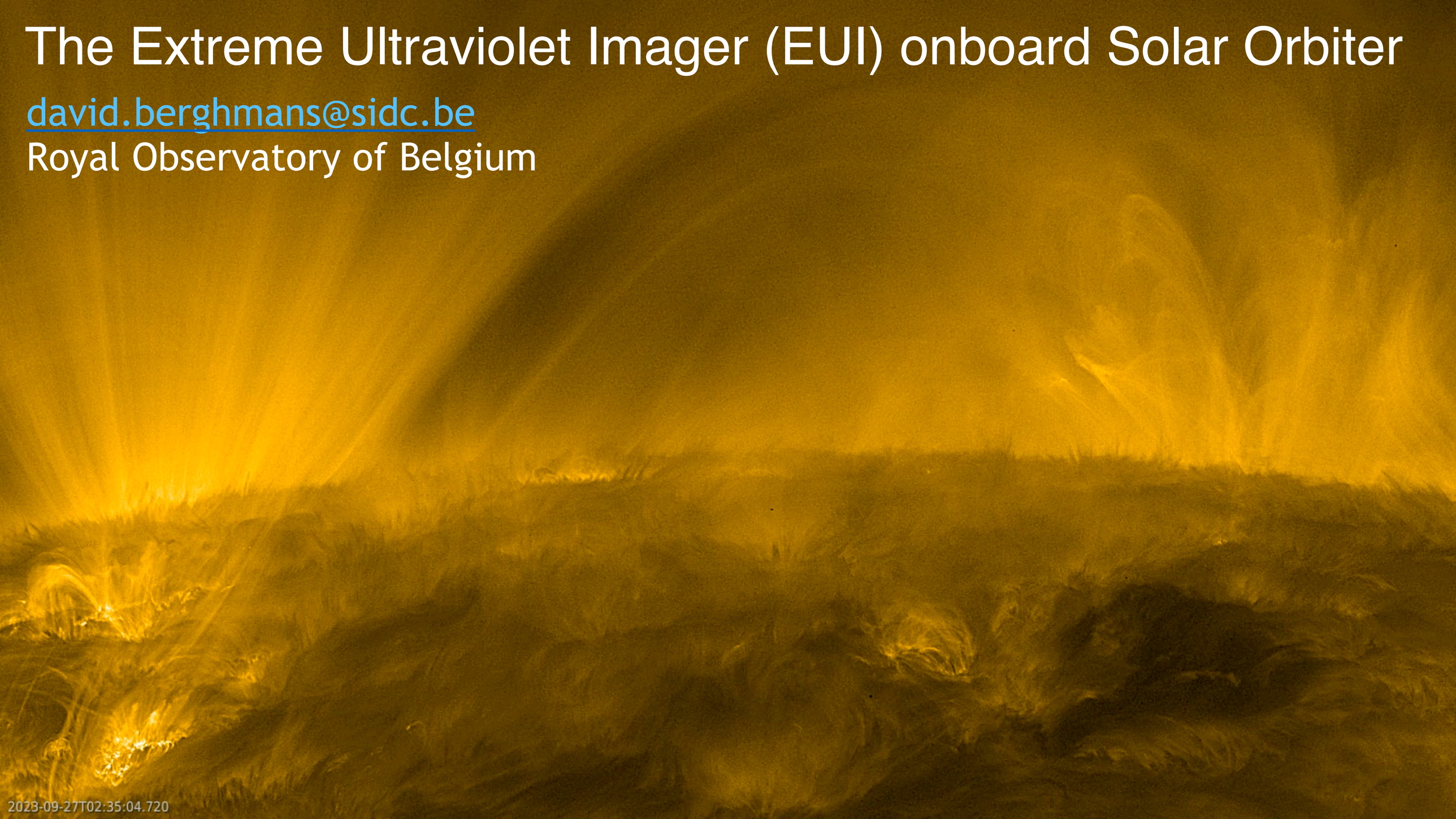
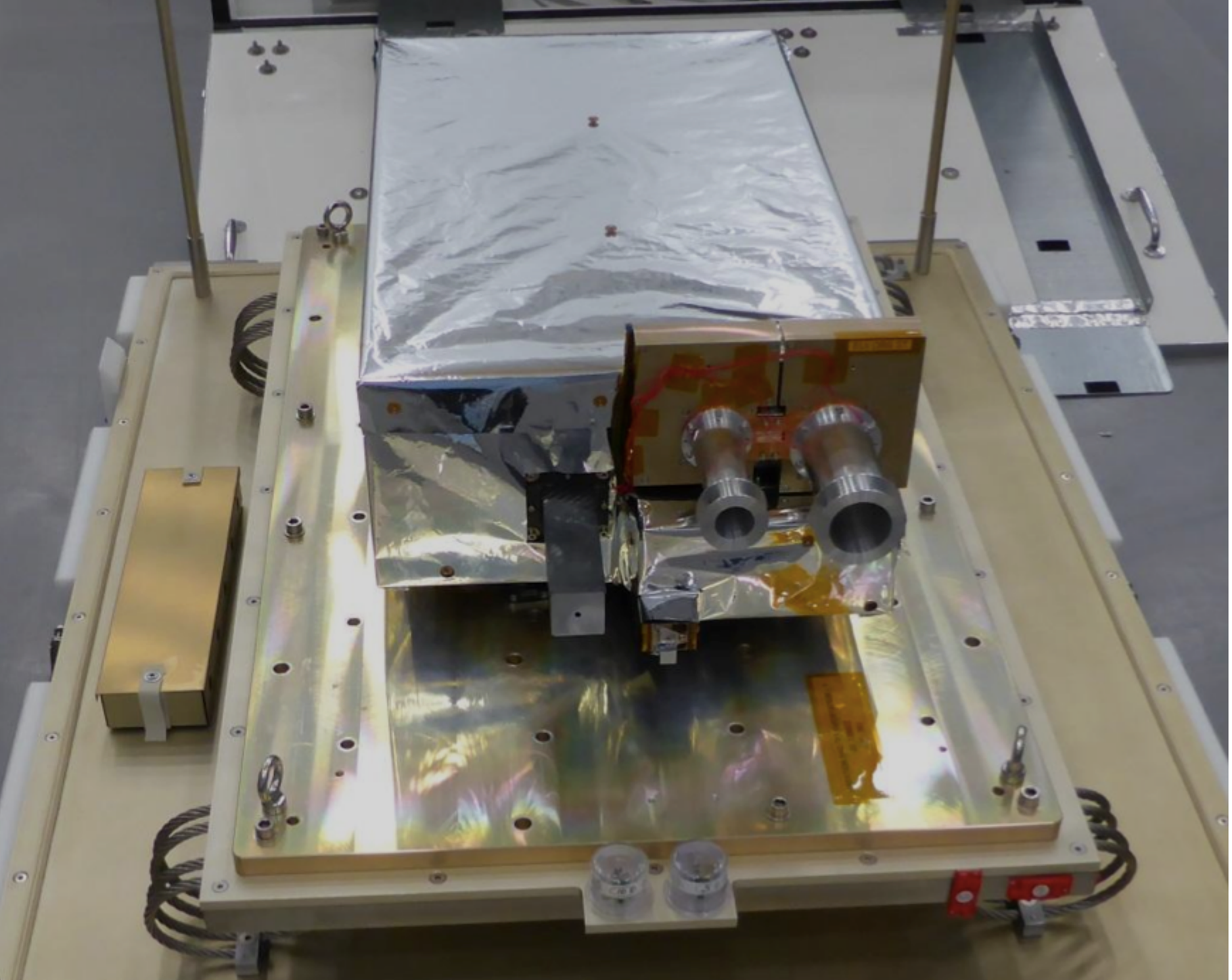
The Extreme Ultraviolet Imager (EUI) onboard Solar Orbiter

david.berghmans@sidc.be
Royal Observatory of Belgium



SWA

EUI



“Extreme Ultraviolet Imager”

Centre Spatial de Liège

Institut d’Astrophysique Spatiale

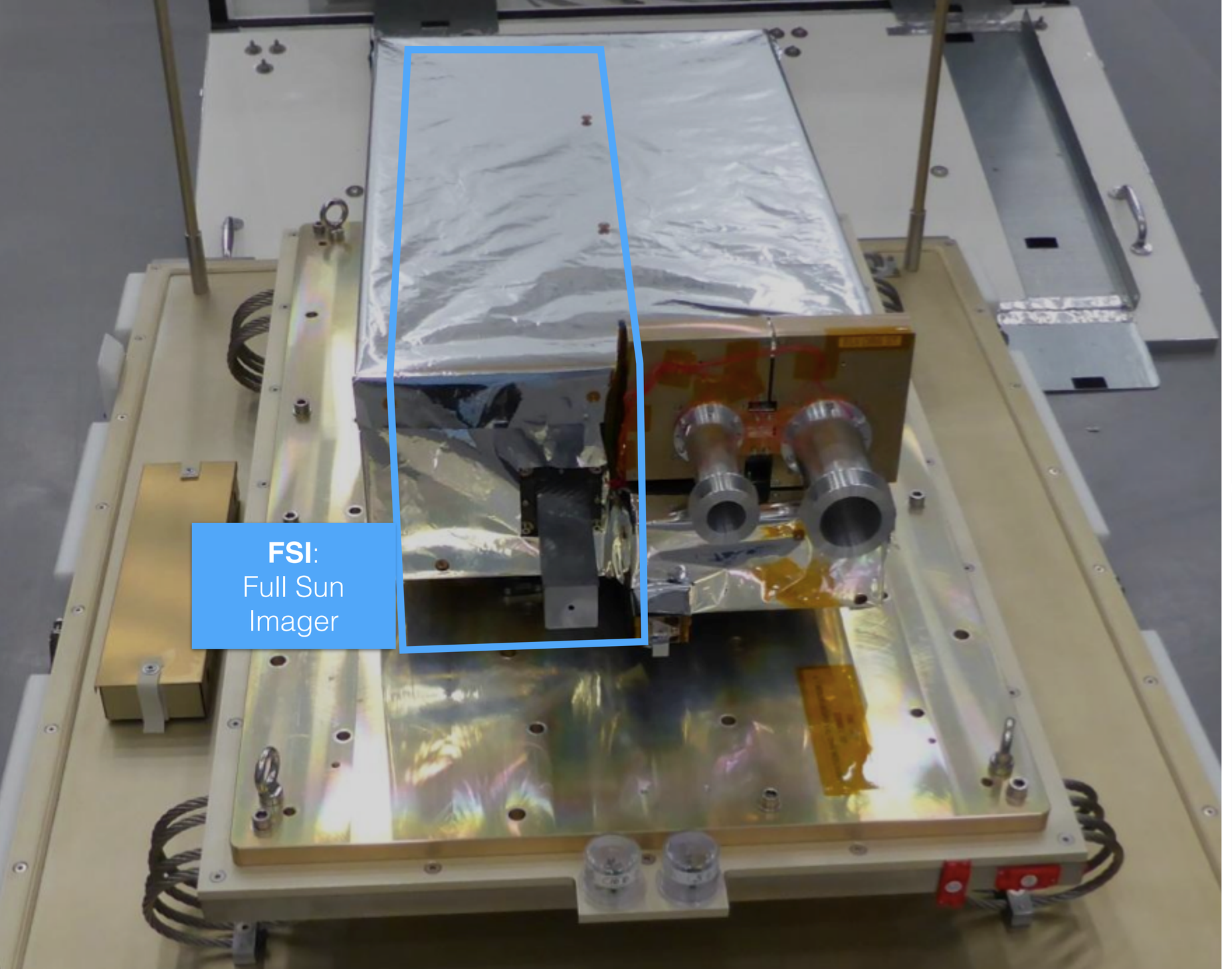
Laboratoire Charles Fabry,
Institut d’Optique

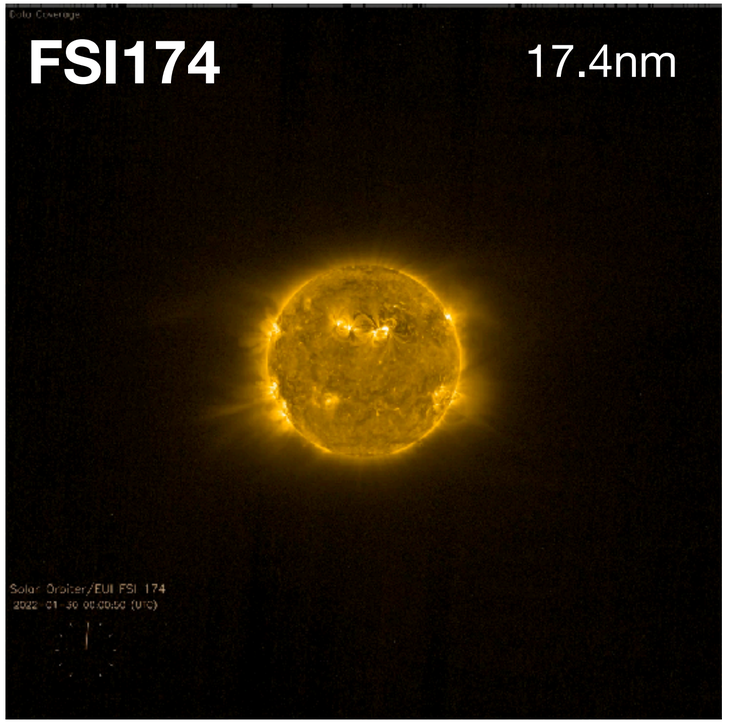
Max Planck Institute for
Solar System Research

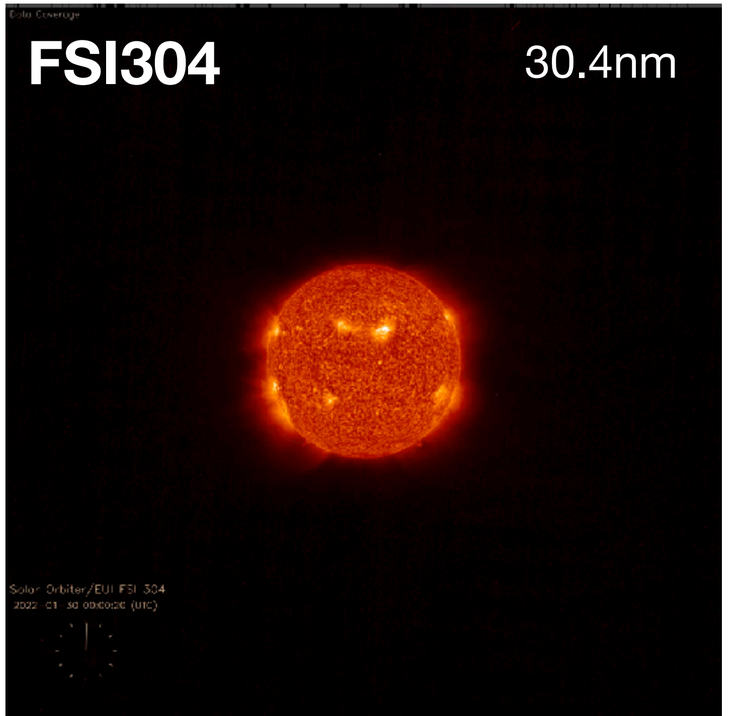
Physikalisch-Meteorologisches
Observatorium Davos

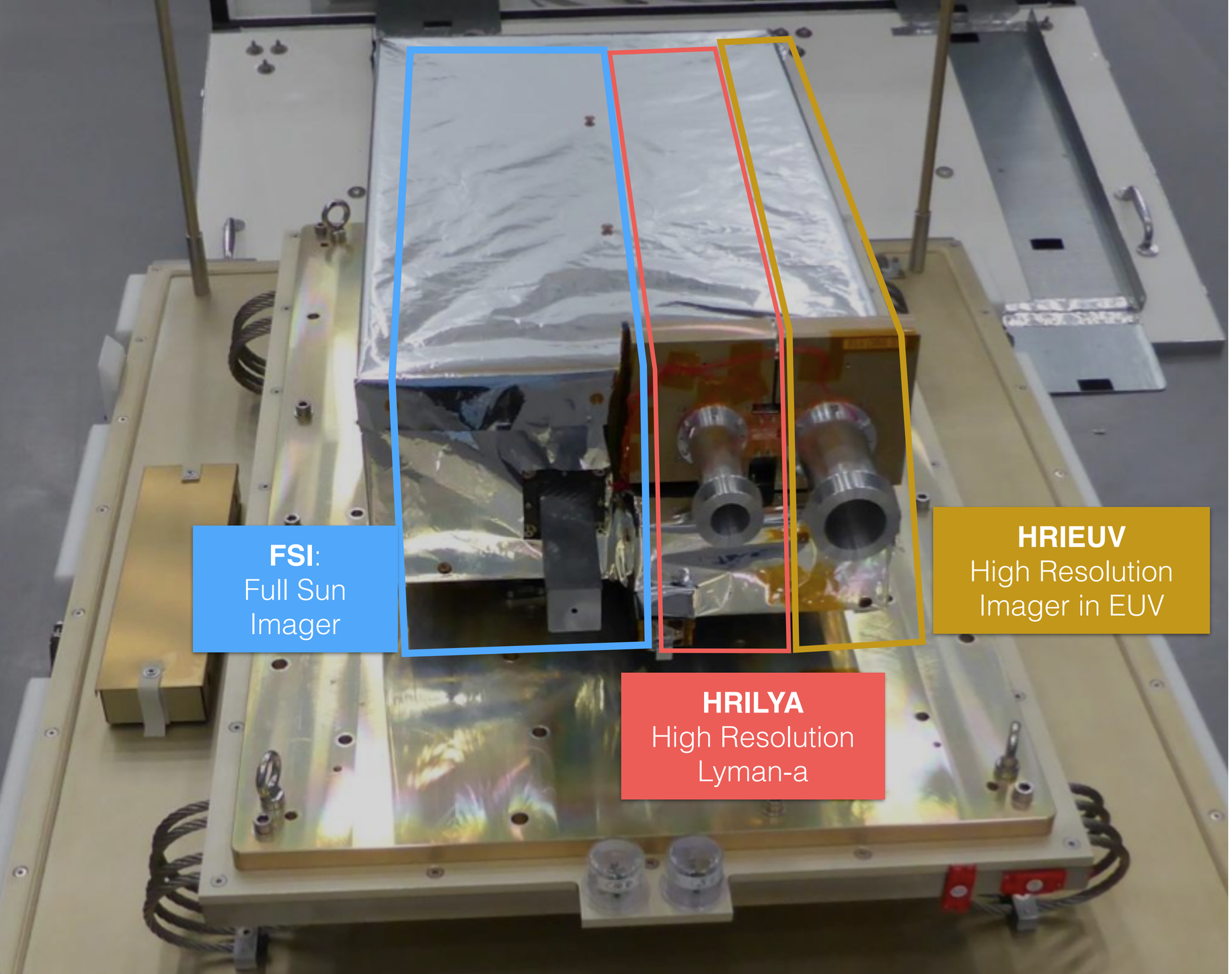
UCL-Mullard Space Science Laborator

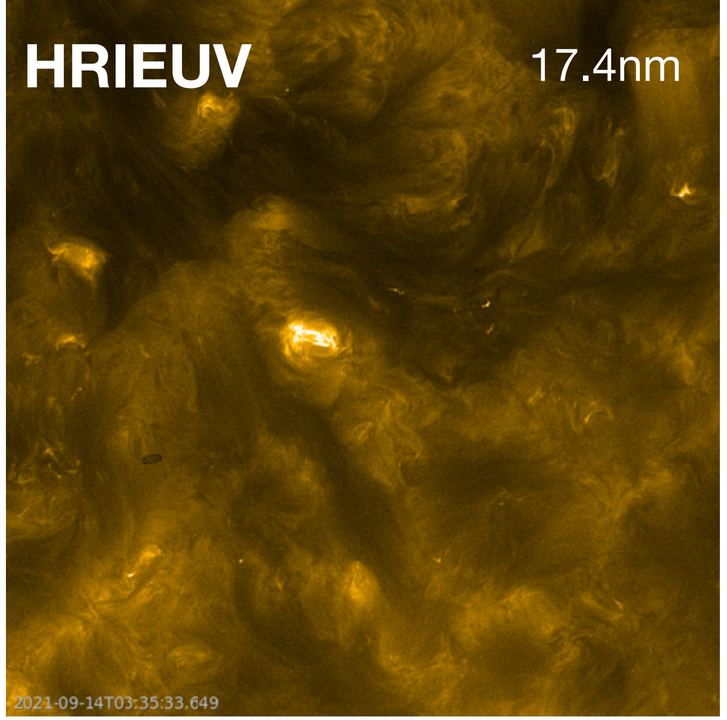
Royal Observatory of Belgium


FSI:
Full Sun
Imager


FSI174
17.4nm


FSI304
30.4nm


FSI:
Full Sun
Imager
HRILYA
High Resolution
Lyman-a
HRIEUV
High Resolution
Imager in EUV


HRIEUV
17.4nm
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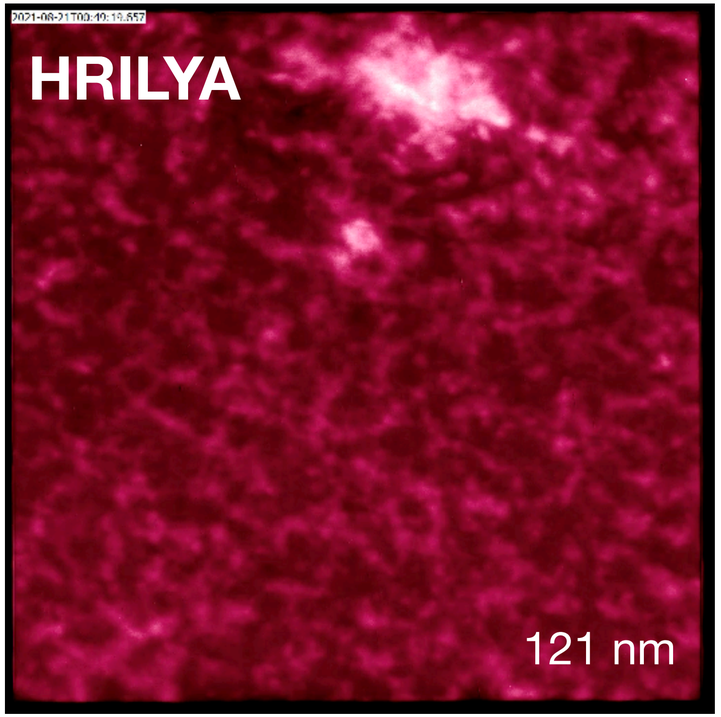
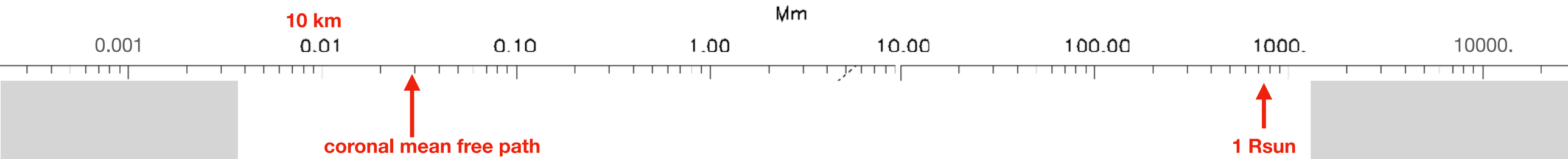

HRILYA
121 nm

The Many Scales of the Magnetic Corona

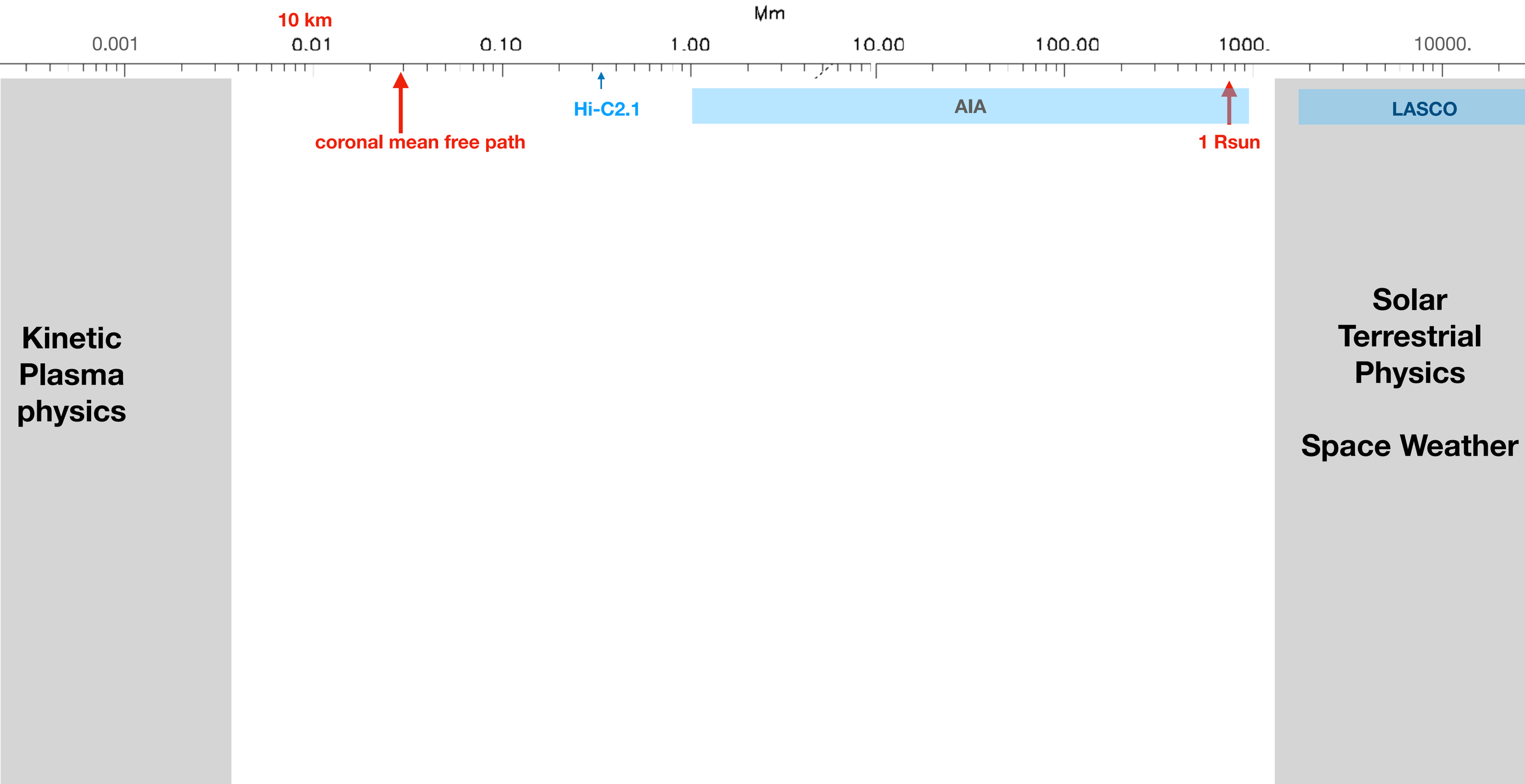


Kinetic Plasma physics

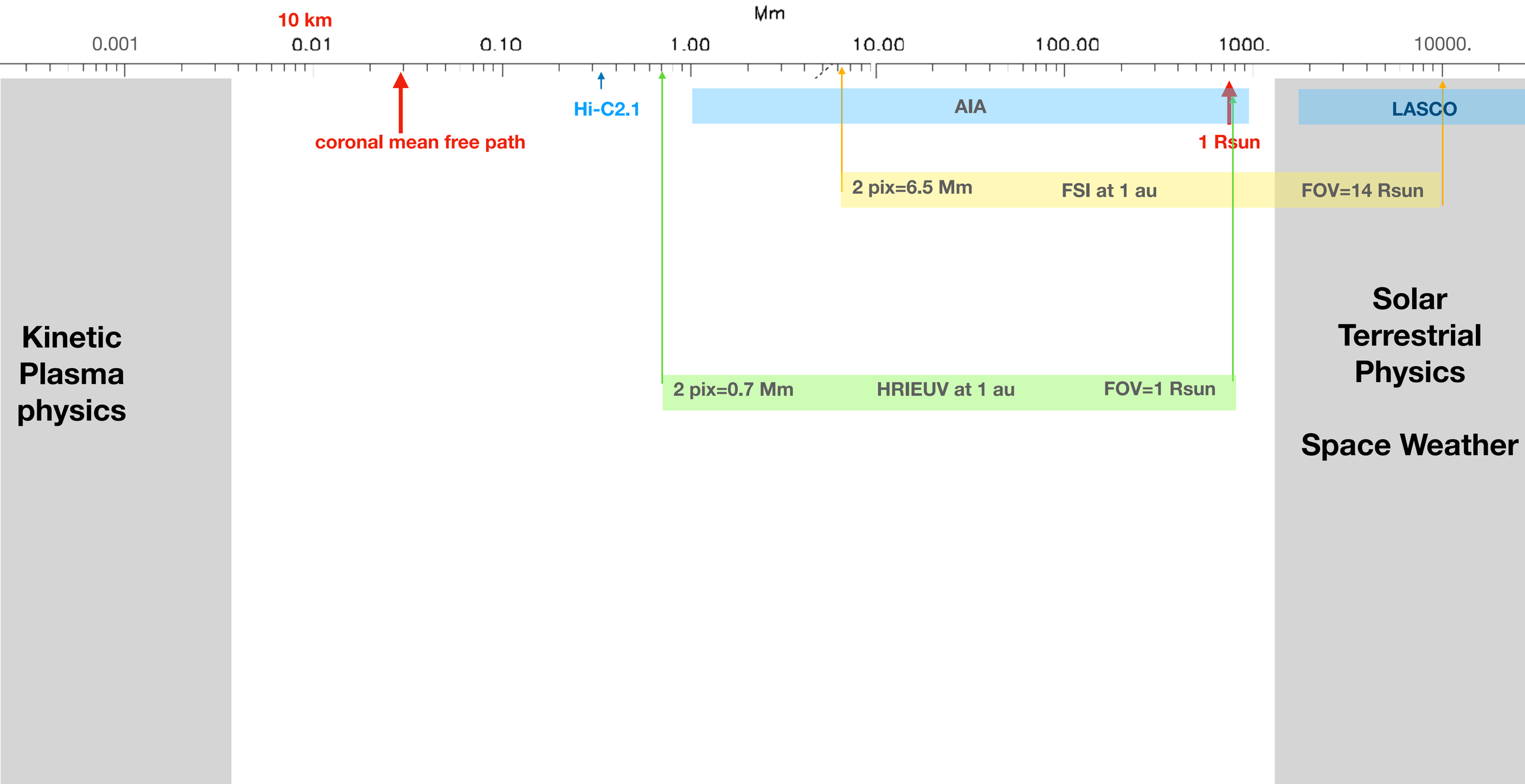
Solar Terrestrial Physics

Space Weather

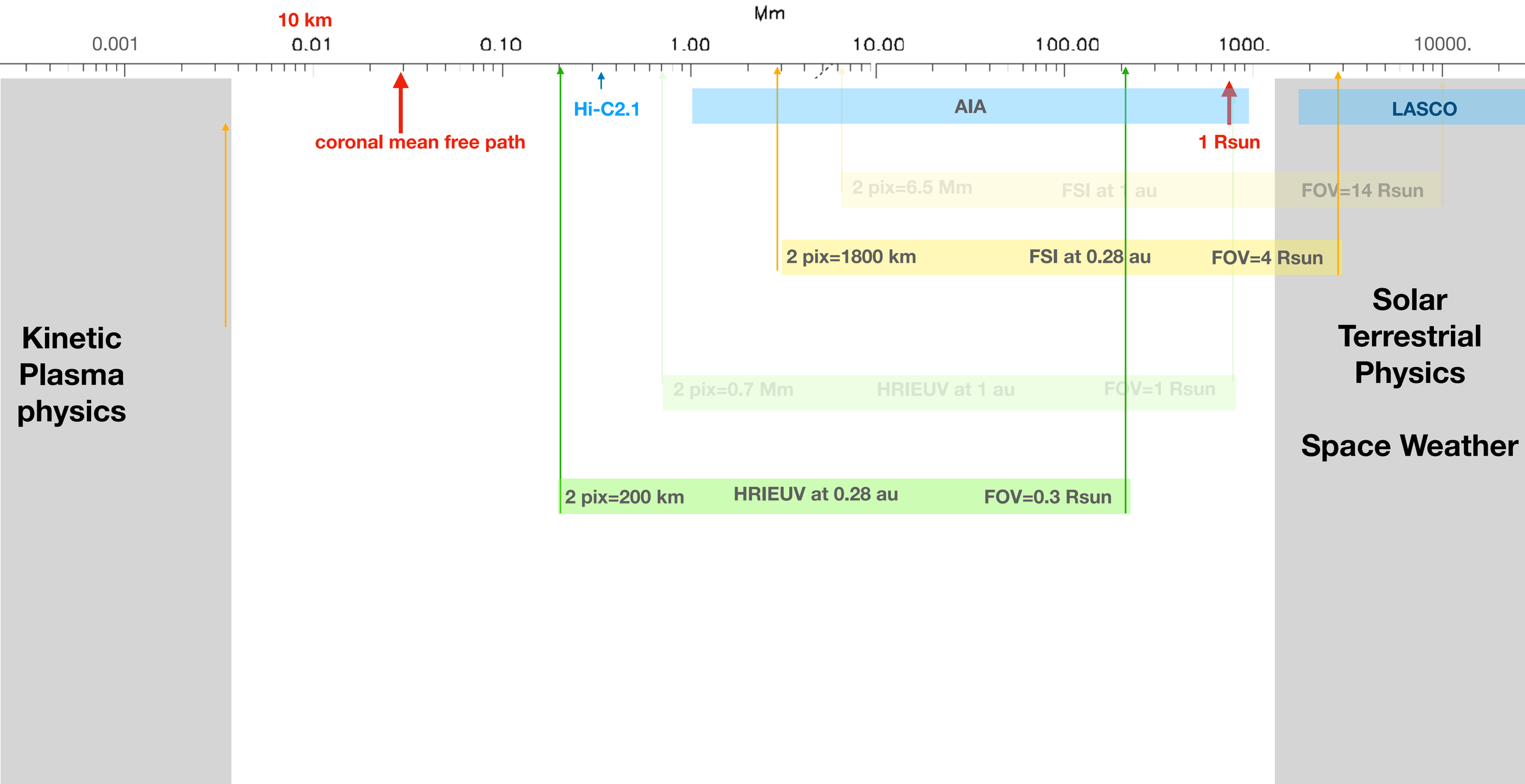
The Many Scales of the Magnetic Corona

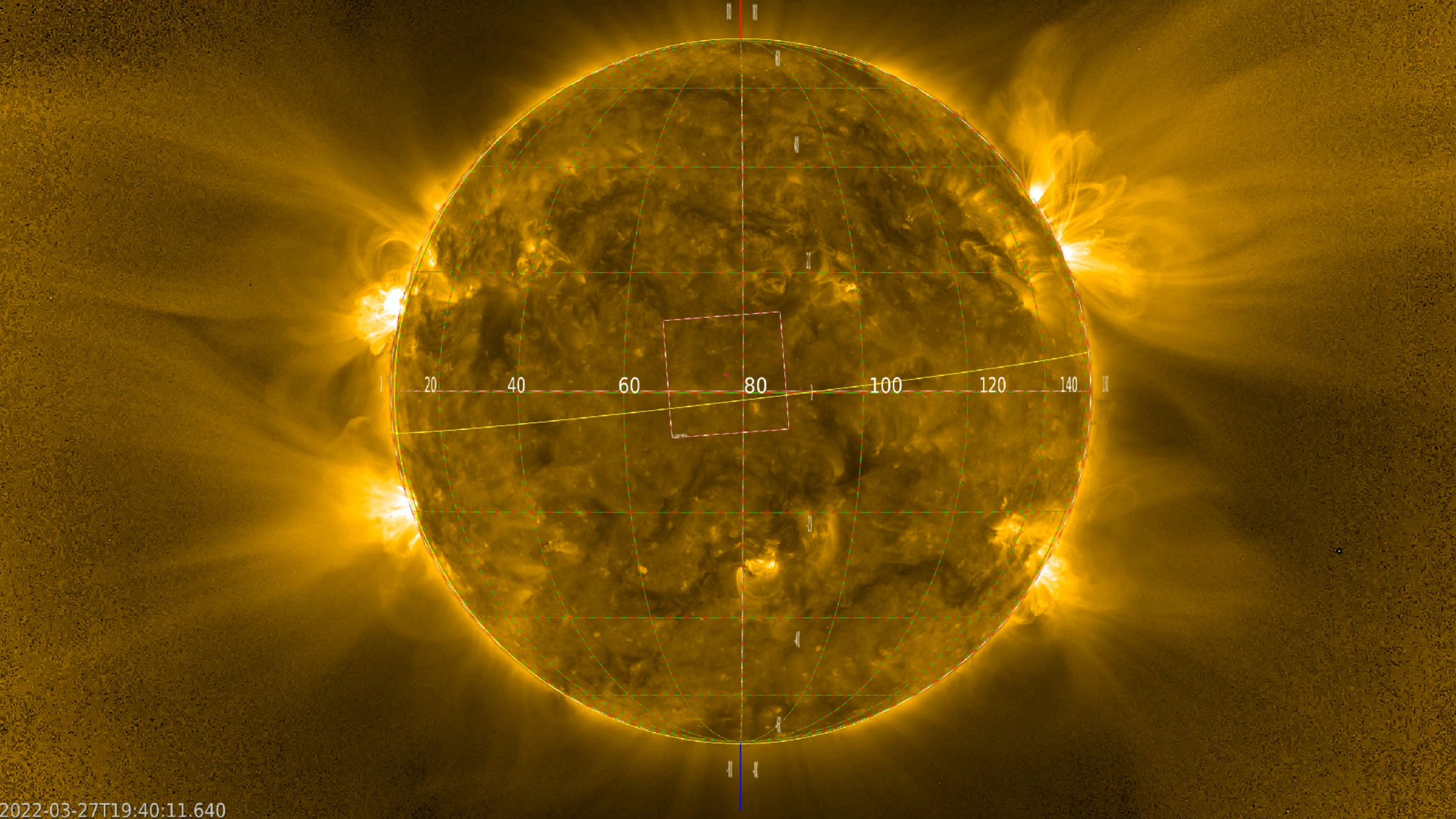


The Many Scales of the Magnetic Corona



The Many Scales of the Magnetic Corona




20
40
60
80
100
120
140
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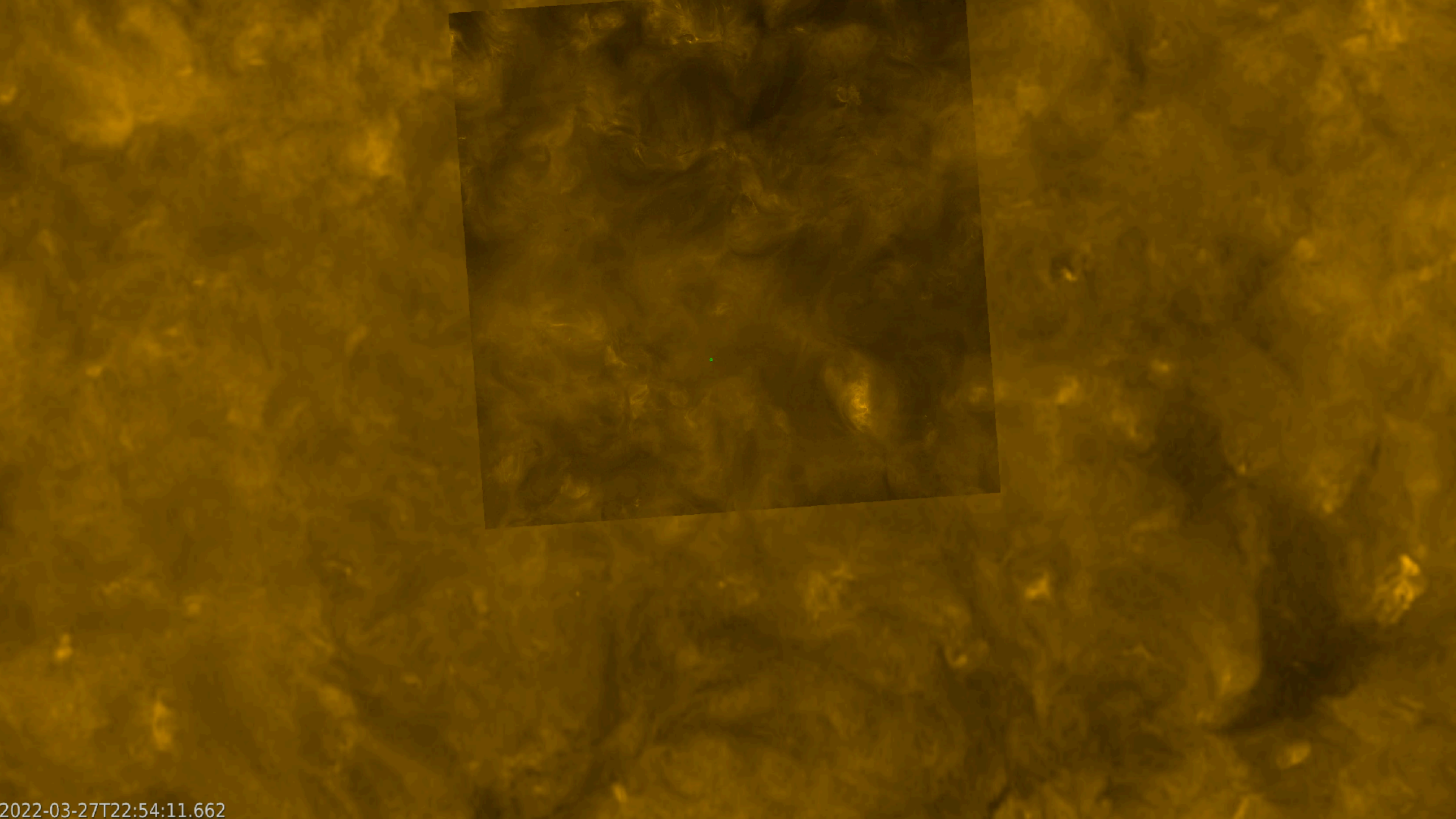
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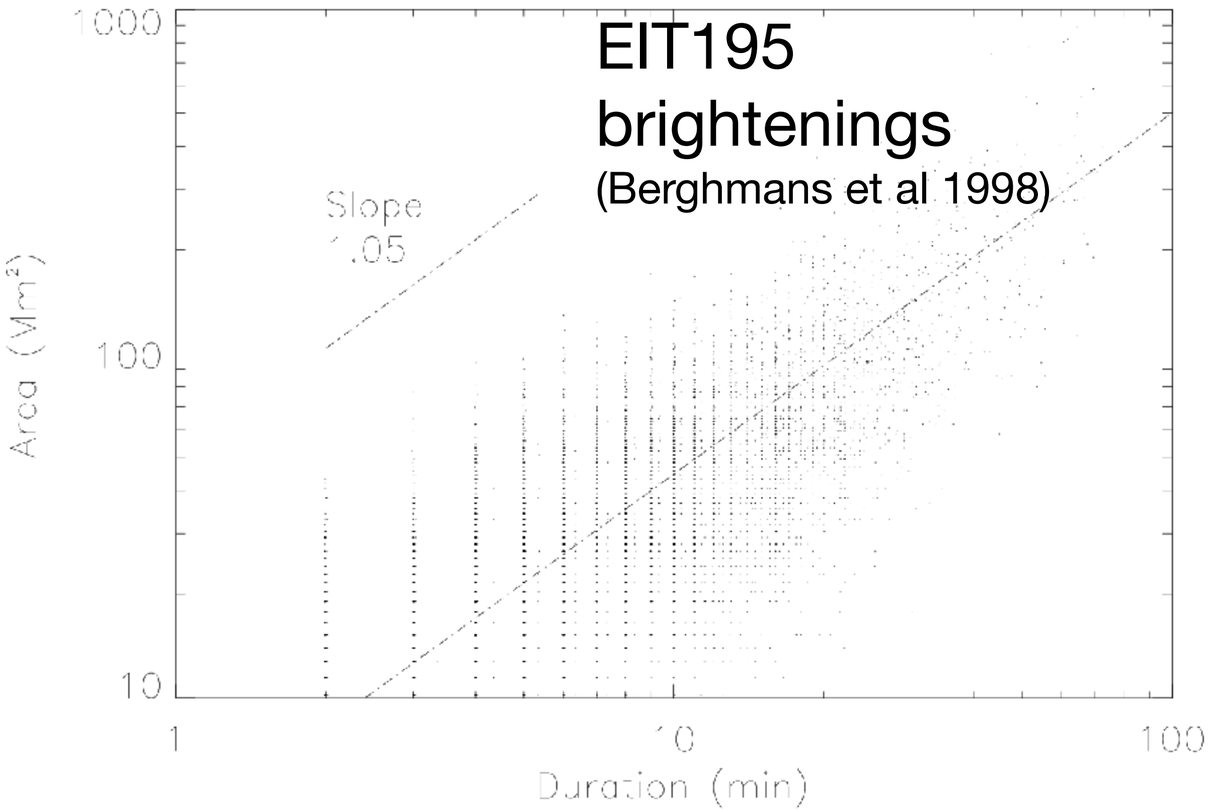
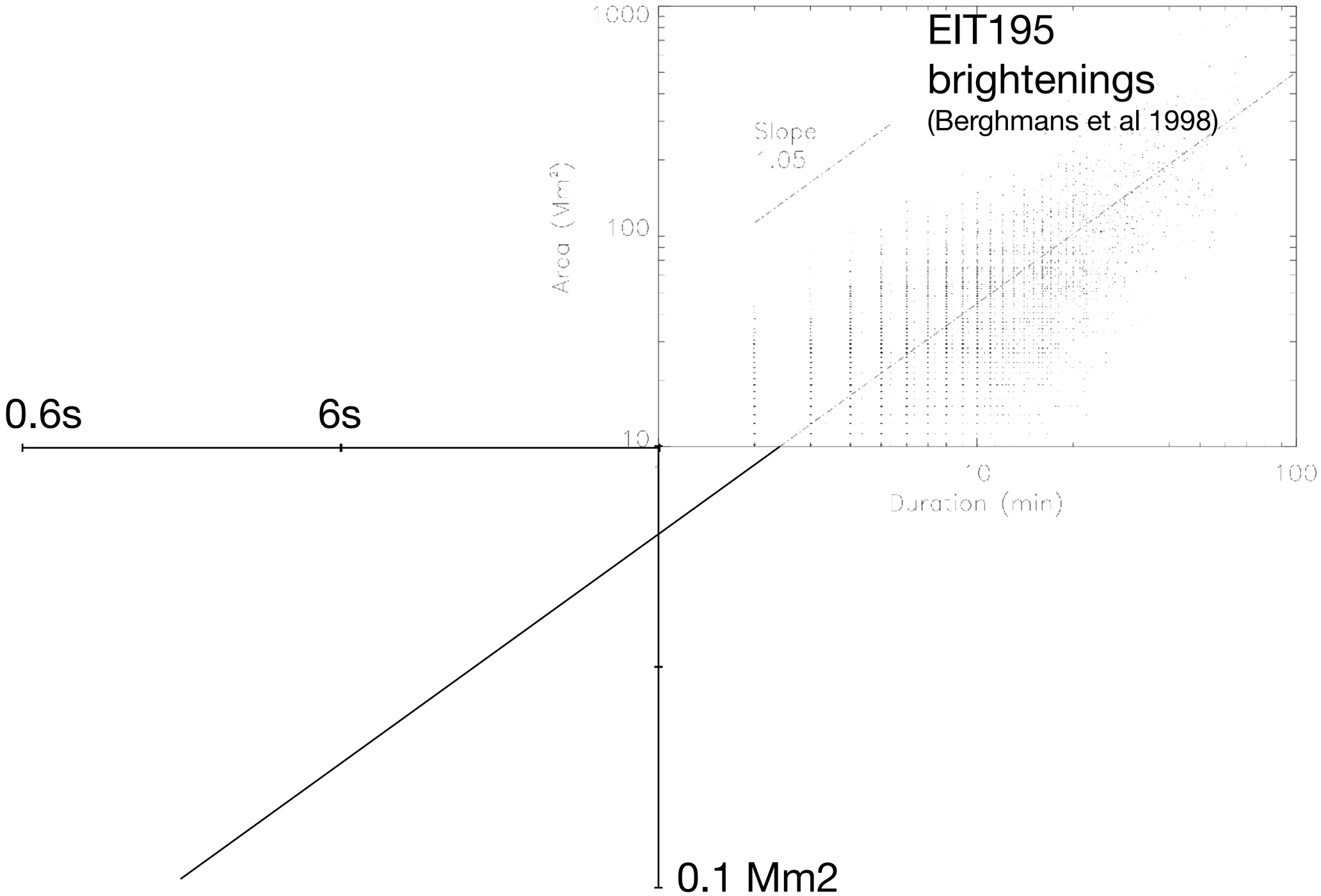
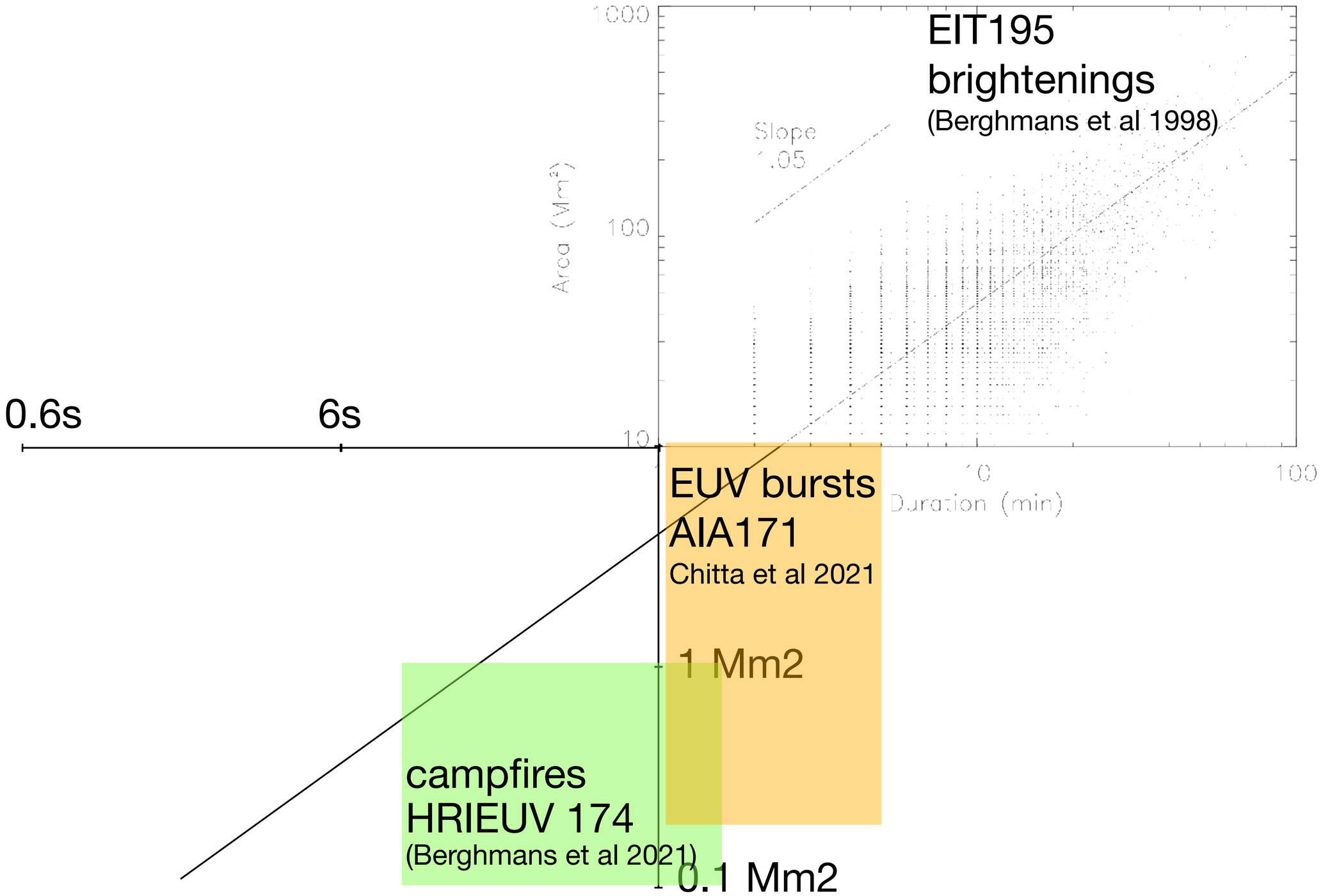
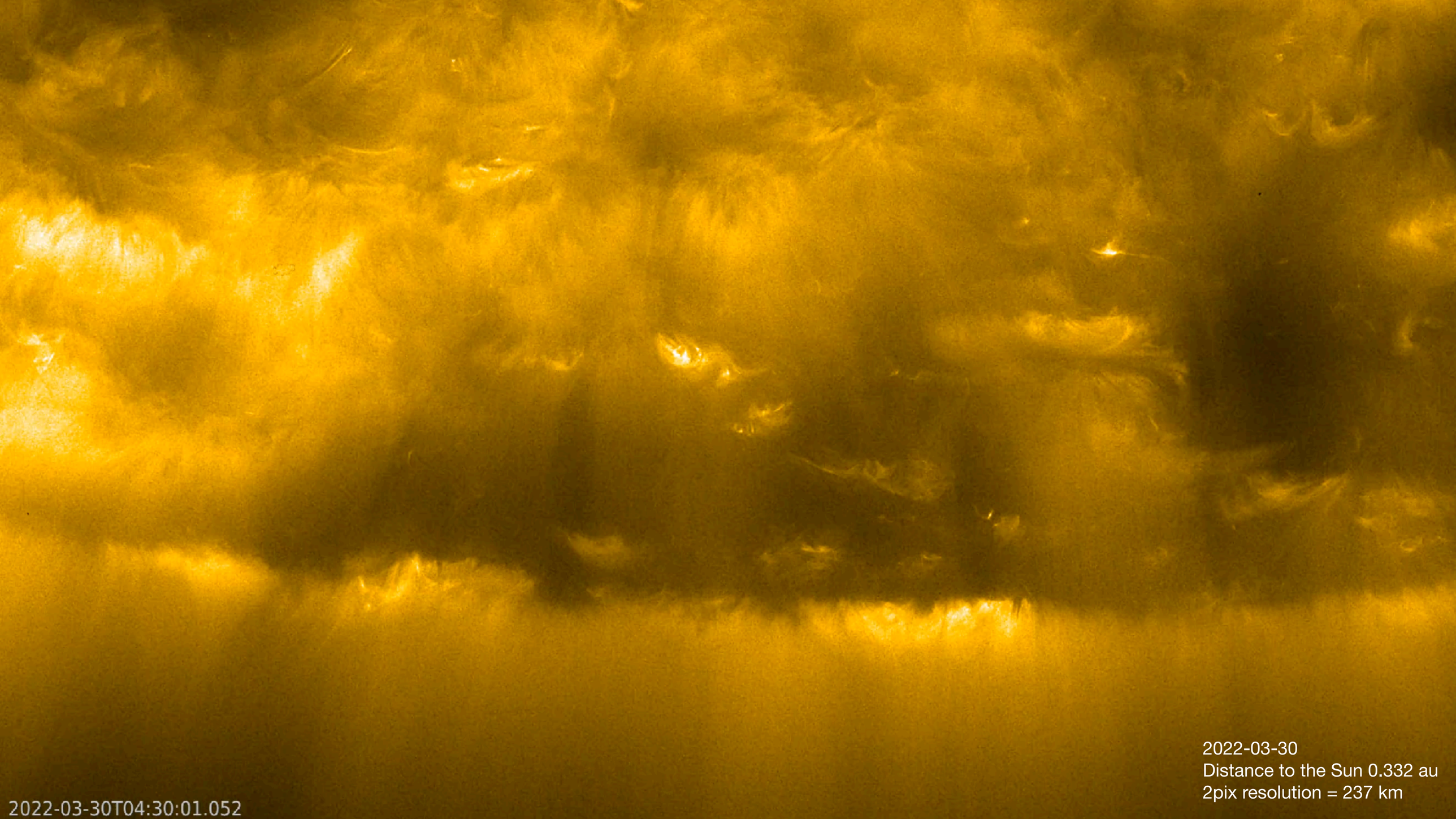

EIT195
brightenings
(Berghmans et al 1998)
Slope
.05
1000
100
10
Area (Mm²)
1
10
100
Duration (min)


EIT195
brightenings
(Berghmans et al 1998)
Slope
.05
Area (Mm²)
1000
100
10
10
100
Duration (min)
0.6s
6s
0.1 Mm2


EIT195
brightenings
(Berghmans et al 1998)
Slope
.05
Area (Mm²)
1000
100
10
Duration (min)
100
0.6s
6s
EUV bursts
AIA171
Chitta et al 2021
1 Mm2
campfires
HRIEUV 174
(Berghmans et al 2021)
0.1 Mm2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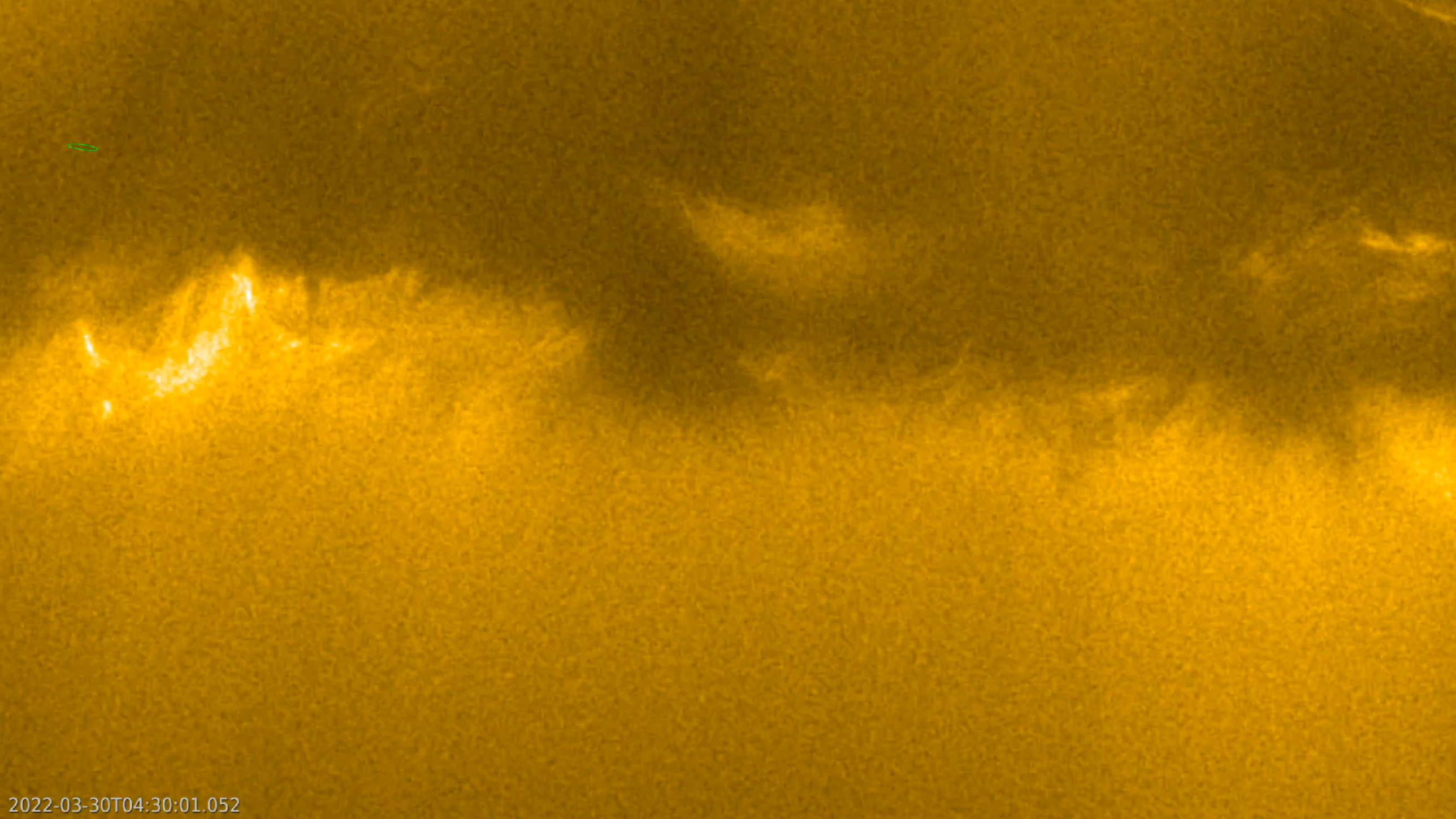
2022-03-30
Distance to the Sun 0.332 au
2pix resolution = 237 km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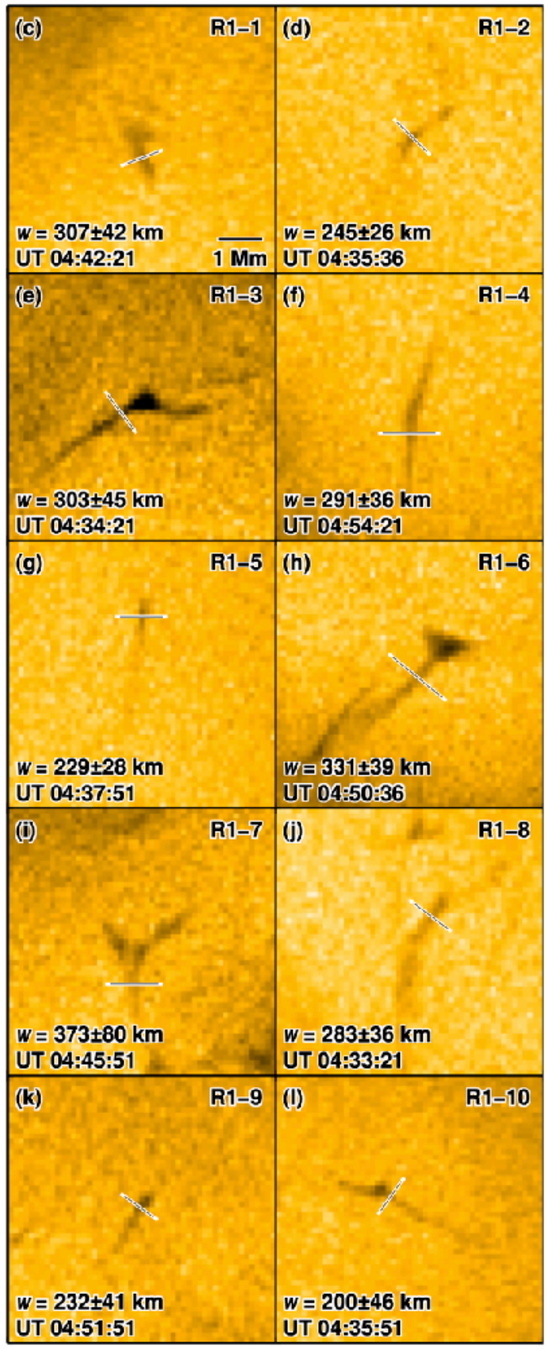
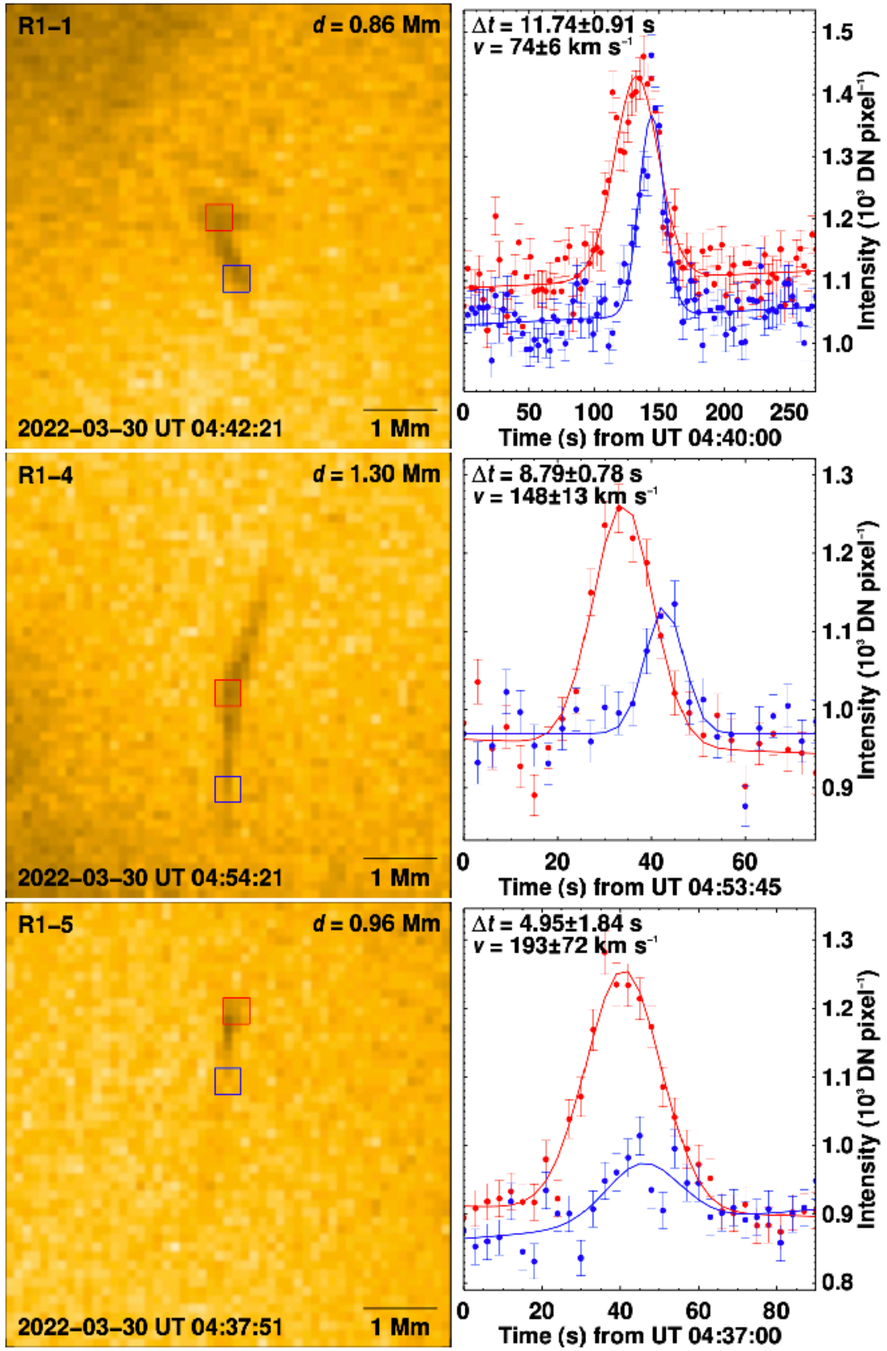
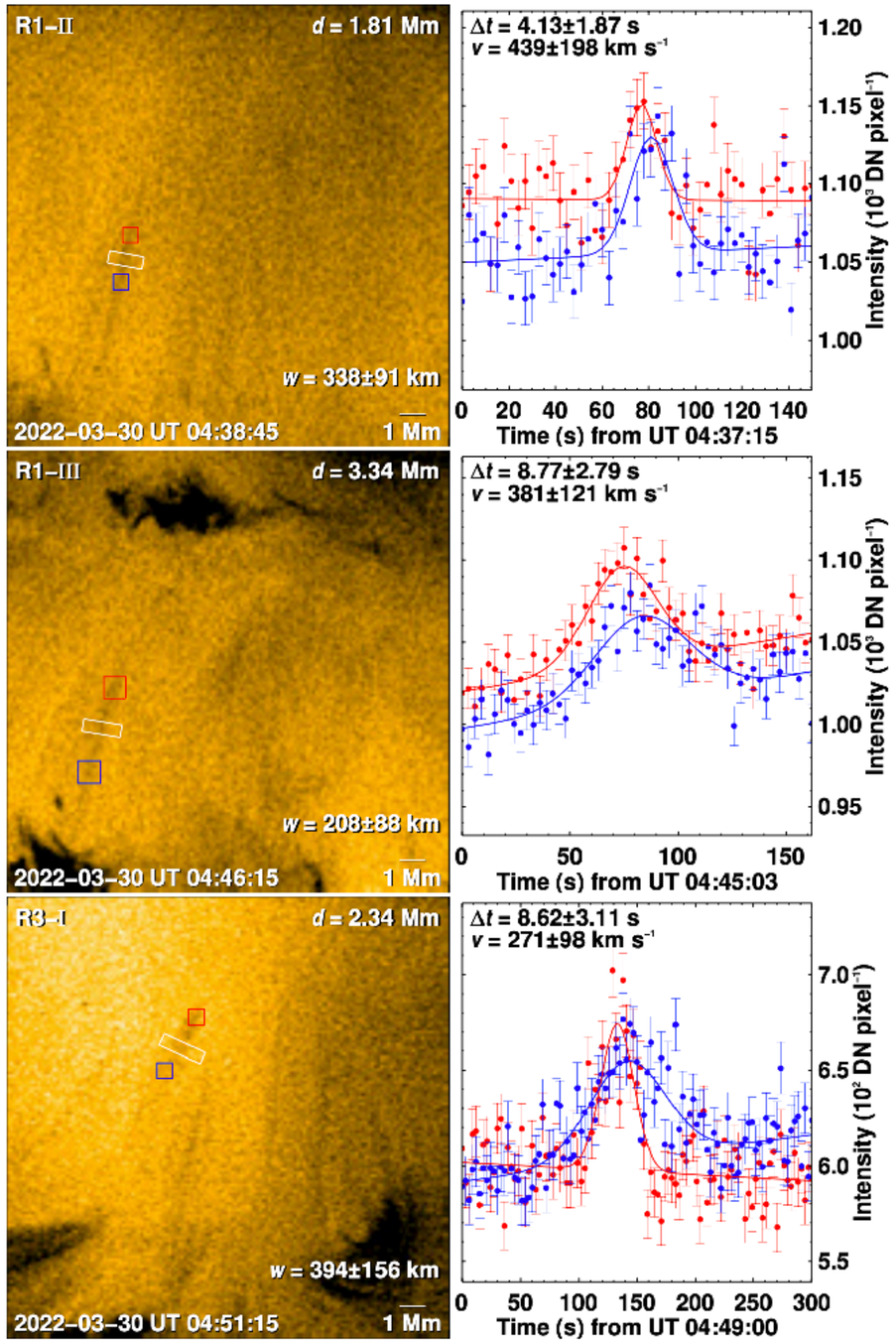
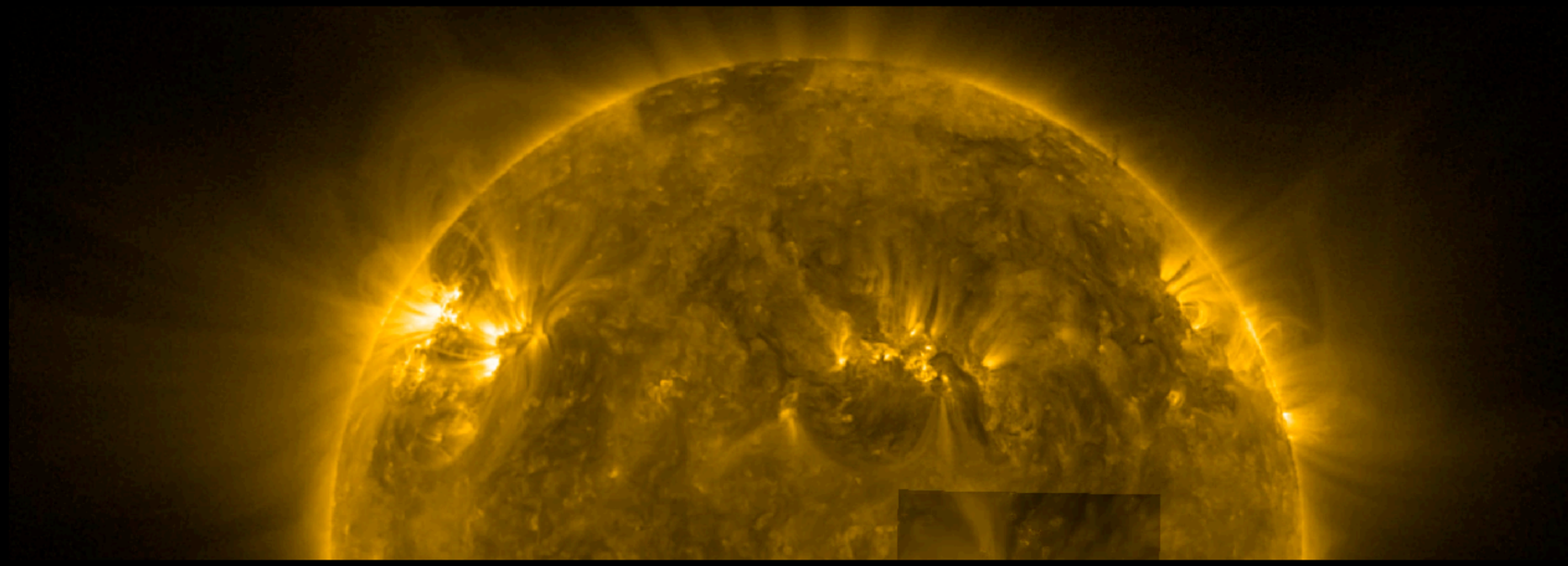
Lakshmi Pradeep Chitta et al , 2023, Science

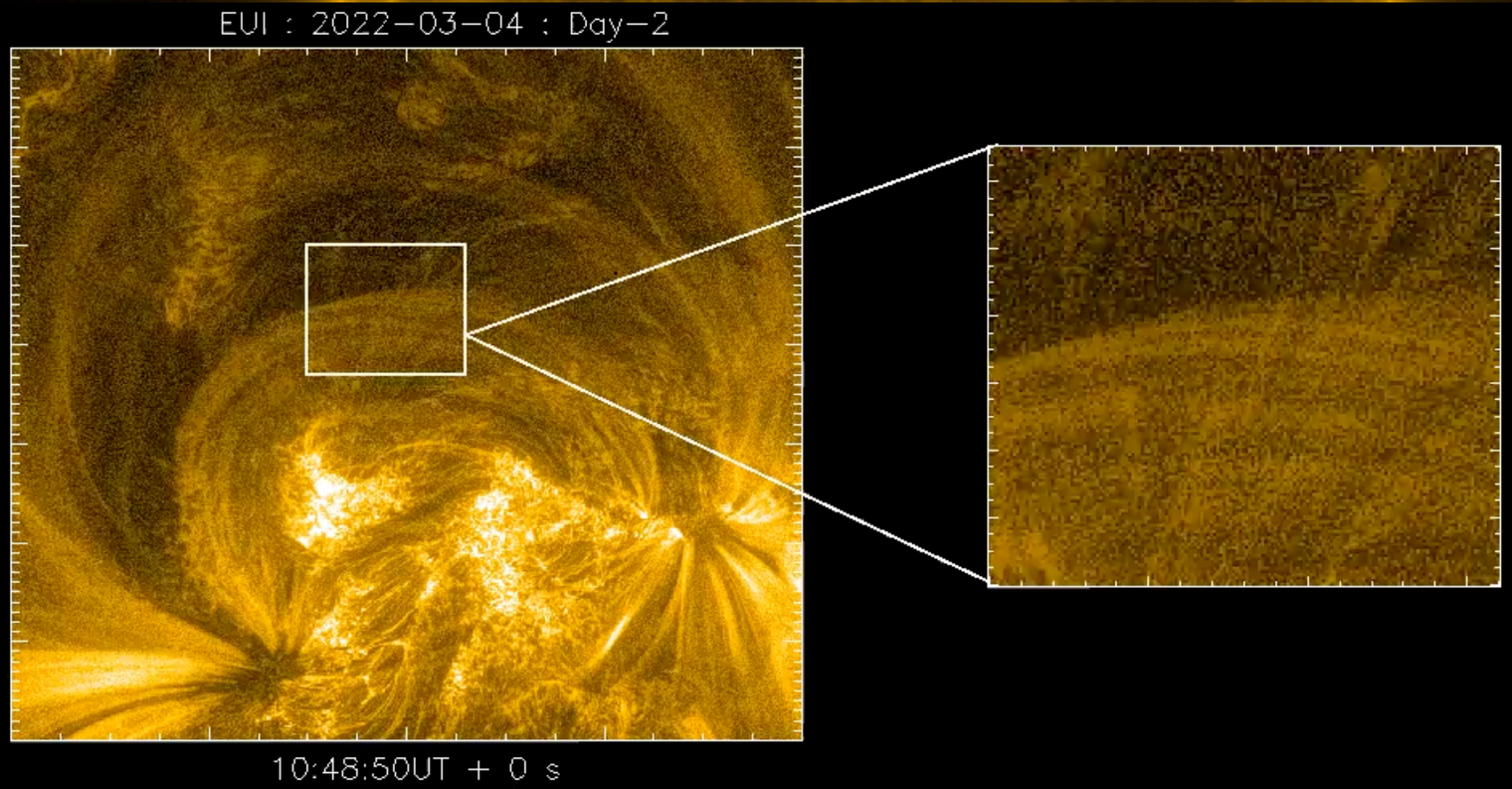


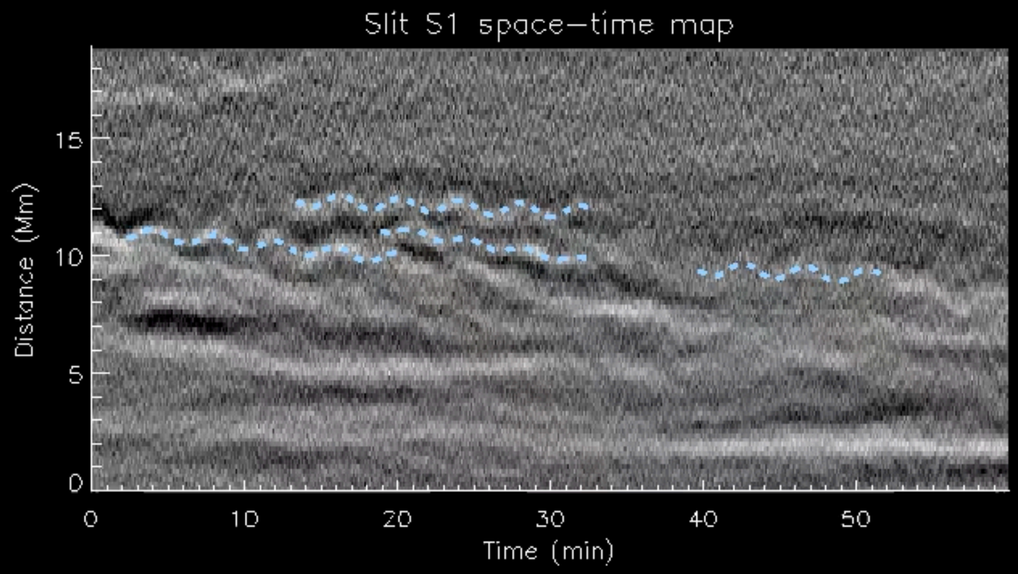




Sudip Mandal et al, 2022 AA







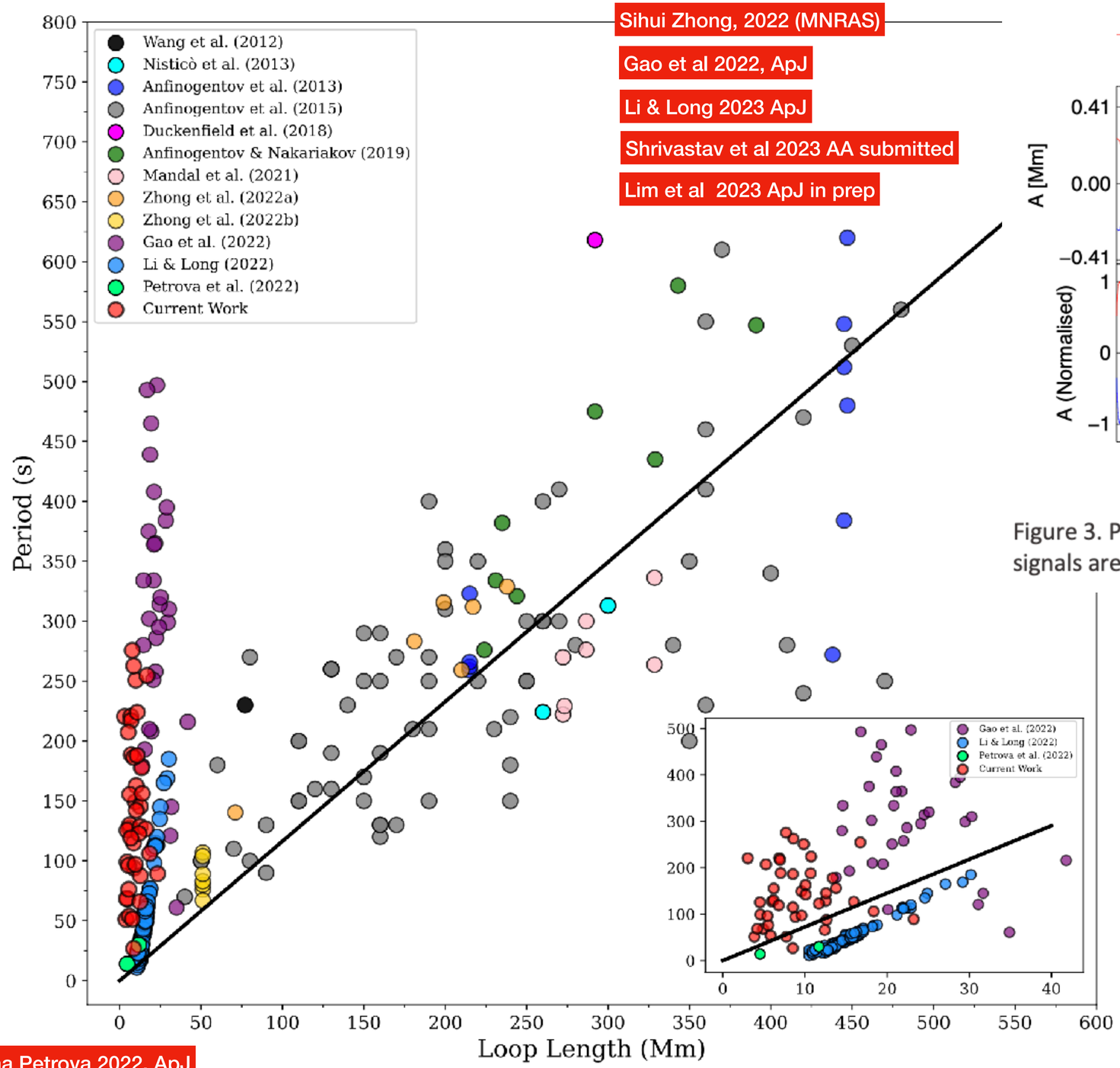
Sihui Zhong, 2022 (MNRAS)

Gao et al 2022, ApJ

Li & Long 2023 ApJ

Shrivastav et al 2023 AA submitted

Lim et al 2023 ApJ in prep



Elena Petrova 2022, ApJ

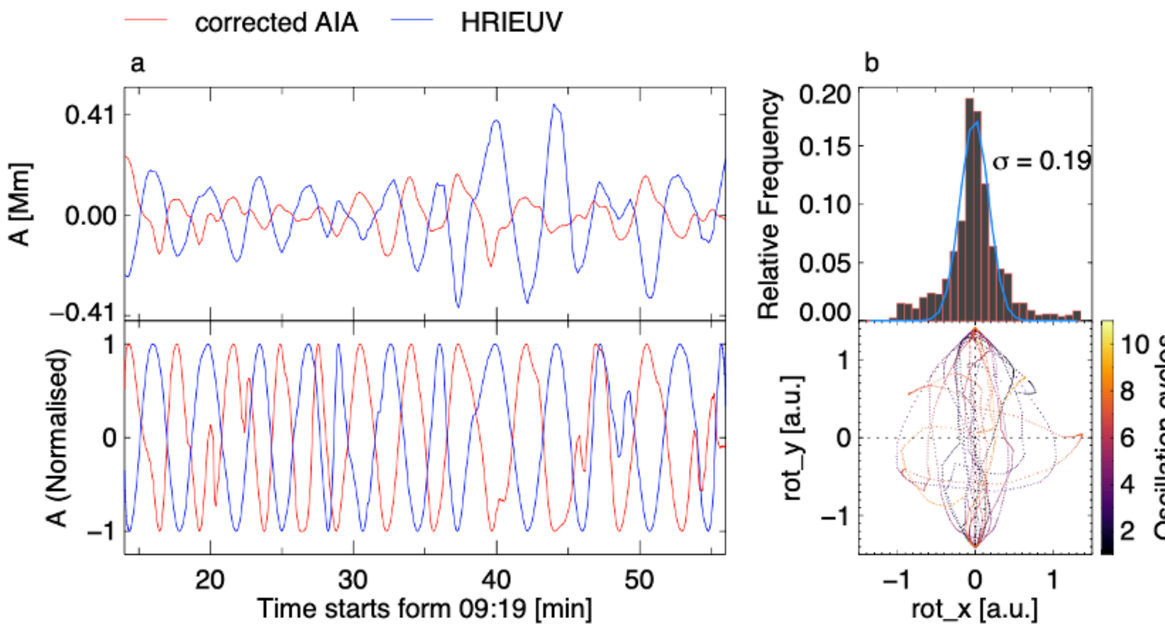
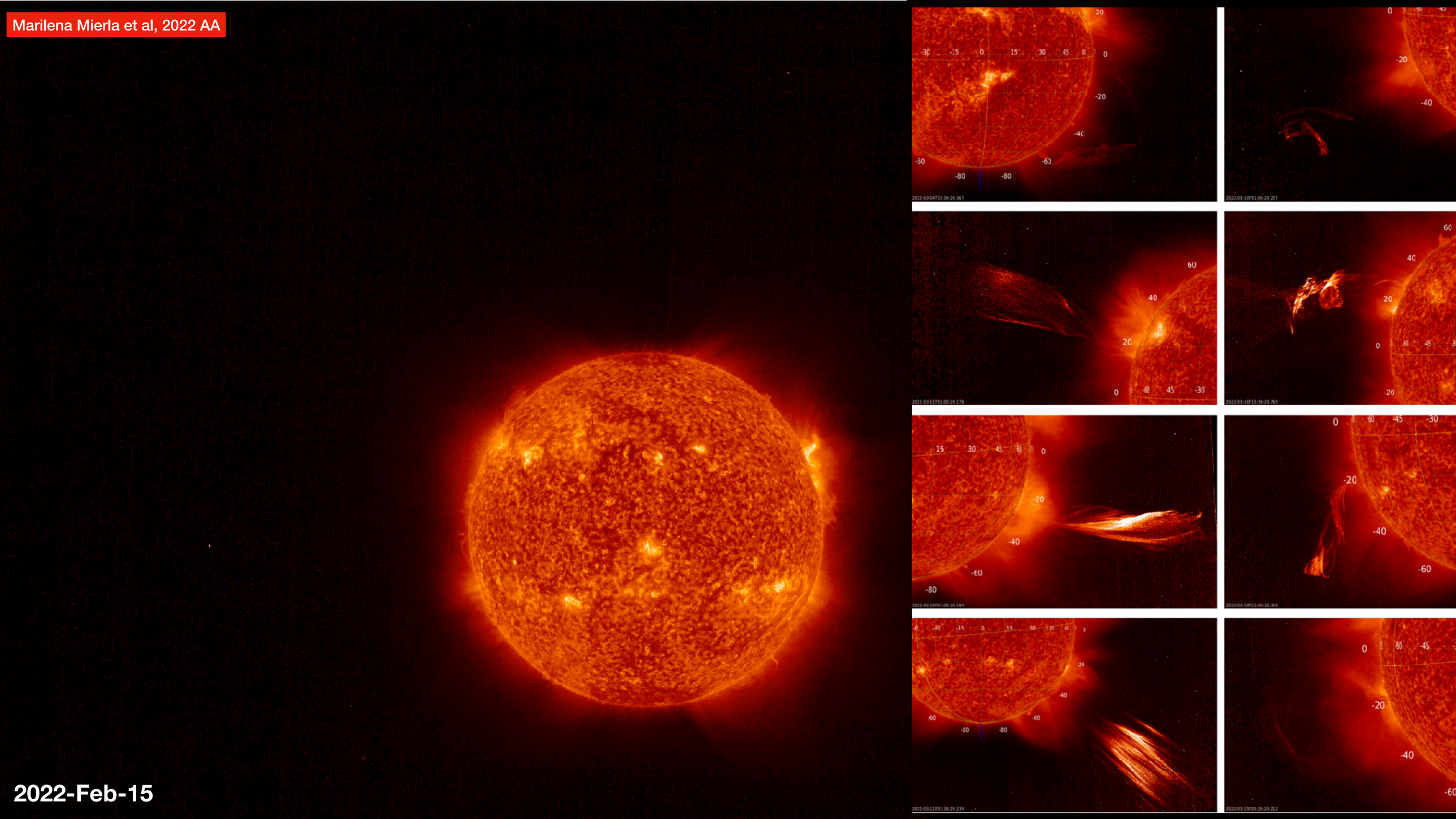


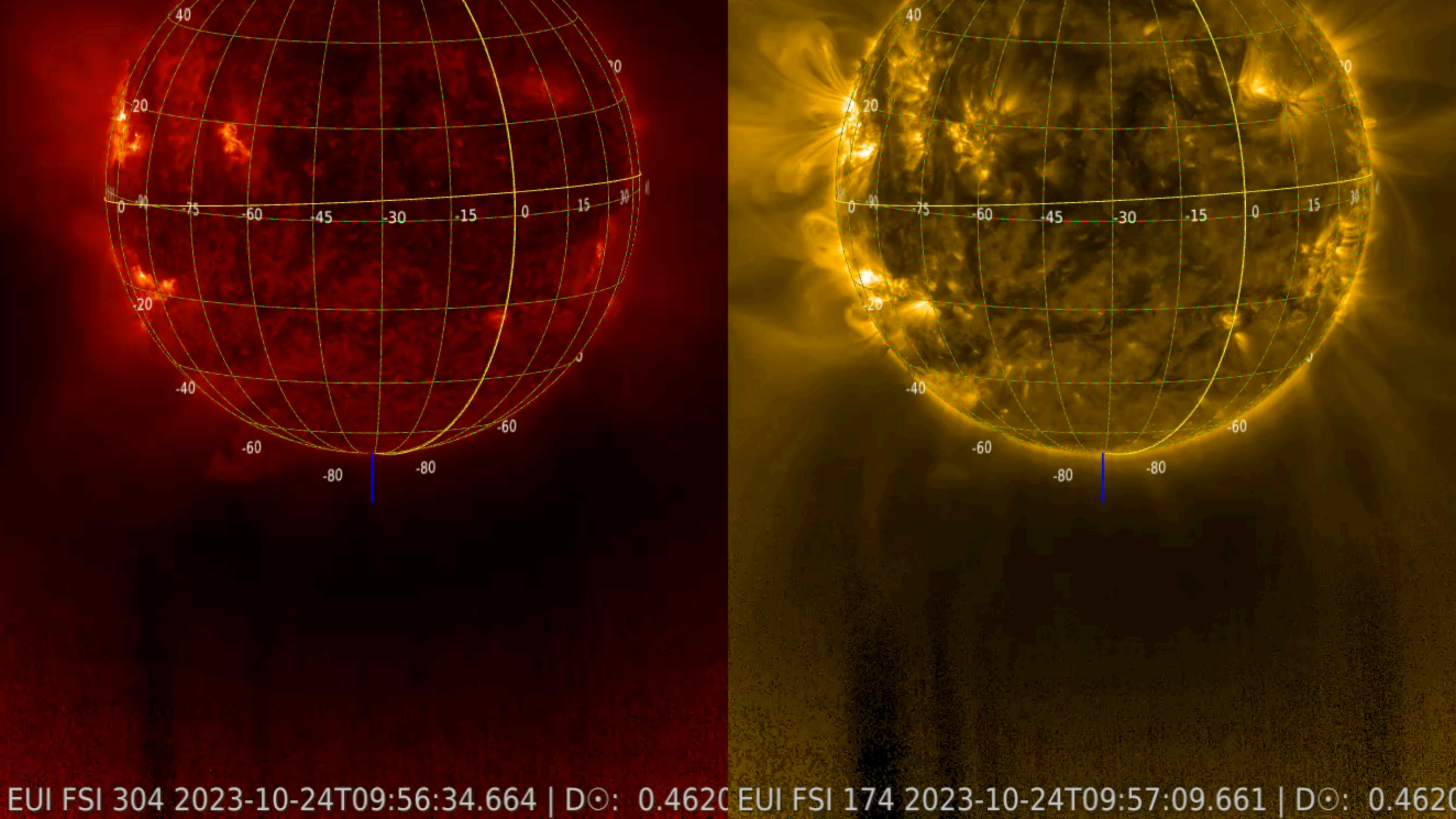
Figure 3. Phase shifts between the kink oscillations detected with HRIEUV and AIA. The signals are averaged over 5 slits near the apex.

Sihui Zhong, 2023 (Nat Comm)

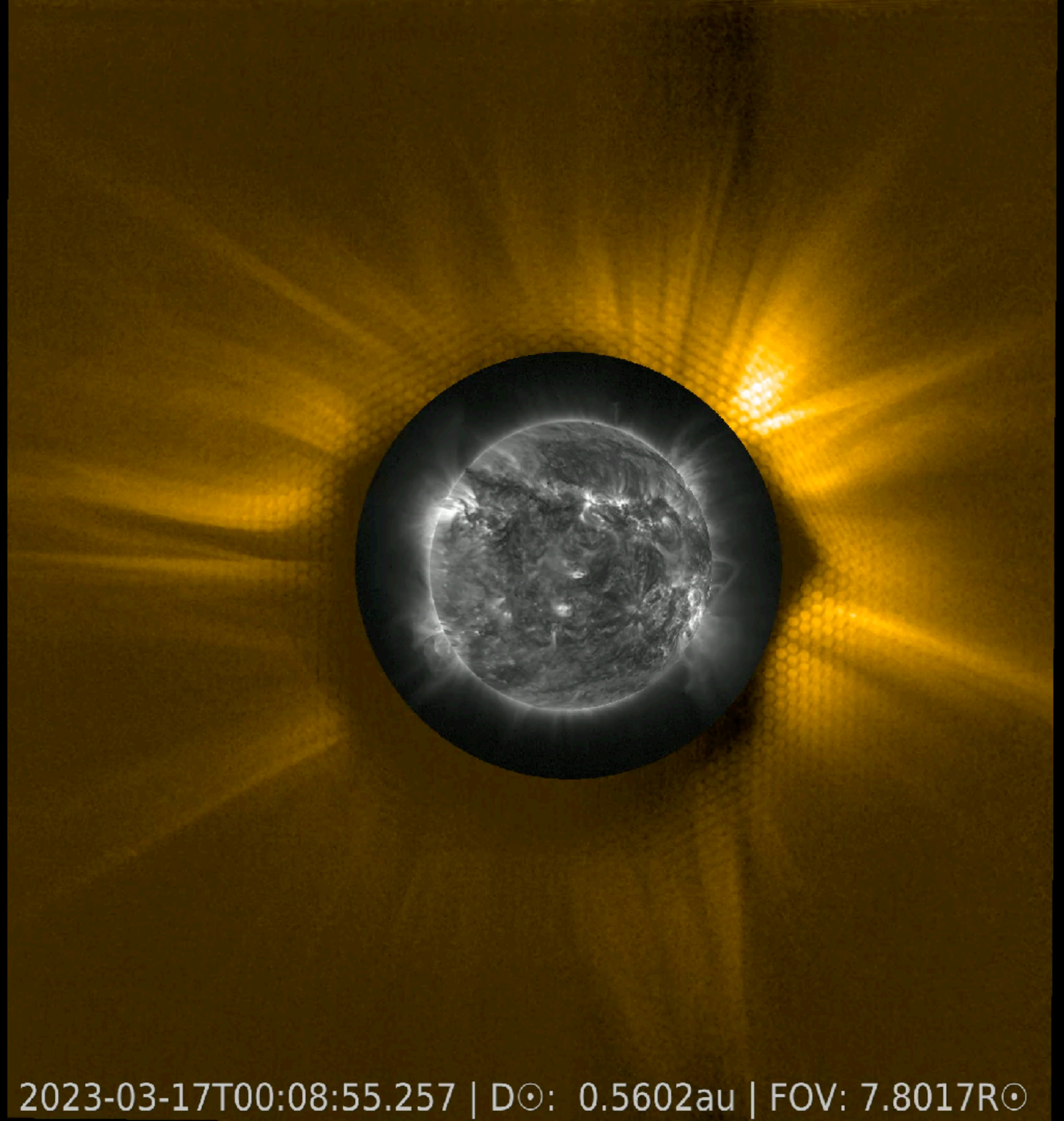
Marilena Mierla et al, 2022 AA



2022-Feb-15


EUI FSI 304 2023-10-24T09:56:34.664 | D☉: 0.4620
EUI FSI 174 2023-10-24T09:57:09.661 | D☉: 0.4620

Frederic Auchère et al
2023 AA



yellow: FSI 174 in occulter mode

grey: PROBA2/SWAP174

The EUI policy: open!

- Guest Investigators:
  https://www.sidc.be/GuestInvestigator/GI_call_2024

- Data access:
  - http://sidc.be/EUI/data
  - SOAR, VSO

- Check user manual
  - https://www.sidc.be/EUI/data/latest_release_notes.html

Handy tools

- Data availability browsing: SODA (Eric.Buchlin@ias.u-psud.fr)
- HRIEUV high cadence sequence list (Daye.Lim@kuleuven.be)
- Visualisation: JHelioviewer (Bogdan.Nicula@oma.be)
- EUI eruption list (Marilena.Mierla@oma.be)
- Jupyter notebook tutorials (Emil.Kraaikamp@oma.be)
- Wow image enhancement (Frederic.Auchere@ias.u-psud.fr)

Not the EUV images you are used to

- Angle with the Earth varies, distance to the sun varies, thus also resolution.
- EUI instrument settings are quiet variable: exposure times, gain settings, filter wheel position, occulter are all documented in the FITS keywords
- We do not re-orient or re-center the data: use the WCS keywords when displaying images!
- All data is reprocessed backward since launch every time the calibration software is updated. Please check the Data Release version and cite the DOI
- Ask the PI team: eui@sidc.be