P2SC-ROB-WR-019-20100719 Weekly report #019	**P2SC Weekly report**	 *
Period covered: Date: Written by: Released by:	Mon July 12 to July 19 2010 Mon July 12 2010 Carlos Cabanas Marie Dominique	Royal Observatory of Belgium PROBA2 Science Center
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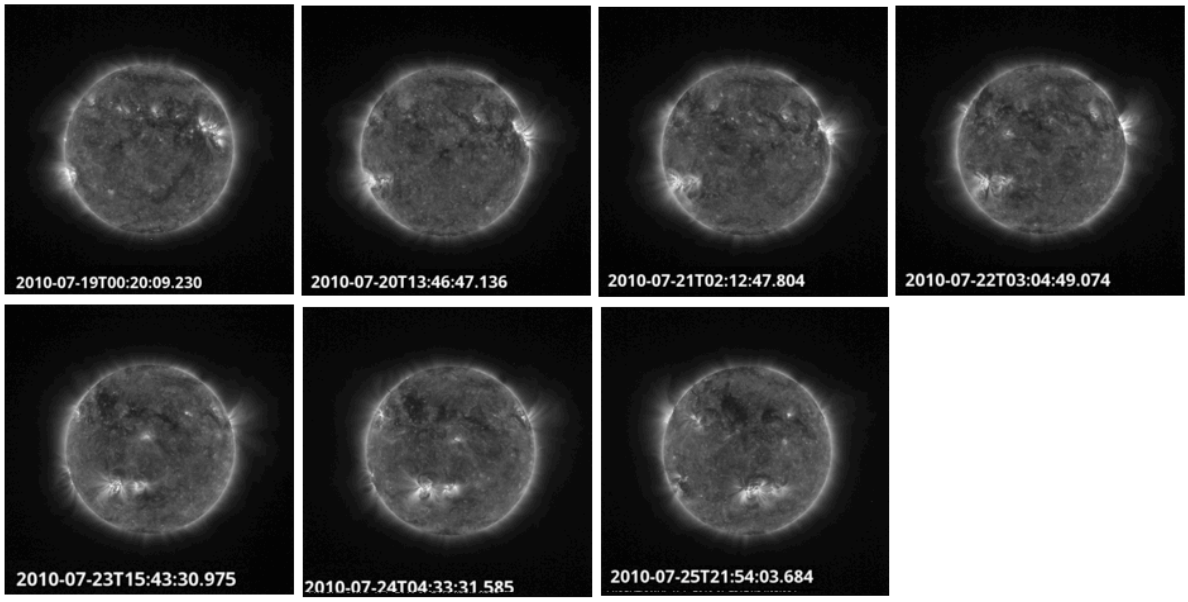
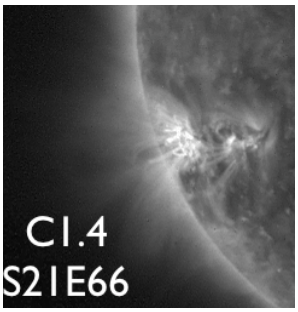
1. Science

Space weather events

Solar activity remained very low during the week. Mainly, two big active regions have been rotating over the South-East quadrant and the North-West limb as it can be seen in the next picture:



These active regions have produced several B-class events and one isolated C-class flare (a c1.4 at 20-July-2010 13:38 UT) .

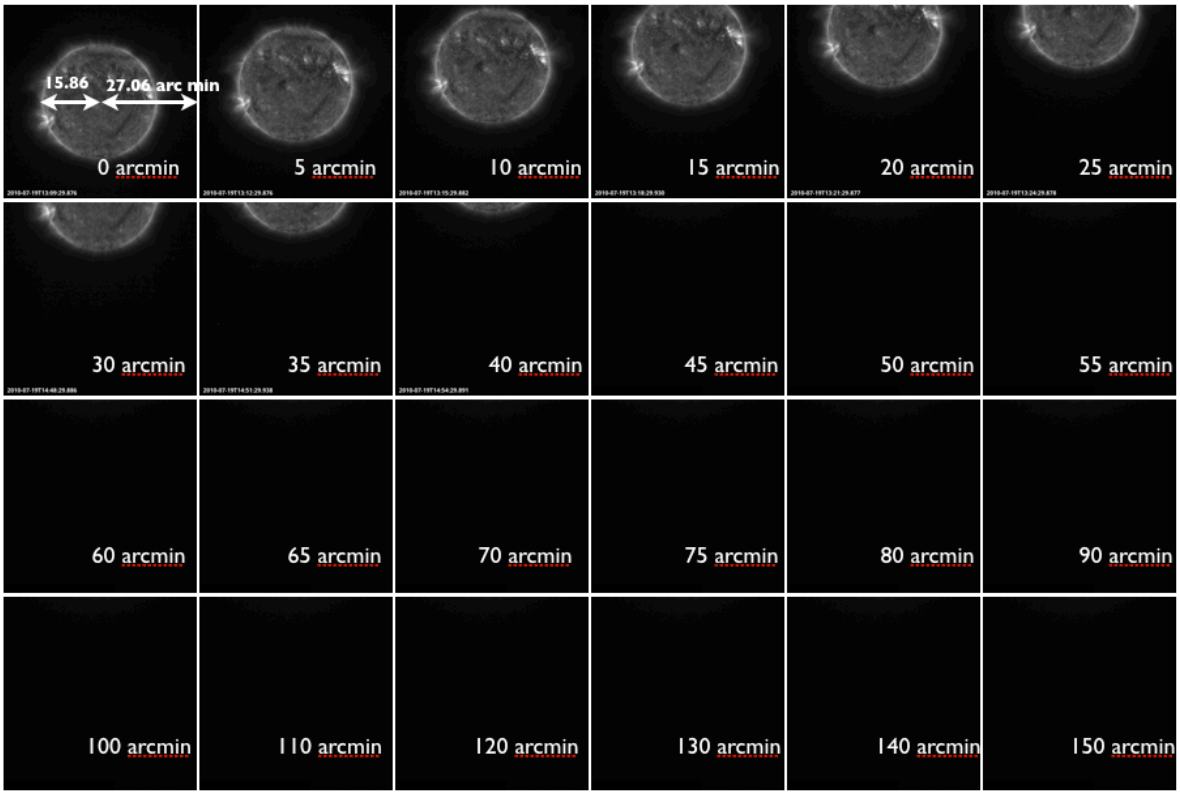


Scientific campaigns

1. Stray light measurement.

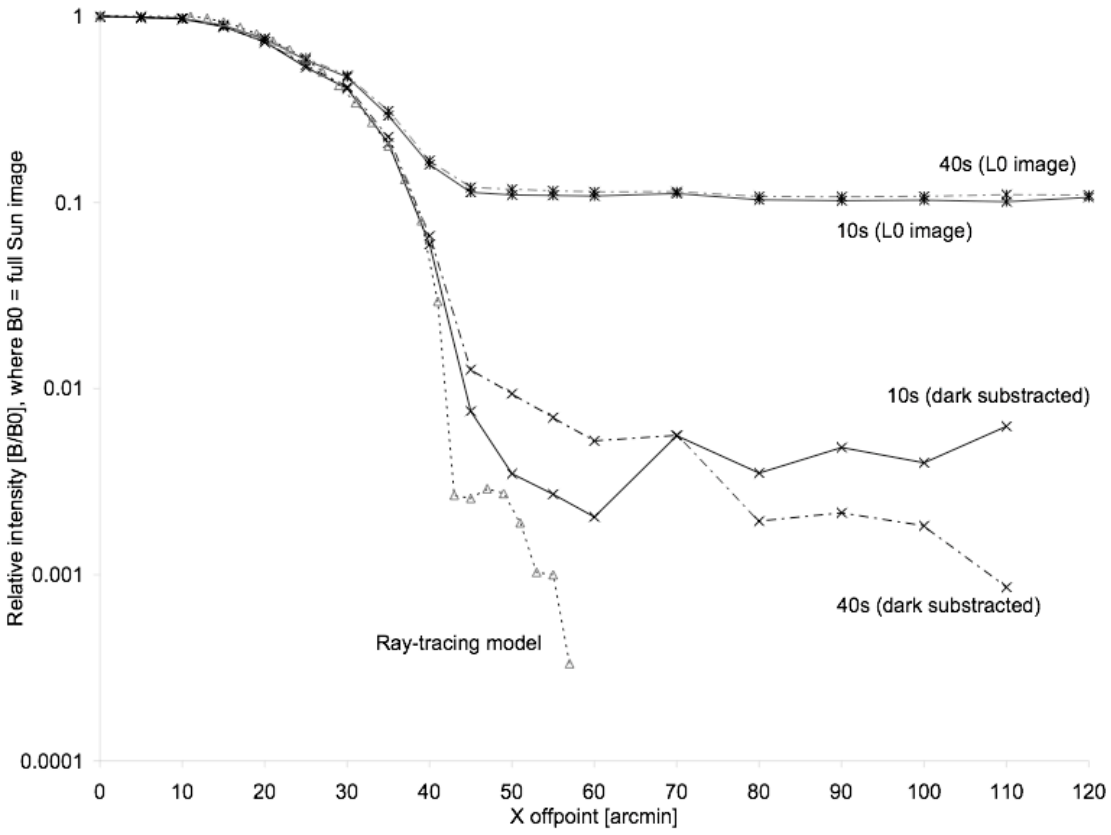
Period1: 19 July 2010 from 13:06 to 13:31 UTC
Period2: 19 July 2010 from 14:45 to 15:10 UTC
Period3: 19 July 2010 from 16:25 to 16:50 UTC
Period4: 19 July 2010 from 18:04 to 18:29 UTC
Intentions: stray light measurement.
Overview of acquired images:
SWAP acquired images during periods where the detector and the north sun were aligned (always sun shinning the same part of the detector).
25 different off-points were performed.
SWAP acquired a set of 2 images (10s) + 2 images (40s) per each off-point position. It means a total of 24 +28+24+24= 100 images.
South Atlantic Anomaly was skipped.
Images were unprocessed and labeled with high priority

The next sequence of pictures show the evolution of the paving campaign:



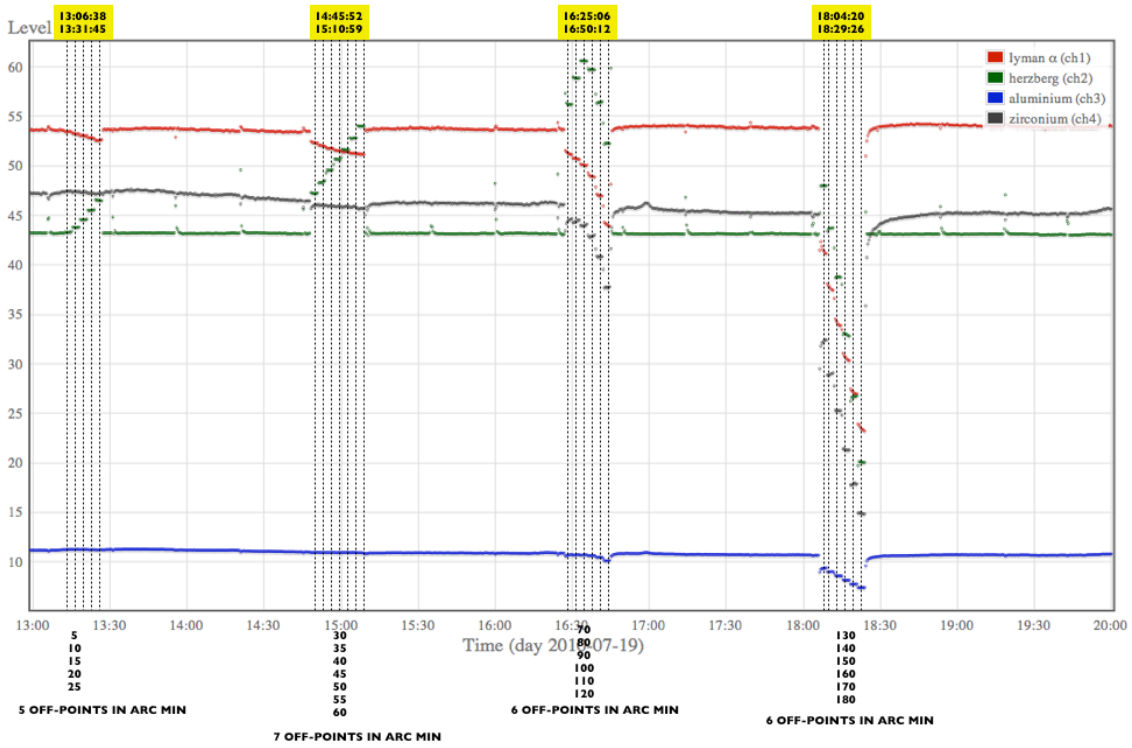
IOS: SWAP_IOS00143
Asked by: CSL

SWAP results:
The follow curves show the analysis of the stray light measurement campaign. (graphic courtesy of Jean-Philippe Halain - CSL)



LYRA results:

LYRA saw the different off-points. *Aluminium, Zirconium and Lyman* alpha channels showed expected results: the signal level decreased as the pointing went down.
Herzgerg channel displayed as in other occasions a peculiar behavior: the signal level increased from a 0 to 90 arc minutes off-point, and decreased from 100 arc minutes to 160 arc minutes. Whether this effect is due to an imprinted degradation is still under investigation..



2. Hot pixel evolution campaign

Period1: 21th of July 2010 from 00:00 to 00:28 UT.

Intentions: renew the on-board pixel map.

Overview of acquired images:

SWAP acquired 12 different sets of images

- 3 images: IT=3s , no LED, off-point=0.
- 3 images: IT=10s , no LED, off-point=0.
- 3 images: IT=3s , LED A, off-point=0.
- 3 images: IT=10s , LED A, off-point=0.
- 3 images: IT=3s , LED B, off-point=0.
- 3 images: IT=10s , LED B, off-point=0.
- 3 images: IT=3s , no LED, off-point=3 degrees.
- 3 images: IT=10s , no LED, off-point=3 degrees
- 3 images: IT=3s , LED A, off-point=3 degrees
- 3 images: IT=10s , LED A, off-point=3 degrees
- 3 images: IT=3s , LED B, off-point=3 degrees
- 3 images: IT=10s , LED B, off-point=3 degrees

A total of 36 unprocessed images were acquired.

- PN=0 (high priority)

IOS: SWAP_IOS00143

Asked by: CSL

Results: ongoing.

Outreach, papers, presentations, etc.

David Berghmans and Ingolf Dammasch participated in the Scientific Assembly of the Committee on space research - COSPAR 2010. It is the biggest interdisciplinary conference on space science worldwide. It took

place in the city of Bremen (Germany) from 18th to 25th July 2010. 26 presentations rooms and 2000 m2 of poster area were made available in order to give 2500 scientists the opportunity to present their latest results in space research and technology. Ingolf Dammasch had an invited talk about Lyra.

To be explored
The results of the stray light measurement campaign need more analysis. Moreover, the campaign should be repeated in order to get 5 images per each off-point position instead of 2, and the paving might be done towards the SWAP radiator direction (Sun East).

2. LYRA instrument status

Calibration
No calibration campaign took place last week.

IOS & operations
No IOSs were submitted.
LYRA remained acquiring the reporting period through Head 2 with a cadence of 50 ms.

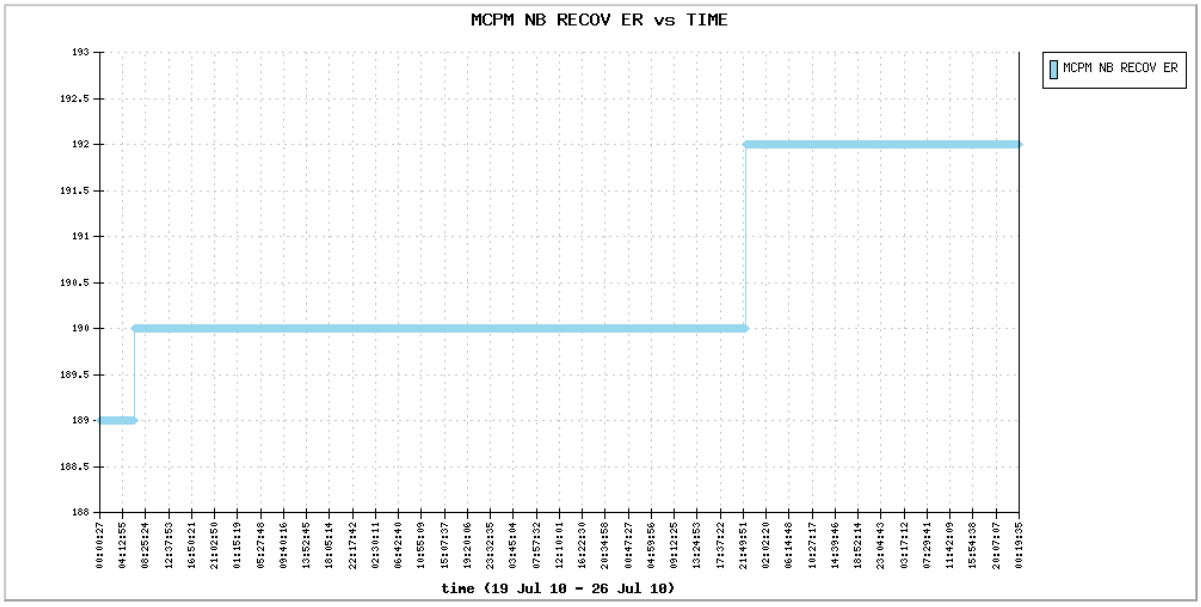
LYRA anomalies

To be explored

3. SWAP instrument status

MCPM recoverable errors

The number of MCPM recoverable errors increased from 189 to 192 during the reporting period:
* MCPM NB RECOV ER changes at time 2010-07-19T06:21:28.000Z from 189 to 190.
* MCPM NB RECOV ER changes at time 2010-07-23T22:21:33.000Z from 190 to 192.



TIME MCPM NB RECOV ER

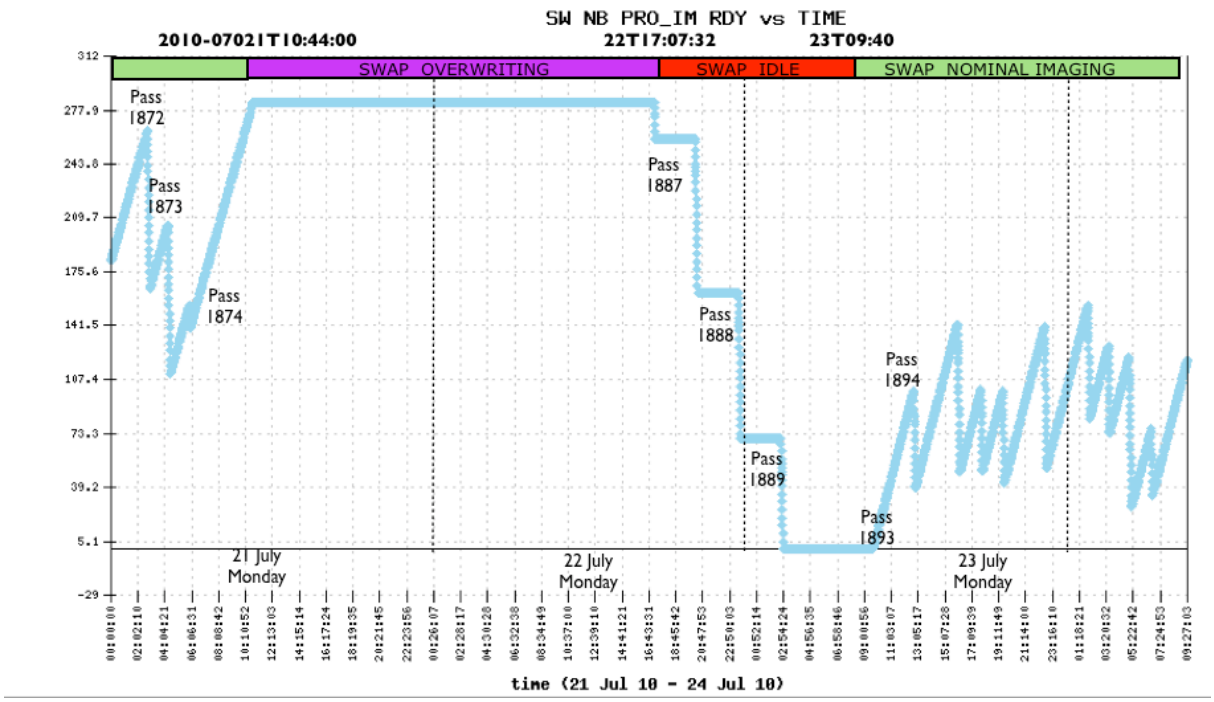
The number of MCPM unrecoverable errors is still 0.

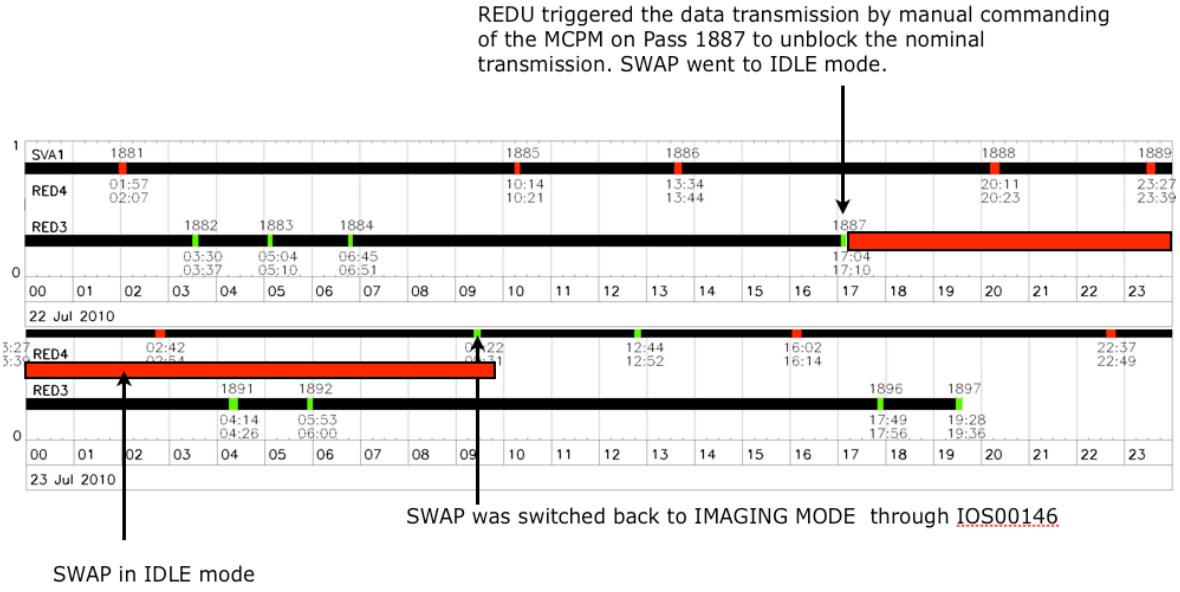
IOS & operations

On Monday 20 SWAP performed a paving campaign with the intention of studying the impact that the stray light has over the pure signal. On 21 of July, SWAP acquired LED images to analyze the hot pixel evolution. Both these campaigns were handled by **SWAP IOS 143.**

On Tuesday 21 2010, SWAP carried out the usual LED calibration campaign. It was handled by **SWAP IOS 144.**

On July 21 the transmission of images was blocked on board. The processed buffer became full and sun images were overwritten. SWAP remained in **IDLE mode** (REDU request) from 17:10 of July 22th to 09:40 of July 23th (16 hours and 30 minutes). SWAP IOS 145 was submitted to command it to IDLE mode and SWAP IOS 146 was sent to switch it back to IMAGING mode. The cadence was increased from 110 seconds do 120, as the buffer was empty, no special campaigns were going to be commanded and there were still six passes left for that day.

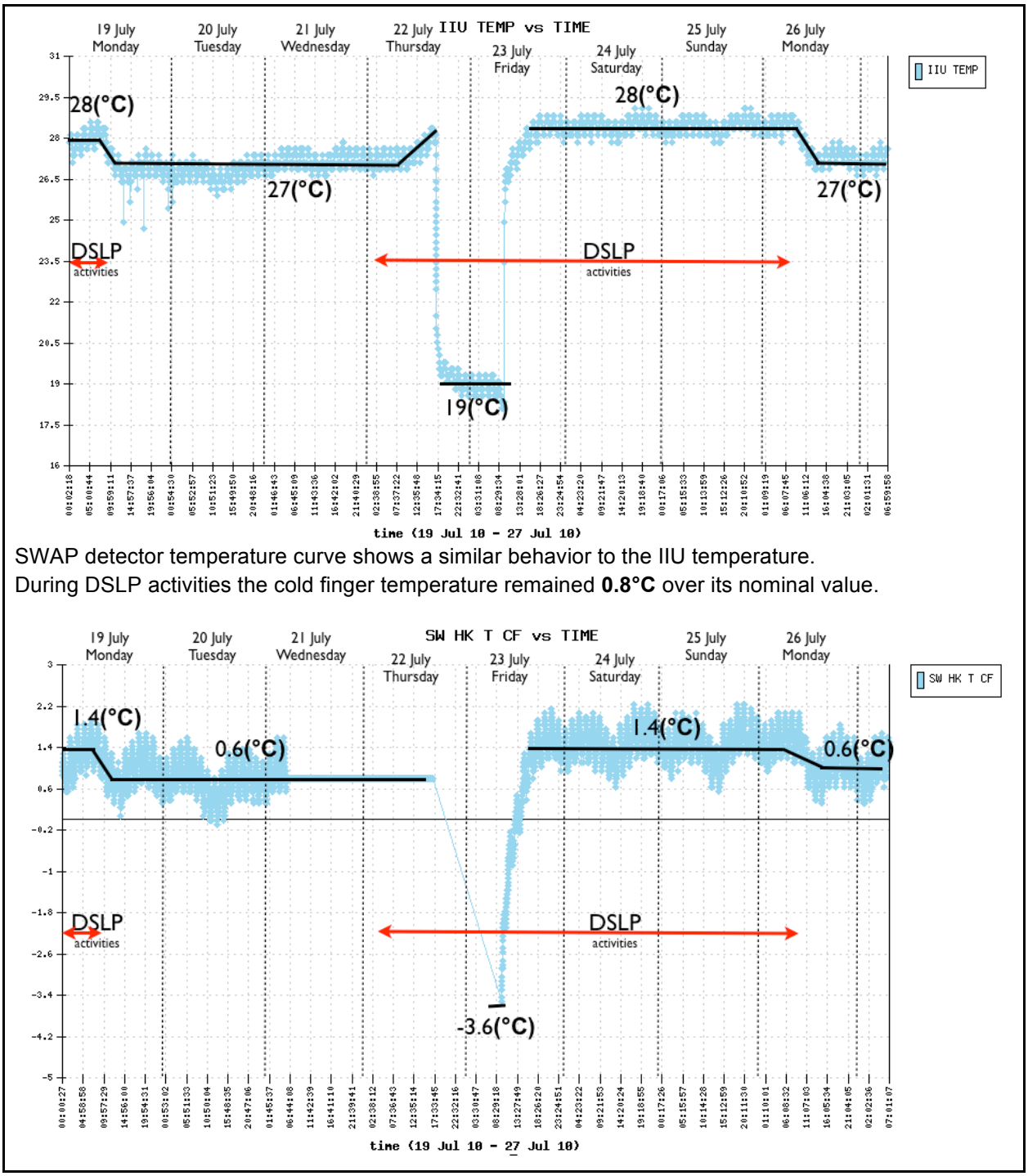




SWAP detector and IIU temperature

For SWAP, the main IIU function is the power supply for the FPA proximity electronics.The IDLE commands keep the MCPM powered, but stop the Proximity Electronics. IIU temperature curve shows clearly the period where SWAP remained in IDLE mode.

It is also remarkable that during DSLP activities the IIU temperature remained **1 (°C)** over its nominal value.



SWAP detector temperature curve shows a similar behavior to the IIU temperature.
During DSLP activities the cold finger temperature remained **0.8°C** over its nominal value.

4. PROBA2 Science Center Status

Carlos Cabanas was operator during this week.

The LYRA EDG was operated manually. SWAP daily movies were also created manually.

The following tools were updated on the operational server:

Software name	Update	Date	Comment
PPT_ADP	r3430/r3442	15/07/2010	First modification to simplify logic using p2sc_string_isnumeric. Second modification to fix bug introduced while changing to use of p2sc_string_isnumeric (underflow detection)
CLOG/ libp2sc	r3466	23/07/2010	FITS history support
libswap	r3448	23/07/2010	SWMPG: fits2png - re-arrange code
PPT	r3465	23/07/2010	Support for prediction of LARs PPT: change ID of PPT_FRAME_P2PREDICT
PTI	r3464	23/07/2010	Fix bug in the picture which represents the quaternions directions.

5. Data reception & discussions with MOC

Passes

Data coverage HK
Nominal

Data coverage SWAP

2010/07/19

- Pass 1855:
    - It was received twice. The first extraction failed because the BBE extraction crashed. The extraction was processed a second time and after that the data was received.

2010/07/20

- Pass 1871:
    - BINSWAP20100720202901000011521 7PROCESSED - Corrupted first packet

2010/07/21

- Pass 1874:
    - BINSWAP20100721055301000011555 5PROCESSED - Packet CRC does not validate (Image content shorter than expected: 589600 < 629712)

2010/07/23

- Pass 1895:
    - BINSWAP20100723152145000011593 4PROCESSED - Packet CRC does not validate (Image content shorter than expected: 65440 < 630400)

2010/07/24

- Pass 1906:
    - BINSWAP20100724173445000011663 9PROCESSED - Packet CRC does not validate (Image content shorter than expected: 327520 < 623200)

Some statistics:
Total number of images between 20100719 and 20100725: 3113
Highest cadence in this period: 13 seconds
Average cadence in this period: 208.13 seconds
Number of image gaps larger than 300 seconds: 328 - due to high priority campaigns and the images overwritten (on board blocked transmission)
Largest data gap: 997.67 minutes

Data coverage LYRA

2010/07/24

- Pass 1906: size of this packet is 1742, but the expected value given in the header is 820. The packet was not processed by the P2SC pipeline.

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
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