



# Quiet Sun magnetism seen by an Mn I line

*Arturo López Ariste*



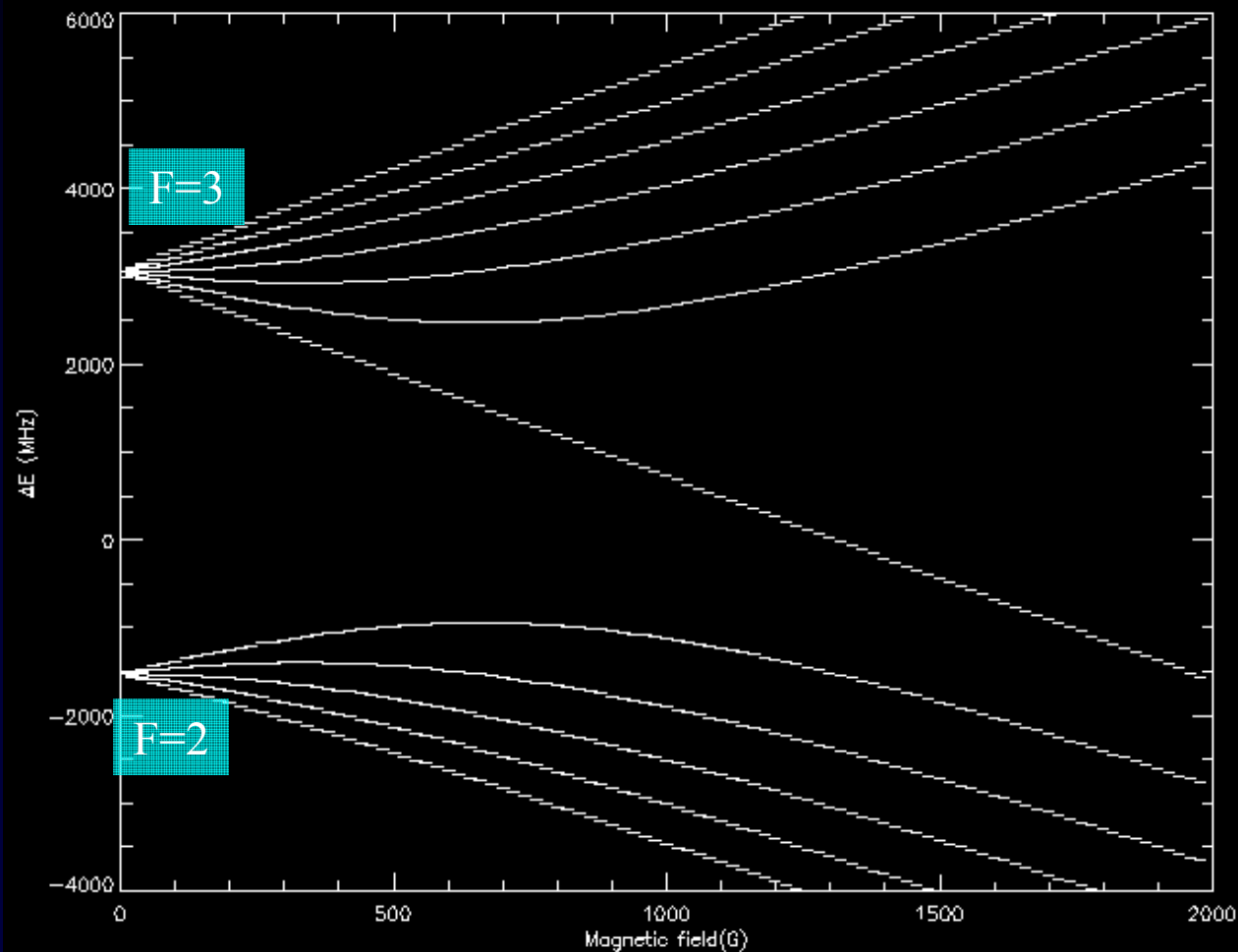
# HFS: Reminder

Mn I, Fine  
Structure:  
 $a^6D_{1/2}$

Mn I, Nucleus :  
 $I=2.5$

$$F=I + J$$

Zeeman effect on  $F, M_F$





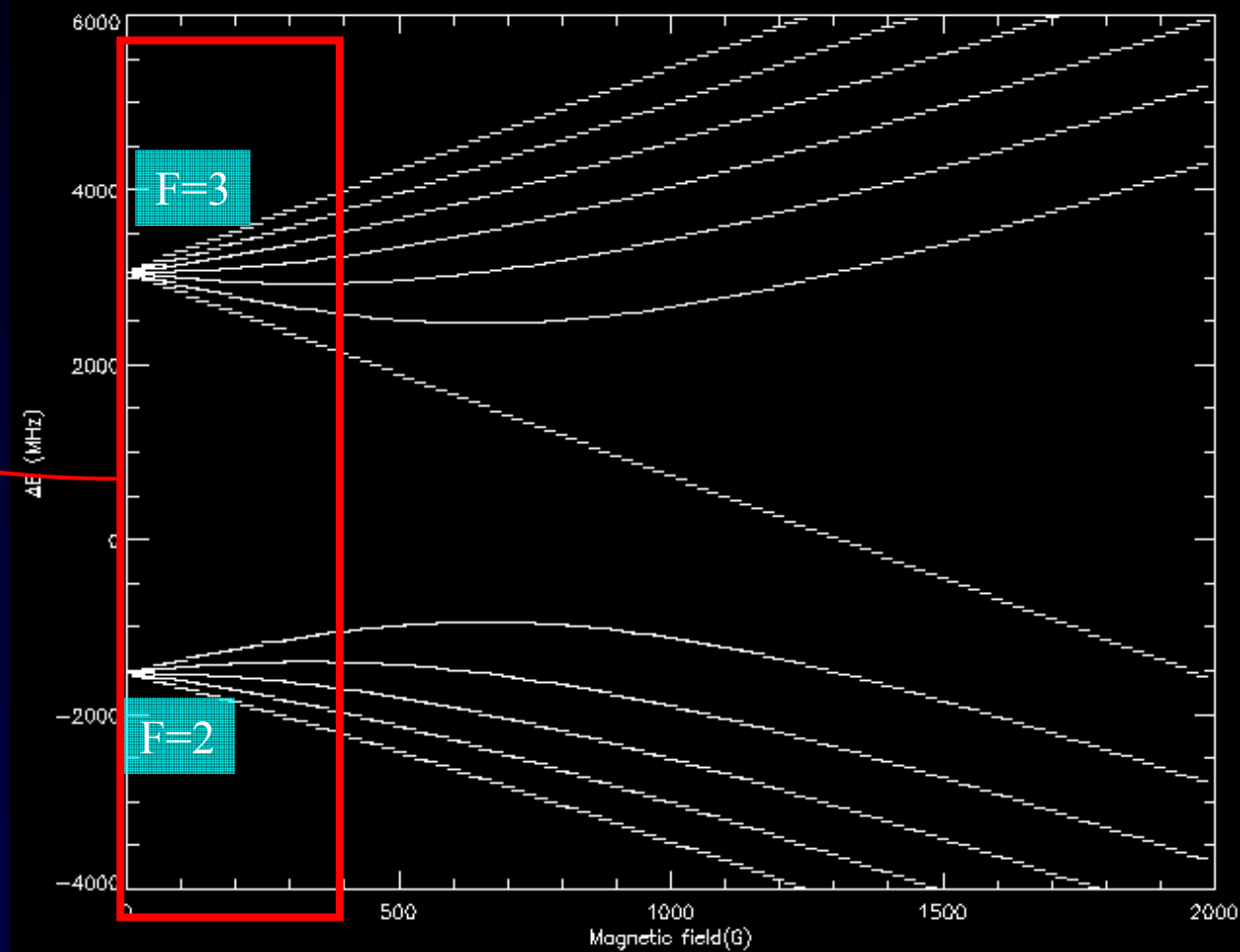
# HFS: Reminder

Mn I, Fine  
Structure:



Zeeman regime

$$F=I + J$$

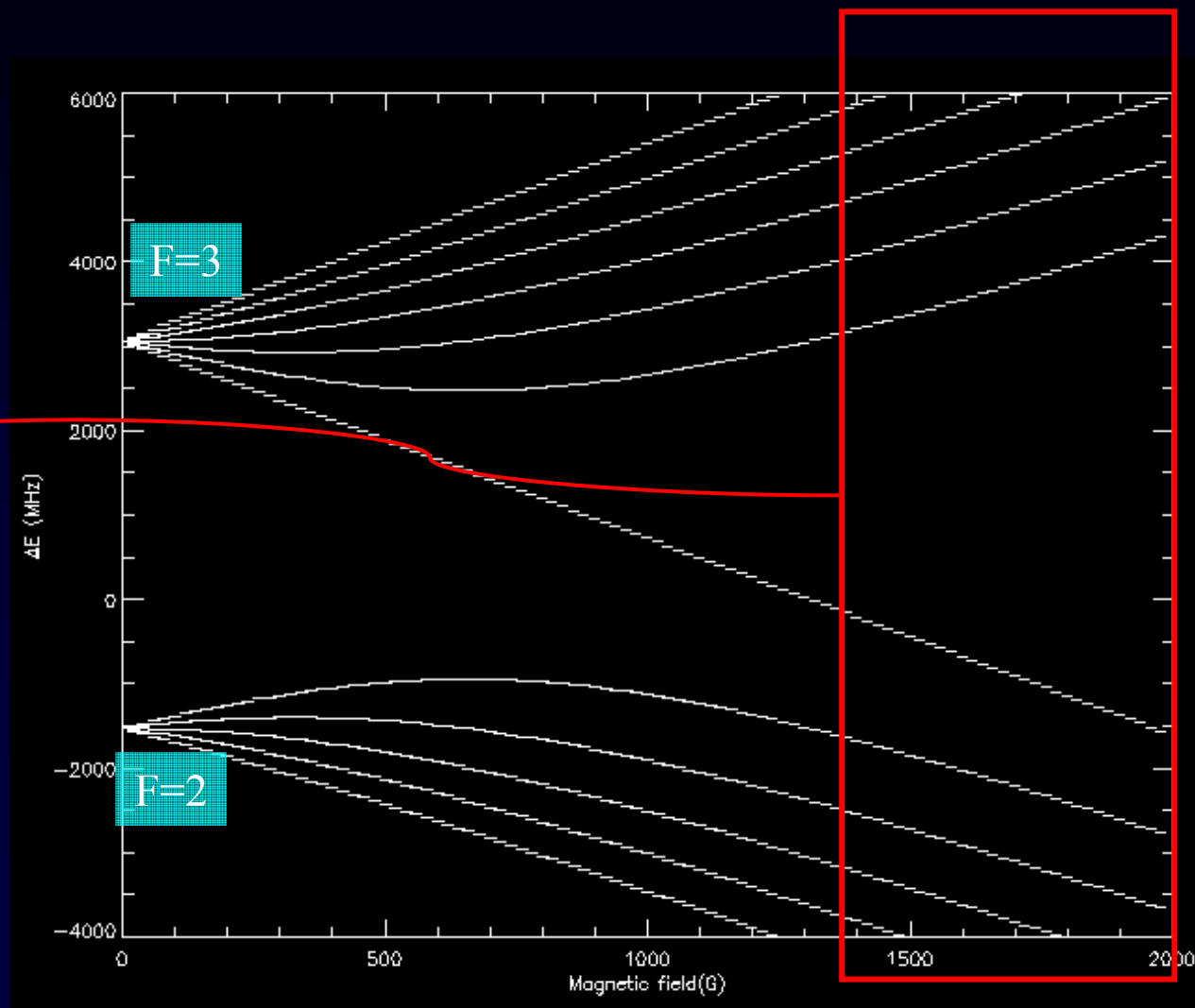




# HFS: Reminder

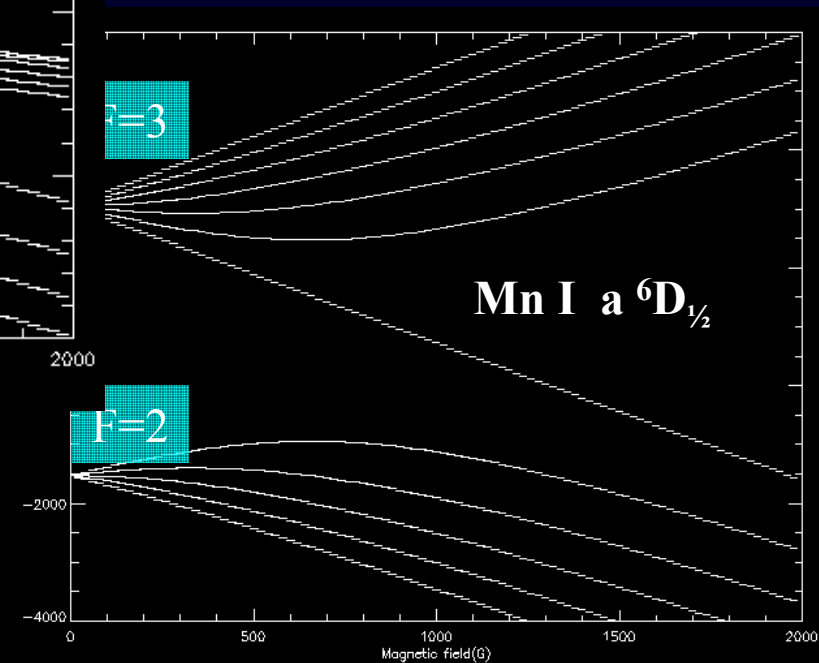
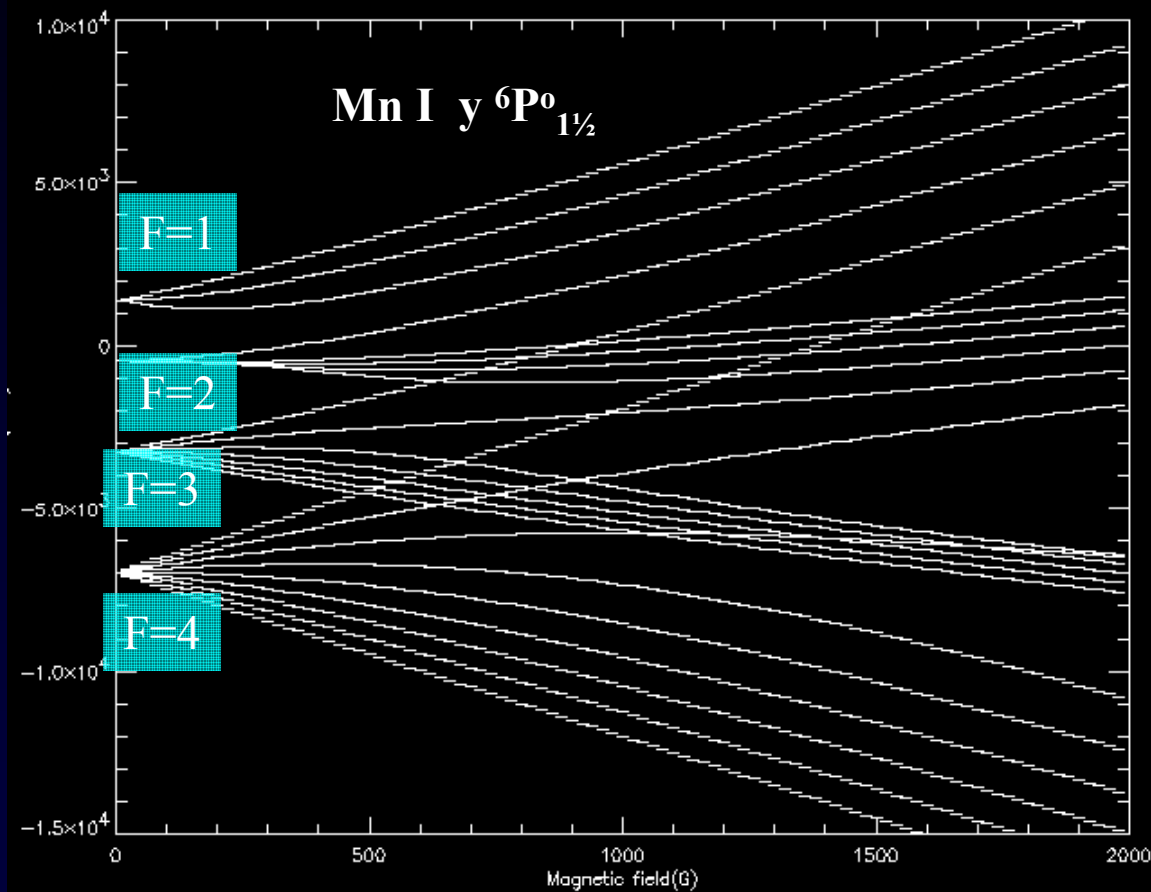
Mn I, Fine  
Structure:  
 $a^6D_{1/2}$

Paschen-Back Regime





# Mn I @ 5537.7 Å





# Line synthesis

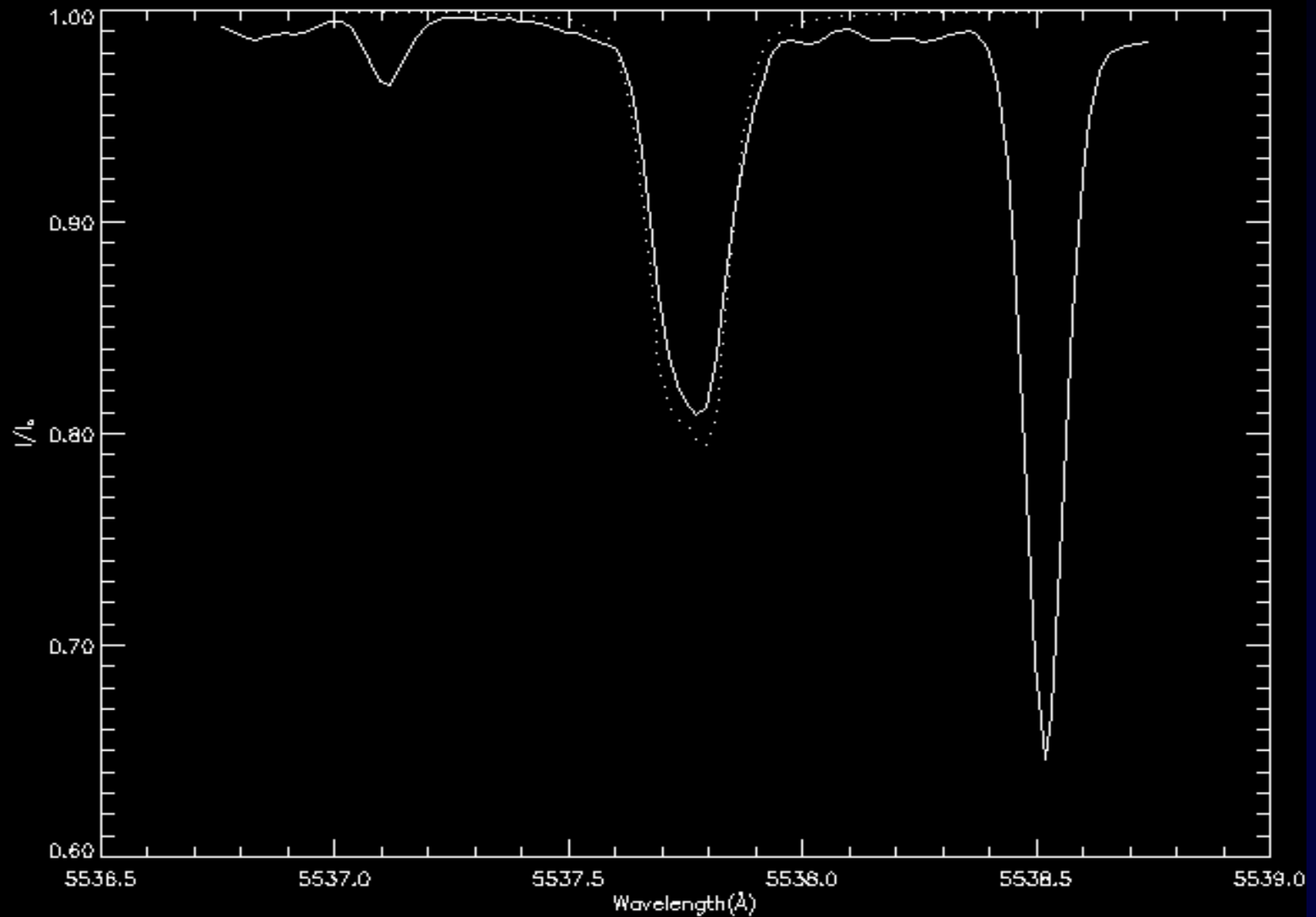
- Computation of atomic level energies:

$$H ([J,I,F],B) = H_{\text{hfs}}(J,I,F) + H_{\text{Zeeman}}(B)$$

- Nuclear gyroscopic factor neglected
- No atomic polarization included
- Electric dipole transitions
- Milne-Eddington atmospheres assumed
- DIAGONAL code modified for hfs computation

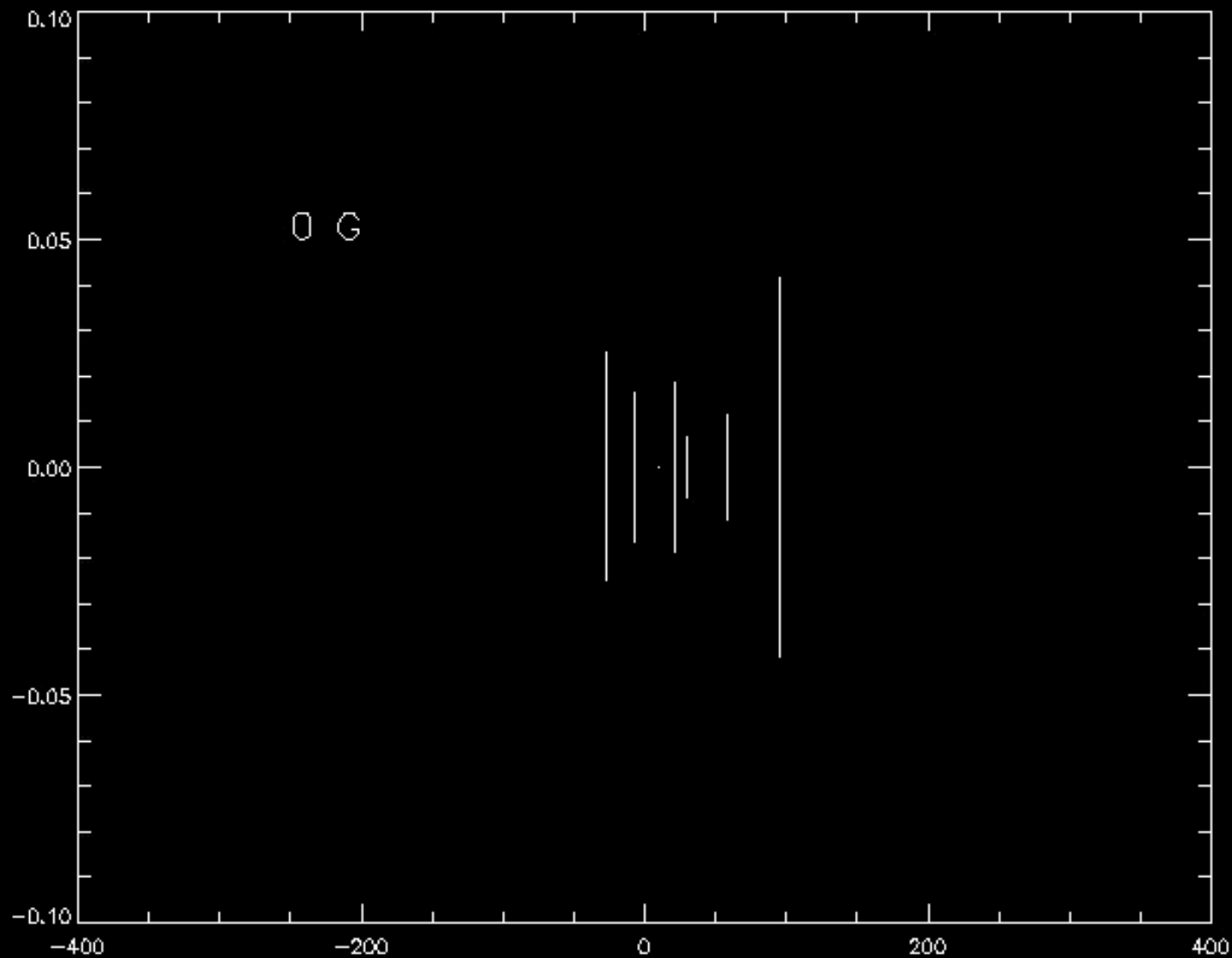


# Line synthesis





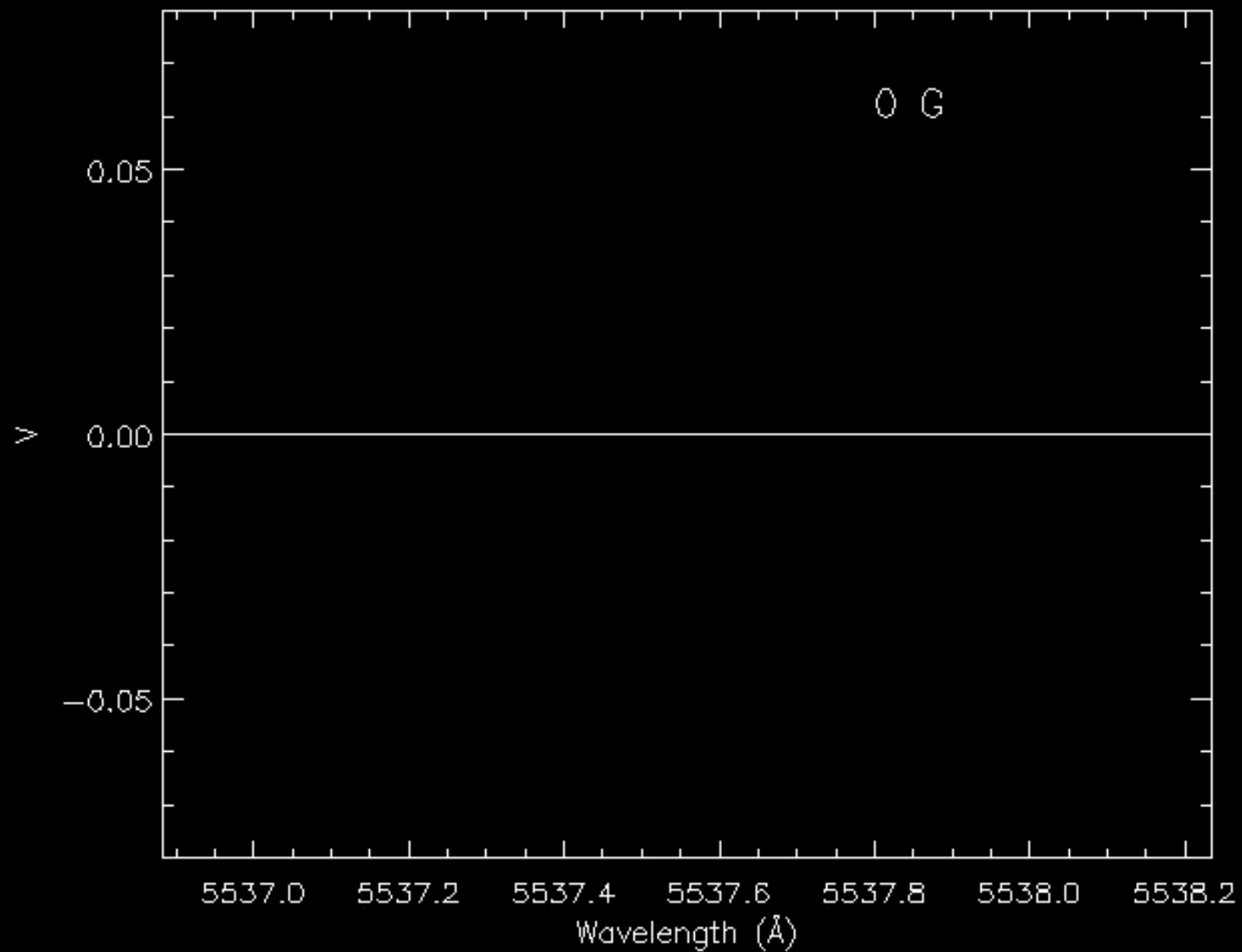
# $\sigma$ -transitions splitting





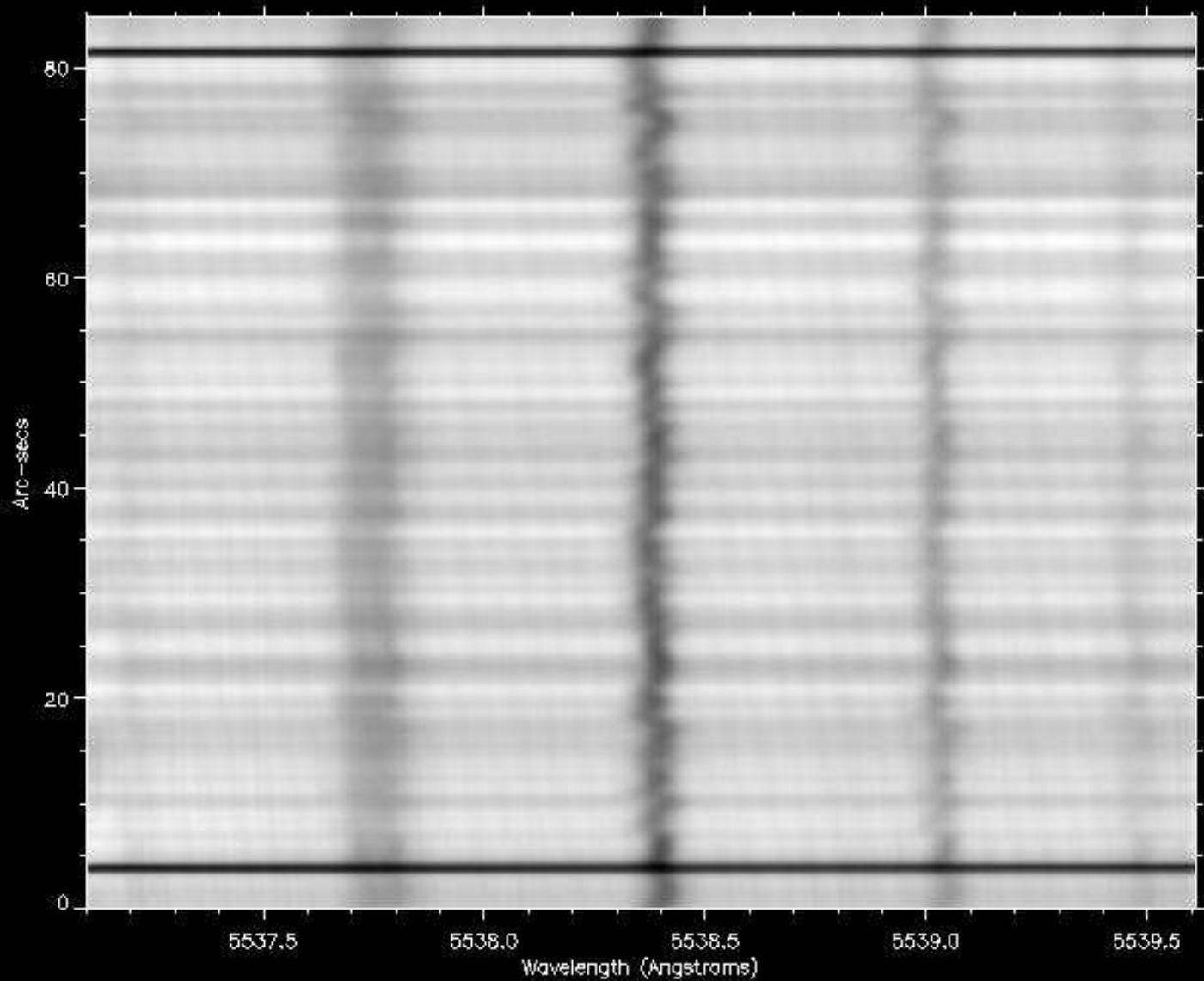


# Stokes V simulation



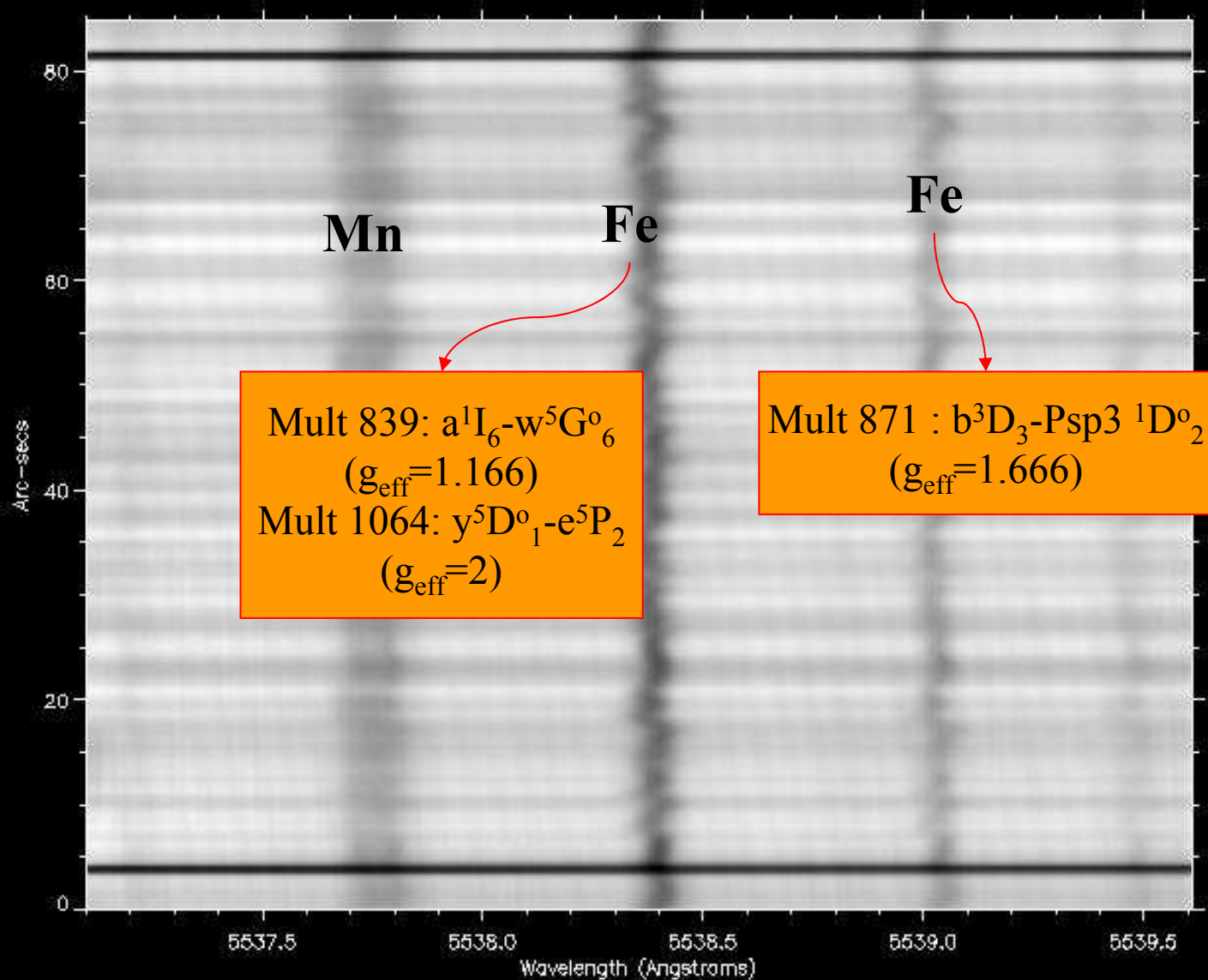


# ASP June '02



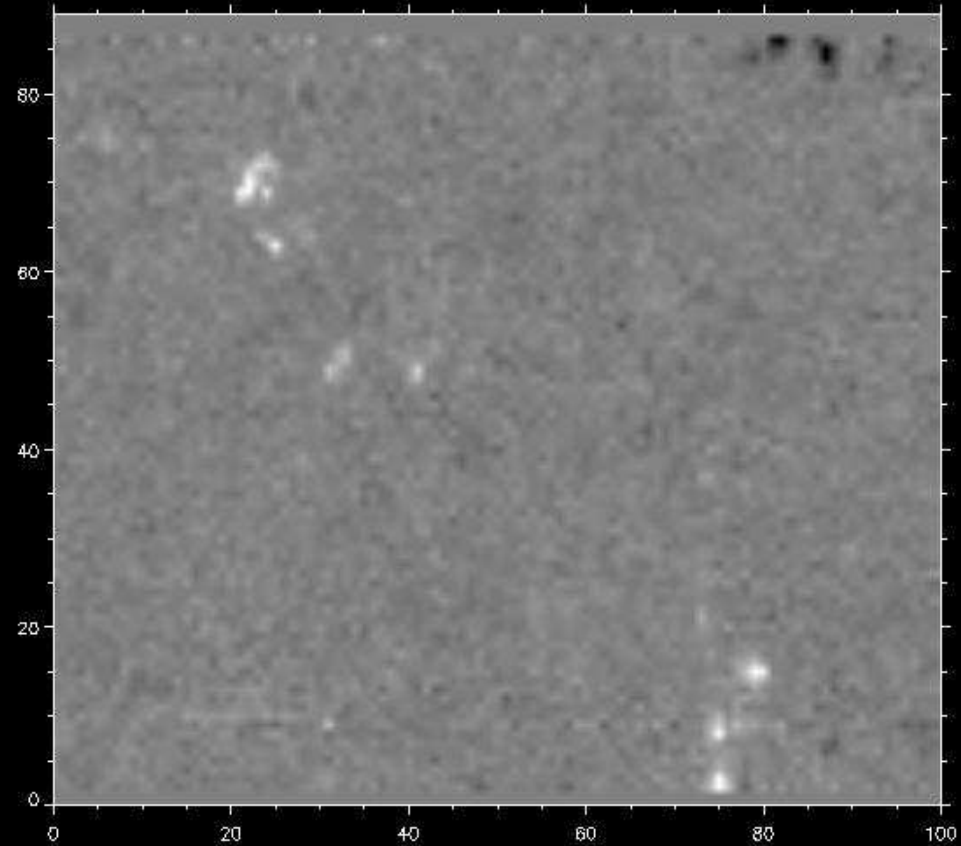
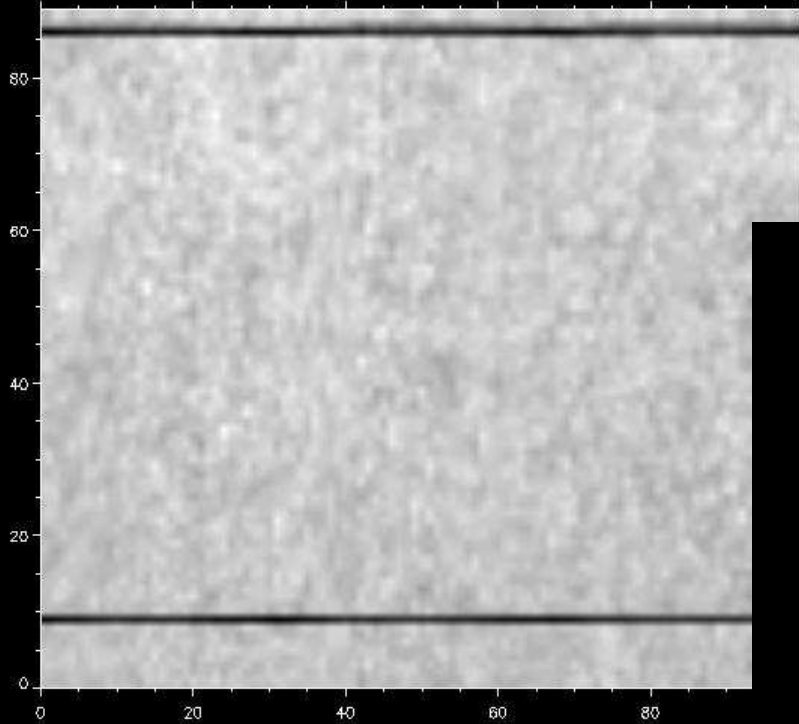


# ASP June '02



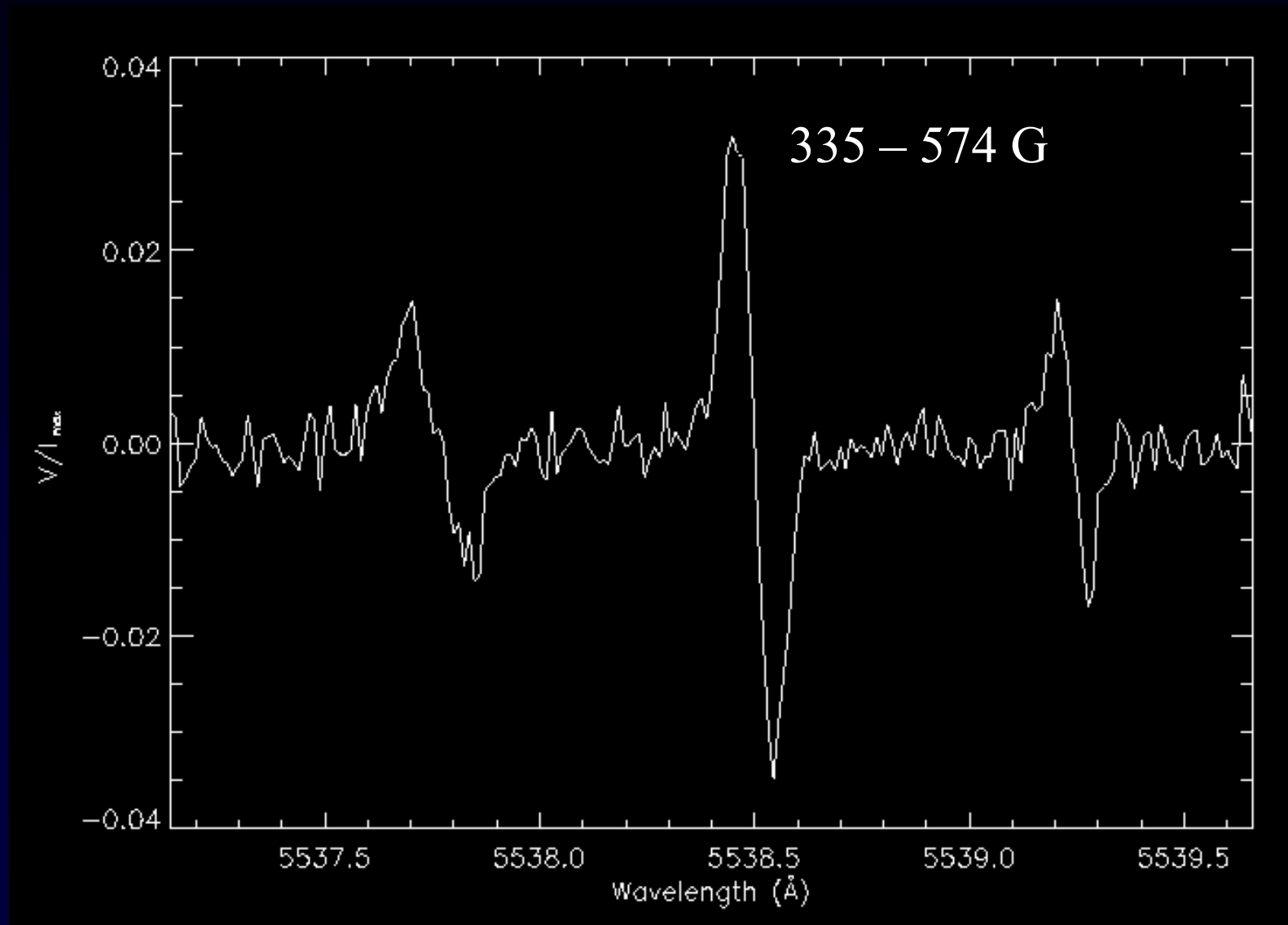


# Op 02: scan over quiet sun near disk center



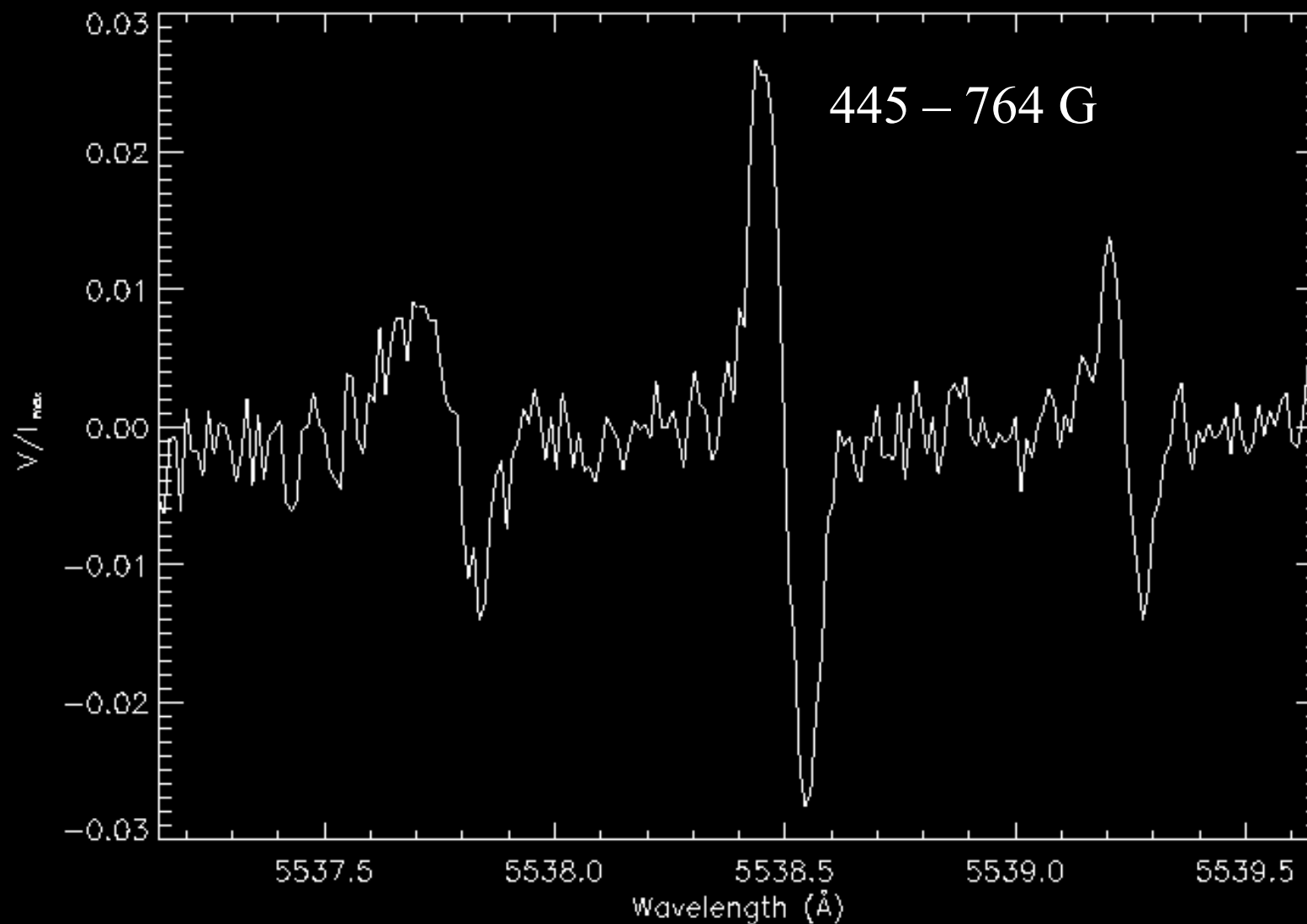


# The network: business as usual...



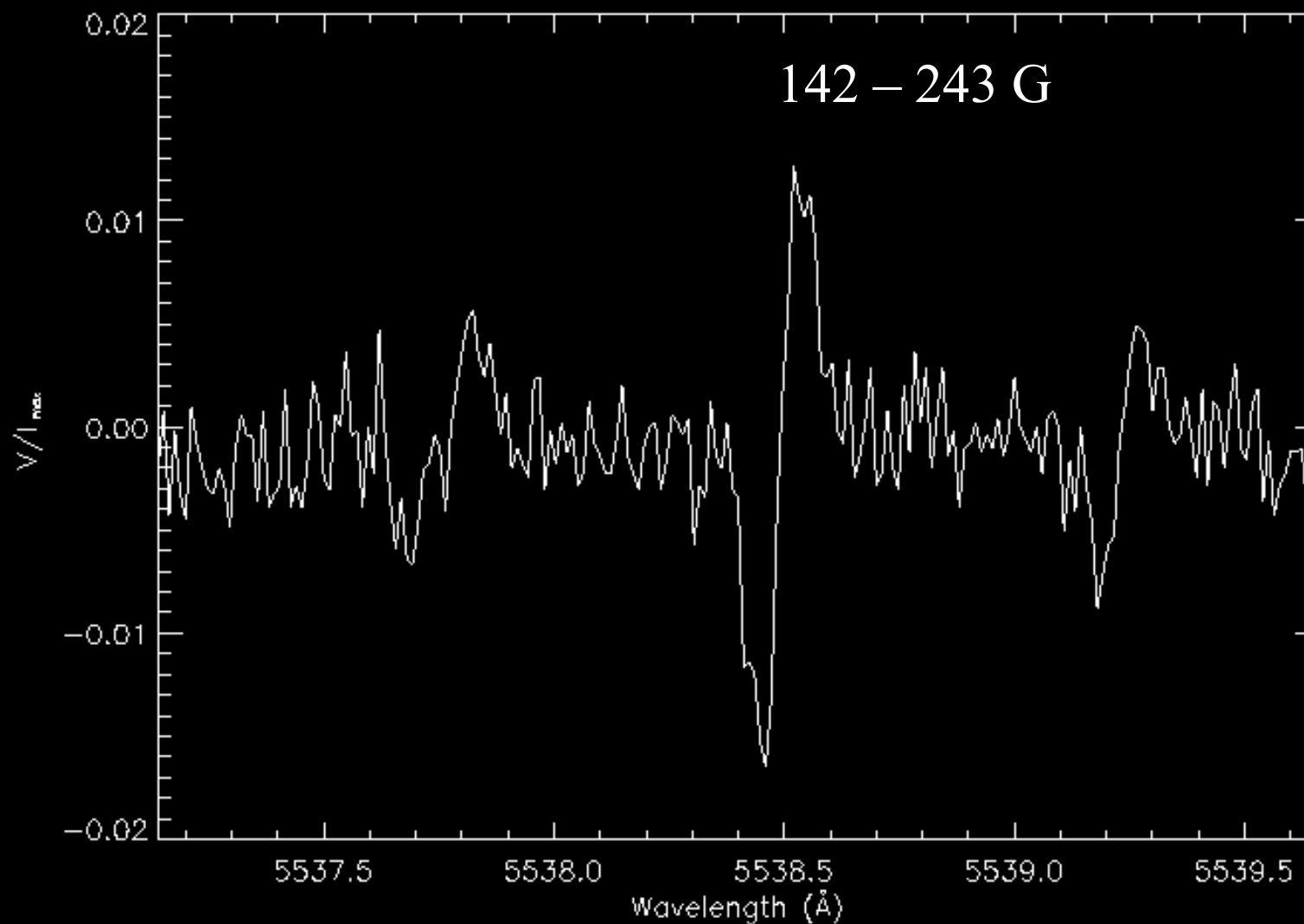


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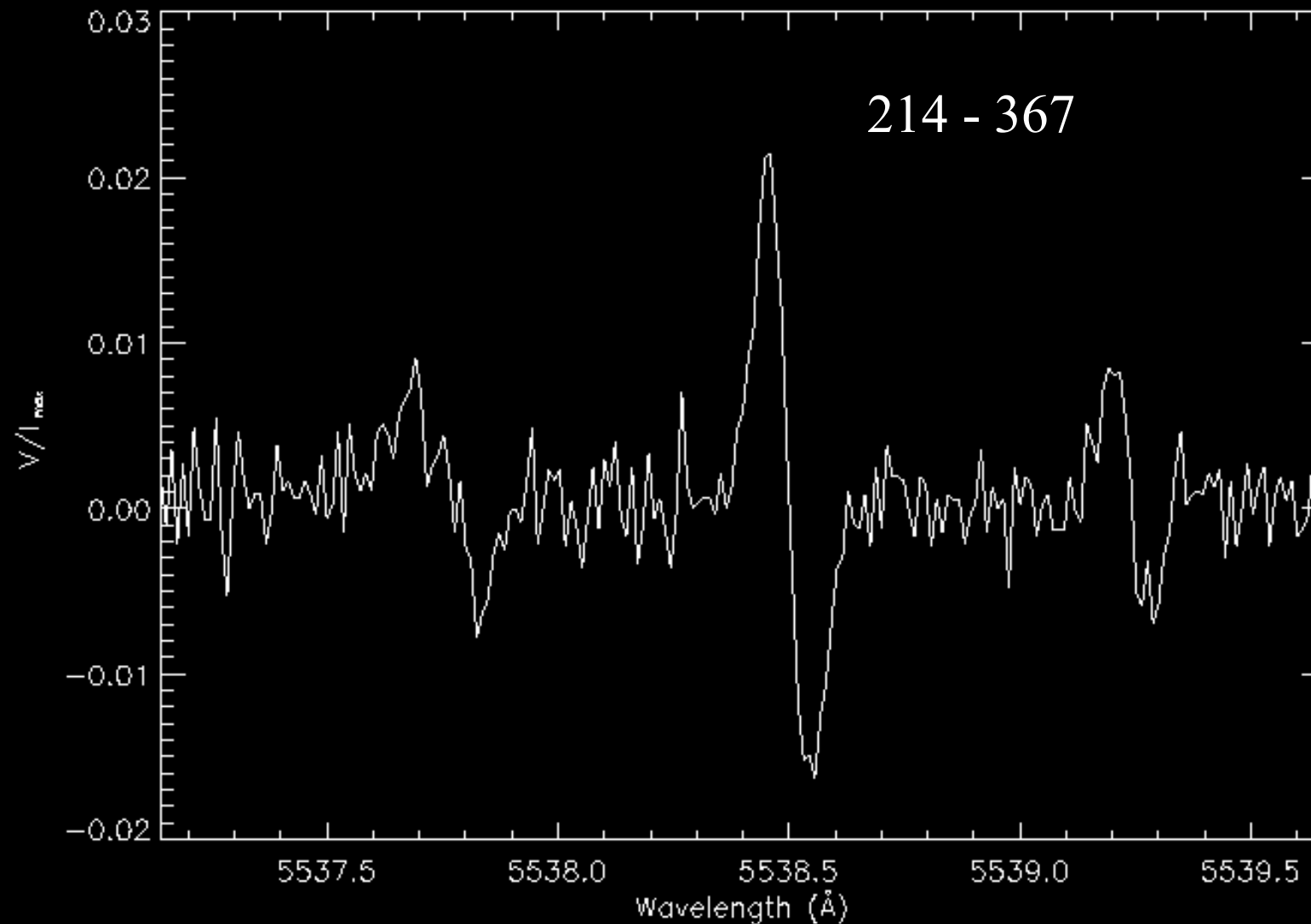


# The network: business as usual???





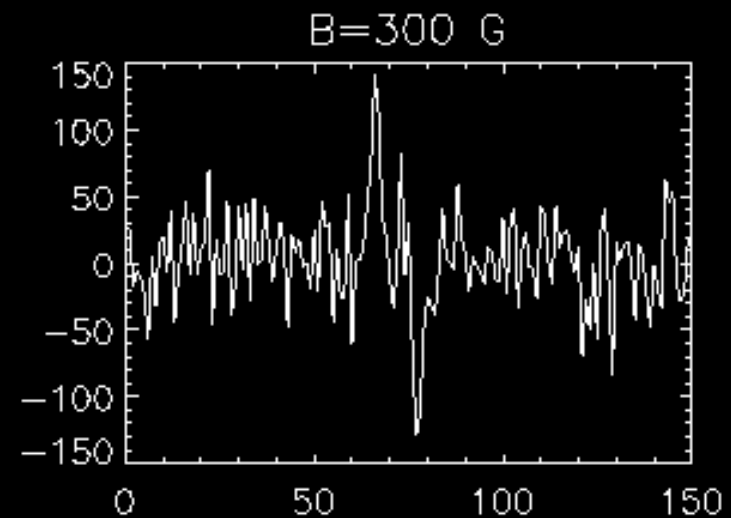
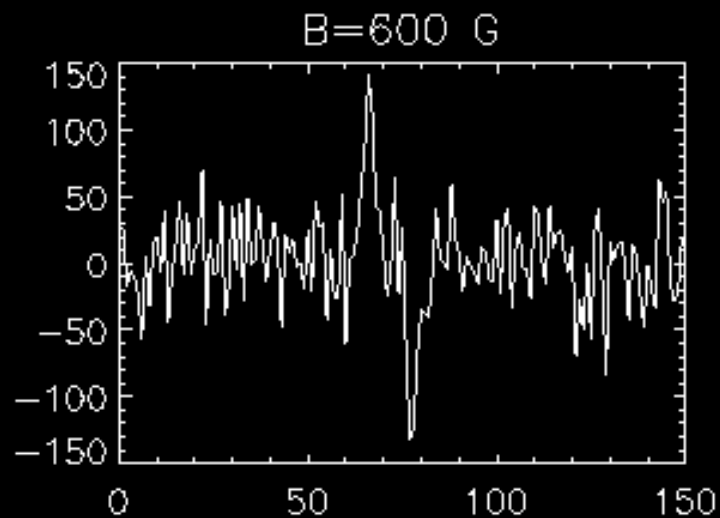
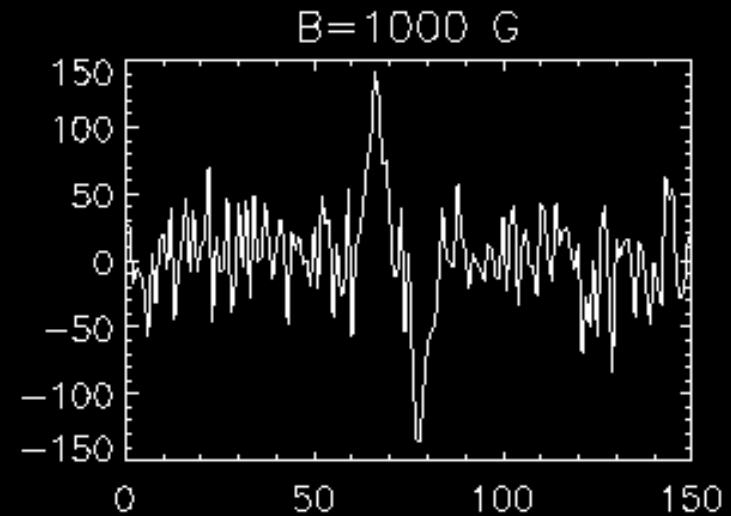
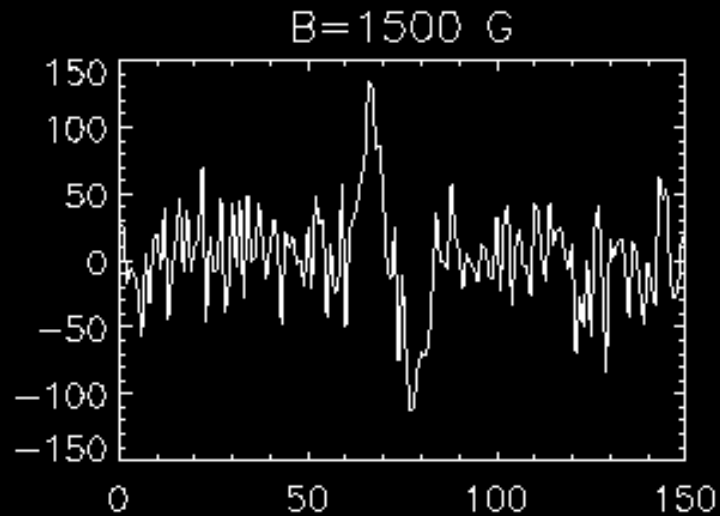
# The network: business as usual???





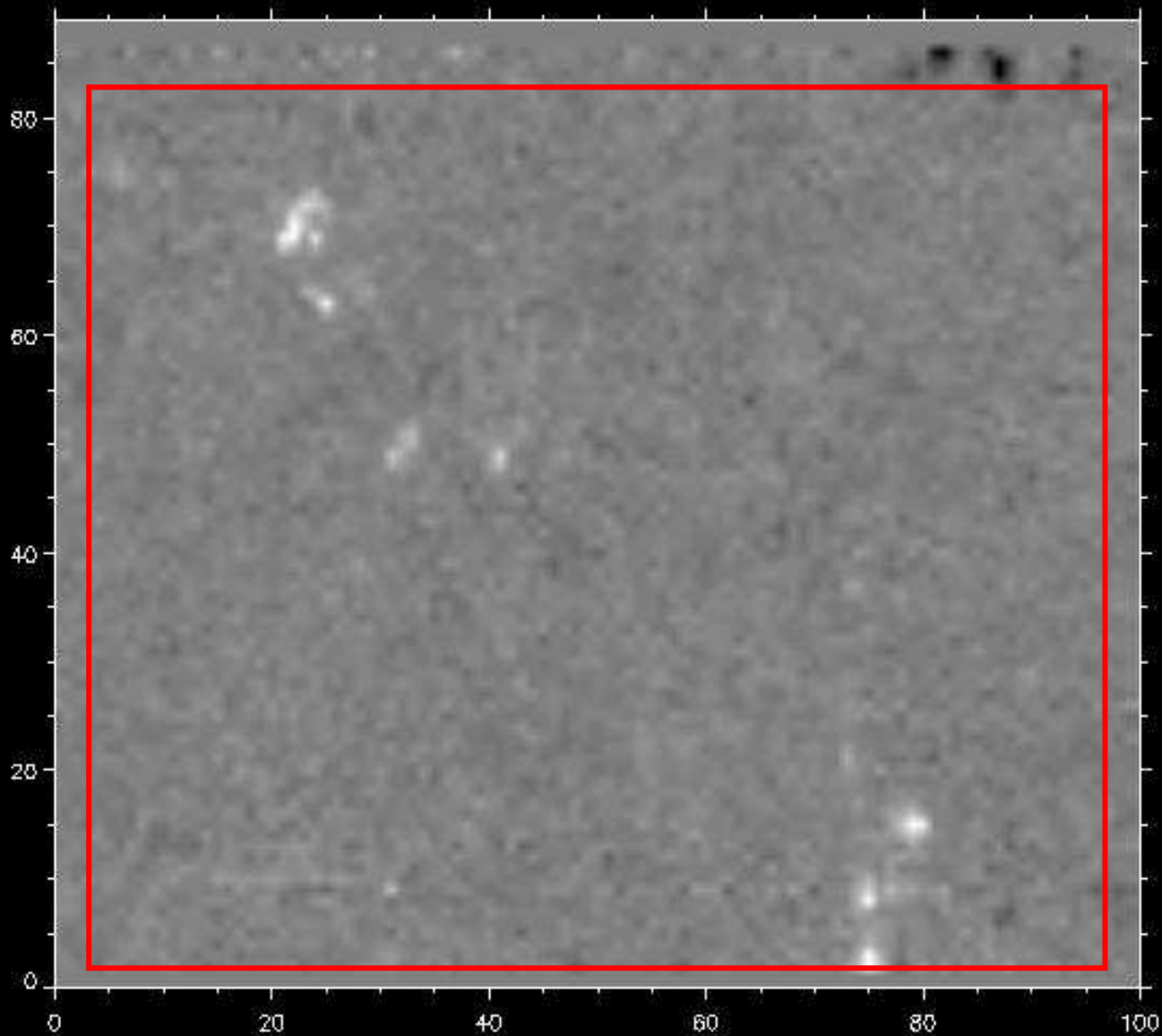


# About noise



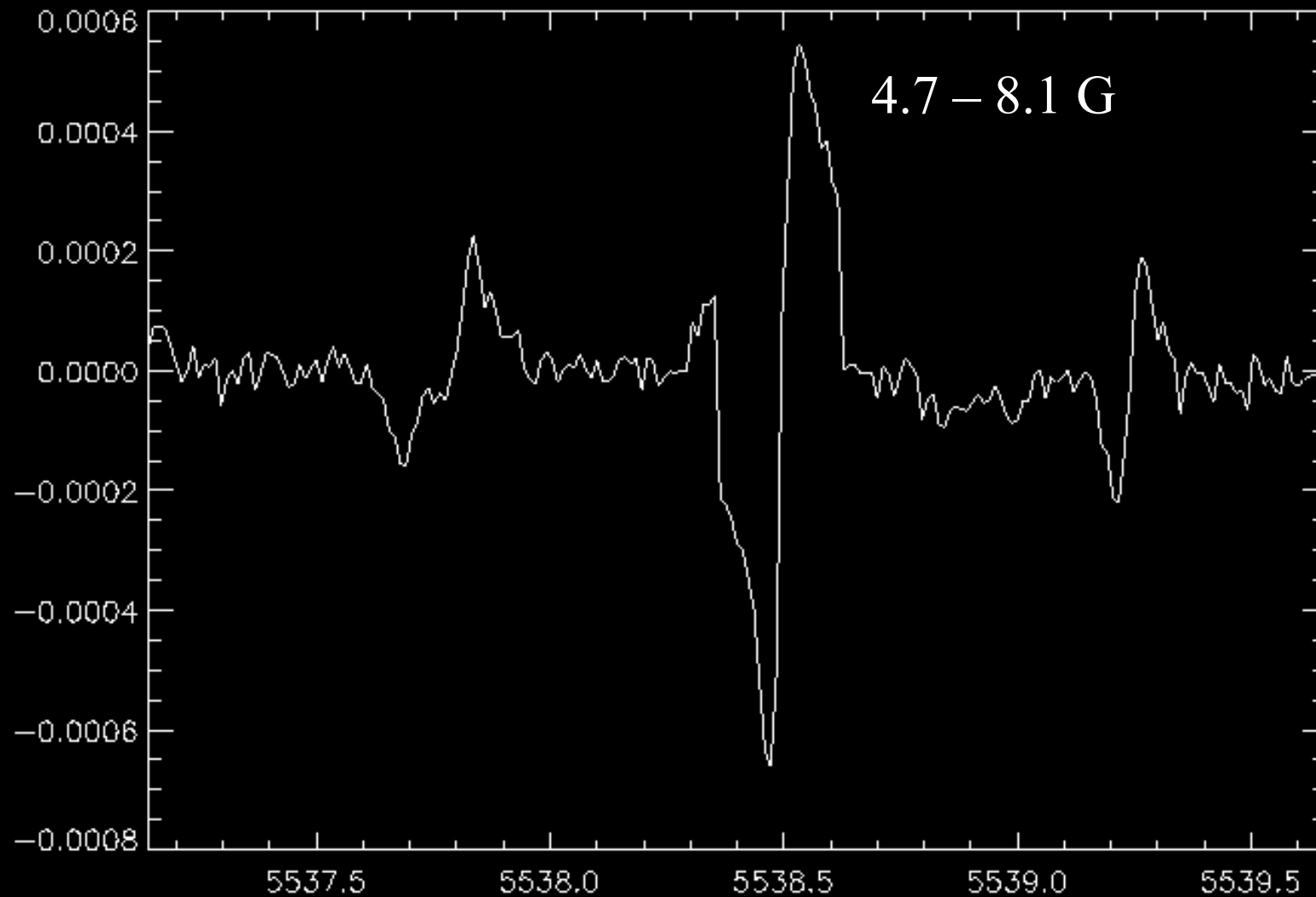


# The internetwork: adding up



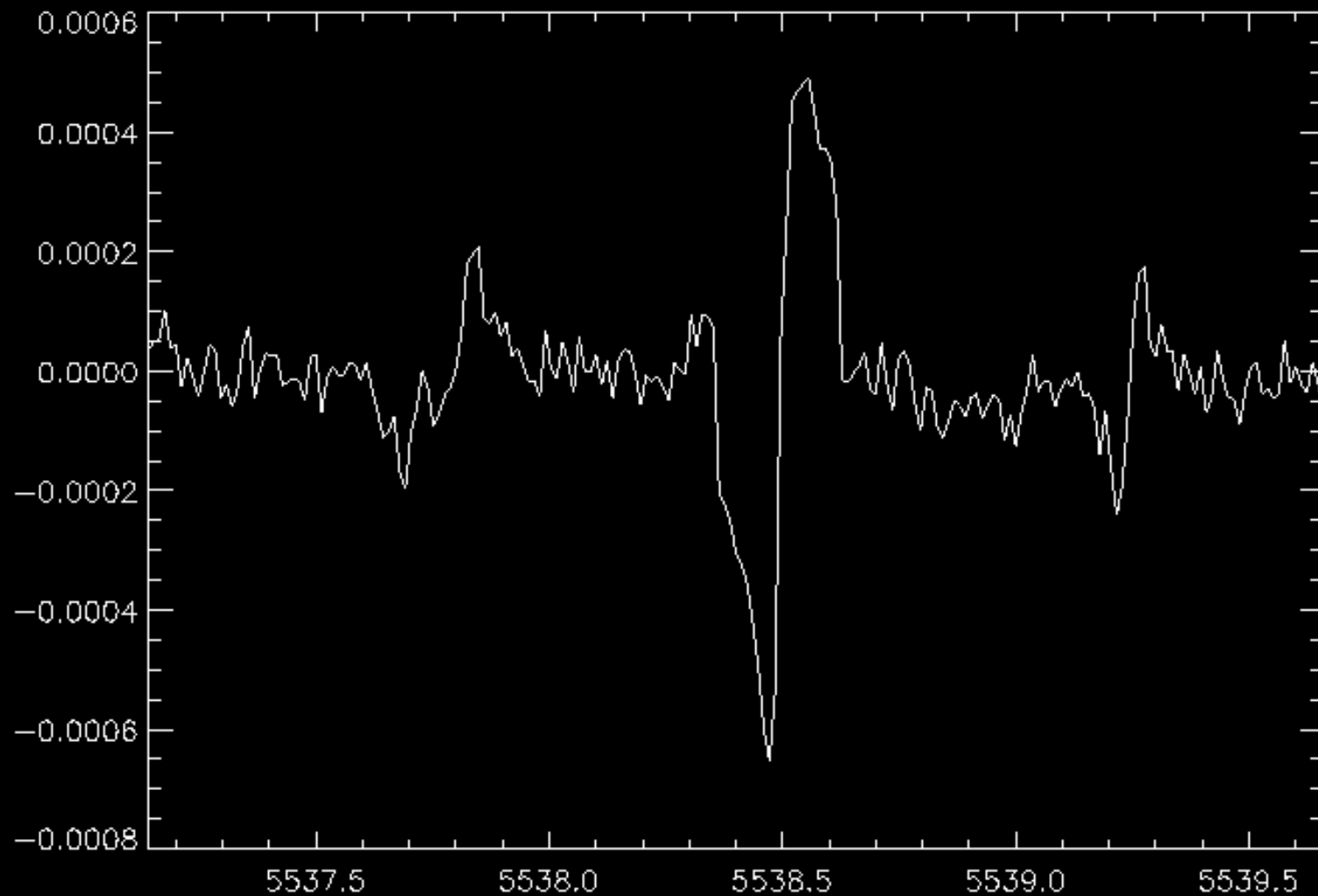


# The internetwork: adding up



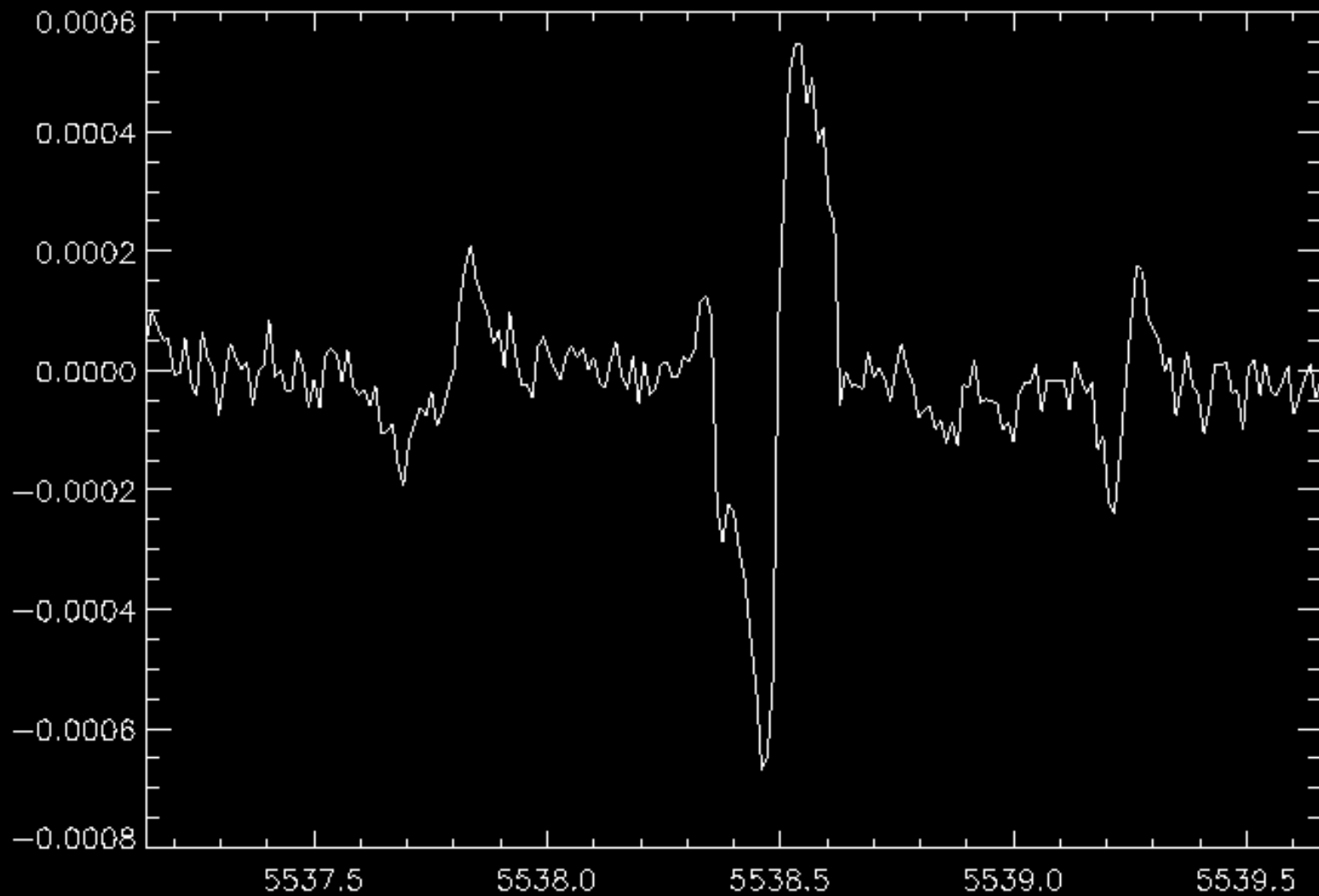


# The internetwork: adding up





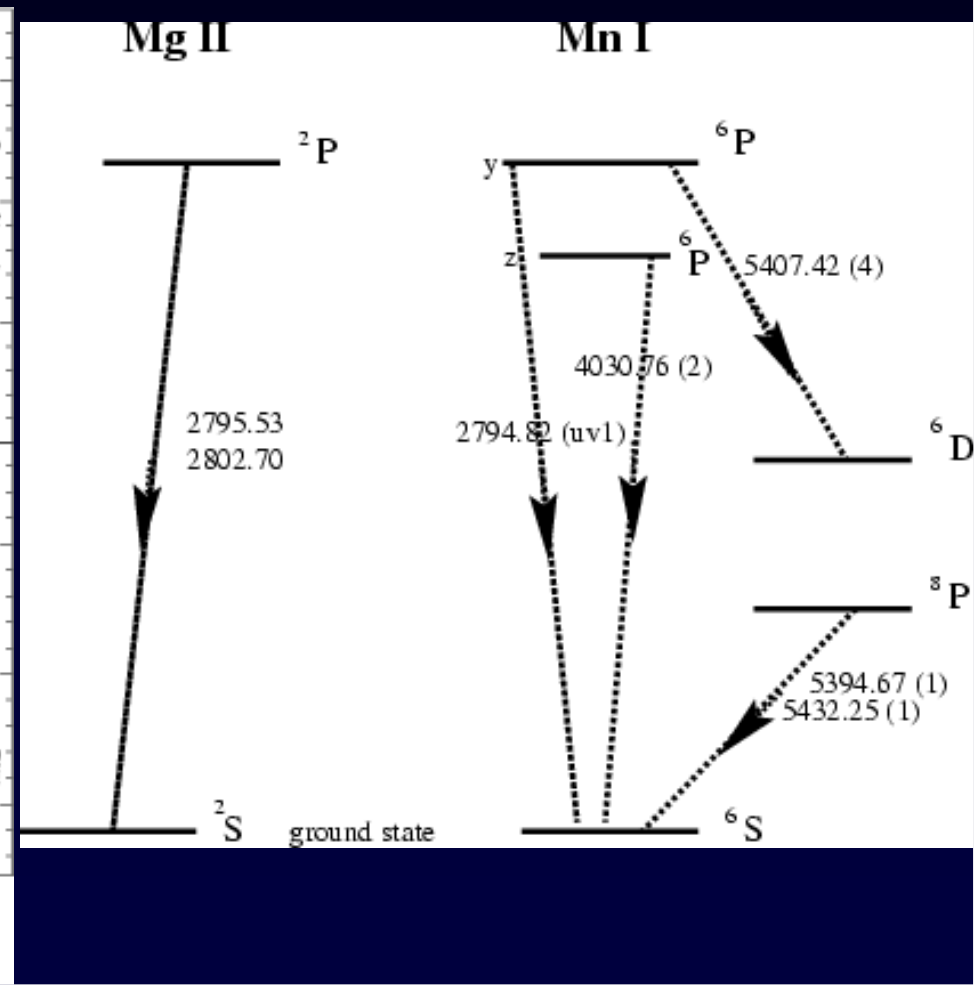
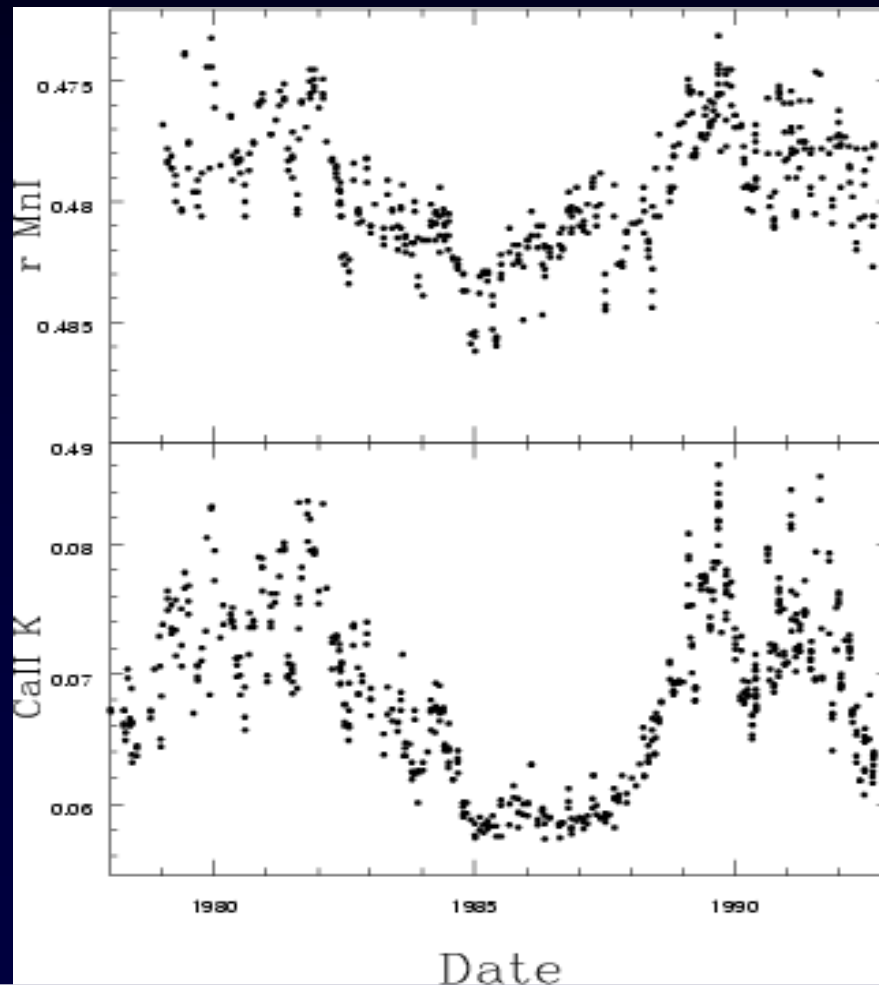
# The internetwork: adding up





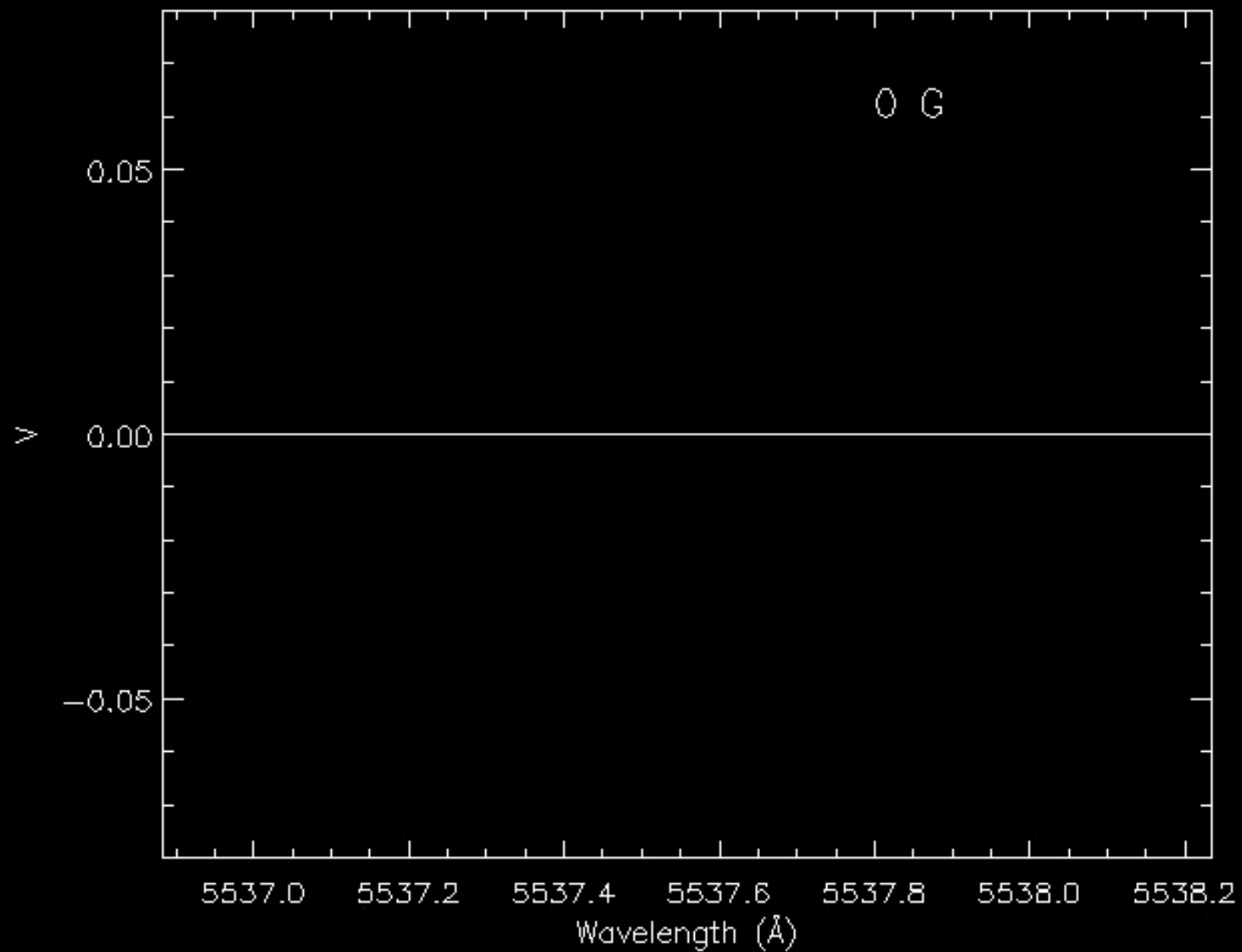
# Inversion or bust?

Doyle, Jevremovic, Short, Hauschildt, Livingston, & Vince  
A&A Letters. 369, 13 (2001)



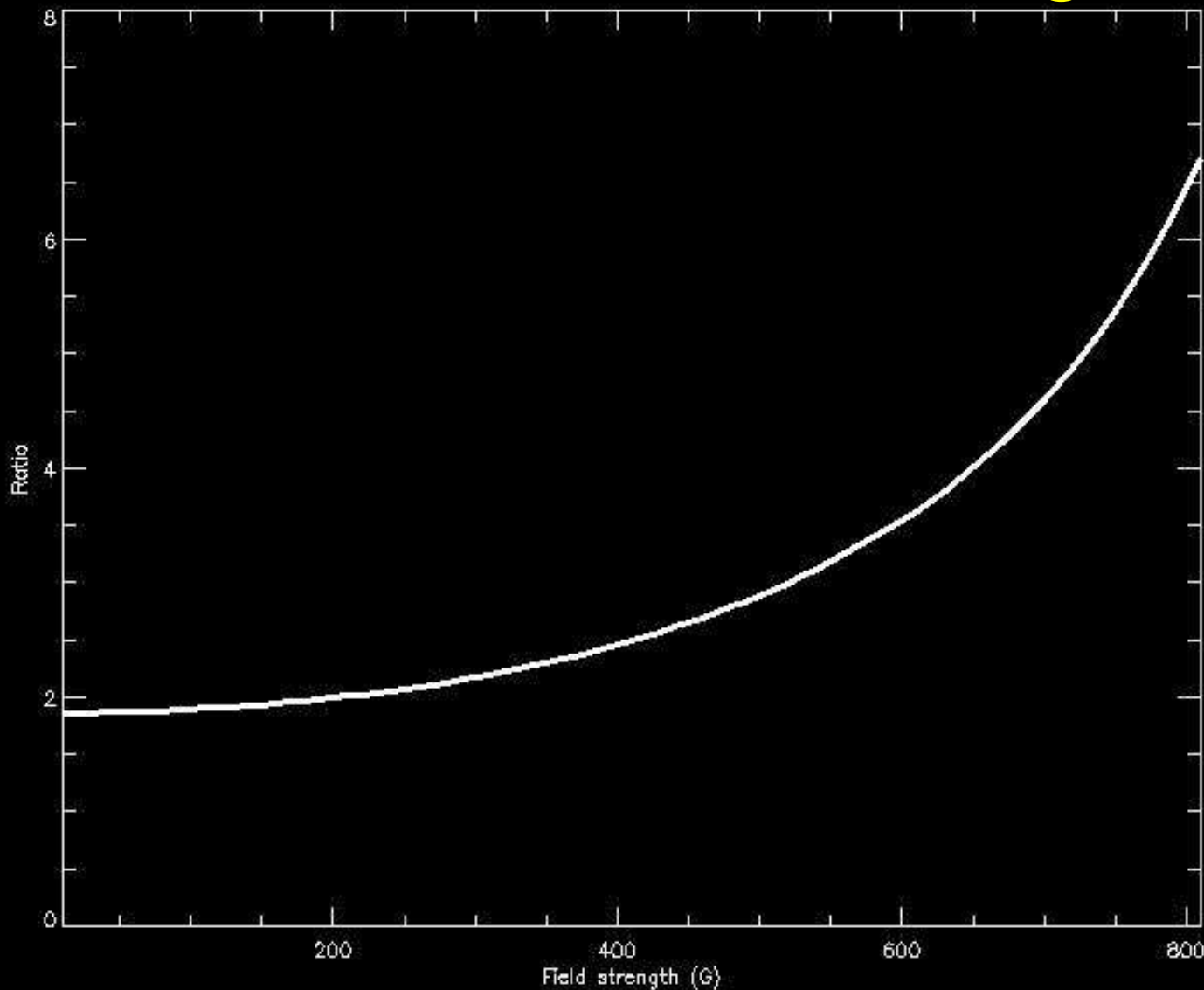


# Stokes V simulation





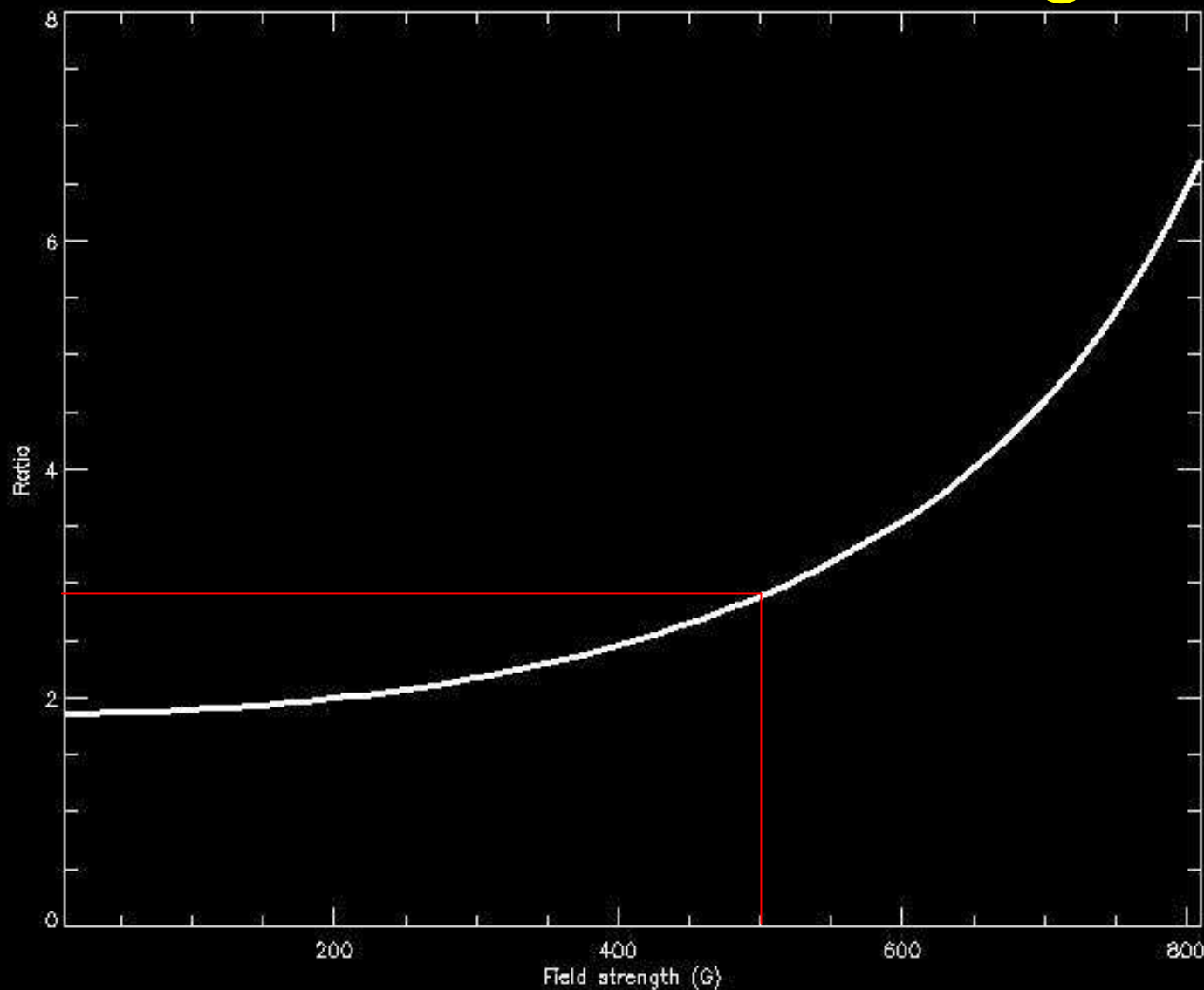
# Ratio between lobes: a monotone function of field strength







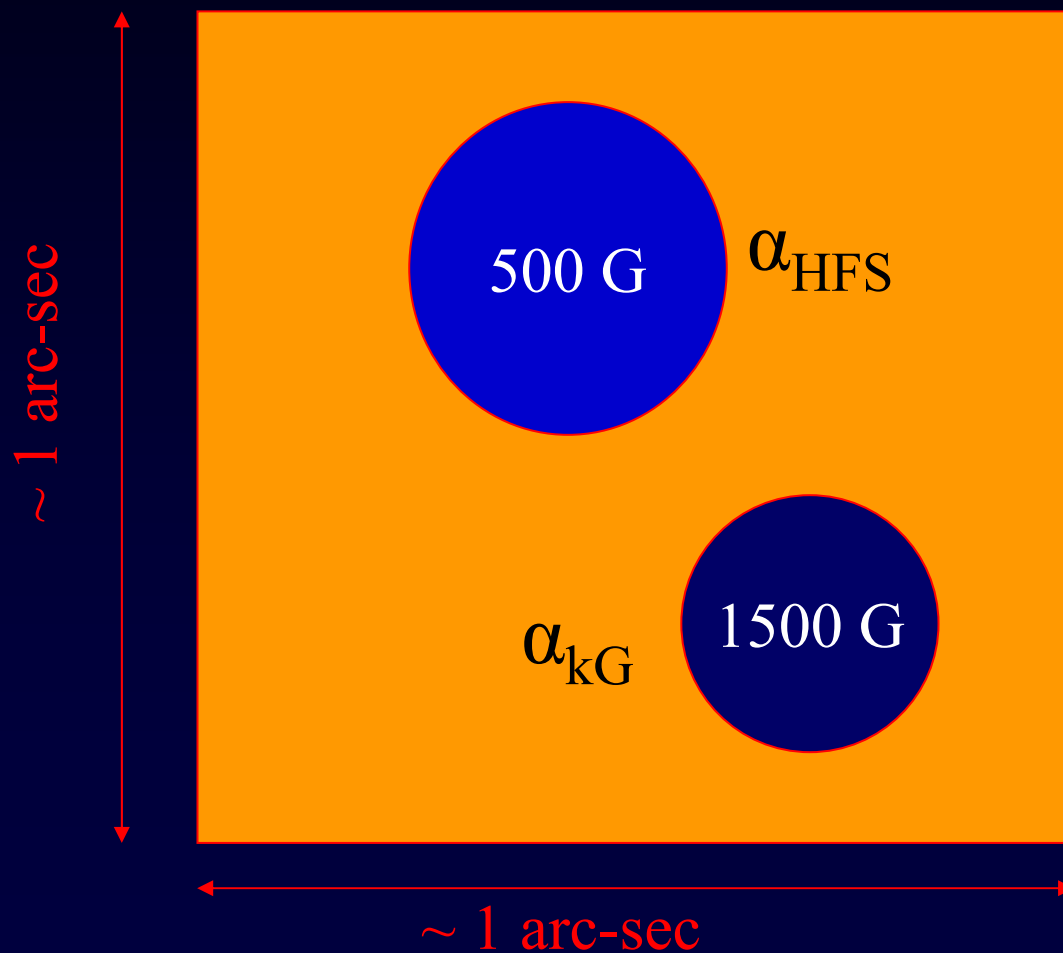
# Ratio between lobes: a monotone function of field strength





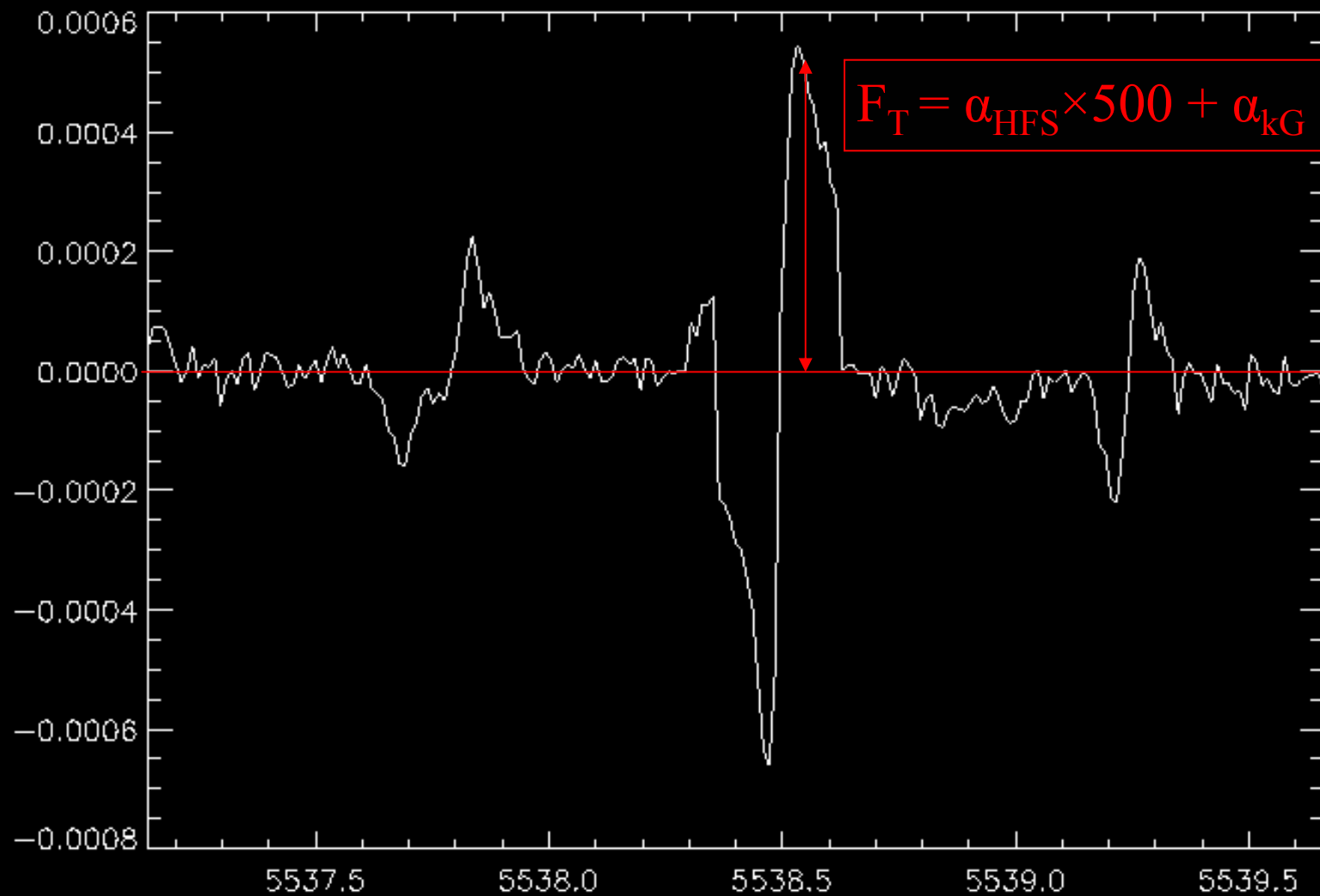
# A game

$$F_T = \alpha_{\text{HFS}} \times 500 + \alpha_{\text{kG}} \times 1500$$



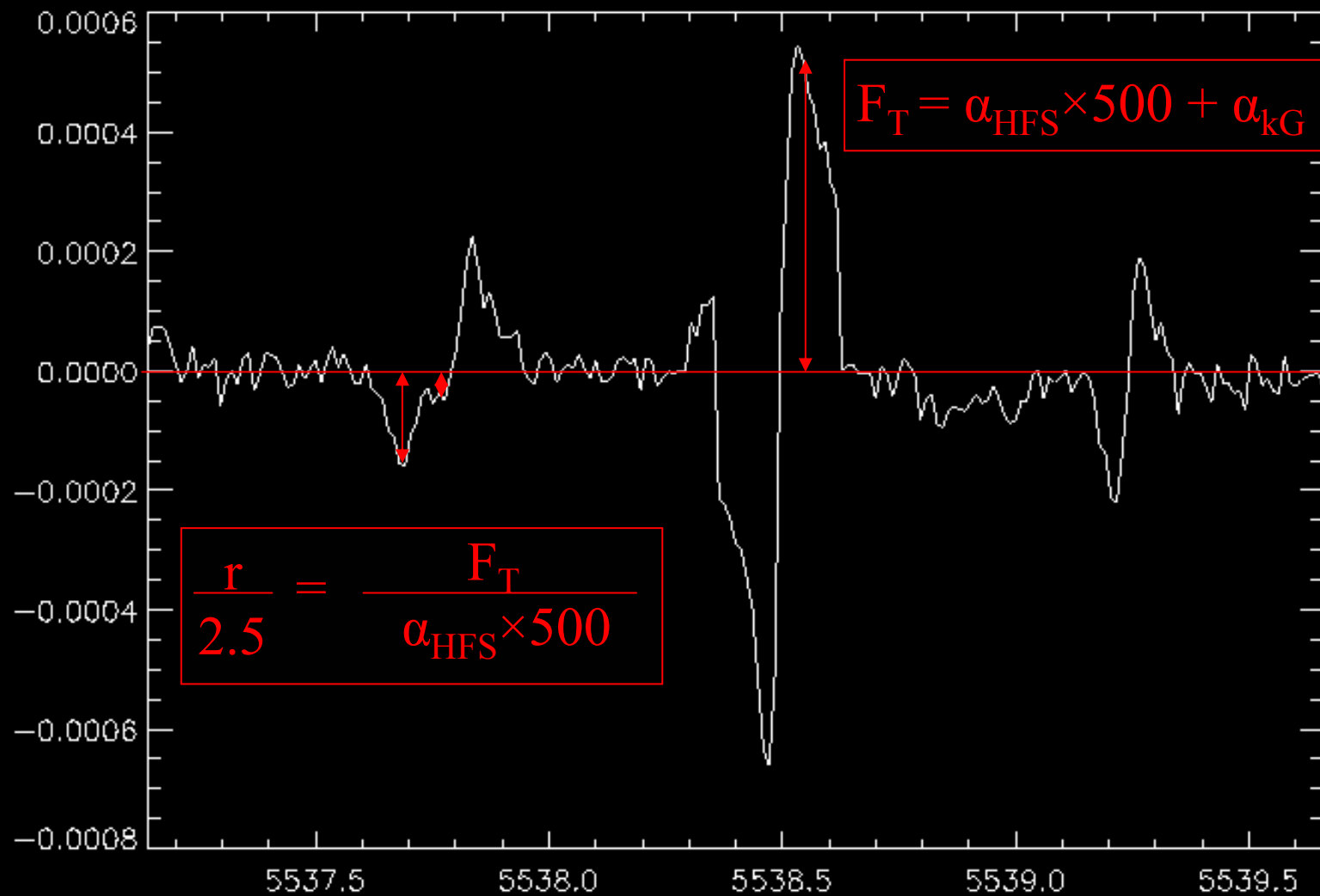


# A game



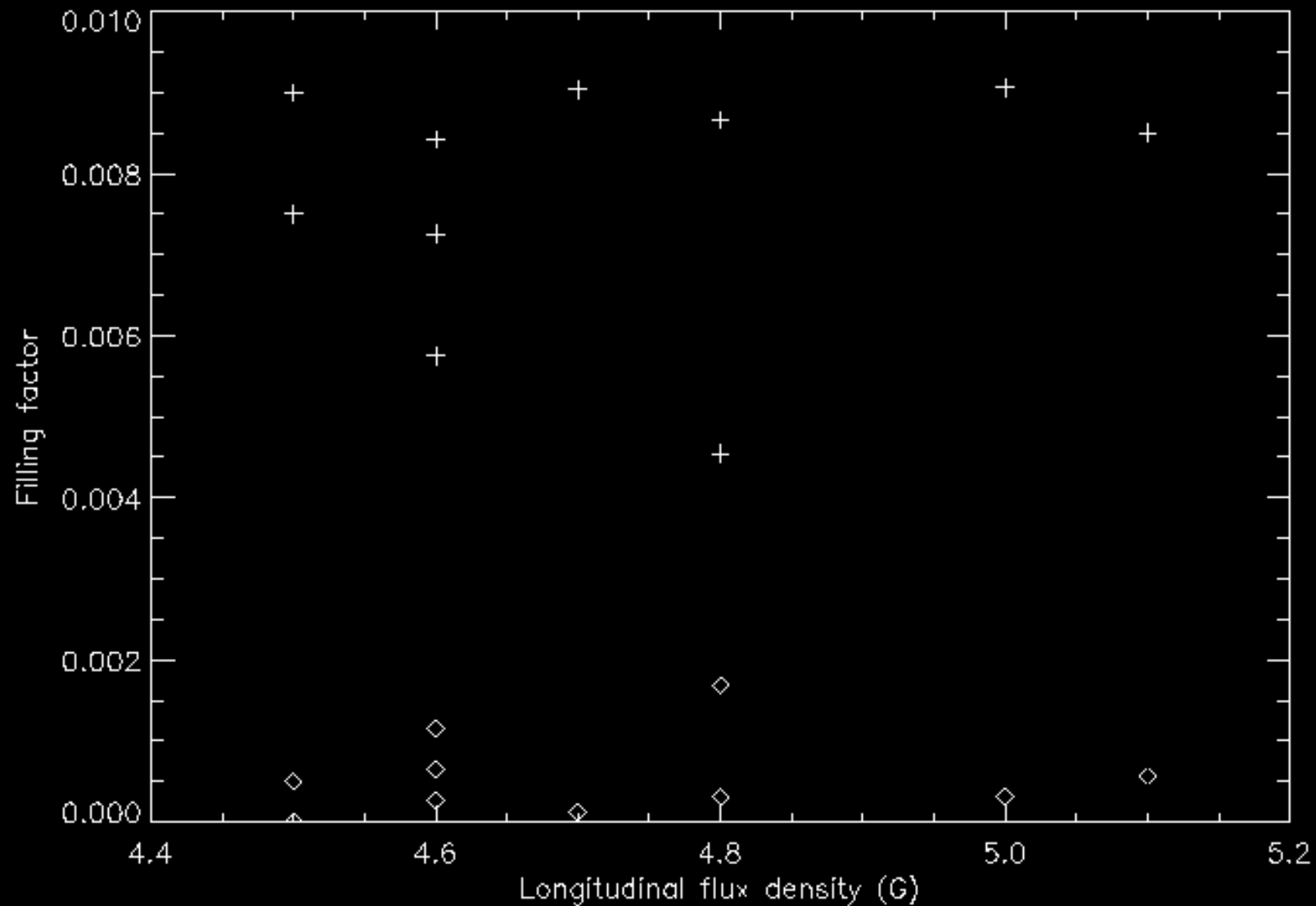


# A game





# Results for the internetwork





# Results for the (noisy) network

