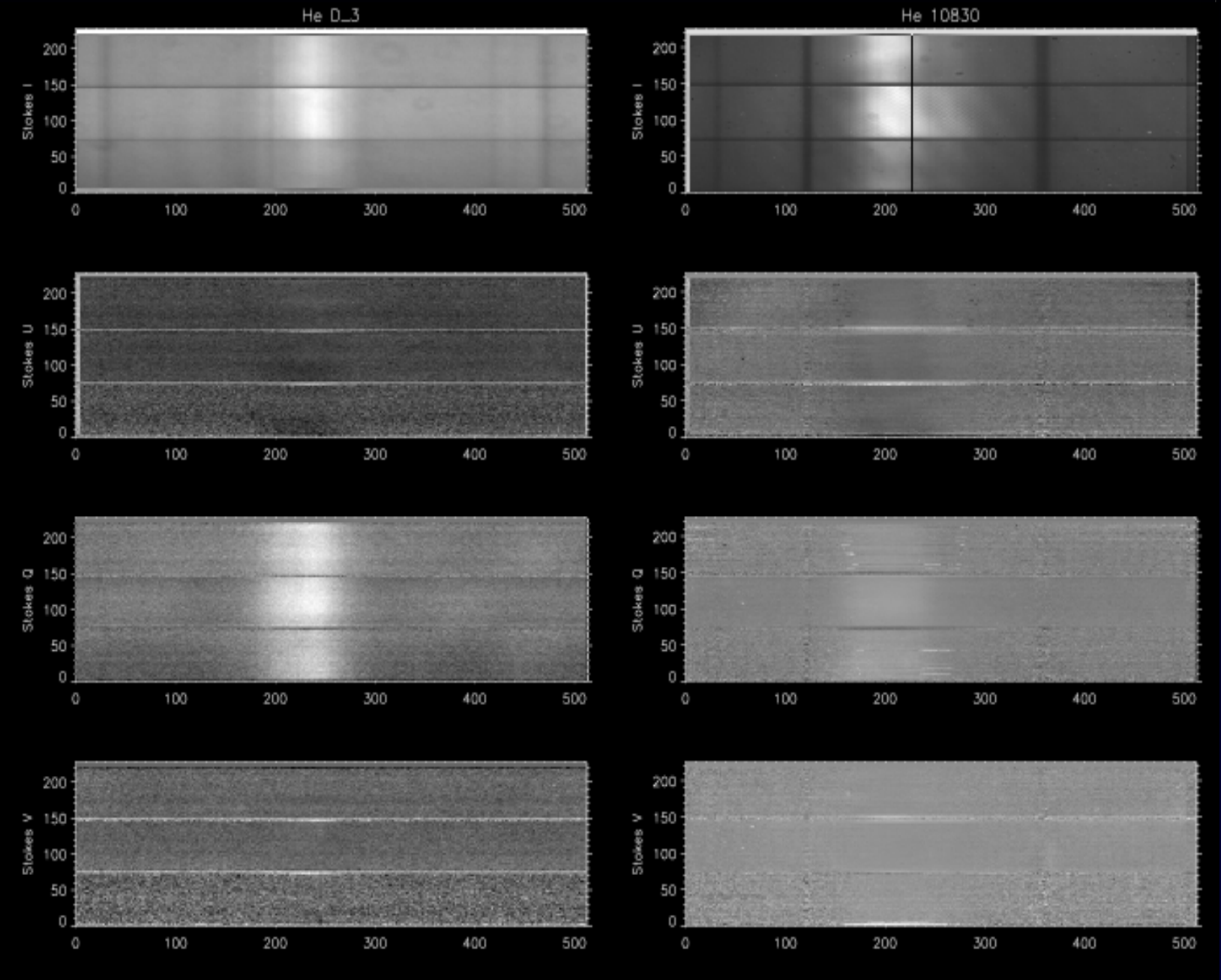
Prominences

A. López Ariste

PCA Inversion Code
NOAA 0661
LOS
iXon1 /V
Xenics
He 10830
iXon2 /V
Ixon2
He D3
iXon3 /V
Ixon3
Hα
BLACK BOX
CPU SELECT
ServSwitch EC Series
iXon5 /V
Ixon5
iXon6 /V
Ixon6

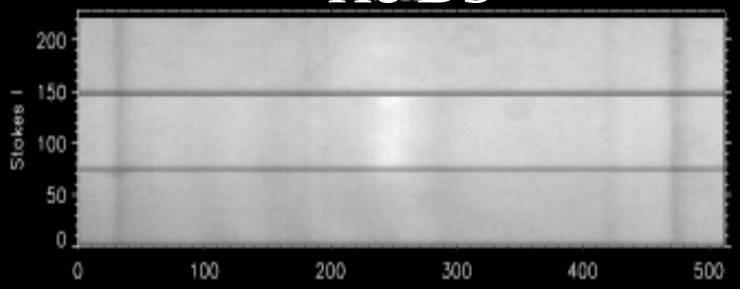
He D3

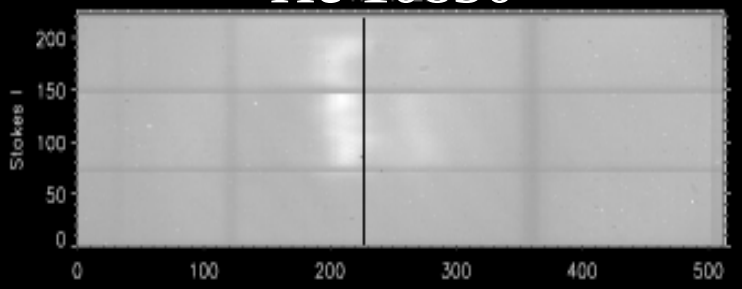
He 10830

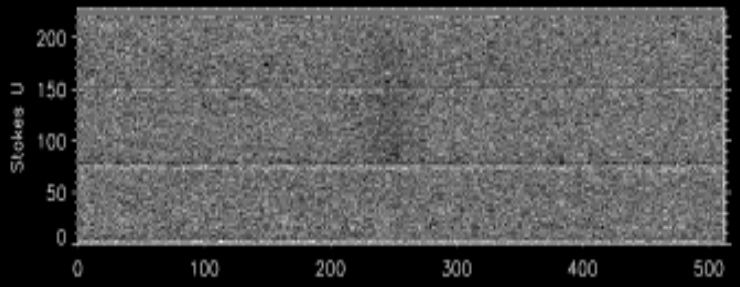


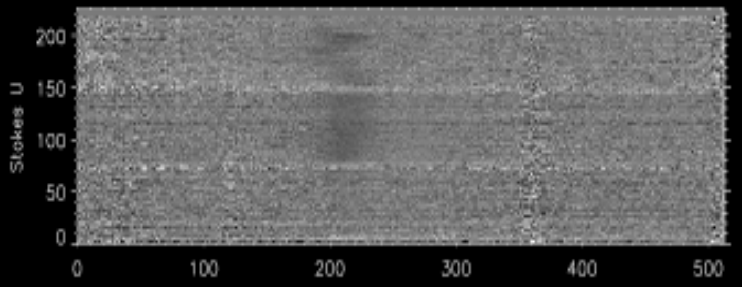
He D3

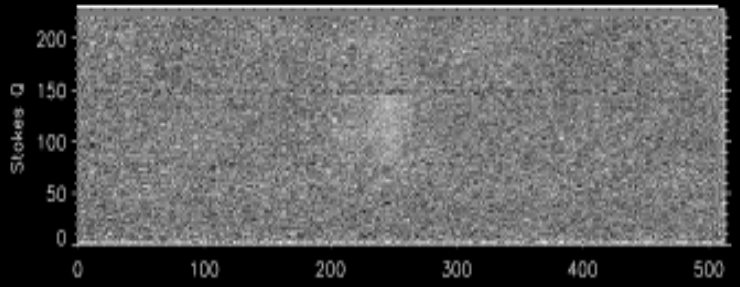
He 10830

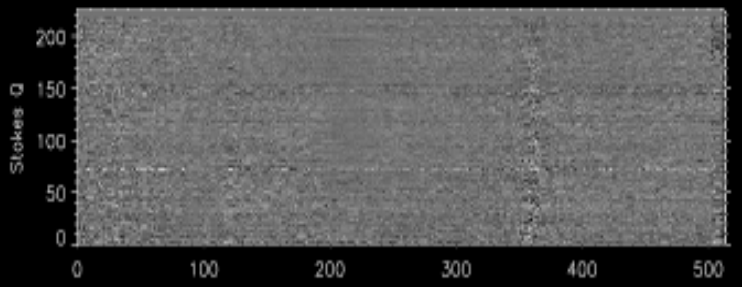


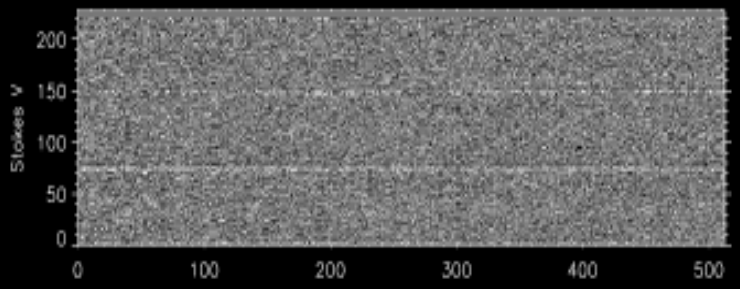


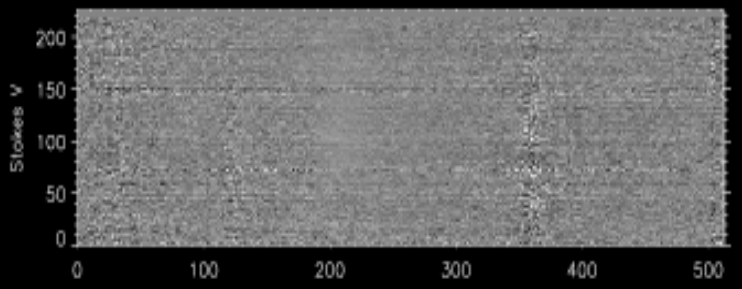








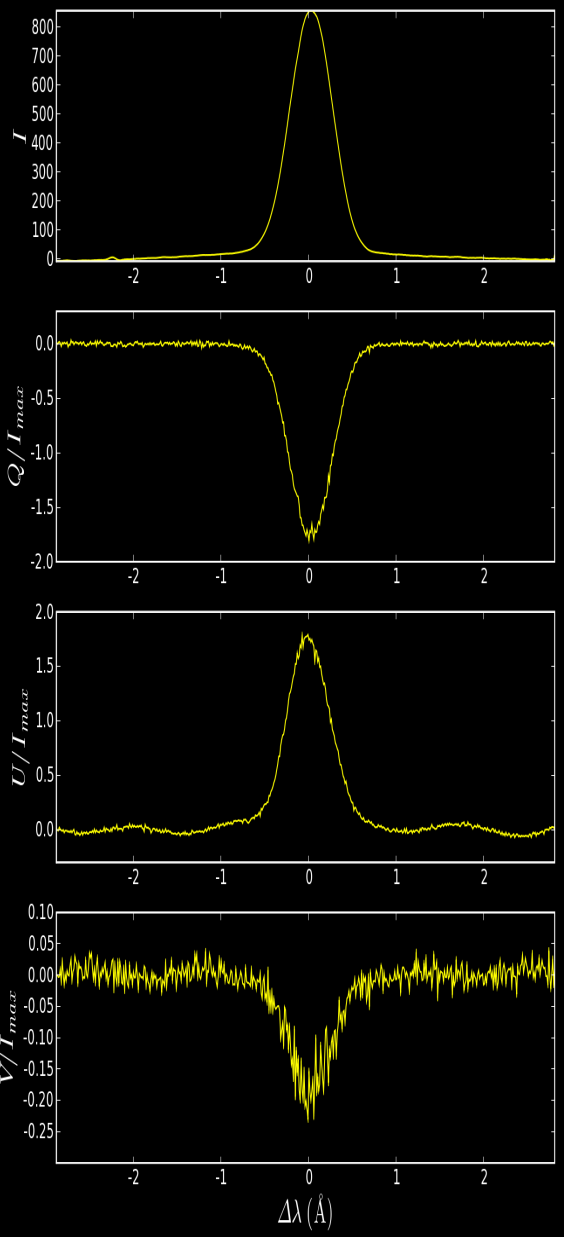


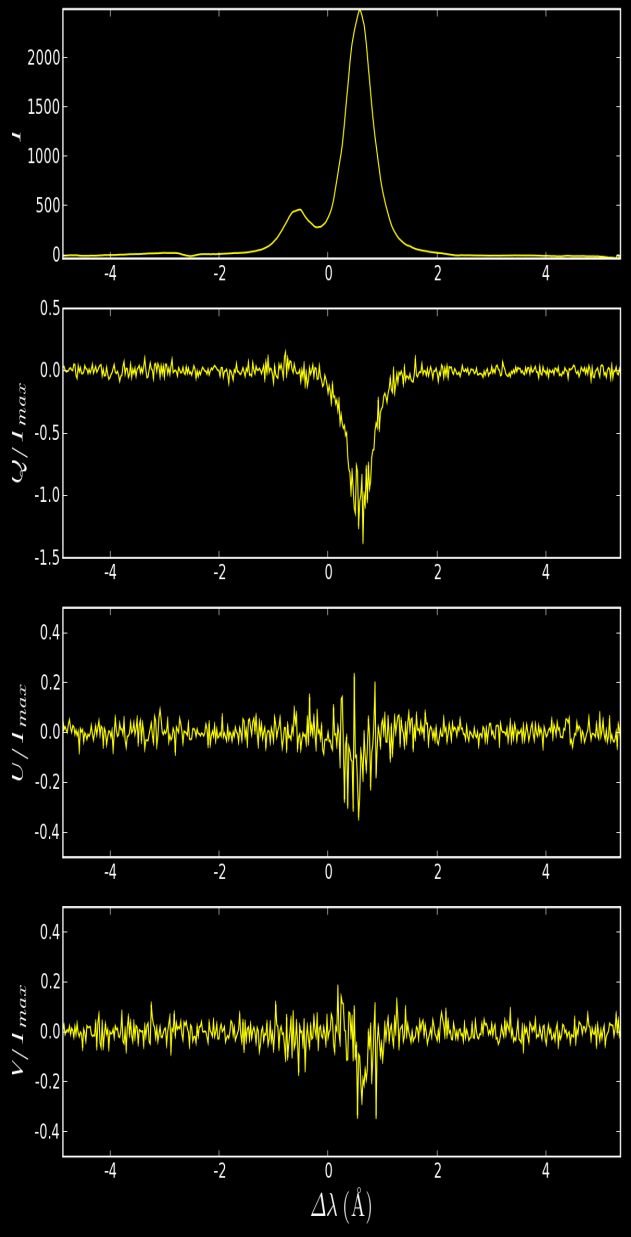


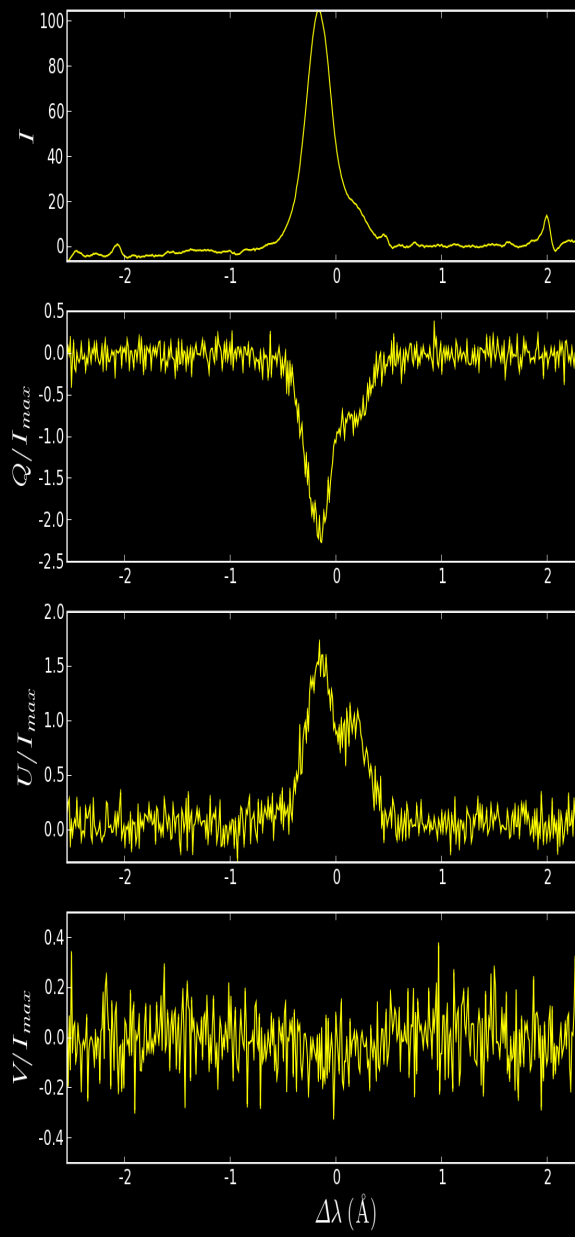
Hα

He 10830

He D3







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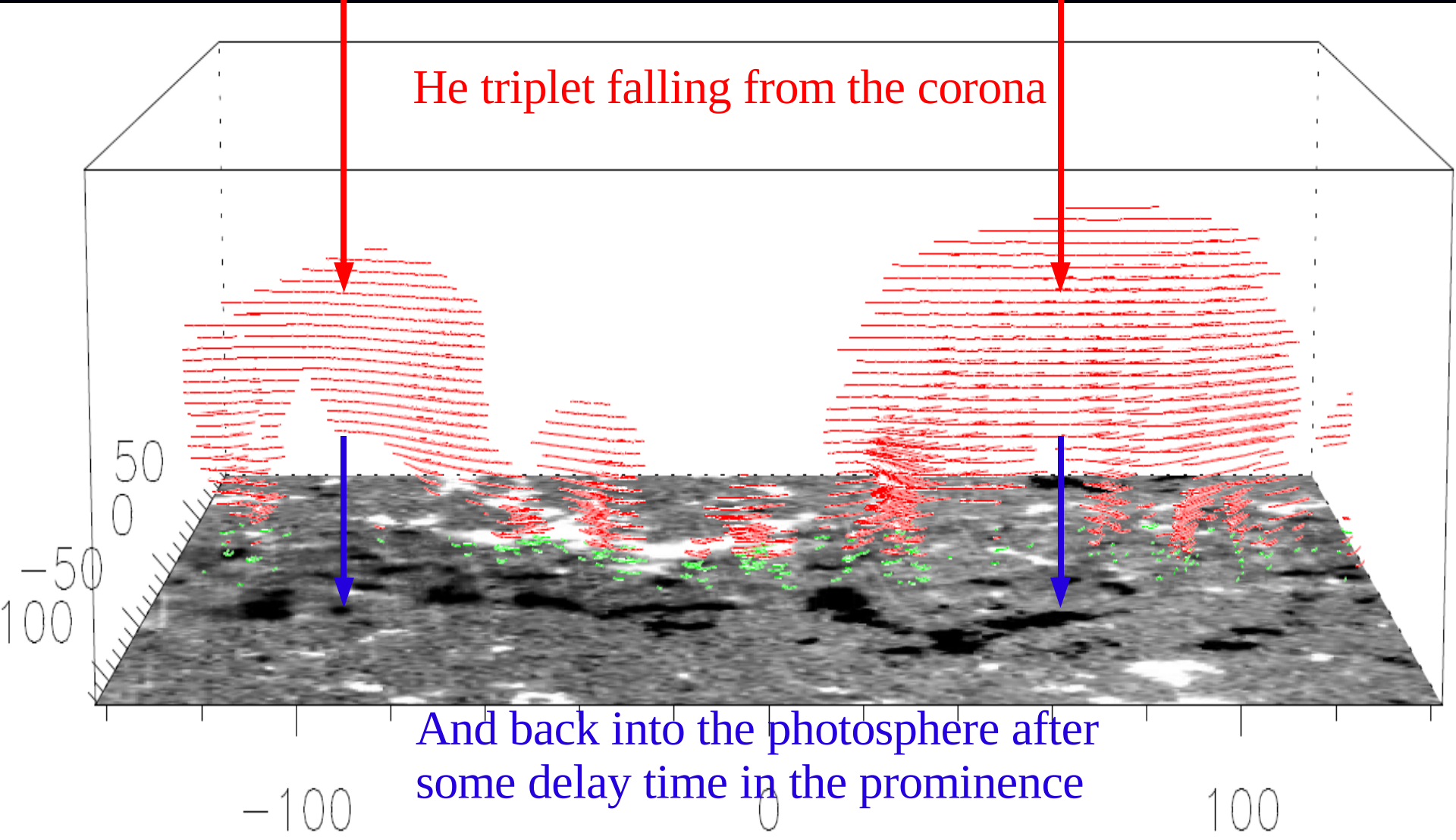
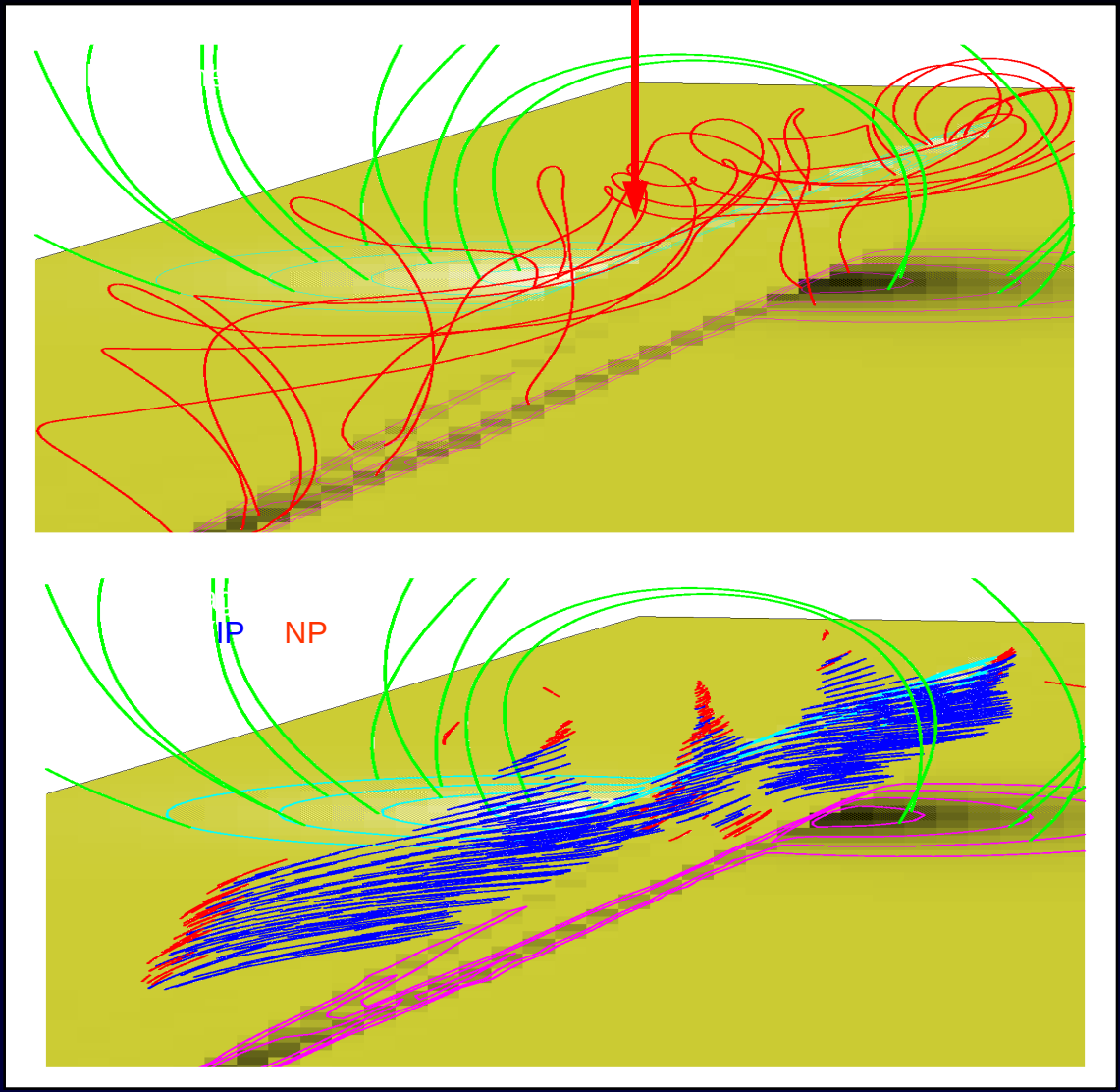
Get us some He triplet, please!

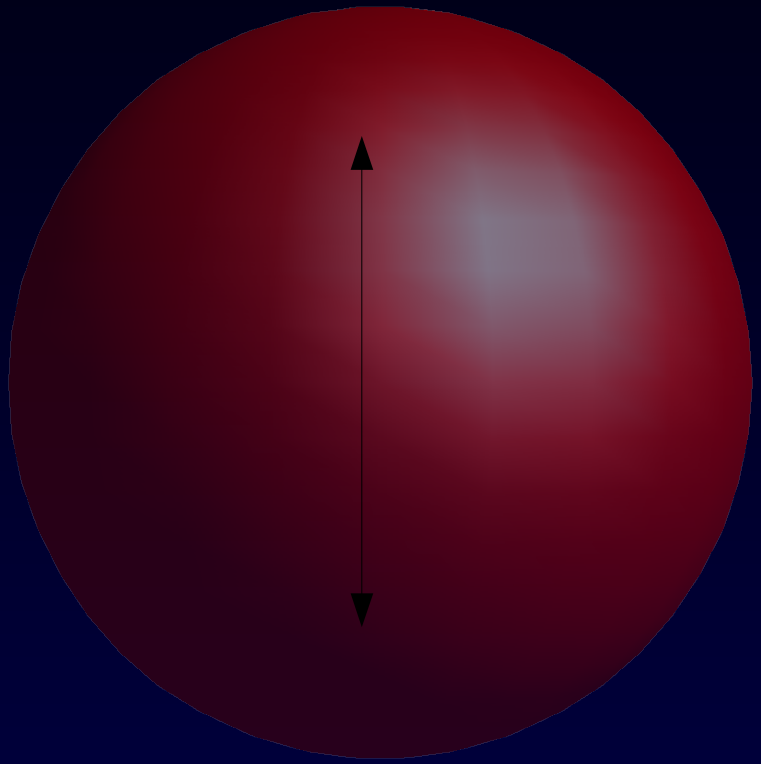


3D line-tied sheared single dipole

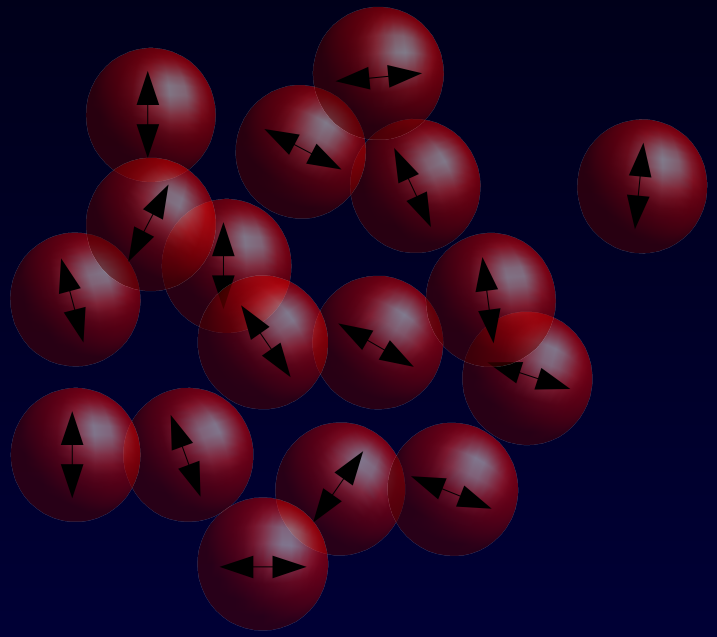


Neutrals diffuse or percolate through field lines

$$\nabla \times E = -\frac{\partial}{\partial t} B$$



$$\nabla \times E = -\frac{\partial}{\partial t} B$$



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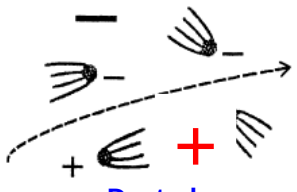
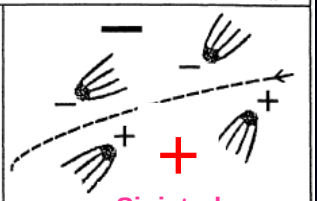
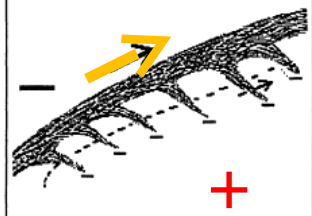
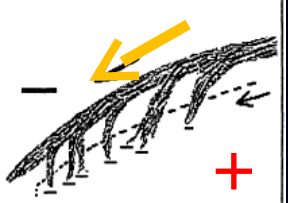
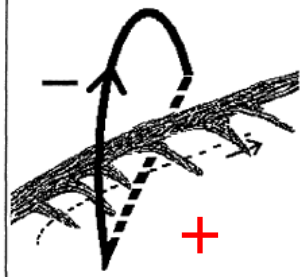
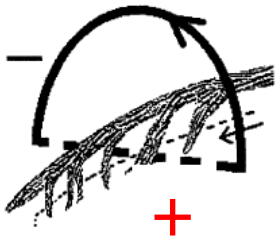
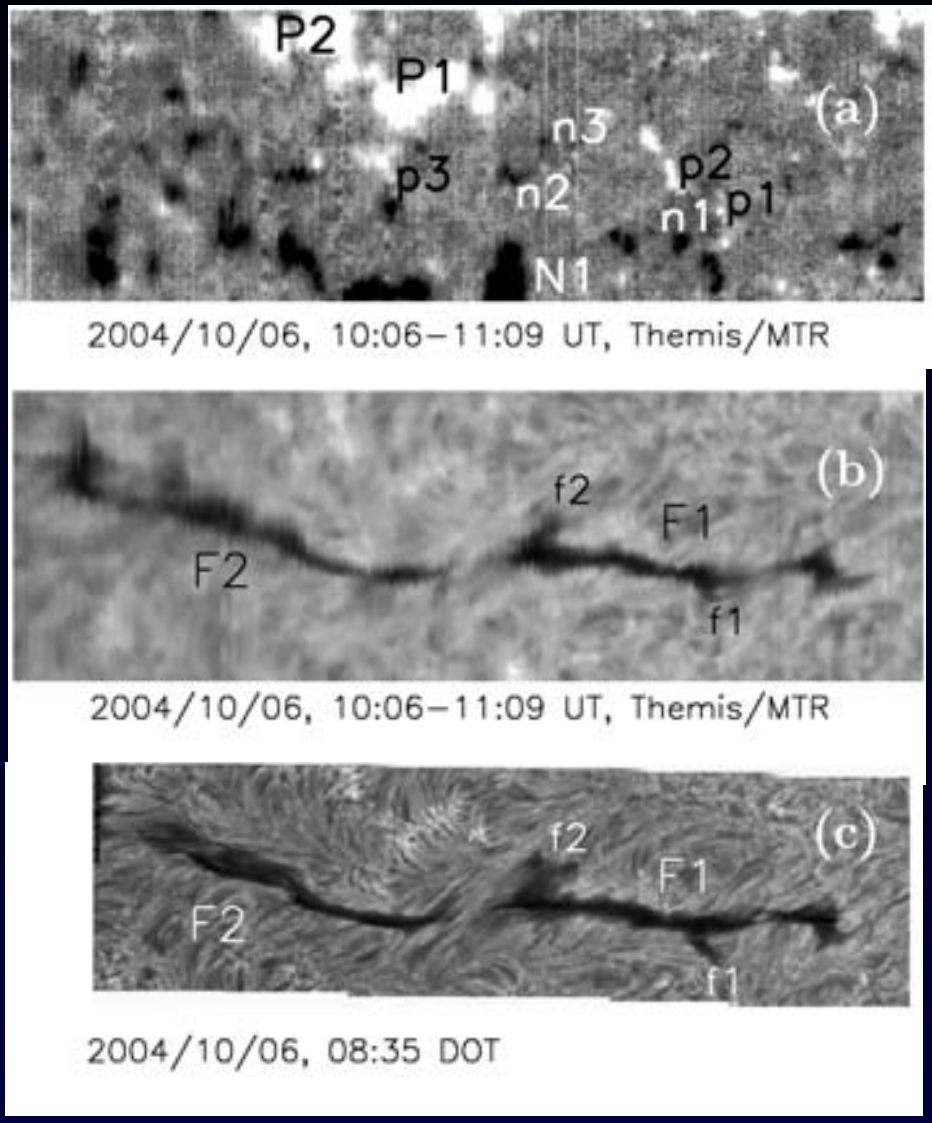
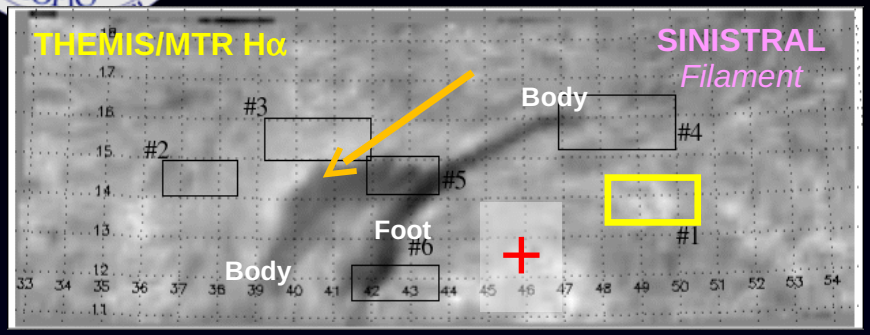
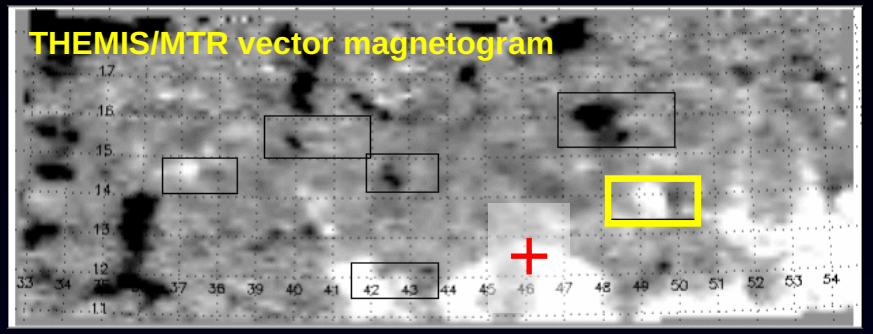
Filament chirality rules

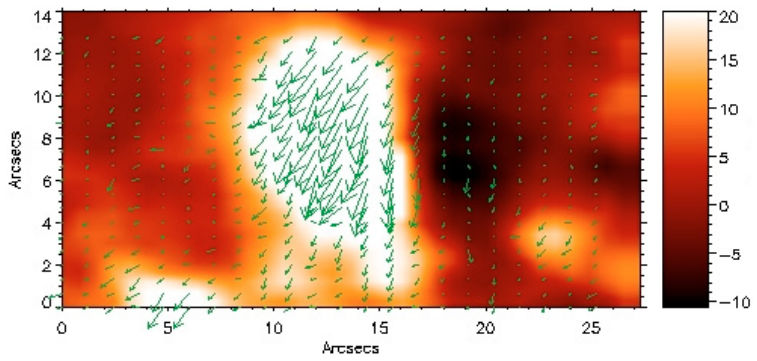
Feature	Chirality	
1. Filament Channels — Small Scale	 Dextral	 Sinistral
2. Filaments — Medium Scale	 Right bearing	 Left bearing
3. Coronal X-Ray Arcades — Large Scale	 Left skew	 Right skew
	Dominant in Northern Hemisphere	Dominant in Southern Hemisphere



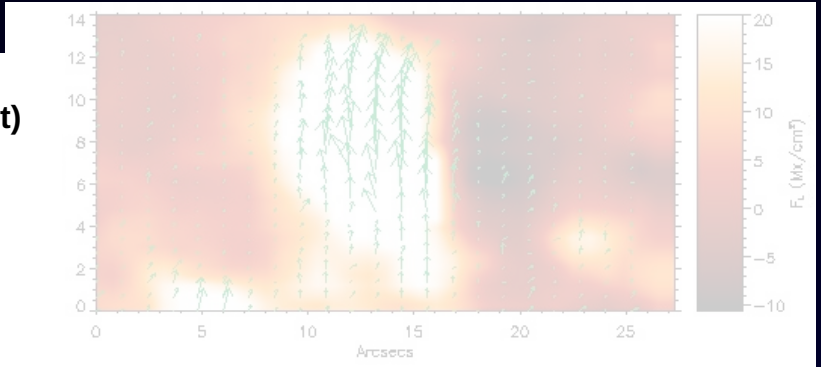
Using chirality rules to solve the 180º ambiguity

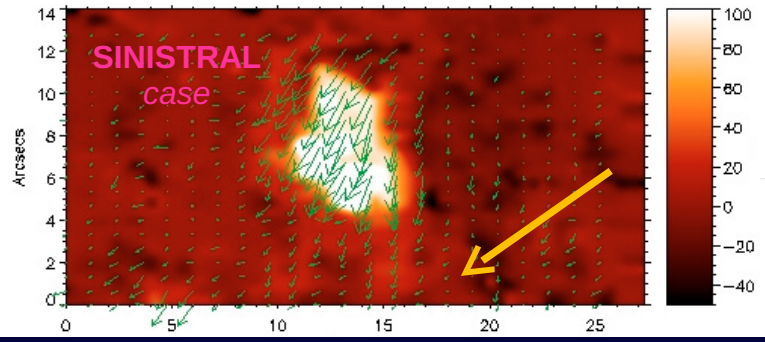




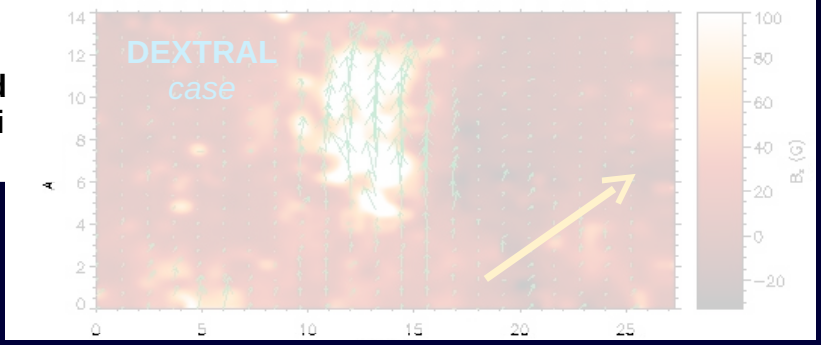


Observed B (line of sight)

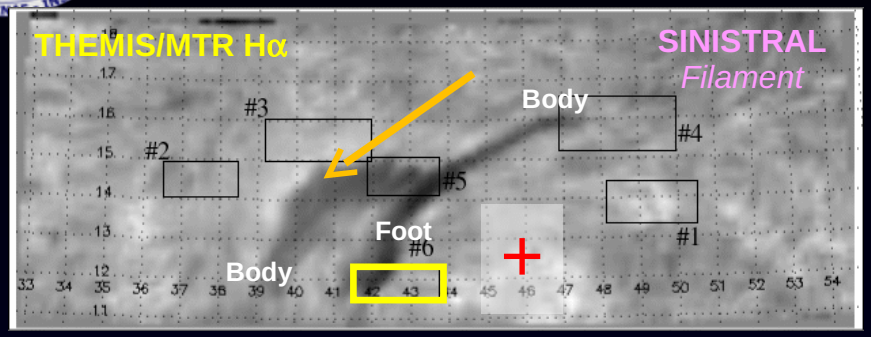


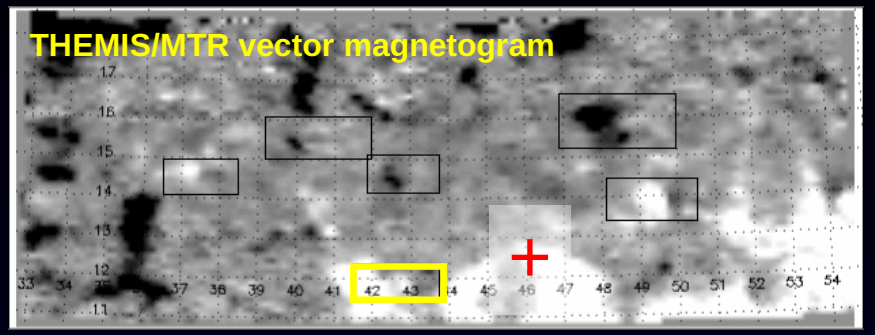


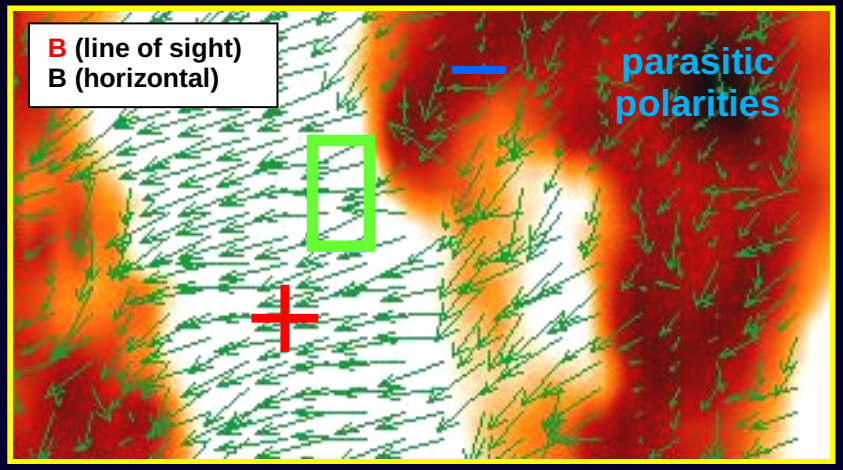
B (vertical) reconstructed from 180º soluti



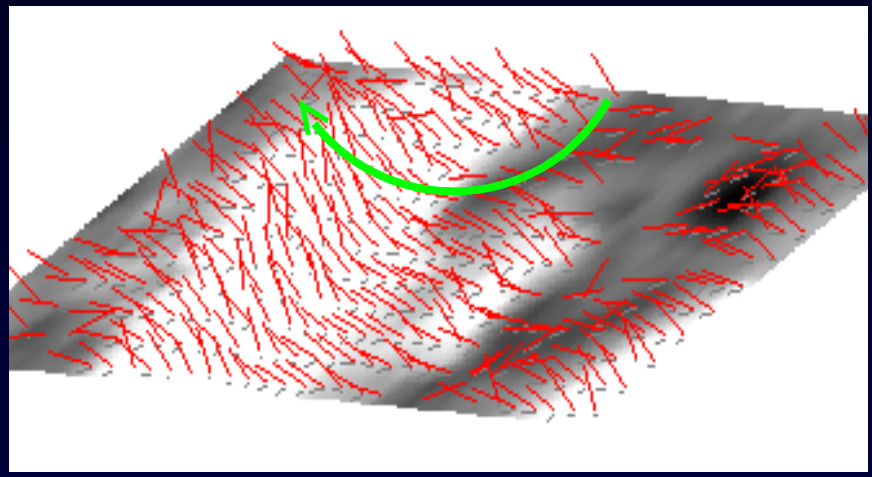
Chirality-based ambiguity resolution gives dips







Photospheric dips measured
below a filament foot and within its channel



Lopez Ariste, Aulanier, Schmieder, Sainz Dalda (2006)

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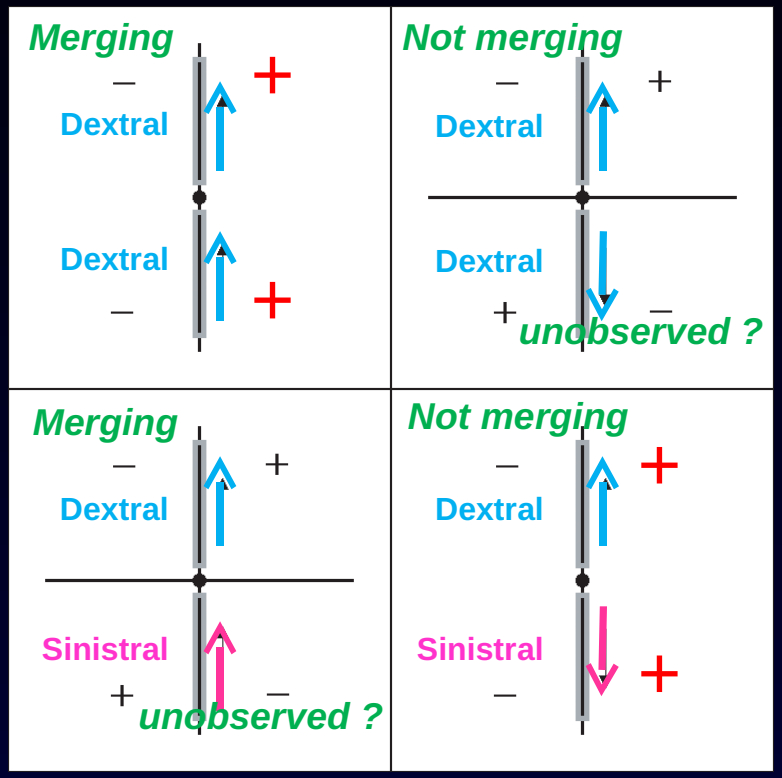
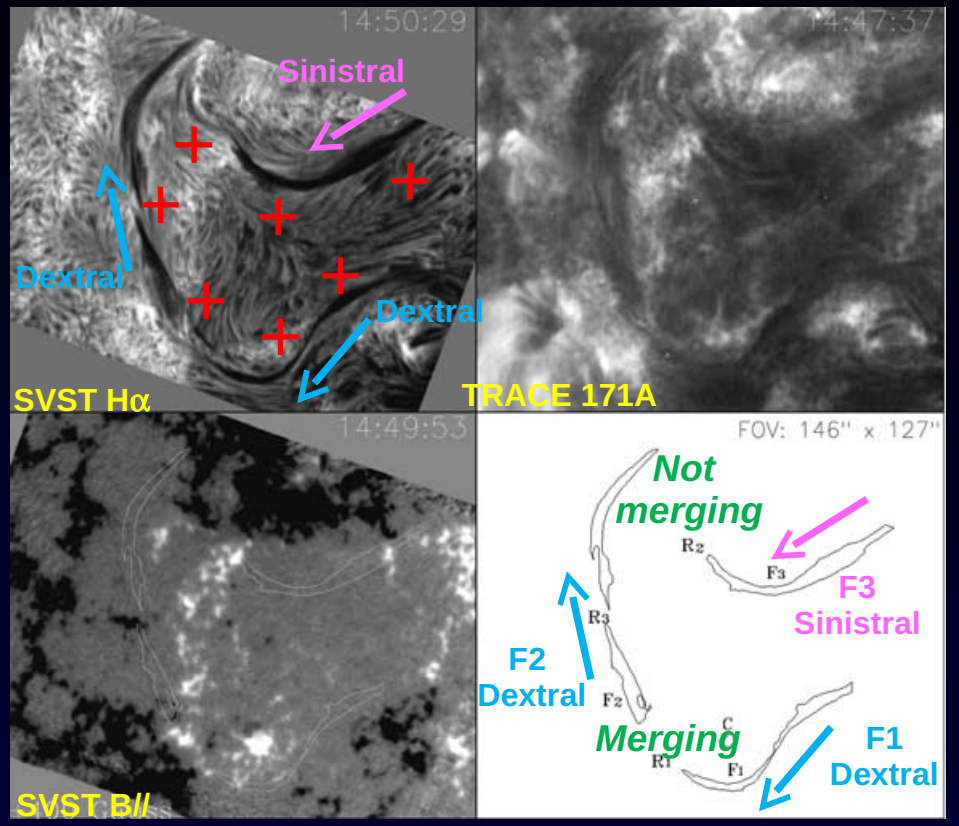
MHD simulations of interacting sheared arcades

MHD simulations of
3D line-tied sheared DOUBLE dipoles



DeVore et al. (2005), Aulanier et al. (2006)

Observations of interacting filaments
during coordinated Joint Observing Programs



Deng et al. (2002) & Schmieder et al. (2004)

Merging ⇔ Same axial field direction
⇔ Same magnetic helicity sign for bipolar fields

Merging ⇔ Same filament chirality
⇔ Same magnetic helicity sign

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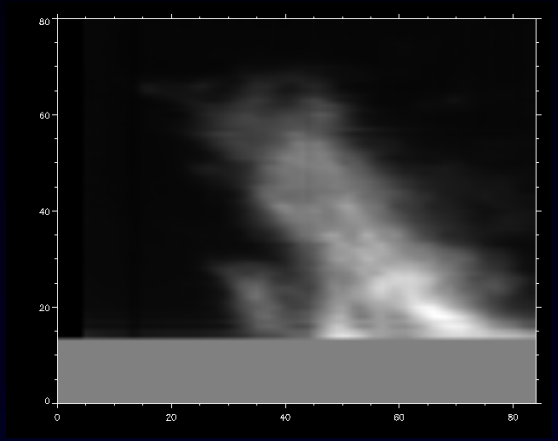
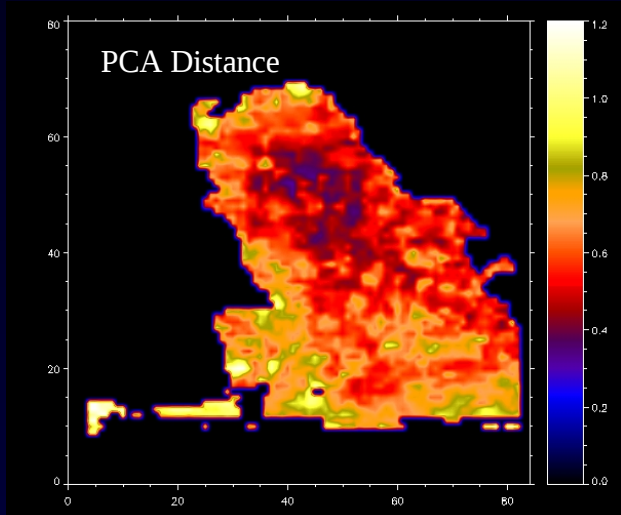
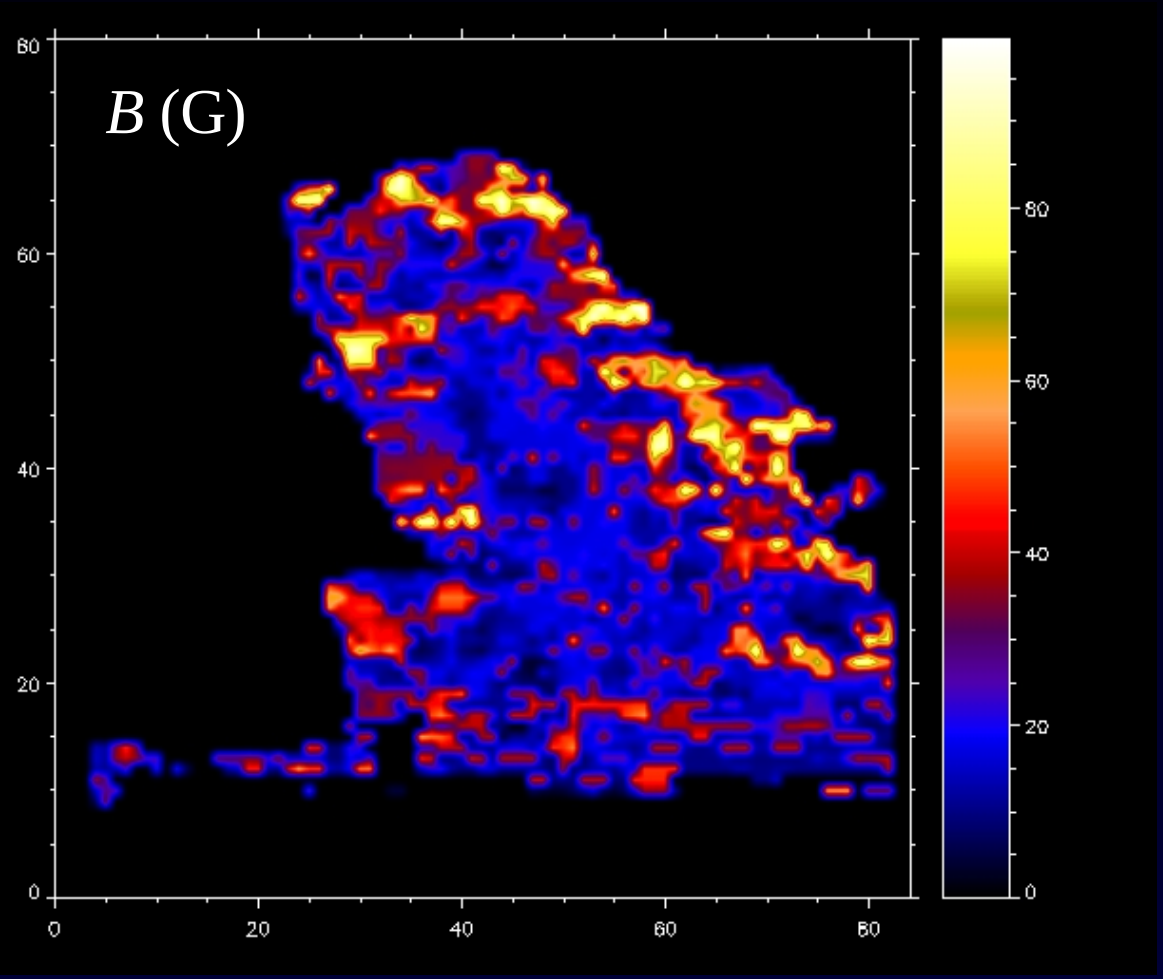
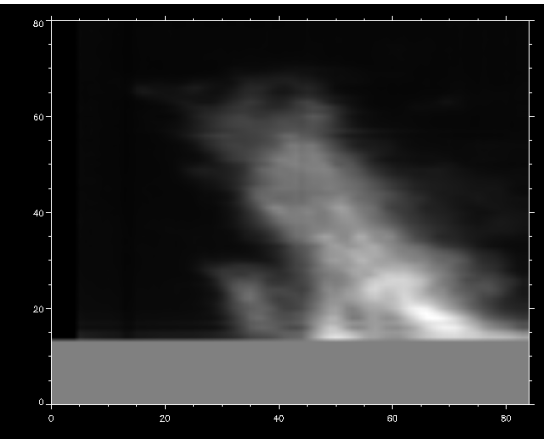


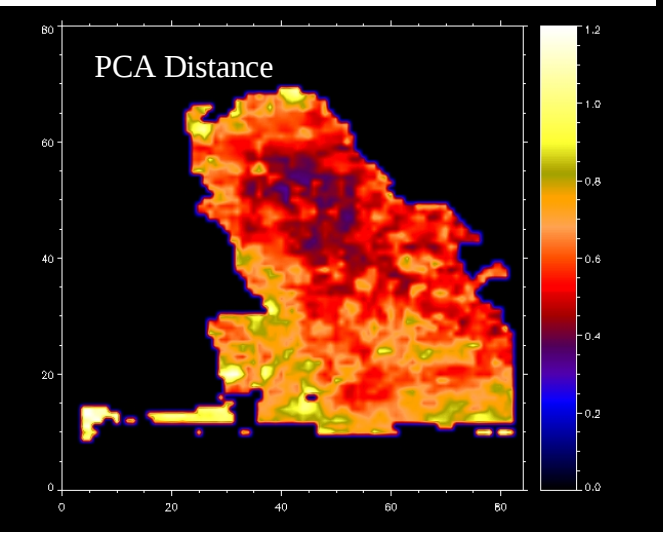


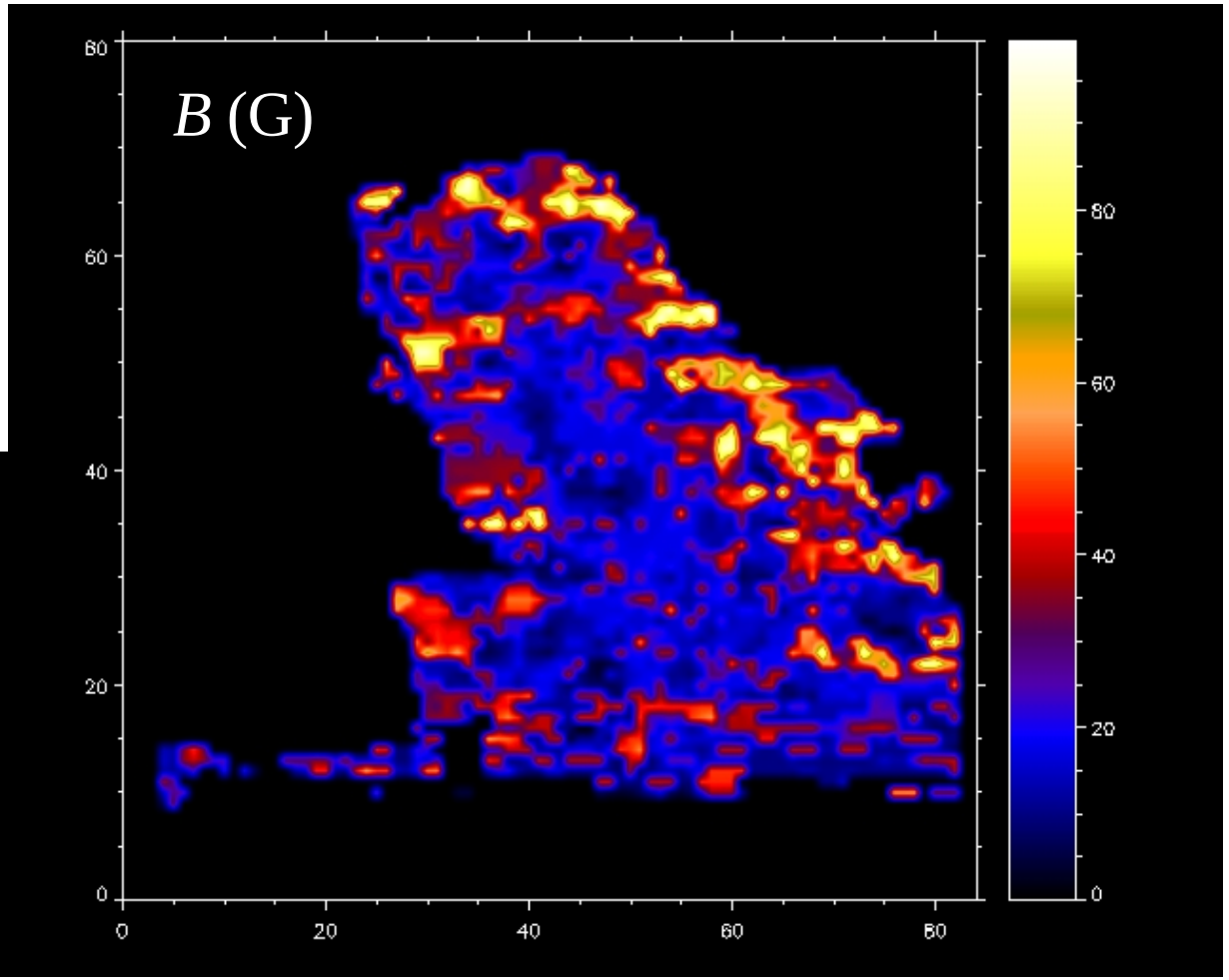


NSO/SPO DST with HAO/ASP, *by Casini, López Ariste, Tomczyk, & Lites 2002*

Prominence Op09/May25

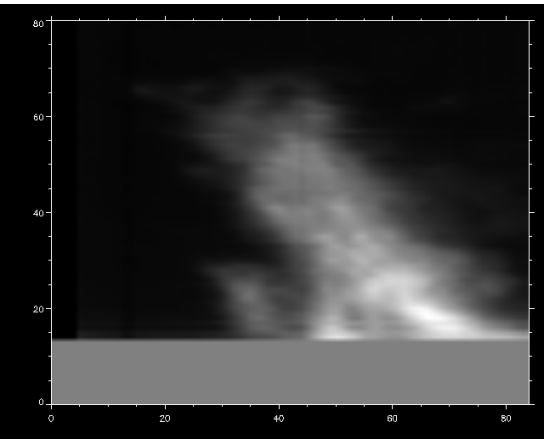


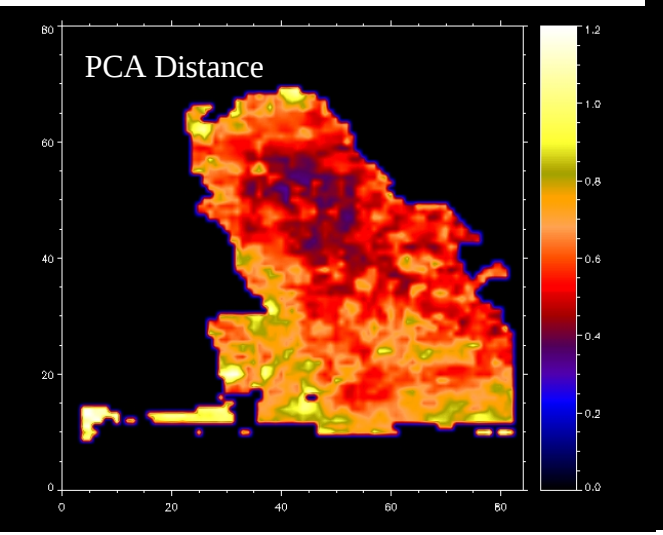


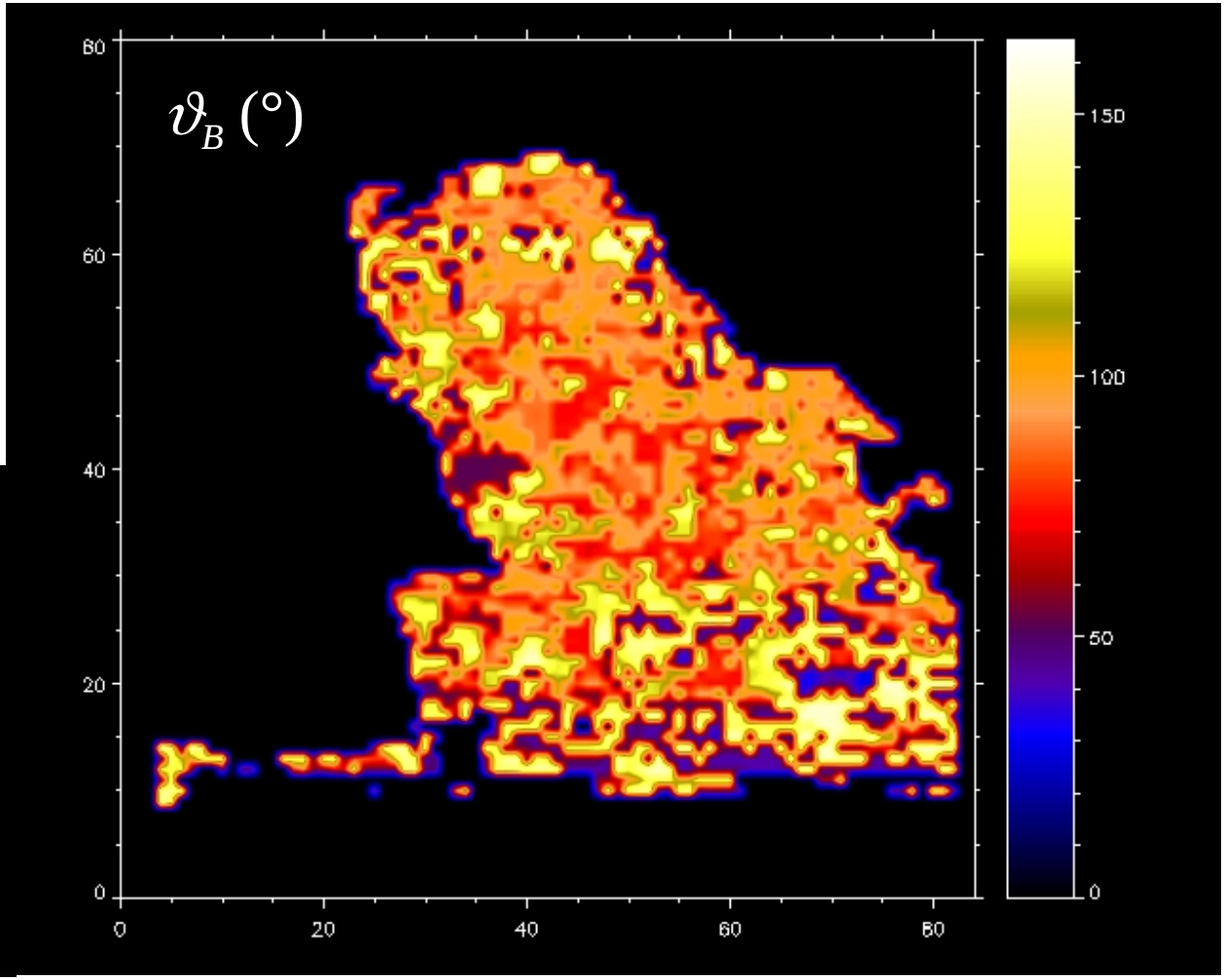


NSO/SPO DST with HAO/ASP,

Prominence Op09/May25

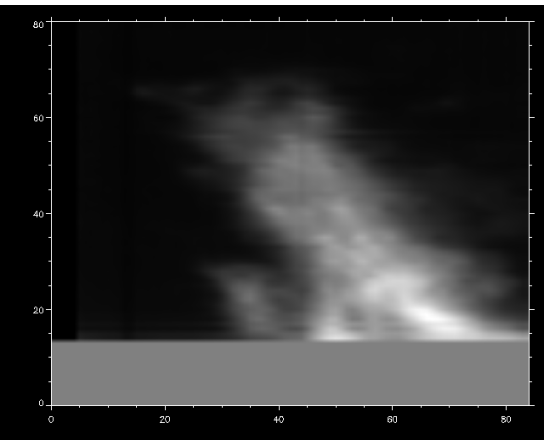


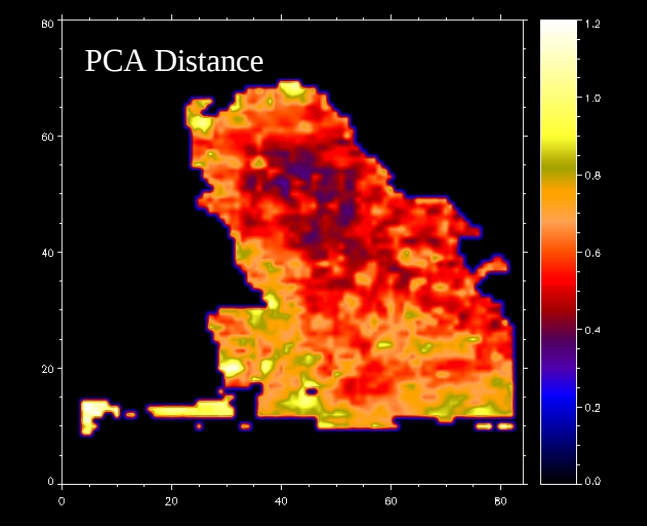


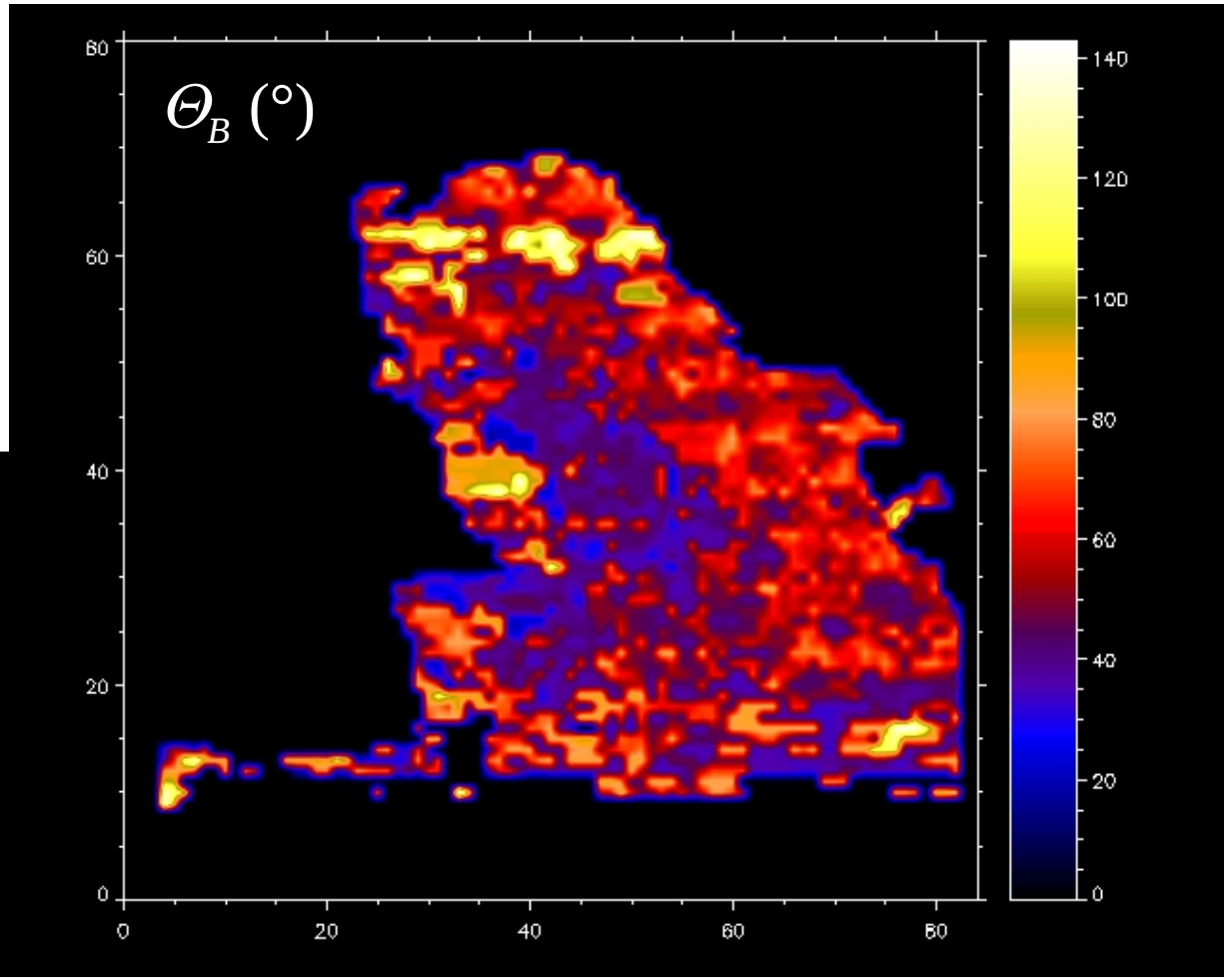


NSO/SPO DST with HAO/ASP,

Prominence Op09/May25







NSO/SPO DST with HAO/ASP,