P2SC-ROB-WR-156-20130318 Weekly report #156	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Mar 18 to Sun Mar 24, 2013 27 Mar 2013 Erik Pylyser Matthew West	Royal Observatory of Belgium PROBA2 Science Center
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1. Science

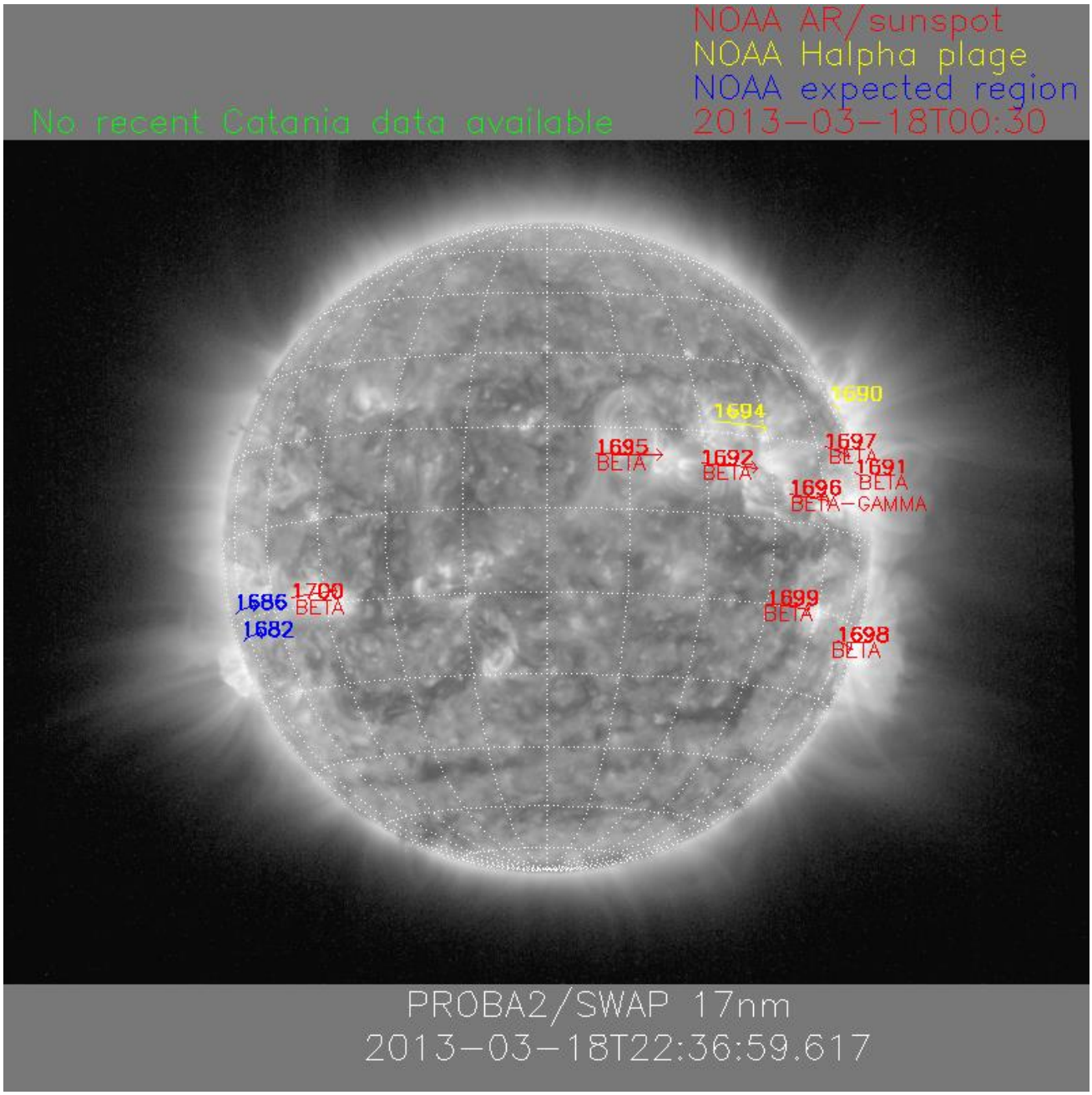
Solar & Space weather events

The level of solar activity[1] this week. Only M- and X-flares are mentioned, the most energetic one(s) are presented in **bold**:

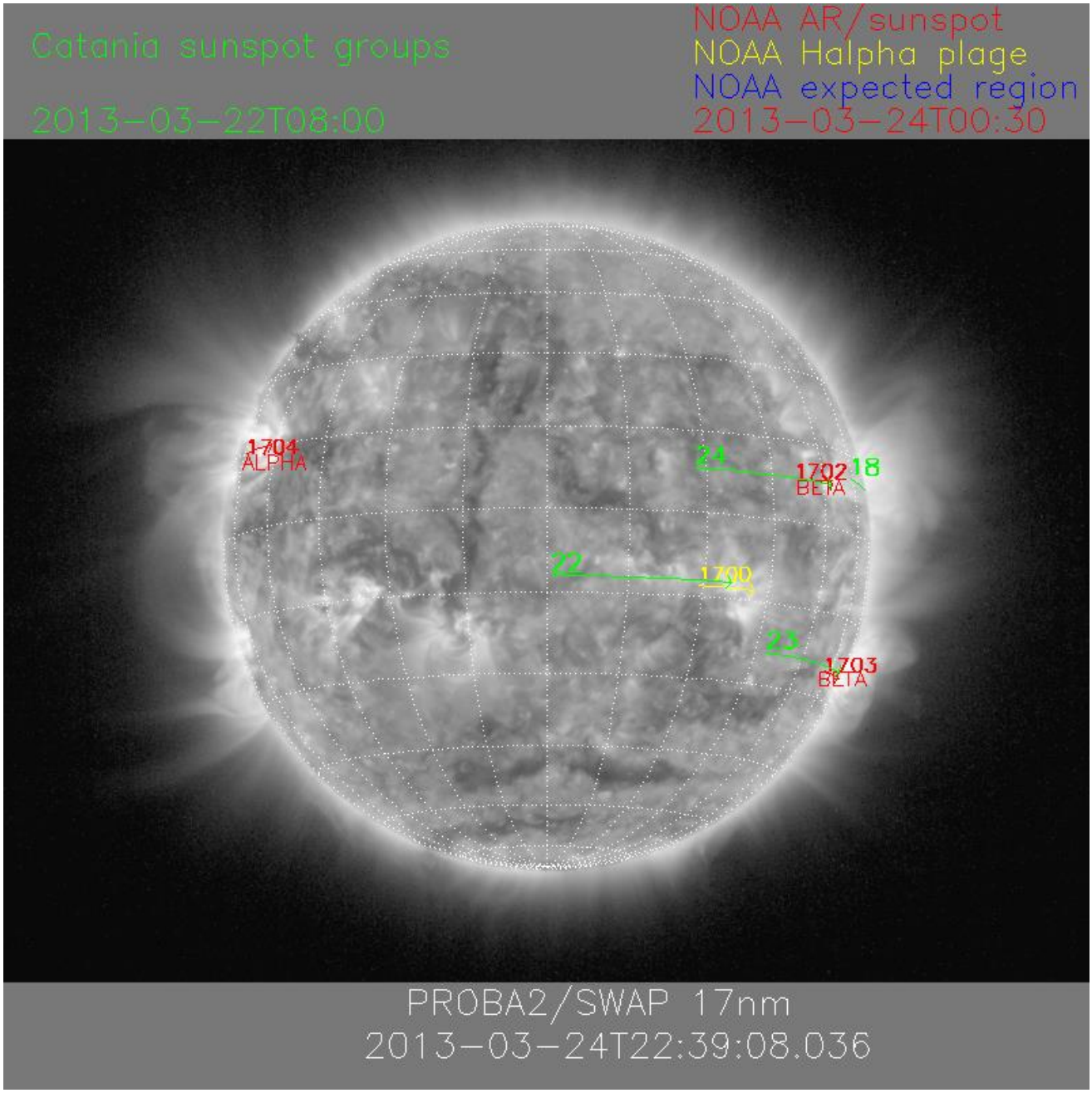
	Monday 18 Mar	Tuesday 19 Mar	Wednesday 20 Mar	Thursday 21 Mar	Friday 22 Mar	Saturday 23 Mar	Sunday 24 Mar
Activity	low	low	low	moderate	low	very low	very low
Flares	-	-	-	**M1.6 @ 21:42**	-	-	-

[1] See appendix. All timings are given in UT.

The SWAP images of March 18 and March 24 are shown below, with annotated active regions.



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



Solar Activity

Solar (flaring) activity was largely determined by AR 11692. Most flares were at C level, i.e. **low** activity, except on Thursday, when AR 11692 generated an M1.6 flare on the west limb (i.e. **moderate** activity). When this AR gradually disappeared behind the limb on Friday, solar flare activity dropped to **very low** during the week-end.

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 the events in this movie can be found further below (limited to SWAP imaging).

During the week, several interesting events occurred, some of which are presented below.

Monday 18th:

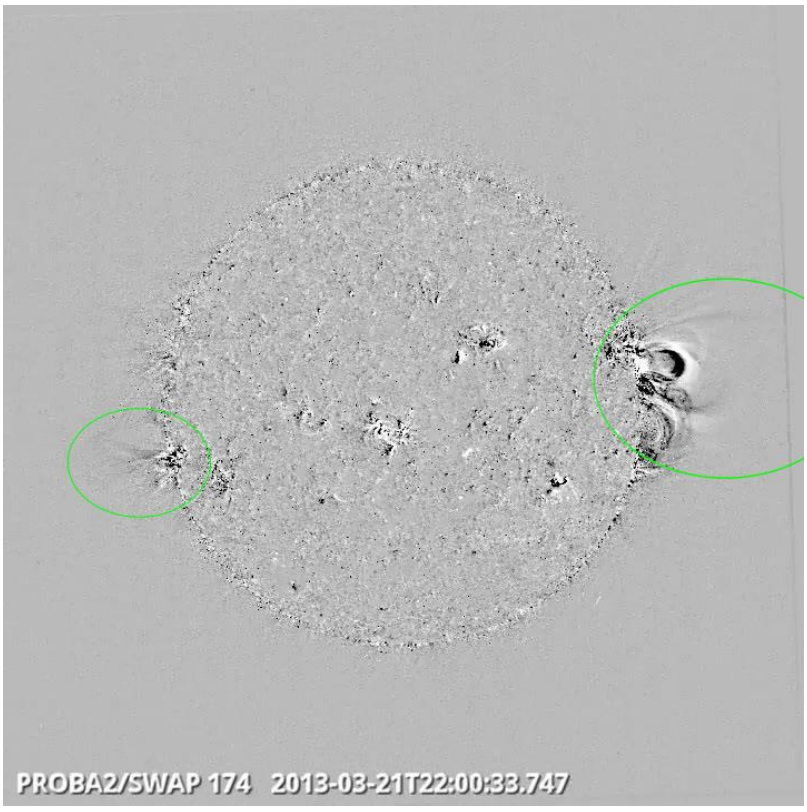
Eruption on the South East limb @ 18:45 - SWAP difference image
Click here (SWAP difference) and here (SWAP normal; HelioViewer) for a movie.

Tuesday 19th:

Double eruption on the South West limb and in North West Quadrant @ 18:45 - SWAP difference image

Thursday 21st:

Eruption on the West limb @ 03:07 - SWAP difference image



Double eruption on the East and West (M1.6) limb @ 22:00 - SWAP difference image
Click here (SWAP difference) and here (SWAP normal; HelioViewer) for a movie.

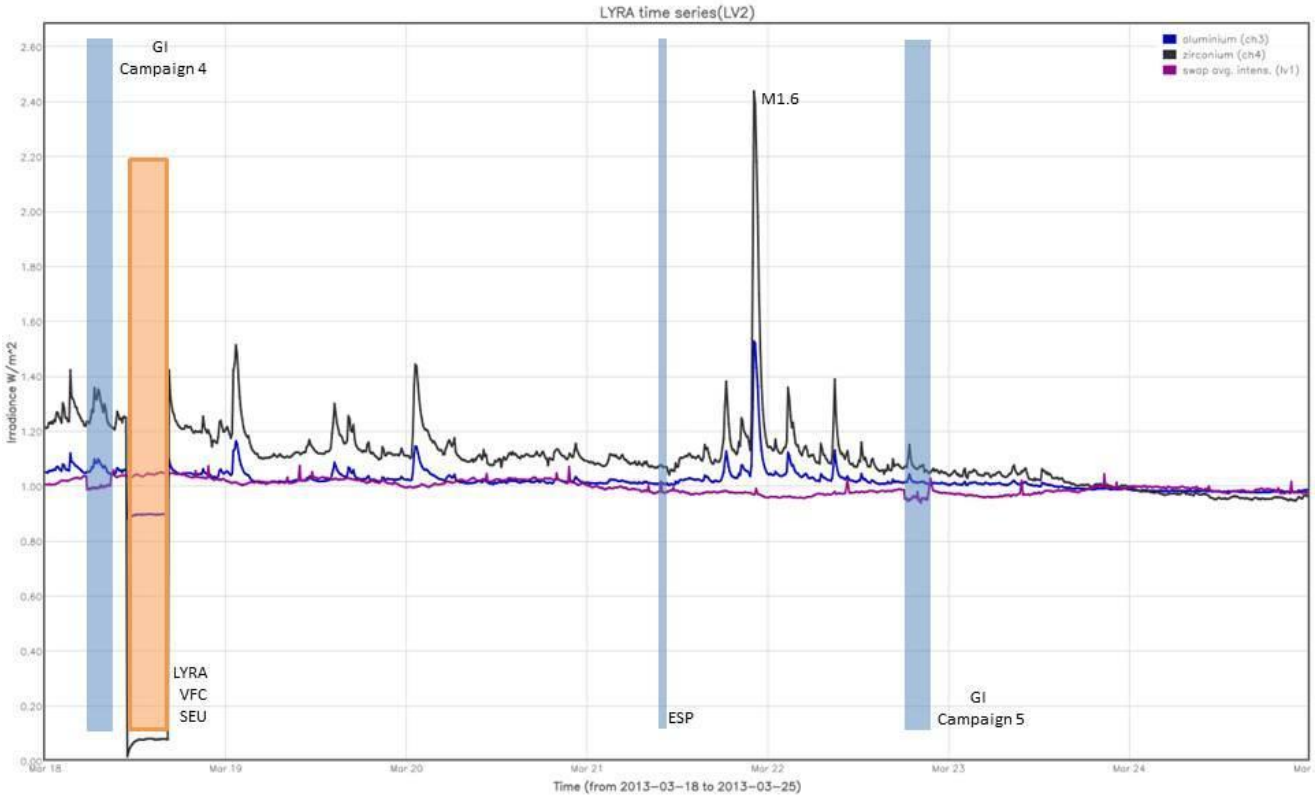
Friday 22nd:

Saturday 23rd: 2 eruptions on the east limb, one north, one south.

Sunday 24th:

On Sunday, SWAP recorded a filament large scale flow, occurring in the center of the disk. A SWAP difference movie of this event can be seen here. This phenomenon is better visible in the SDO 304 movie here.

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:
- GI campaign 4 on Monday; 05:32 - 08:38
- ESP experiment on Thursday
- GI campaign 5 on Friday; 18:09 - 21:12

The orange shaded periods correspond to, from left to right:
- Single Event Upset at the level of LYRA VFC

The red shaded period corresponds to:
- None

Outreach, papers, presentations, etc.

- The scientific part of the contents of the “Solar Activity” section above is published in this week’s STCE Bulletin (see http://www.stce.be/newsletter/newsletter.php)

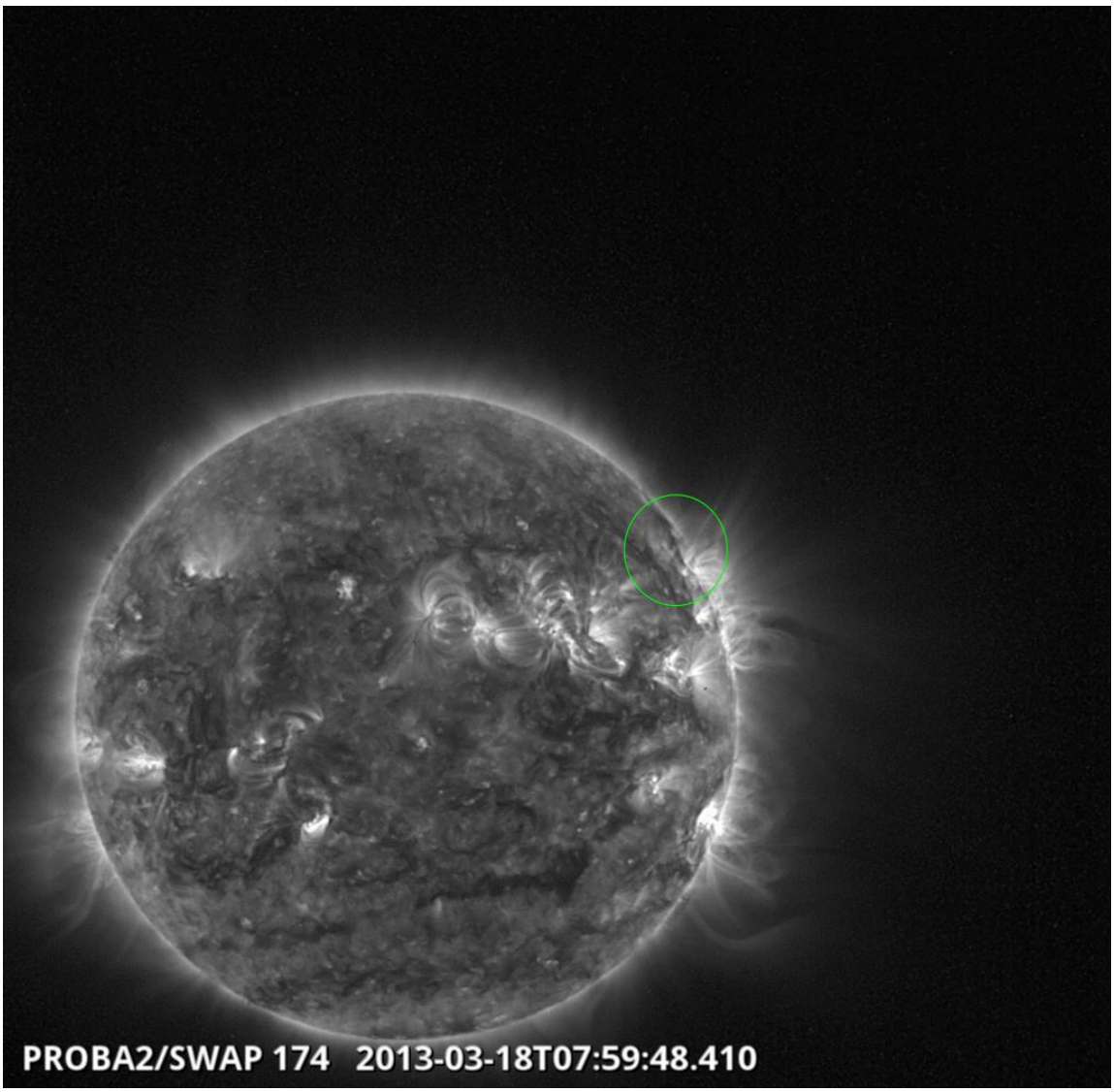
Please also consult http://proba2.oma.be/science/publications for a list of interesting articles using SWAP & LYRA data, as well as a link to the complete article list.

Guest Investigator Program

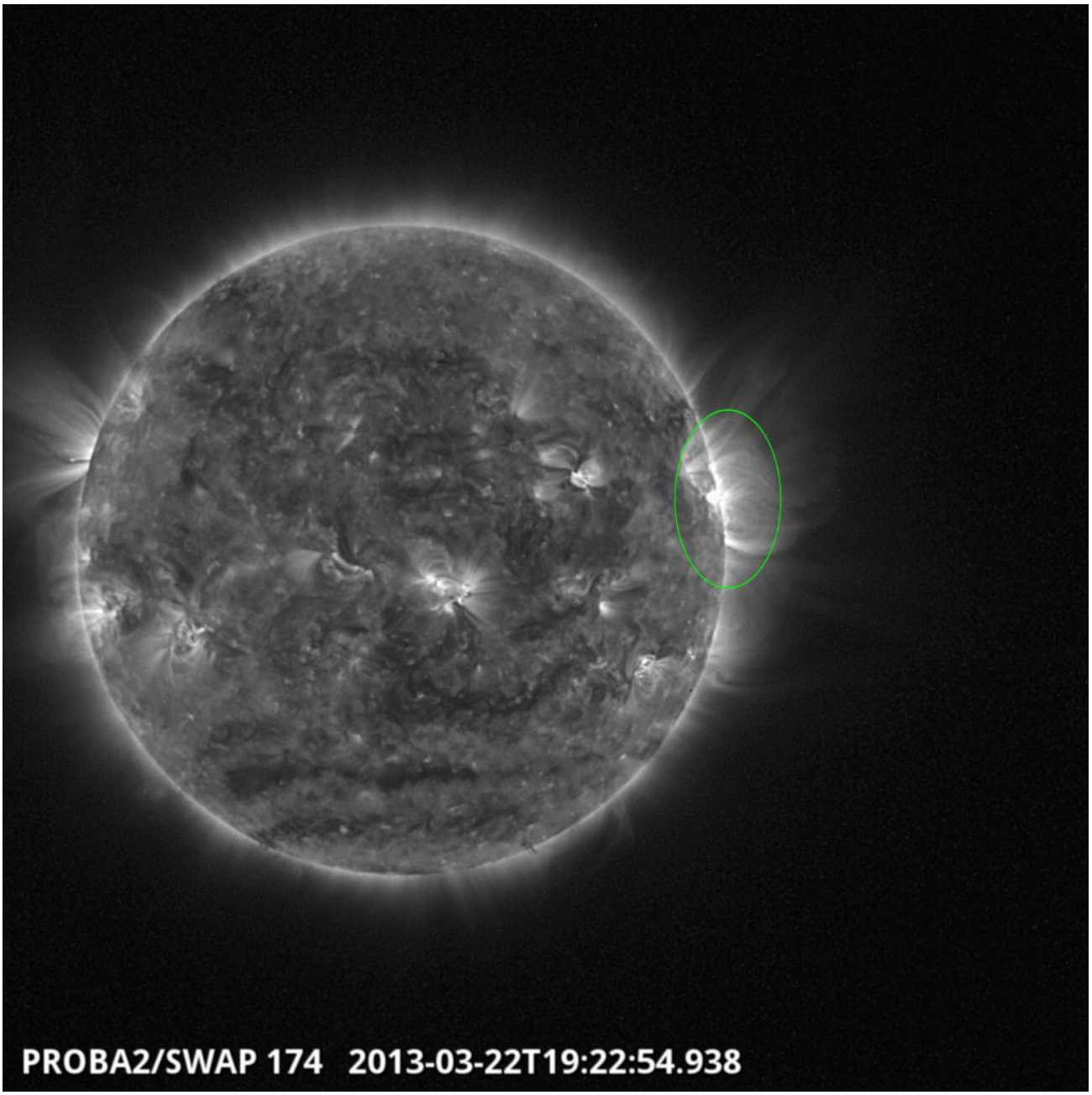
- Maria Madjarska & Klaus Dalsgaard arrived on Monday 11th for their GI program (2 weeks): ‘EUV/Xray jets from coronal holes and the origin of the solar wind’. Their stay ended on March 22nd.

- This week, 2 SWAP campaigns were executed with specific off-points to hunt for jets at the border of coronal holes and active regions.

The area indicated below was targeted on Monday 18th:



The area indicated below was targeted on Friday 22nd:



2. LYRA instrument status

Calibration

No LYRA calibration this week.

IOS & operations

Monday 18 Mar	Tuesday 19 Mar	Wednesday 20 Mar	Thursday 21 Mar	Friday 22 Mar	Saturday 23 Mar	Sunday 24 Mar
Nominal acquisition LYIOS00317	Nominal acquisition LYIOS00317	Nominal acquisition + daily U3 LYIOS00318	Nominal acquisition + daily U3 LYIOS00318	Nominal acquisition + daily U3 LYIOS00318	Nominal acquisition + daily U3 LYIOS00318	Nominal acquisition + daily U3 LYIOS00318

The following science campaigns were performed by LYRA:
- daily U3 observations campaign (except on Monday & Tuesday)

LYRA detector temperature

LYRA detector 2 temperature globally varied between 48.9 to 48.0 degrees C, taking into account the daily U3 activation periods; the latter result in a temperature increase of about 0.6 degrees C.

On Monday 18th, LYRA temperature showed a drop to 47 degrees (1.3 degrees below nominal), between 10:47 and 18:05. Analysis indicates that this is (most probably) due to a Single Event Upset which occurred at 10:47 at the level of the VFC (Voltage to Frequency Converter) .
The system restored itself at 16:20 at the time of the execution of a foreseen automated command.

To be explored
- None

3. SWAP instrument status

Calibration

No SWAP calibration this week.

MCPM errors

The number of MCPM recoverable errors increased from 7092 to 7161.

The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 18 Mar	Tuesday 19 Mar	Wednesday 20 Mar	Thursday 21 Mar	Friday 22 Mar	Saturday 23 Mar	Sunday 24 Mar
Nominal acquisition + GI campaign 4 IOS00459 727 images	Nominal acquisition IOS00459 645 images	Nominal acquisition IOS00459 621 images	Nominal acquisition + ESP IOS00459 582 images	Nominal acquisition + GI campaign 5 IOS00460 661 images	Nominal acquisition IOS00460 502 images	Nominal acquisition IOS00460 485 images

Special operations for SWAP, this week:
- GI campaign 4 on Monday; 05:32 - 08:38 (off-pointing north west)
- ESP jump on Thursday
- GI campaign 5 on Friday; 18:09 - 21:12 (off-pointing west)

SWAP detector temperature

The SWAP Cold Finger Temperature, globally varied between 0.23 and -0.48 degrees C.

To be explored

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4. PROBA2 Science Center Status

The main operator is Koen Stegen.

The following changes were made to the P2SC:
- None

5. Data reception & discussions with MOC

Passes

The delivery of the passes for this week (passes 10521 to 10581) was nominal, except for:
- None

Data coverage HK

All HK data files (LYRA_AD) have been received, except for:
- None

Data coverage SWAP

All SWAP Science data files (BINSWAP) have been received, except for:
- None

Total number of images between 2013 Mar 18 0UT and 2013 Mar 25 0UT: 4265
Highest cadence in this period: 40 seconds
Average cadence in this period: 141.74 seconds
Number of image gaps larger than 300 seconds: 13
Largest data gap: 6.50 minutes

The large gap is due to the ESP experiment on Thursday.

Data coverage LYRA

All LYRA Science data files (BINLYRA) have been received, except for:
- 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?)