

Roseland
Centre
for Solar
Physics

SST coordination with Solar Orbiter and other telescopes in space

Luc Rouppe van der Voort

Roseland Centre for Solar Physics (RoCS), University of Oslo

In collaboration with Nicolas Poirier, Elias Udnæs, Reetika Joshi, Aline Brunvoll, Rebecca Nguyen

Movies available at: http://tsih3.uio.no/lapalma/subl/26_solo/

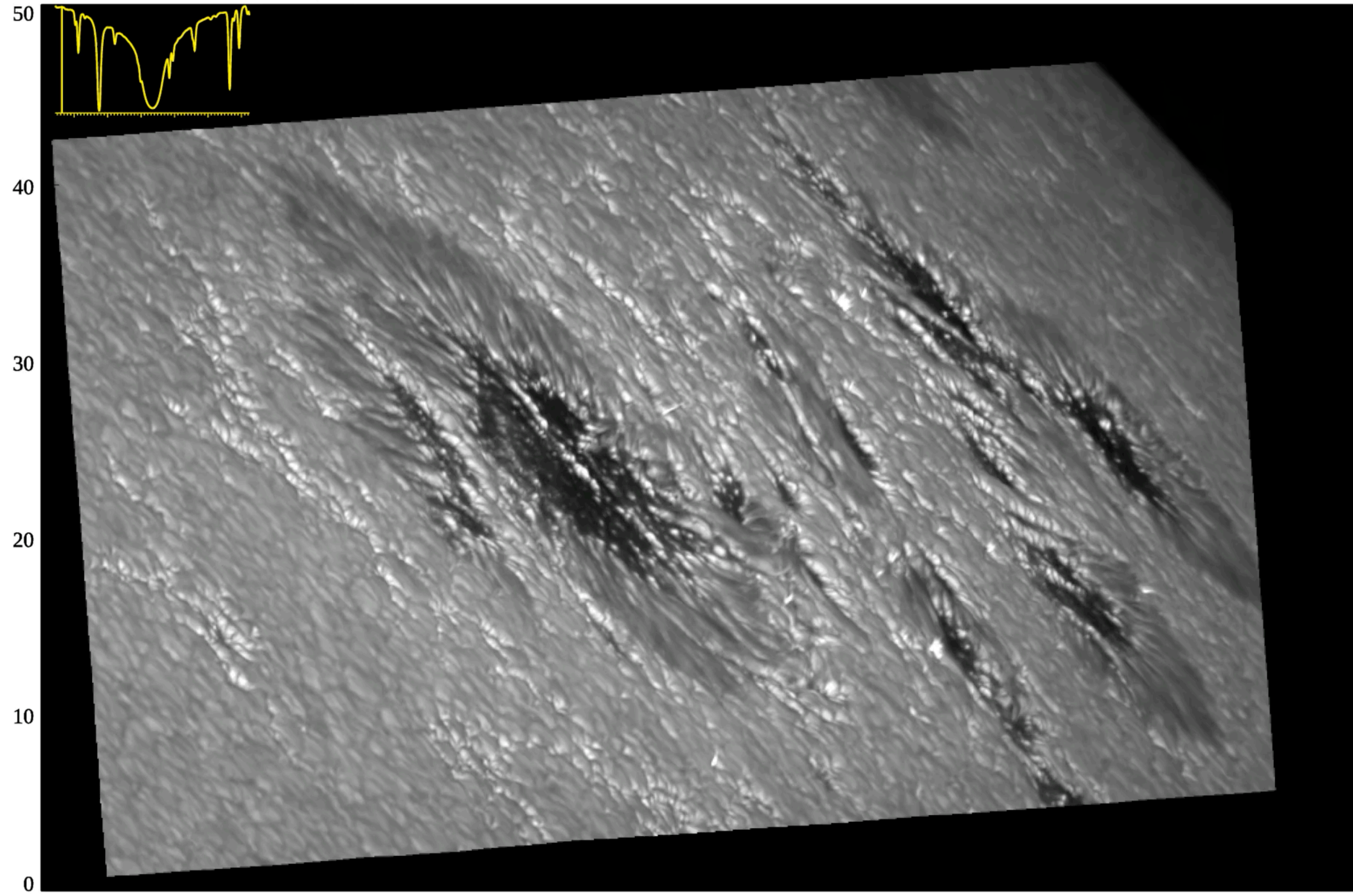
Solar Orbiter "Atmospheric Heating" Science Working Group online seminar, Feb 23, 2026

Swedish 1-m Solar Telescope (SST) on La Palma (Spain)

CRISP and CHROMIS instruments:

- High spatial resolution: $<0.2''$
- High spectral resolution: e.g. 30λ in ~ 10 s
- High temporal resolution: $\sim 10 - 40$ s
- Large FOV: CRISP2 $120''$, CHROMIS $77''$

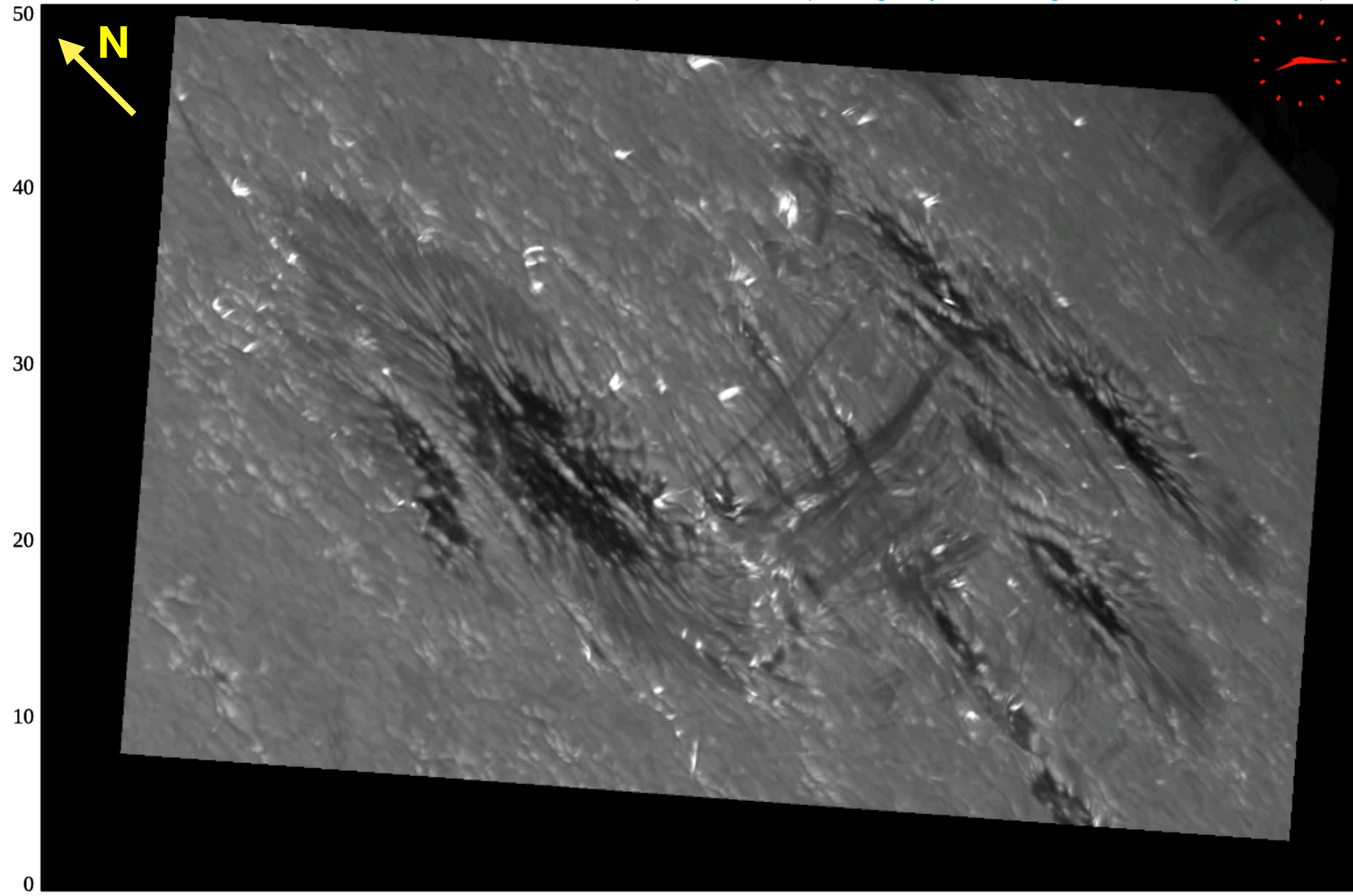




H-beta 4861Å

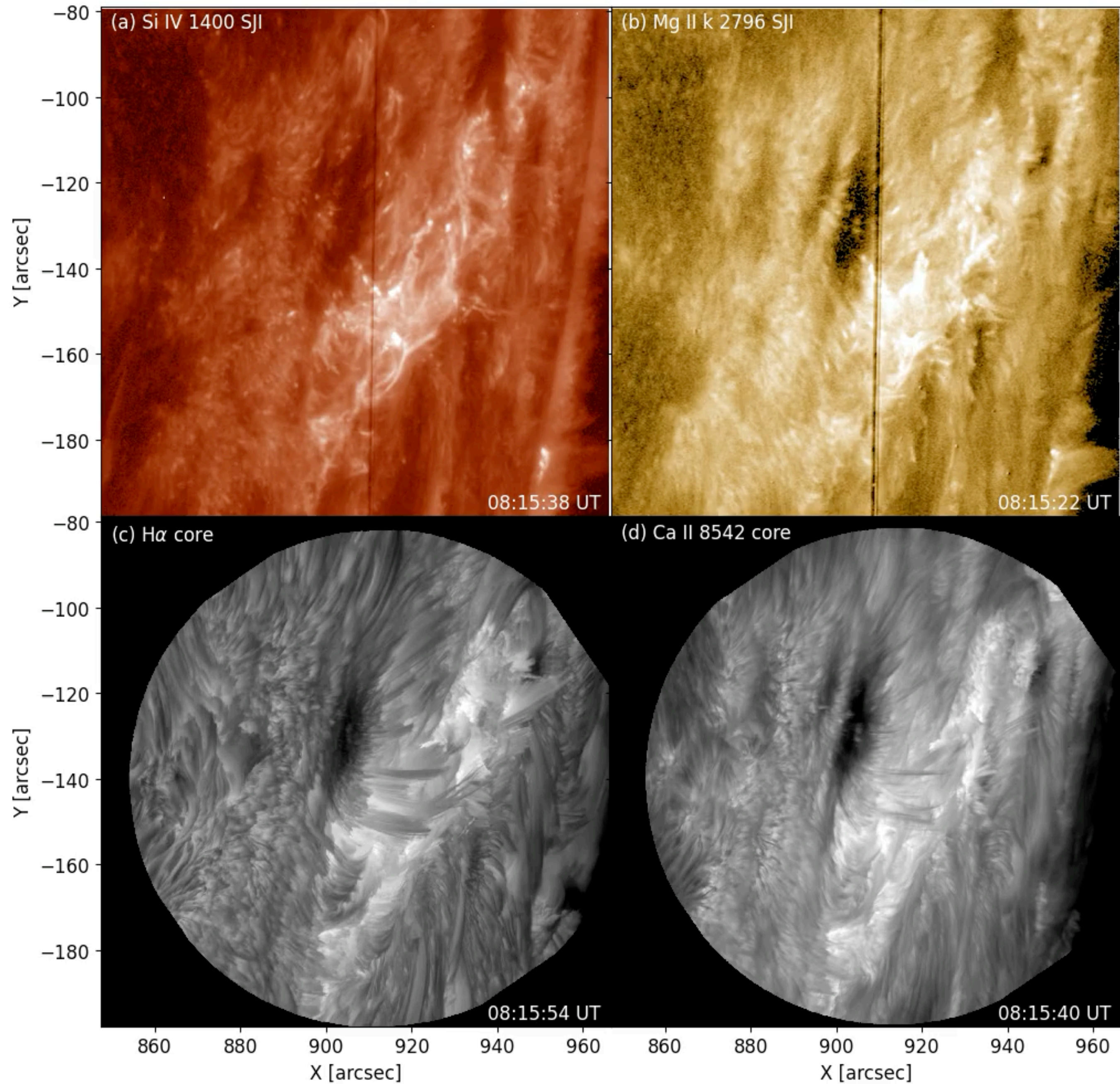
λ : 29 positions

~11 s



- Excellent seeing
- Adaptive Optics
- Image reconstruction (MOMFBD)

~2 h observation



24-May-2024

C9 class flare (08:46 UT)

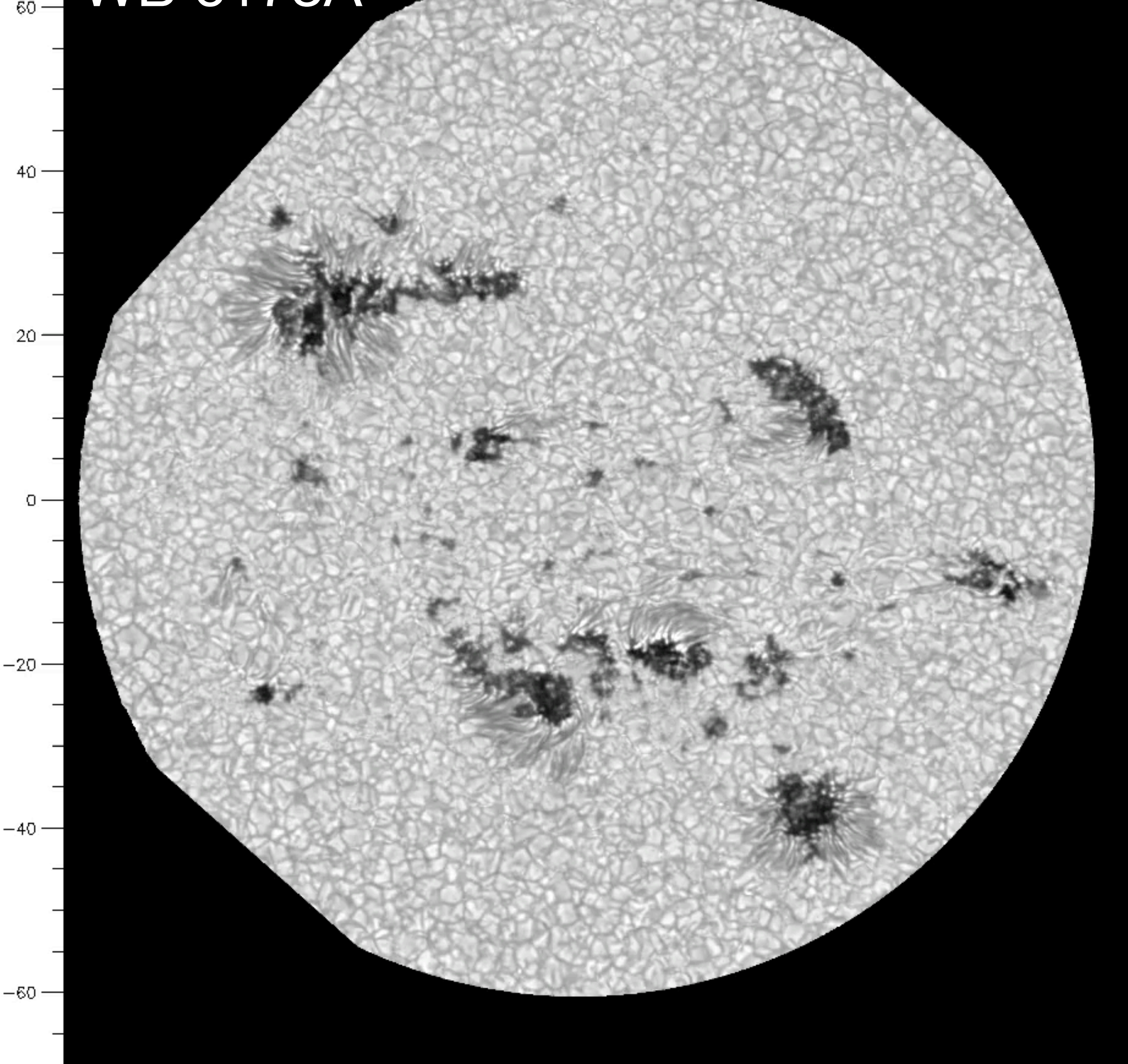
CRISP:

- Fe I 6173Å polarimetry
- Ca II 8542Å polarimetry
- H-alpha spectral imaging
- 37 s cadence

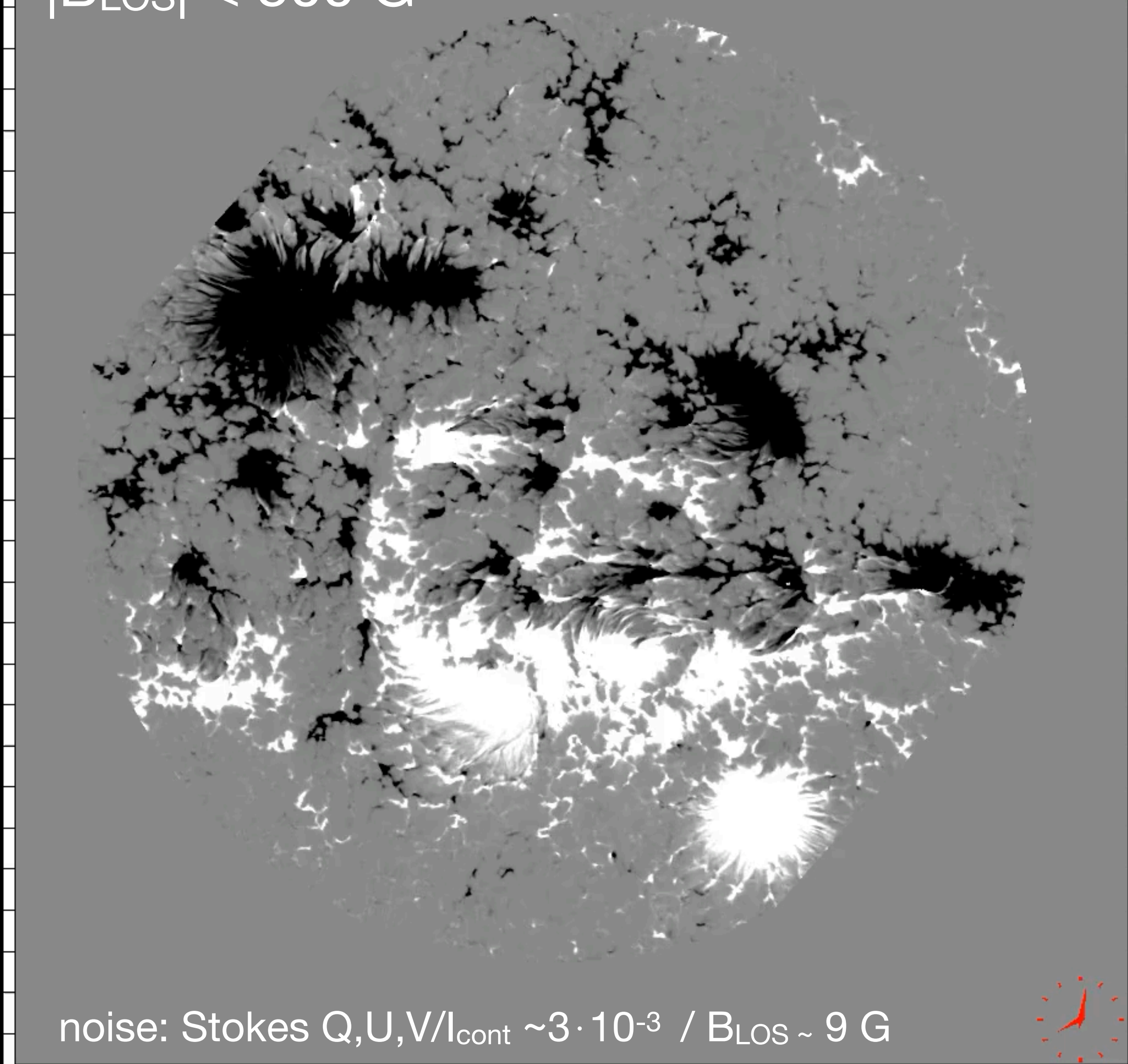
02:19 h observation

CRISP2 - 12-Oct-2025 - Emerging AR14246 - 37 min

WB 6173Å



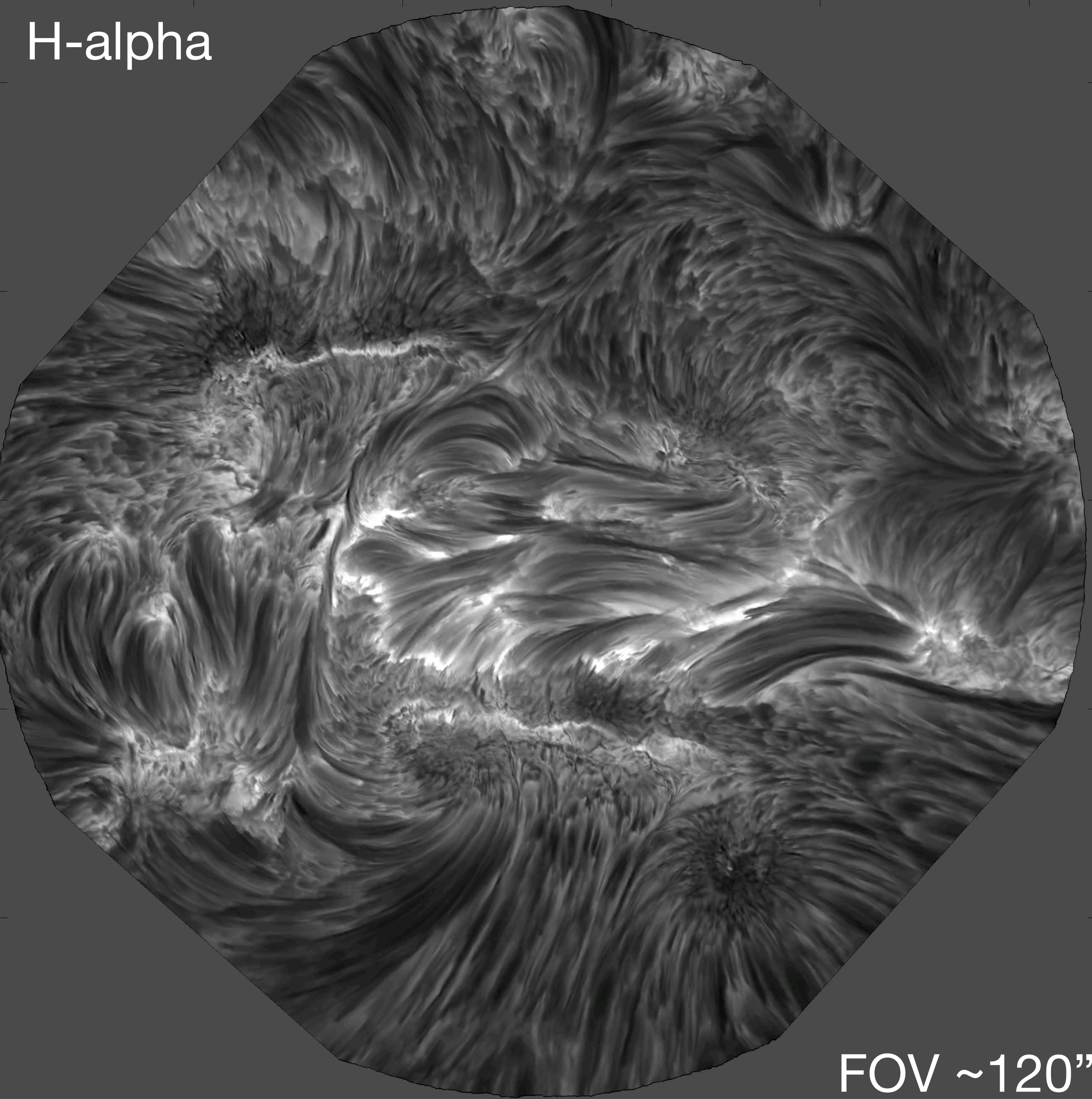
$|B_{\text{Los}}| < 500 \text{ G}$



noise: Stokes Q,U,V/ I_{cont} $\sim 3 \cdot 10^{-3}$ / $B_{\text{LOS}} \sim 9 \text{ G}$



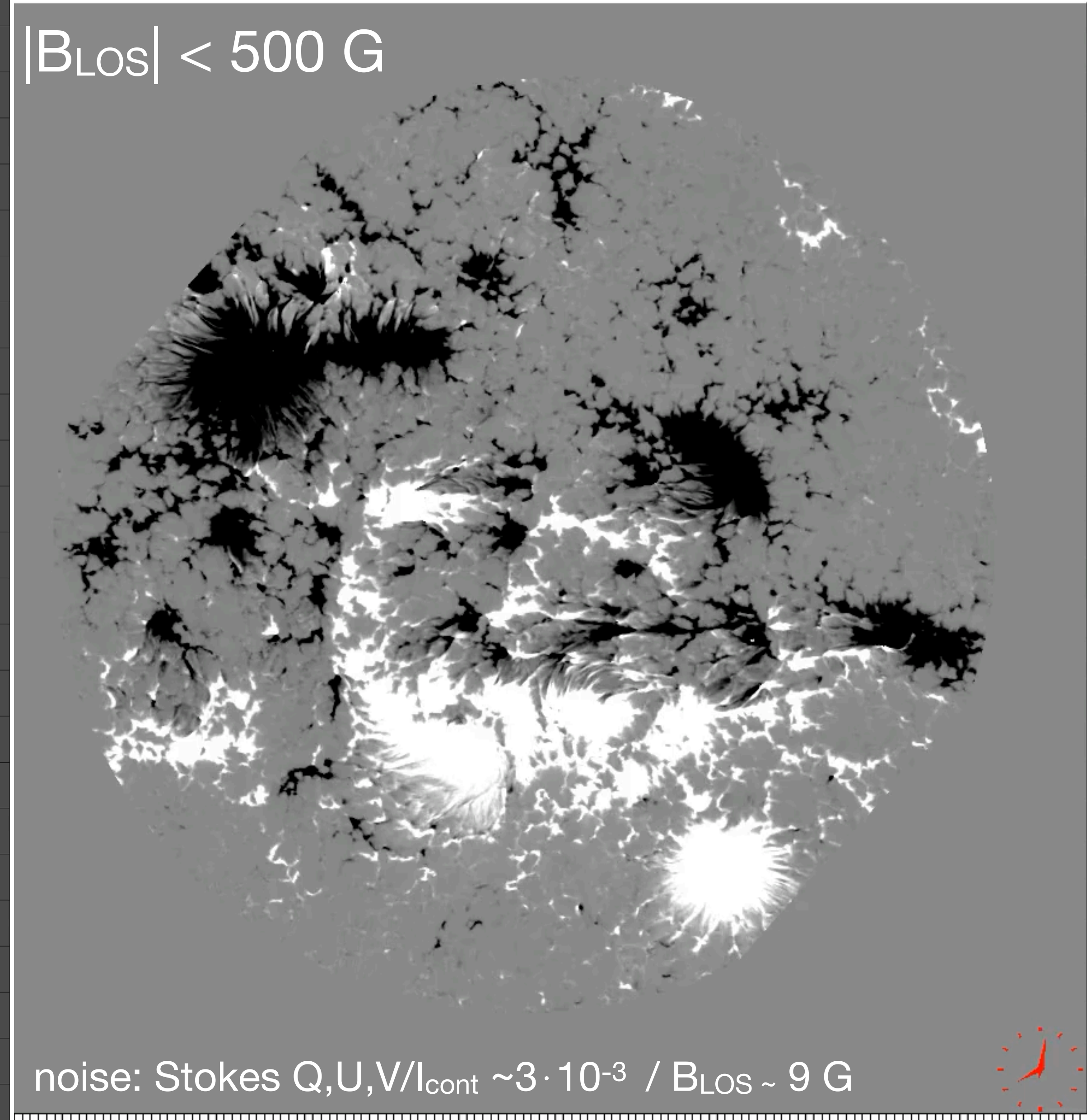
H-alpha



FOV ~120''

erging AR14246 - 37 min

$|B_{\text{Los}}| < 500 \text{ G}$



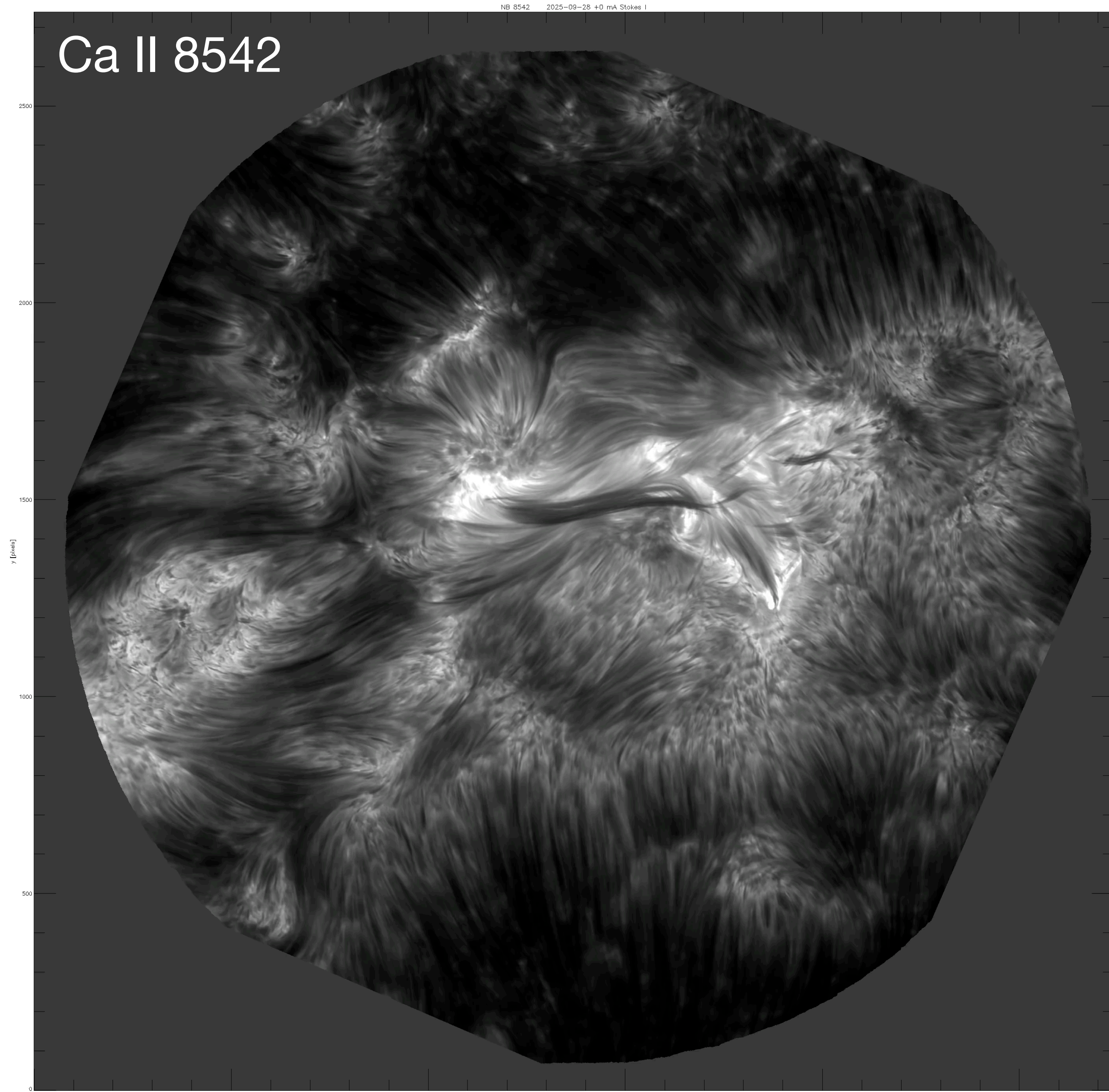
noise: Stokes Q,U,V/I_{cont} $\sim 3 \cdot 10^{-3}$ / B_{LOS} $\sim 9 \text{ G}$

-60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60



Ca II 8542

NB 8542 2025-09-28 +0 mA Stokes I

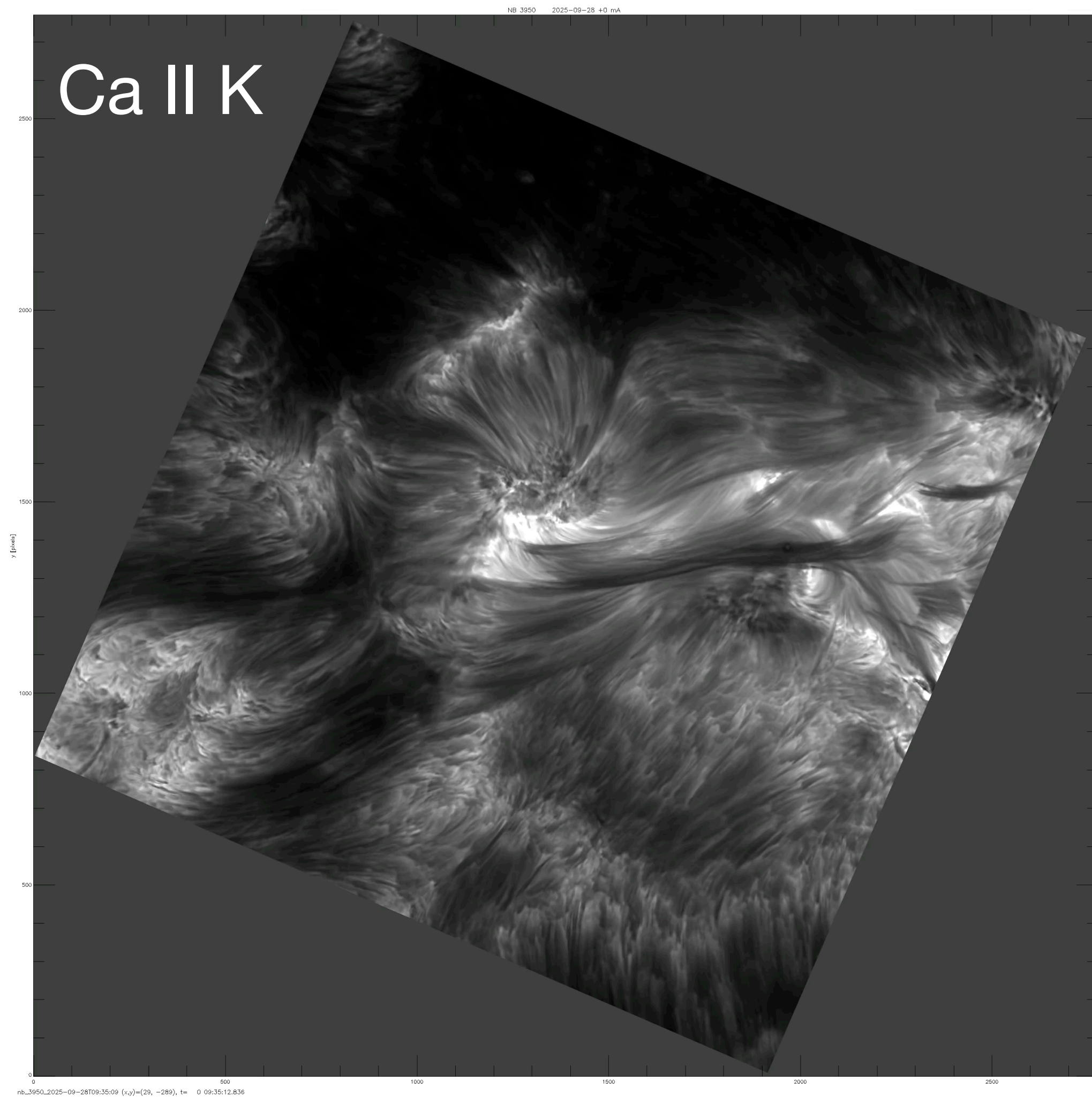


28-Sep-2025 : LMSAL/Stockholm/
Oslo campaign

IRIS target, with HeSP

Ca II 8542Å : 10 s (16 wavelengths, full Stokes)

CRISP2 : FOV 120''



28-Sep-2025 : LMSAL/
Stockholm/Oslo campaign

IRIS target, with HeSP

Ca II K 3933Å : 8 s (17 + 1 wavelengths)

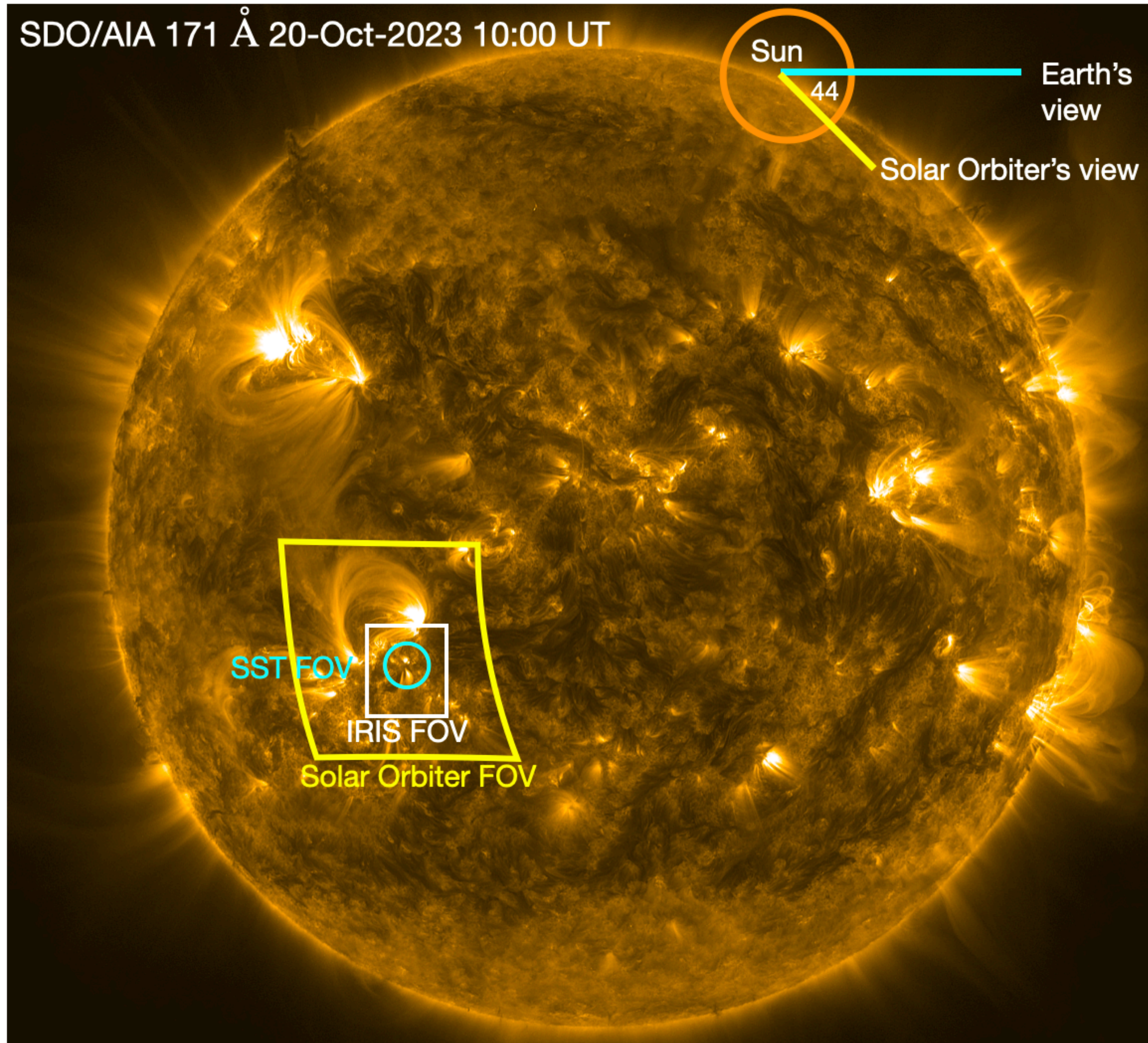
CHROMIS: FOV ~77"

MUSE SG 170"x170"

CRISP2 120"

CHROMIS 77"

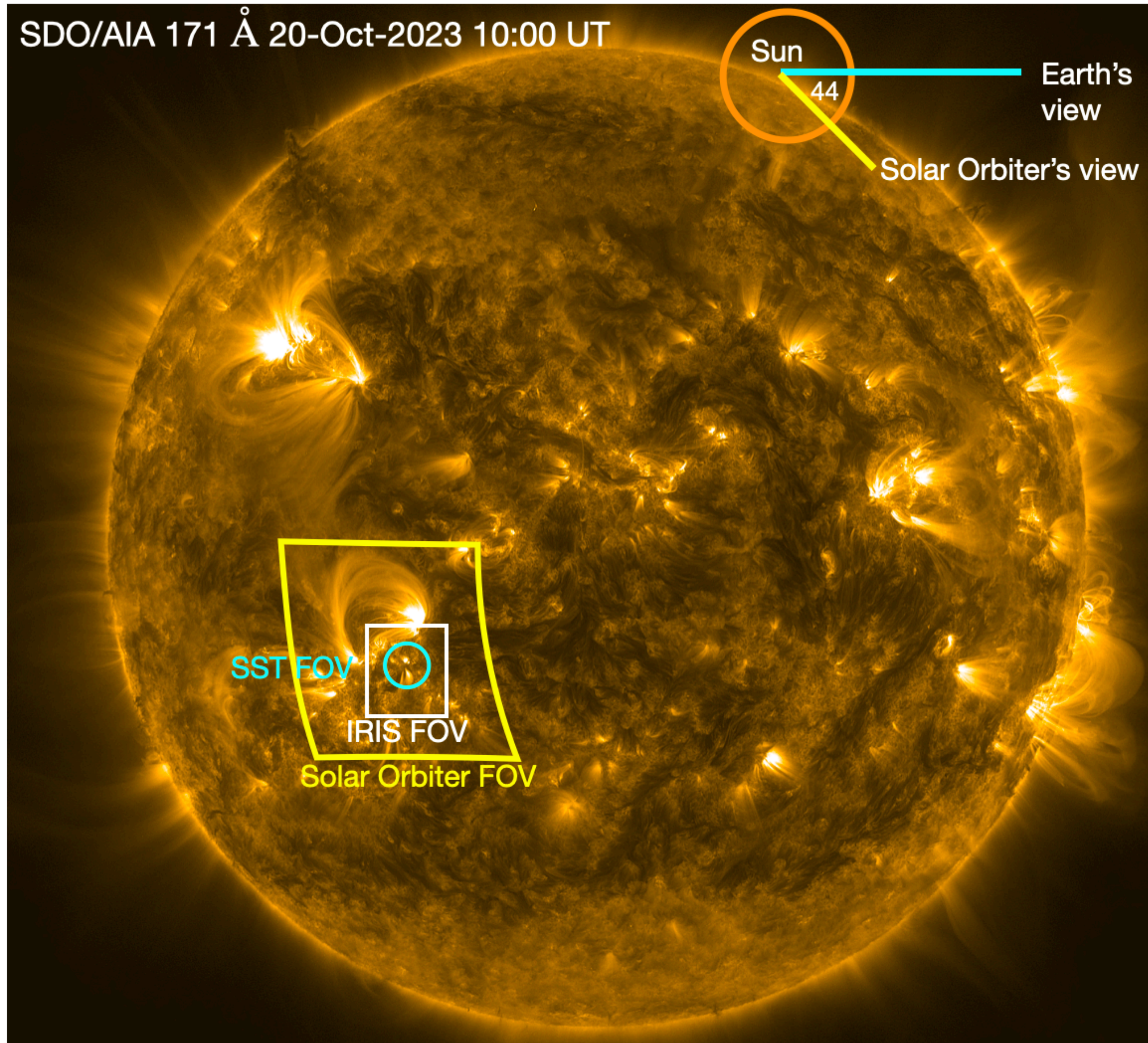
Coordination between Solar Orbiter, SST and IRIS



SST campaigns

- Sep/Oct 2023 : Stockholm (Danilovic et al.)
- Oct 2024 : Stockholm & Oslo
SOOP Long-term AR PI's Froment, Eklund, Li
- Oct 2025 : Oslo
SOOP Nano-flares PI Narang
SOOP Filament PI Parenti
SOOP Sunspot oscillations PI Fludra
SOOP Supergranulation tracking PI Chitta

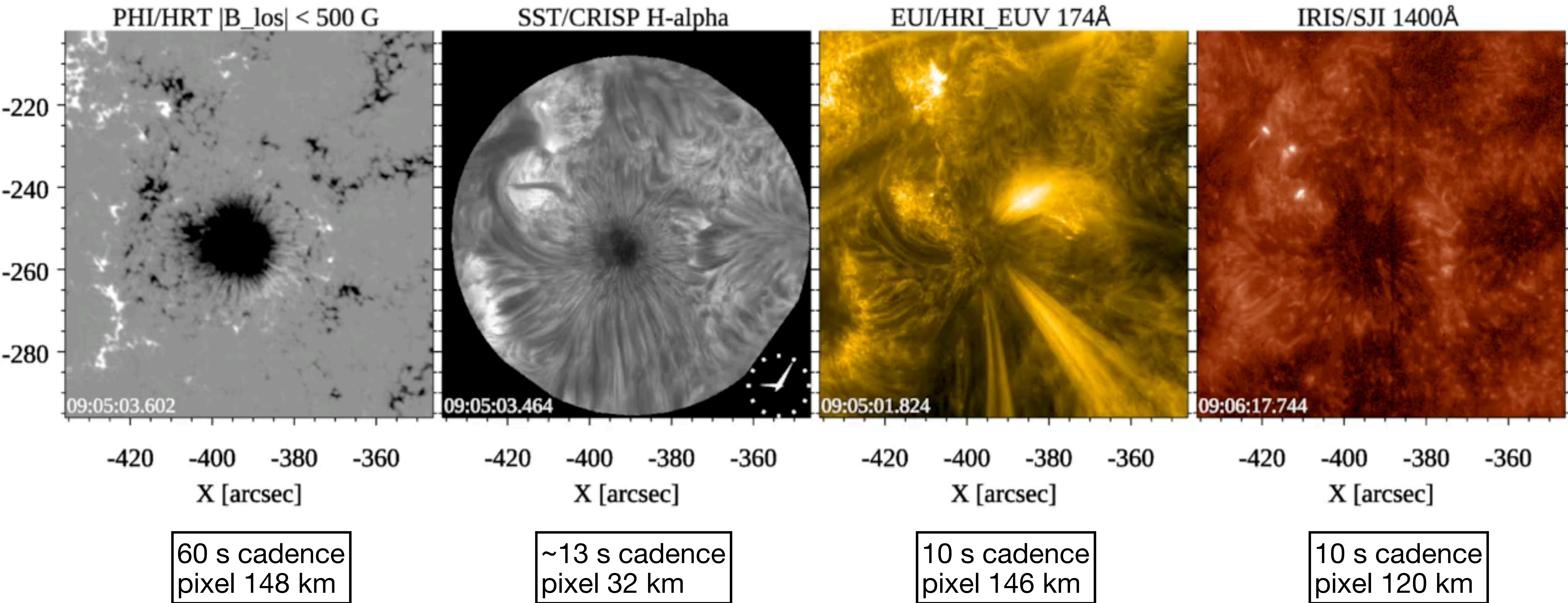
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SOOP Supergranulation tracking PI Chitta
- Aug 2026 : Stockholm (10 - 27 Aug)
RSW28 and RSW29
- Sep 2026 : Oslo (10 - 18 Sep)
RSW30

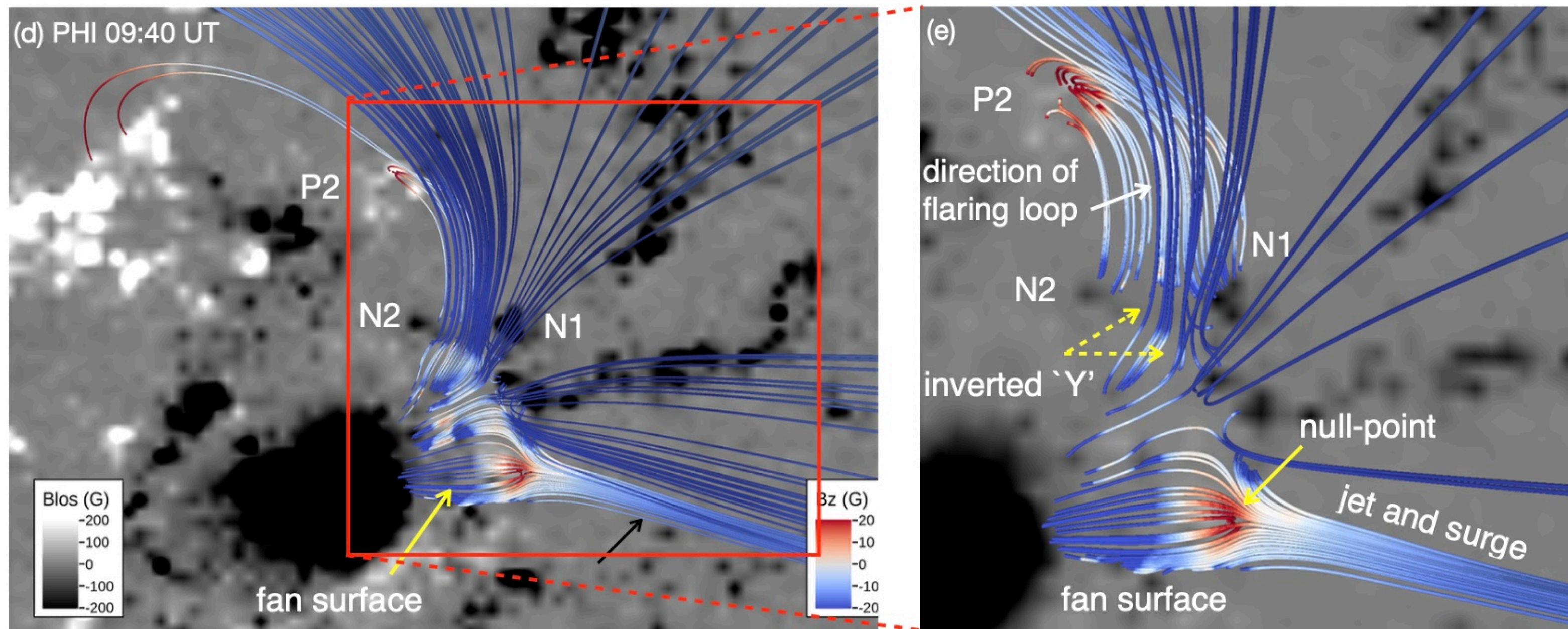
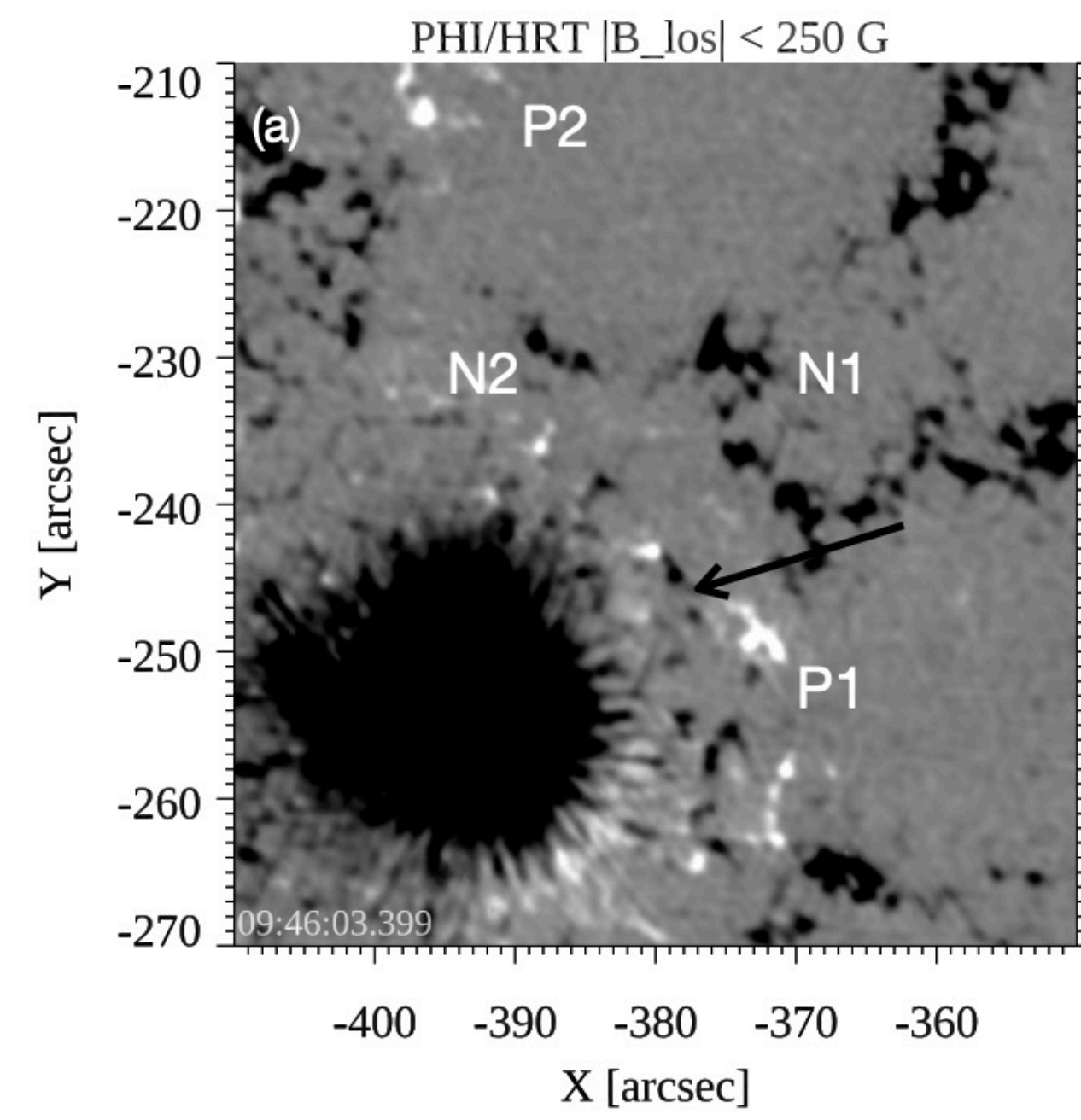
20 Oct 2023: Coordination with Solar Orbiter, IRIS and SST

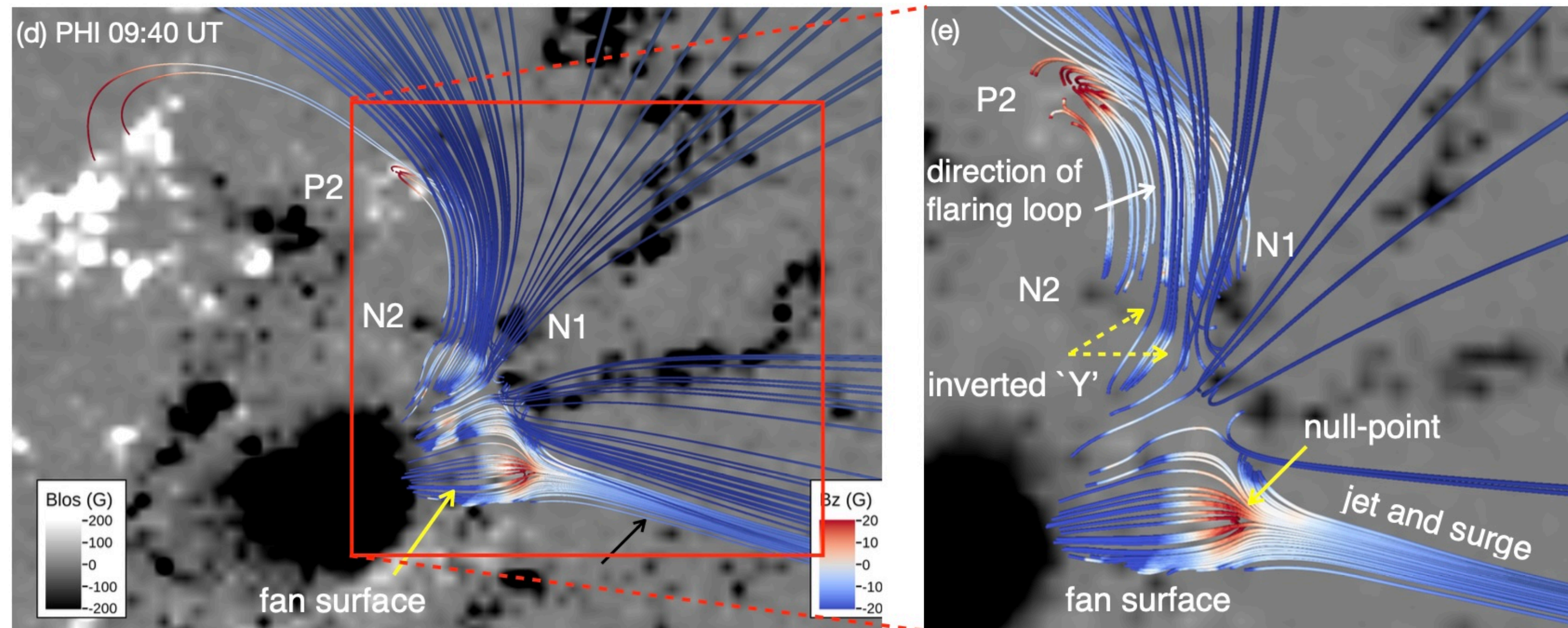
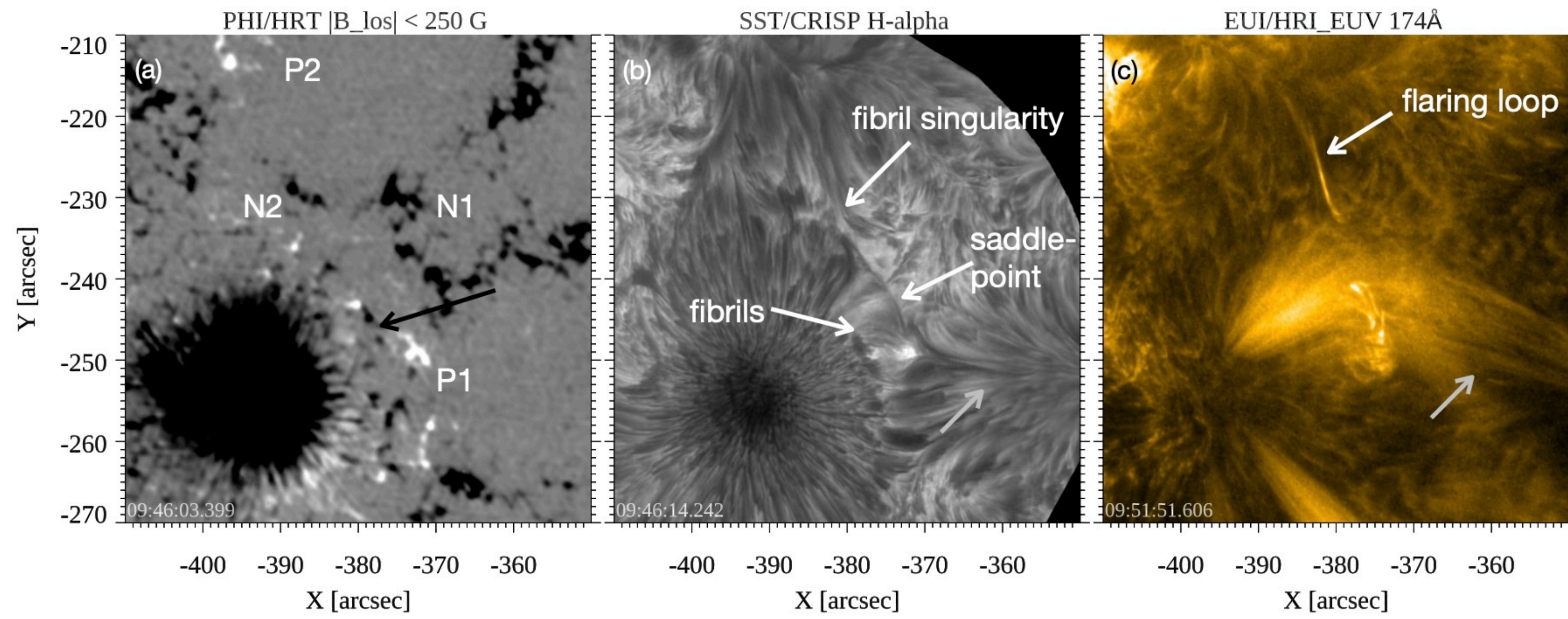


http://tsih3.uio.no/lapalma/subl/26_solo/PHI+SST+EUI+IRIS_2023-10-20_fullfov.mp4

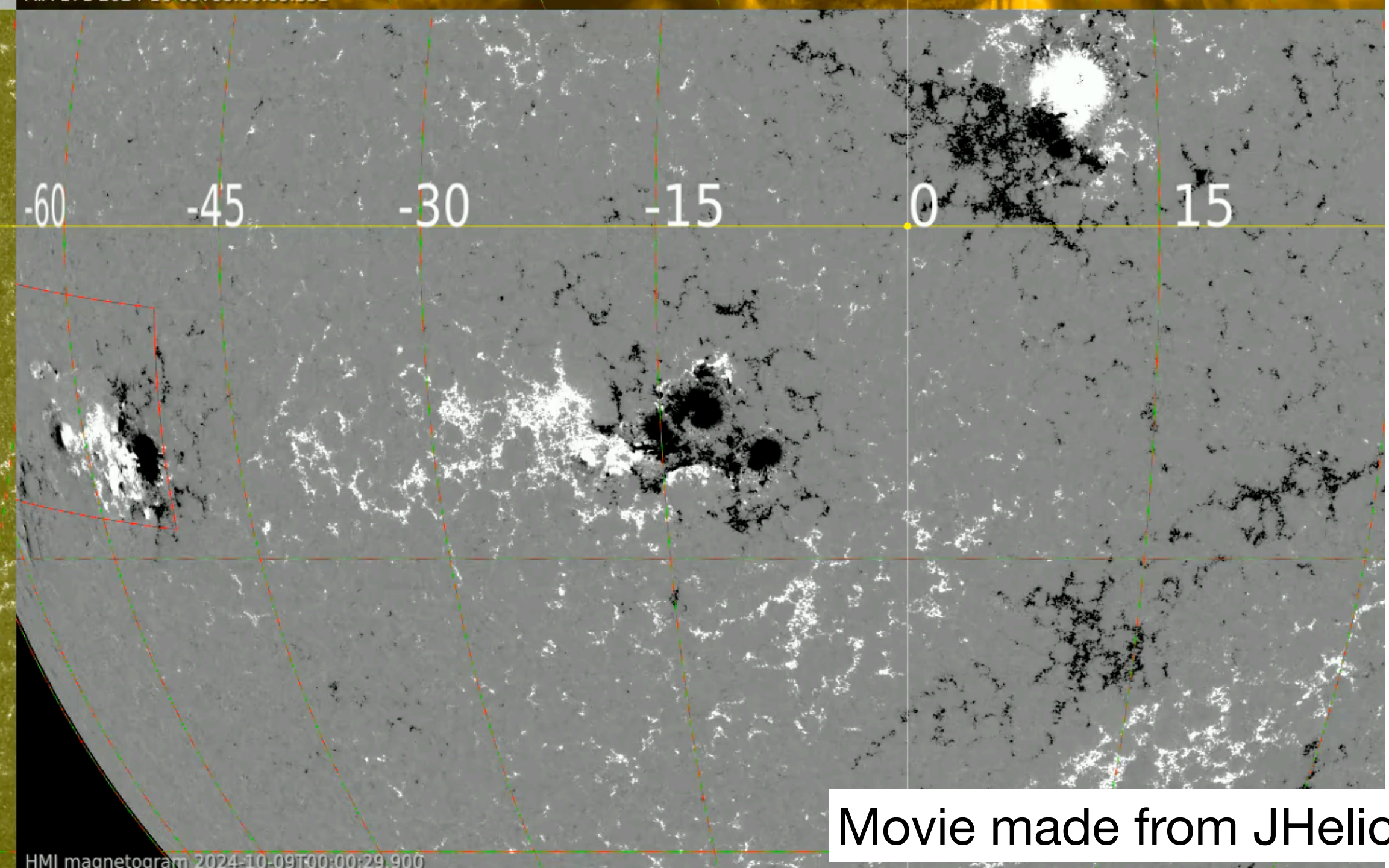
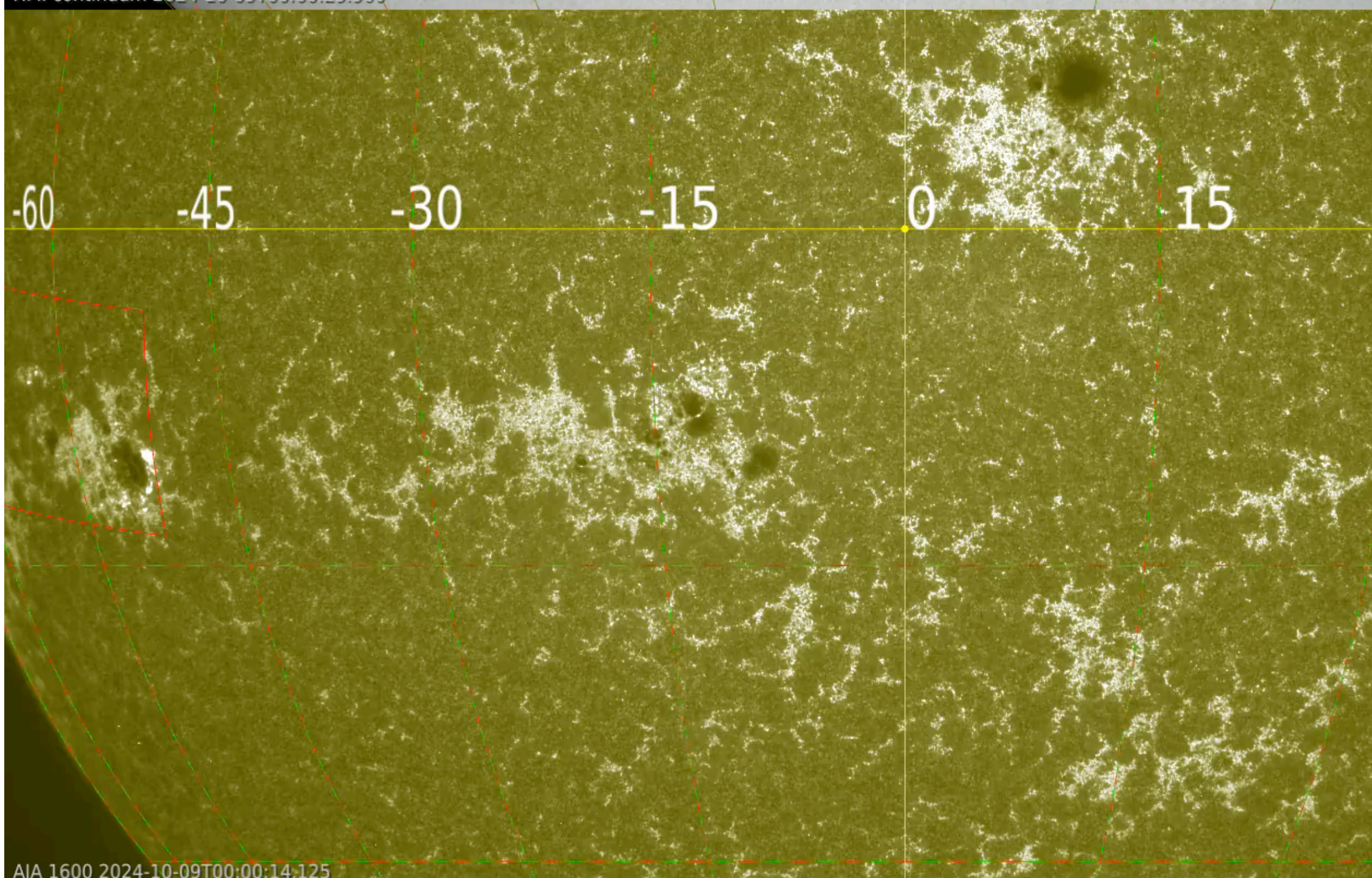
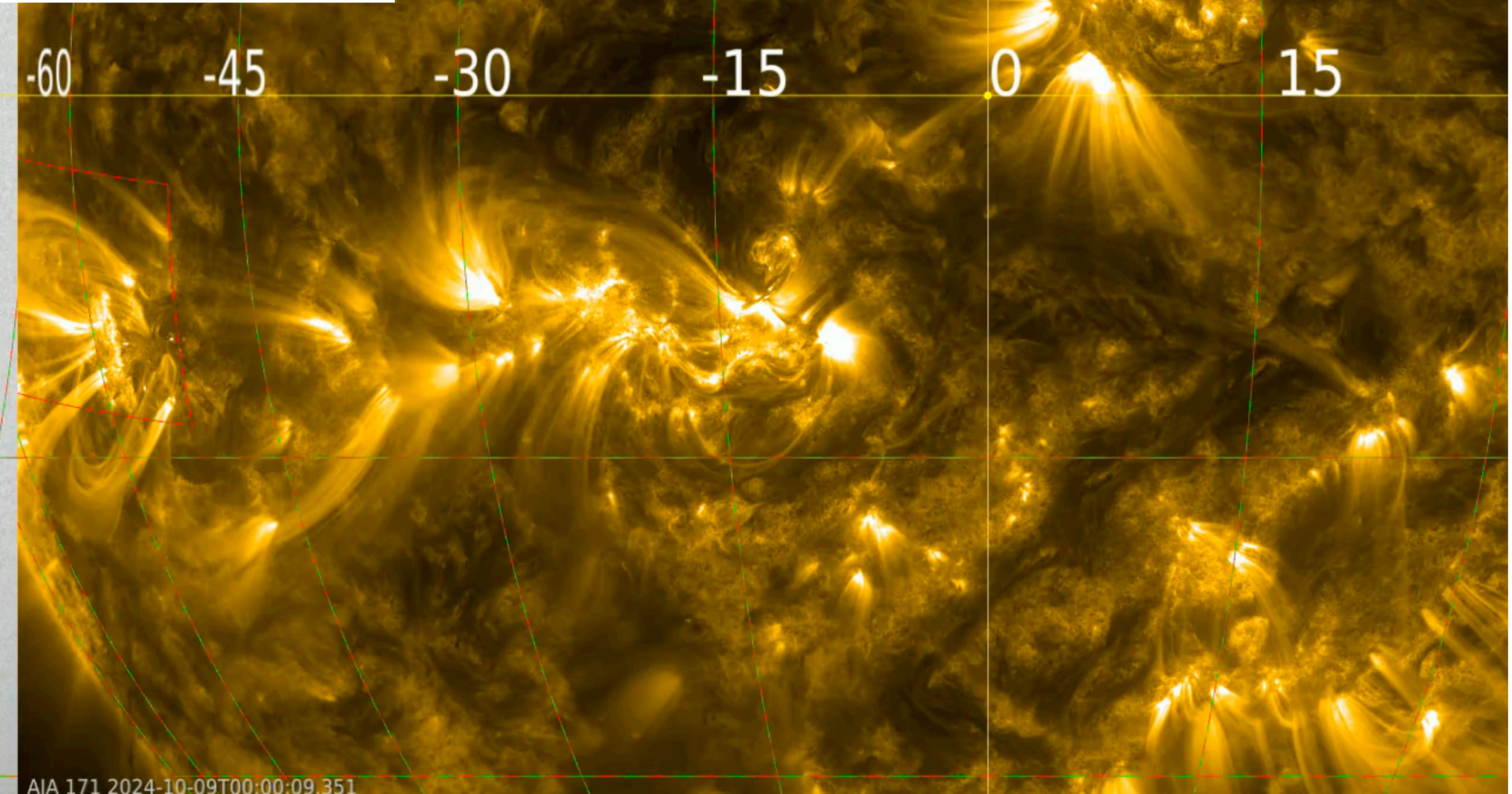
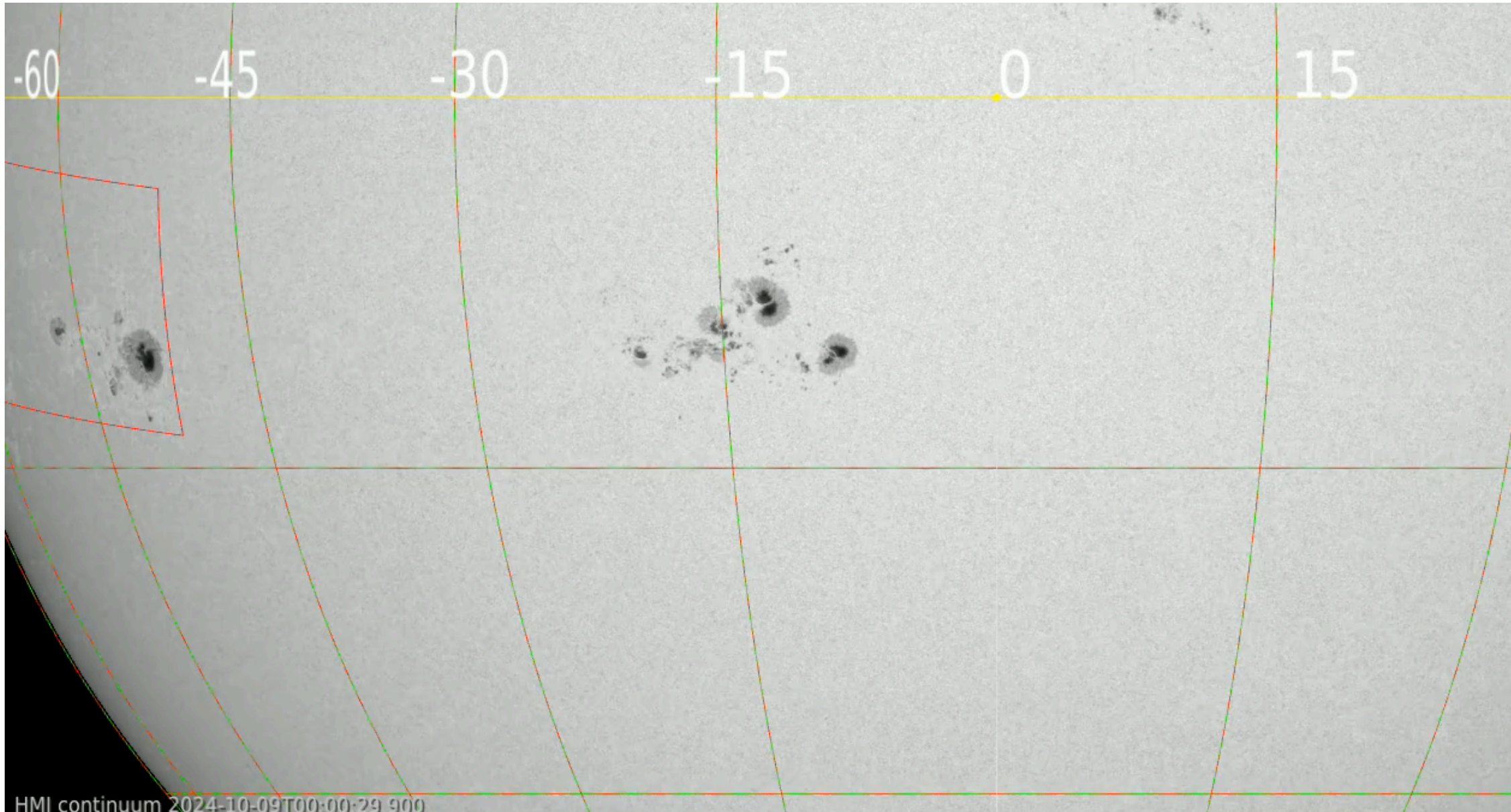
SST observations courtesy of S. Danilovic.

Reetika Joshi et al. 2026 A&A, arXiv:2512.01886



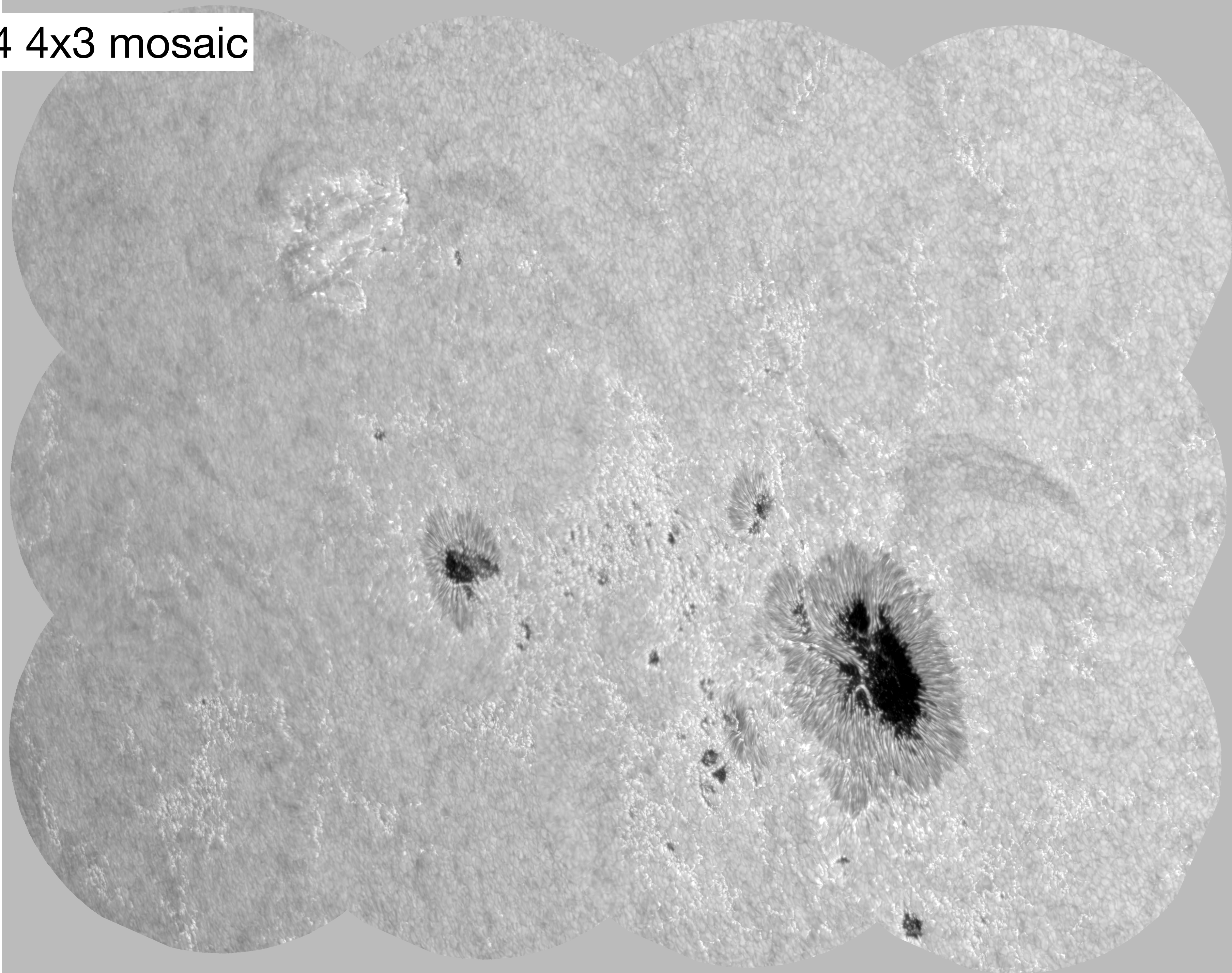


9-15 Oct 2024 SOOP Long-term AR PI's Froment, Eklund, Li

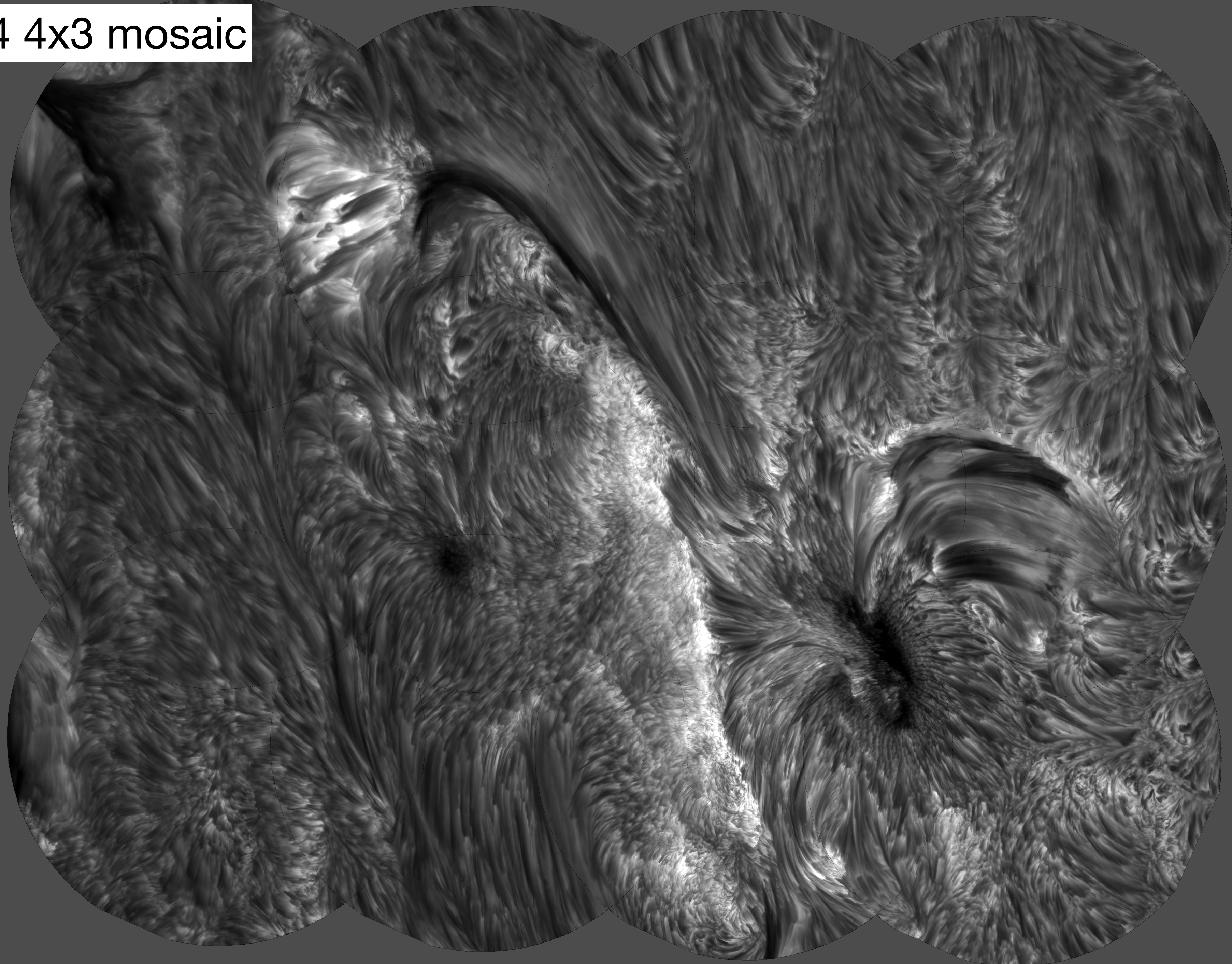


Movie made from JHelioviewer

09-Oct-2024 4x3 mosaic



09-Oct-2024 4x3 mosaic



09-Oct-2024 4x3 mosaic

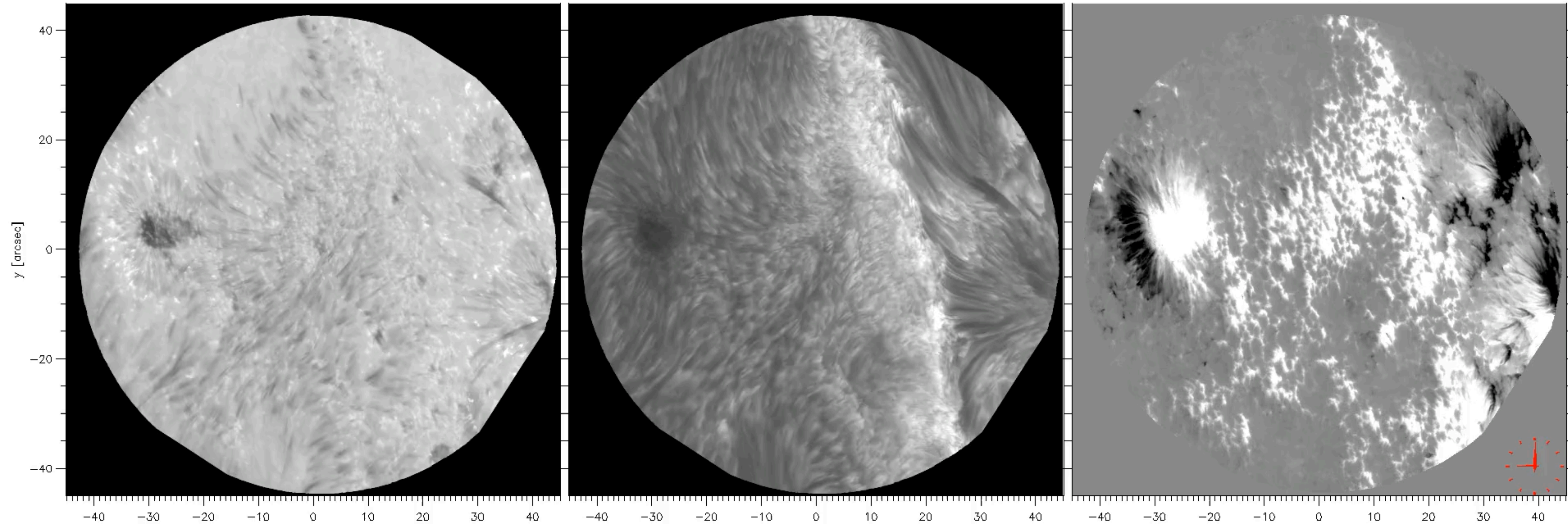


09-Oct-2024 : EUI/HRI coordination window (30 min)

H-alpha -800 mÅ

H-alpha line core

Fe I 6173 $B_{los} < \pm 500$ G

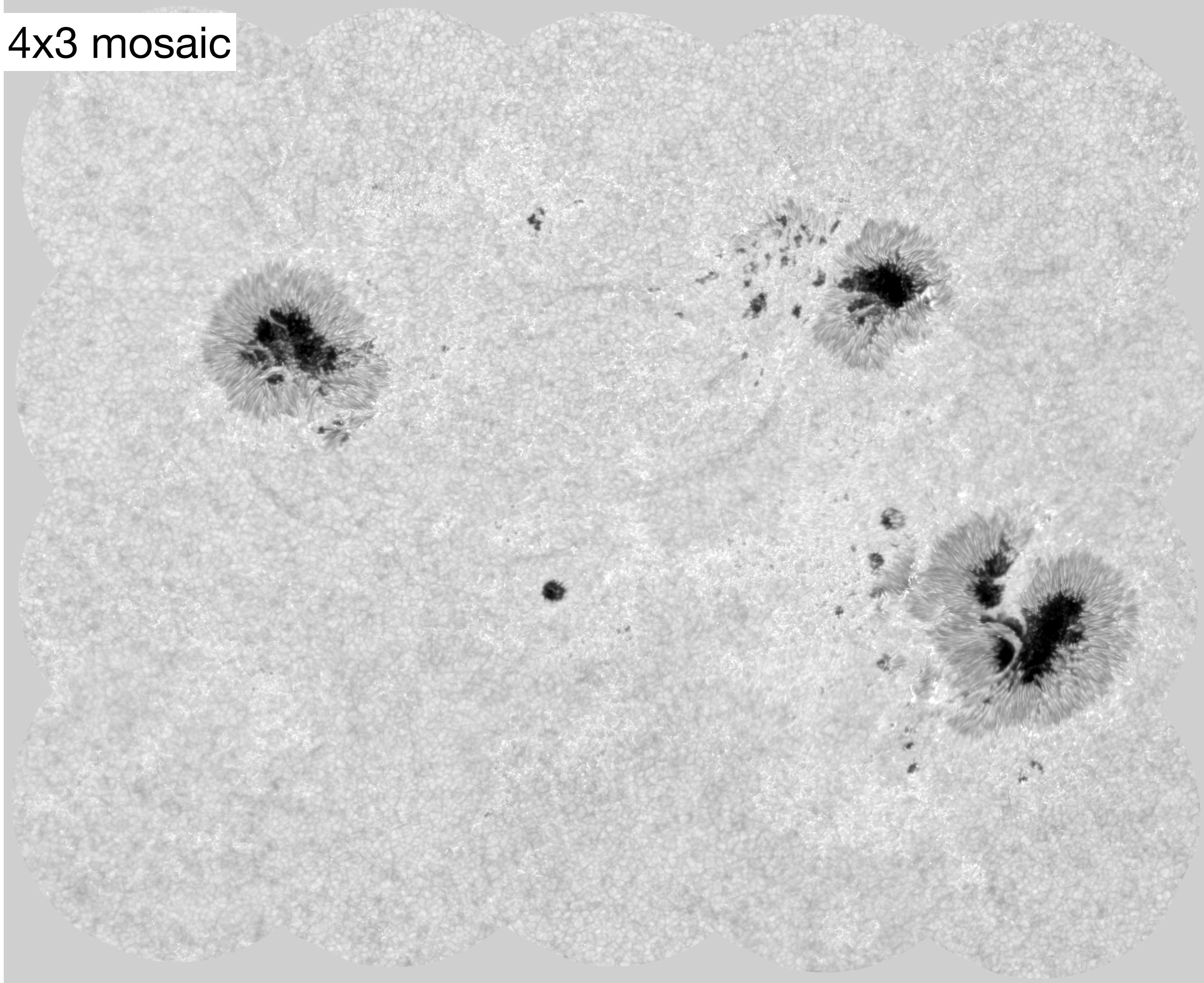


Full AR program: Fe I 6173Å spectropol + Ca II 8542Å spectropol + H-alpha (30.4 s)

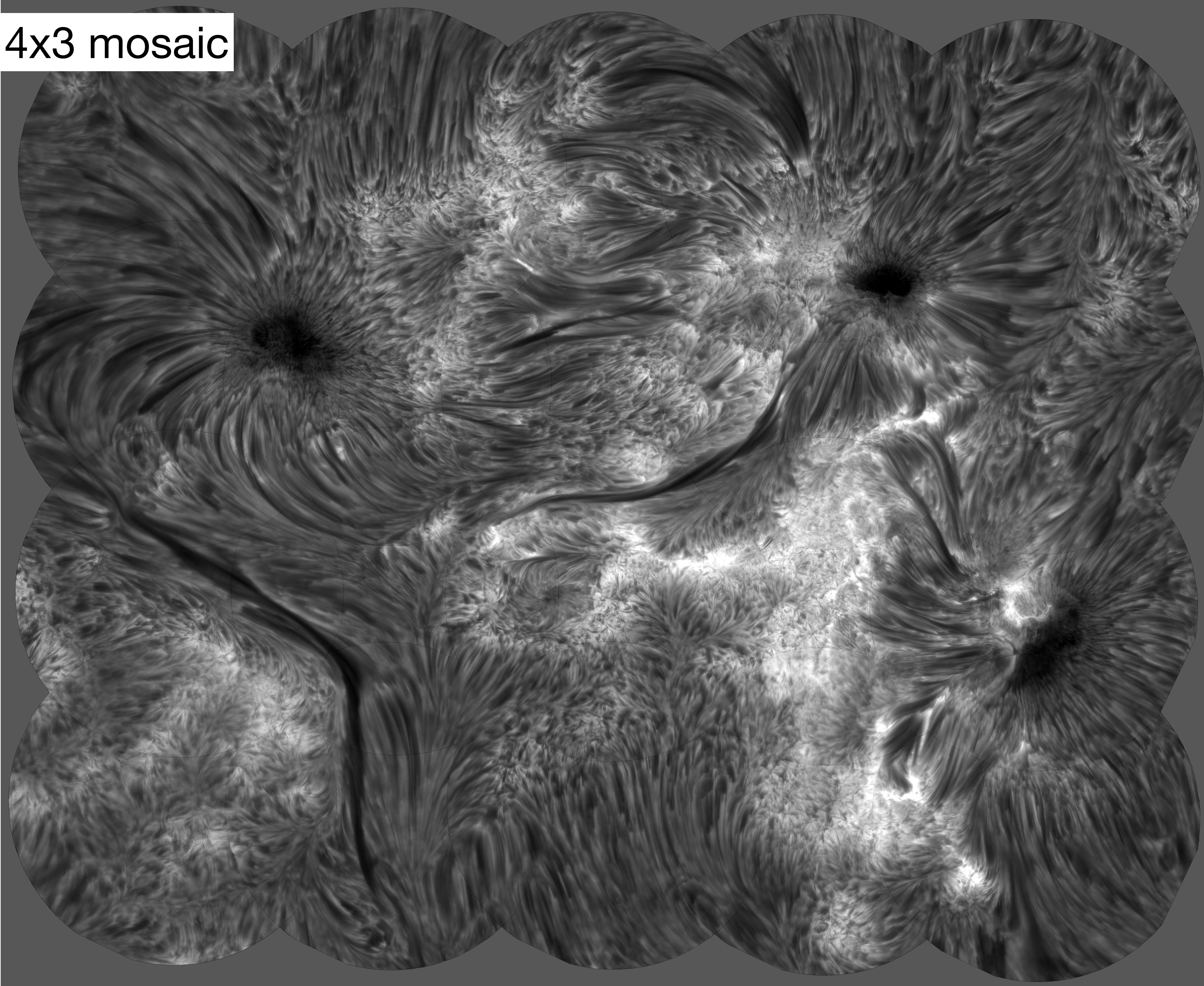
http://tsih3.uio.no/lapalma/subl/26_solo/halpha+blos_3pan_2024-10-09_090001.mp4

Oct 2024: Long-term AR SOOP PI's Froment, Eklund, Li

14-Oct-2024 4x3 mosaic



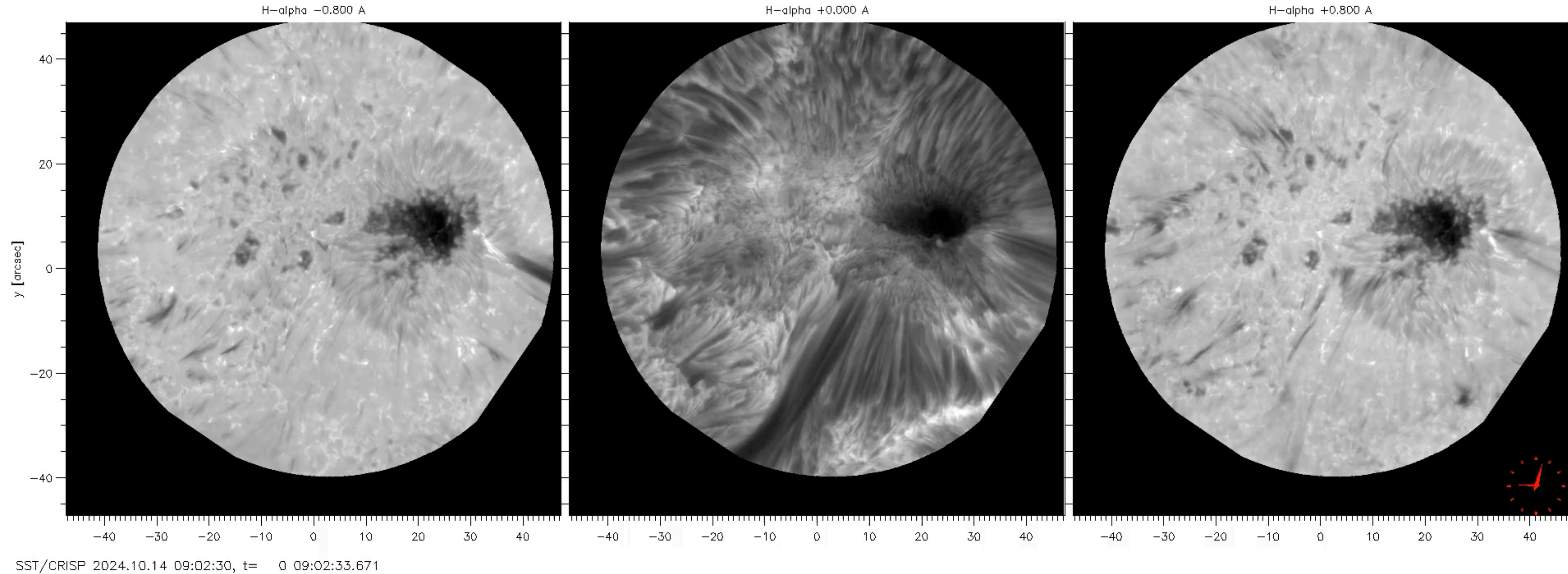
14-Oct-2024 4x3 mosaic



14-Oct-2024 4x3 mosaic

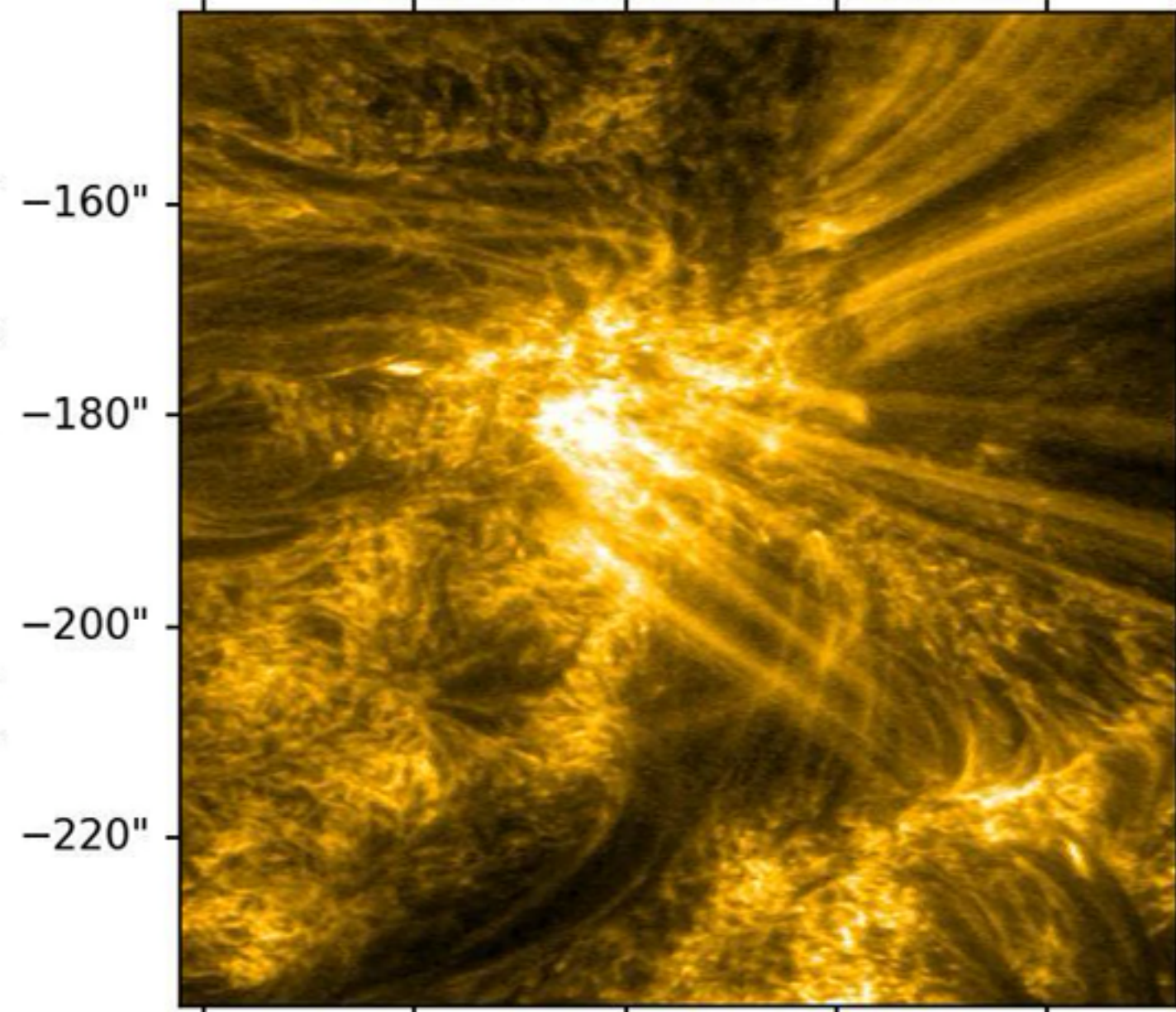


14-Oct-2024 : EUI/HRT coordination window (60 min)

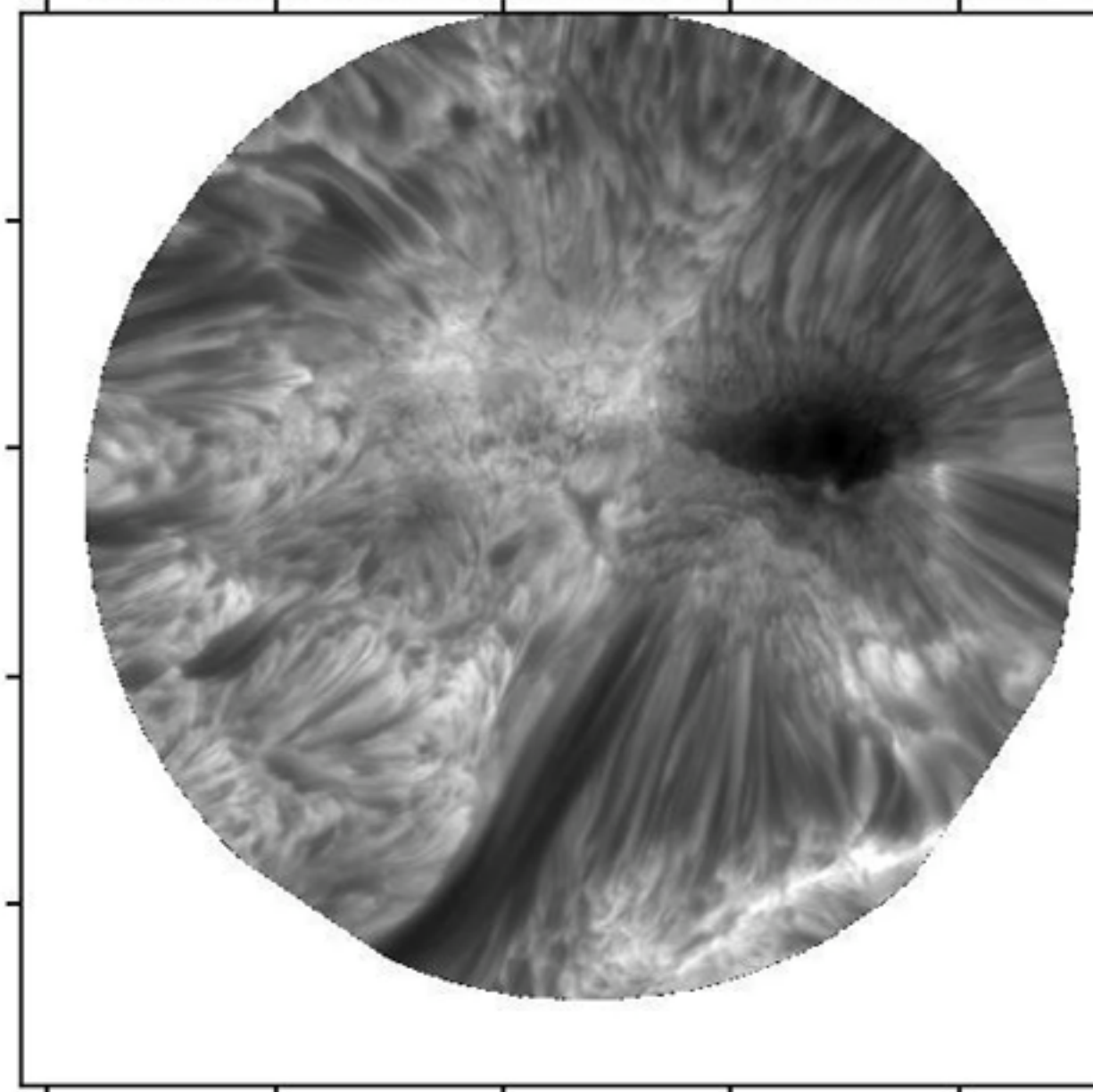


H-alpha only program: (5.9 s)

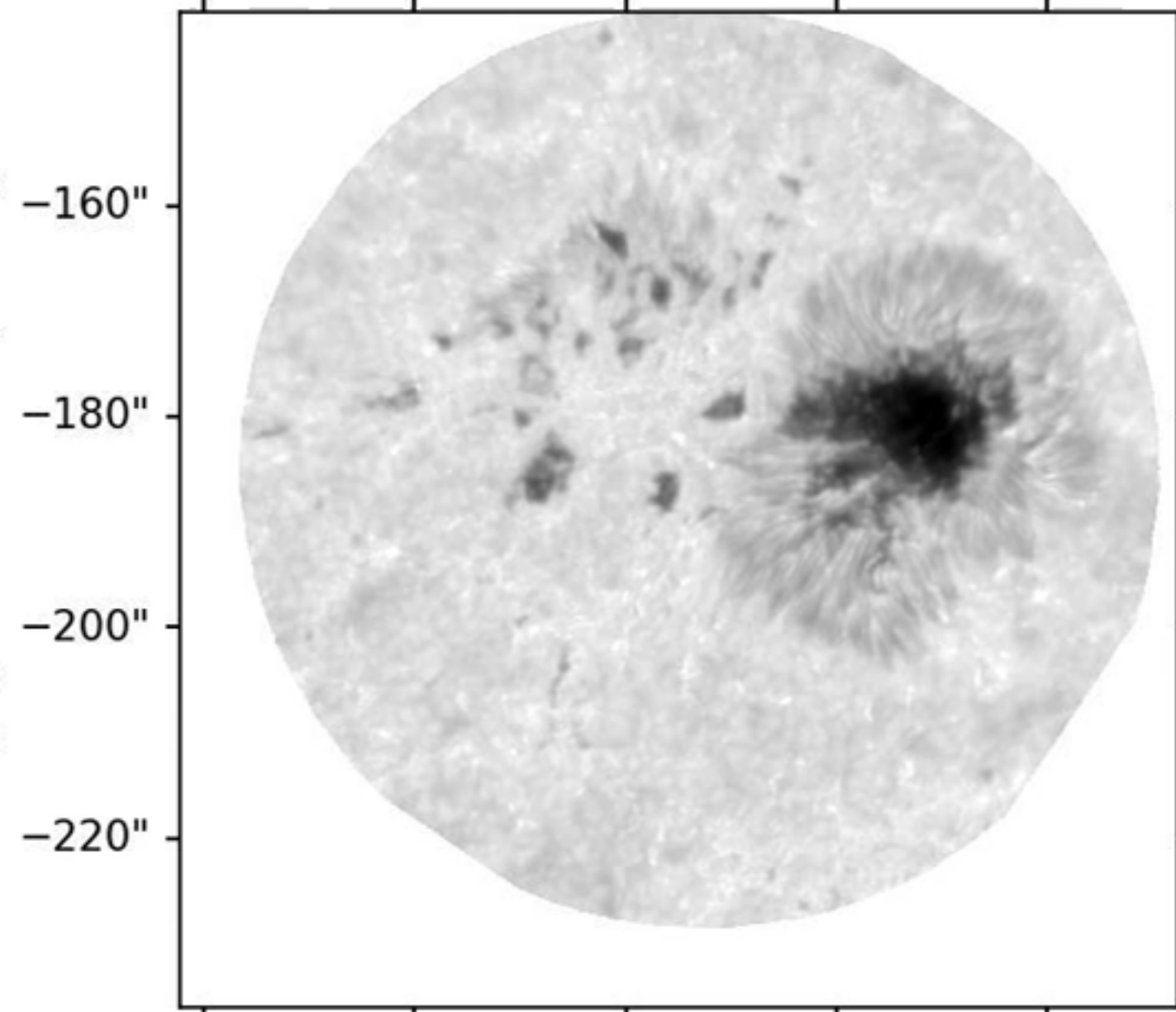
EUI/HRI-174: 2024-10-14T09:05:00



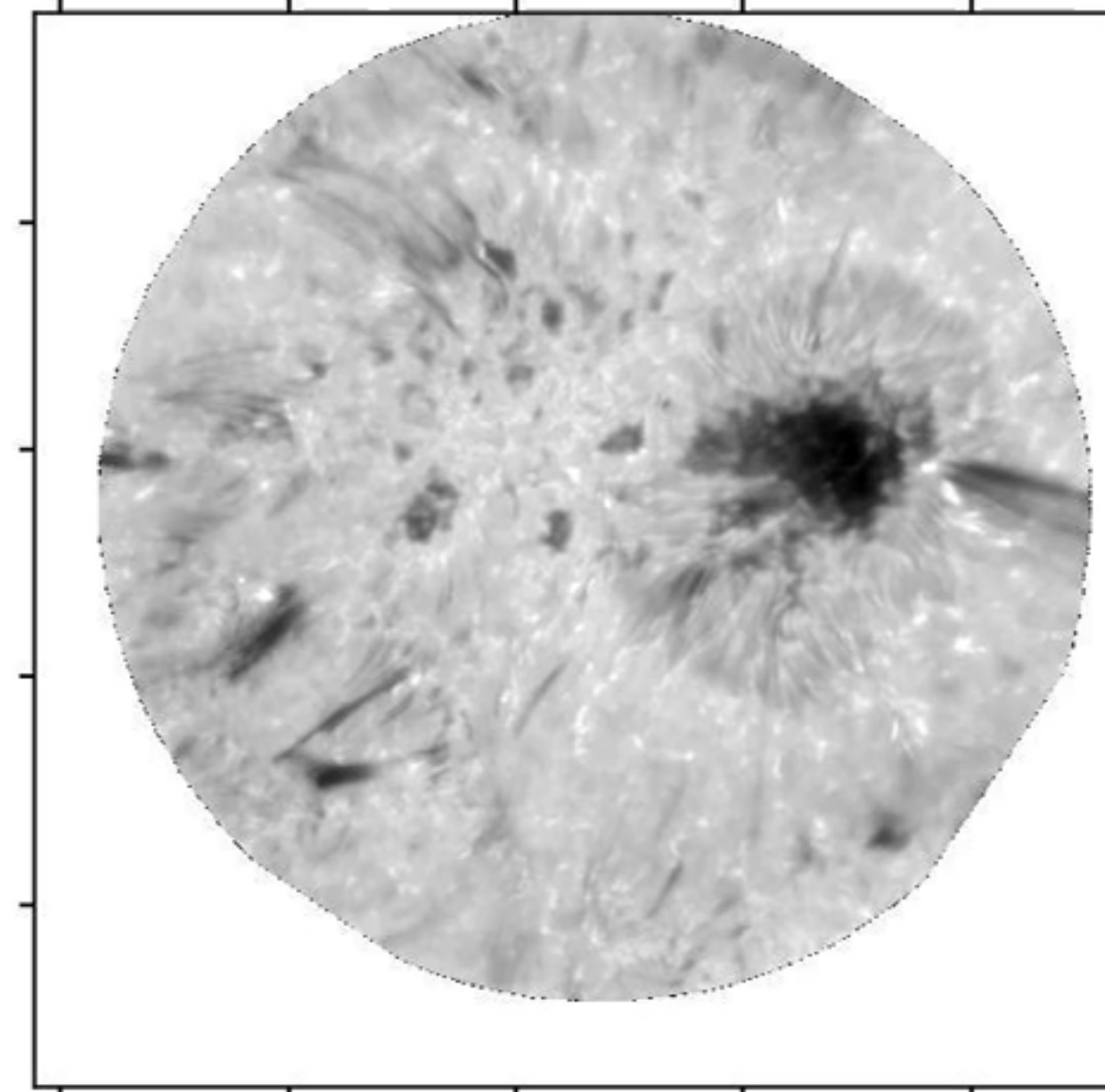
SST/CRISP H α (core): 2024-10-14T09:05:02



SST/CRISP H α (wb): 2024-10-14T09:05:02



SST/CRISP H α (+0.8A): 2024-10-14T09:05:02



180" 200" 220" 240" 260"

Helioprojective Longitude (Solar-X)

180" 200" 220" 240" 260"

Helioprojective Longitude (Solar-X)

14-Oct-2024 SOOP long-term AR

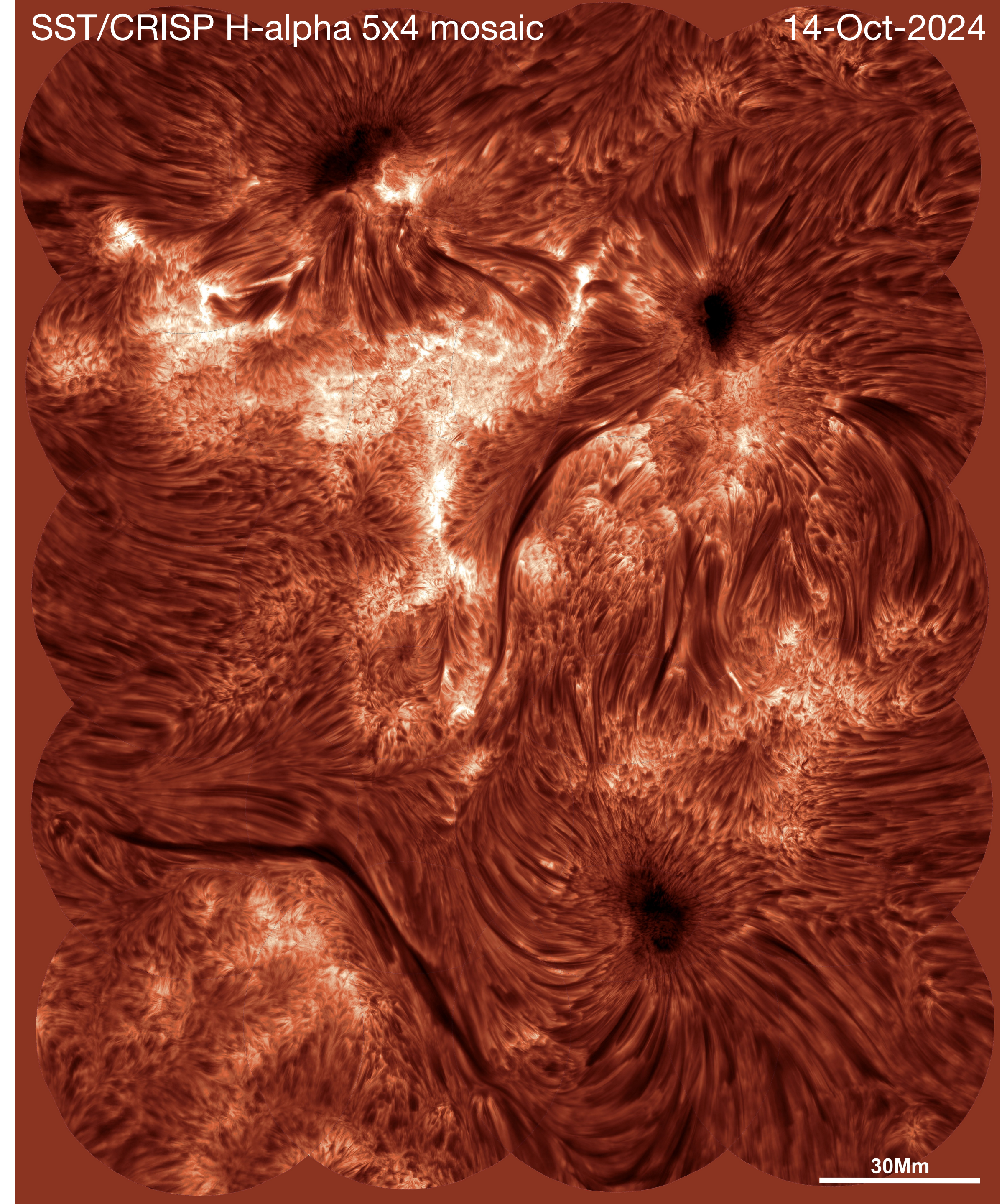
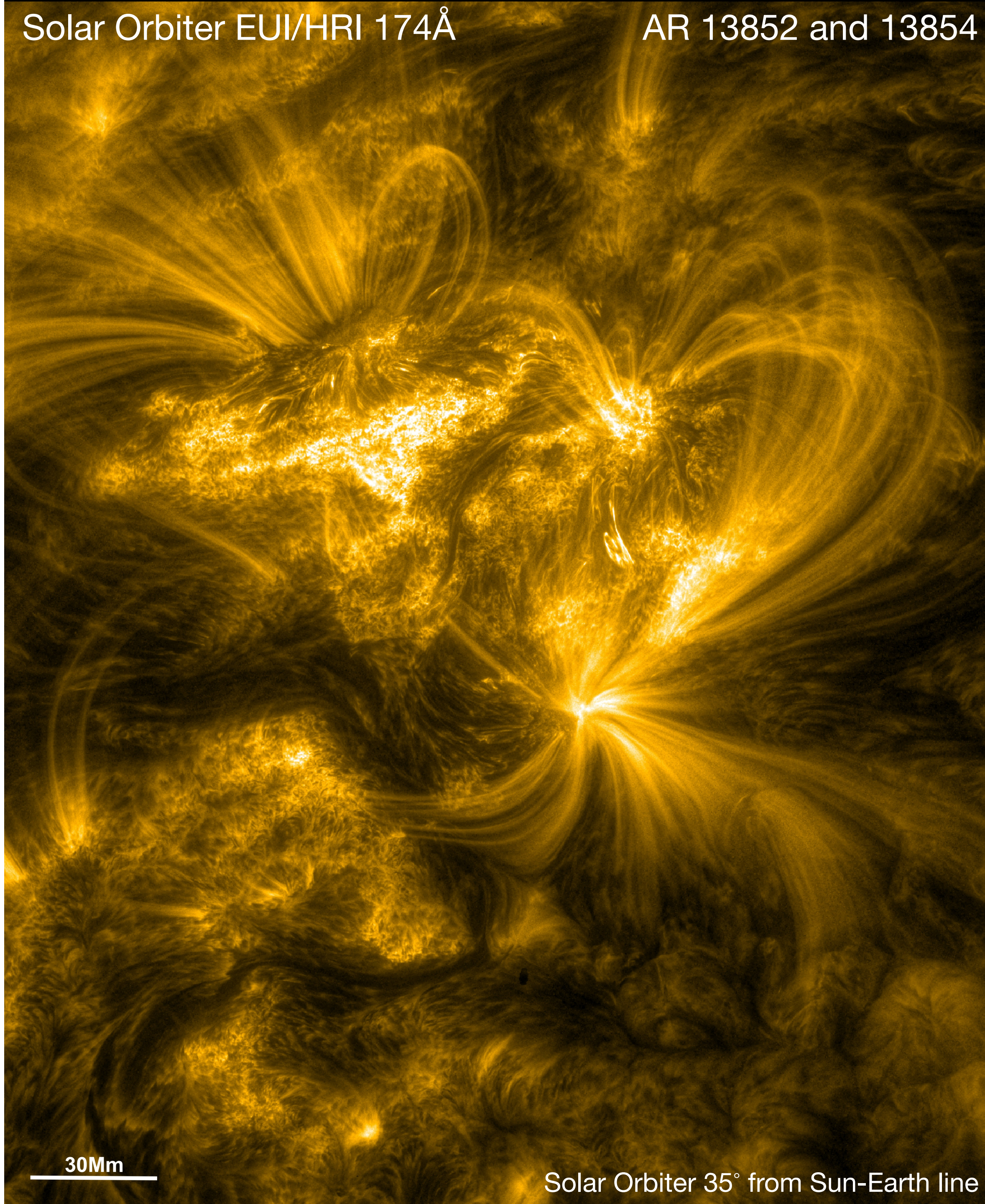
Alignment by eye by Nicolas Poirier

Solar Orbiter EUI/HRI 174Å

AR 13852 and 13854

SST/CRISP H-alpha 5x4 mosaic

14-Oct-2024



30Mm

Solar Orbiter 35° from Sun-Earth line

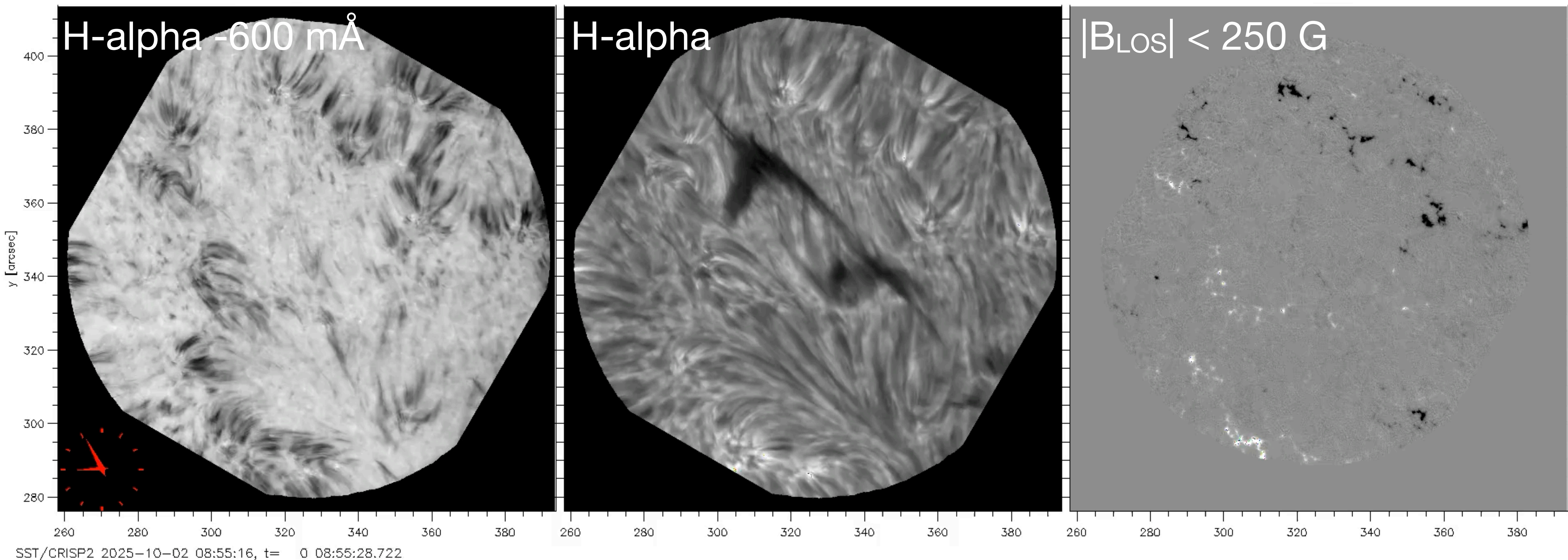
30Mm

02-Oct-2025 SOOP Nanoflares (PI Narang)

CRISP2: H-alpha and Fe I 6173Å (cadence 15 s)

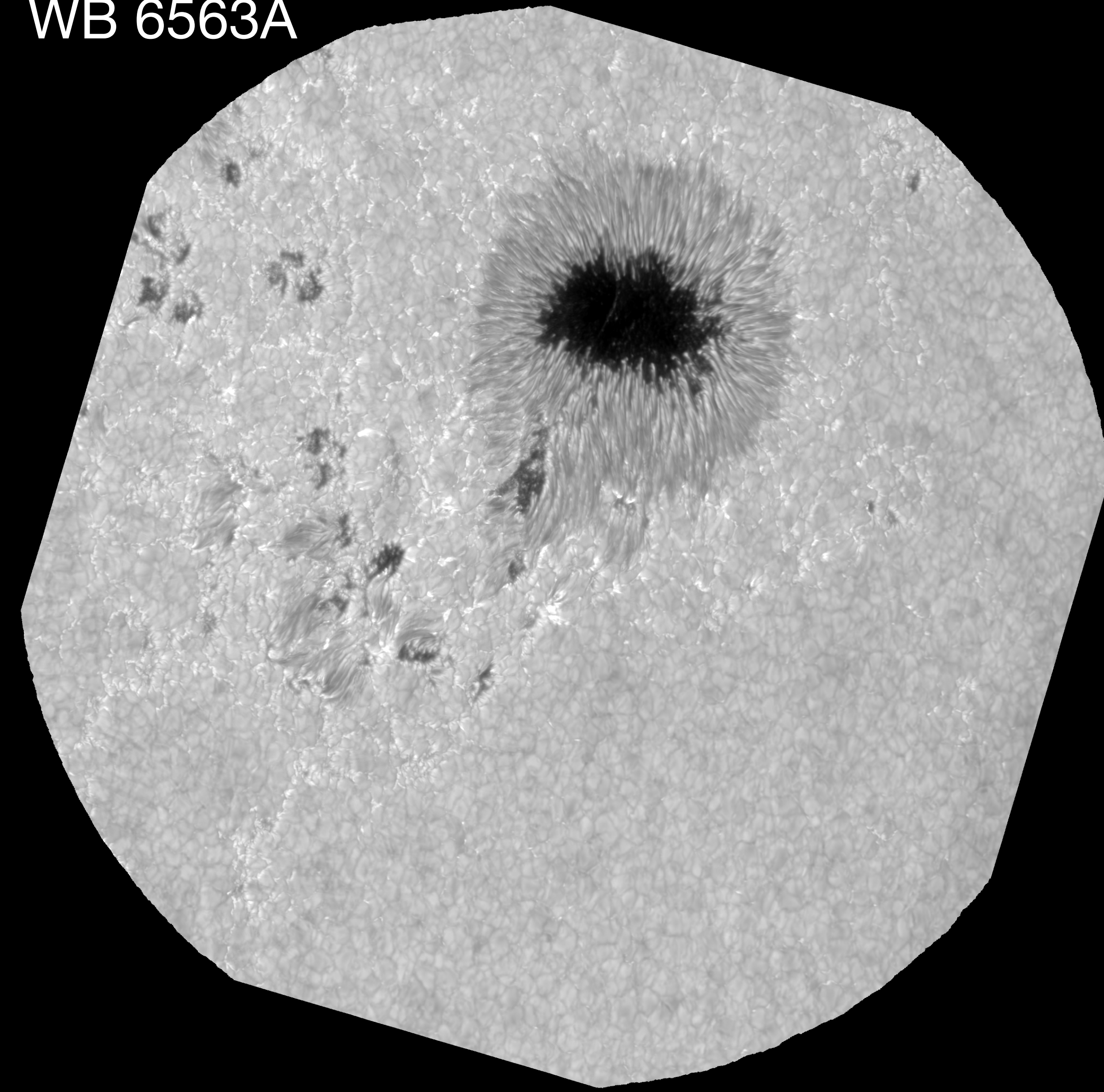
Frame selection (dropping worst seeing) → effective cadence ~19 s

http://tsih3.uio.no/lapalma/subl/26_solo/halpha+blos_3pan_2025-10-02_085516.mp4

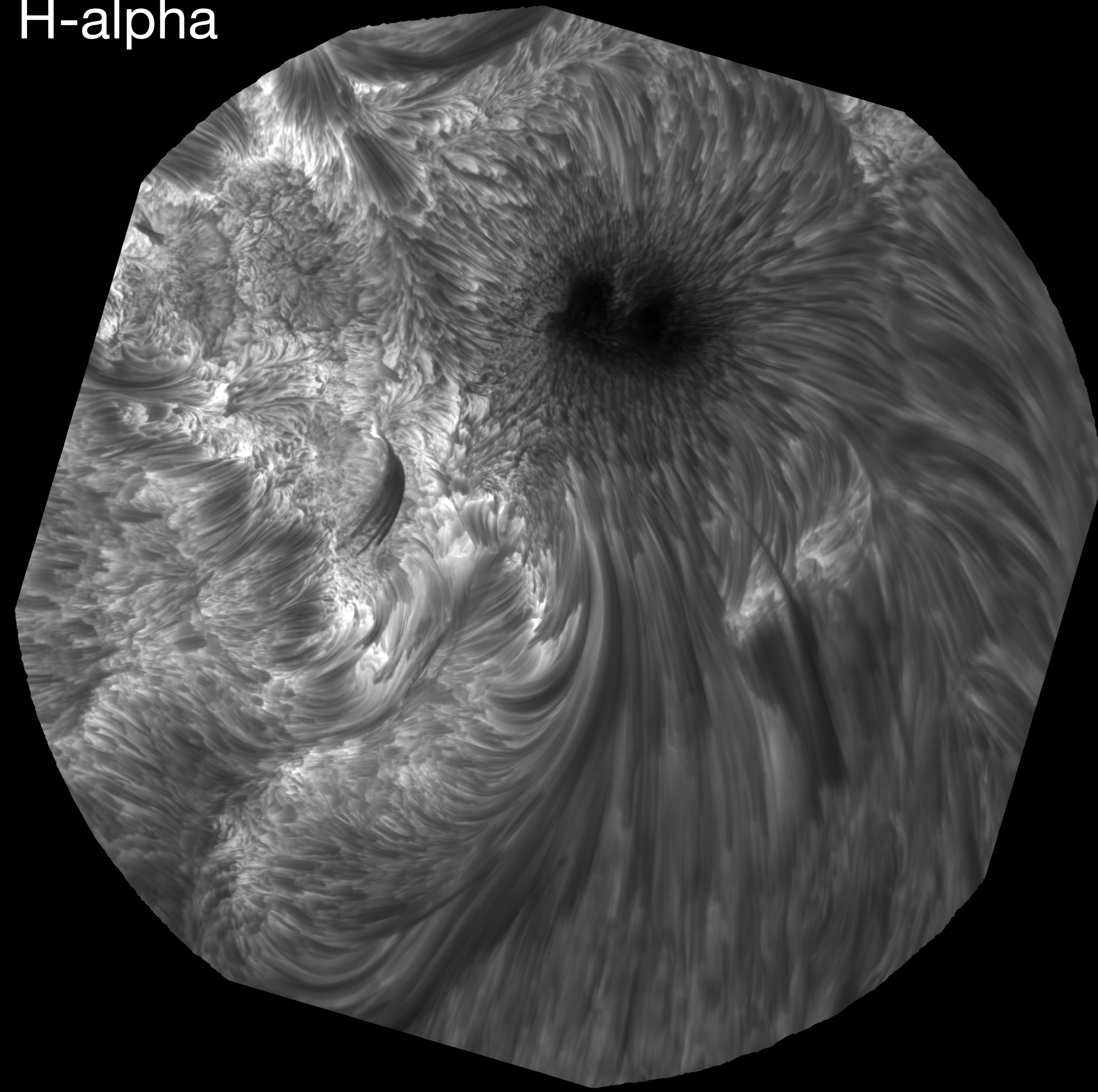


05-Oct-2025 SOOP Sunspot oscillations (PI Fludra)

WB 6563Å



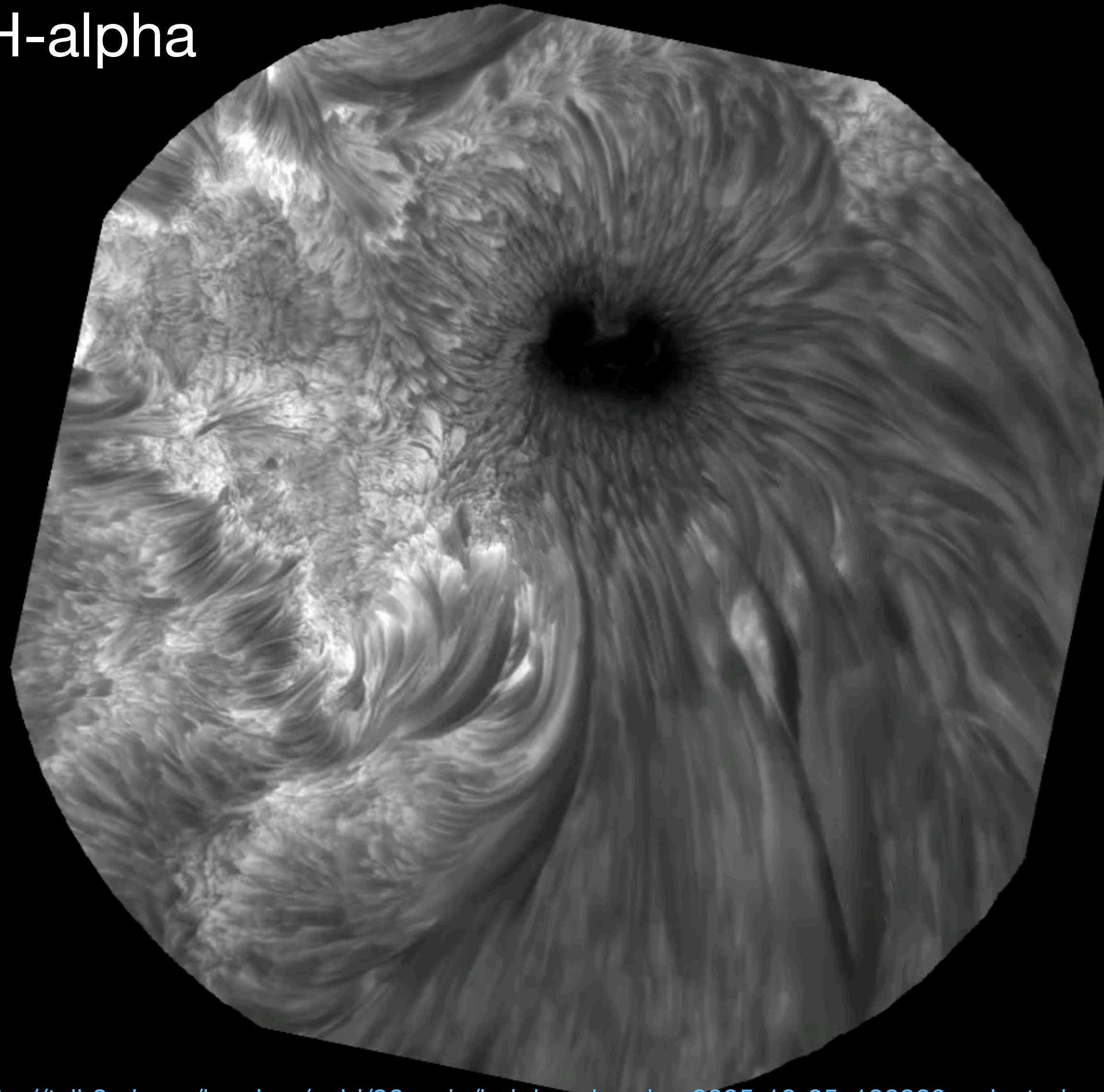
H-alpha



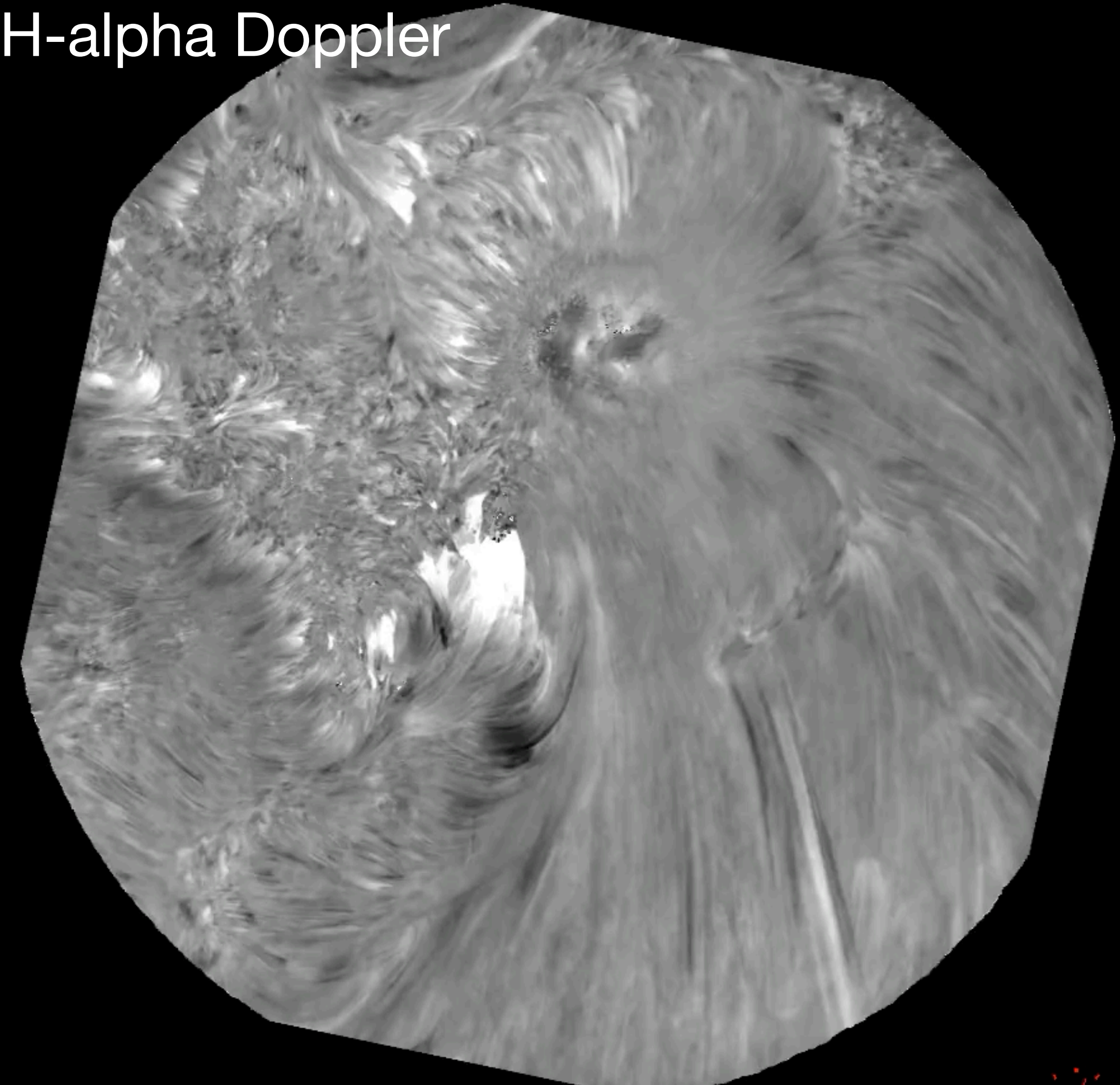
05-Oct-2025 SOOP Sunspot oscillations (PI Fludra)

H-alpha only (6 s) - frame selection ~22 s - 1 h observation

H-alpha

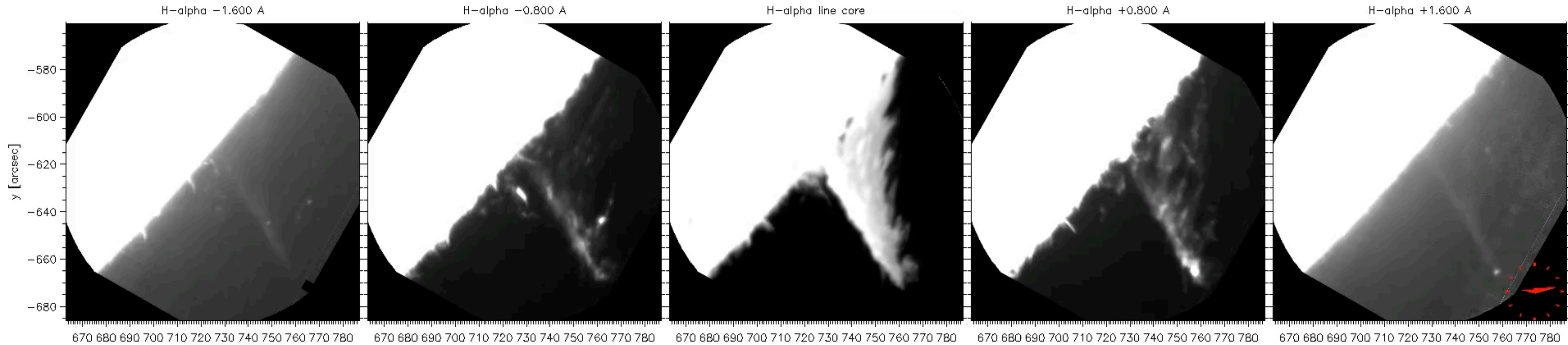


H-alpha Doppler



06-Oct-2025 SOOP Filament (PI Parenti)

H-alpha only (21 positions, 5.5 s)
2 times 1 h observation



SST/CRISP2 2025.10.06 09:13:11, t= 0 09:13:15.282

Observation without adaptive optics, no MOMFBD image restoration

Coordination with SST:

- Large field of view
- Photospheric and chromospheric magnetic field ~30 s
- Chromospheric dynamics <10 s

CRISP2 120"

CHROMIS 77"

Coordination with SST:

- Large field of view
- Photospheric and chromospheric magnetic field ~30 s
- Chromospheric dynamics <10 s

Coordination in 2026

Preferred coordination time:
~08:30 - 10:00 UT

Aug 2026 : contact Stockholm
Sep 2026 : contact Oslo (me)

CRISP2 120''

CHROMIS 77''