



# Spectropolarimetry inversions with PCA.

I: Polarization  $> 5 \times 10^{-4}$

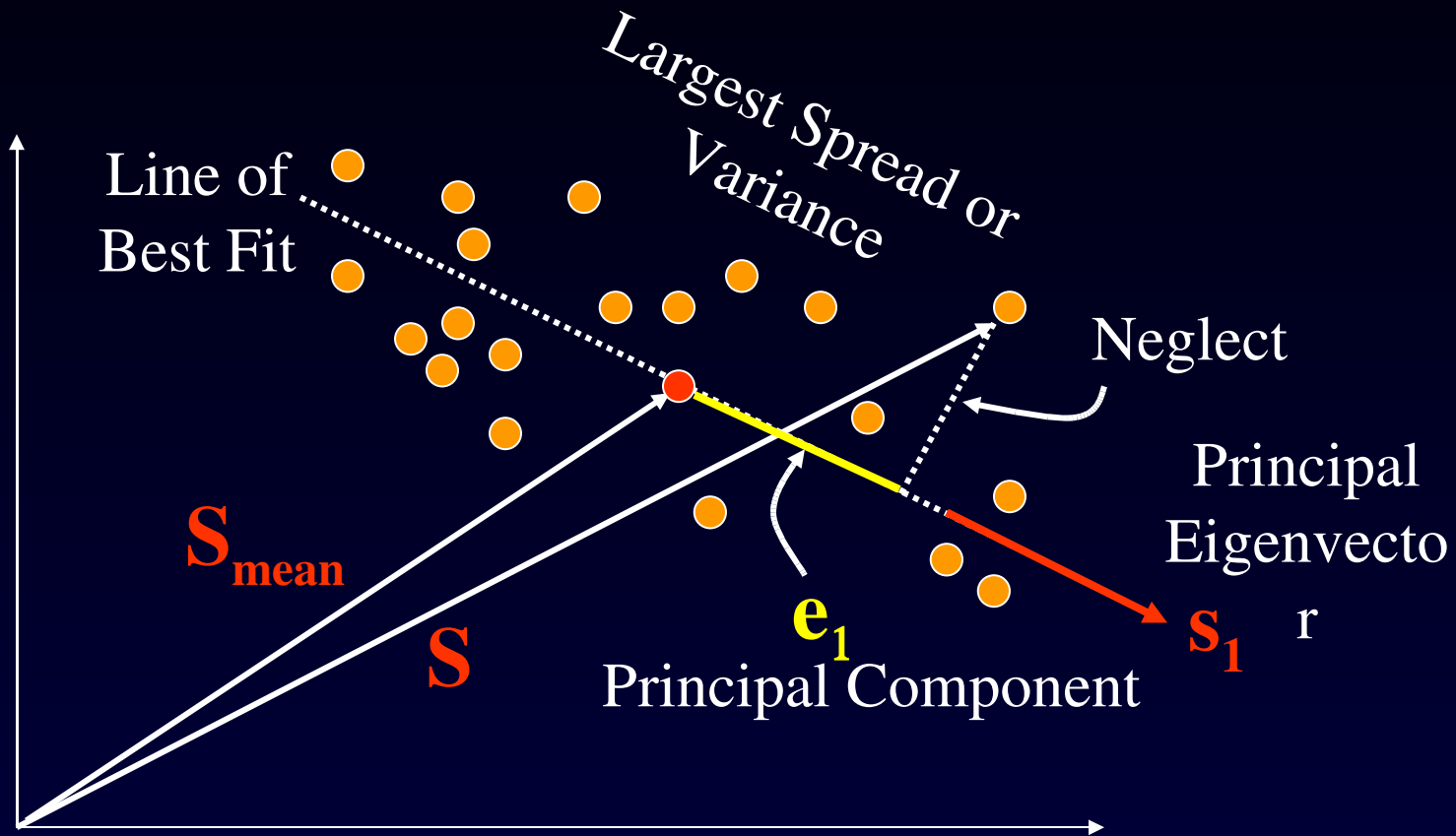
what has been done and what THEMIS needs

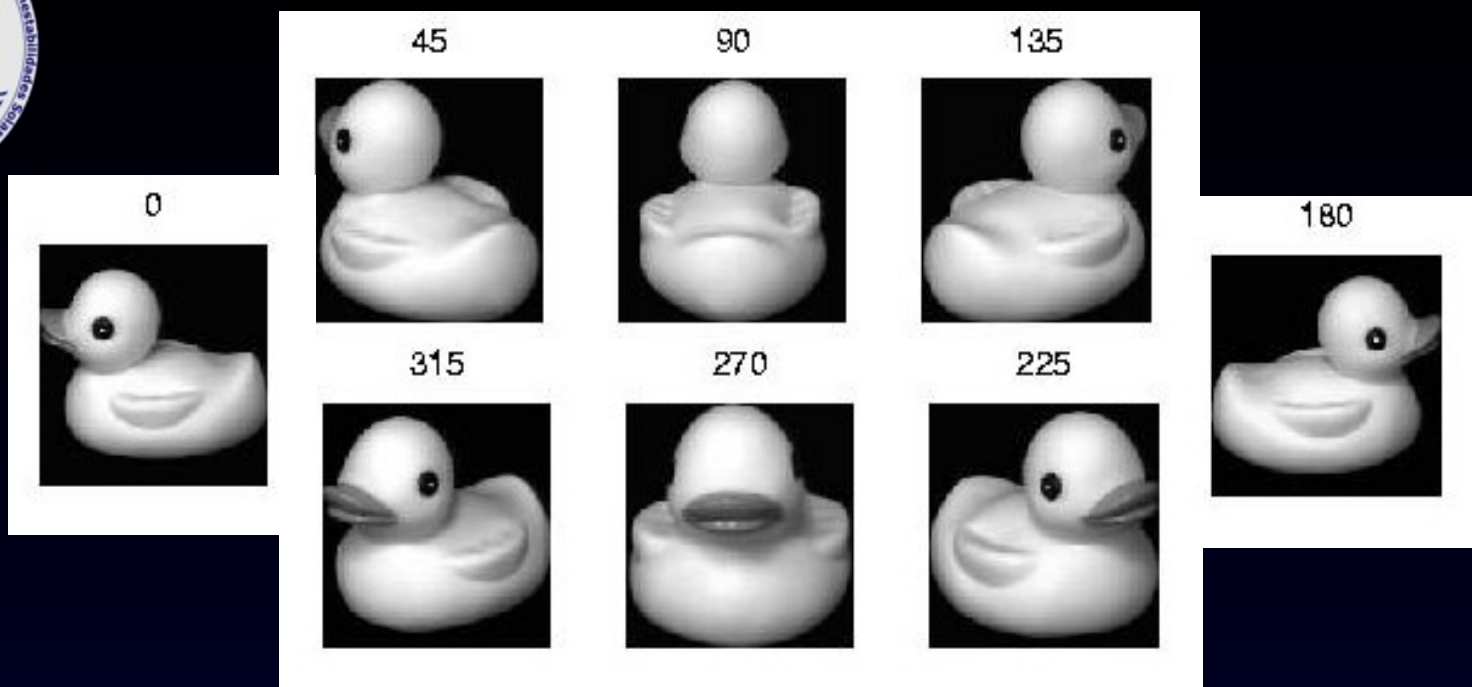
A. López Ariste

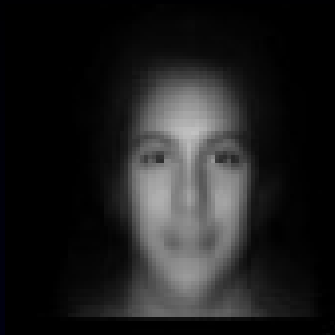


# PCA in 2 D

$$S = S_{\text{mean}} + e_1 s_1 + \dots$$









sample

1

6

11

16

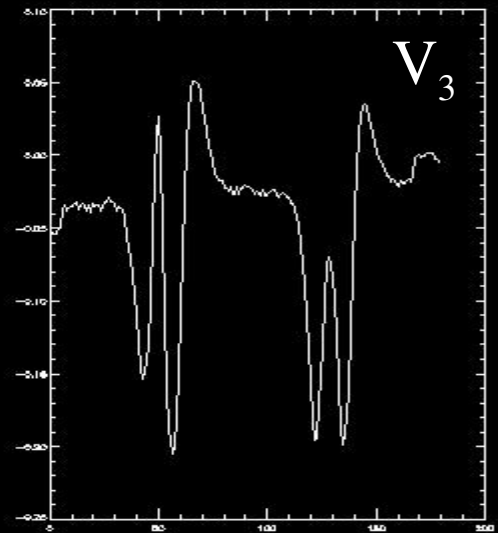
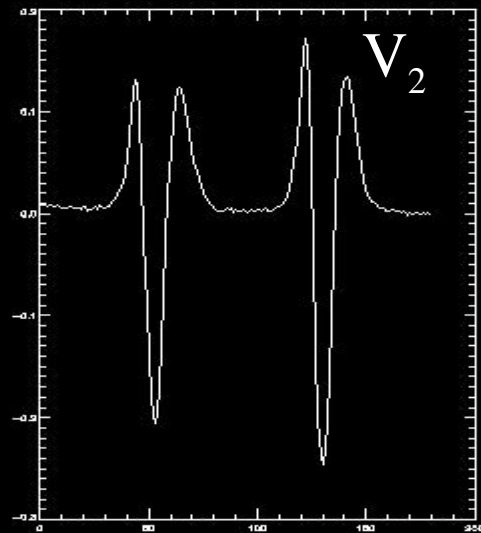
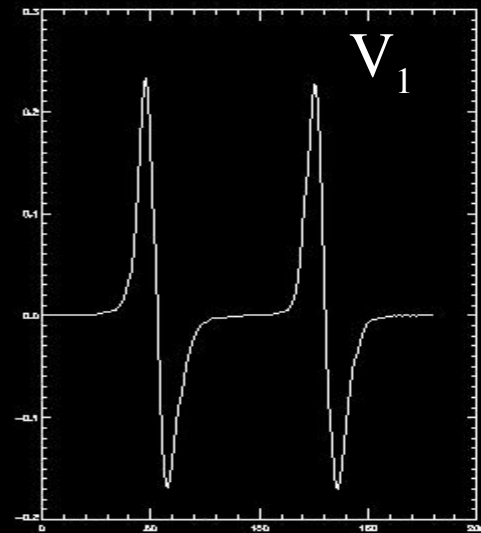
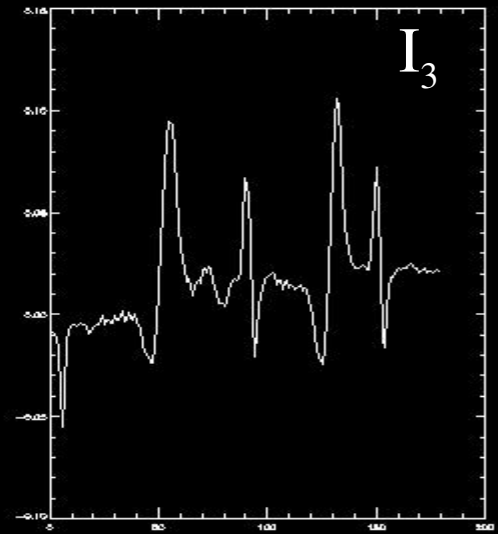
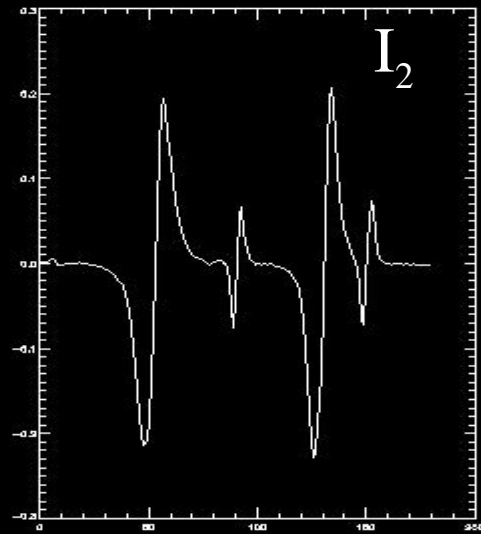
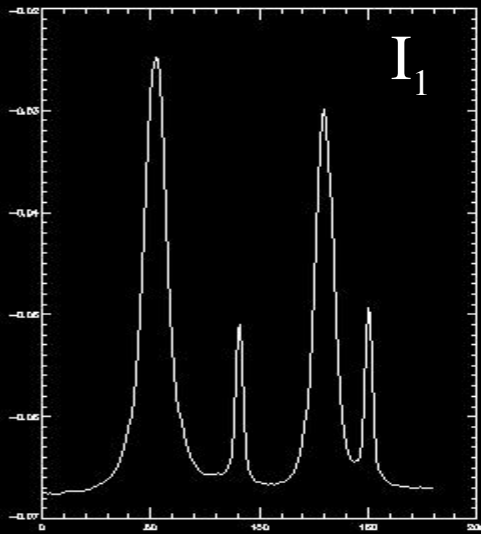
21

26



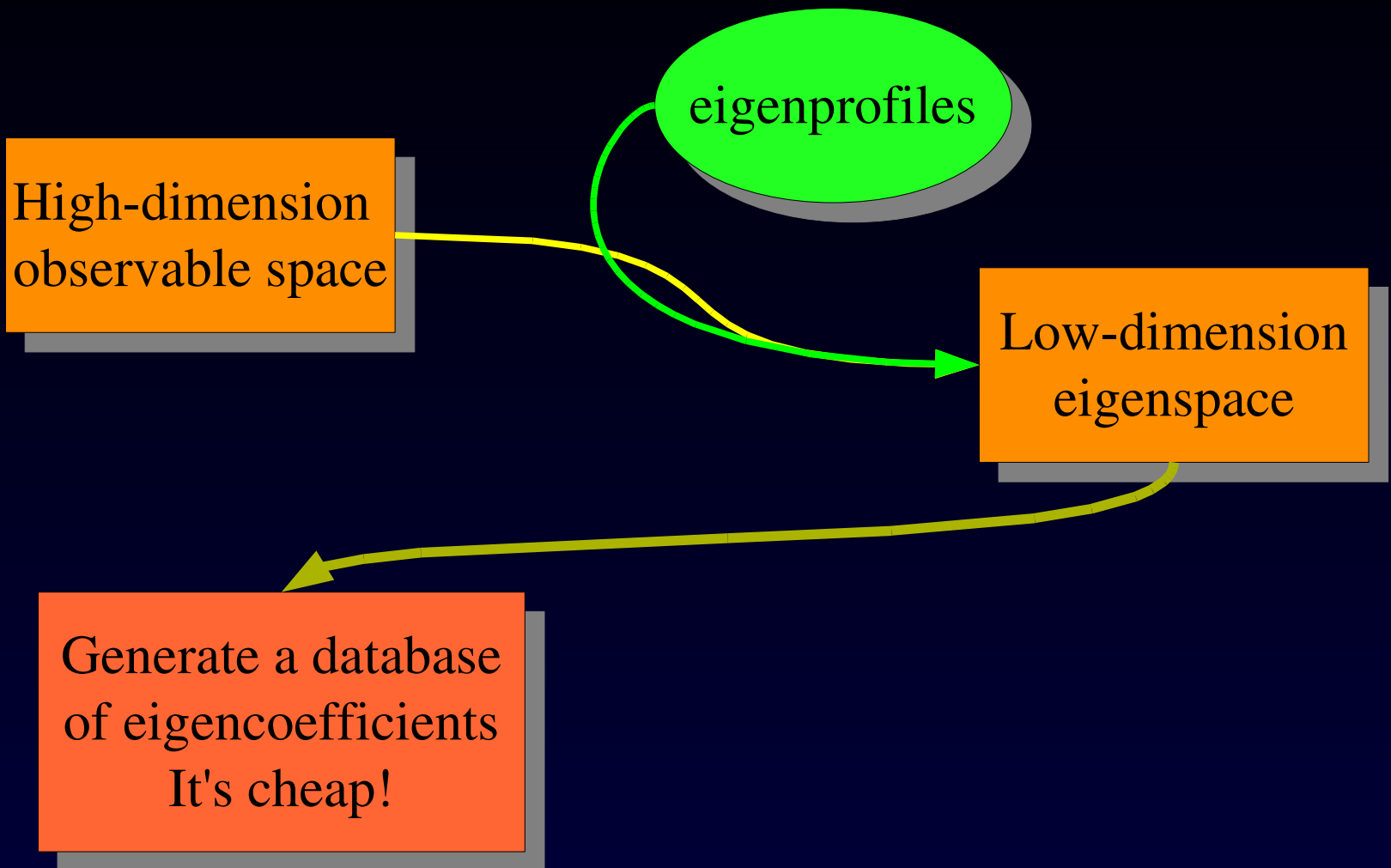


# Eigenprofiles for FeI @ 630 nm



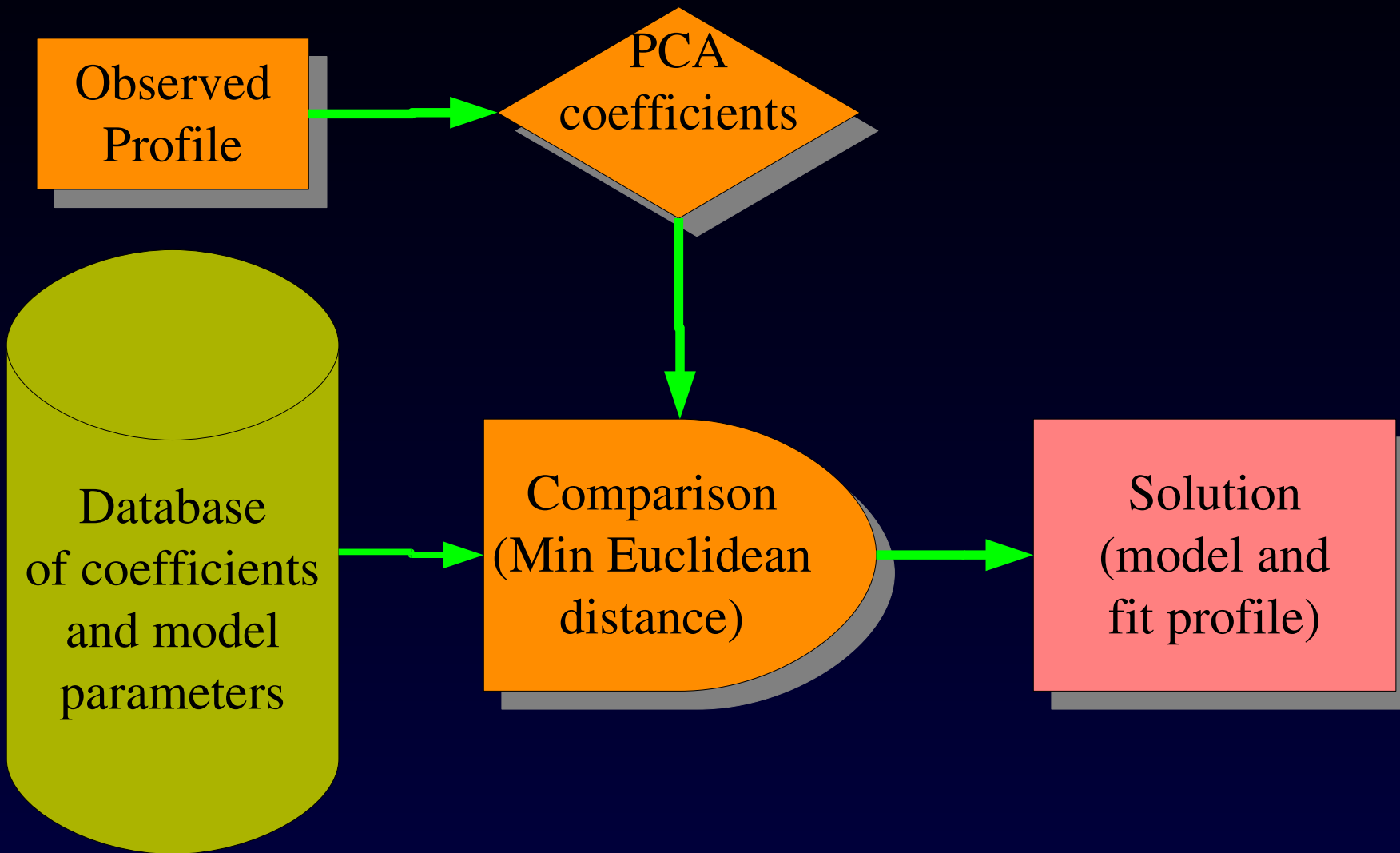


# From eigenprofiles to an inversion code





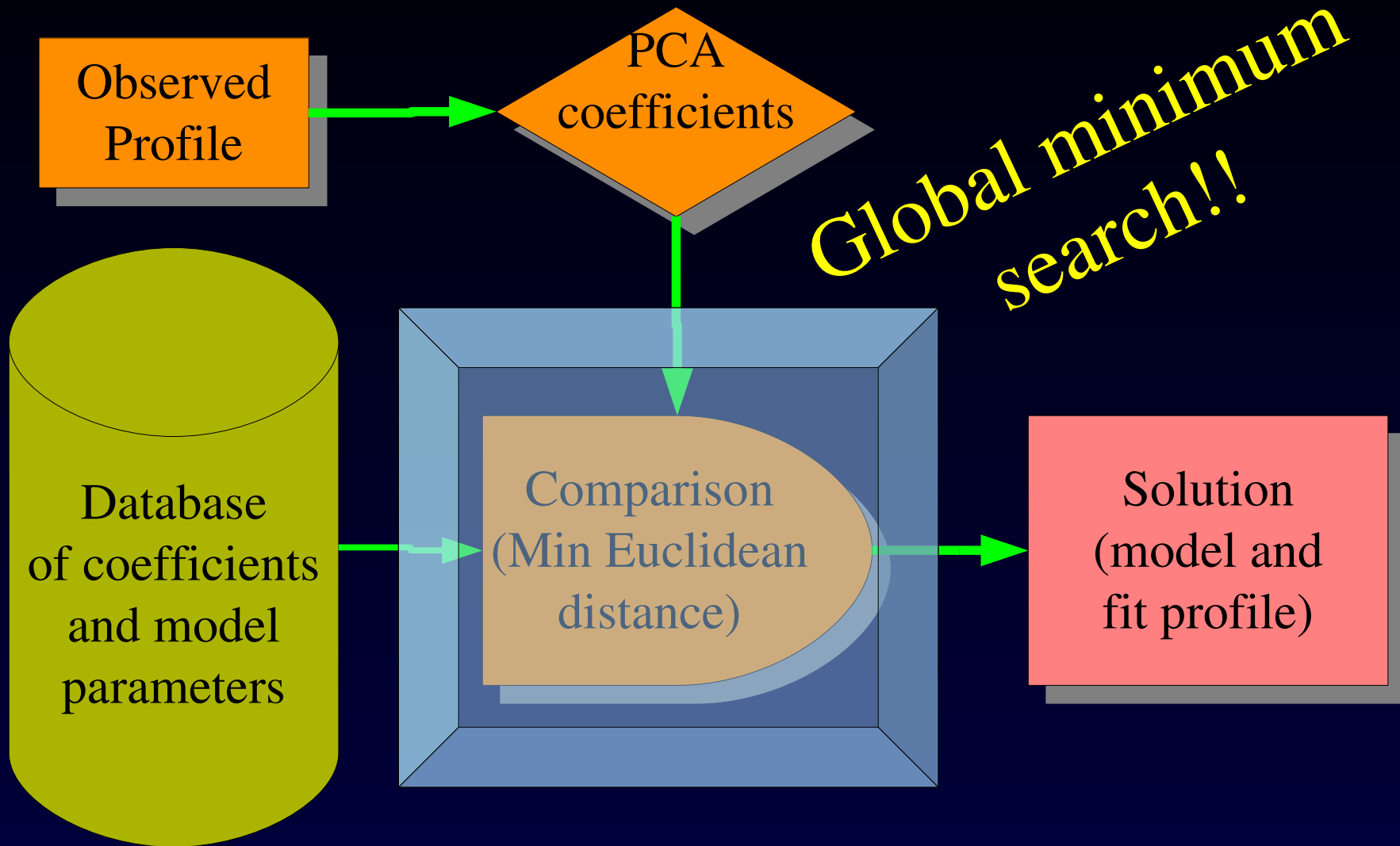
# Inversion algorithm





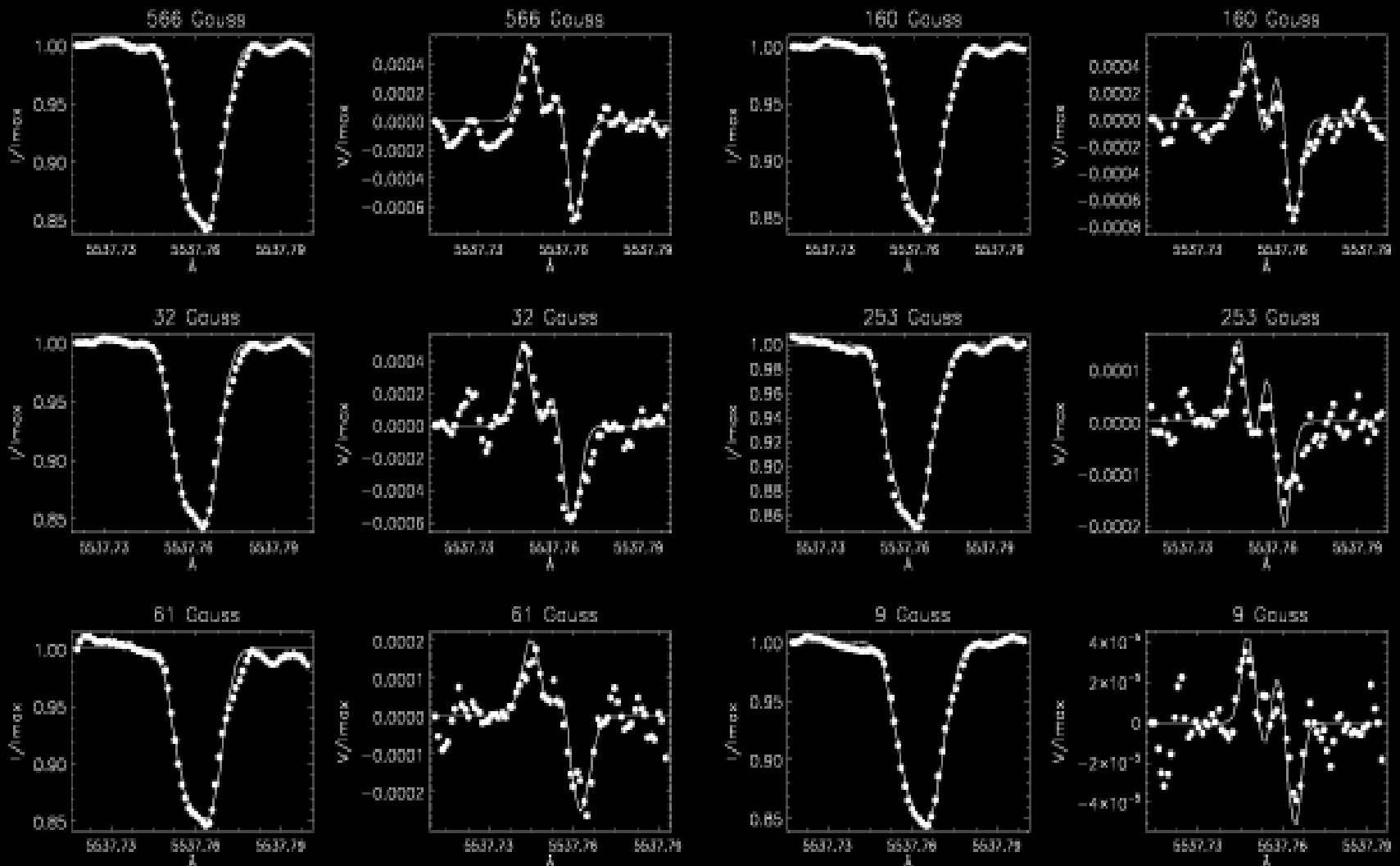


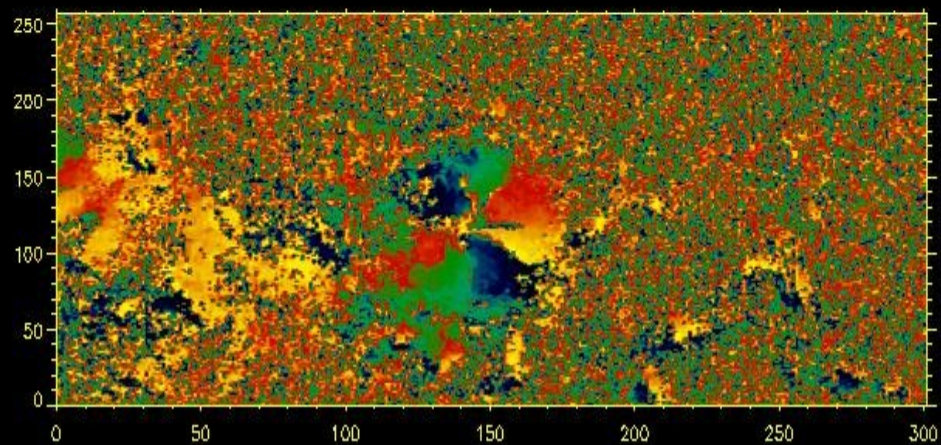
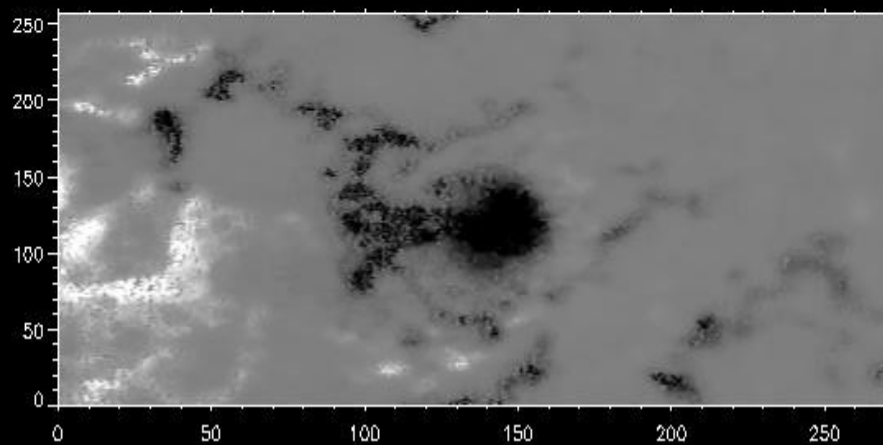
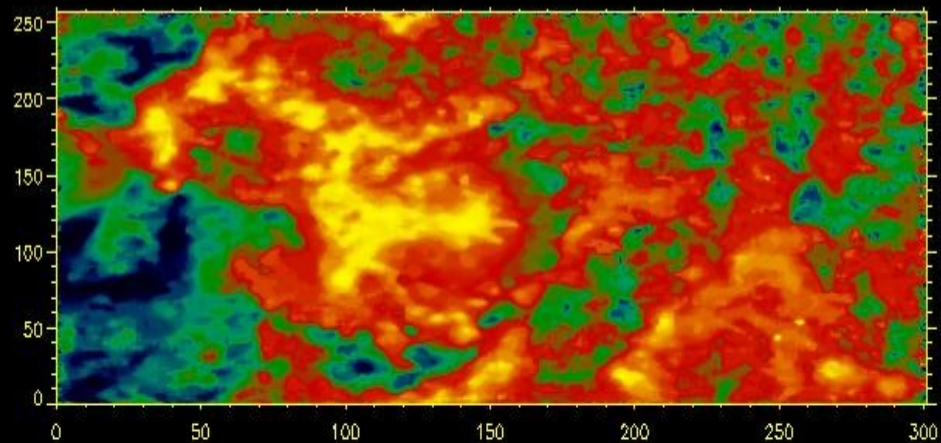
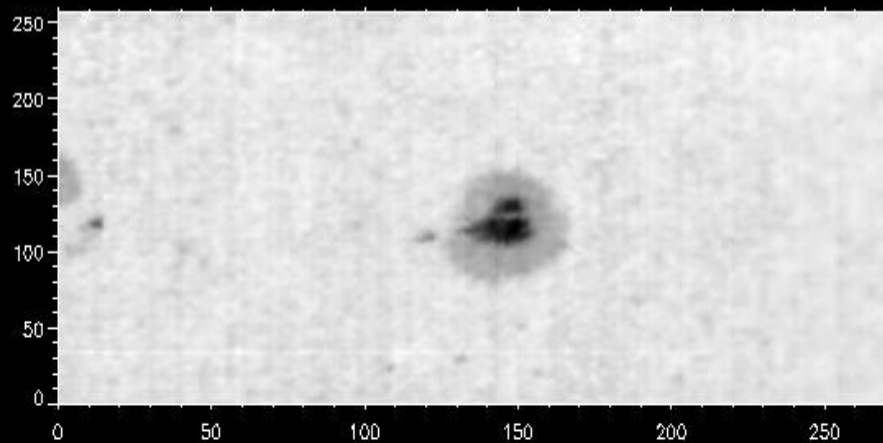
# Inversion algorithm

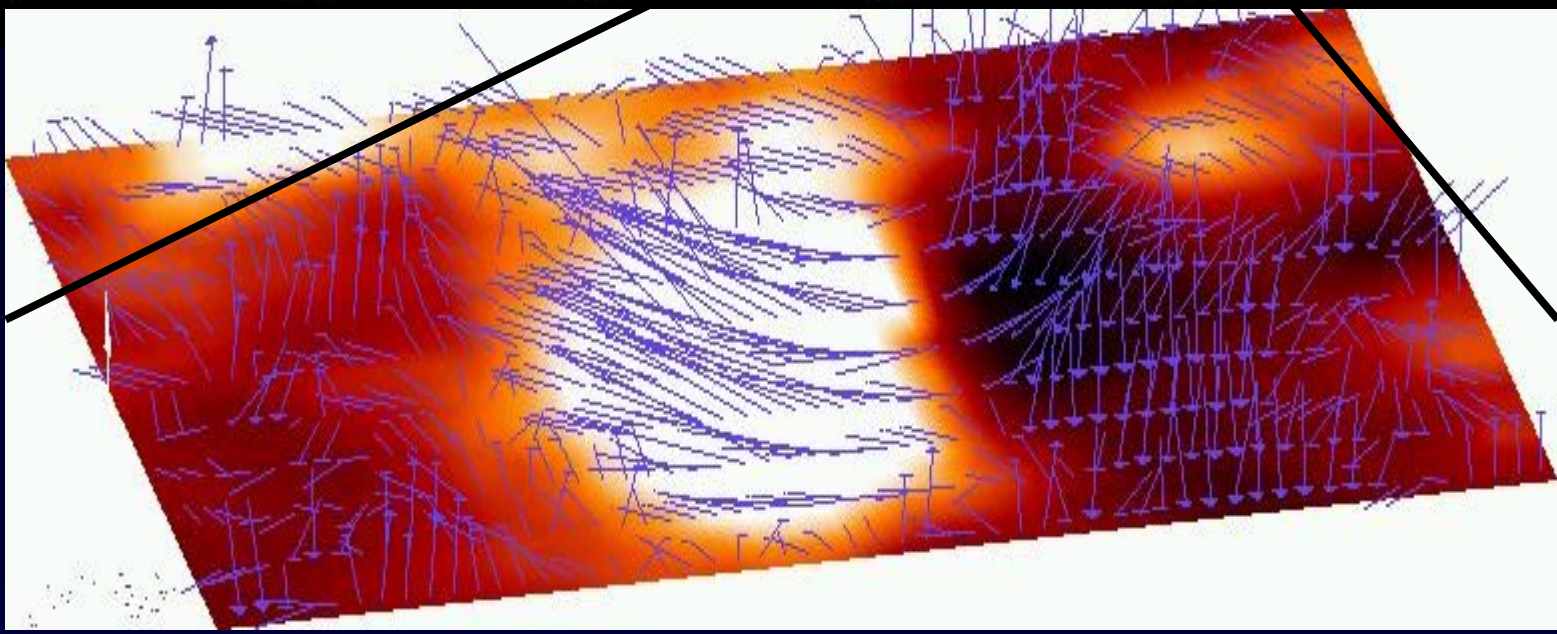
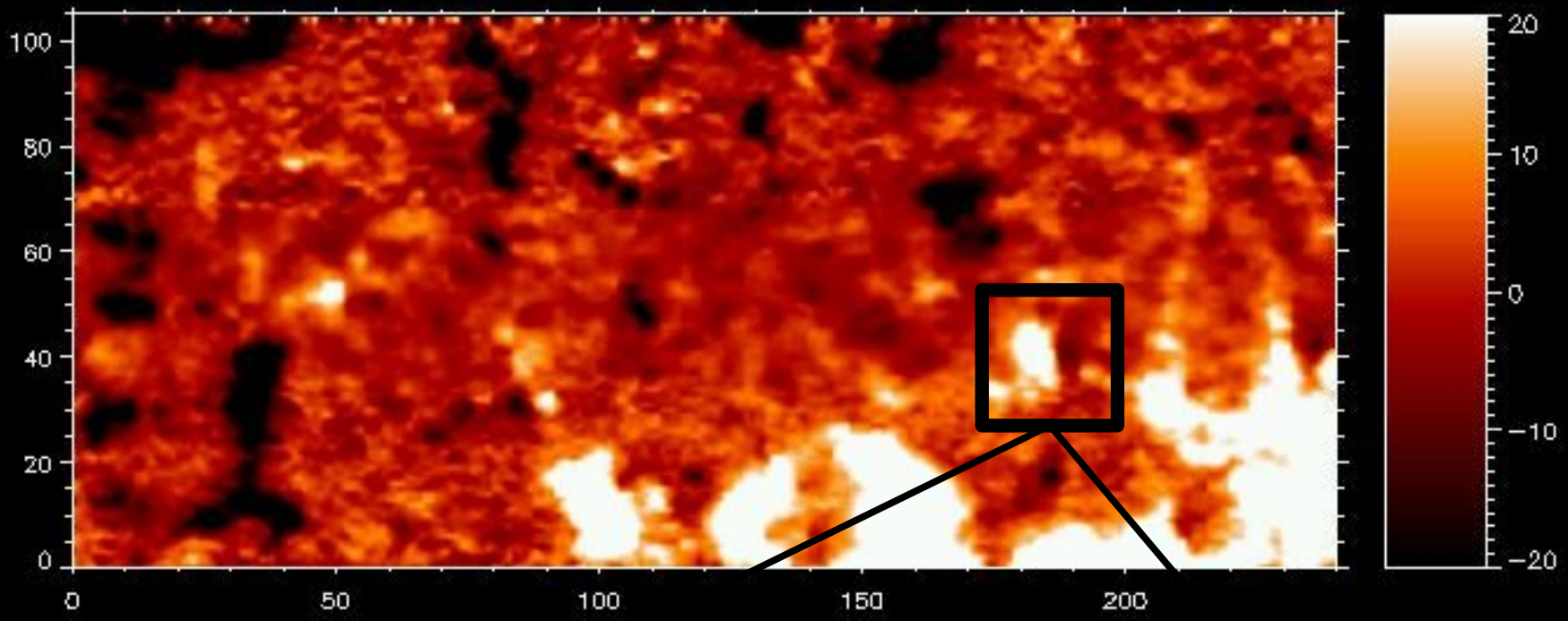




# Example of fits of a MnI line (Stokes I and V)



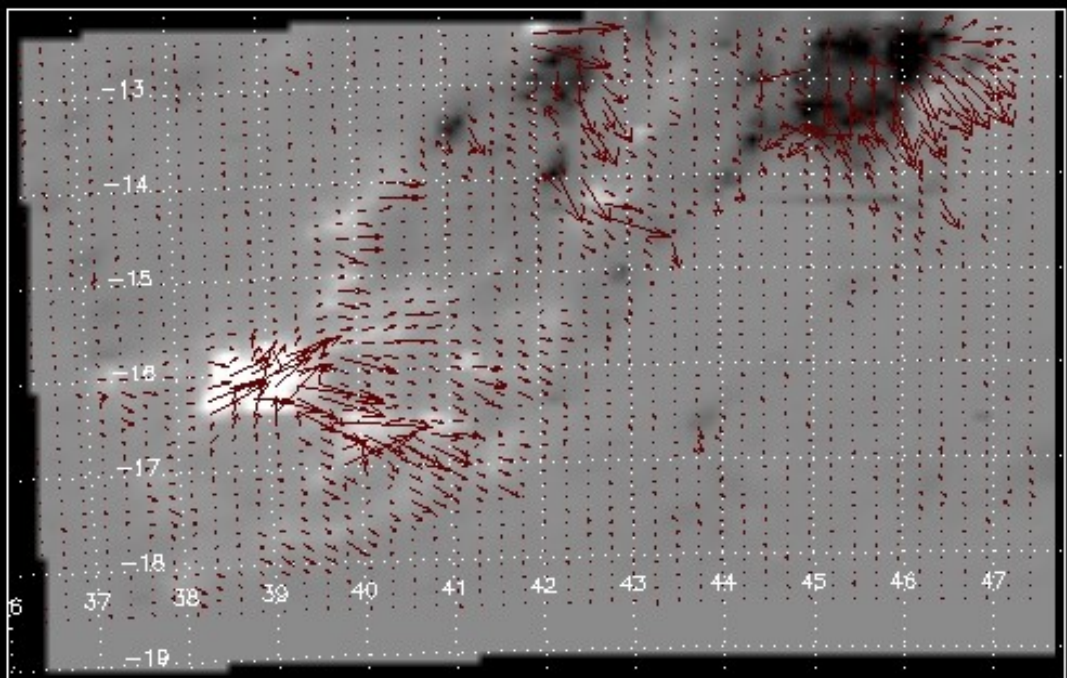






# VIEW INVERTED MAPS

You are looking at the FITS file:t001\_b1303\_sp\_20051107\_08164266\_m3.fits



Map rendering parameter:  Color Table

387

Upper threshold

-461

Bottom threshold

◆ Azimuth

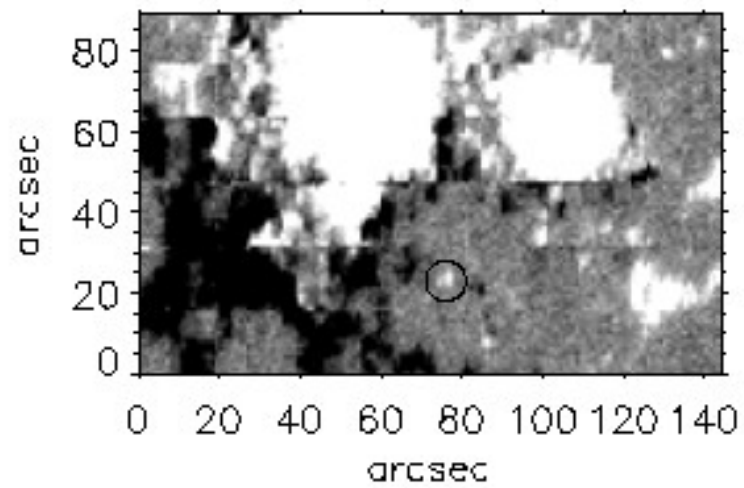
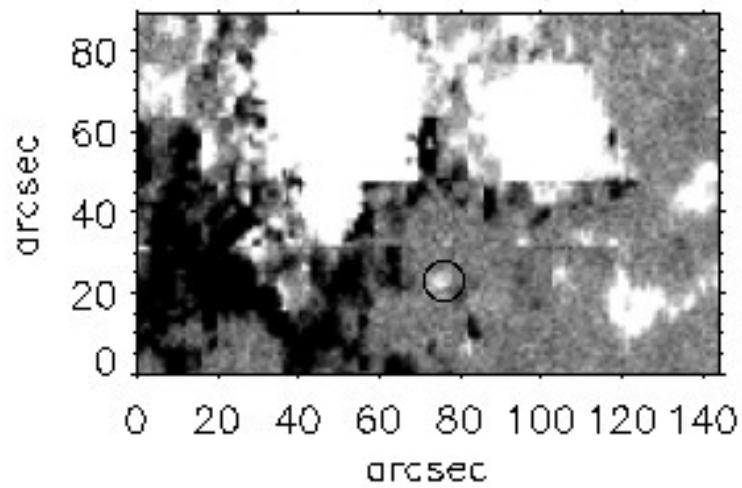
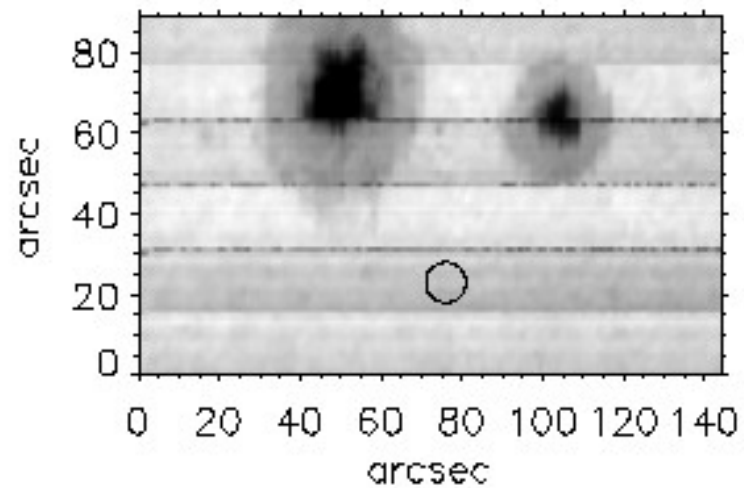
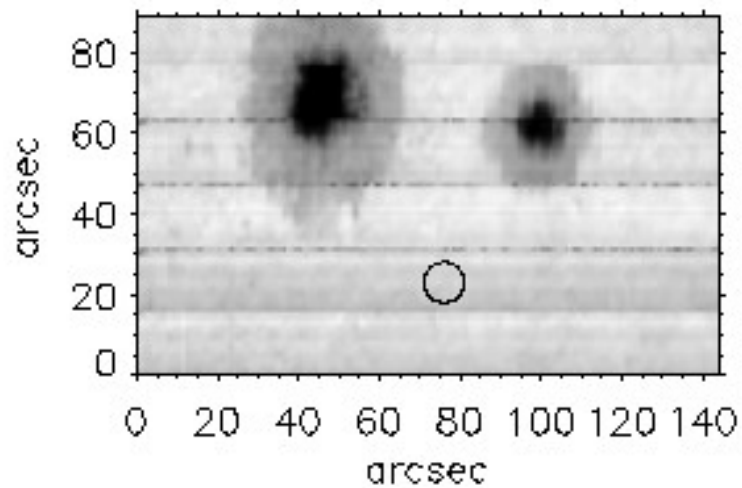
◆ Azimuth+180

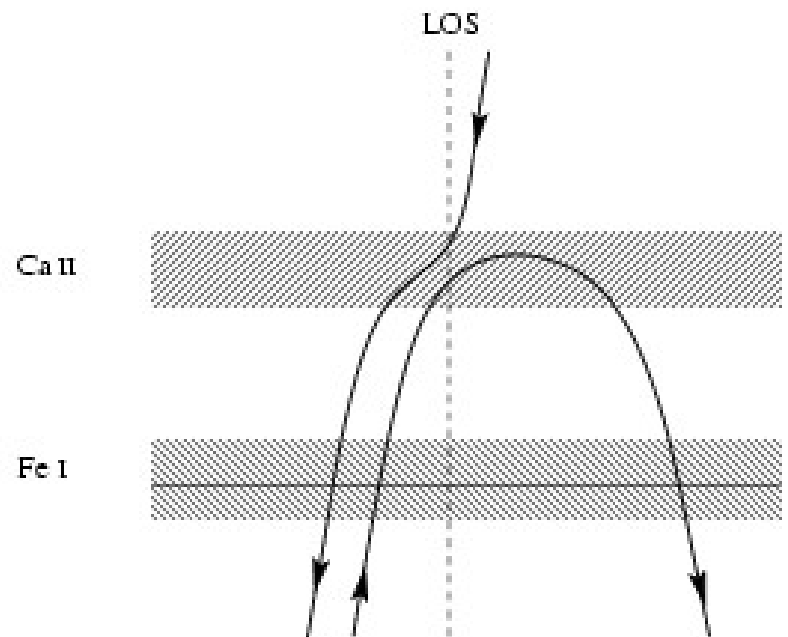
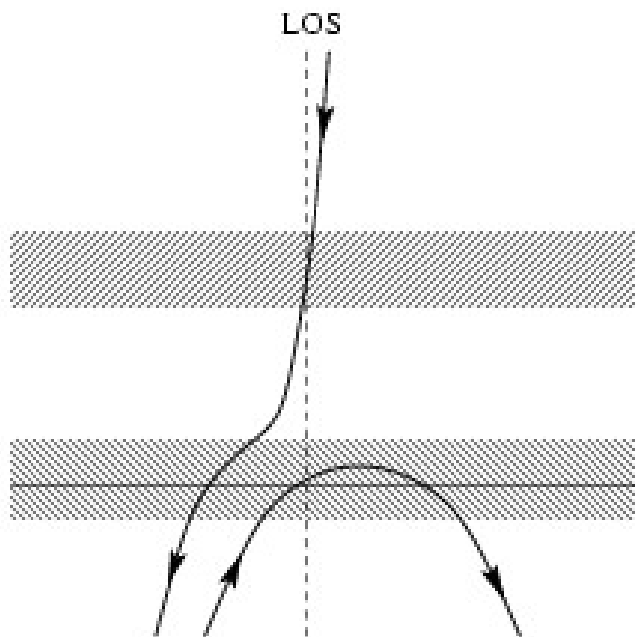
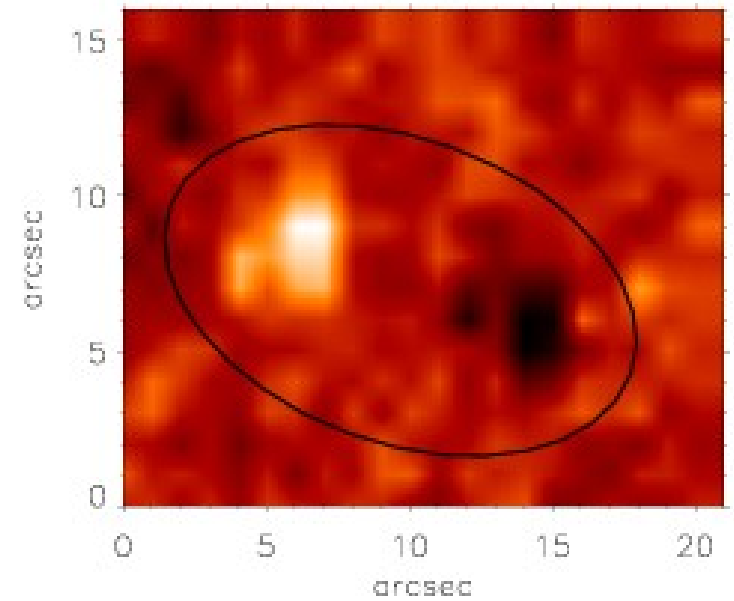
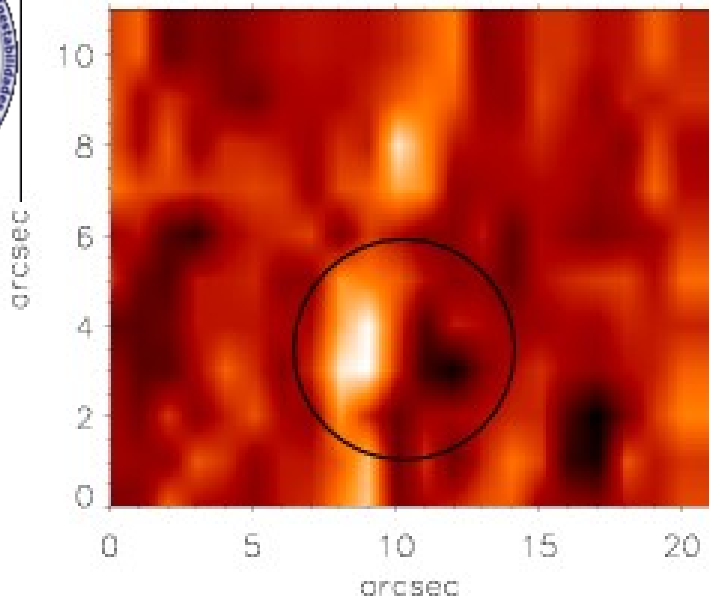
5

Arrow density

5

Arrow Length







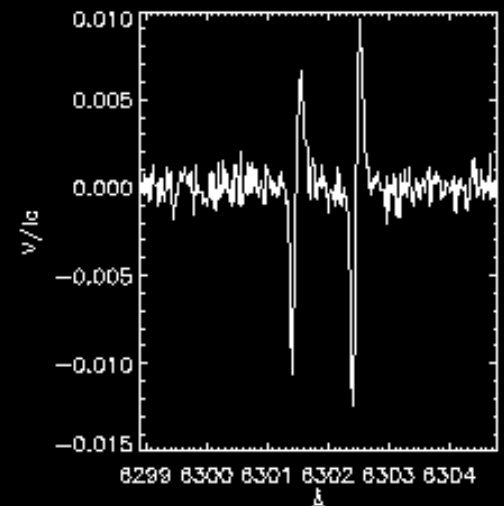
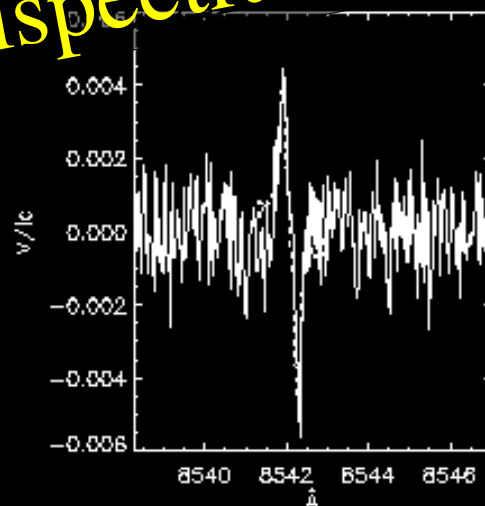
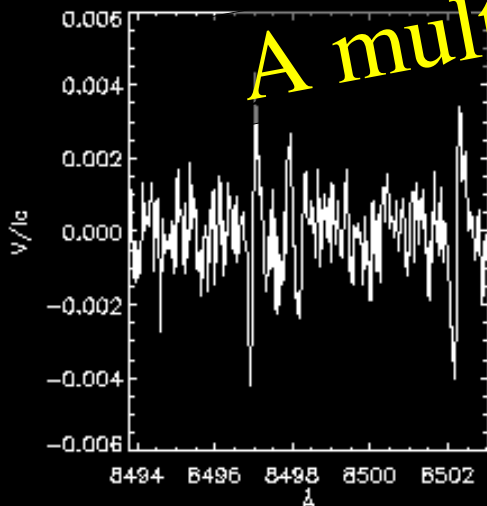
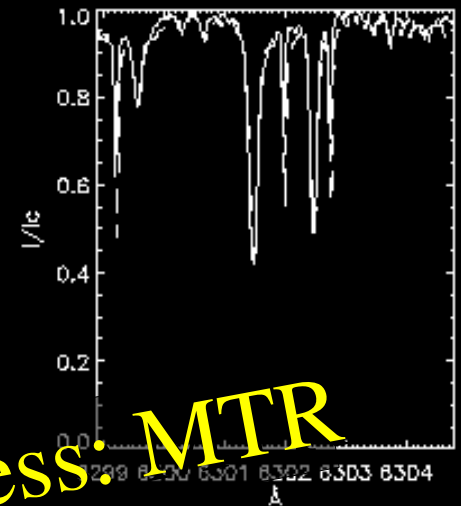
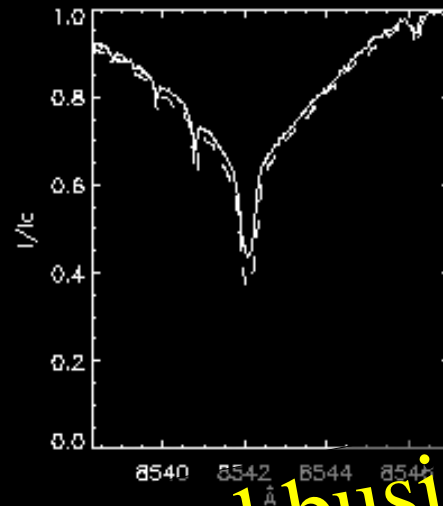
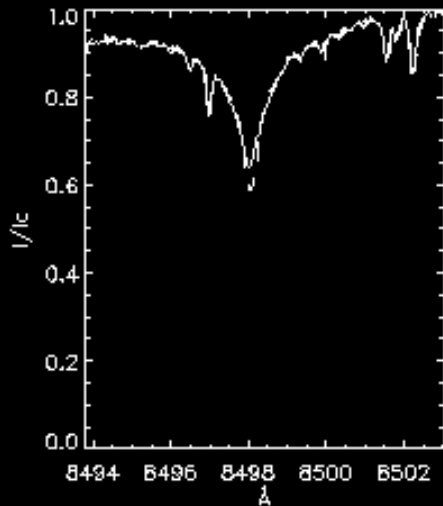
# What is next (my THEMIS perspective)

- High S/N polarimetry? : Tomorrow's talk
- Imaging?: No competitive with other telescopes (SST/VTT/DST)
- Photospheric polarimetry?: No competitive with Hinode
- Temporal evolution: No competitive with Hinode/HMI/SOLIS
- Chromosphere-Photosphere magnetic connexion?: YES
- Photospheric “polymagnetism”?: YES





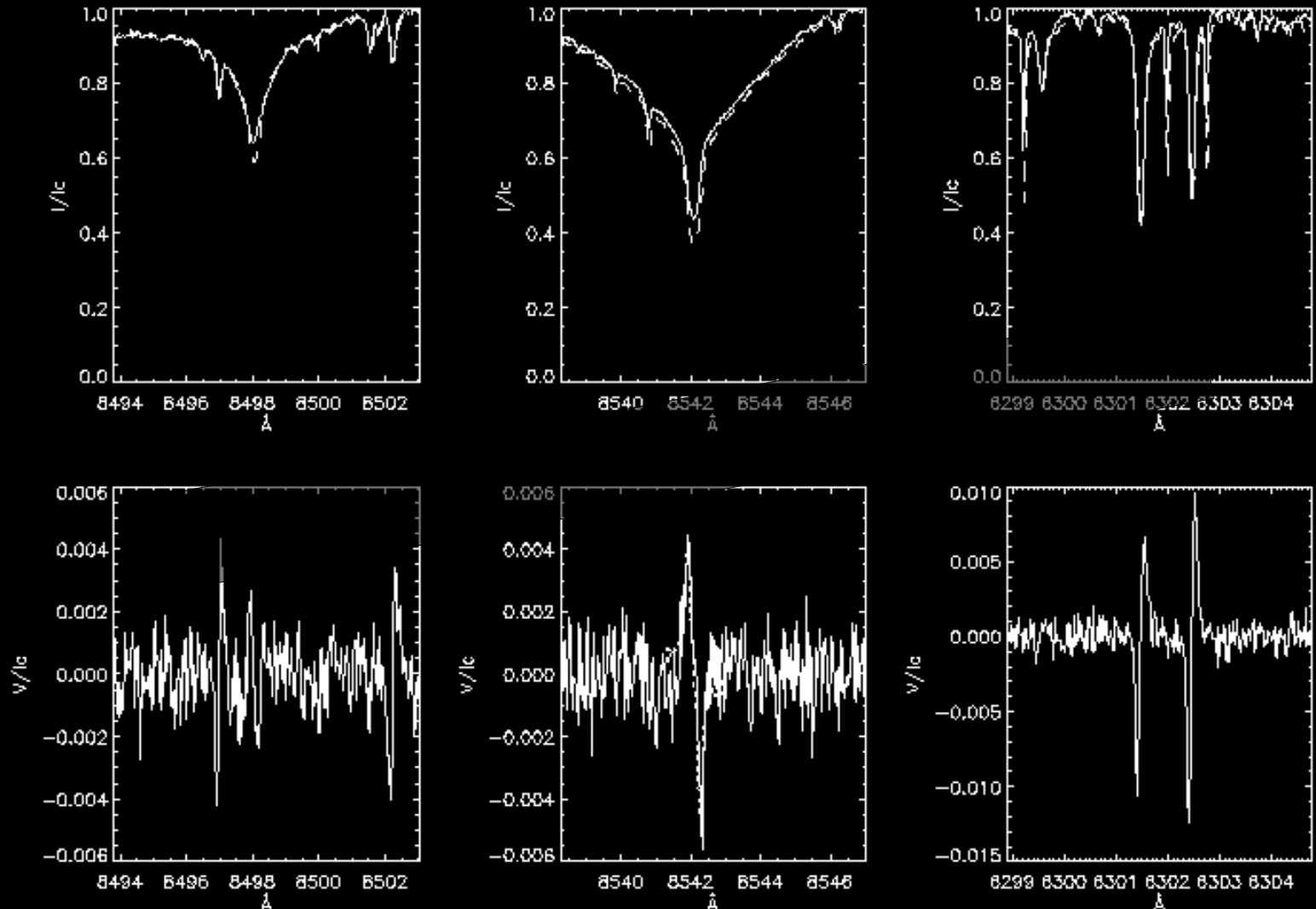
# Chromosphere-Photosphere connection

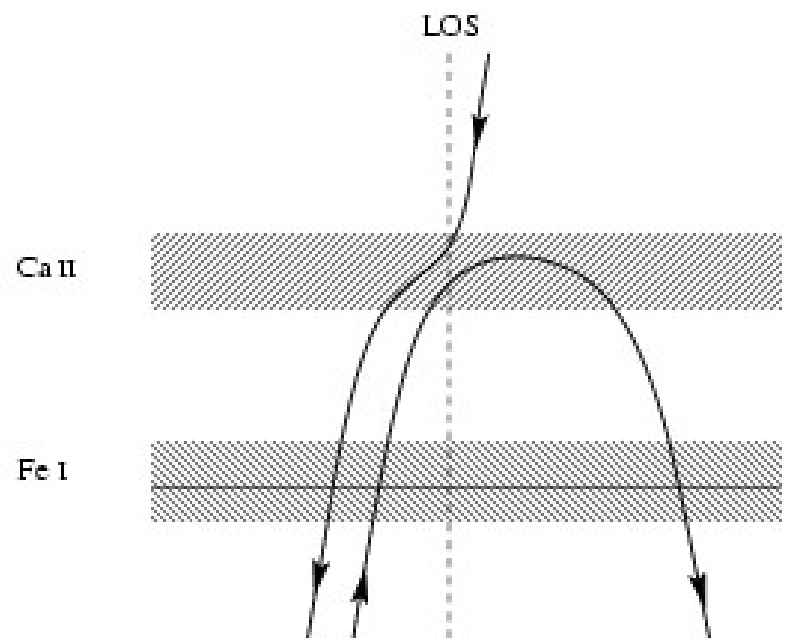
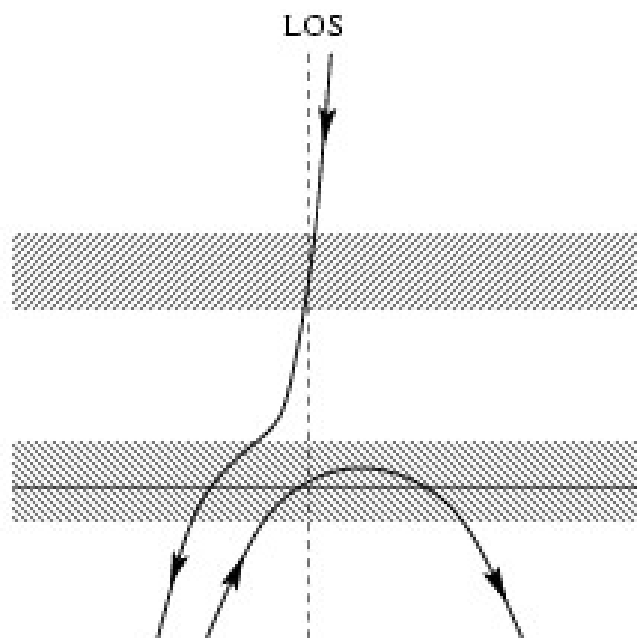
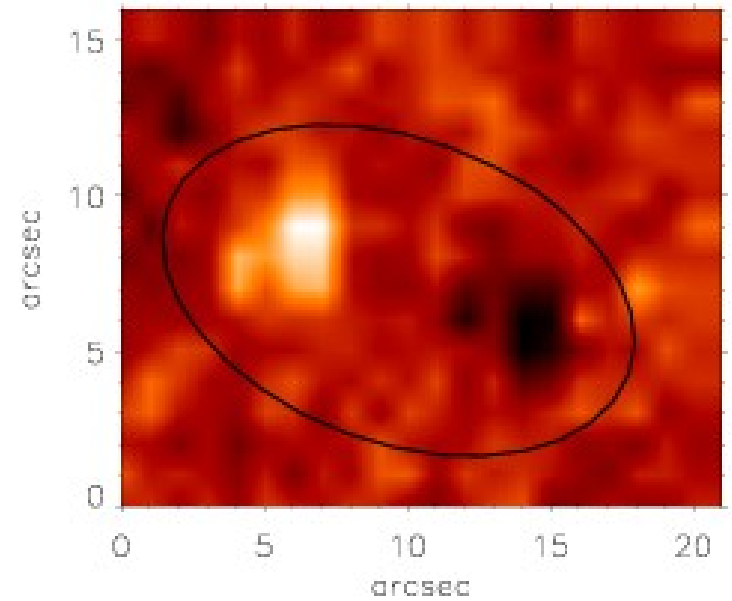
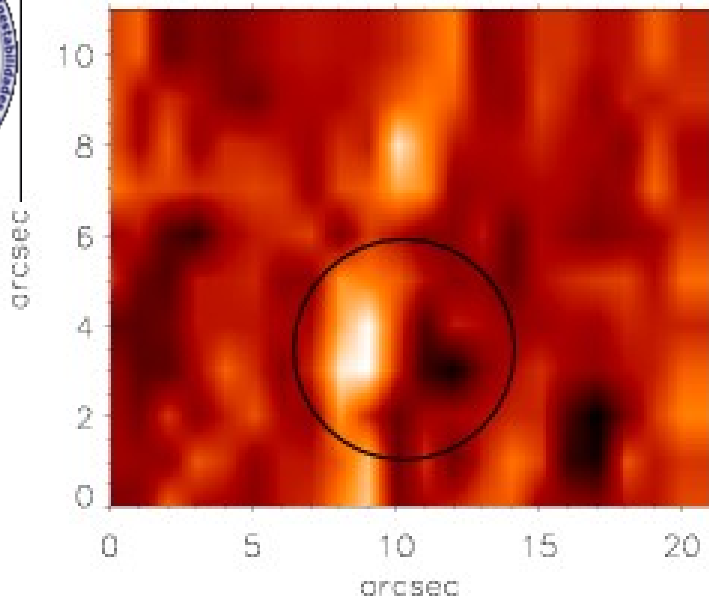


A multispectral business: MTR



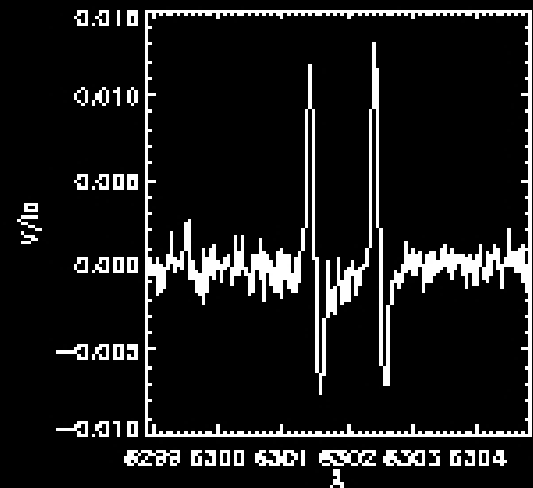
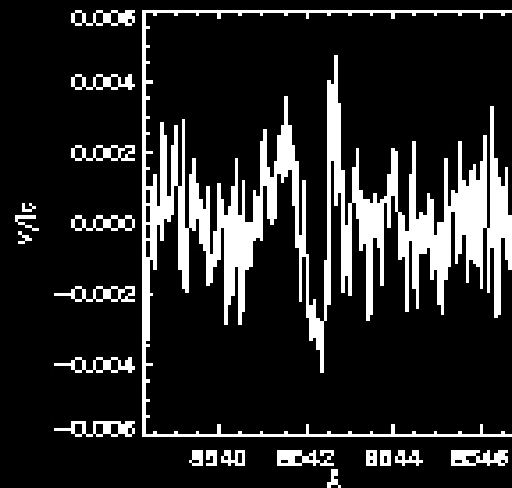
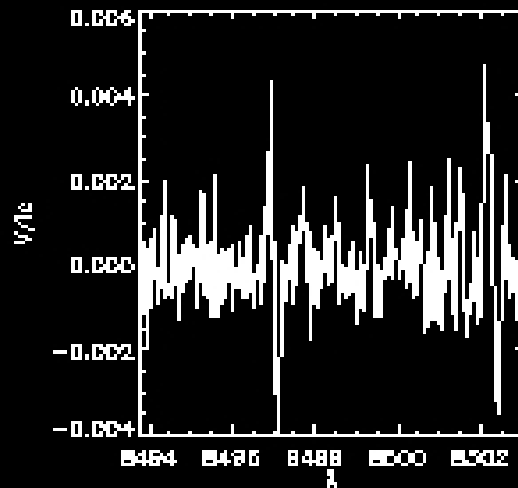
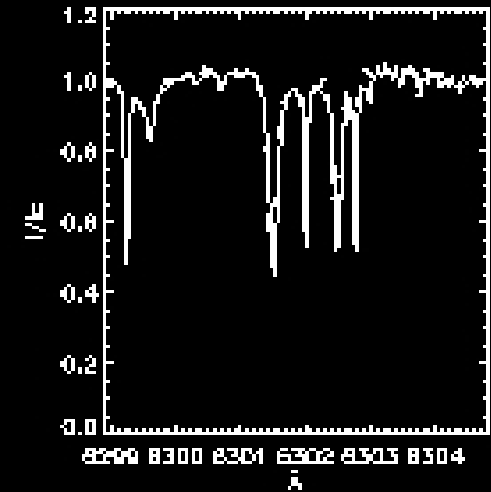
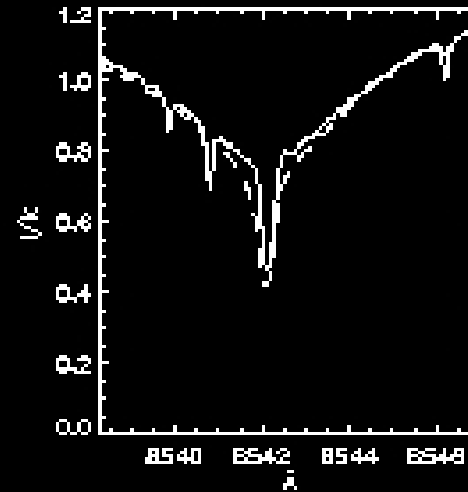
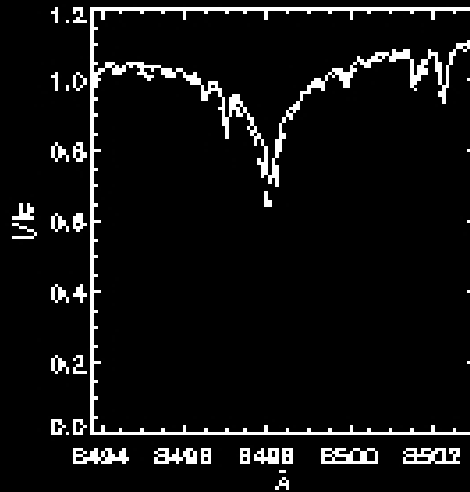
# Chromosphere-Photosphere connection





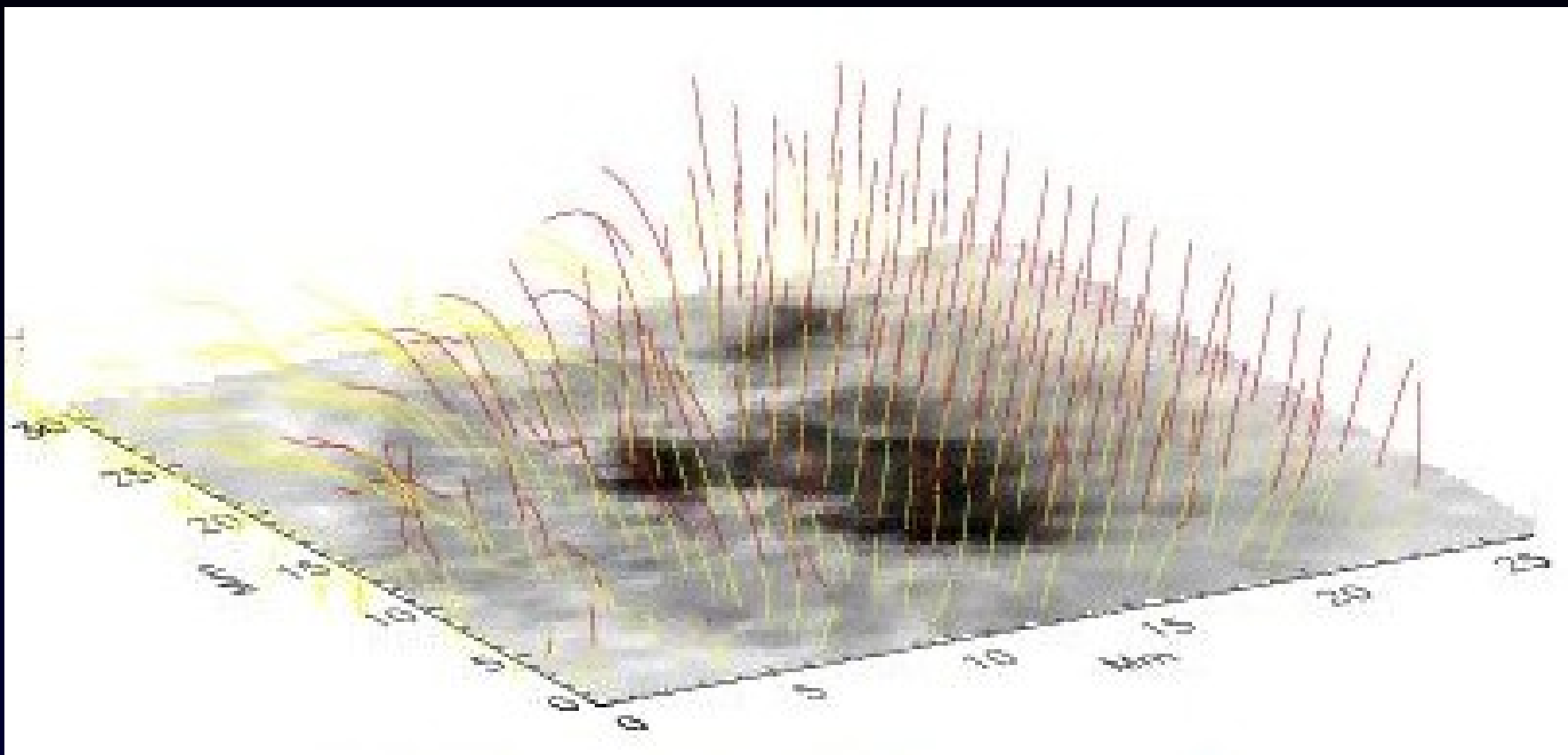


# Chromosphere-Photosphere connection



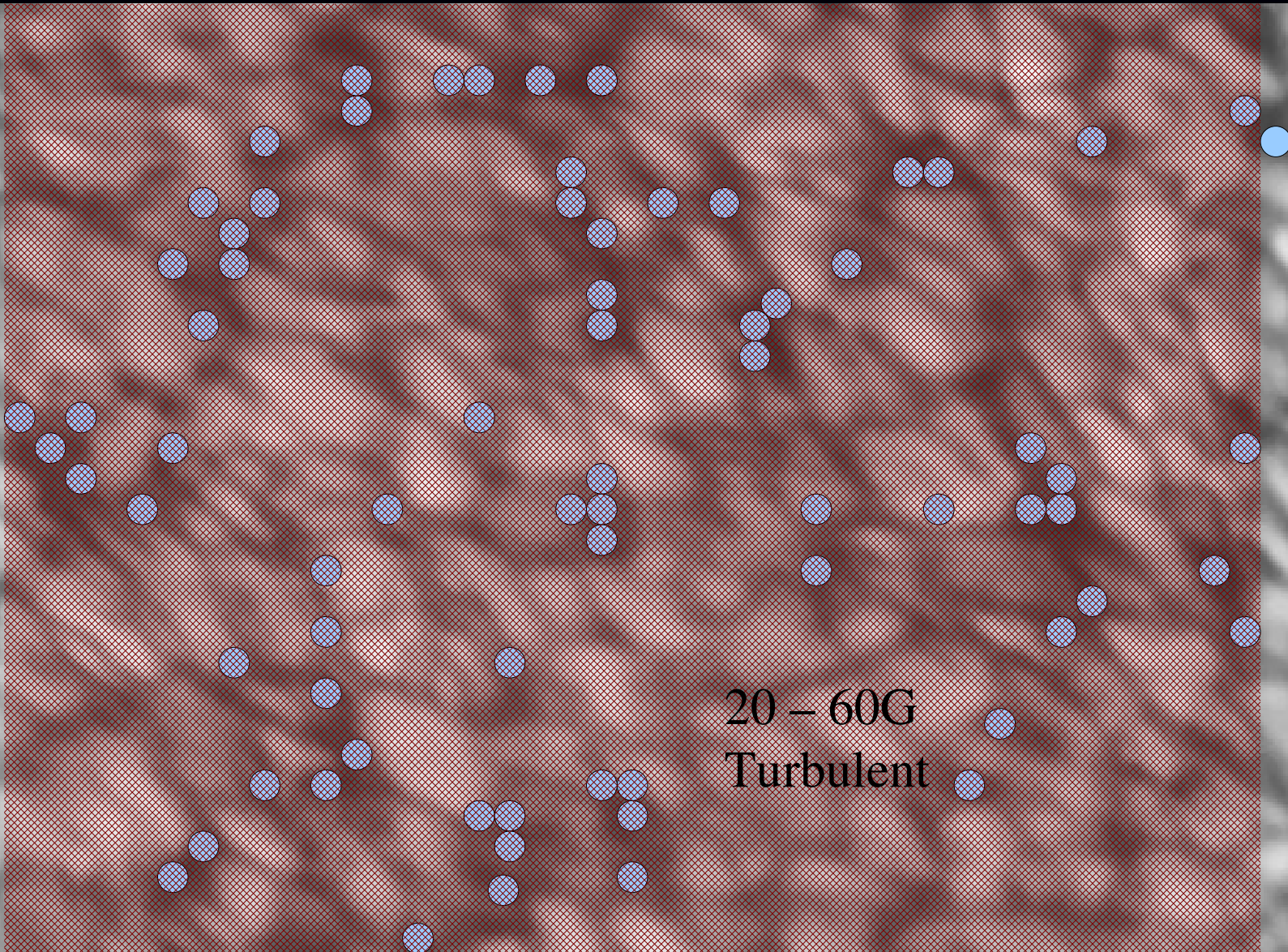


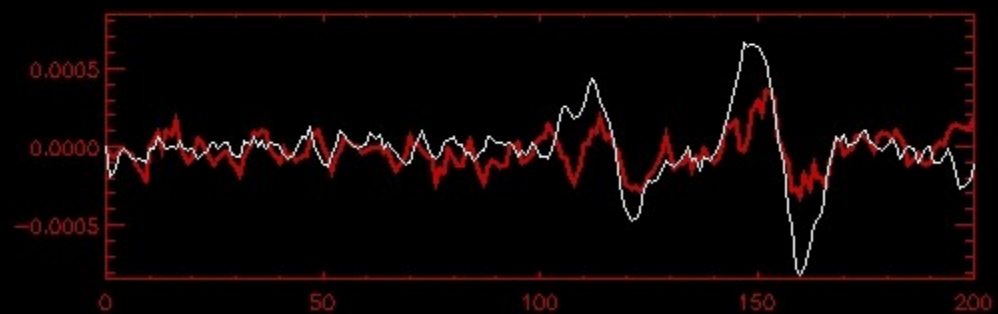
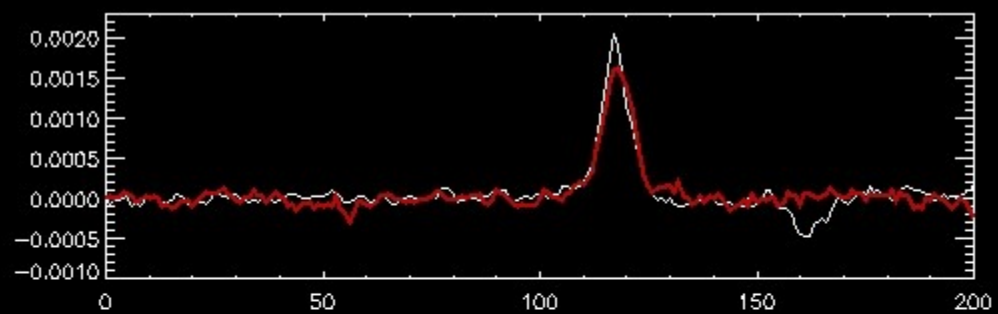
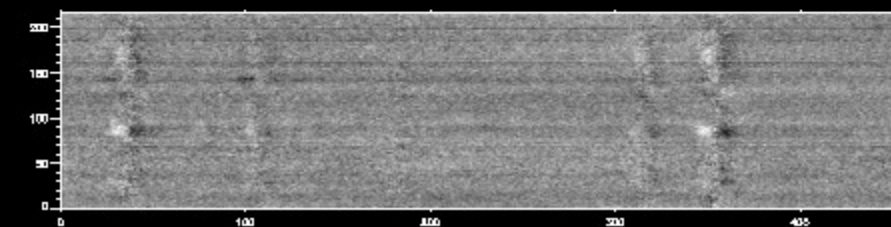
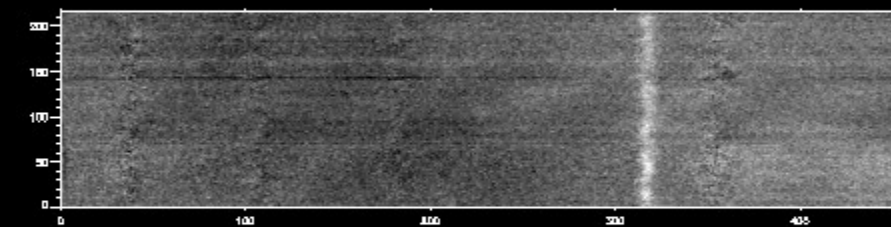
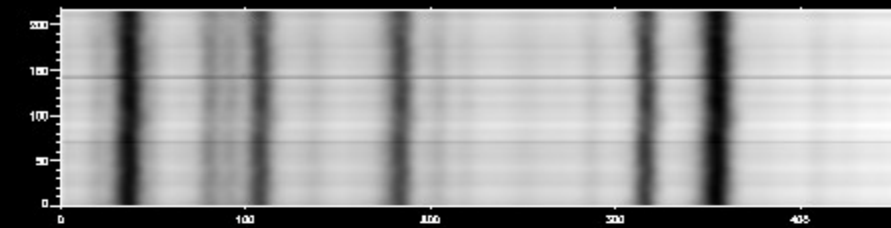
# Chromosphere-Photosphere connection





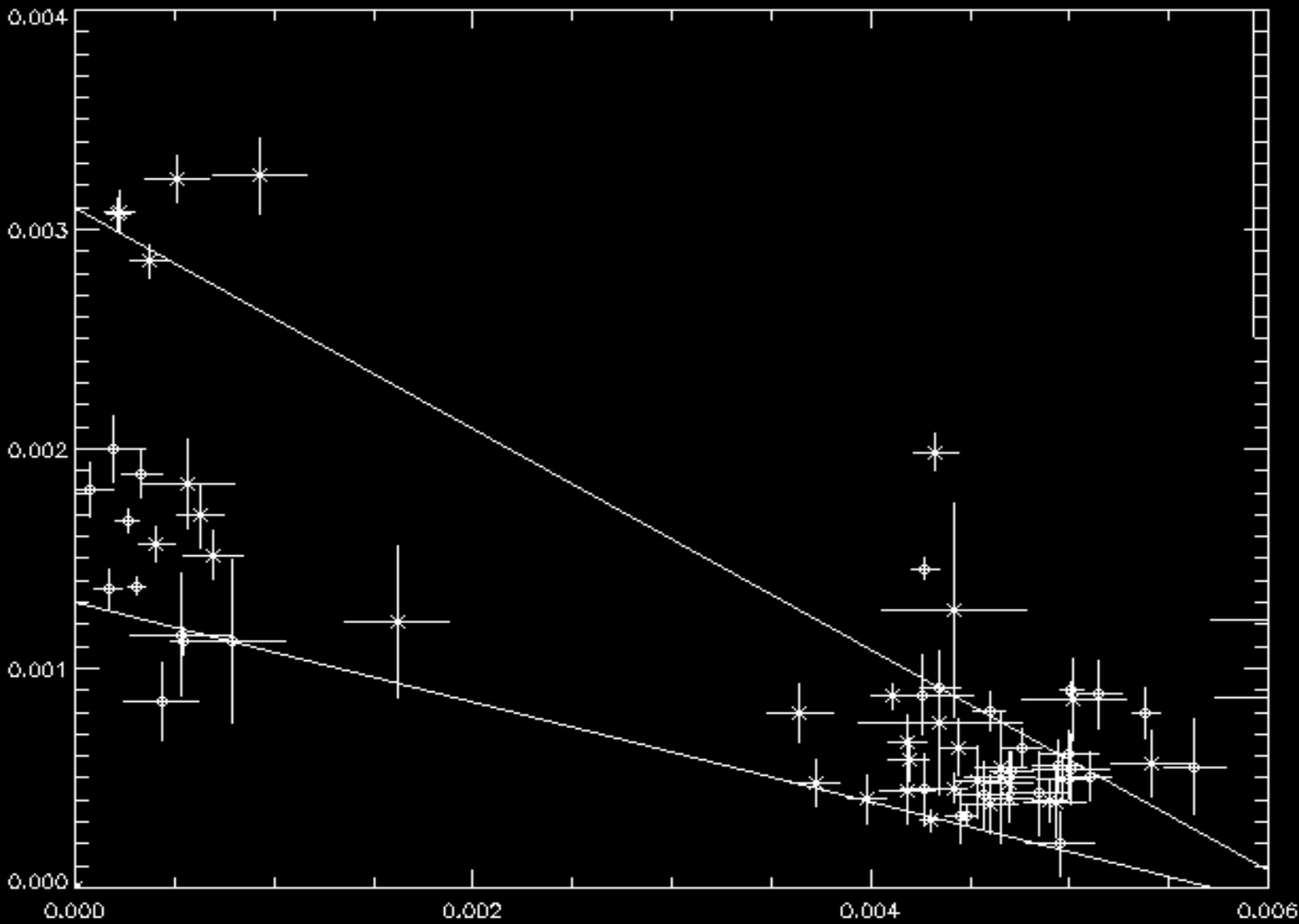
# Photospheric Polymagnetism





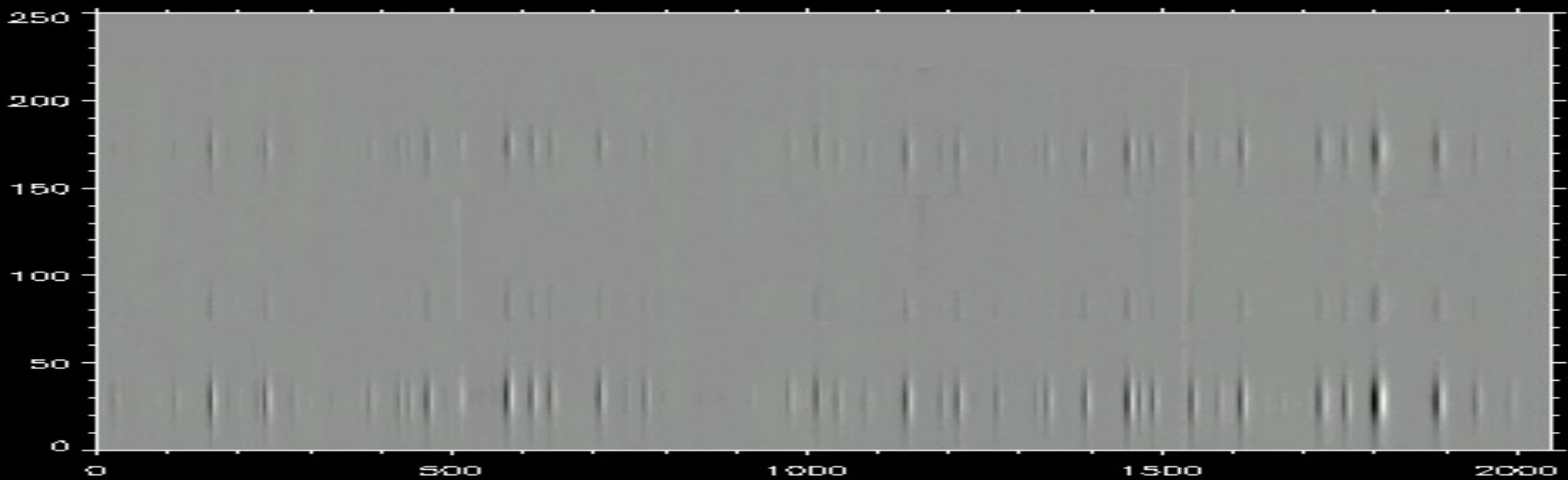
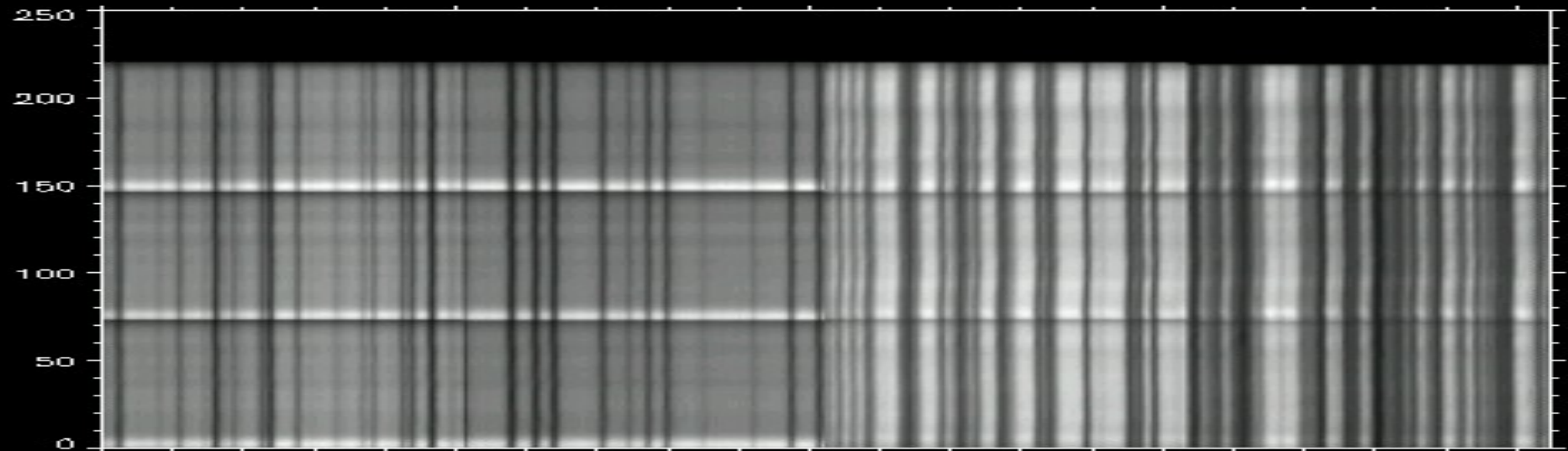


Stokes V amplitude



Stokes Q Amplitude









# Zeeman effect of turbulent fields?













Traditional Zeeman agrees?

















# Extra info



