Peacock Jets

A dynamics description
and an attempt to describe the magnetic configuration

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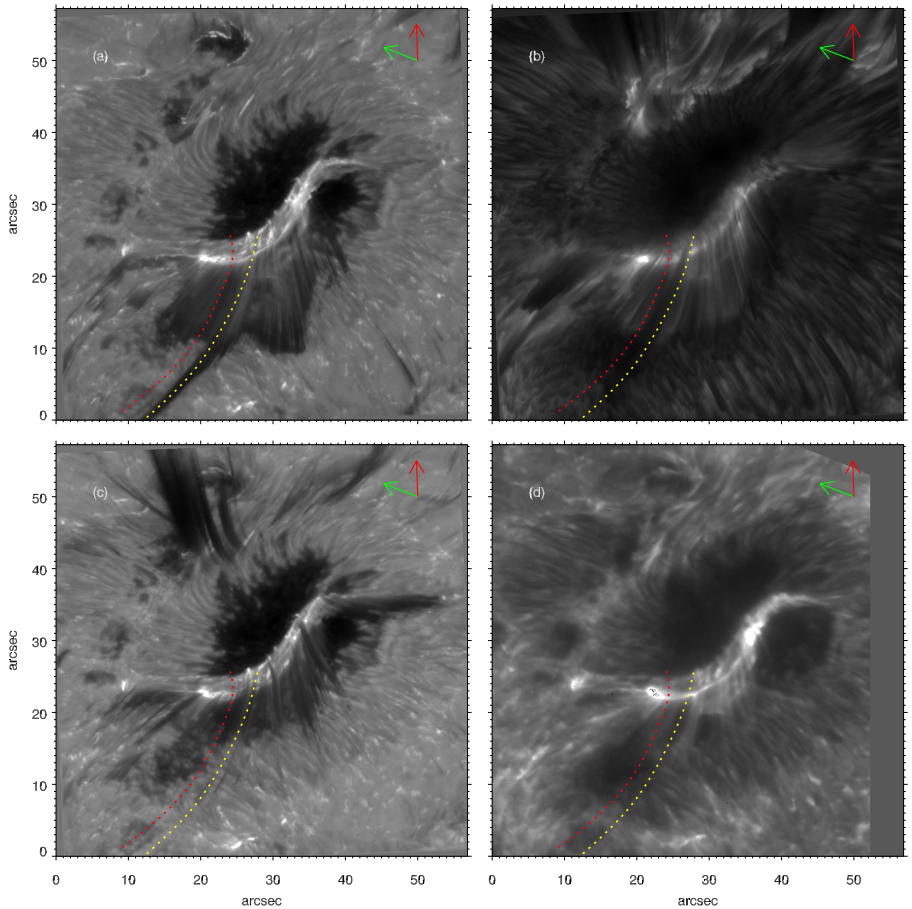


Observational facts

Target: AR11785 (13-07-05)

Instrument: CRisp(SST)

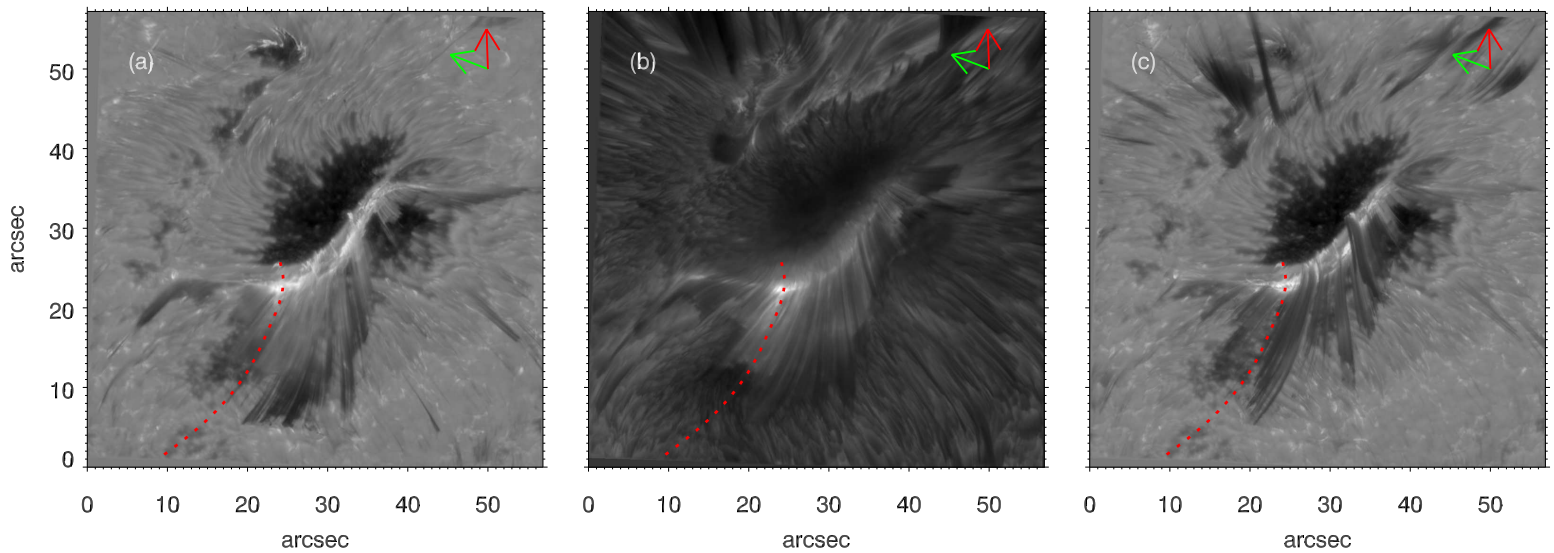
Filter: H-α

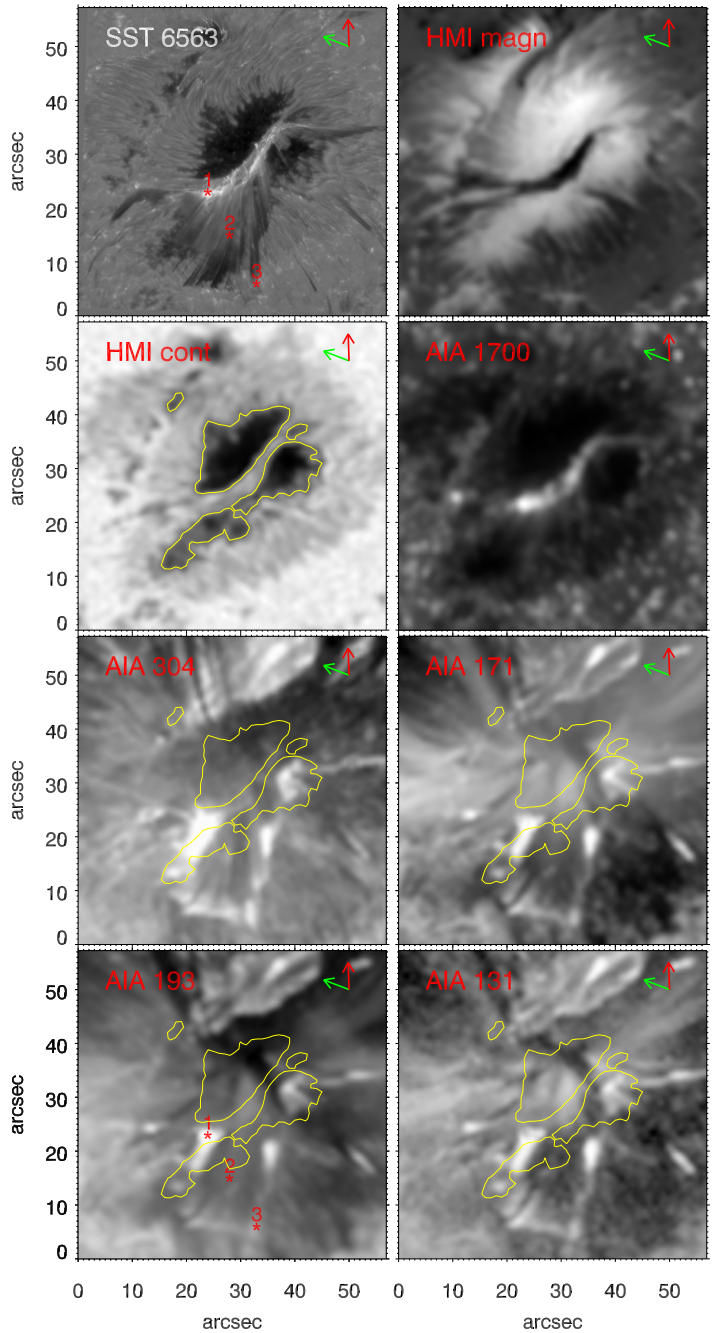
Duration: 8:11 9:38 UT

Cadence: 8.8 s

Observing angle: 32 deg

(a) Blue wing image at $\Delta\lambda$ = -45 km s^{-1};
(b) the line core;
(c) red wing image at $\Delta\lambda$ = 45 km s^{-1};
(d) co-temporal wide-band image in the SOT Ca II H filter.


(a)
(b)
(c)
arcsec
arcsec
0
10
20
30
40
50



Remarkable features

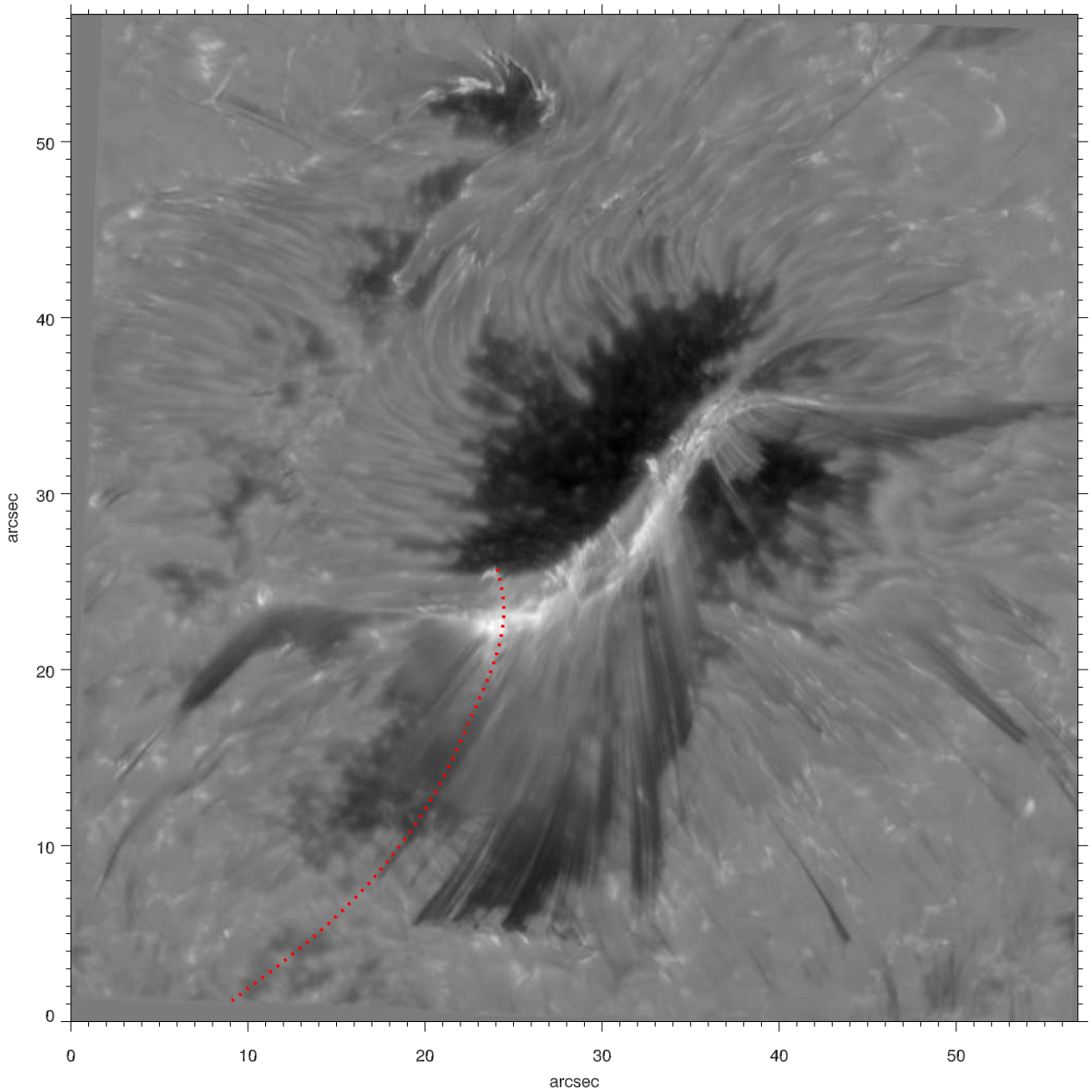
Bright footpoints in 1700 Å(and 1600 Å) channels.

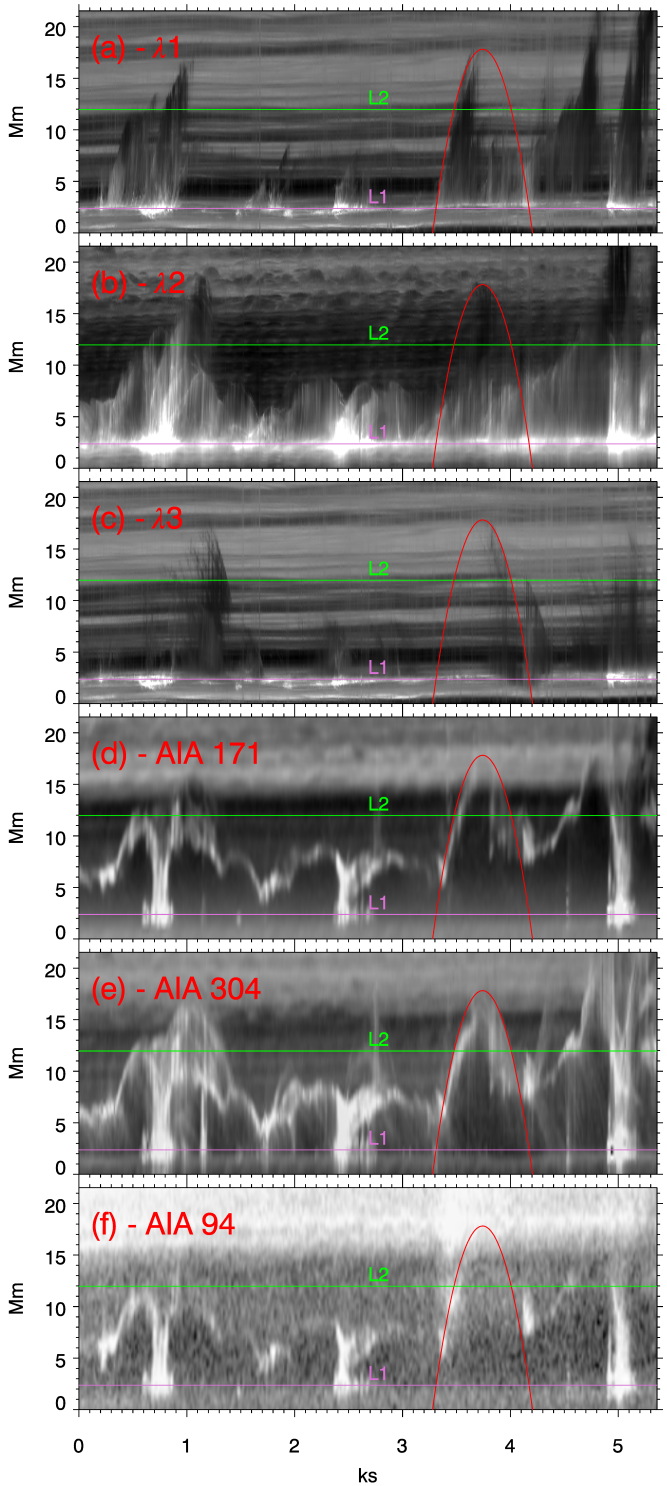
Brightest footpoints appear also in EUV AIA channels.

Bright jets front in EUV AIA channels

Footpoints in a mixed polarity region

Dynamics





Time-space diagram in Hα

Parabolic trajectories

Plane of the sky (POS) motion:

a_{POS}

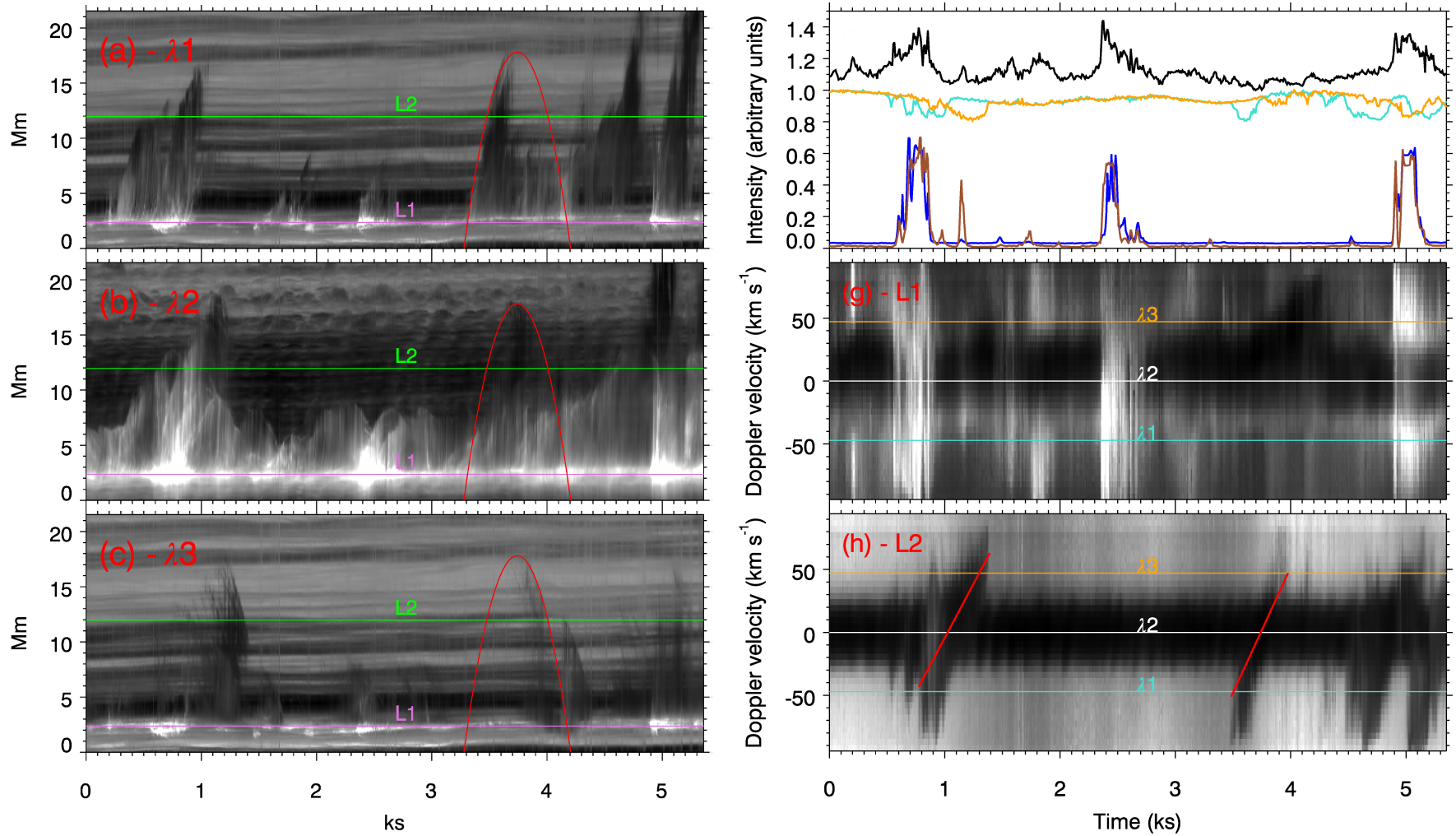
v_{POS}

Time-space diagram EUV AIA

Co-spatial hot jets

Bright front

Impulsive brightenings on the LB



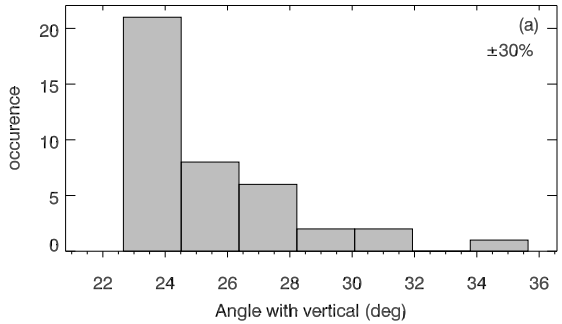
Time-λ diagram in Hα

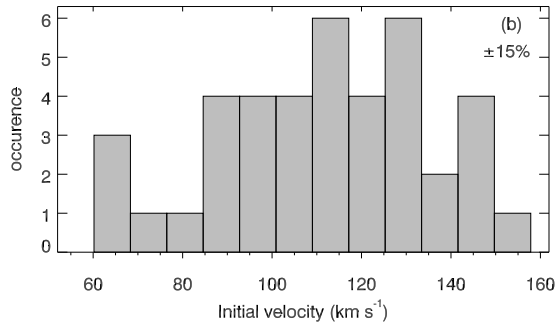
Impulsive brightenings on the LB

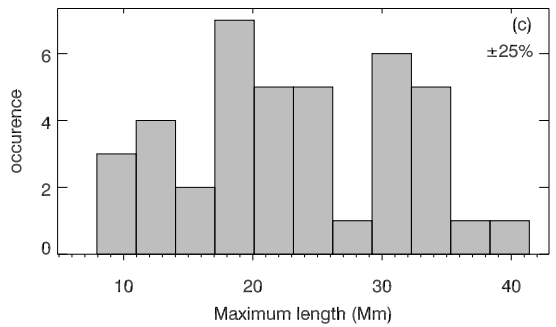
Superposition of dark diagonal feature on H-α profile

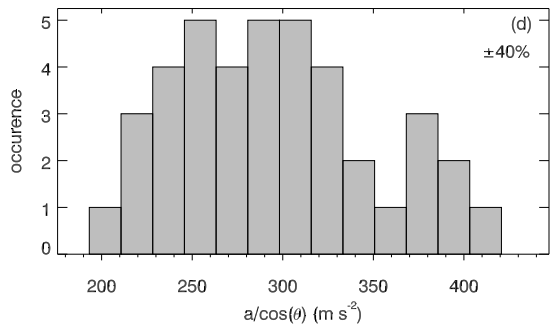
From the slope of the absorption feature:a_{LOS}

From the Dopplershift: v_{LOS}







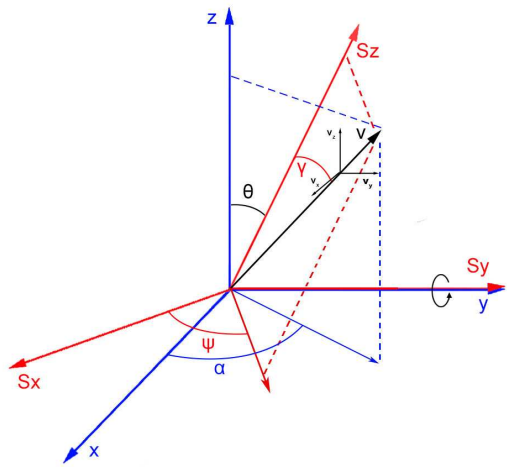


Results

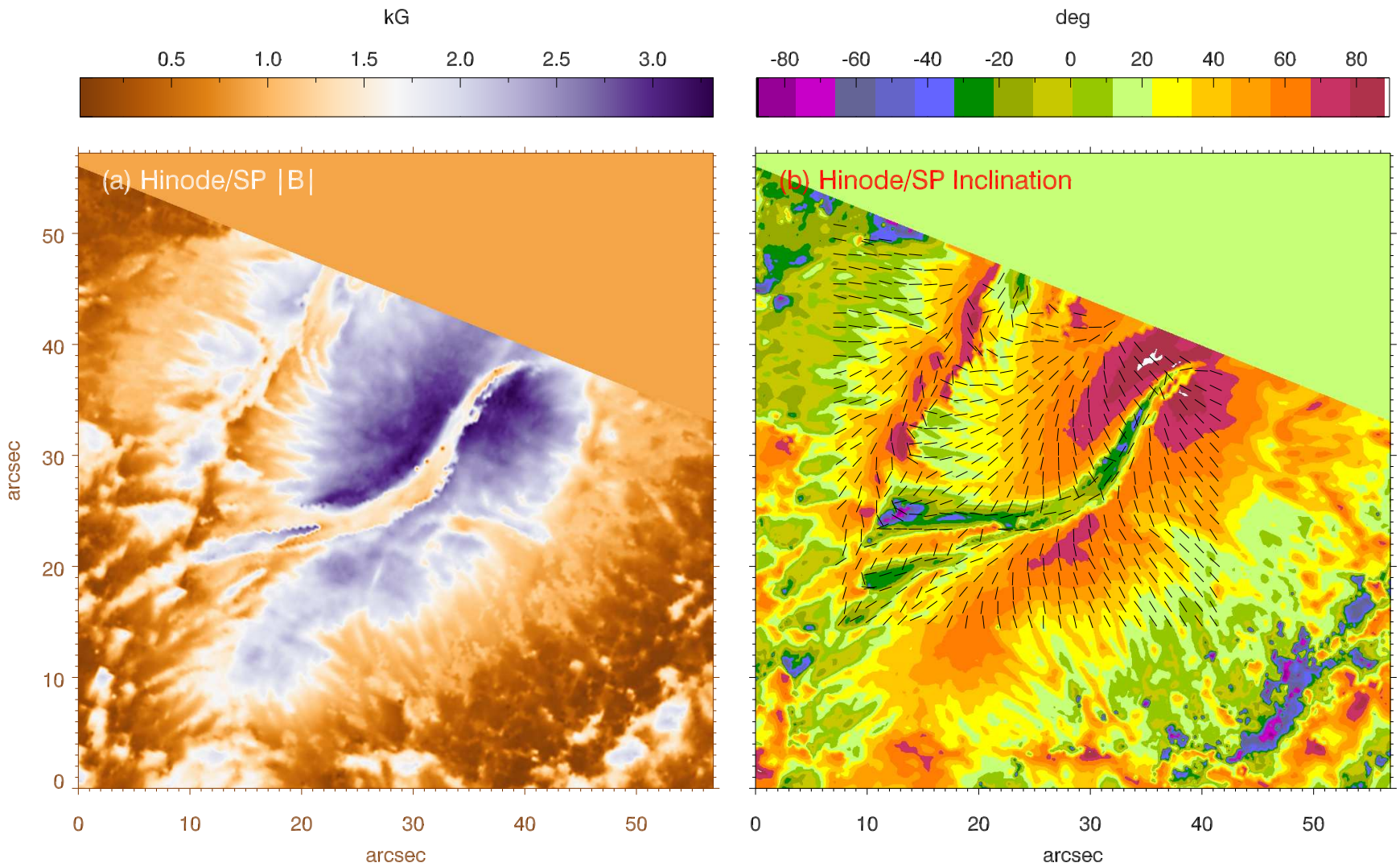
$$v_0 = \sqrt{v_{LOS}^2(t_0) + v_{POS}^2(t_0)}$$

$$a = \sqrt{a_{LOS}^2 + v_{POS}^2}$$

$$s(t) = v_0(t - t_0) - \frac{a}{2}(t - t_0)^2$$



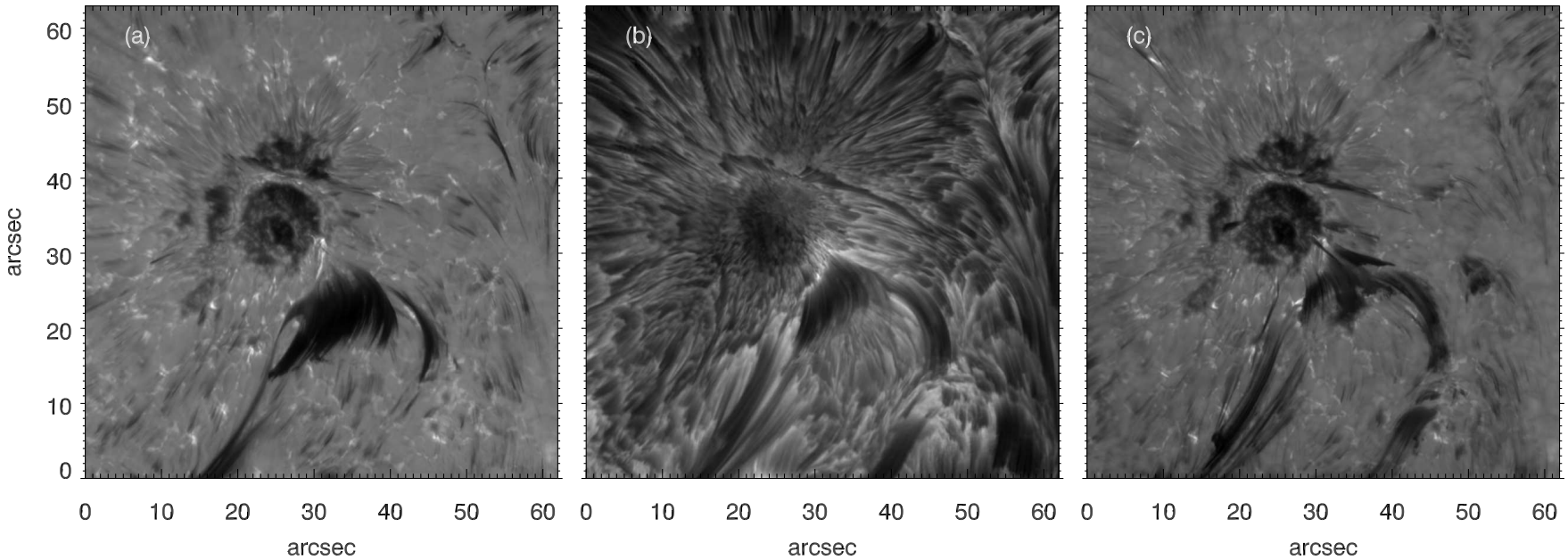
Photospheric magnetogram



A new dataset: observational facts

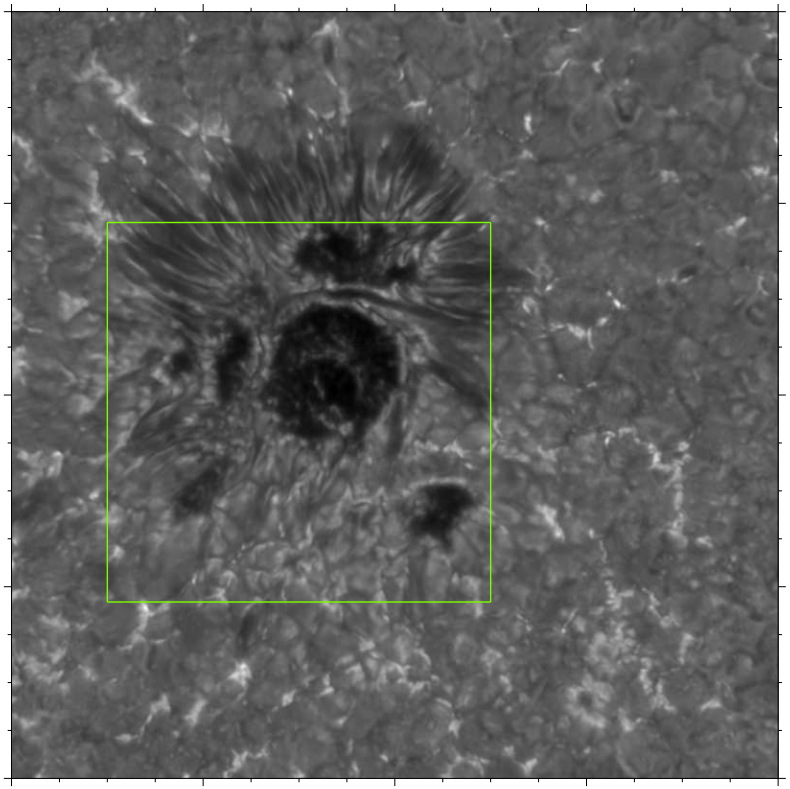
Target: AR12376 (15-07-04)
Duration: 8:18 10:21 UT
Filter: H-α, Fe I 6301/6302 Å, Ca II 8542 Å

Instrument: CRisp(SST)
Observing angle: 11 deg

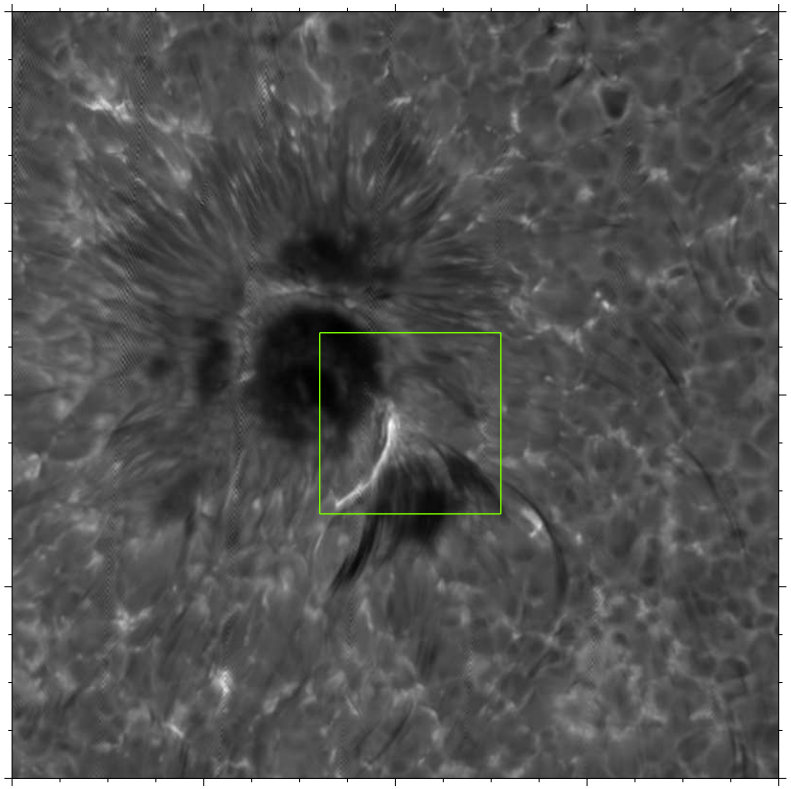


$\lambda_B = 6561.92$ Å $\lambda = 6563.00$ Å $\lambda_R = 6564.08$ Å

Inversion of the Stokes parameters with NICOLE code

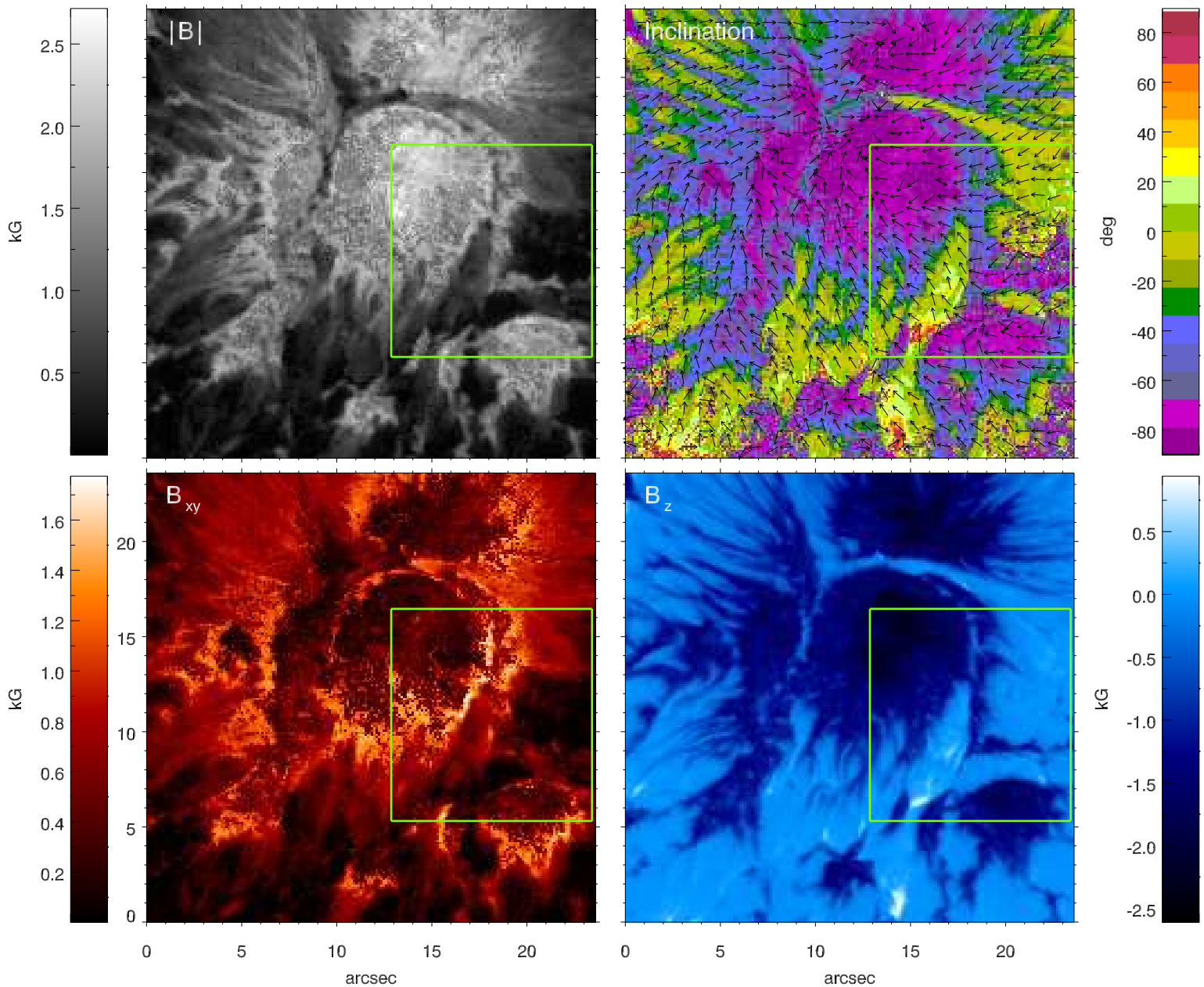


Fe I 6302.00 Å

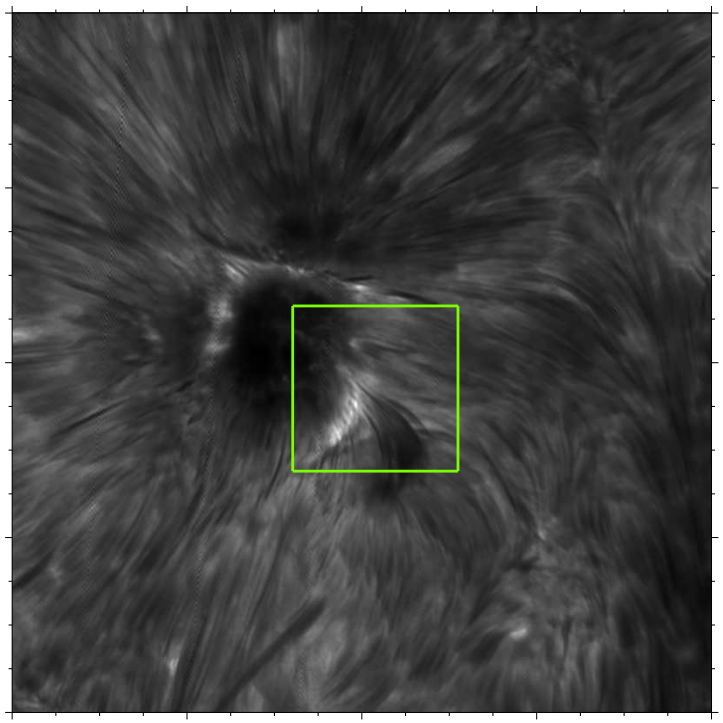


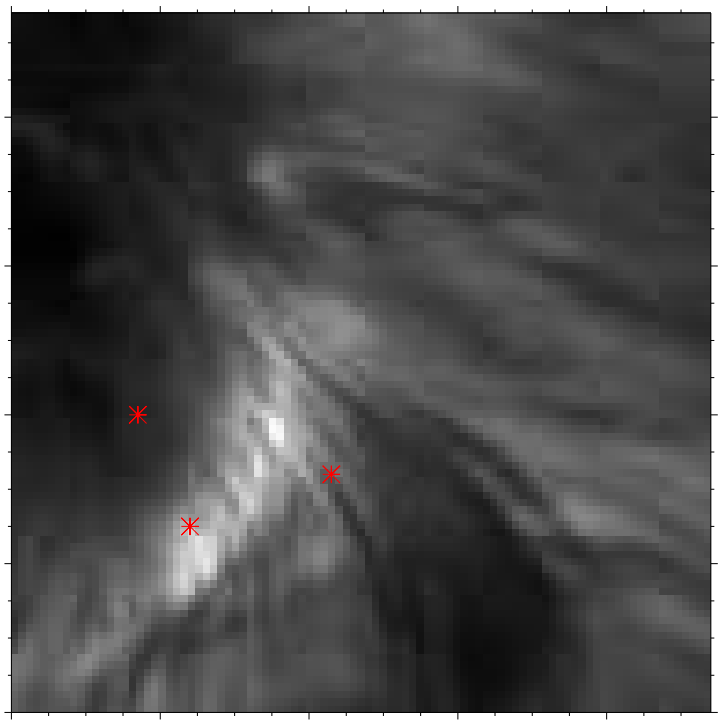
Ca II 8541.52 Å

Photospheric magnetogram

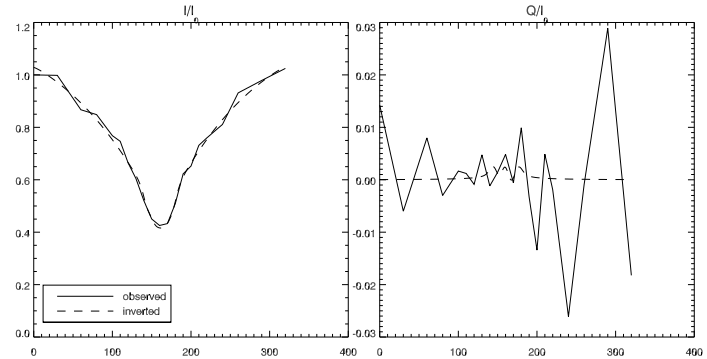


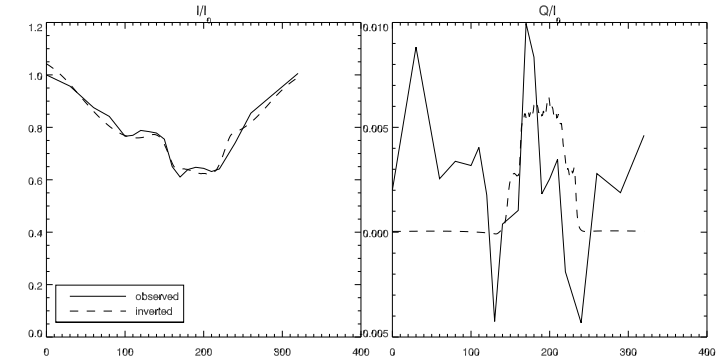
Selection of 3 pixels from the Ca II image

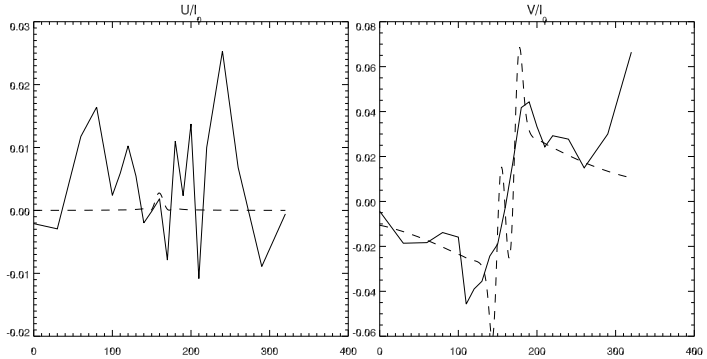


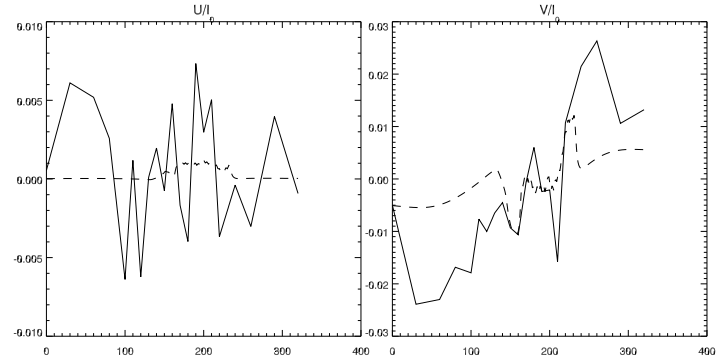


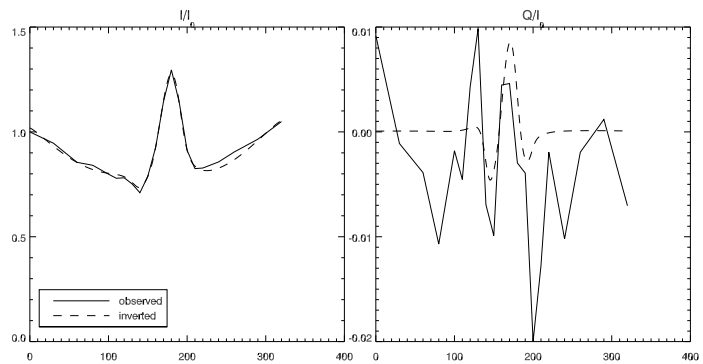
$\lambda = 8542.0$ Å

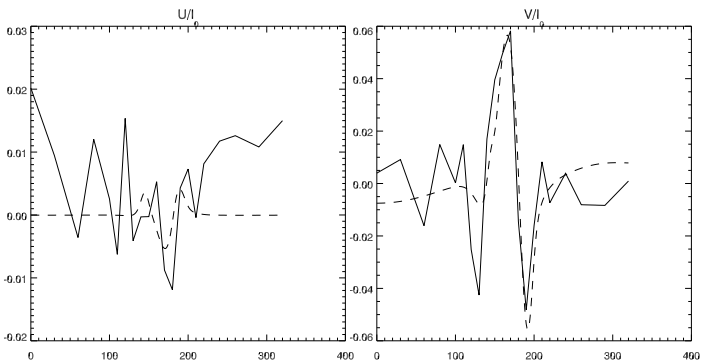












One pixel at the footpoint

Inclination in photosphere is 9 deg, in chromosphere is 32 deg

Conclusions

Jets are...

- launched impulsively from the LB.
- mostly preceded by brightenings.
- driven by magnetic reconnection.

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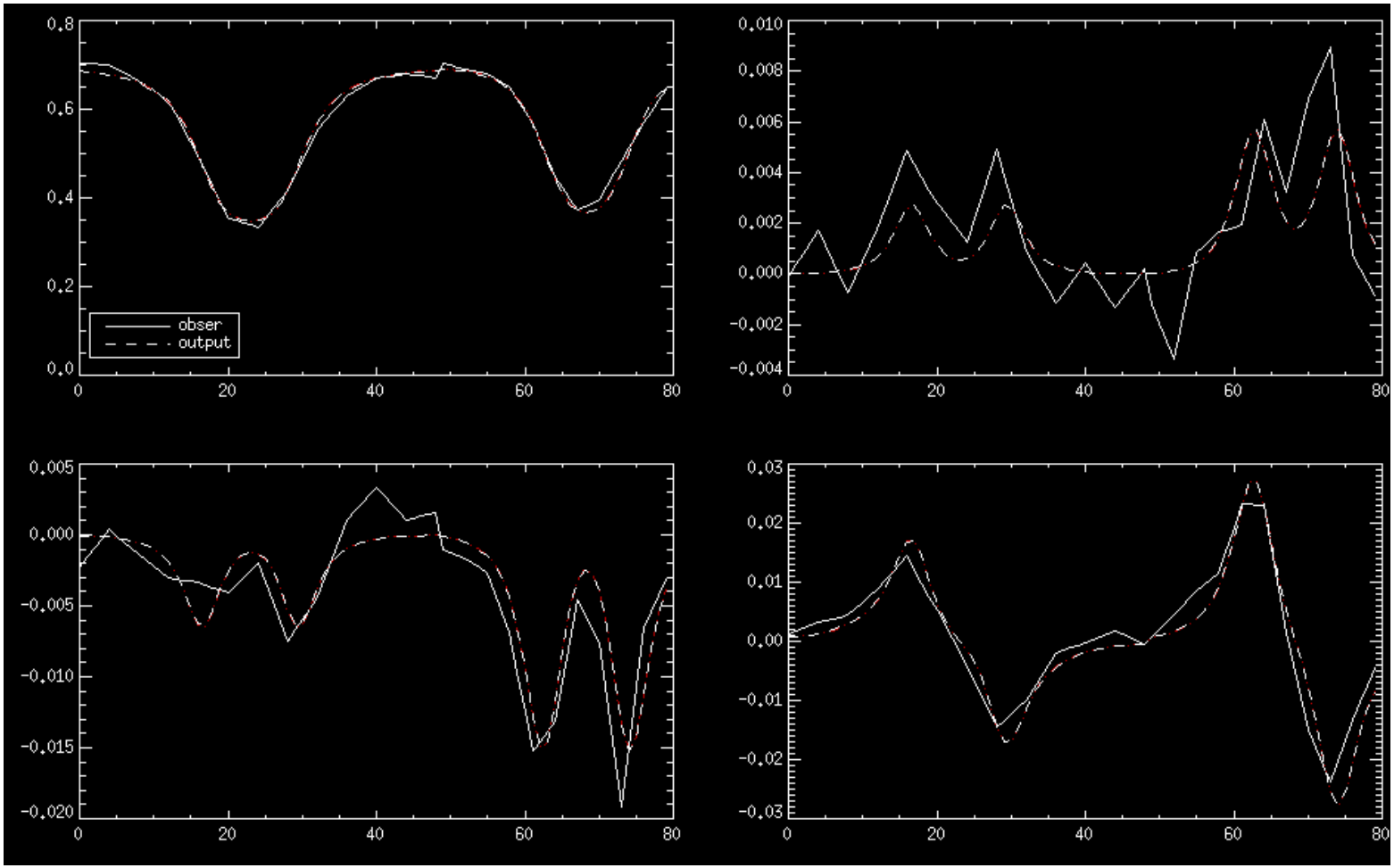
obser
output
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0.6
0.4
0.2
0.0
0.010
0.008
0.006
0.004
0.002
0.000
-0.002
-0.004
0.005
0.000
-0.005
-0.010
-0.015
-0.020
0.03
0.02
0.01
0.00
-0.01
-0.02
-0.03
0
20
40
60
80

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