P2SC-ROB-WR-209 - 20140324 Weekly report #209	**P2SC Weekly report**	
Period covered: Date: Written by: Approved by:	Mon Mar 24 to Sun Mar 30, 2014 02 April 2014 Robbe Vansintjan Matthew West	Royal Observatory of Belgium - PROBA2 Science Center
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1. Science

Solar & Space weather events

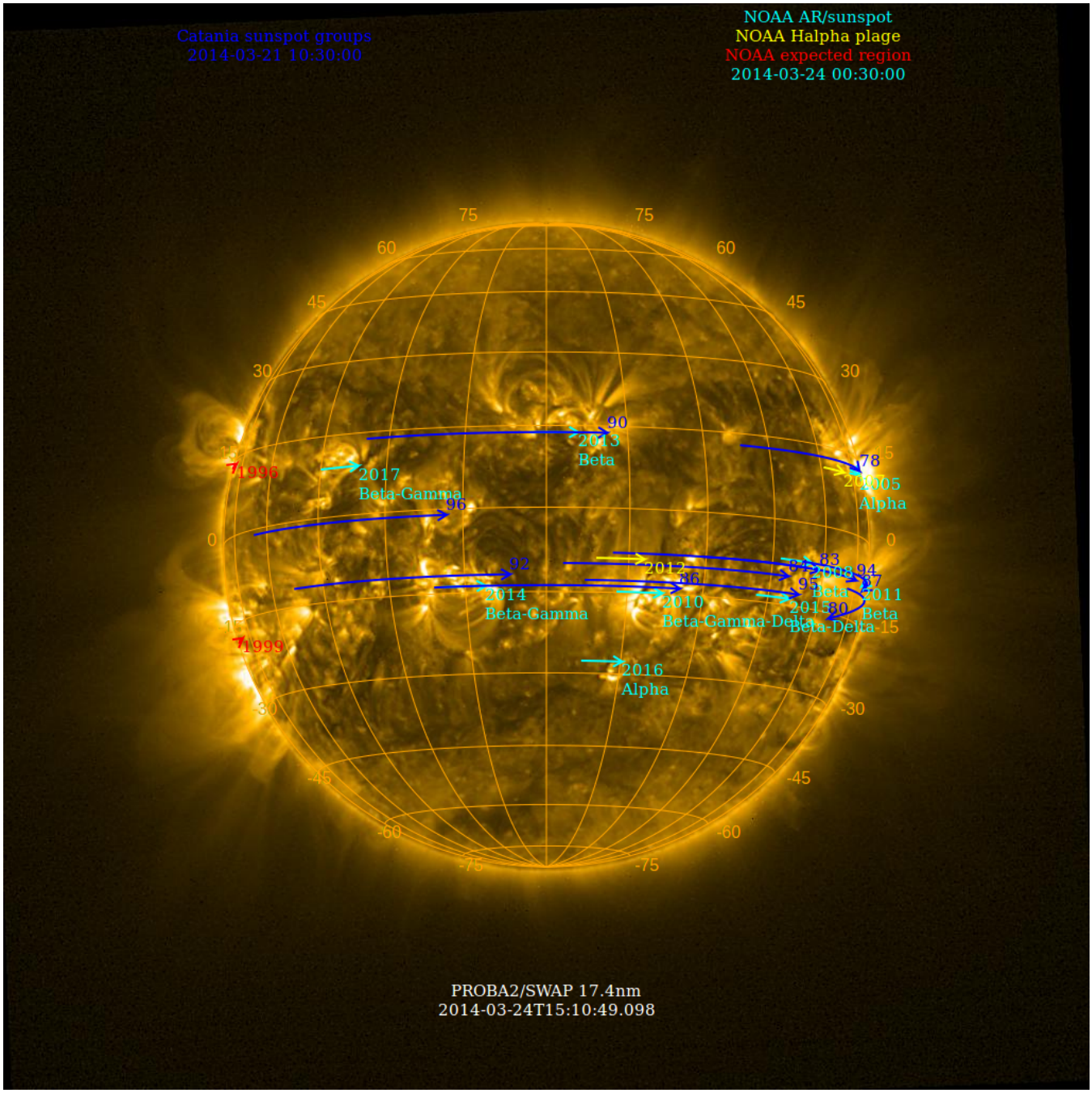
The level of solar activity[1] fluctuated between **low** and **high** this week.

Only M- and X-flares are mentioned, the most energetic one(s) per day are presented in **bold**:

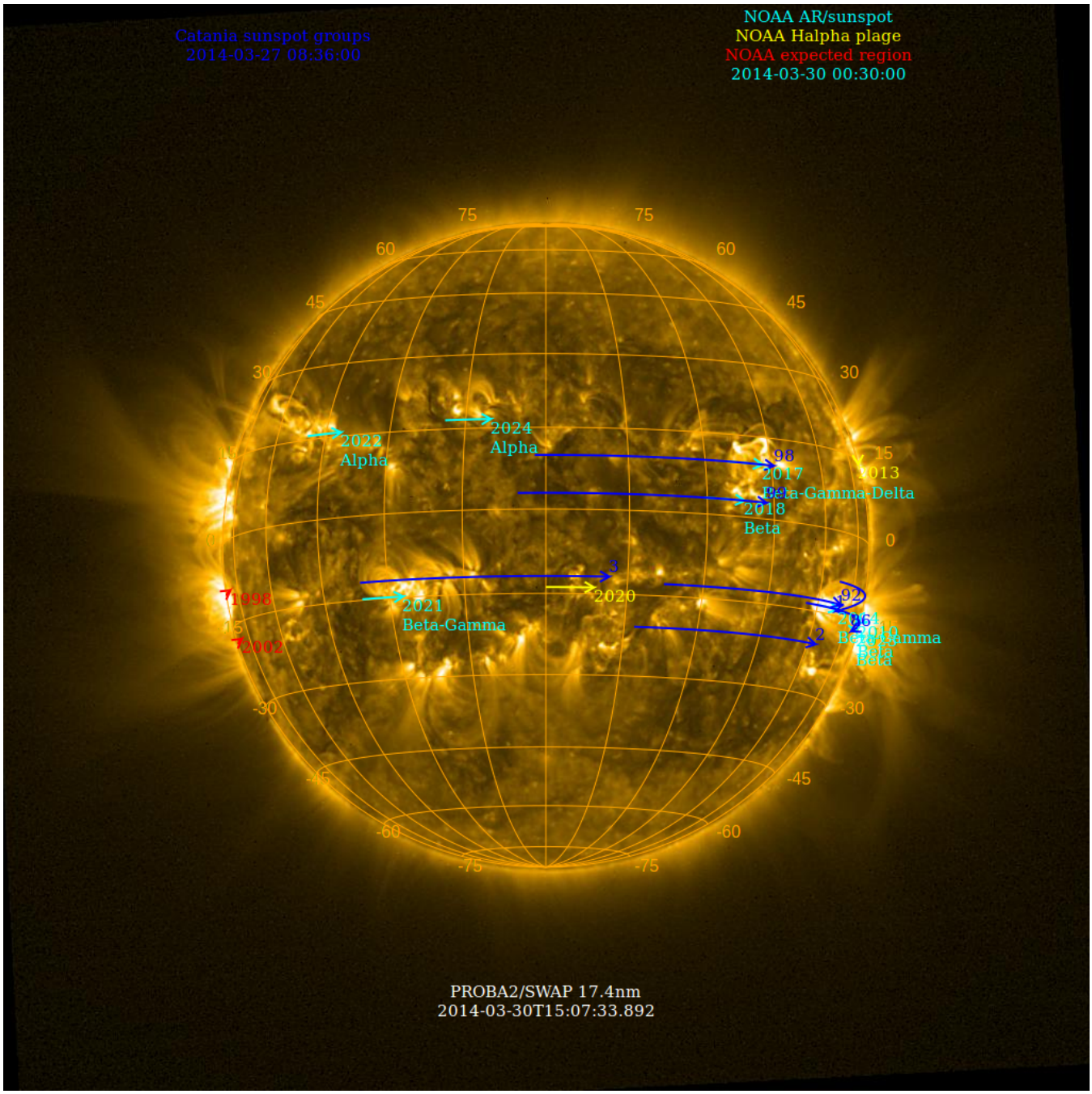
	Monday 24 Mar	Tuesday 25 Mar	Wednesday 26 Mar	Thursday 27 Mar	Friday 28 Mar	Saturday 29 Mar	Sunday 30 Mar
Activity	low	low	low	low	moderate	high	moderate
Flares	-	-	-	-	**M2.6@23:51** **M2.0@19:18**	**X1.0@17:48**	**M2.1@11:55**

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

The SWAP images of Mar 24 and Mar 30 are shown below, with annotated active regions.



http://sidc.be/soteria/soteria.php


Catania sunspot groups
2014-03-27 08:36:00
NOAA AR/sunspot
NOAA Halpha plage
NOAA expected region
2014-03-30 00:30:00
75
60
45
30
15
0
-15
-30
-45
-60
-75
2022
Alpha
2024
Alpha
98
2017
Beta-Gamma-Delta
2018
Beta
1998
2002
2021
Beta-Gamma
2020
3
92
2
PROBA2/SWAP 17.4nm
2014-03-30T15:07:33.892

Solar Activity
Solar flare activity fluctuated between low and high during the week.
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 (SWAP week 209).

Details about some of this week's events, can be found further below.

Wednesday Mar 26

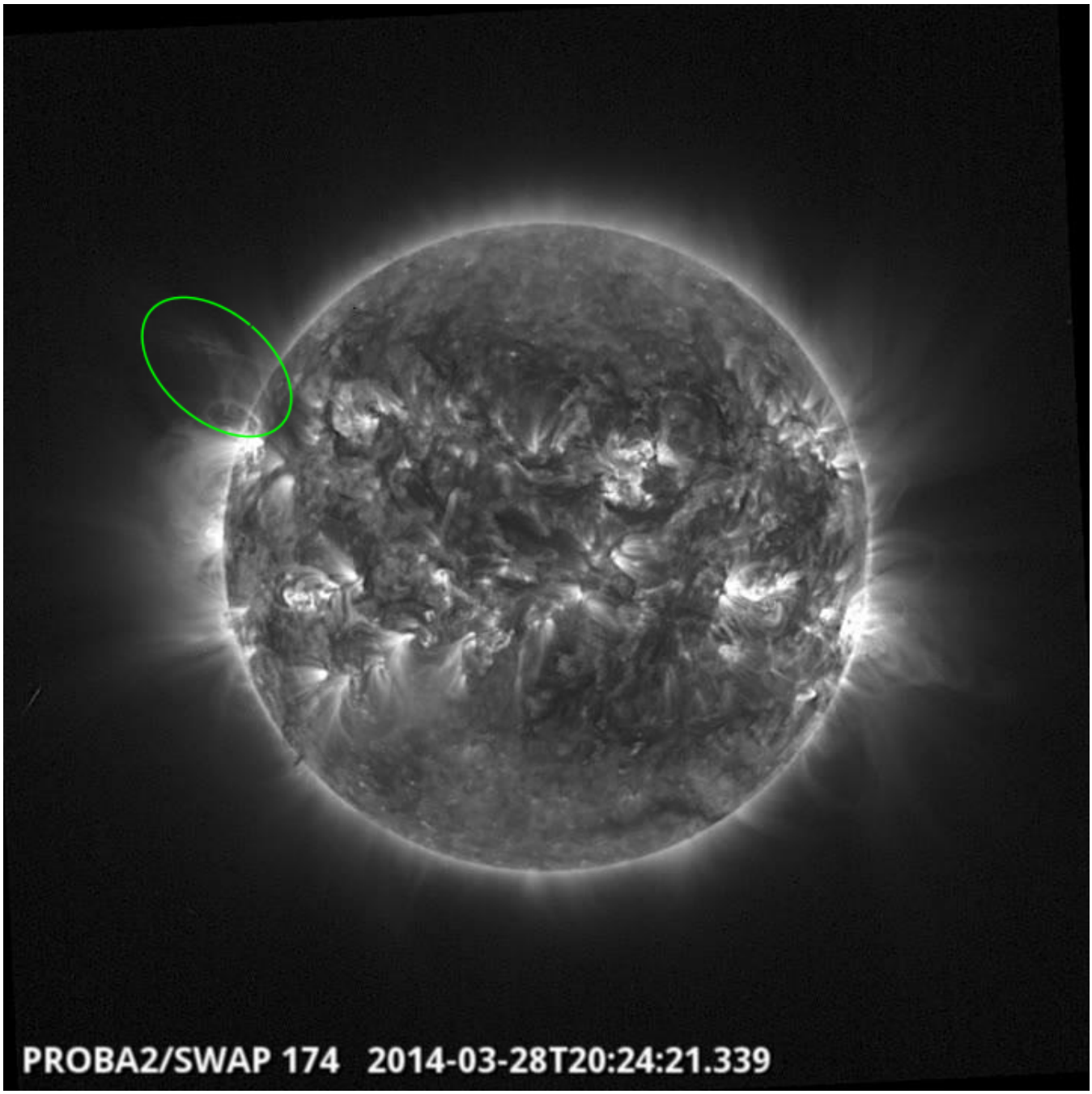
Eruption on the southeast limb @ 05:34 - SWAP difference image

Find a movie of the event **here** (SWAP daily difference movie)

Friday Mar 28

EIT wave on the northwest quad @ 19:32 - SWAP difference image

Find a movie of the event **here** (SWAP daily difference movie)



Eruption on the northeast limb @ 20:24 - SWAP image

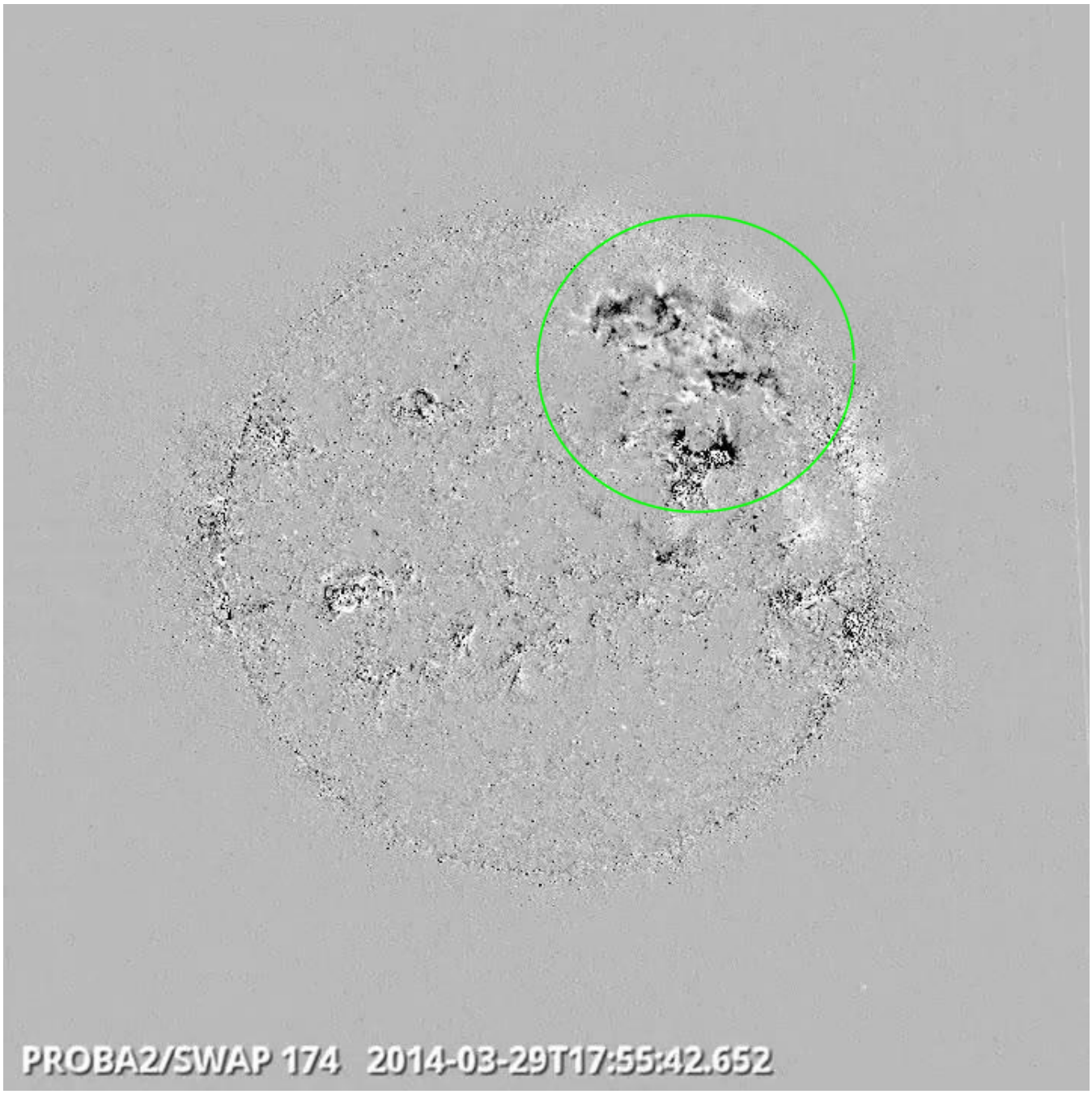
Find a movie of the event **here** (SWAP daily movie)

Saturday Mar 29

Eruption on the northeast quad @ 02:06 - SWAP difference image

Find a movie of the event **here** (SWAP daily movie)

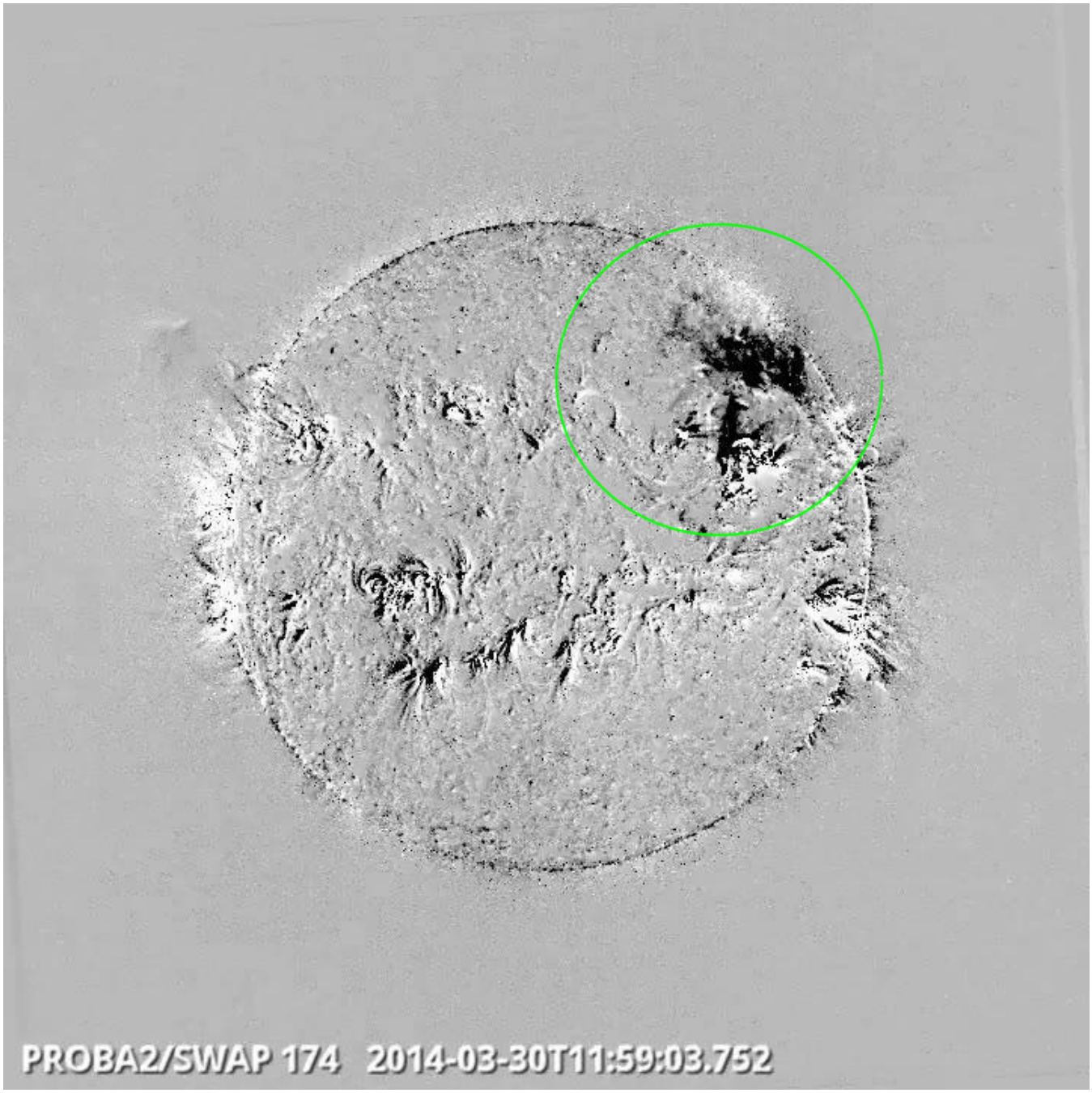
Find a movie of the event **here** (SWAP daily diffrence movie)



EIT wave on the northwest quad @ 17:55 - SWAP difference image

Find a movie of the event **here** (SWAP daily difference movie)

Sunday Mar 30



EIT wave on the northwest quad @ 11:59 - SWAP difference image

Find a movie of the event **here** (SWAP daily difference movie)

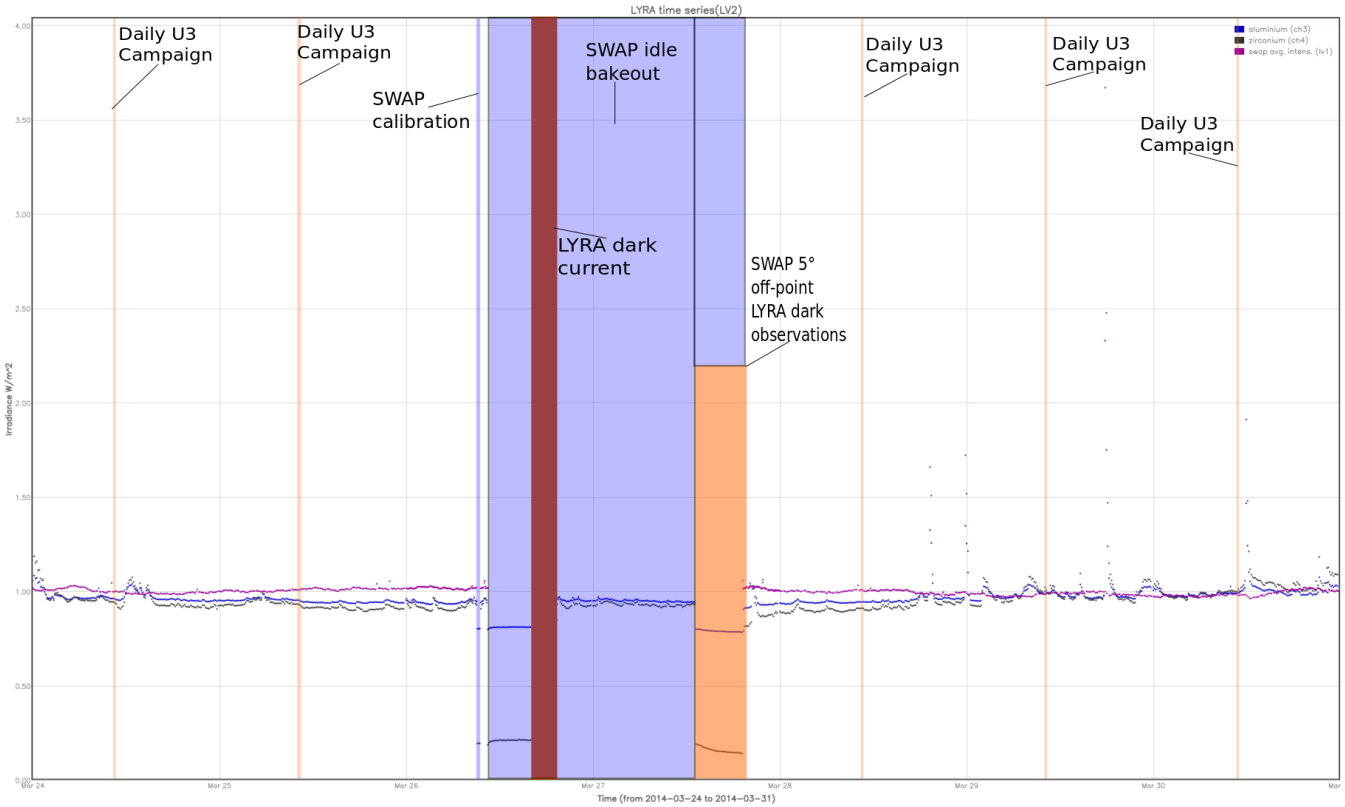
Eruption on the northeast limb @ 13:12 - SWAP difference image

Find a movie of the event **here** (SWAP daily movie)

Find a movie of the event **here** (SWAP daily diffrence movie)

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 (SWAP Average Intensity; integrated solar intensity per SWAP image pixel)



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

- SWAP calibration with 5° off point
- SWAP being put into idle mode so the heaters can be turned on for the SWAP bakeout
- SWAP 5° off pointed measurements

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

- Daily unit 3 campaigns; two times
- LYRA taking dark current measurements(covers closed) starting with units 2 and 3 and then with units 2 and 1
- LYRA taking dark observations (without the Sun in the field of view) starting with units 2 and 3 and then with units 2 and 1
- Daily unit 3 campaigns; three times

Due to an issue with the LYRA covers when SWAP entered idle mode, the dark current measurement campaign was delayed. Measurements were repeated.

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.

The science section of this weekly report is also published in the weekly STCE newsletter (http://www.stce.be/newsletter/newsletter.php).

- David Bergmans: Gave a presentation on PROBA2 and eclipses at volkssterrenwacht Urania
- Koen Stegen: Gave a presentation to students visiting ROB, organised by *European Space Education Resource Office* (ESERO) . The talk was entitled: "From the Sun to earth in 60 minutes."
- Chris Bethge presented: "SWAP Combining SWAP and CoMP to study coronal pseudostreamers and their influence on solar wind speeds."
- Elke Dhuys: Gave a presentation on PROBA2 at a nearby high school

Guest Investigator Program

- Chris Bethge: SWAP Combining SWAP and CoMP to study coronal pseudostreamers and their influence on solar wind speeds.

2. LYRA instrument status

Calibration

No calibration performed this week.

IOS & operations

Monday 24 Mar	Tuesday 25 Mar	Wednesday 26 Mar	Thursday 27 Mar	Friday 28 Mar	Saturday 29 Mar	Sunday 30 Mar
Nominal acquisition + daily U3 LYIOS00384	Nominal acquisition + daily U3 LYIOS00385 LYIOS00386 LYIOS00387	Nominal acquisition + dark current LYIOS00387 LYIOS00388	Nominal acquisition + dark observations LYIOS00388	Nominal acquisition + daily U3 LYIOS00388	Nominal acquisition + daily U3 LYIOS00388	Nominal acquisition + daily U3 LYIOS00388

The following science campaigns were performed by LYRA:

- daily U3 observations campaign
- dark current measurements with all three units
- dark observations at a 5° off point from the Sun with all three units

LYRA detector temperature

LYRA detector 2 temperature globally varied between 46.4 and 51 °C, taking into account the daily U3 activation periods.

To be explored

- None

3. SWAP instrument status

Calibration

The weekly calibration was modified because of the bake out campaign. It was subsequently performed at a 5° off point on 2014-Mar-26

MCPM errors

The number of MCPM recoverable errors increased from 17189 to 17446.
The number of MCPM unrecoverable errors remained at 1127.

IOS & operations

Monday 24 Mar	Tuesday 25 Mar	Wednesday 26 Mar	Thursday 27 Mar	Friday 28 Mar	Saturday 29 Mar	Sunday 30 Mar
Nominal acquisition IOS00507 651 images	Nominal acquisition IOS00508 664 images	Nominal acquisition + 5° calibration + bakeout IOS00508 325 images	Nominal acquisition + bakeout + 5° off pointing campaign IOS00508 360 images	Nominal acquisition IOS00508 562 images	Nominal acquisition IOS00508 651 images	Nominal acquisition IOS00508 497 images

Special operations for SWAP, this week:

- The bi-weekly calibration but off pointed by 5°
- Bakeout: SWAP is put into idle mode and the heaters are turned on
- A 5° off pointing campaign

SWAP detector temperature

The SWAP Cold Finger Temperature globally varied between 0.1° and 50.2 °C.

To be explored

- None

4. PROBA2 Science Center Status

The main operator is Robbe Vansintjan.

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 13709 to 13772) was nominal, except for:

- 13735, 13736 13737, 13738, 13739, 13740, 13741

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:

- 13735, 13736 13737, 13738, 13739, 13740, 13741

Total number of images between 2014 Mar 24 0UT and 2014 Mar 31 0UT: 3844
Highest cadence in this period: 0 seconds
Average cadence in this period: 157.34 seconds
Number of image gaps larger than 300 seconds: 1
Largest data gap: 1598.78 minutes

The organised bakeout campaign caused SWAP to enter an idle state, this resulted in a data gap and a number of BINSWAP files not being sent.

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)