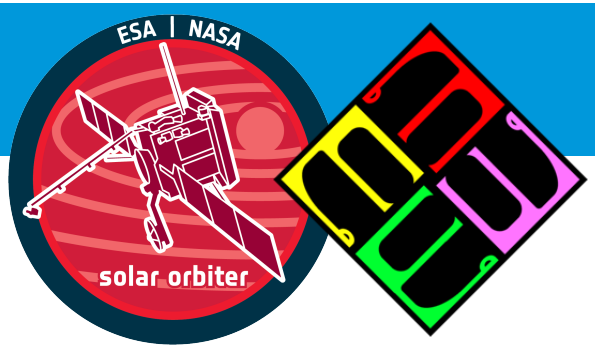


EUI report
May 16 - Sep 16 = STP 203 - 222

D. Berghmans for the EUI consortium

SWT 2022 Sept 16 Belfast

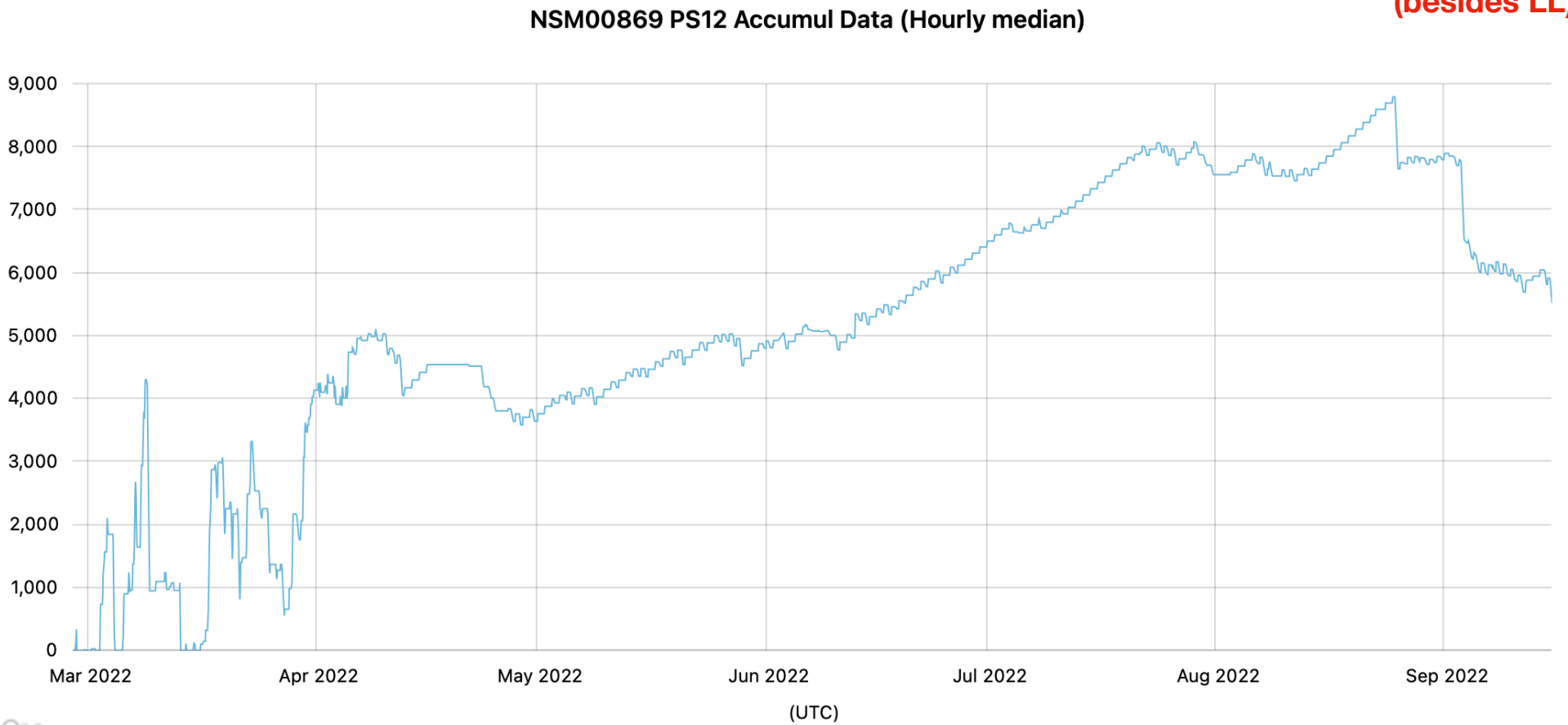
Contact: david.Berghmans@sidc.be (PI)

Highlights May 16 - Sept 16 = STP 203 - 222

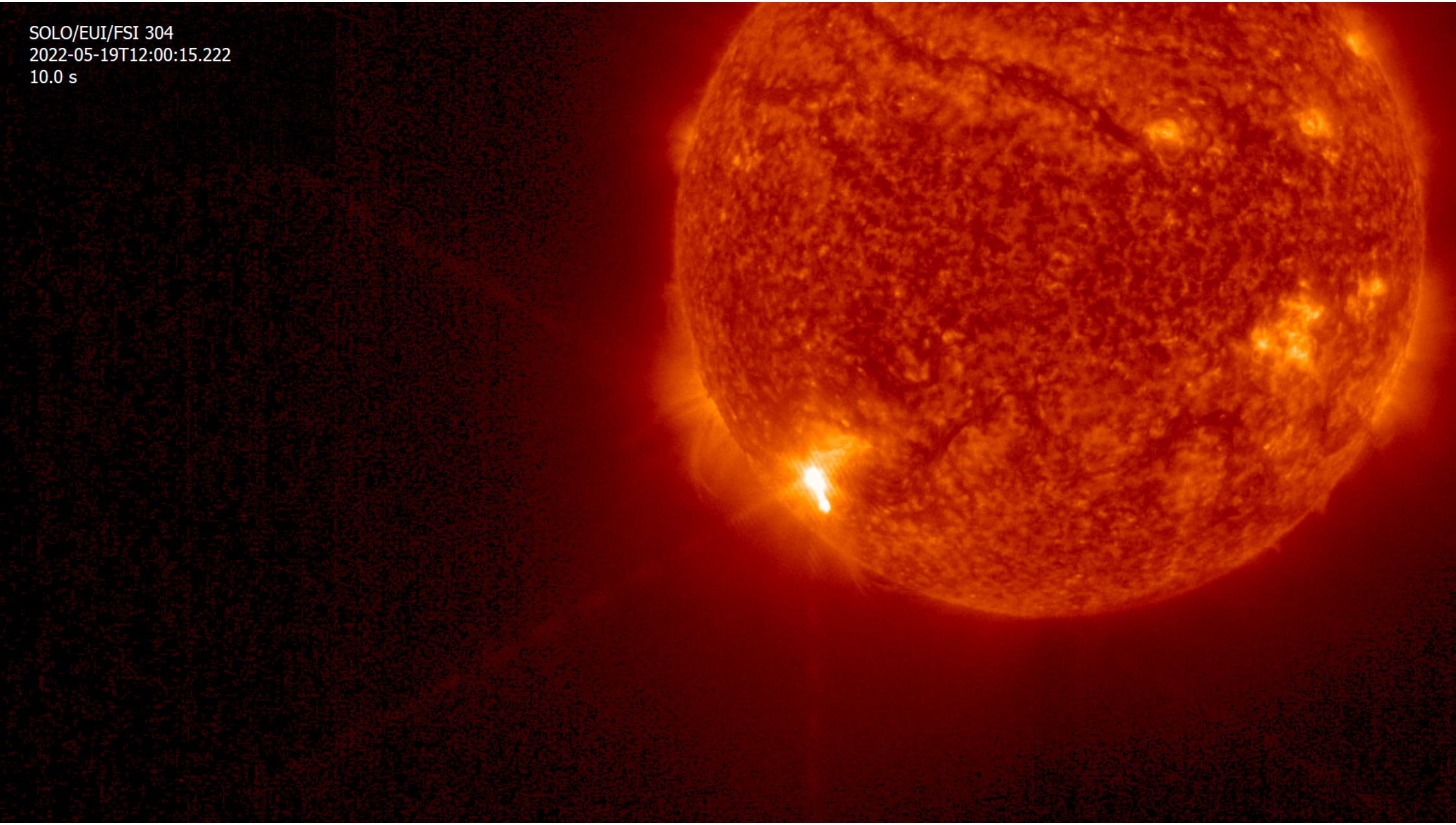
Current Instrument Status	**Instrument is nominal.** Software update June 9 SOB blockage end of July, reboot on Aug 2 HRILYA degradation under study
Observations executed	FSI synoptics + shallow exposures for flares, Monthly LED campaigns, June 12 star campaign
Data download	SSMM packet store still contains (~ 5.8 GiB), >July 22
Latest Data release	EUI Data Release 5 was issued 2022-04-25, will be appended EUI data Release 6 targeted end 2022.
Science results	published papers: 21 (+6) papers
Upcoming instrument activity	RSWs, Oct 8- Nov 7

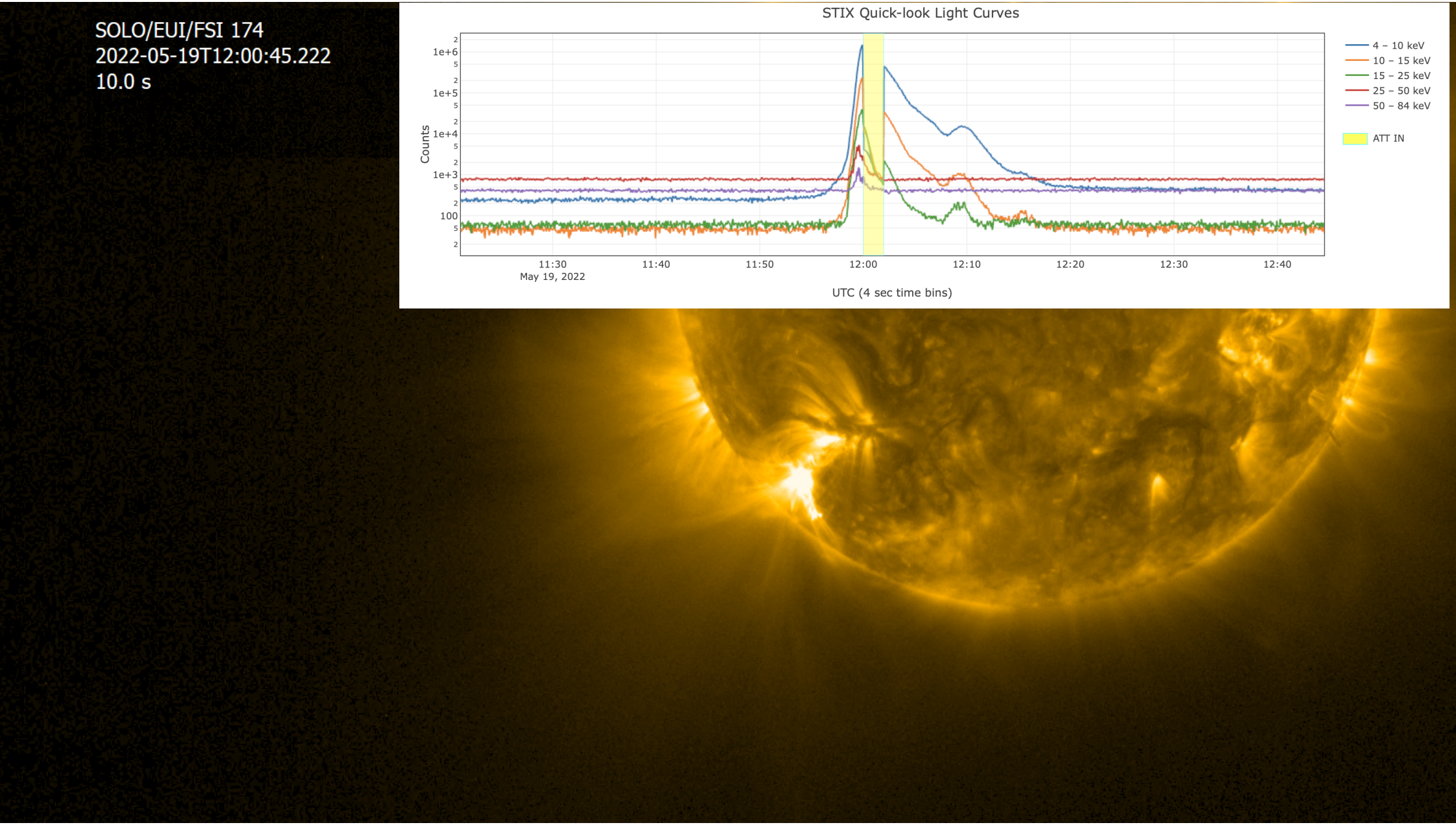
SSMM EUI Packet store

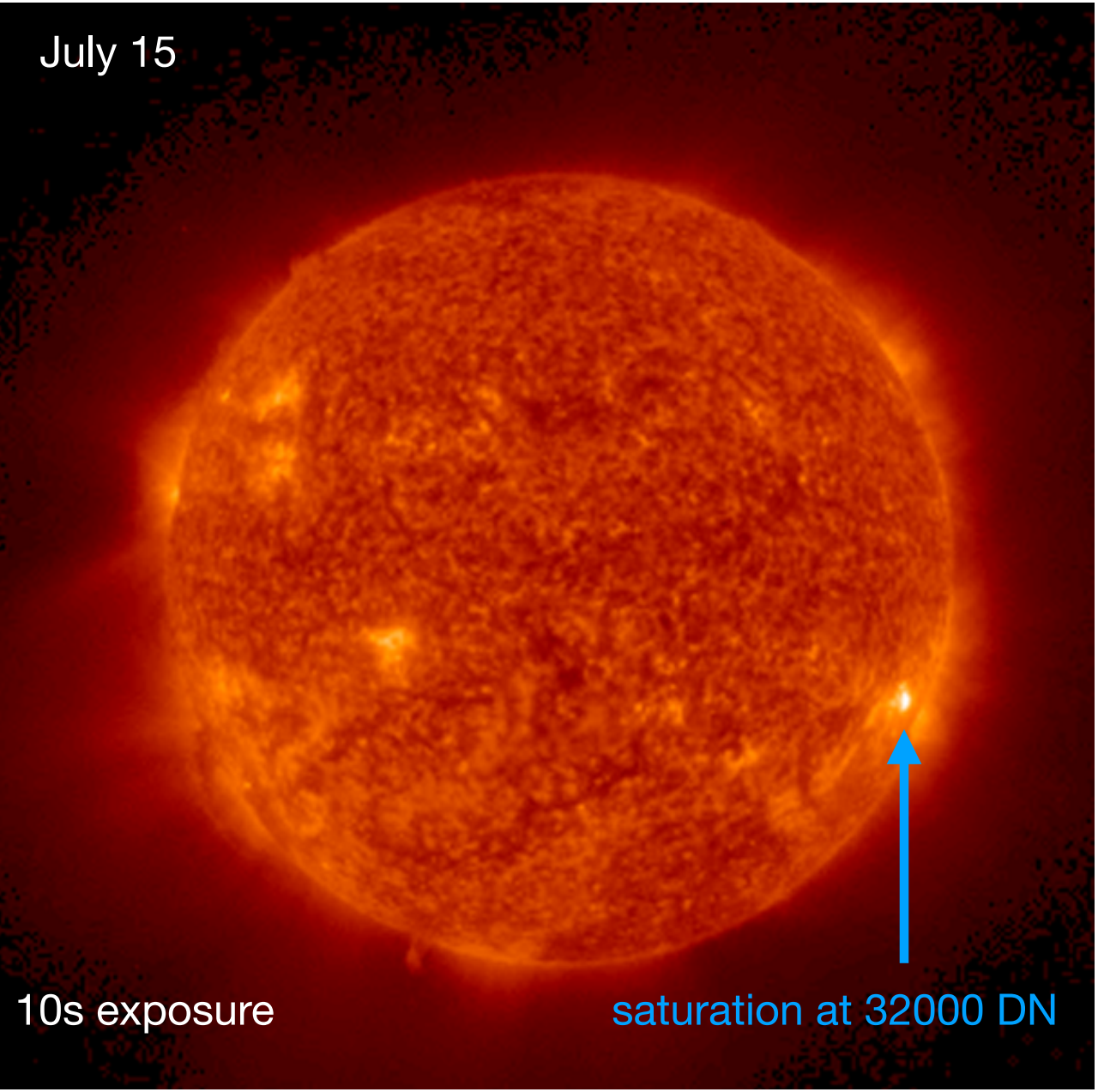
Latest data on the ground (besides LL): July 23

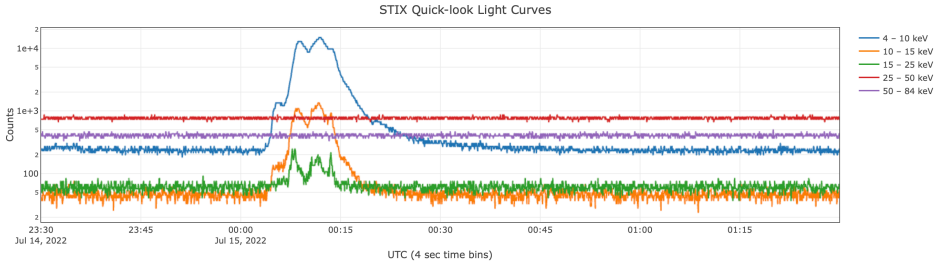


Flares

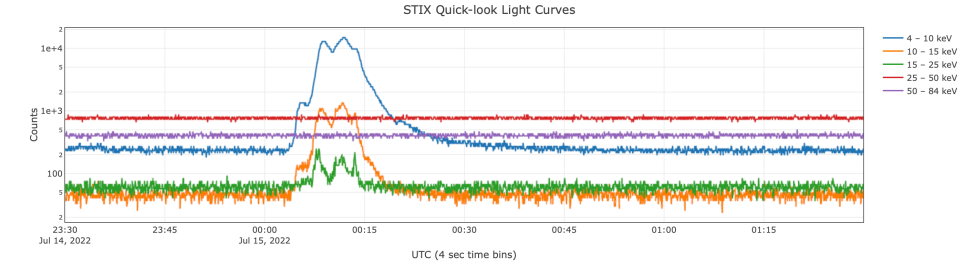

SOLO/EUI/FSI 304
2022-05-19T12:00:15.222
10.0 s


SOLO/EUI/FSI 174
2022-05-19T12:00:45.222
10.0 s
STIX Quick-look Light Curves
Counts
2
1e+6
5
2
1e+5
5
2
1e+4
5
2
1e+3
5
2
100
5
2
11:30
May 19, 2022
11:40
11:50
12:00
12:10
12:20
12:30
12:40
UTC (4 sec time bins)
4 – 10 keV
10 – 15 keV
15 – 25 keV
25 – 50 keV
50 – 84 keV
ATT IN


July 15
10s exposure
saturation at 32000 DN


STIX Quick-look Light Curves
Counts
1e+4
1e+3
100
23:30
Jul 14, 2022
23:45
00:00
Jul 15, 2022
00:15
00:30
00:45
01:00
01:15
UTC (4 sec time bins)
4 – 10 keV
10 – 15 keV
15 – 25 keV
25 – 50 keV
50 – 84 keV

July 15



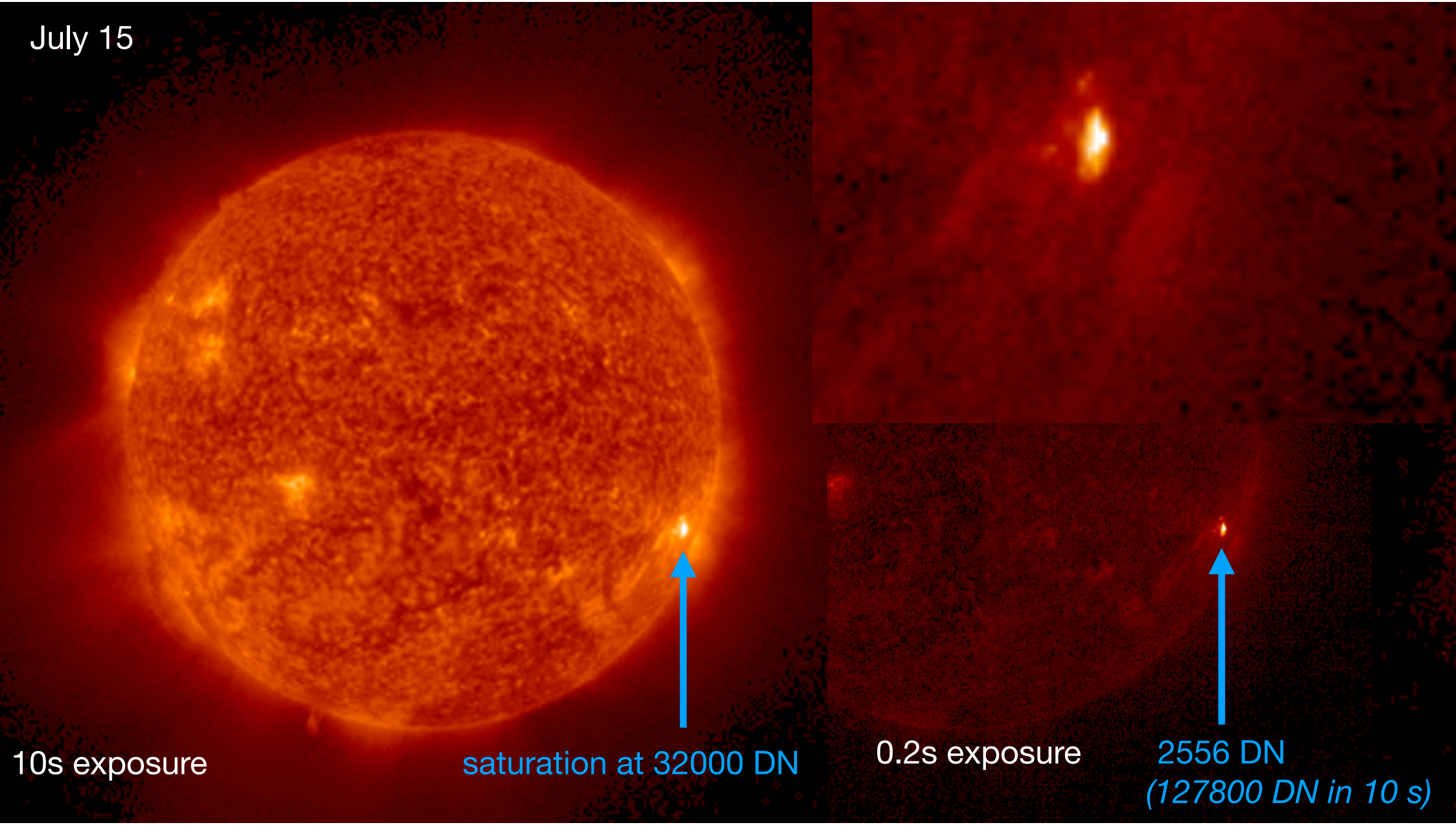
10s exposure

saturation at 32000 DN

0.2s exposure

2556 DN

(127800 DN in 10 s)

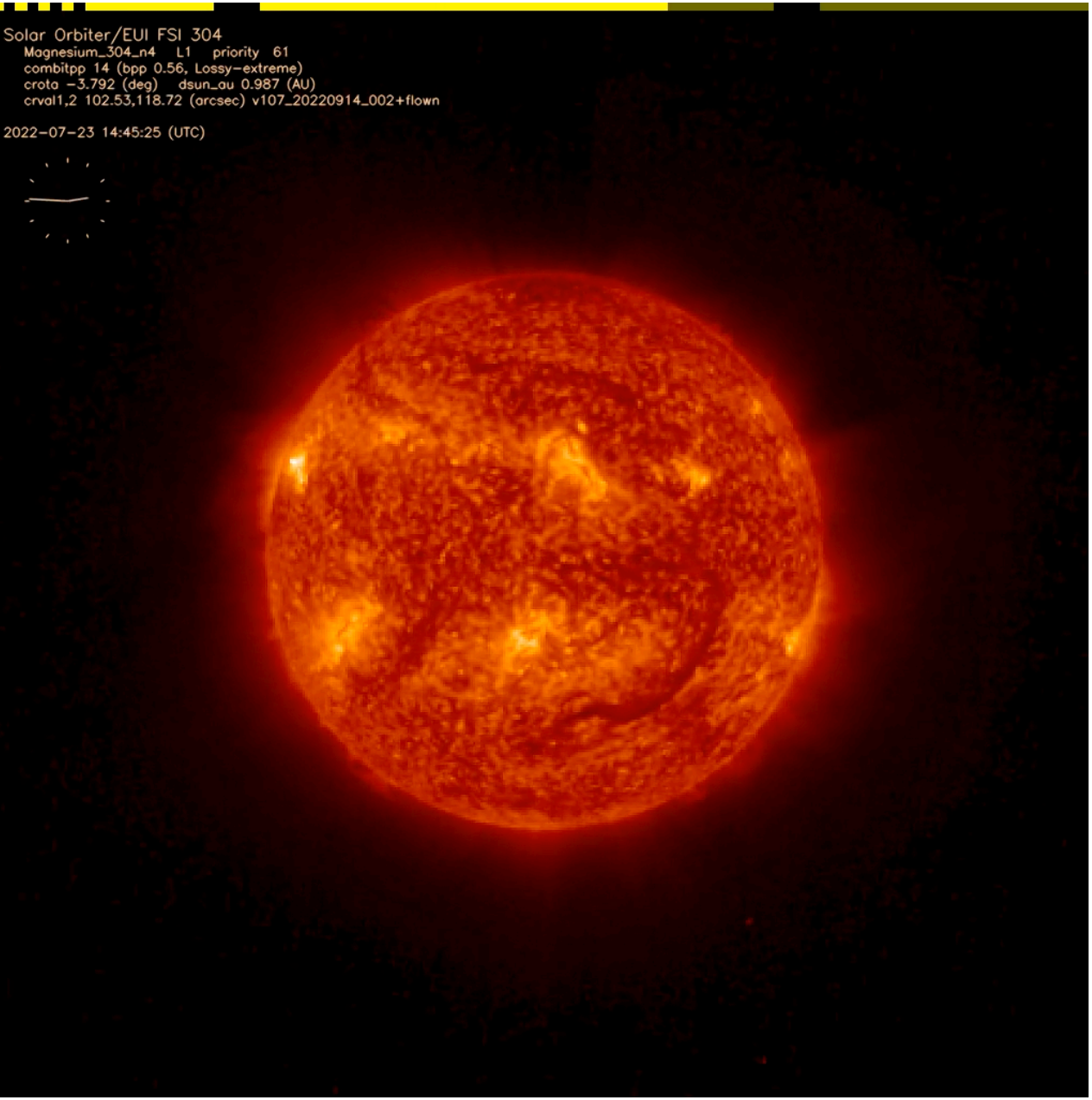

July 15
10s exposure
saturation at 32000 DN
0.2s exposure
2556 DN
(127800 DN in 10 s)

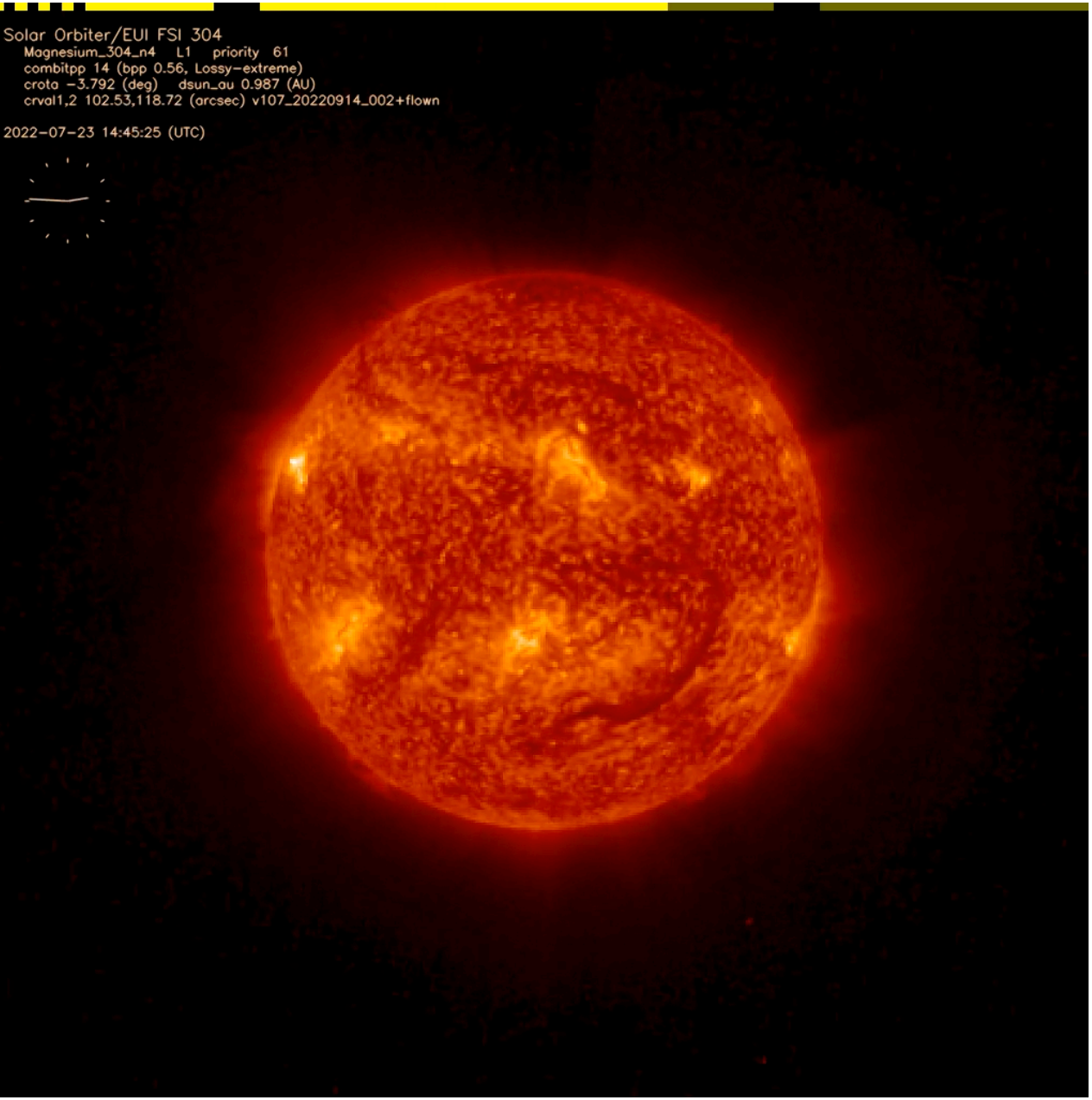
Suggestions for future perihelia

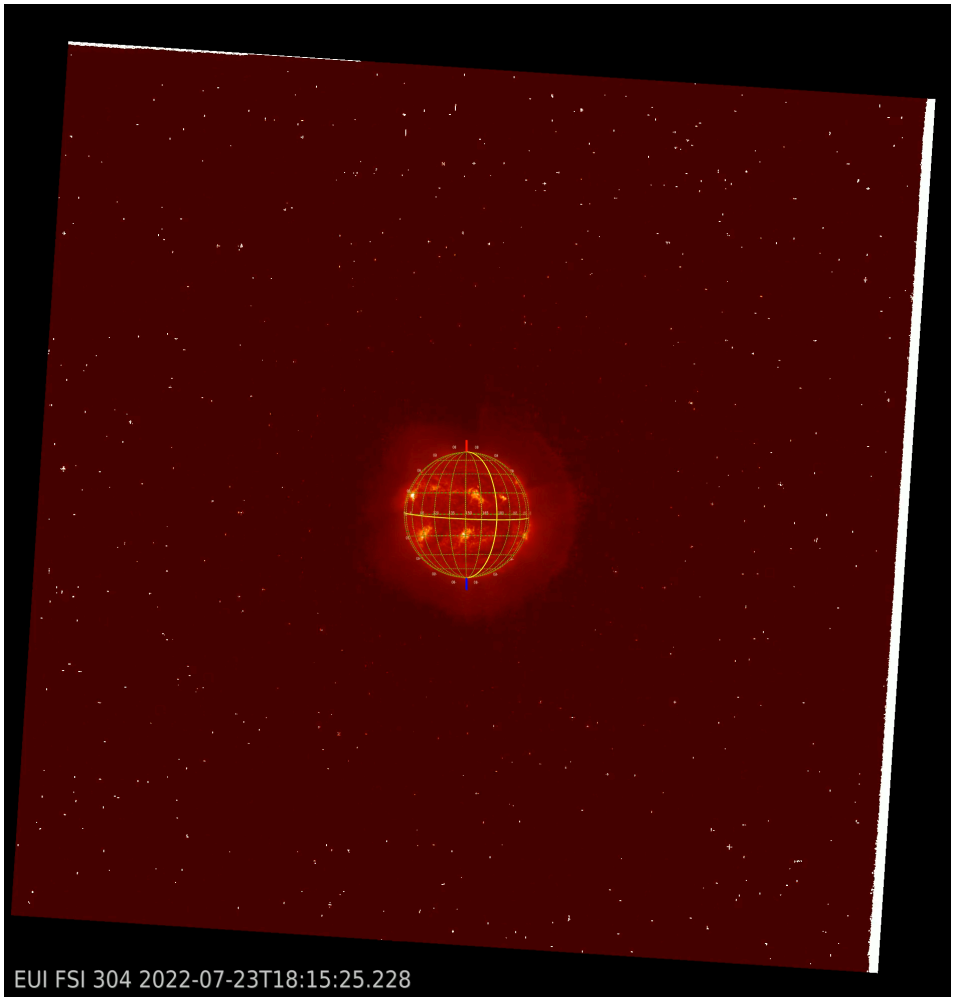
In coordination with ground based observatories, take high-resolution, high cadence observations of

- flares
- (quiescent or not) prominences

Eruptions


Solar Orbiter/EUI FSI 304
Magnesium_304_n4 L1 priority 61
combitpp 14 (bpp 0.56, Lossy-extreme)
crota -3.792 (deg) dsun_au 0.987 (AU)
crval1,2 102.53,118.72 (arcsec) v107_20220914_002+flown
2022-07-23 14:45:25 (UTC)


Solar Orbiter/EUI FSI 304
Magnesium_304_n4 L1 priority 61
combitpp 14 (bpp 0.56, Lossy-extreme)
crota -3.792 (deg) dsun_au 0.987 (AU)
crval1,2 102.53,118.72 (arcsec) v107_20220914_002+flown
2022-07-23 14:45:25 (UTC)

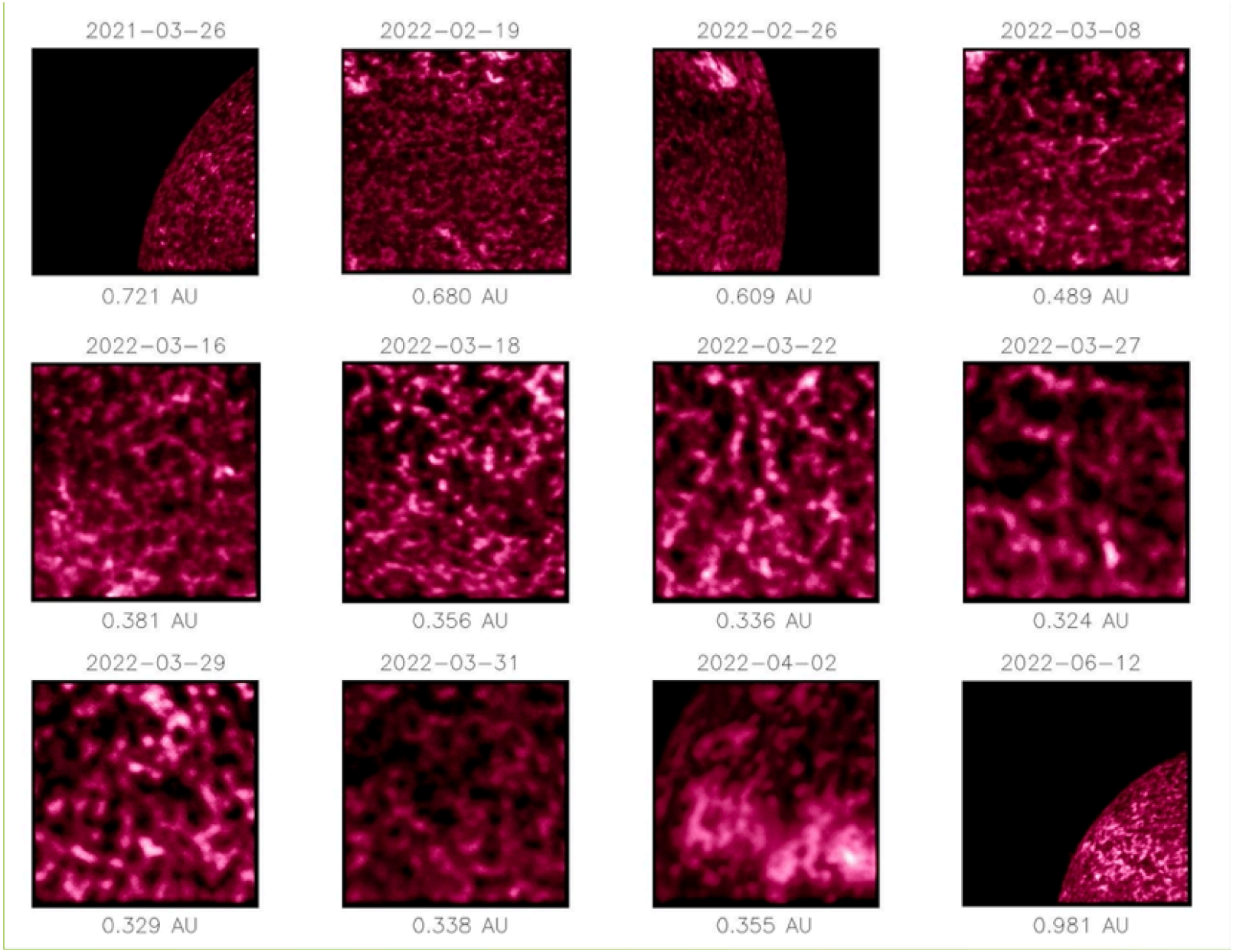

EUI FSI 304 2022-07-23T18:15:25.228

HRILYA degradation analysis

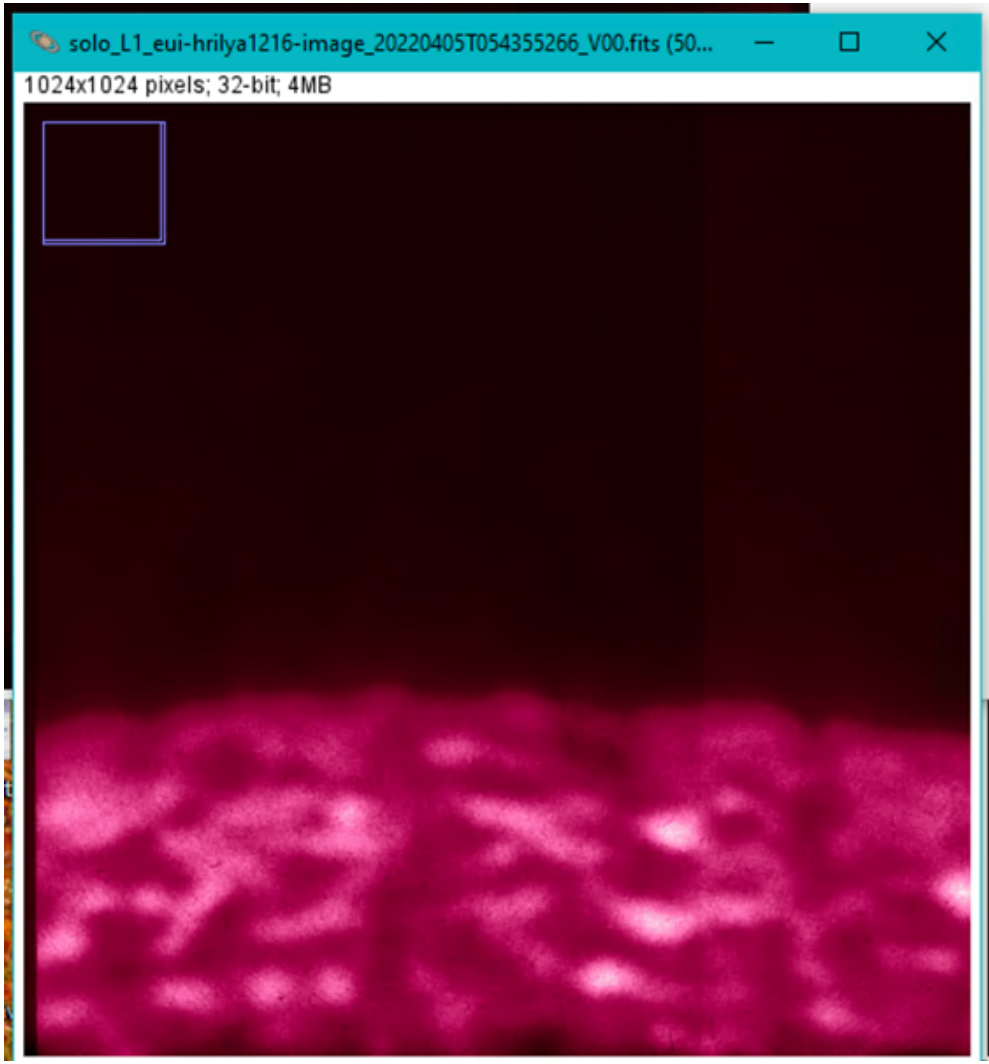
Udo Schuehle (MPS)

HRILYA resolution during perihelion

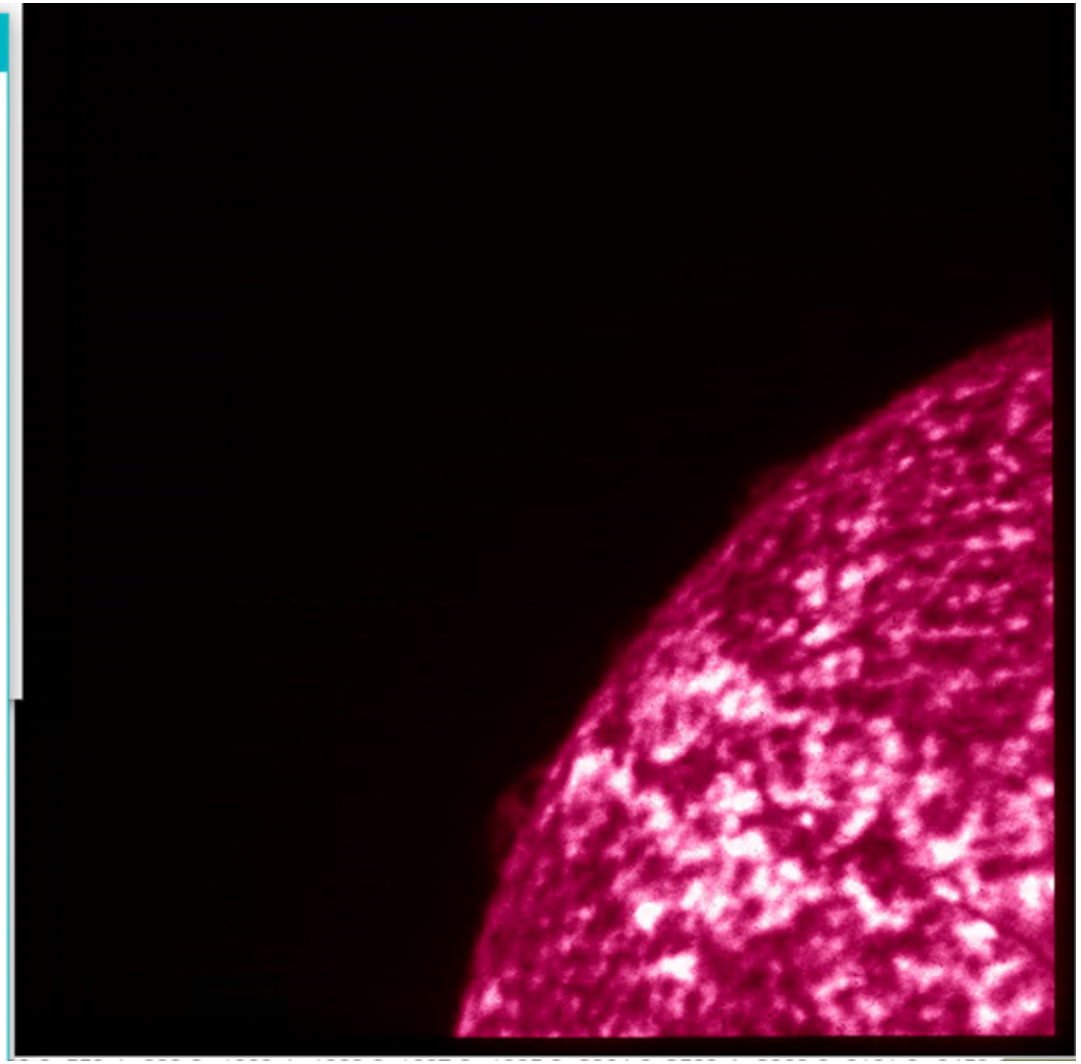
- During perihelion the HRILYA channel saw a strong degradation of resolution.
- in April a new study was designed for 12 June when the S/C has returned further away from the Sun. These data have been received in August.
- the data show a recovery of the resolution with distance from the Sun.


2021-03-26
0.721 AU
2022-02-19
0.680 AU
2022-02-26
0.609 AU
2022-03-08
0.489 AU
2022-03-16
0.381 AU
2022-03-18
0.356 AU
2022-03-22
0.336 AU
2022-03-27
0.324 AU
2022-03-29
0.329 AU
2022-03-31
0.338 AU
2022-04-02
0.355 AU
2022-06-12
0.981 AU

First image on 12 June after the perihelion



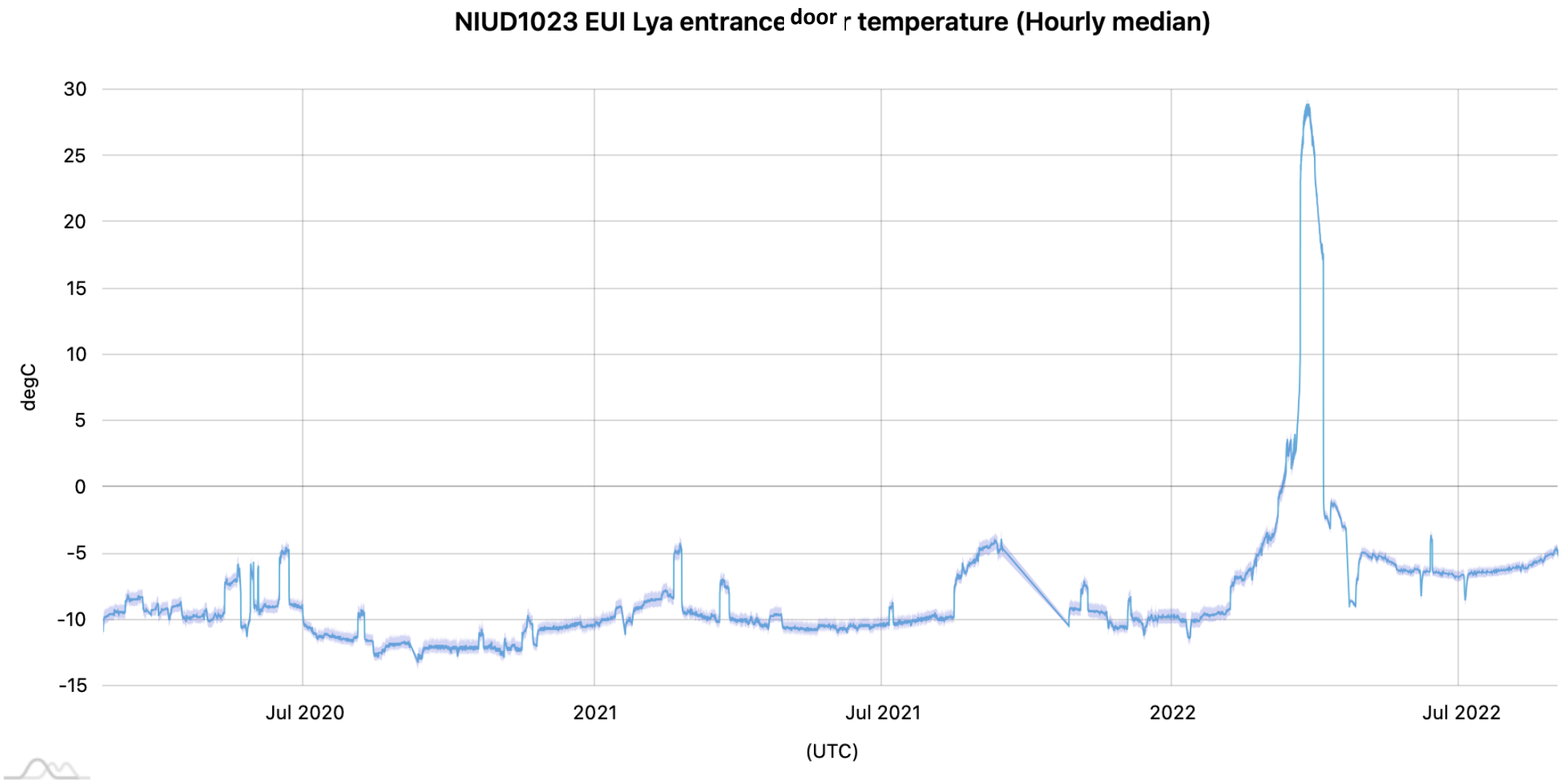
Last image of April 5

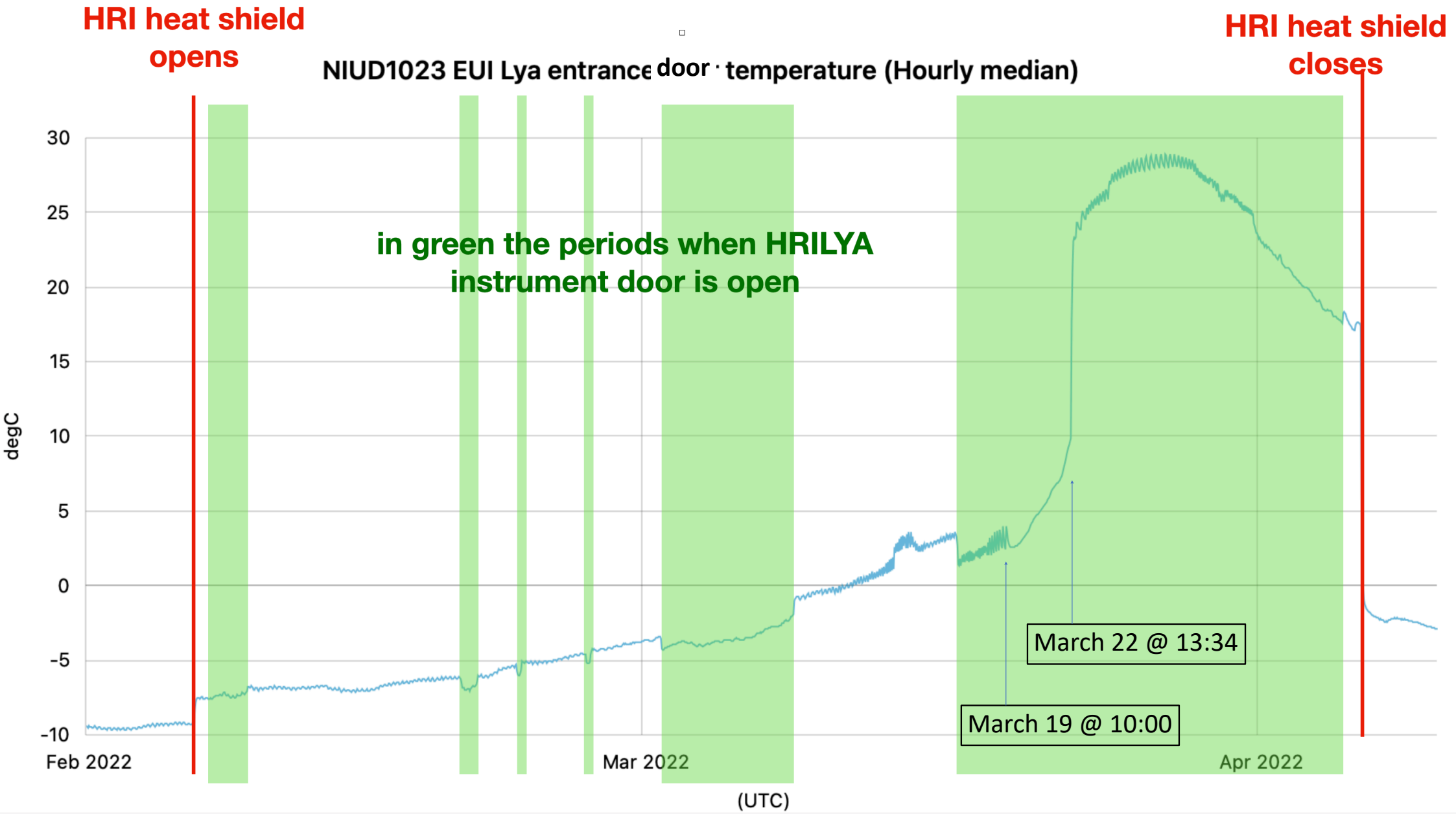


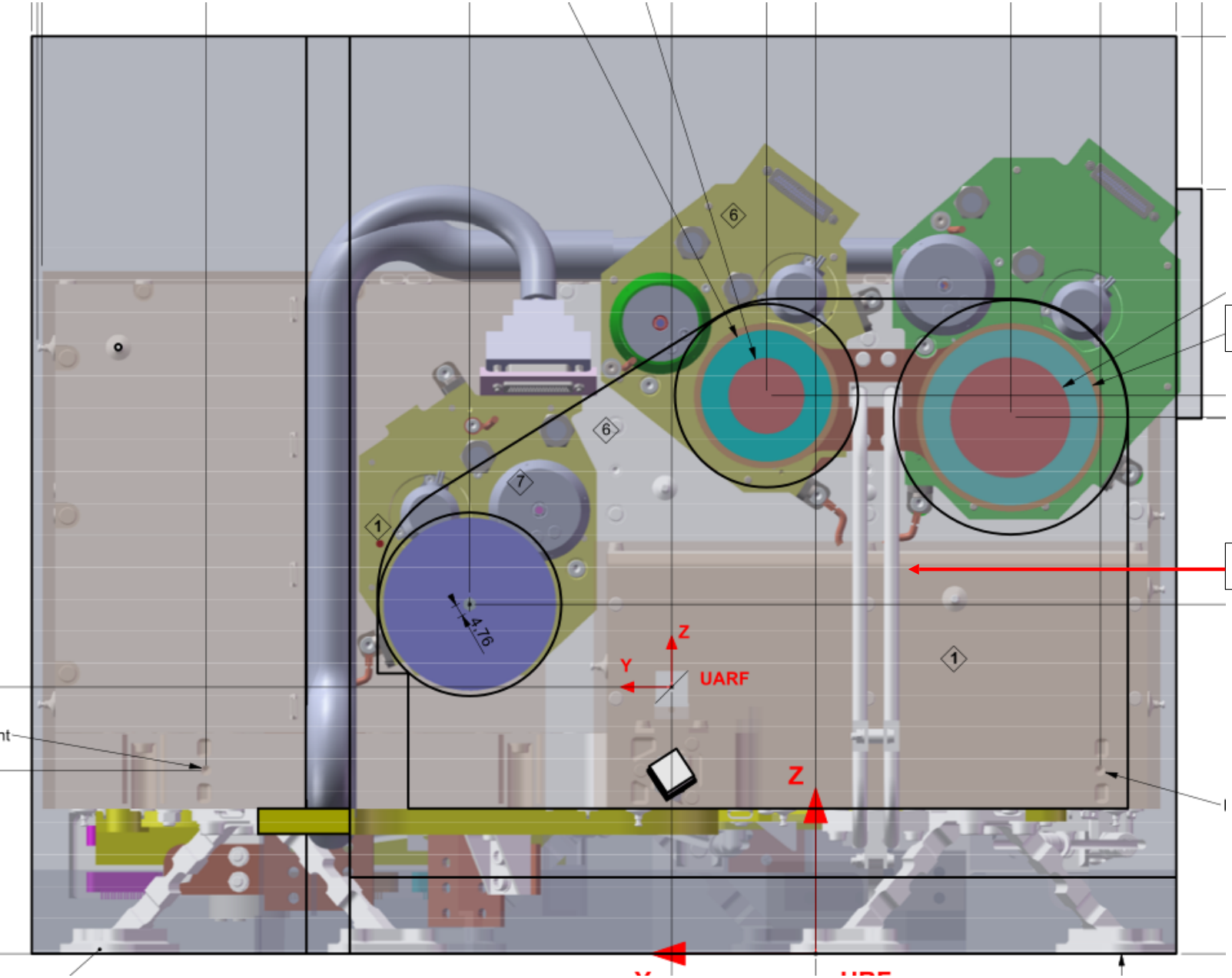
Half hour after door opening

Possible solutions

- We believe the degradation is caused by a thermal lensing effect of the Entrance Filter.
- The effect may have two causes:
  - a radial gradient of the temperature of the filter due to good conductance of the filter mount to the Hot Element, which is as cold as -10 °C, causing a refractive index gradient.
  - a stress-induced refractive index change due to the tight mounting of the filter being at such a low temperature, while the CTE of the retainer is twice as high as the filter (MgF2).


NIUD1023 EUI Lya entrance door temperature (Hourly median)
30
25
20
15
10
5
0
-5
-10
-15
degC
Jul 2020
2021
Jul 2021
2022
Jul 2022
(UTC)


HRI heat shield opens
HRI heat shield closes
NIUD1023 EUI Lya entrance door · temperature (Hourly median)
in green the periods when HRILYA instrument door is open
March 22 @ 13:34
March 19 @ 10:00
30
25
20
15
10
5
0
-5
-10
degC
Feb 2022
Mar 2022
Apr 2022
(UTC)


Heat conducting “goggle”
Heat pipes to Hot Element IF
Z
Y
UARF
Z
4.76
6
6
7
1
1
1