

# Recent EUI operations news

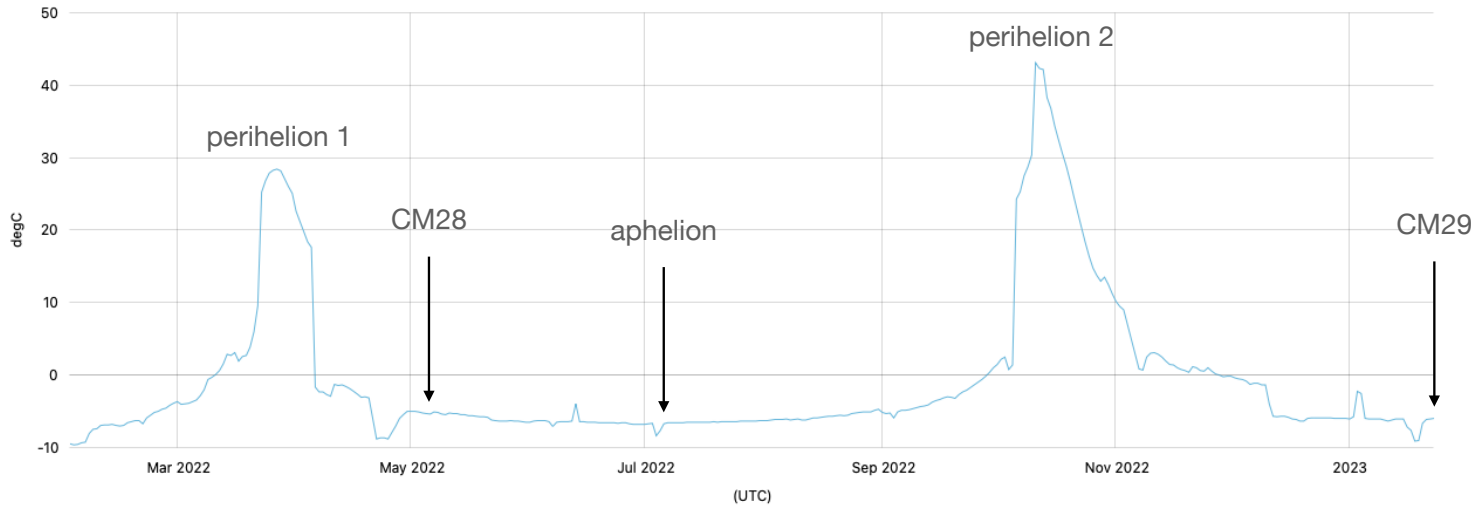
D. Berghmans

29th Consortium Meeting  
Online, 2023-01-25

Contact: [david.Berghmans@sidc.be](mailto:david.Berghmans@sidc.be) (PI)

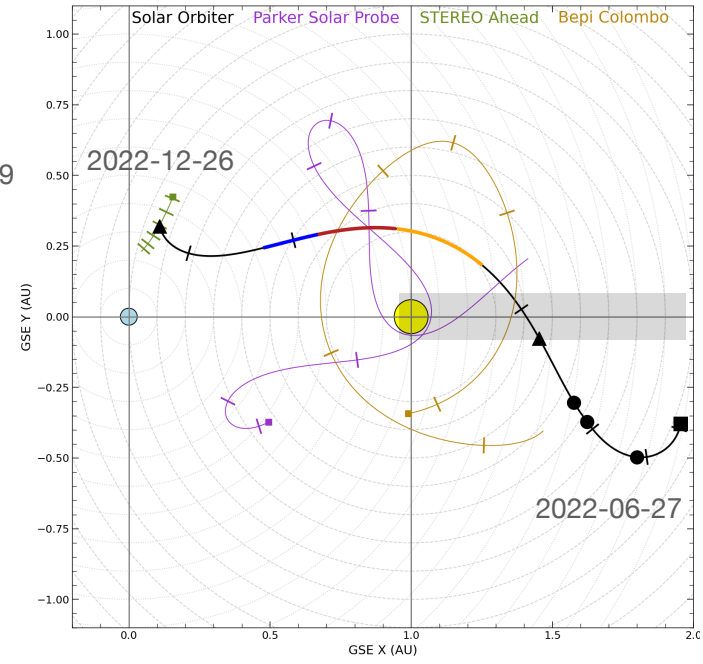
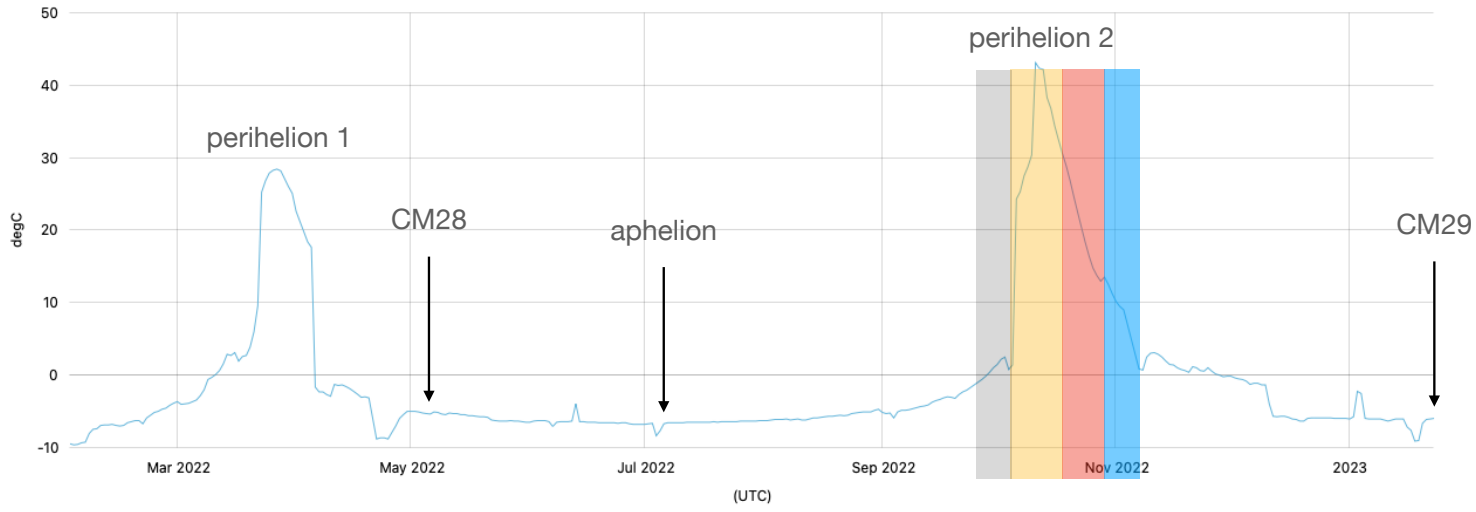


# HRILYA door motor temperature (aka as 'entrance filter temperature)

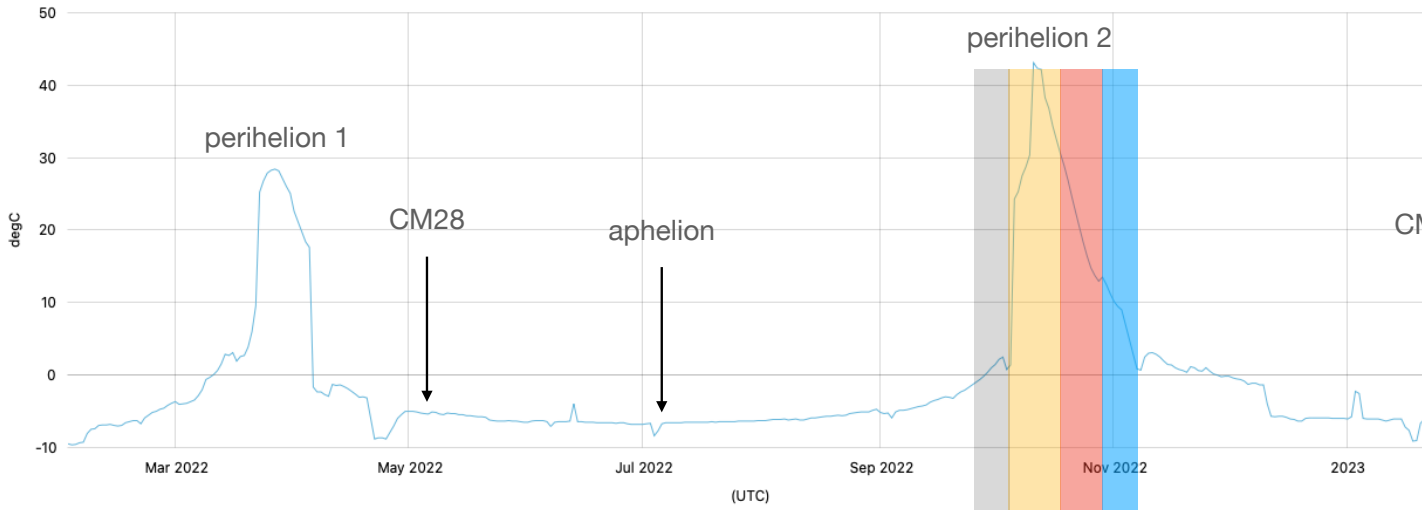




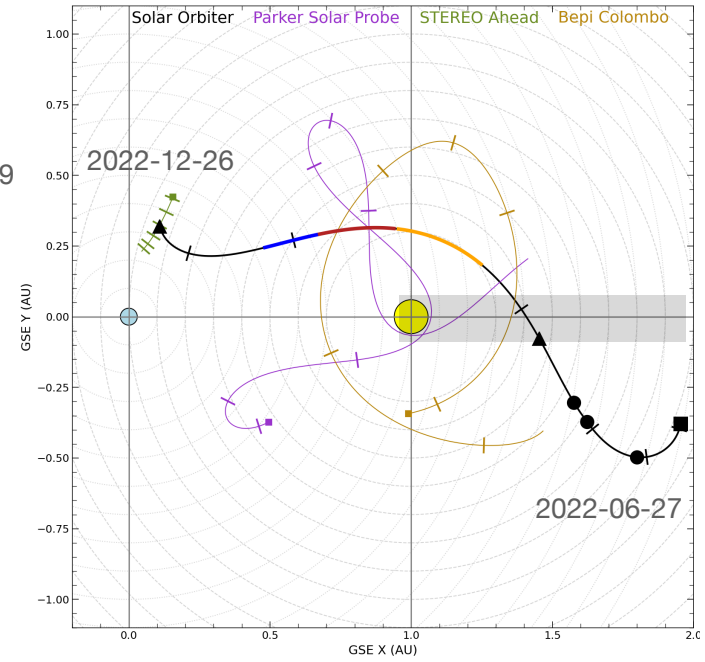
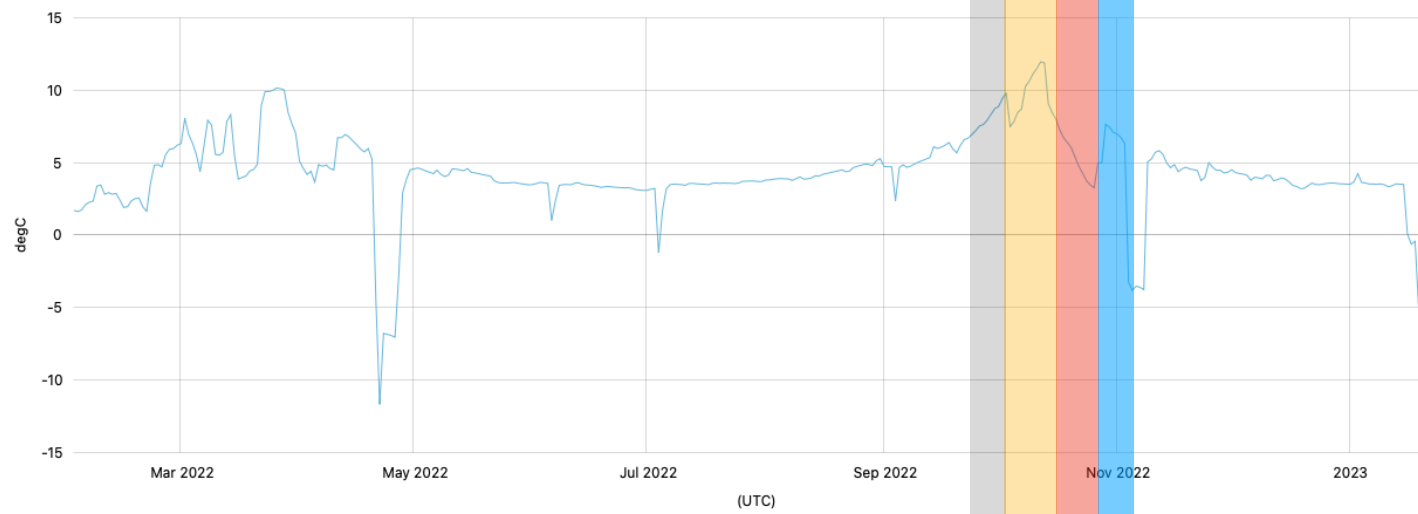
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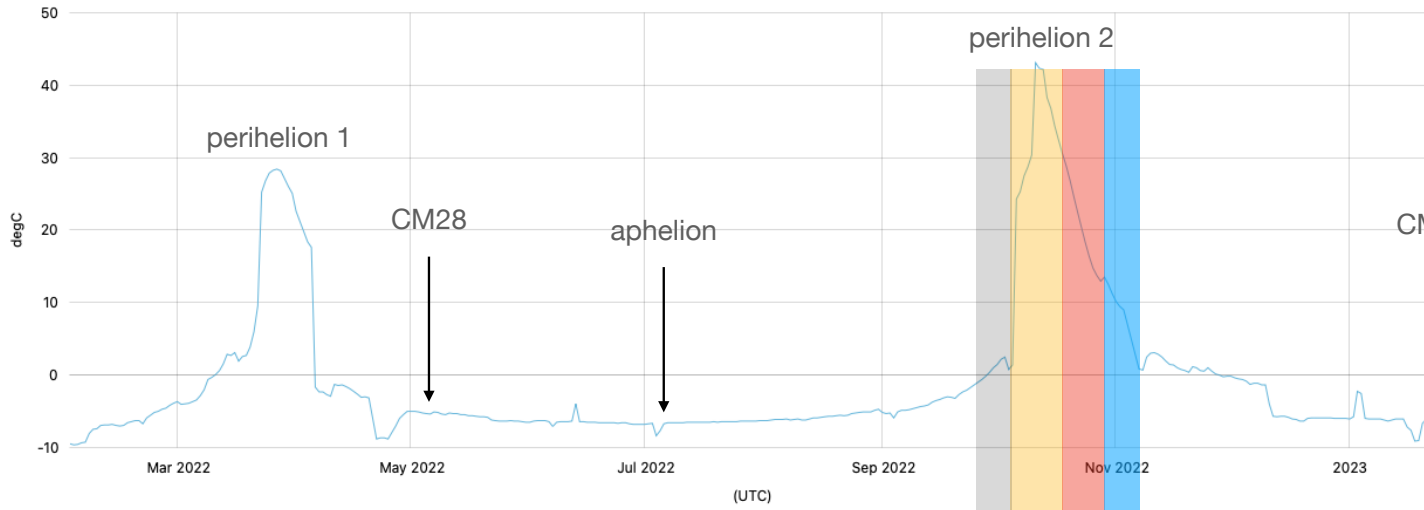
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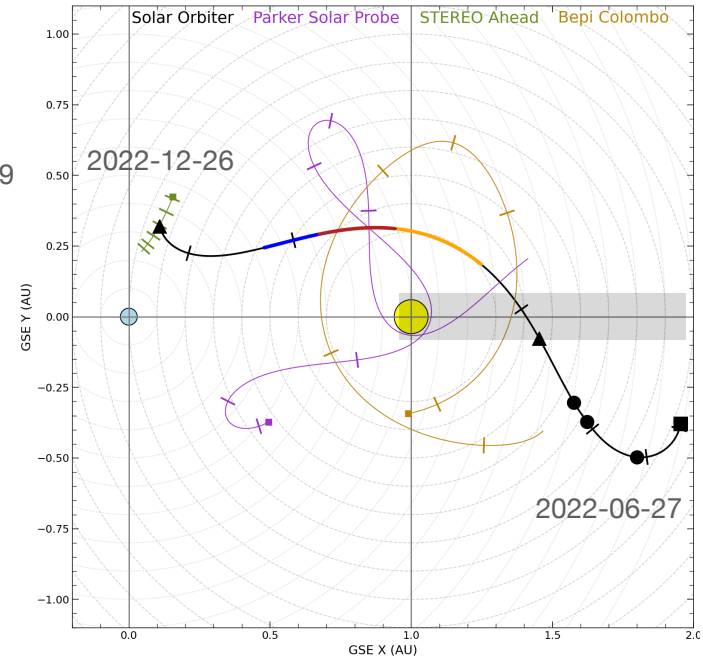
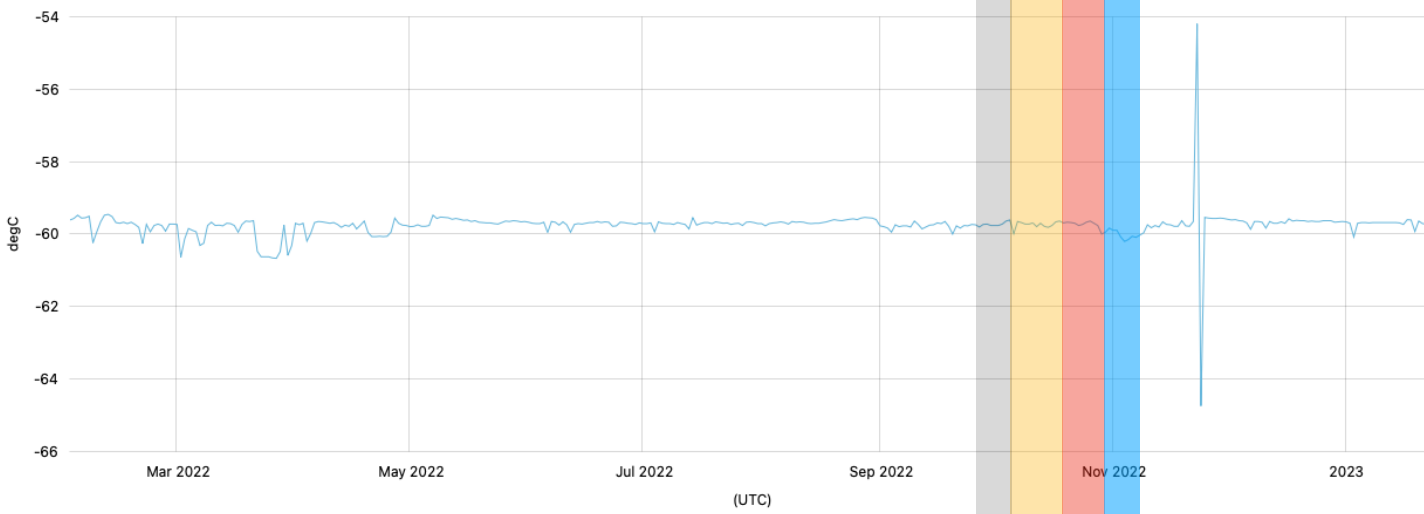
# CEB reference temperature



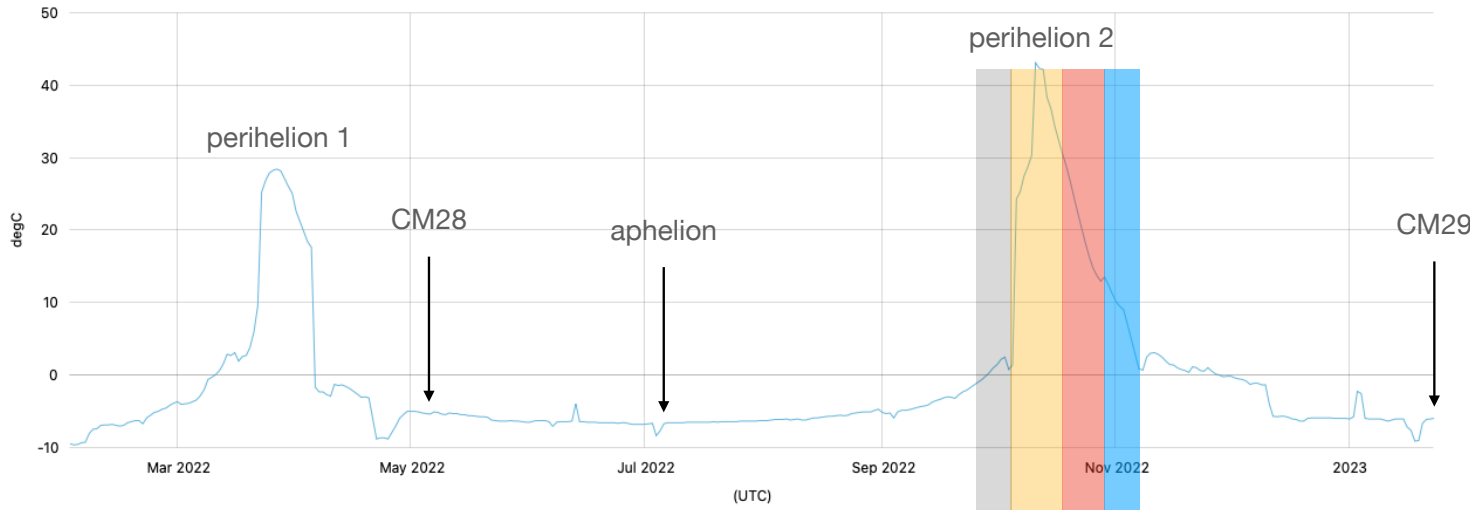
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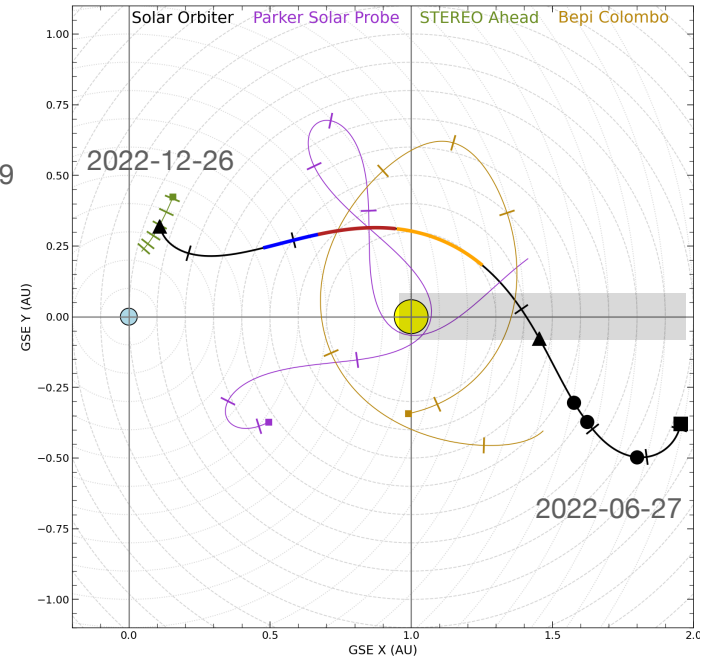
# FSI Cold Element radiator



### HRILYA door motor temperature (aka as 'entrance filter temperature)



### SSMM EUI data content (max capacity is 9600 Mib)

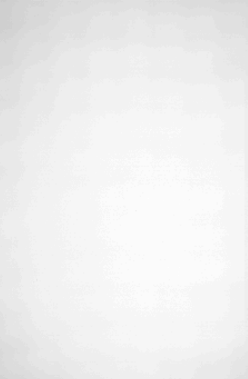




**Monthly LED calibration images  
(100 MiB/month, starting 2022 June 12)**

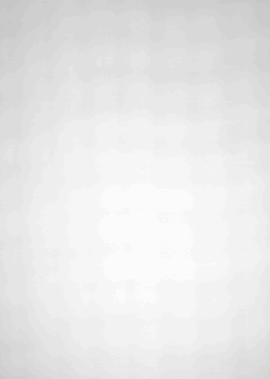
IDL 0

2020-03-03

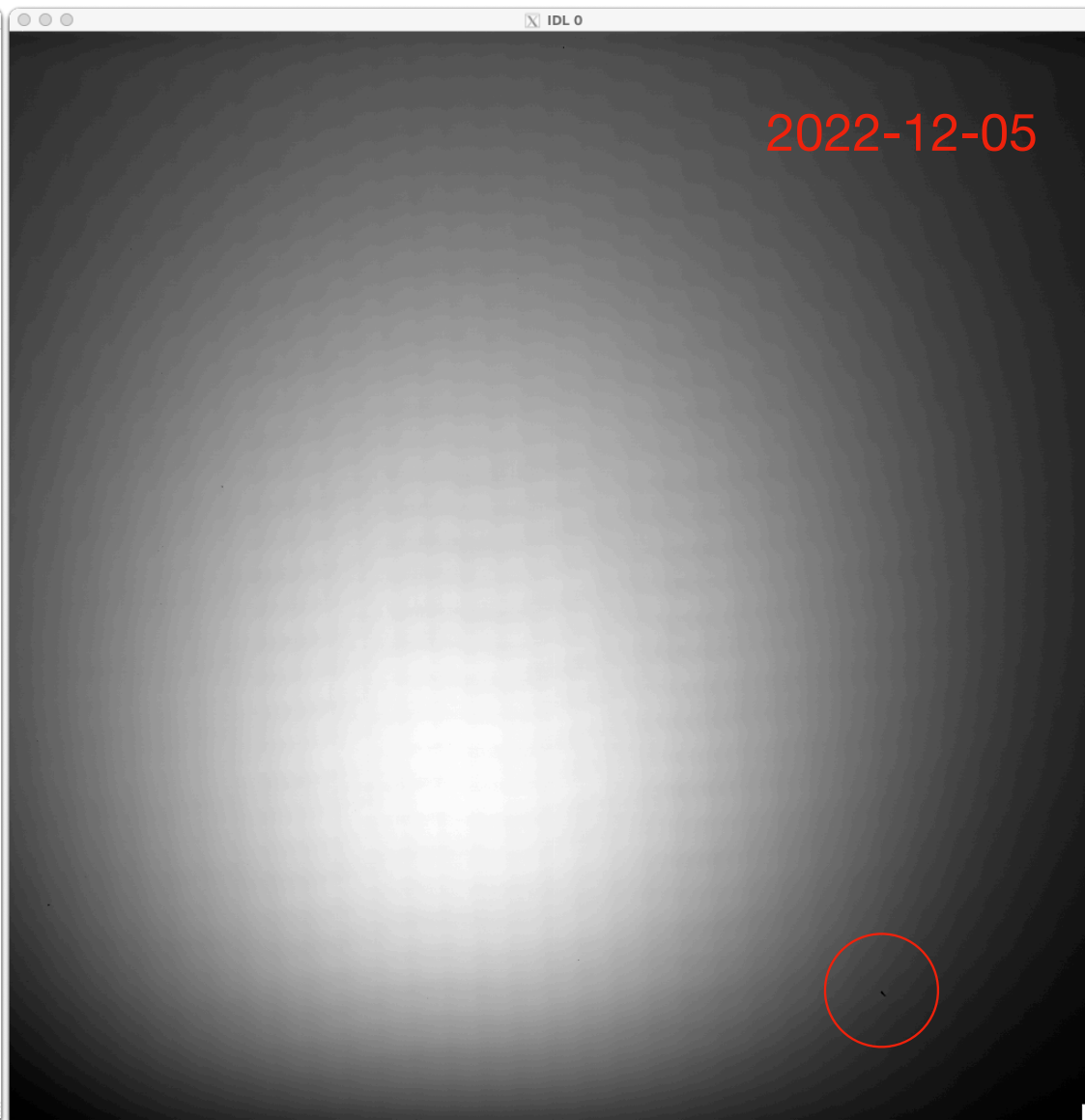
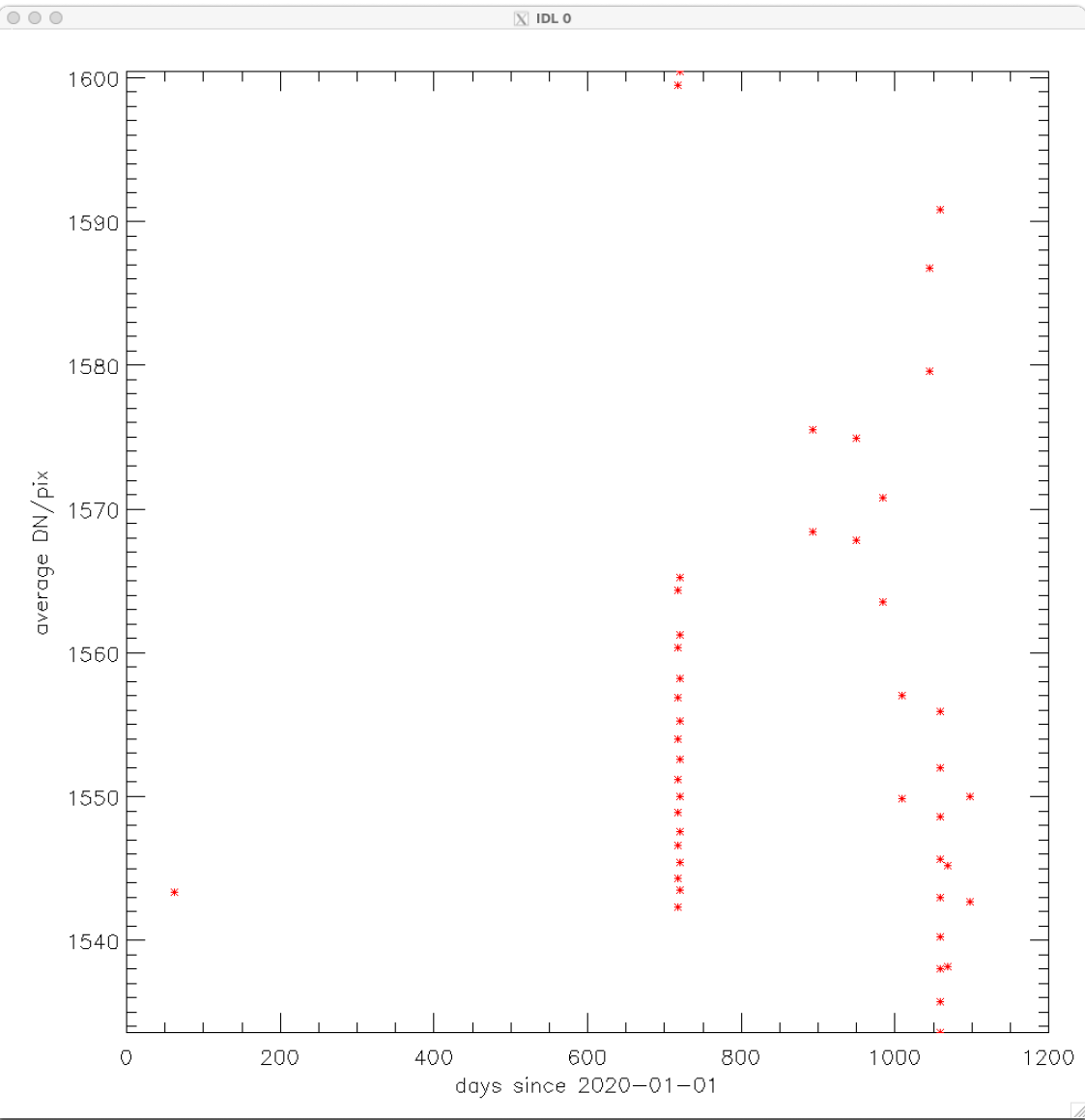


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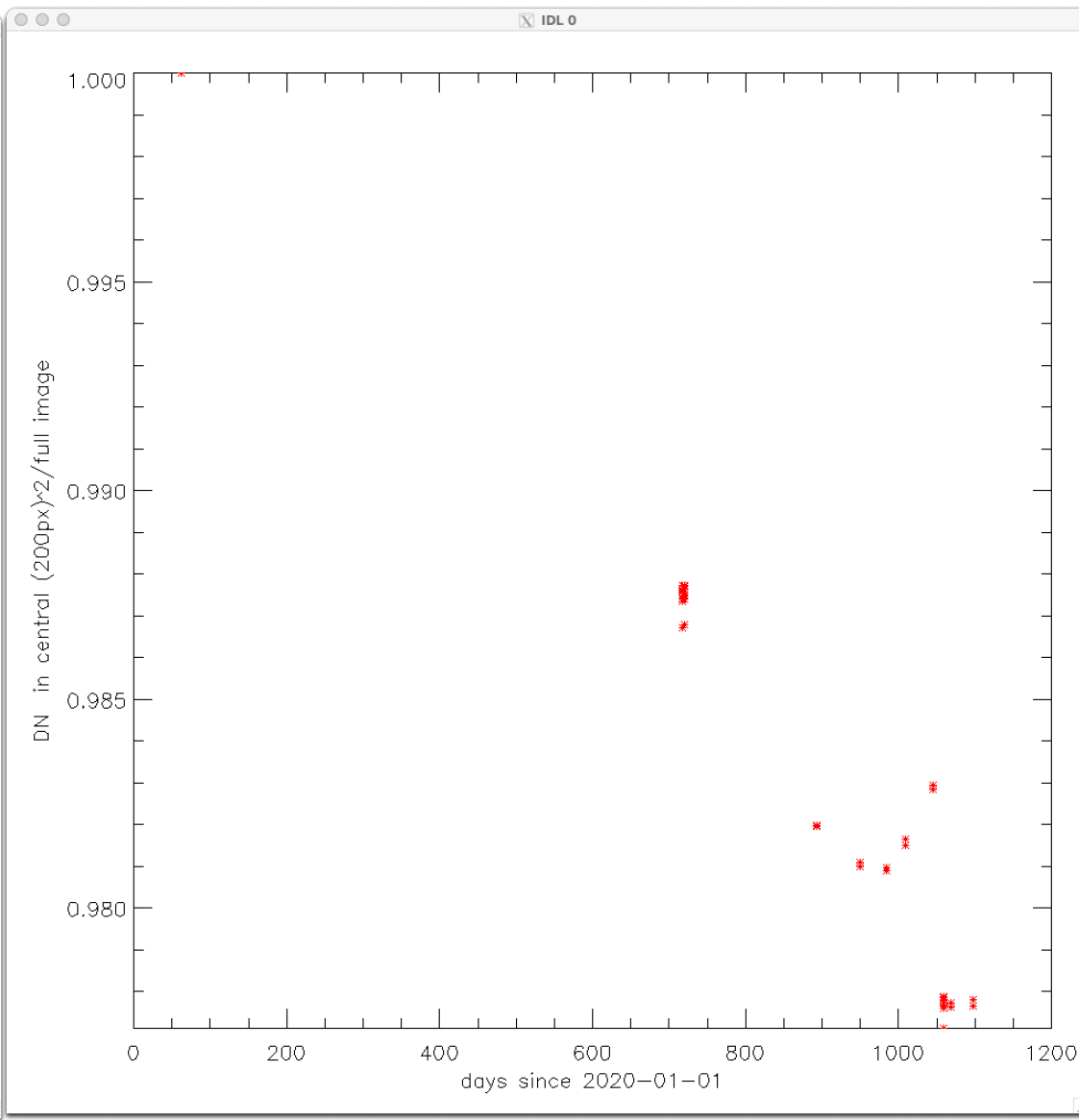
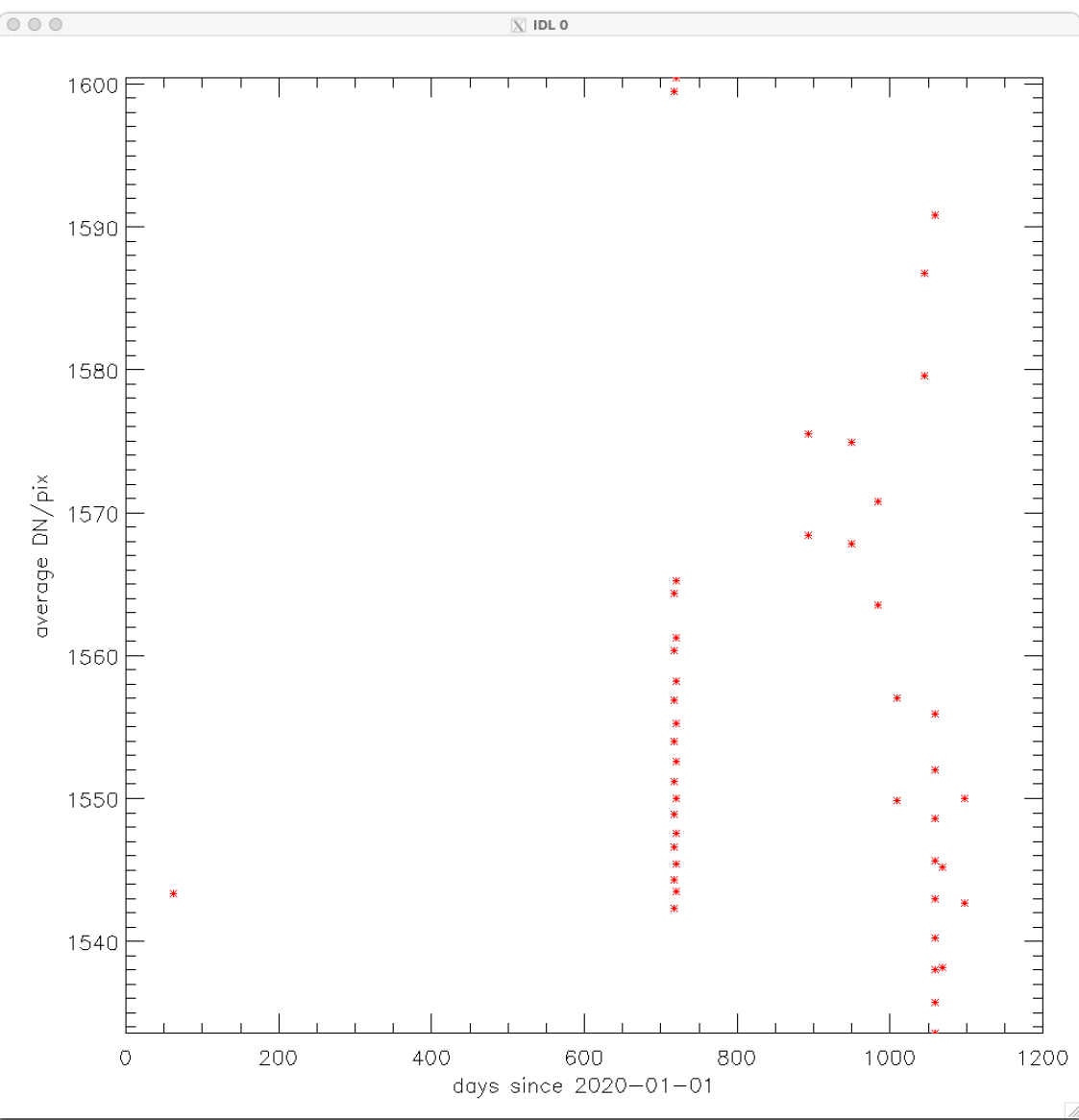
2022-12-05



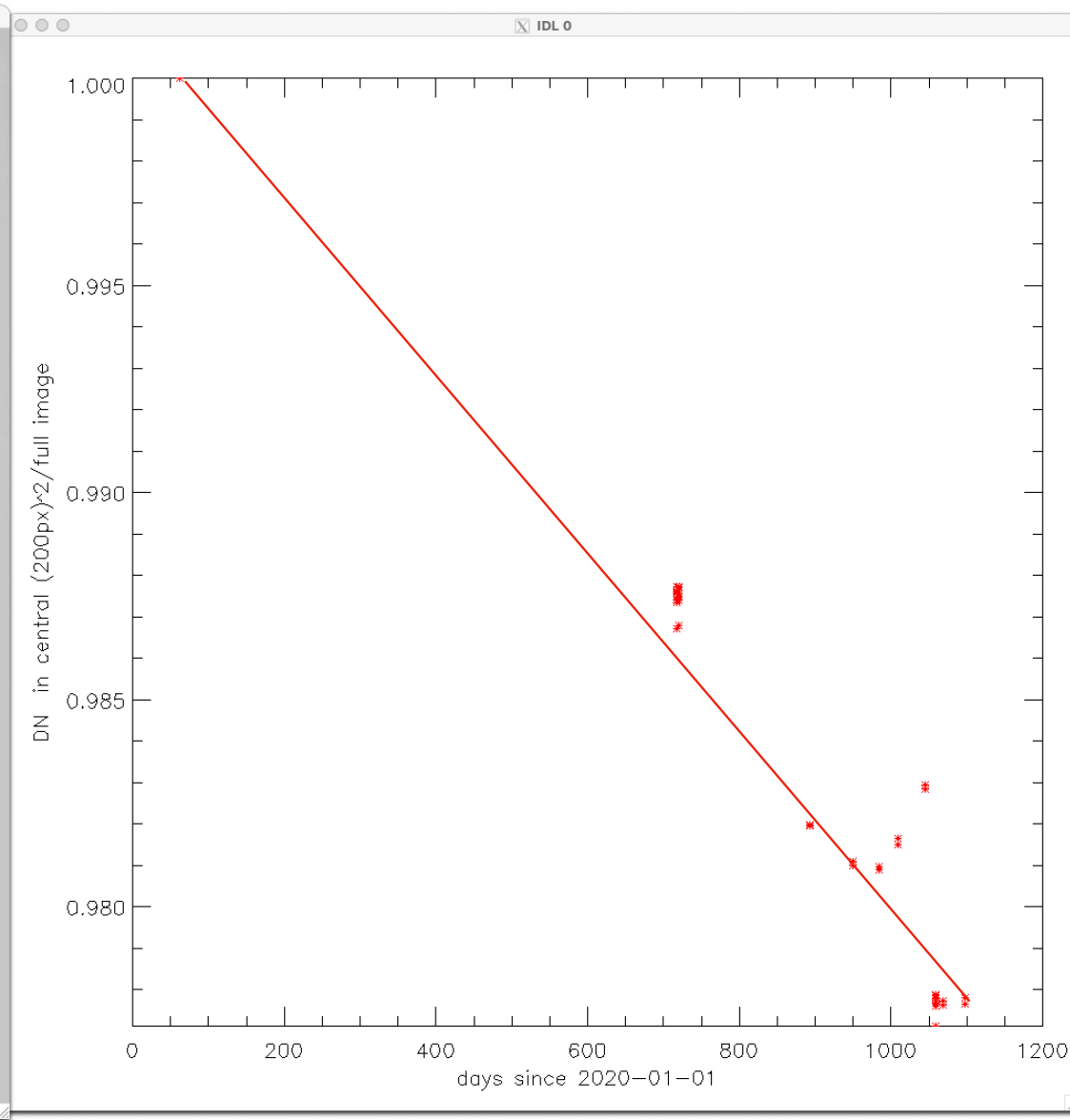
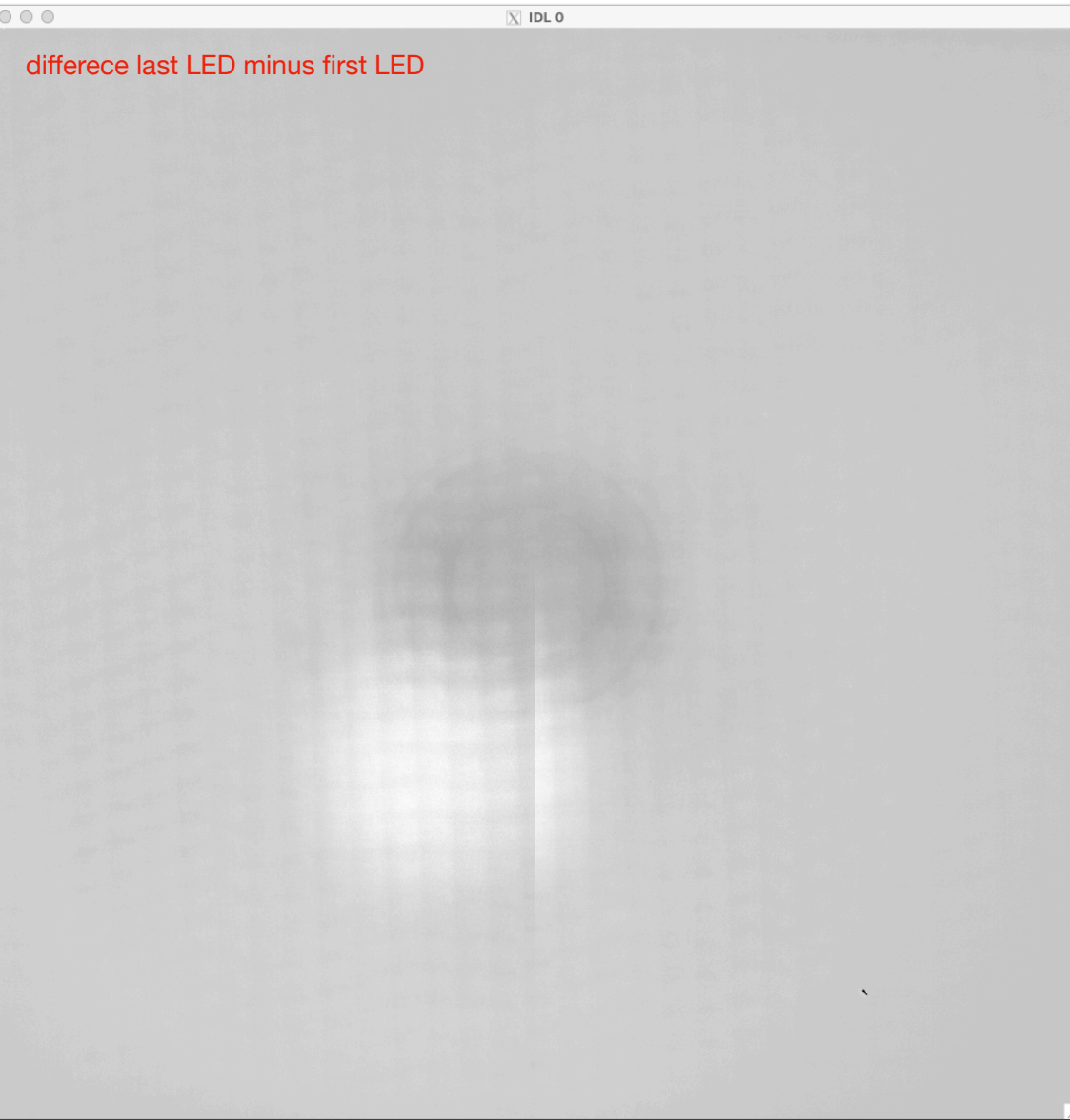
FSI 0.1s LG

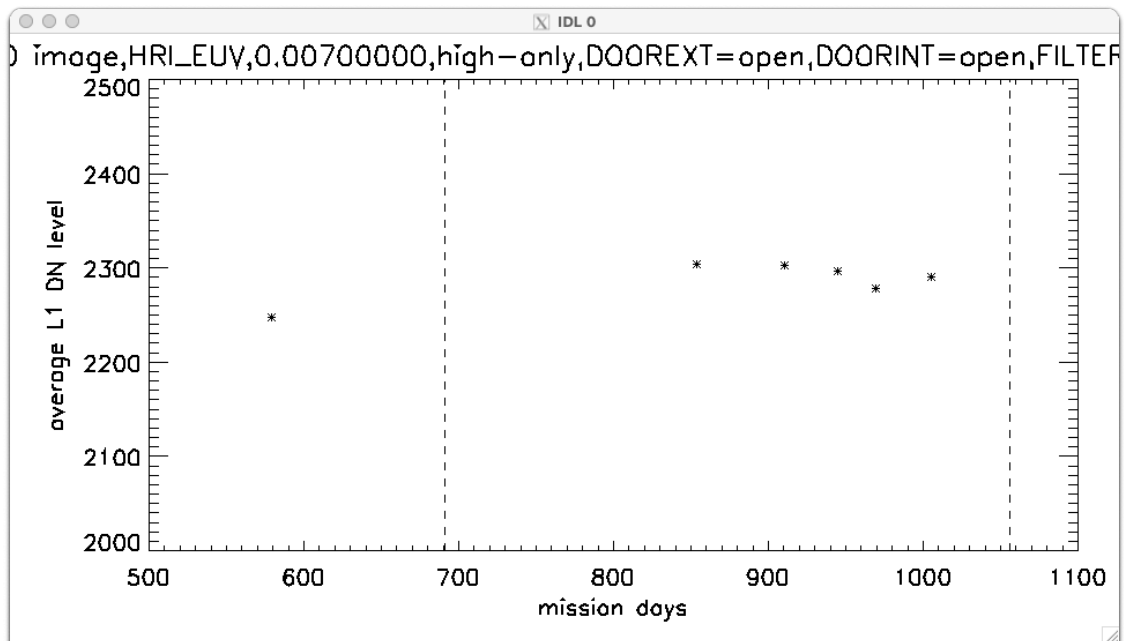






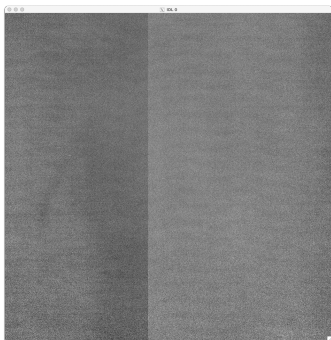




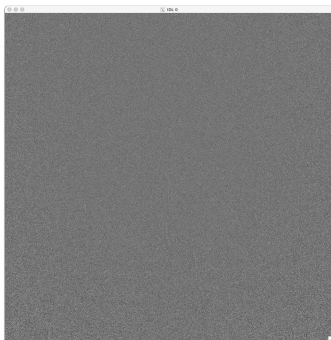


ratio over RSW1,2,3

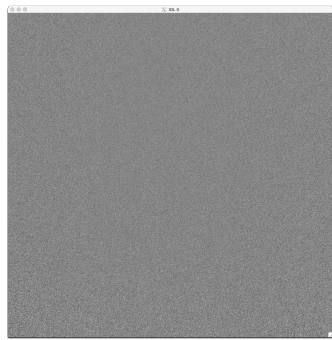
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 / 2021-09-11T05:31:20.206



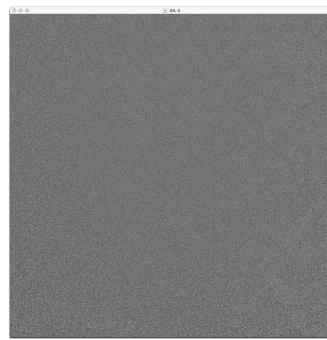
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 / 2022-06-12T11:25:21.253



2022-09-12T00:25:21.235  
 / 2022-08-08T06:25:21.153

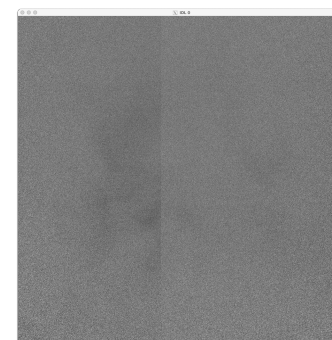


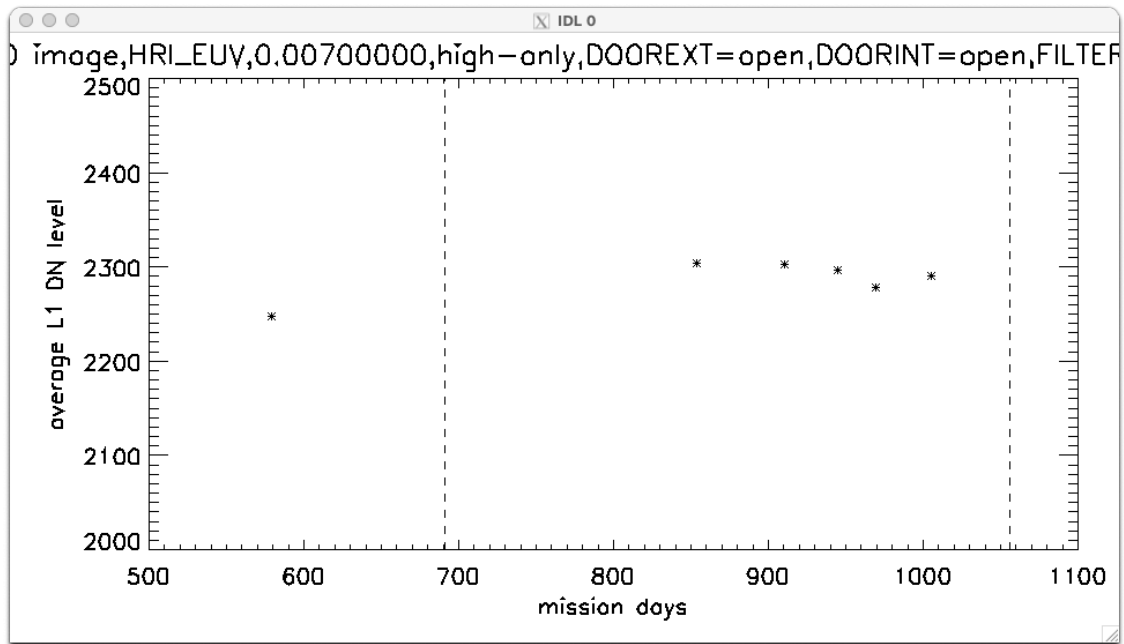
2022-10-06T09:35:21.208  
 / 2022-09-12T00:25:21.235



ratio over RSW4,5,6

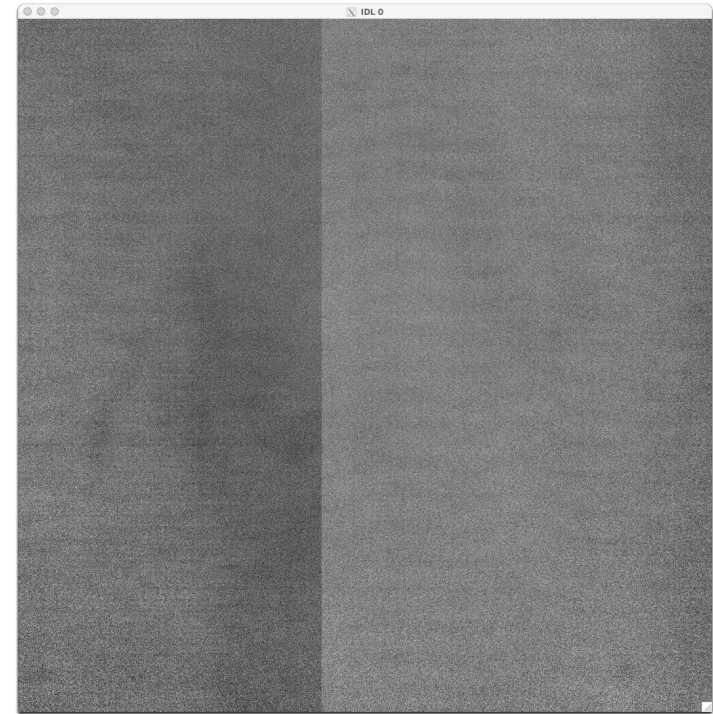
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 / 2022-10-06T09:35:21.208





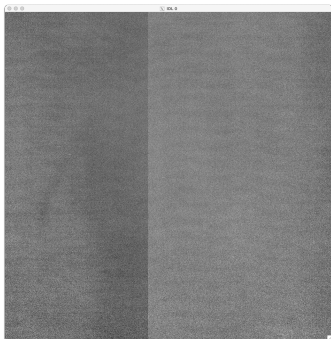
ratio end 2022 / end 2021

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 / 2021-09-11T05:31:20.206

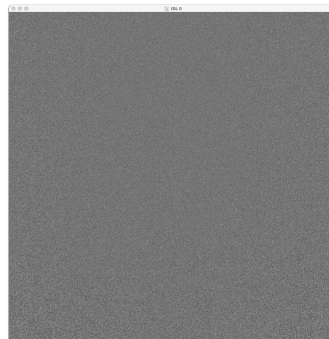


ratio over RSW1,2,3

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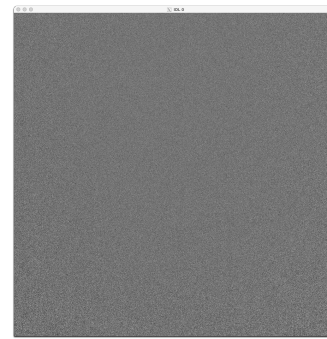
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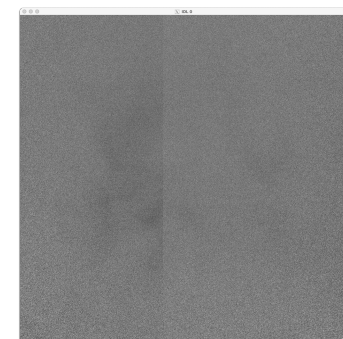


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ratio over RSW4,5,6

2022-11-11T00:04:21.256  
 / 2022-10-06T09:35:21.208

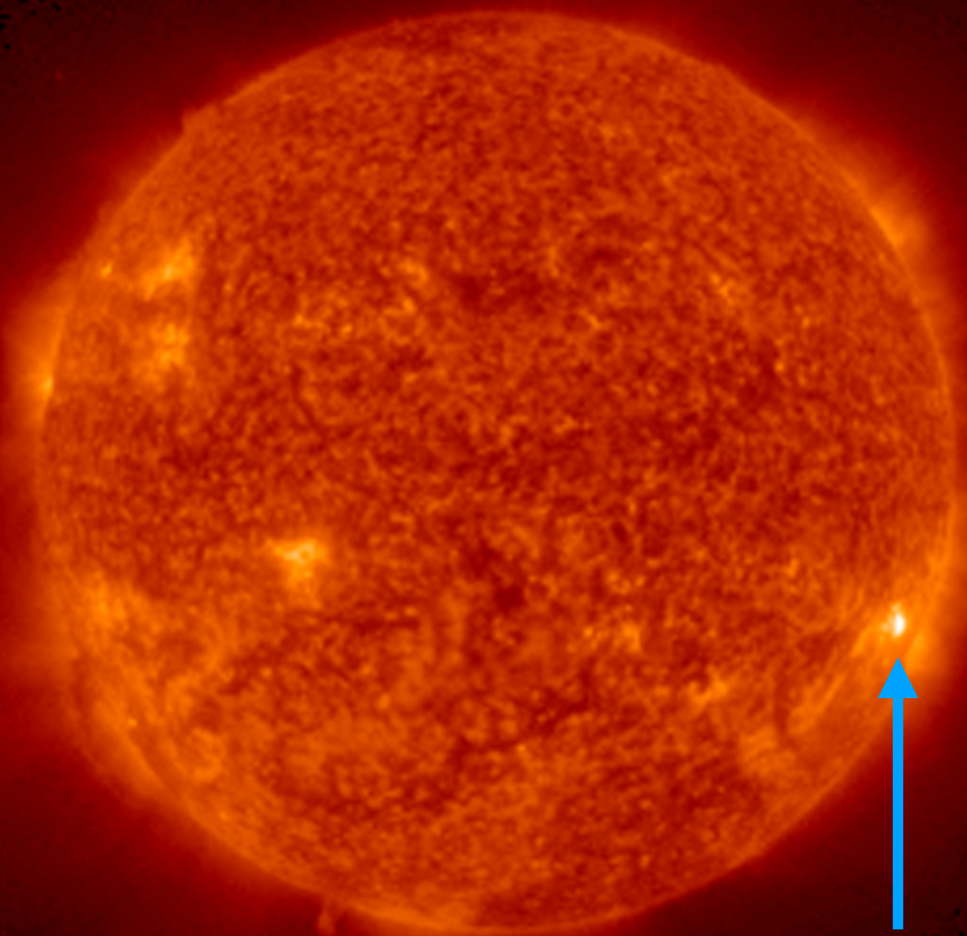




**Short Exposure images  
(start of experiments early July 2022)**

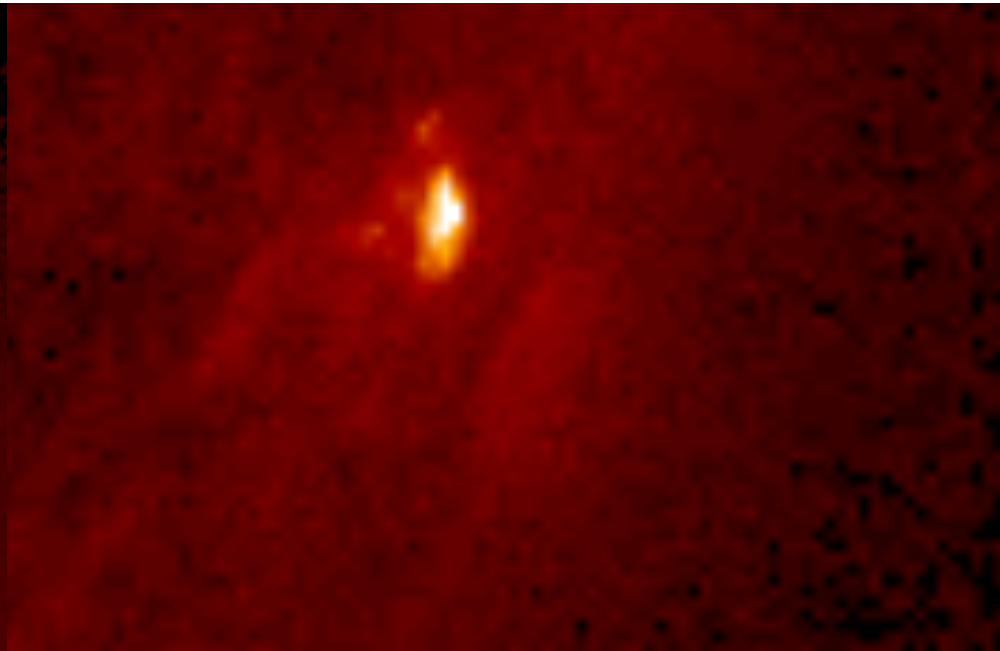


2022 July 15



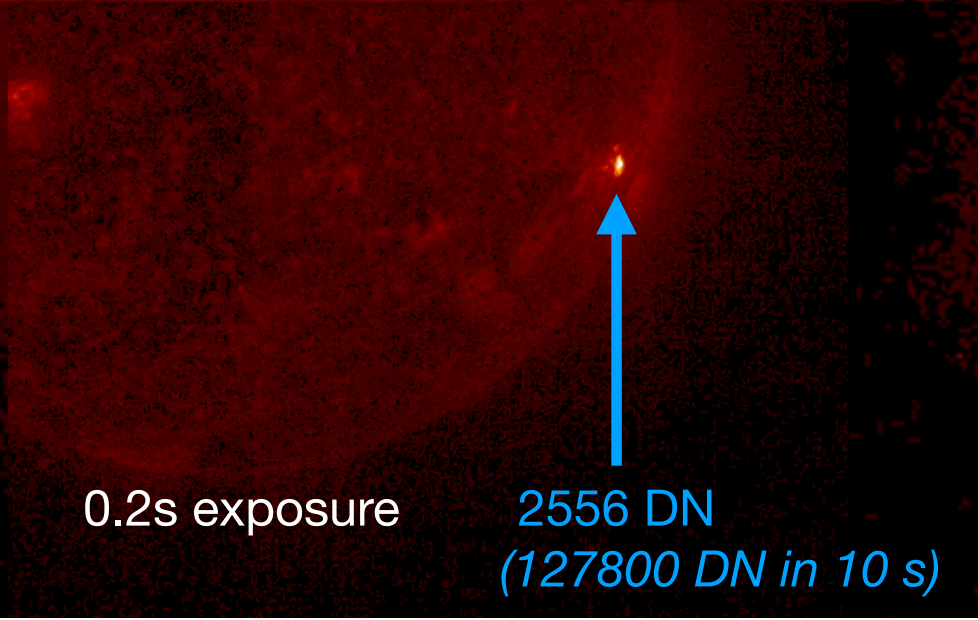
10s exposure

saturation at 32000 DN

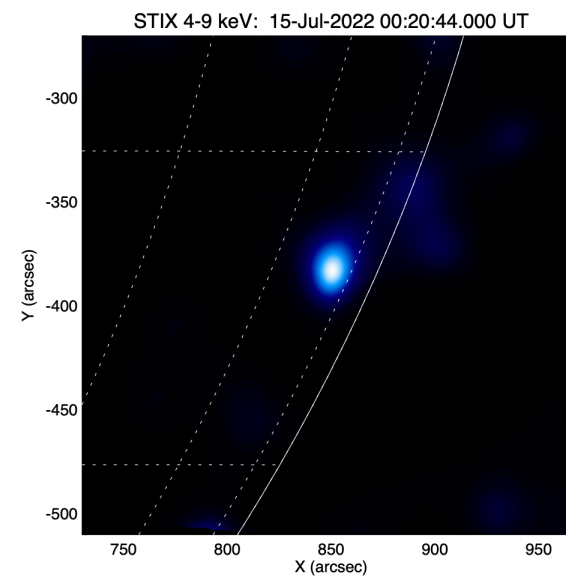
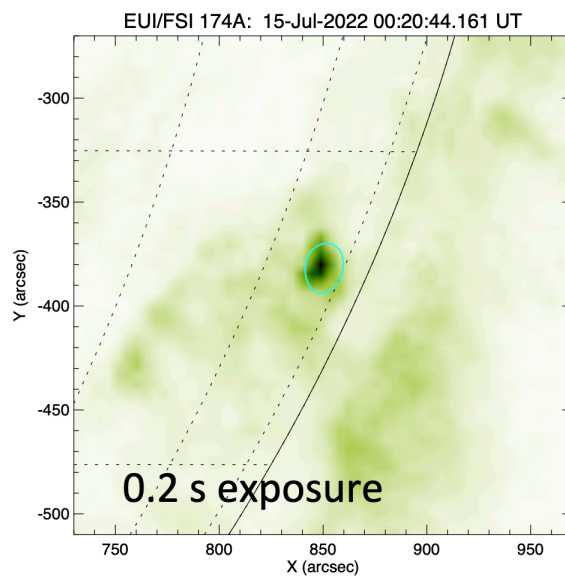
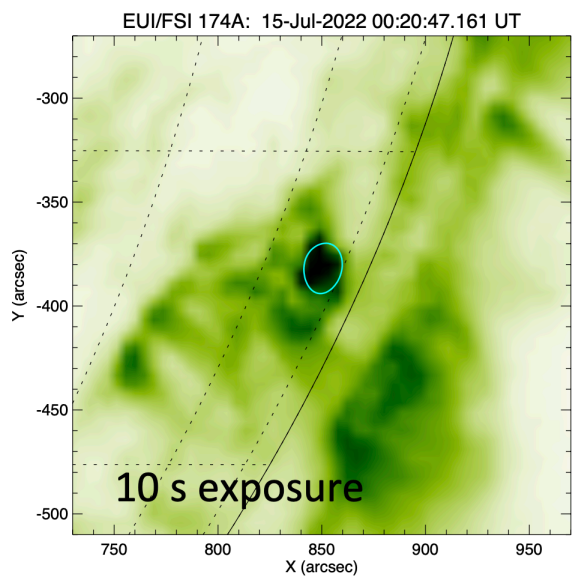
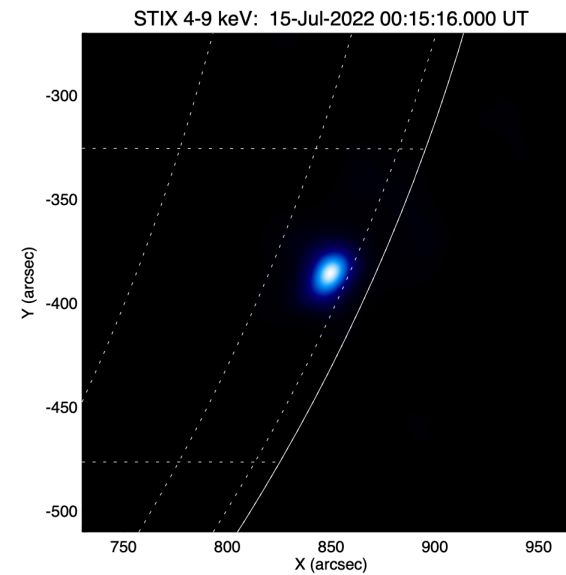
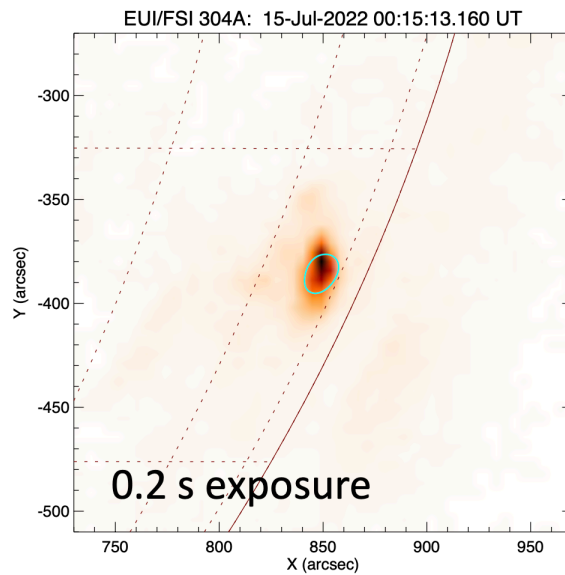
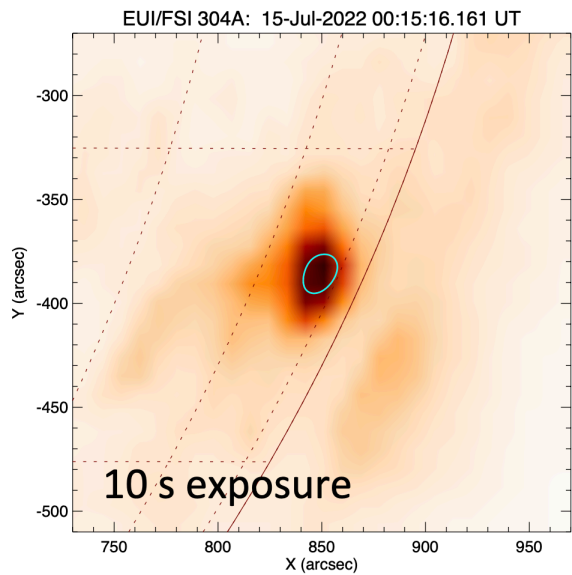


0.2s exposure

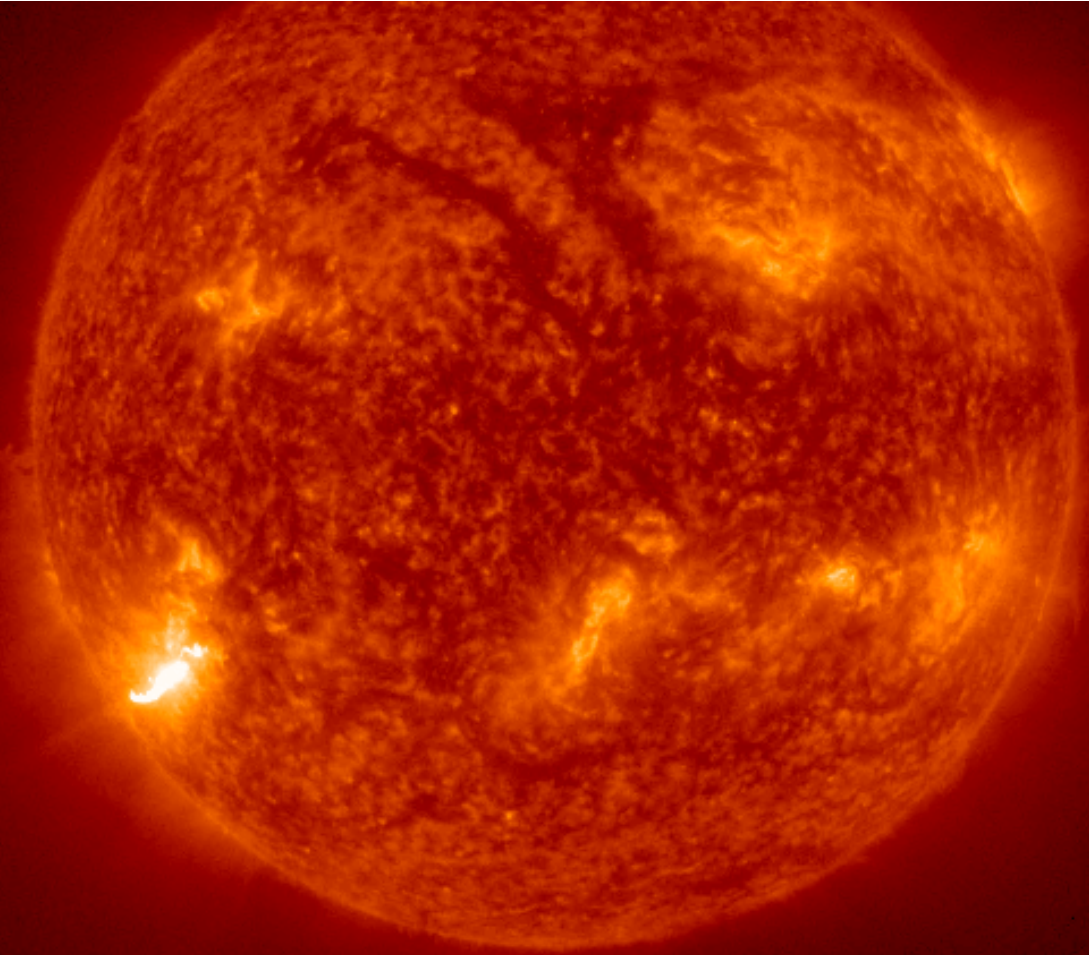
2556 DN  
(127800 DN in 10 s)

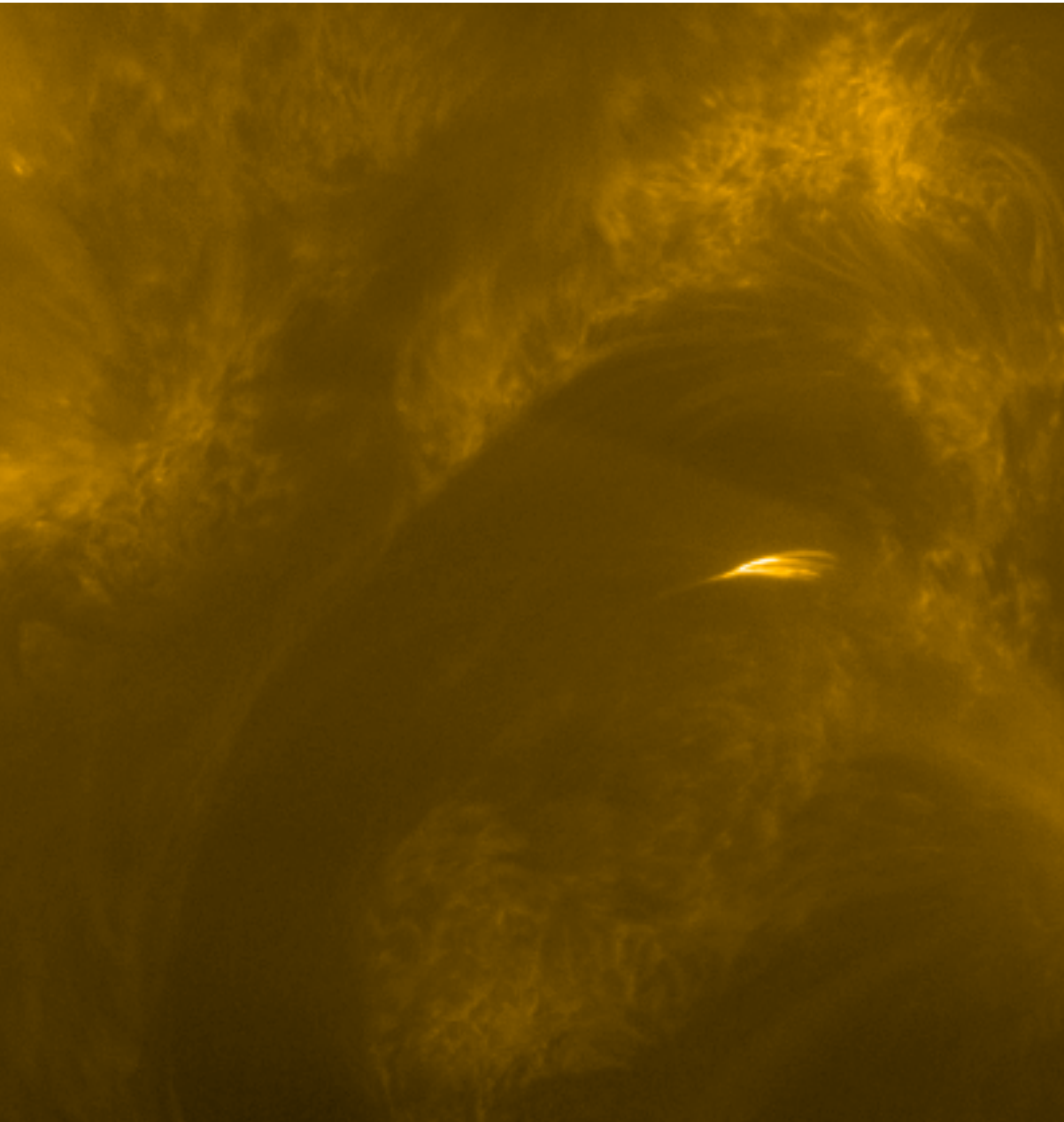






2023-01-06  
alternating 0.2s/10s





HRIEUV shallow exposures



# Short exposures

- Each image is preceded by an image with 2% exposure time
- Short exposure images are thresholded: only what saturates in the regular images is kept in the short exposure images
- Cost telemetry:
  - FSI: telemetry +15%, timing: none
  - HRIEUV: telemetry +4%, cannot go faster than 5s cadence, 1.65s exposure time

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## Worth it?

- Telemetry cost can be further optimised (stronger compression, reprioritisation)
- HRIEUV: only when there is flare potential? only when cadence >5s?

Krzysztof Barczynskion  
EPD-STIX-EUI flare list

Laura Hayes  
STIX/EUI coordination

Nils Janitsek  
EPD/EUI coordination



# **Onboard hick-ups**

Aug 1: SOB blockage

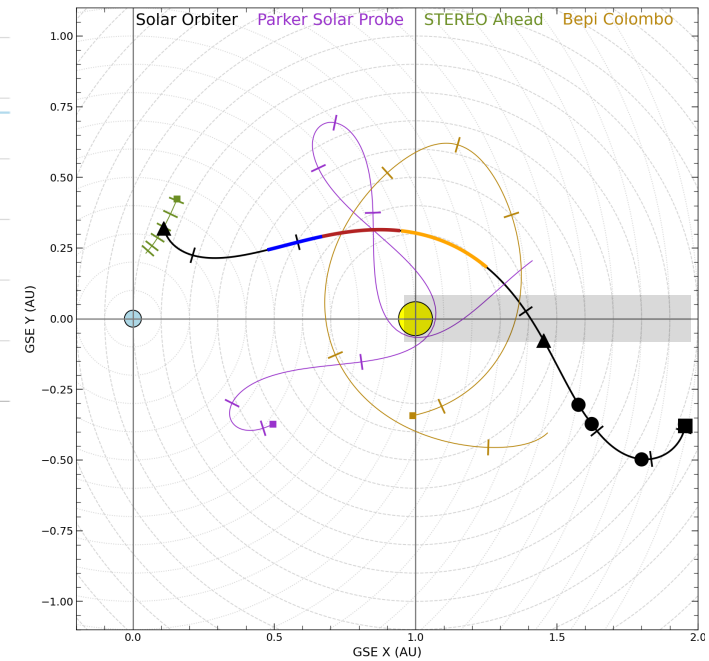
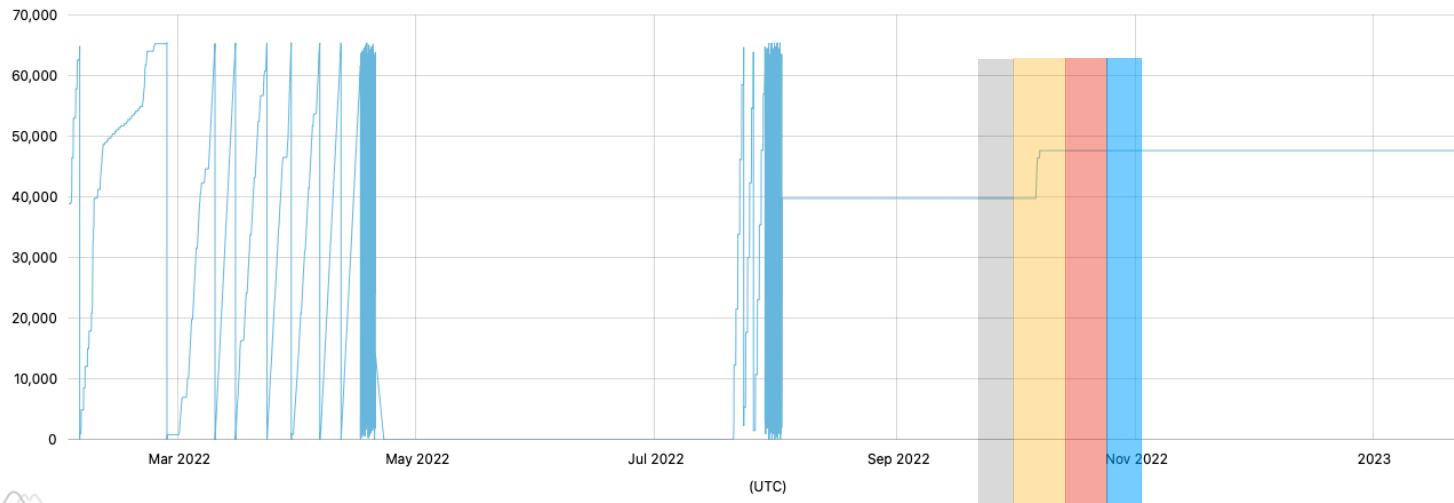
Sept 18: clock jumps

Nov 3: SSMM problem

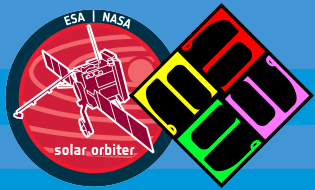


# 2022-aug-01 SOB is stuck, reboot

NIU05149 EUI EDAC SOB uncorrectable count







## Clock Jump Sept 18



- EUI clock jumped 65536 seconds backwards on Sept 18. We have never seen before a backward jump.
- Earlier in the mission we had 65536s jumps forwards. The forward jumps are now corrected in real time by onboard software
- Possible the onboard software made an unnecessary correction?
- This jump was corrected manually by a timesync and did not happen again.
- The software update of mid January has a permanent fix for this.

# November 3: SSMM anomaly

- a part of the SSMM memory misbehaved
- an automated recovery to switch to the redundant side of the SSMM failed
- all observations were halted for a couple of days at the end of RSW6
- MOC managed to recover the data content of the SSMM
- core problem is identified, fixes are being prepared





SCIENCE & EXPLORATION

# Solar snake spotted slithering across Sun's surface

14/11/2022 96182 VIEWS 250 LIKES 472737 ID 00:00:11



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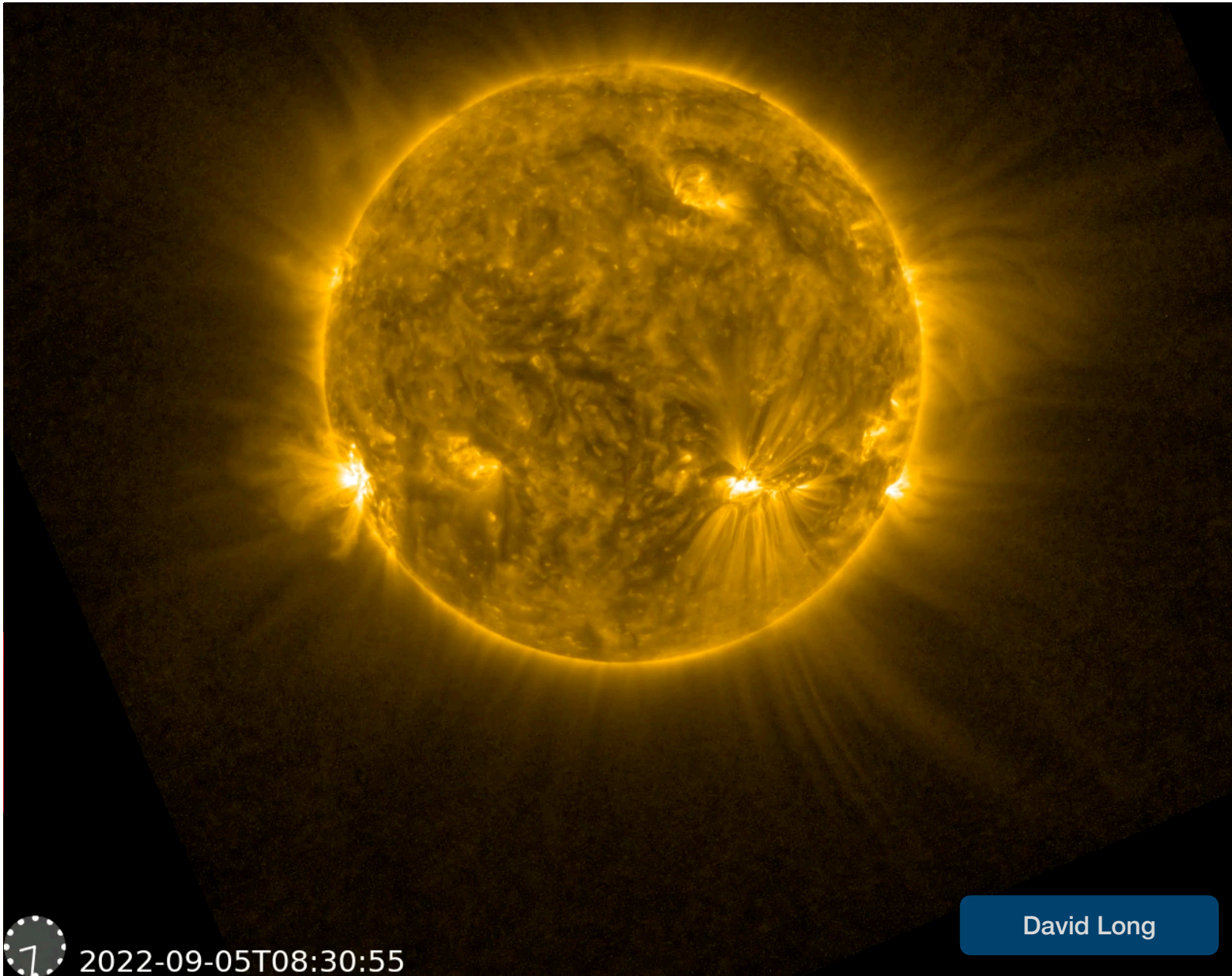
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DETAILS RELATED

Solar Orbiter has spotted a 'tube' of cooler atmospheric gases slithering its way through the Sun's magnetic field. The observation provides an intriguing new addition to the zoo of features revealed by the ESA-led Solar Orbiter mission, especially since the snake was a precursor to a much larger eruption.

The snake was seen on 5 September 2022, as Solar Orbiter was approaching the Sun for a close pass that took place on 12 October. It is a tube of cool plasma suspended by magnetic fields in the hotter surrounding plasma of the Sun's atmosphere.





SCIENCE & EXPLORATION

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## DETAILS

## RELATED

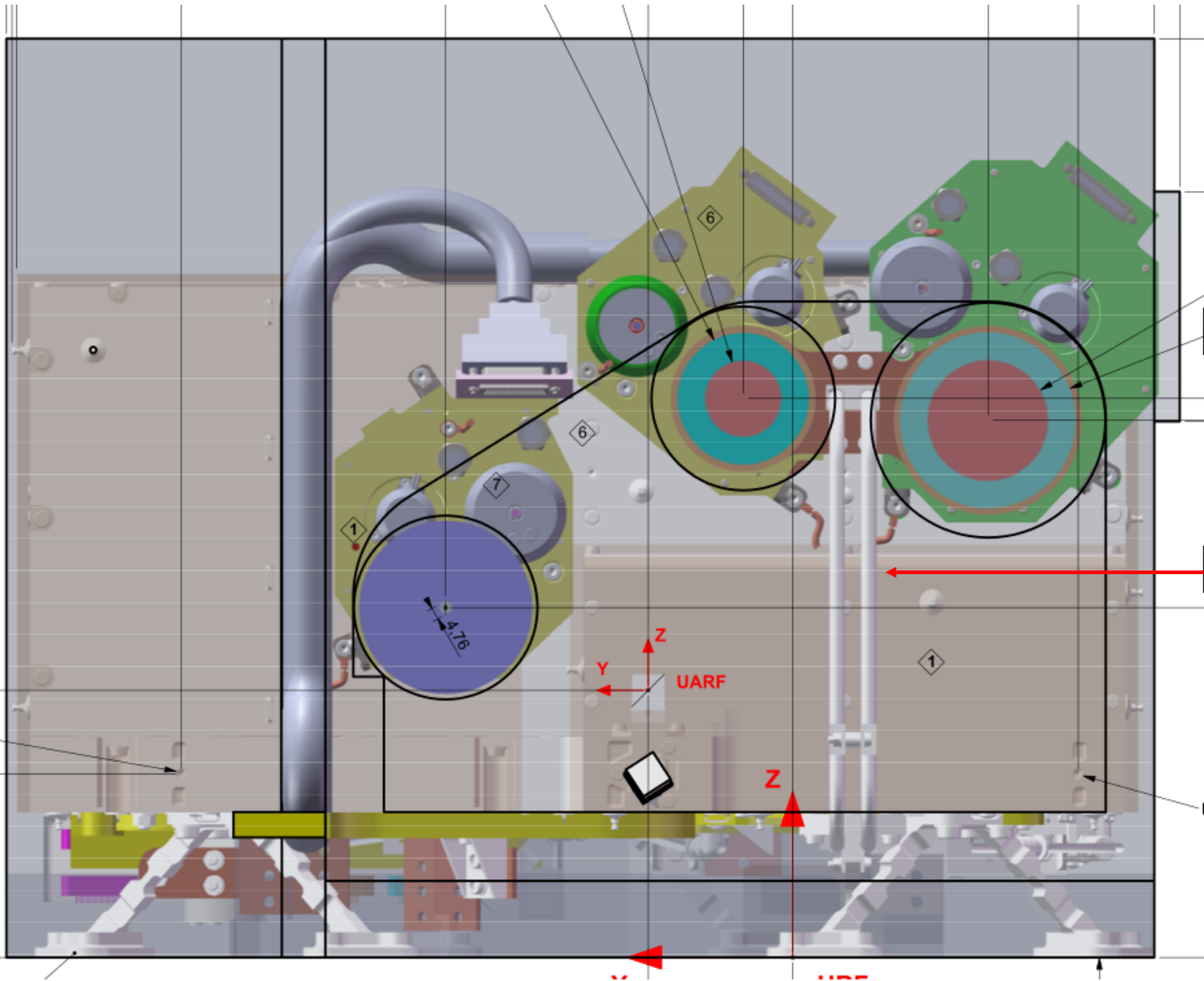
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David Long

1 2022-09-05T08:30:55

# Front filter temperatures



Heat conducting "goggle"

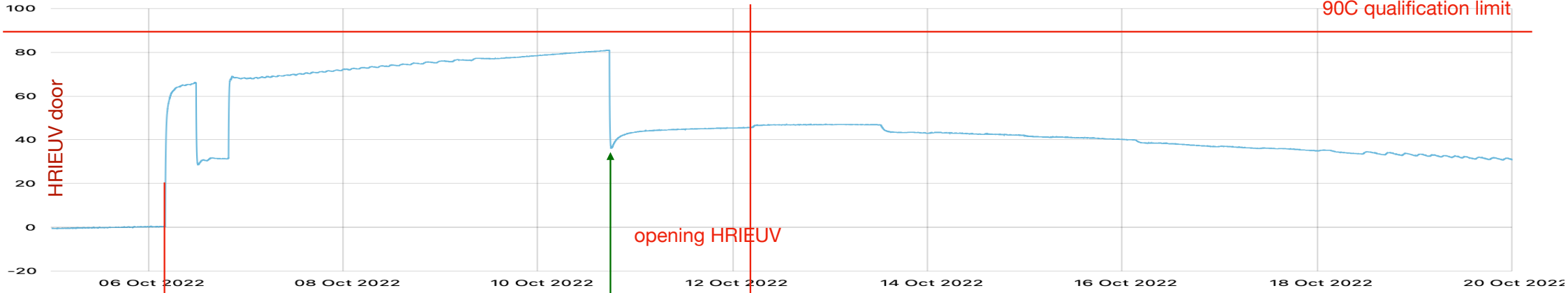
Heat pipes to Hot Element IF

Z  
Y  
UARF

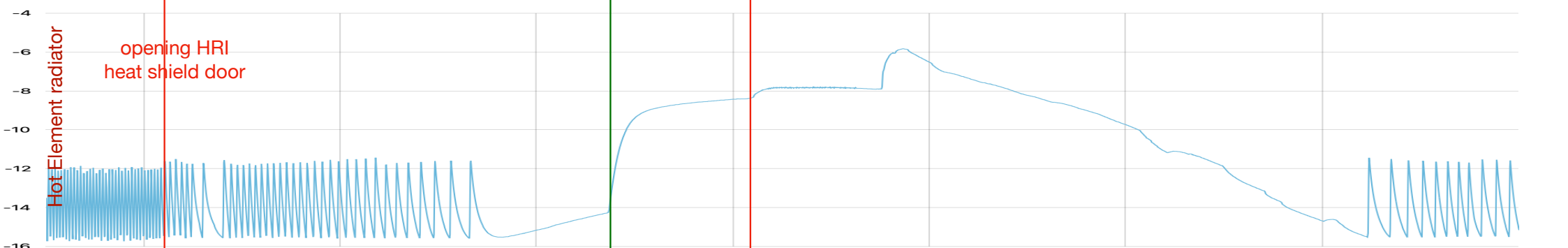
4.76

nt

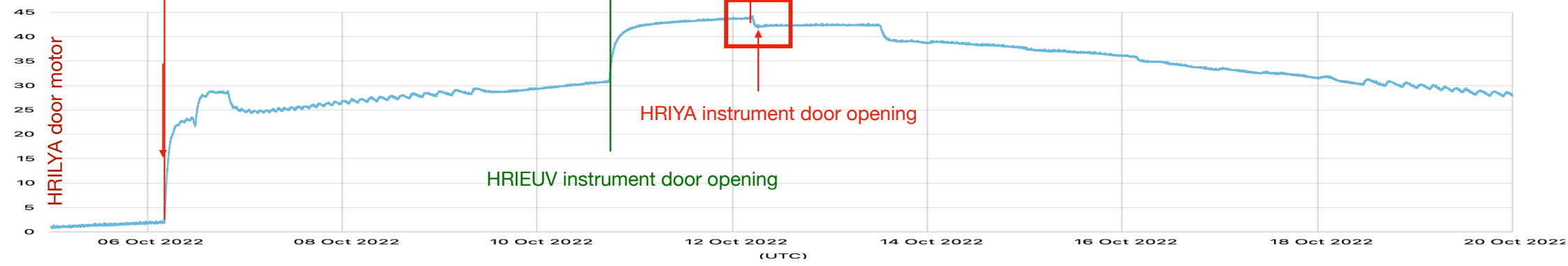
NIUD103B EUI EUV entrance filter temperature



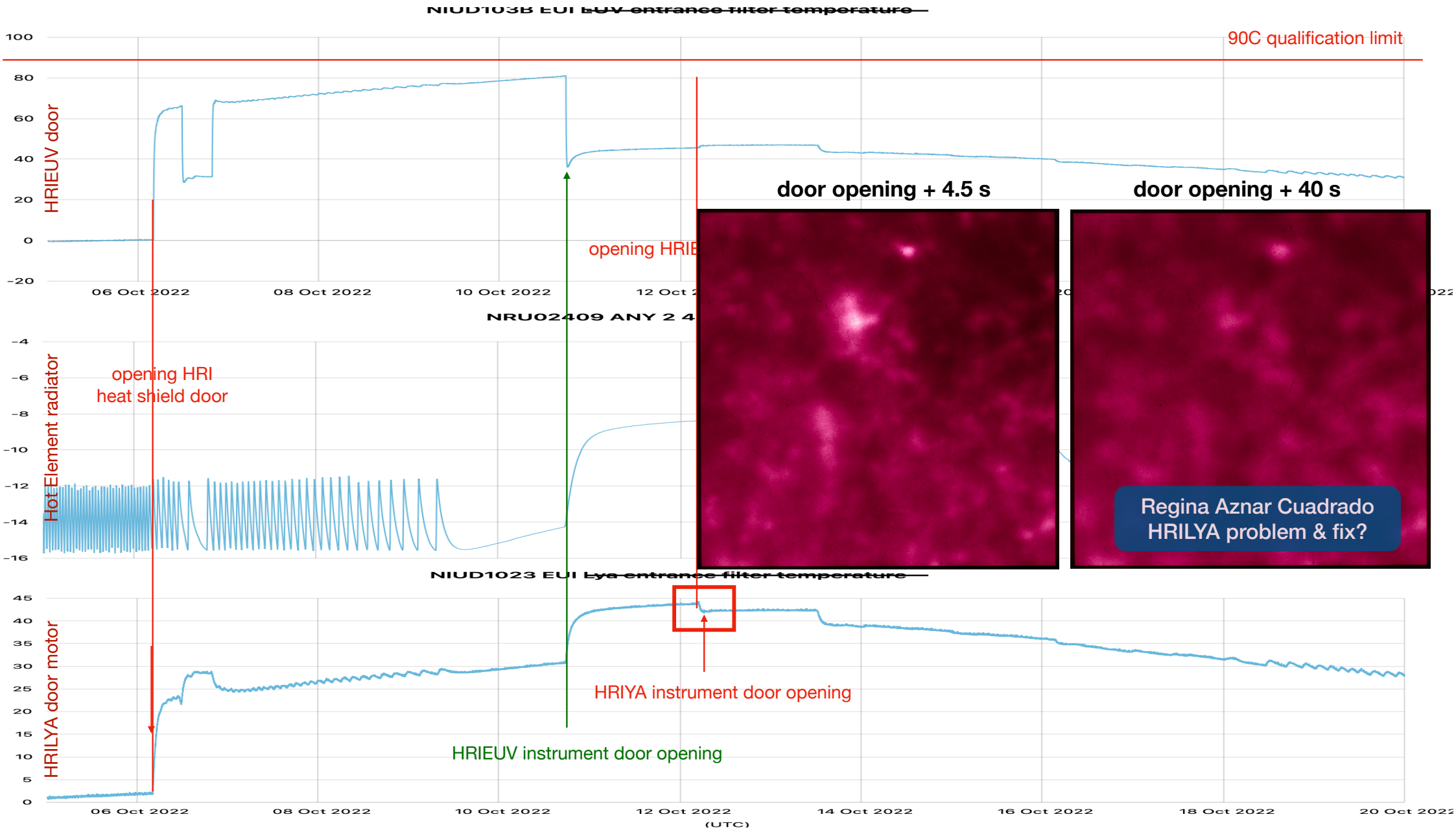
NRU02409 ANY 2 4 9 EUI OU HE1



NIUD1023 EUI Lya entrance filter temperature













Solar Orbiter's unprecedented view of the quiet corona



# October 12



# QUIET CORONA

Watch on YouTube

## SCIENCE & EXPLORATION

# Solar Orbiter's unprecedented view of the quiet corona

27/10/2022 15050 VIEWS 226 LIKES 472419 ID 00:01:27



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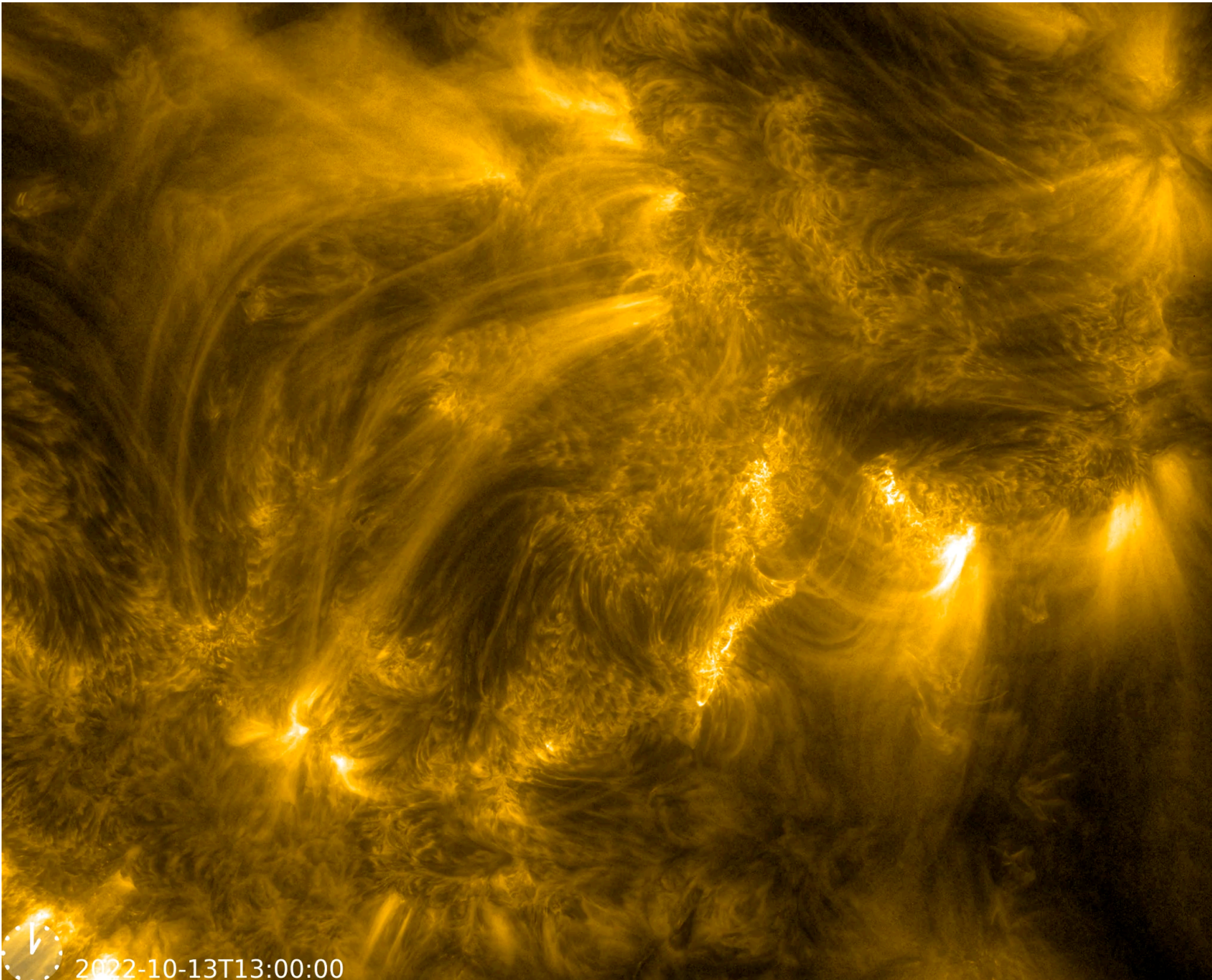
DETAILS

RELATED

The ESA-led Solar Orbiter mission has experienced its second close encounter with the Sun. It is delivering more stunning data, and at higher resolution than ever before.

The moment of closest approach took place on 12 October at 19:12 UTC (21:12 CEST), when Solar Orbiter was just 29% of the Earth's distance from the Sun. This movie comes from 13 October, when the spacecraft's Extreme Ultraviolet Imager (EUI) returned the highest resolution movie of the quiet corona ever taken with any instrument.





SCIENCE & EXPLORATION

## Solar Orbiter's unprecedented view of the quiet corona

27/10/2022 15050 VIEWS 226 LIKES 472419 ID 00:01:27



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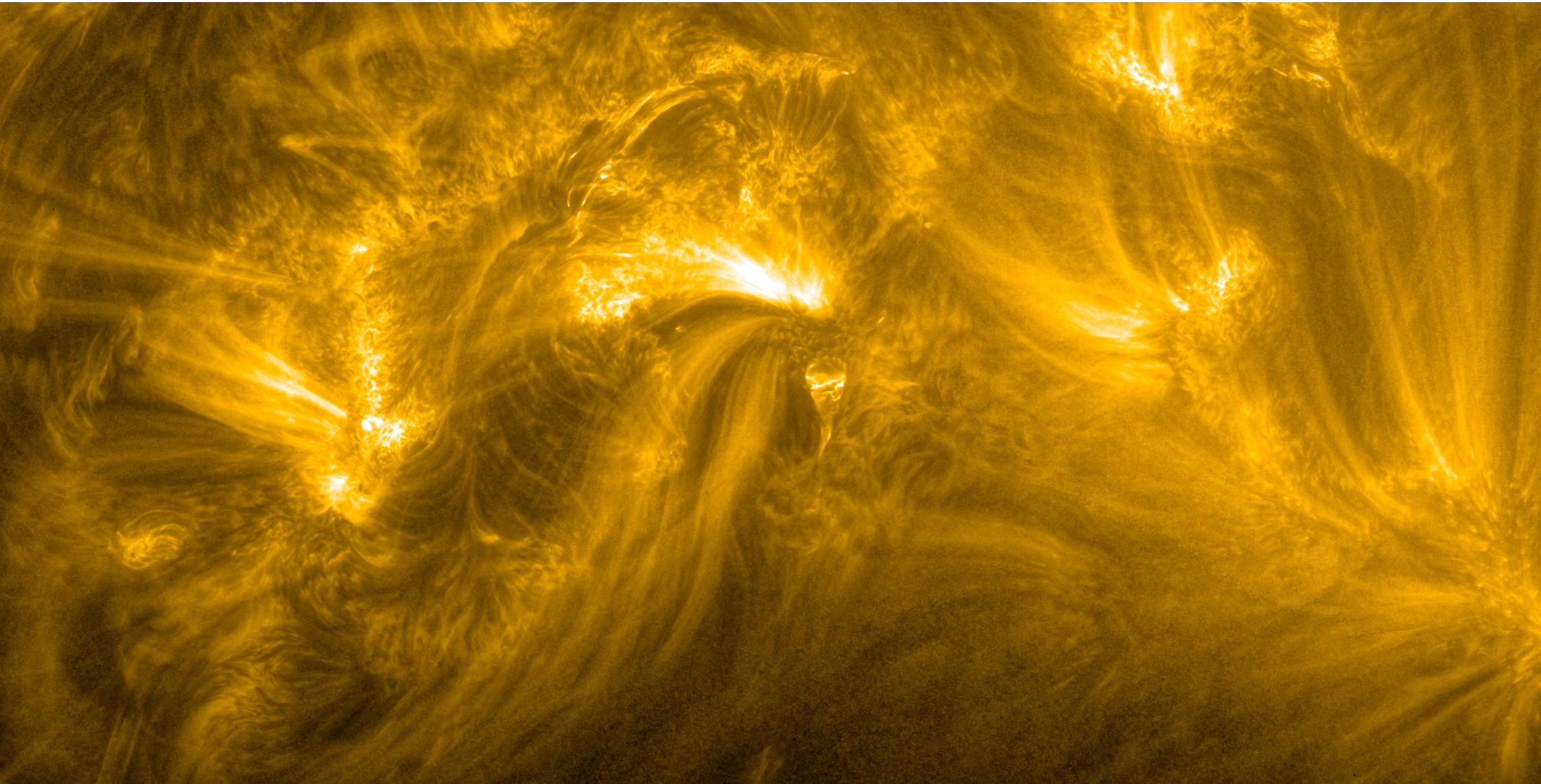
DETAILS

RELATED

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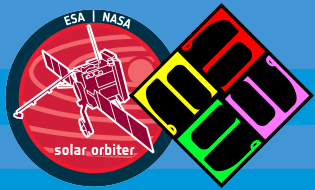


2022-10-18T14:00:00

Elena Petrova  
'Gandalf's hat'

wow processed  
F. Auchère

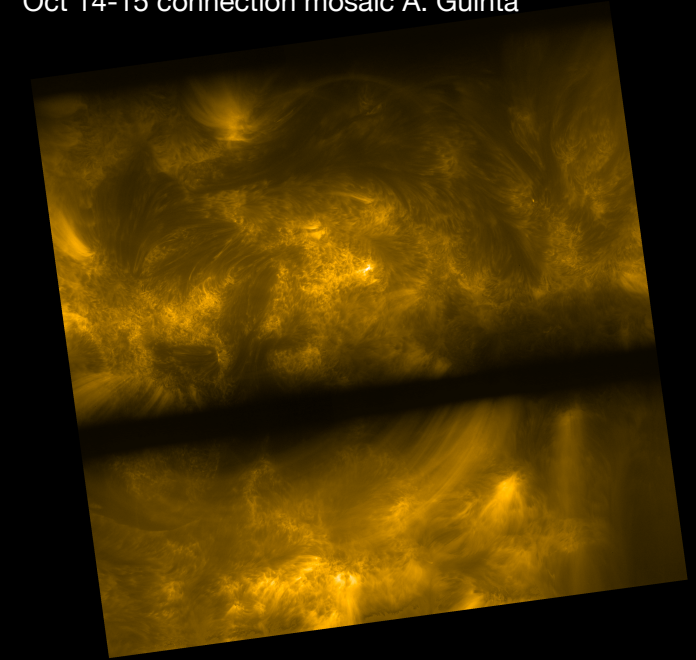




# HRIEUV filter wheel problem Oct 14-18

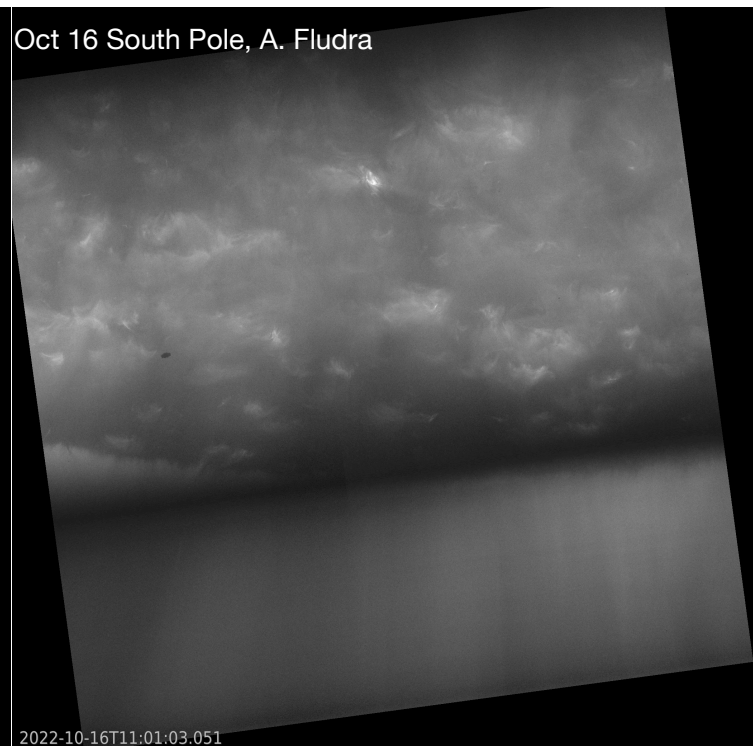


Oct 14-15 connection mosaic A. Guinta



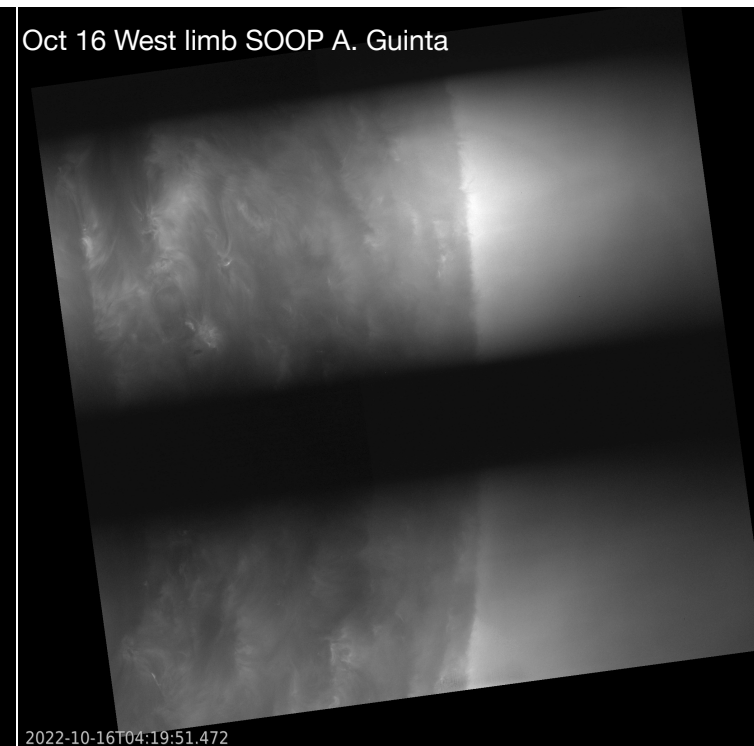
2022-10-15T00:13:01.572

Oct 16 South Pole, A. Fludra



2022-10-16T11:01:03.051

Oct 16 West limb SOOP A. Guinta



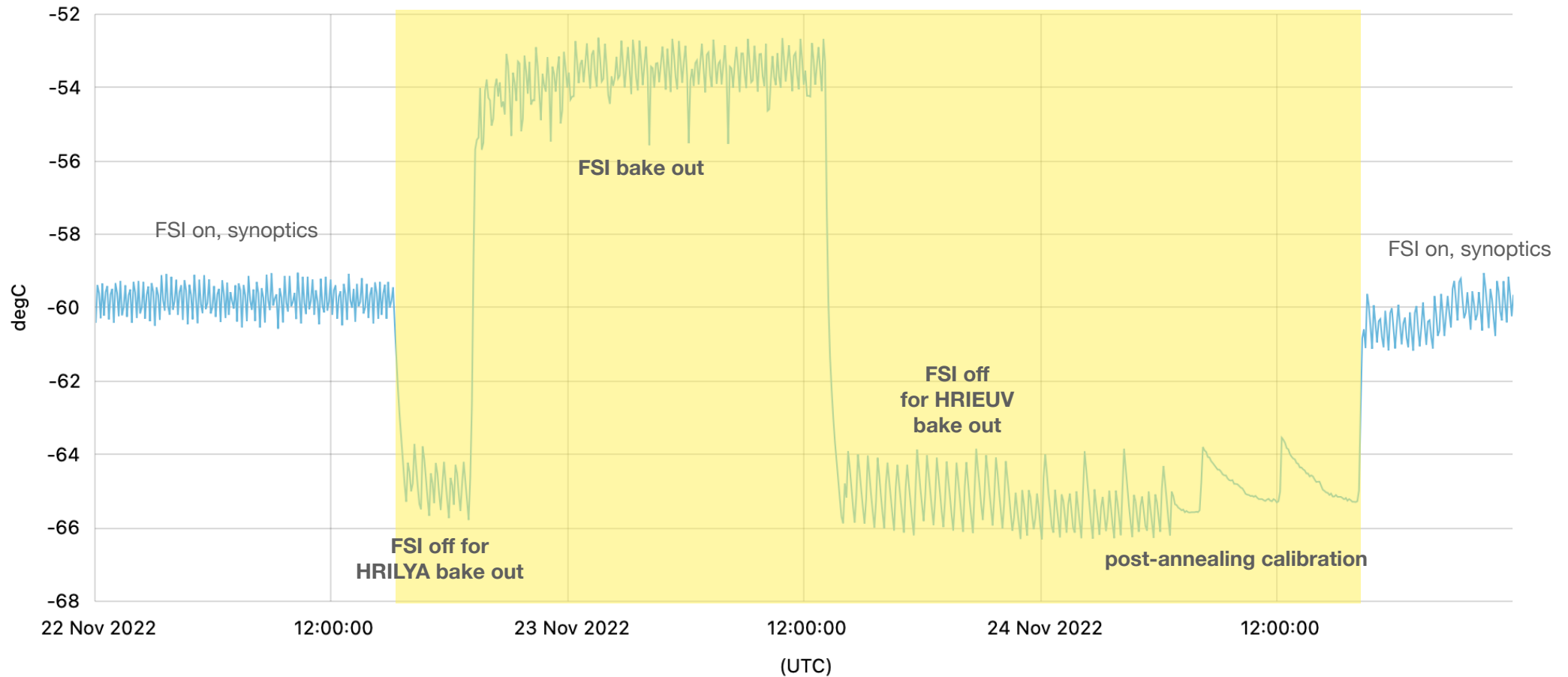
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# 2022 November 22: Annealing campaign

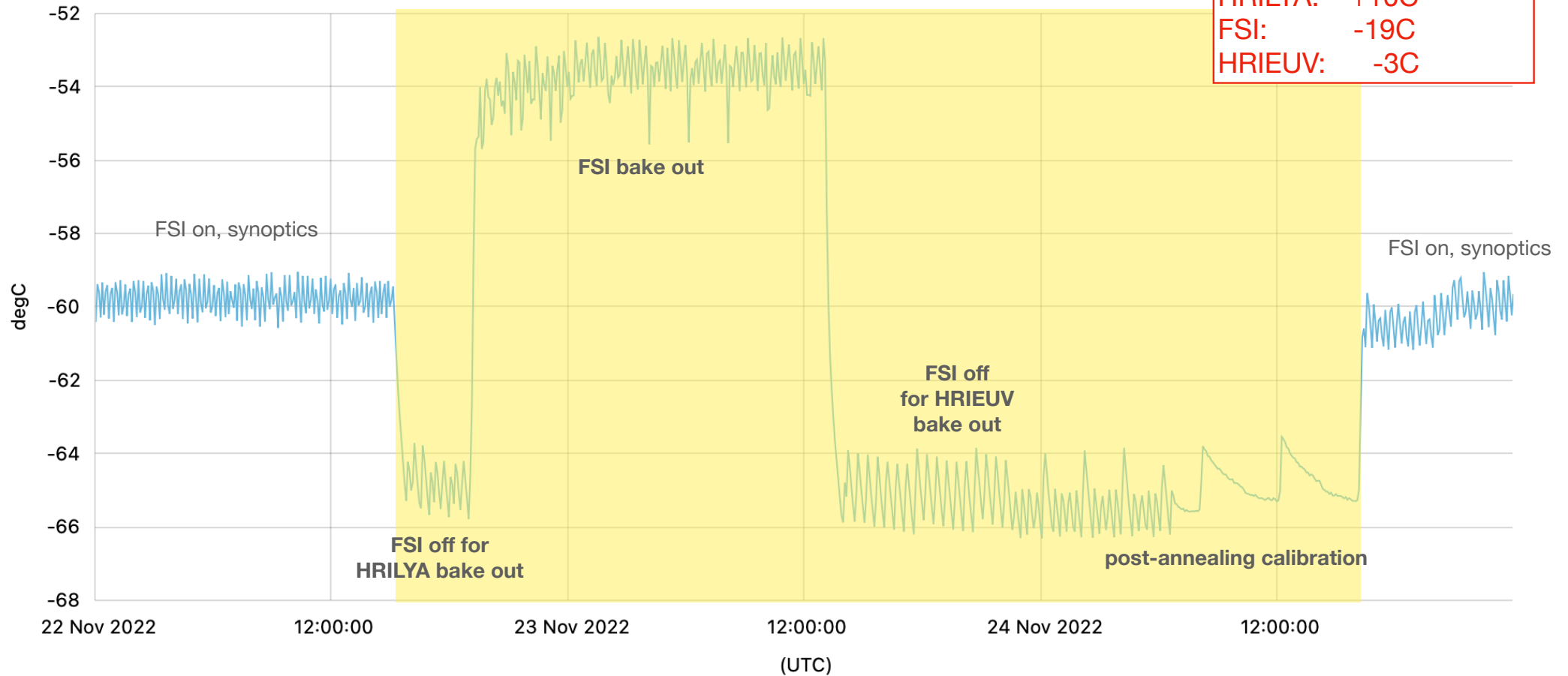
NRU02811 ANP 4 1 11 EUI OU CE1  
Cold Element Radiator connected to FSI



# 2022 November 22: Annealing campaign

NRU02811 ANP 4 1 11 EUI OU CE1  
Cold Element Radiator connected to FSI

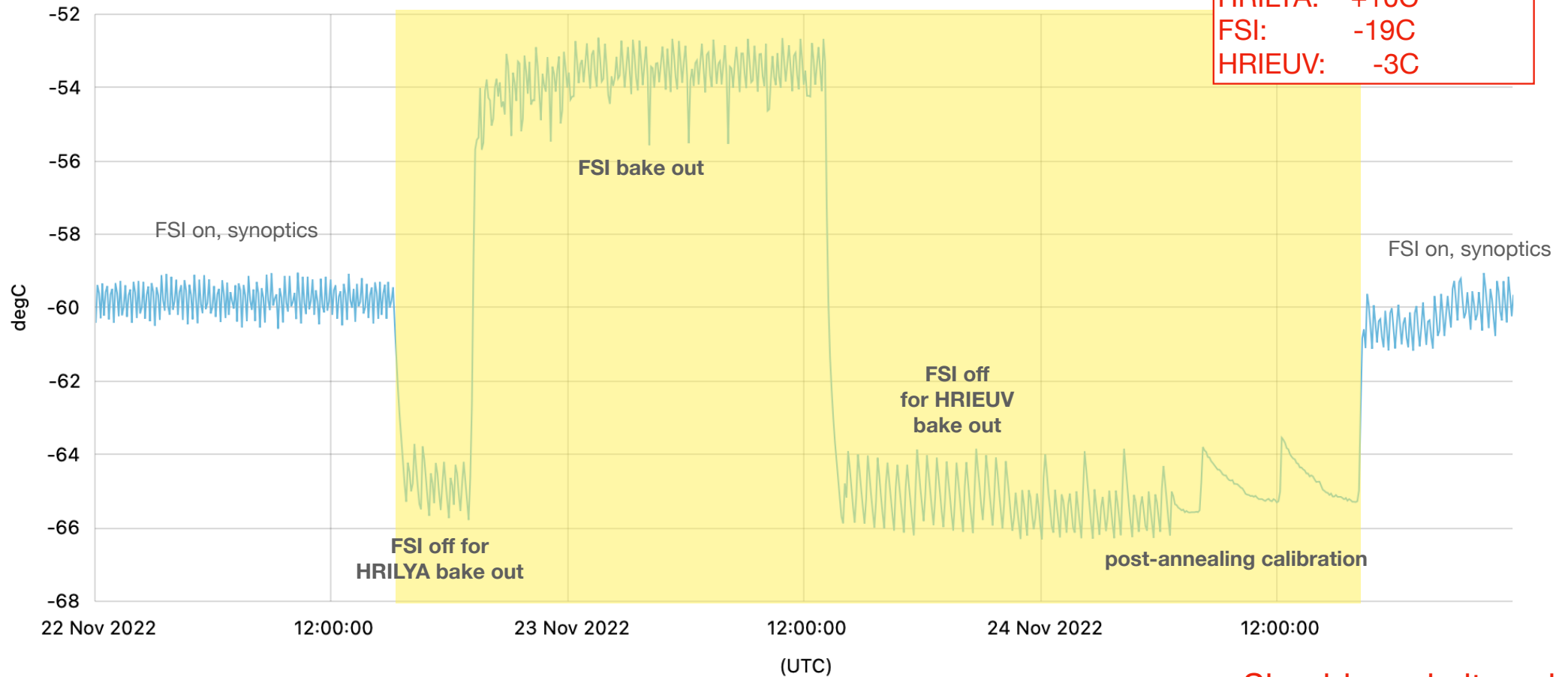
Stable hot temperatures:  
HRILYA: +10C  
FSI: -19C  
HRIEUV: -3C



# 2022 November 22: Annealing campaign

NRU02811 ANP 4 1 11 EUI OU CE1  
Cold Element Radiator connected to FSI

Stable hot temperatures:  
HRILYA: +10C  
FSI: -19C  
HRIEUV: -3C



Should we do it again?



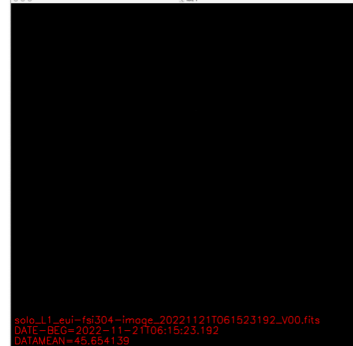
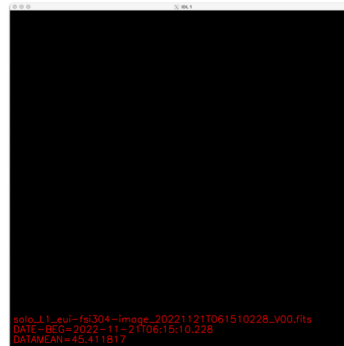
# November 24 filter wheel test

## FILTER WHEEL TEST

### Timeline as simulated from IOR

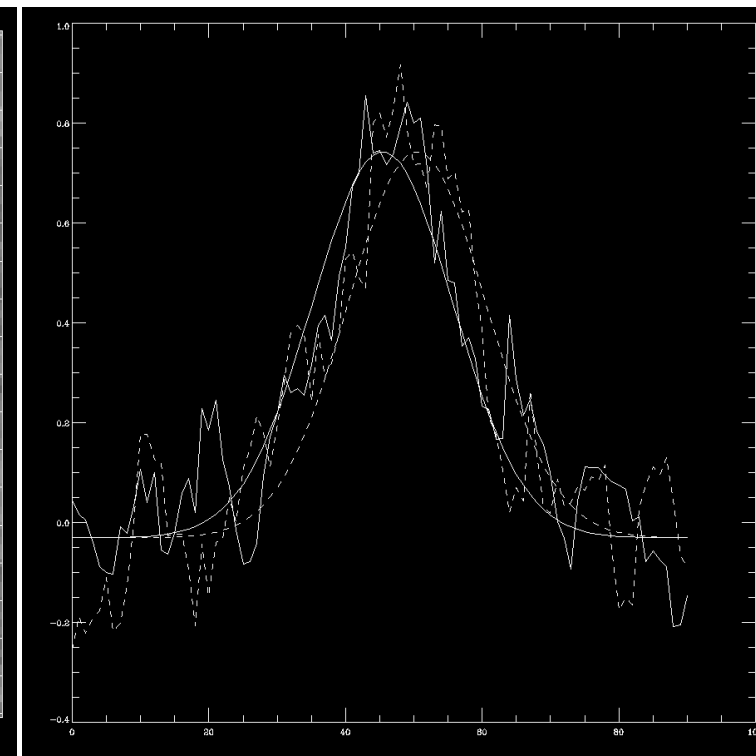
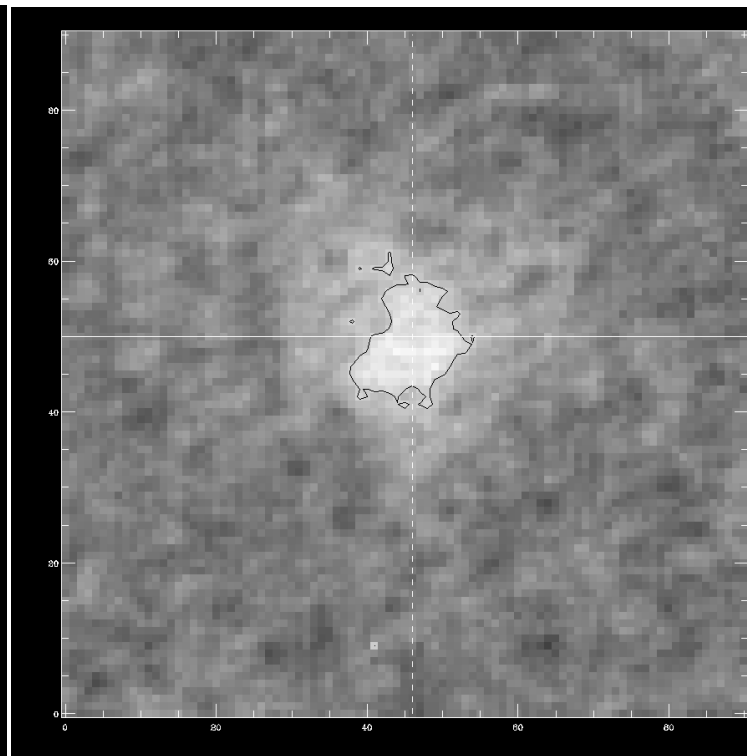
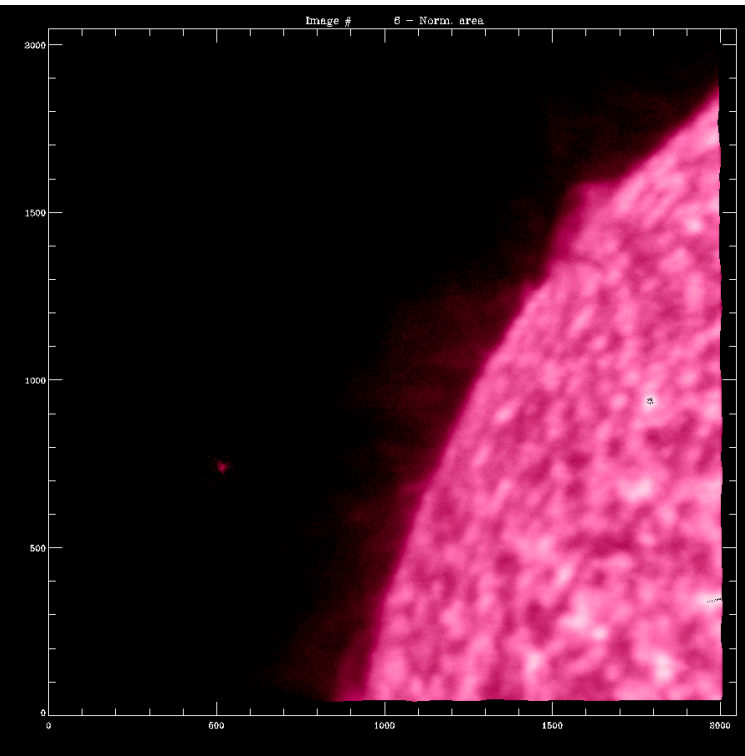
```
2022-11-21 06:00:30.000 FSI D00R cclose
2022-11-21 06:12:00.000 FILTER_MOVE_POS FSI: 4 filter from position 175 (blk) to position 150 (174_n13) line 36
2022-11-21 06:12:30.000 FILTER_MOVE_POS FSI: 4 filter from position 150 (174_n13) to position 150 (174_n13) line 36
2022-11-21 06:13:00.000 FILTER_MOVE_POS FSI: 18 filter from position 150 (174_n13) to position 175 (blk) line 37
2022-11-21 06:13:10.000 EXPOSURE ( 0 pri255 p 101 ln 38 c41) 0.200s FSI blk 1536x1536 (2x2, x 0, y 0) HG 16383
2022-11-21 06:13:13.000 EXPOSURE (14863 pri 49 p 101 ln 39 c 0) 10.000s FSI blk 3072x3072 (1x1, x 0, y 0) HG 16383
2022-11-21 06:13:26.000 EXPOSURE (14863 pri 49 p 101 ln 39 c 0) 10.000s FSI blk 3072x3072 (1x1, x 0, y 0) HG 16383
2022-11-21 06:13:39.000 FILTER_MOVE_POS FSI: 1 filter from position 175 (blk) to position 0 (304_n4)
2022-11-21 06:13:41.000 EXPOSURE (14864 pri 49 p 101 ln 41 c 0) 10.000s FSI 304_n4 3072x3072 (1x1, x 0, y 0) HG 16383
2022-11-21 06:13:54.000 EXPOSURE (14864 pri 49 p 101 ln 41 c 0) 10.000s FSI 304_n4 3072x3072 (1x1, x 0, y 0) HG 16383
2022-11-21 06:15:07.000 EXPOSURE ( 0 pri255 p 101 ln 43 c41) 0.200s FSI 304_n4 1536x1536 (2x2, x 0, y 0) HG 16383
2022-11-21 06:15:10.000 EXPOSURE (14865 pri 49 p 101 ln 44 c 0) 10.000s FSI 304_n4 3072x3072 (1x1, x 0, y 0) HG 16383
2022-11-21 06:15:23.000 EXPOSURE (14865 pri 49 p 101 ln 44 c 0) 10.000s FSI 304_n4 3072x3072 (1x1, x 0, y 0) HG 16383
```

### Actual images (corresponding to yellow lines)





# 2022 November 24: Alpha Virginis



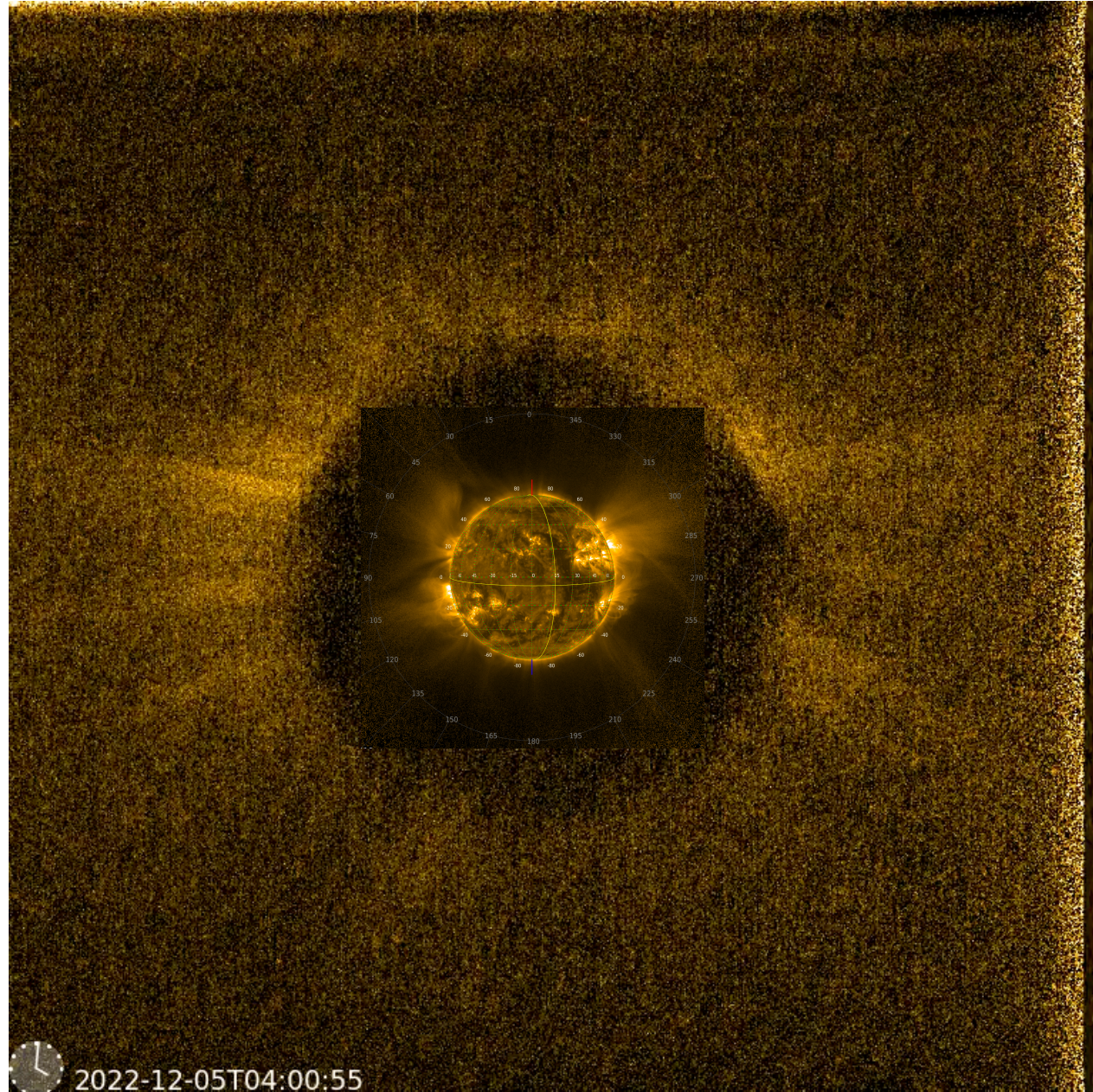




# Long duration occulter campaigns

December 5 till January 1

FSI 174  
HG only  
1000s exposures  
1080s cadence  
2x2 binned  
lossless compressed





# Long duration occulter campaigns

December 5 till January 1

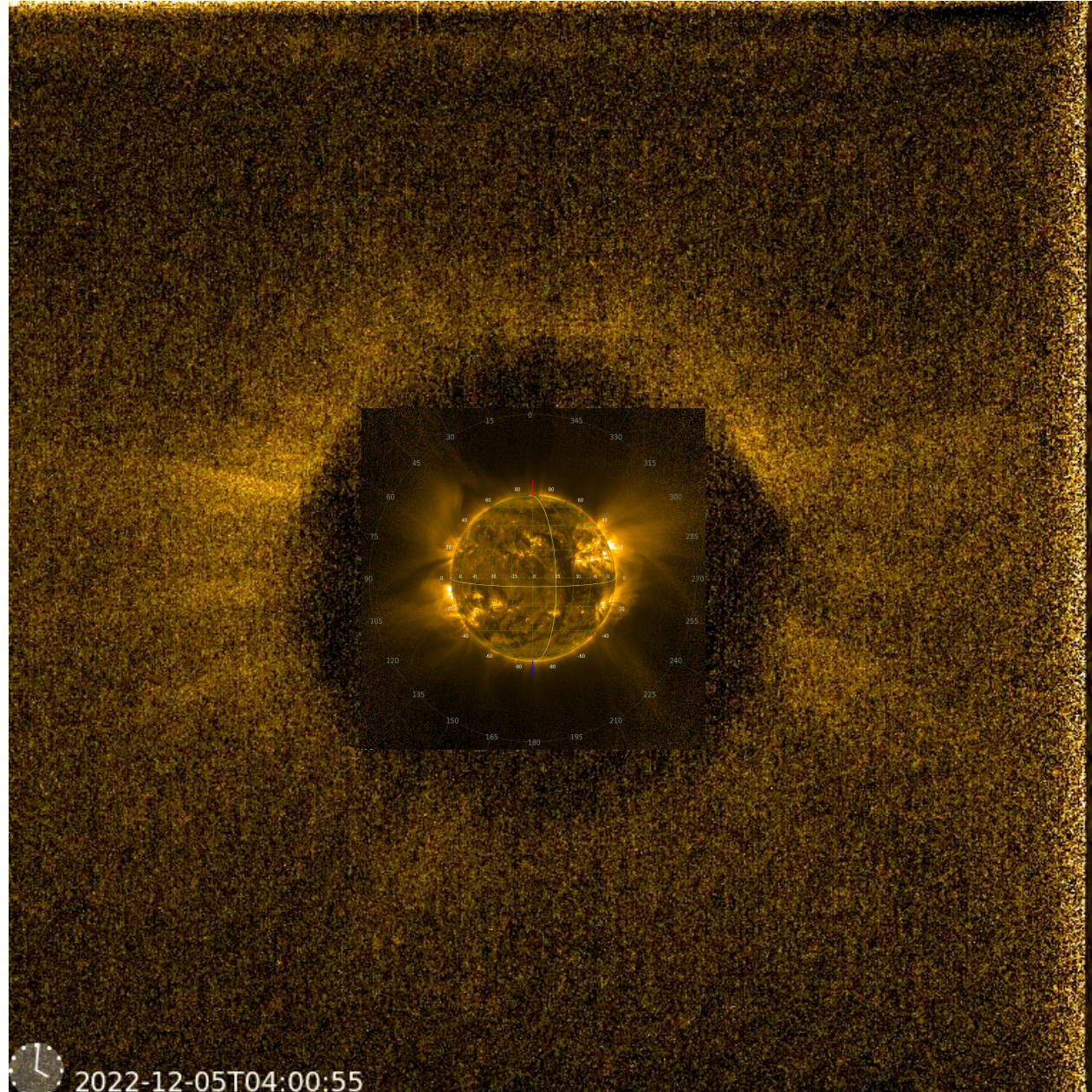
FSI 174  
HG only  
1000s exposures  
1080s cadence  
2x2 binned  
lossless compressed

To be repeated whenever regular  
FSI synoptics show the same perspective as  
AIA/SWAP/EUVI-A?

Lucie Green

Marilena Mierla

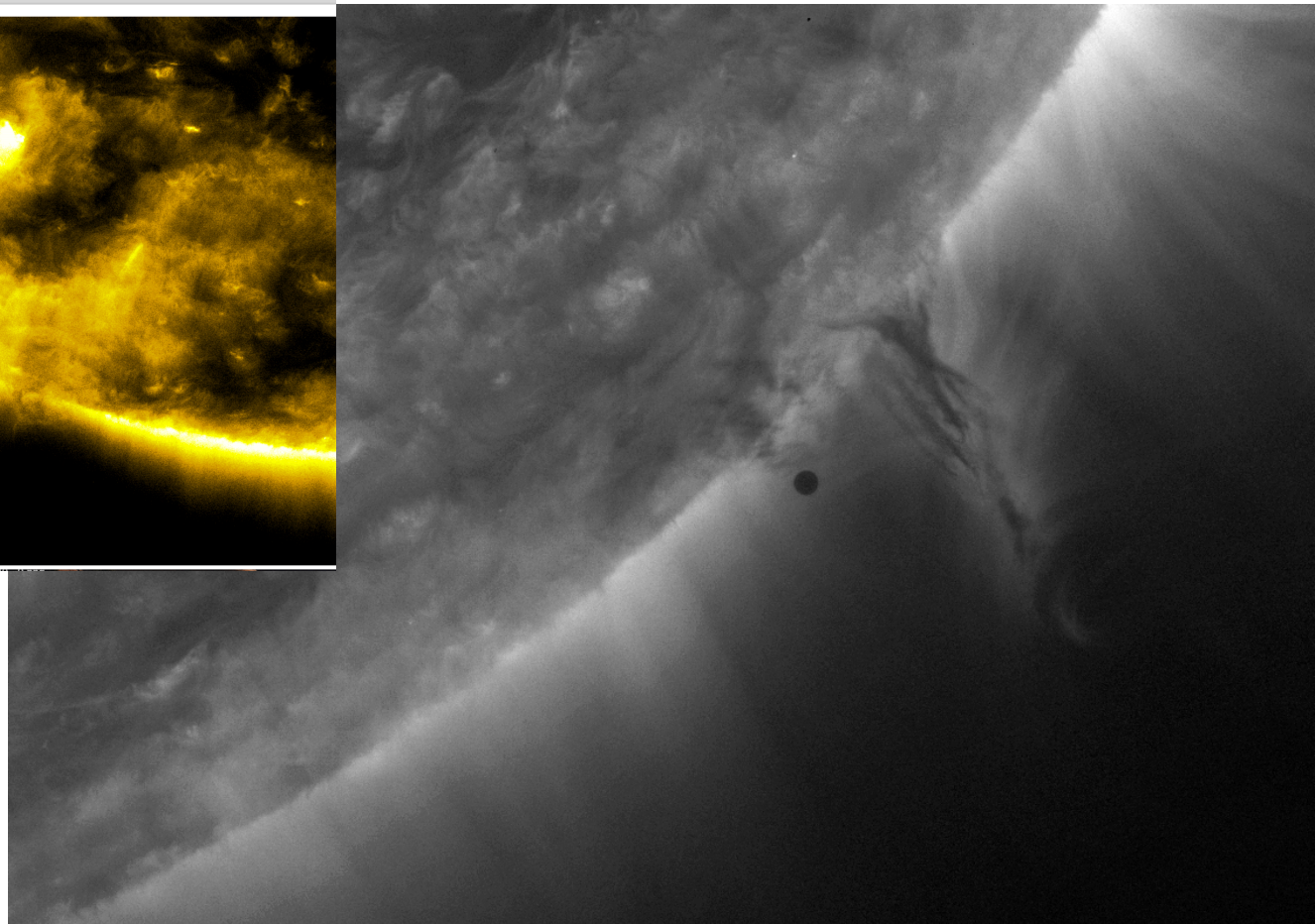
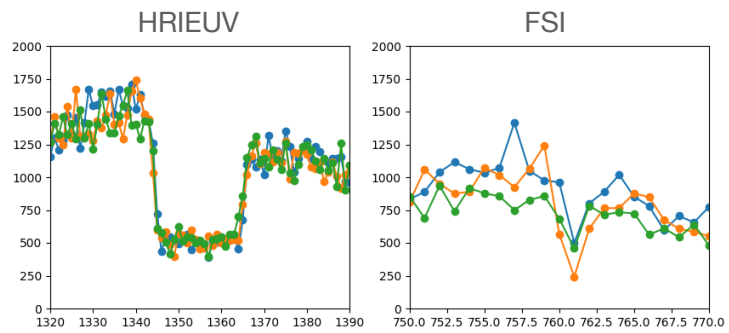
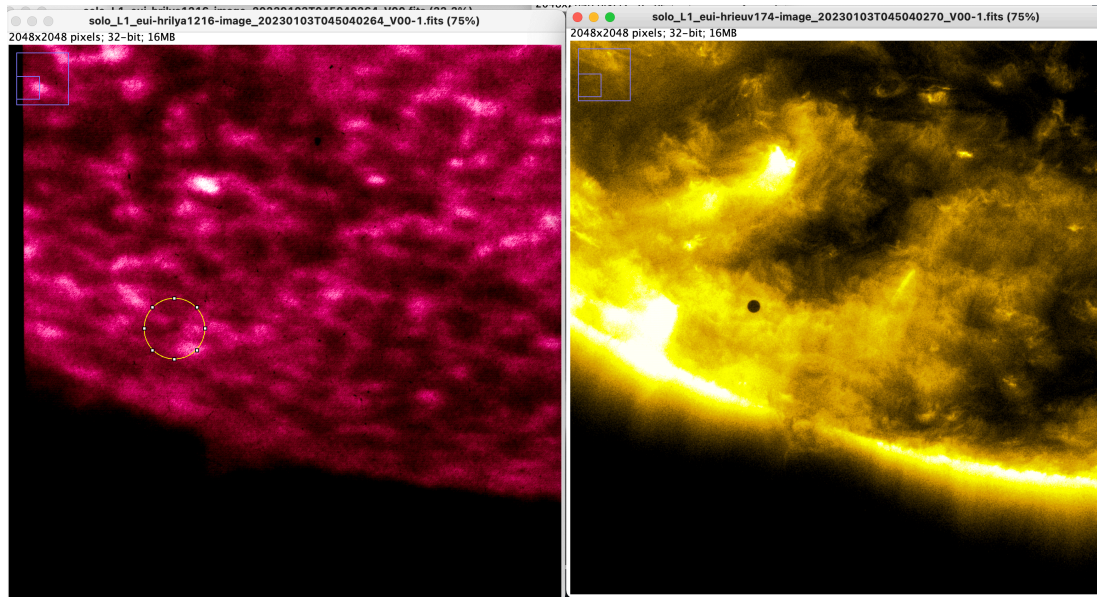
Ritesh Patel



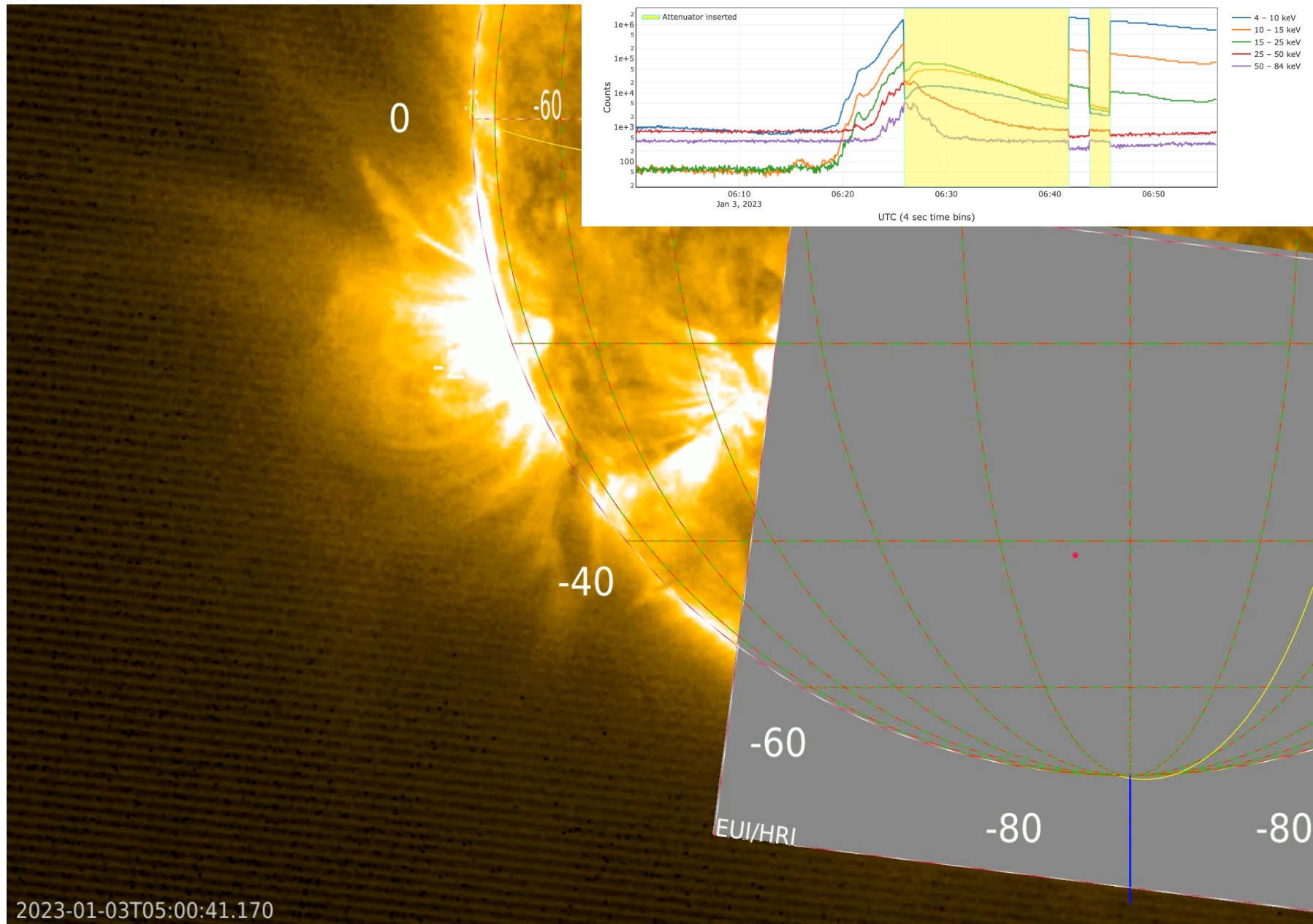




# 2023-01-03 Mercury transit



# 2023-01-03 'X6' flare





# Other matters

Phil Smith

- Jan 16 software update
- at ROB we lost an operator (Alfredo Micera). No immediate replacement
- coPI David Long @ MSSL moves to Queen's Univ Belfast. New coPI@ MSSL is Hamish Reid
- Monday morning telecons very successful. Thanks to Pradeep & Marilena. Hamish will be co-chair in near future.
- EUI guest investigator program starting
- science is going great. 29 papers published/accepted. Countless more in the pipeline for AA Special Issue + 1 high profile paper

Cis Verbeeck  
GI program