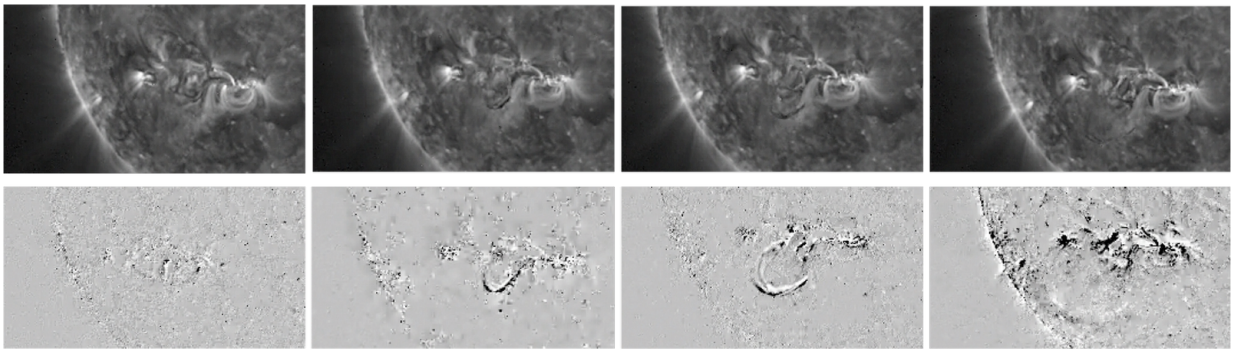
*Overview*

The SWAP images of Jul 04 and Jul 11 are shown below, with annotated active regions:



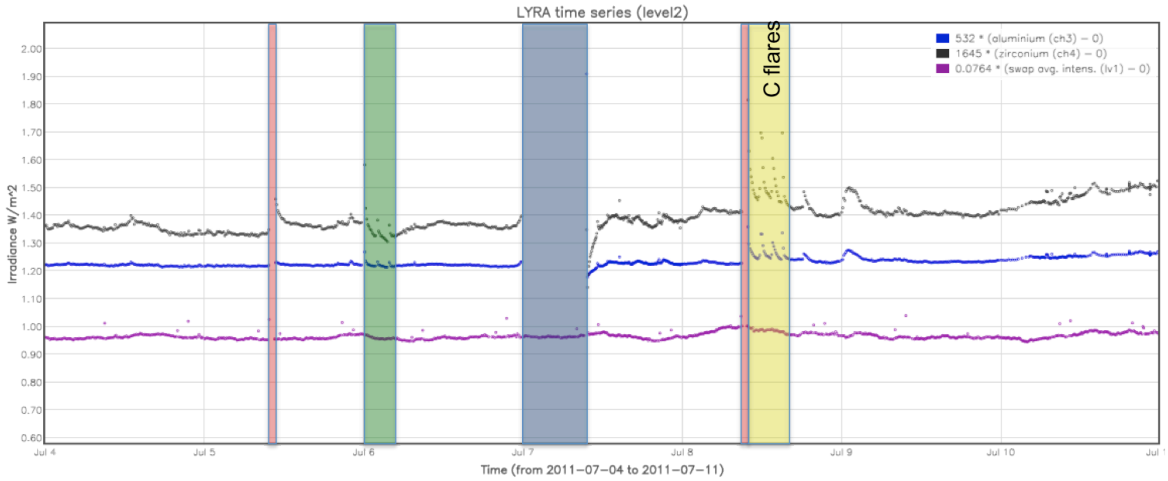




In general, the Sun was not very active. On LYRA, the only noticeable activity was a series of C flares on Jul 08. Nevertheless, Swap observed 7 small filament eruptions that were associated to CME (none of which was directed toward Earth).



Most of the activity was associated AR 11247, which started to be visible on the East limb on Jul 04.

Week overview of LYRA Al/Zr signals and SWAP average intensity (SWAVINT in purple):




The calibration campaign is annotated in blue, the back-up acmpaign in green, and data gaps due to propulsion campaigns in red. The peaks in LYRA signals are due to solar flares. The tiny, periodical peaks in SWAVINT were caused by crossing over the SAA.

**Scientific campaigns**

- Jul 05: propulsion experiment 09:53 - 10:31
- Jul 06: back-up acquisition units 3 and 1 (LREP_03 a and b) 00:00-03:44
- Jul 07: ESP experiment 09:13 - 09:42 + Lyra calibration LREP_02 00:00-09:37
- Jul 08: propulsion experiment 09:00 - 09:38

**Outreach, papers, presentations, etc.**

Dr. Matthieu Kretzschmar joins the LYRA team. He will be involved in the scientific exploitation of the data. His main fields of investigation relate to irradiance, flares and occultations.

**To be explored**
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## 2. LYRA instrument status

**Calibration**

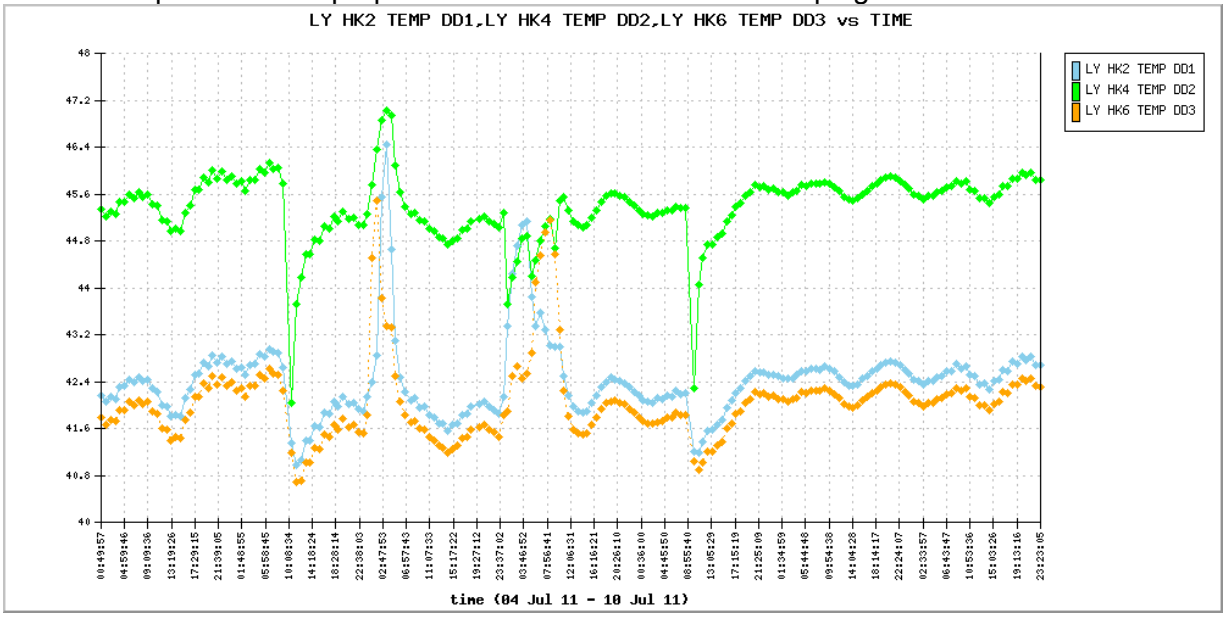
- A back-up campaign took place on Jul 06 for both units 3 and 1 (LREP_03 a and b) from 00:00 to 03:44
- On Jul 07, we scheduled the usual calibration sequence LREP_02 00:00-09:37

**IOS & operations**

| Monday 04 Jul | Tuesday 05 Jul | Wednesday 06 Jul | Thursday 07 Jul | Friday 08 Jul | Saturday 09 Jul | Sunday 10 Jul |
|---|---|---|---|---|---|---|
| Nominal acquisition<br><br>LYIOS00177 | Nominal acquisition<br>+ propulsion campaign<br><br>LYIOS00178 | Nominal acquisition<br>+ back-up campaign<br><br>LYIOS00179 | Nominal acquisition<br>+ calibration campaign<br><br>LYIOS00179 | Nominal acquisition<br>+ propulsion campaign<br><br>LYIOS00179 | Nominal acquisition<br><br>LYIOS00179 | Nominal acquisition<br><br>LYIOS00179 |

**LYRA detector temperature**

The LYRA detector 2 temperature (nominal unit) fluctuated between 44.5 and 46 degrees Celsius. The peak of Jul 06 is due to the back-up acquisition. Downward excursions were seen as a consequence of the propulsion and LYRA calibration campaigns.




**To be explored**

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## 3. SWAP instrument status

**Calibration: /**

**MCPM recoverable errors**

increased from 5 to 70 this week.

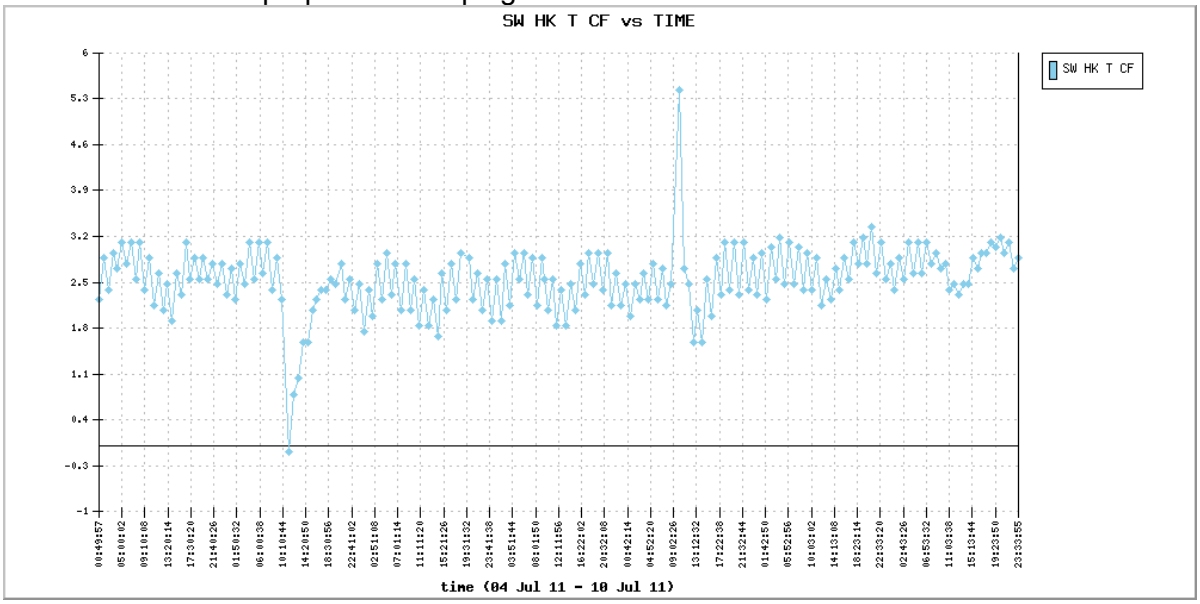
The number of MCPM unrecoverable errors is still 0.

**IOS & operations**

| Monday<br>04 Jul | Tuesday<br>05 Jul | Wednesday<br>06 Jul | Thursday<br>07 Jul | Friday<br>08 Jul | Saturday<br>09 Jul | Sunday<br>10 Jul |
|---|---|---|---|---|---|---|
| Nominal acquisition<br><br>IOS00314<br>782 images | Nominal acquisition<br>+ propulsion campaign<br><br>IOS00315<br>761 images | Nominal acquisition<br><br>IOS00315<br>774 images | Nominal acquisition<br>+ ESP campaign<br><br>IOS00315<br>711 images | Nominal acquisition<br>+ propulsion campaign<br><br>IOS00315<br>672 images | Nominal acquisition<br><br>IOS00315<br>682 images | Nominal acquisition<br><br>IOS00315<br>722 images |

**SWAP detector temperature**

The SWAP Cold Finger Temperature fluctuated between 1.5 and 3.5 degrees Celsius. Effects were seen of the two propulsion campaigns.




**To be explored**

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## 4. PROBA2 Science Center Status

M. Dominique was operator during this week.

The following tools were updated on the operational server:

| Software name | Update | Date | Comment |
|---|---|---|---|
| ADP | r4138 | 2011/07/05 | enhancement of performances |

## 5. Data reception & discussions with MOC

**Passes**
The data reception this week was perturbed by a wrong configuration of SVA antenna. After the replacement of the SG40 GPS receiver on 01/07/2011, the signal reception has been limiting to an elevation higher than 5 deg while the KSAT XML reply did not cut the pass.
As the signal reception was expected up to the horizon mask, many packets were lost on almost all downlink passes from 2011-07-01 till the end of the week.

As a result, passes 5114, 5117 and 5121 contained multiple small gaps of 330 sec in SWAP data and some other passes contained one image corrupted or truncated. Nevertheless, no pass can be considered as totally failing.

The P2SC has been unavailable from Jul 10 00:30 to Jul 11 13:31 due to the crash of one server.

**Data coverage HK**
The HK data were not complete this week. All packets have been received, but data gaps remained

- on Jul 05 from 19:55:59 to 20:07:59, right before pass 5074
- on Jul 06 from 07:12:30 to 07:21:00 (pass 5079) and from 18:47:30 to 19:29:00 (pass 5083)
- on Jul 07 from 02:40:01 to 03:26:01 (pass 5086) and from 03:58:31 to 04:05:01 (pass 5087)

**Data coverage SWAP**

Many images are missing this week because of the wrong configuration setting of the SVA antenna mentioned before. Thanks to the prioritizing of SWAP image download, this never resulted in any significant gap, but well in multiple small gaps of 330s (like in pass 5114 where 7 such gaps were observed).

Statistics for complete week:

*Total number of images between 2011 Jul 04 0UT and 2011 Jul 11 0UT: 5108*
*Highest cadence in this period: 110 seconds*
*Average cadence in this period: 118.38 seconds*
*Number of image gaps larger than 300 seconds: 17*
*Largest data gap: 39.37 minutes*

Most of the gaps are short gaps of 330s, the longer gaps correspond to ESP and propulsion campaigns.

**Data coverage LYRA**
The LYRA data were complete this week (see overview in Sect.1).

## 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 |
| SCOS | Spacecraft Operation System |
| 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 |
| TBW | To Be Written |
| TC | Telecommand |
| TPMU | Thermal Plasma Measurement Unit |
| UTC | Coordinated Universal Time |
| UV | Ultraviolet |