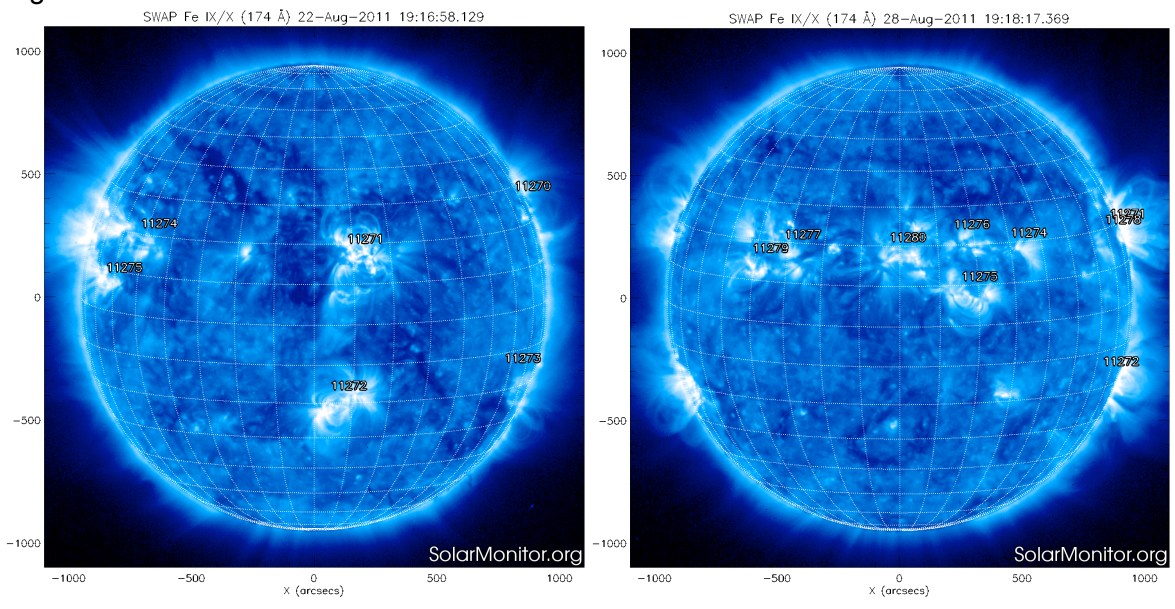
P2SC-ROB-WR-075-20110822 Weekly report #075	**P2SC Weekly report**	
Period covered: Date: Written by: Released by:	Mon Aug 22 to Sun Aug 28 2011 Mon Aug 29 2011 Anik De Groof Joe Zender	Royal Observatory of Belgium PROBA2 Science Center
To:	LYRA PI, marie.dominique@sidc.be SWAP PI, david@sidc.be	http://proba2.sidc.be ++ 32 (0) 2 373 0 559
cc:	ROB DIR, ronald@oma.be ESA Redu, Etienne.Tilmans@esa.int ESA D/SRE, Joe.Zender@esa.int ESA D/TEC, Karsten.Strauch@esa.int	

1. Science

Solar & Space weather events

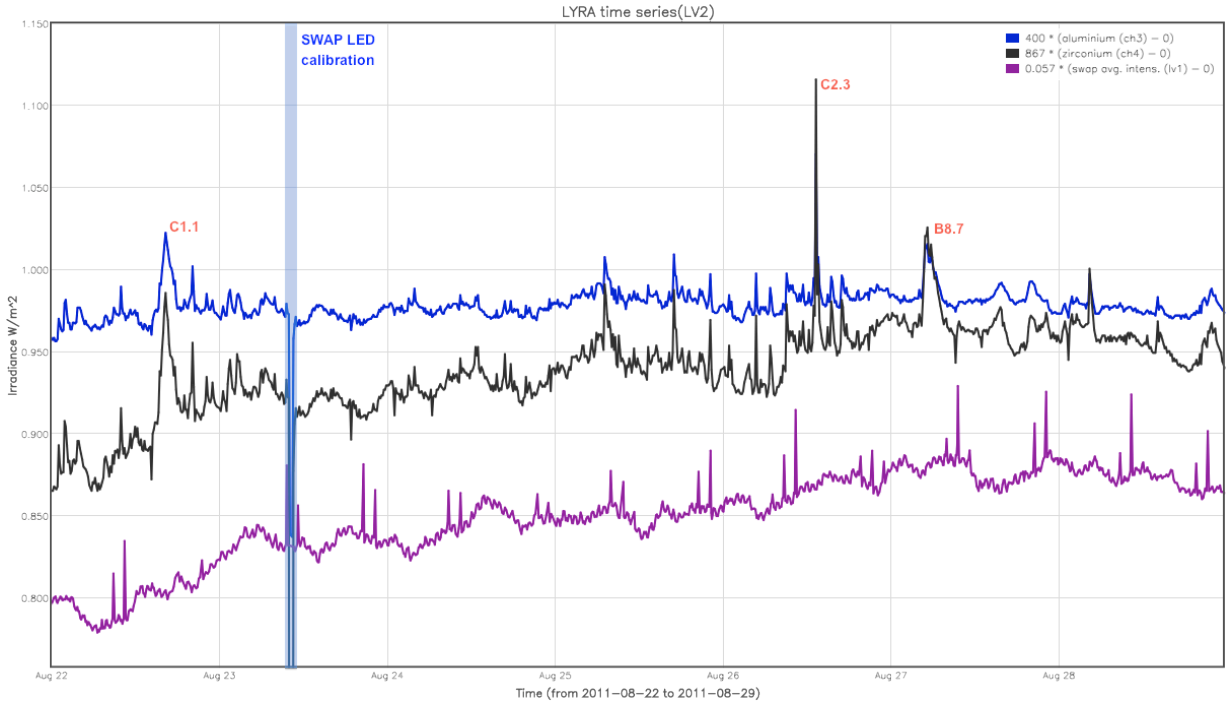
Overview

The SWAP images of August 22 and August 28 are shown below, with annotated active regions:



In general the solar activity on the Sun was very quiet. AR11271 crossed the Western hemisphere this week and produced 4 small C flares. All the other ARs (9 in total) did not produce any solar flare.
On August 28, SWAP captured a small CME originating from AR11271 off-limb but the signal was very weak and the resulting data not spectacular.

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



The calibration campaigns are annotated in blue, data gaps 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.

The overall rise in SWAP average intensity an LYRA Zr is the result of the 9 new active regions that appeared throughout the week (especially on Monday). They however did not produce a lot of activity.

Scientific campaigns

There were no scientific campaigns performed this week.

Outreach, papers, presentations, etc.

No conferences or guest investigators visiting this week.

To be explored
/

2. LYRA instrument status

Calibration

There was no LYRA calibration scheduled.

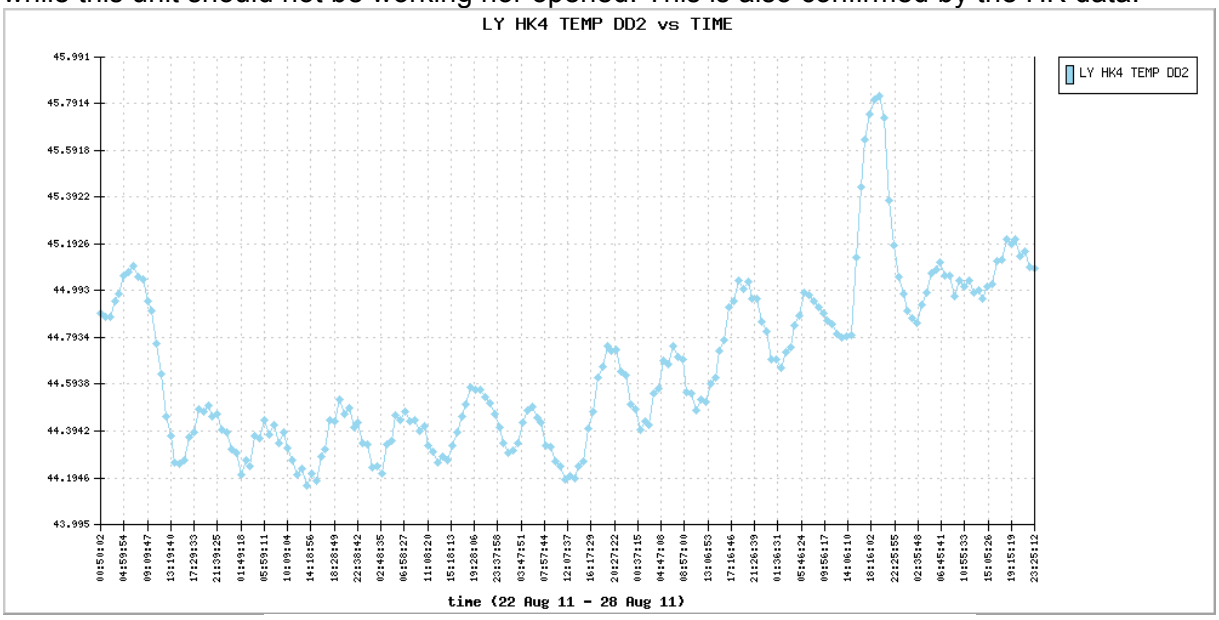
IOS & operations

Monday 22 Aug	Tuesday 23 Aug	Wednesday 24 Aug	Thursday 25 Aug	Friday 26 Aug	Saturday 27 Aug	Sunday 28 Aug
Nominal acquisition 50ms cadence LYIOS00187	Nominal acquisition LYIOS00187	Nominal acquisition LYIOS00187	Nominal acquisition LYIOS00187	Nominal acquisition LYIOS00187	Nominal acquisition LYIOS00187	Nominal acquisition LYIOS00187

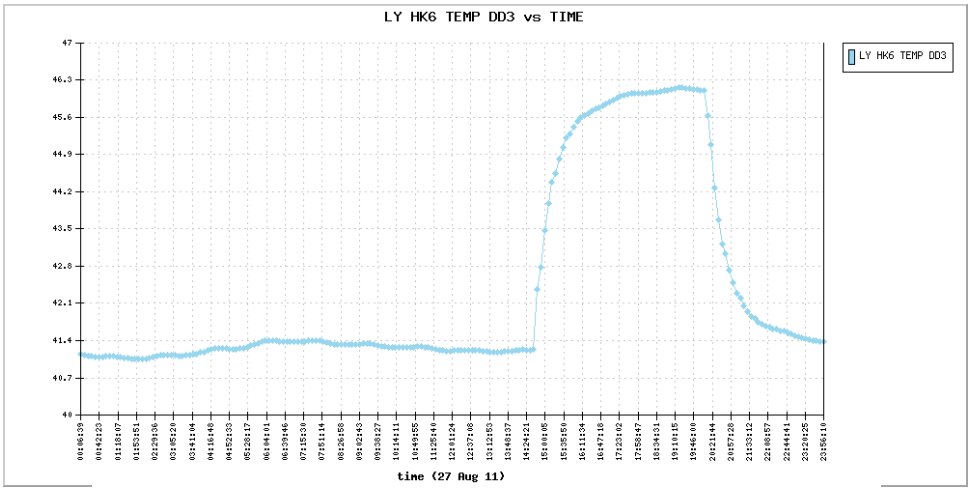
LYRA detector temperature

The LYRA detector 2 temperature (nominal unit) fluctuated between 44 and 45.8 degrees Celsius. The overall evolution is normal for a nominal week with plasma measurements on Thursday and in the weekend.

But one peak is unexplained: the rise in temperature of 1 degree on Saturday 14-20UT. The temperature rise is even more extended in unit 3 detector temperatures (5 degrees difference!) while this unit should not be working nor opened. This is also confirmed by the HK data.



Temperature evolution of unit 2 detector over the week



Temperature evolution of unit 3 detector on Saturday 27 Aug

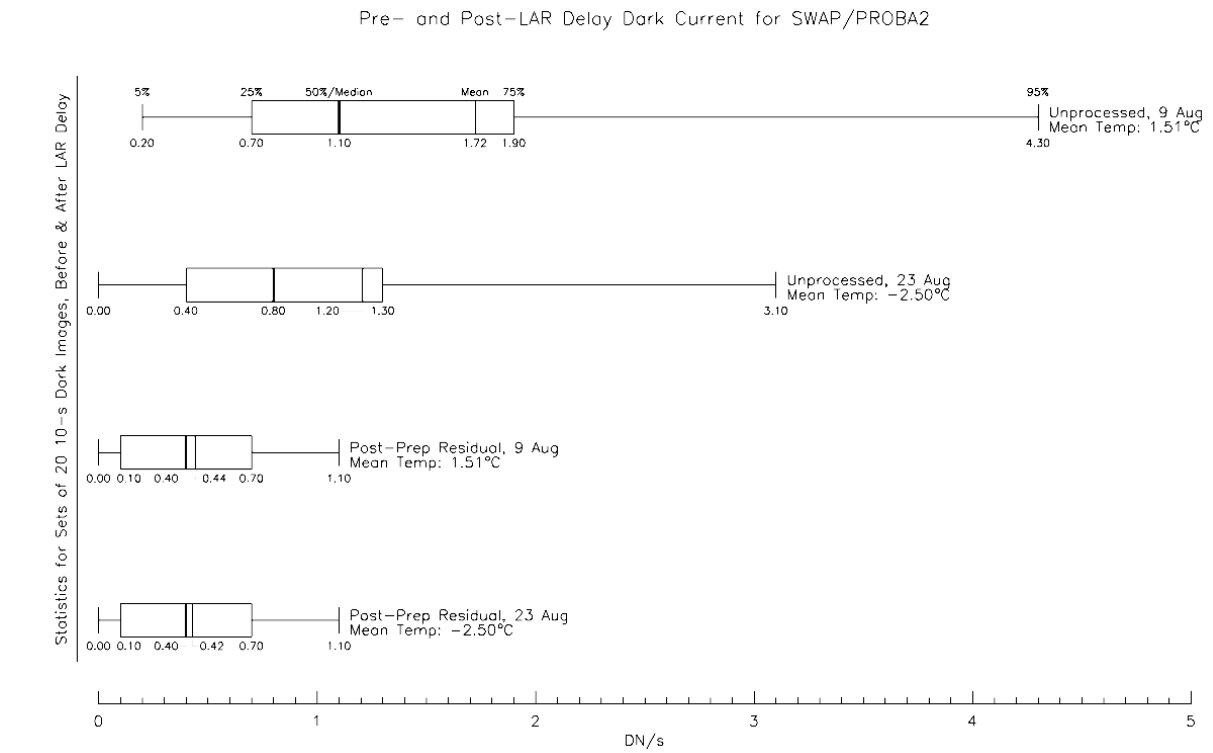
The start and end of the temperature rise both happened at the time of a VFC calibration. The hypothesis is that the heater of detector 3 switched on erroneously.
Such a change in LYRA instrument settings at the time of a calibration was seen before and upto now attributed to a bit flip. The issue got solved automatically at the time of the next calibration, 5,5 hours later.

This time no HK parameter reflected this uncommanded state. Only the temperatures and voltages showed an unusual value.

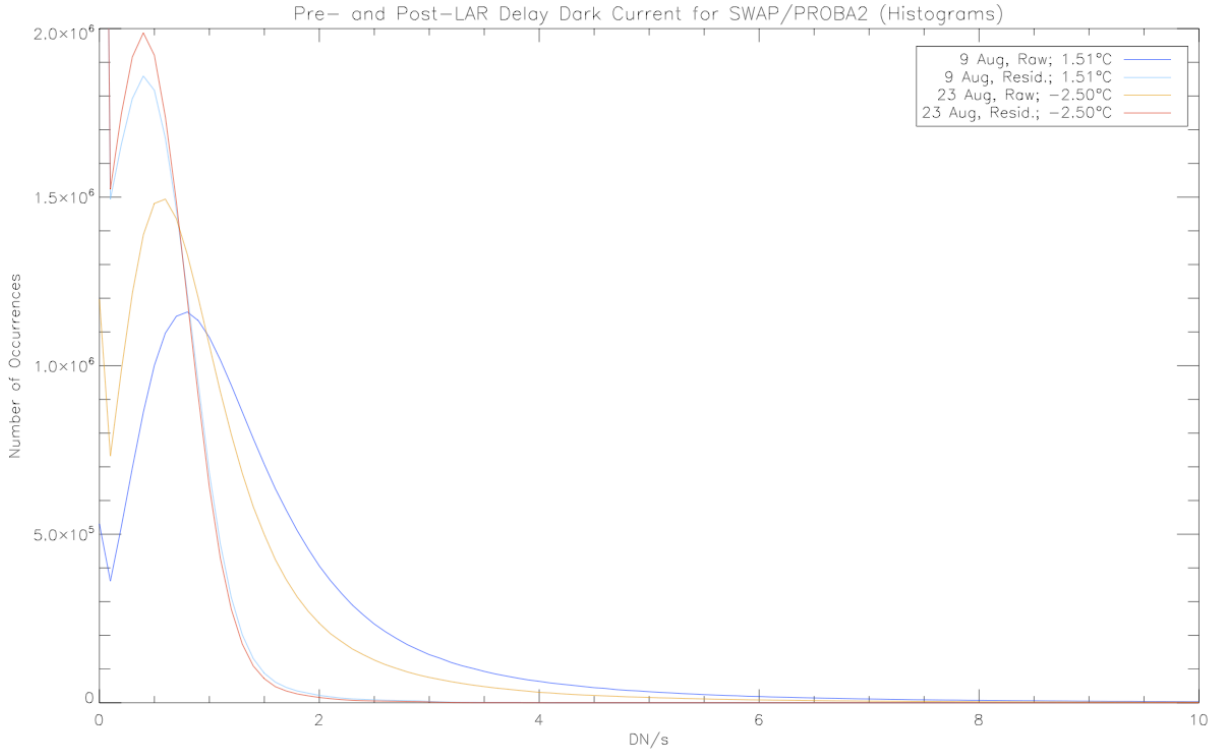
To be explored
Unexplained temperature peak in detector 3 on Saturday 27 August 14-20UT:

3. SWAP instrument status

Calibration
A regular, biweekly calibration campaign with darks and LEDs took place on Tuesday 23 August at 10UT.
The unprocessed, dark images were compared to the last calibration campaign of 9 August to quantify the effect of the LAR delay of 7 minutes (resulting in temperature drop of approx. 4 degrees) on SWAP images.



The 2 first boxplots above show the median, mean and spread of the number of DNs per second in `dark' images taken before and after the LAR delay. It is shown that the lower temperature highly affects the spread and also lowers the median/mean DN in a dark image. The lower 2 boxplots compare the situation after calibrating the images. The effect is not so large there, so we might want to refine the model used to subtract dark current by taking more dark calibration images with the currently nominal temperature (-2,5 degrees).
Plots of corresponding histograms are shown below:

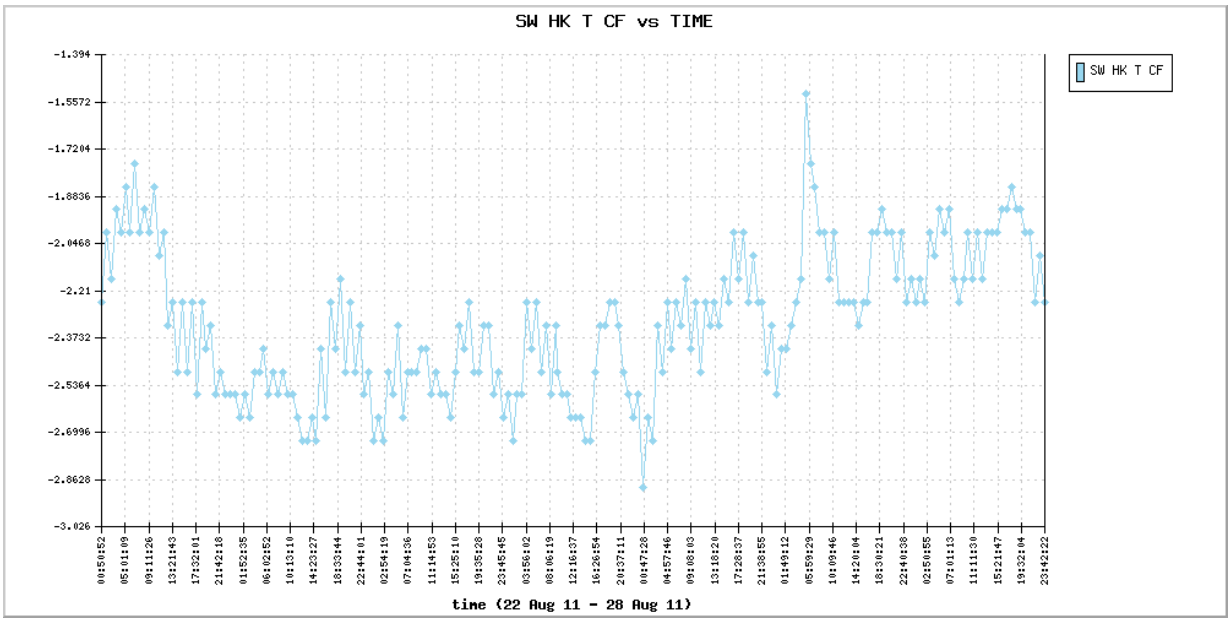


MCPM recoverable errors
increased from 248 to 268 this week.
The number of MCPM unrecoverable errors is still 0.

IOS & operations

Monday 22 Aug	Tuesday 23 Aug	Wednesday 24 Aug	Thursday 25 Aug	Friday 26 Aug	Saturday 27 Aug	Sunday 28 Aug
Nominal acquisition 110s cadence IOS00323 692 images	Nominal acquisition + SWAP LED campaign IOS00324 642 images	Nominal acquisition IOS00324 680 images	Nominal acquisition IOS00324 553 images	Nominal acquisition IOS00324 684 images	Nominal acquisition IOS00324 578 images	Nominal acquisition IOS00324 675 images

SWAP detector temperature
The SWAP Cold Finger Temperature fluctuated between -2,9 and -1,3 degrees Celsius. Again, an unexpected peak in temperature is seen on Saturday, while the instrument was not performing any special campaign. The other fluctuations are nominal.



To be explored
More analysis is needed on the effect the LAR delay had on SWAP images. We will explore whether more dark images at low temperatures need to be taken to improve the dark current subtraction after the LAR delay test.

4. PROBA2 Science Center Status

Anik De Groof was operator during this week.

No tools were updated on the operational server.

5. Data reception & discussions with MOC

Passes
In general the data reception this week was very good.
Only a few passes contained a few corrupted or truncated data: 5503, 5511, 5548, 5552

Data coverage HK
The HK data were complete this week.

Data coverage SWAP

The overall data coverage was good.

Statistics for complete week:

Total number of images between 2011 Aug 22 0UT and 2011 Aug 28 0UT: 3829
Highest cadence in this period: 30 seconds
Average cadence in this period: 135.41 seconds
Number of image gaps larger than 300 seconds: 5
Largest data gap: 29.00 minutes

The one large data gap was commanded to allow an ESP test. The 4 other gaps were all smaller than 6 minutes and due to image overwriting onboard or missing SWAP packets.

Data coverage LYRA
The LYRA data were complete this week (see overview in Sect.1). Pass 5548 contained one corrupt packet but this did not cause a data gap.

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