



Magnetic Fields on DQ White Dwarfs with Carbon Molecular Lines

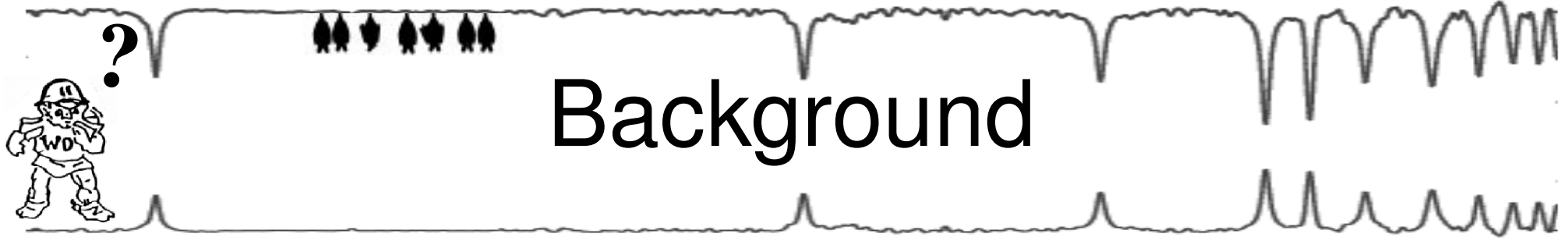
- A New CH White Dwarf

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Partners in crime: Svetlana Berdyugina, Andrei Berdyugin

17th European White Dwarf Workshop
Tübingen, Germany

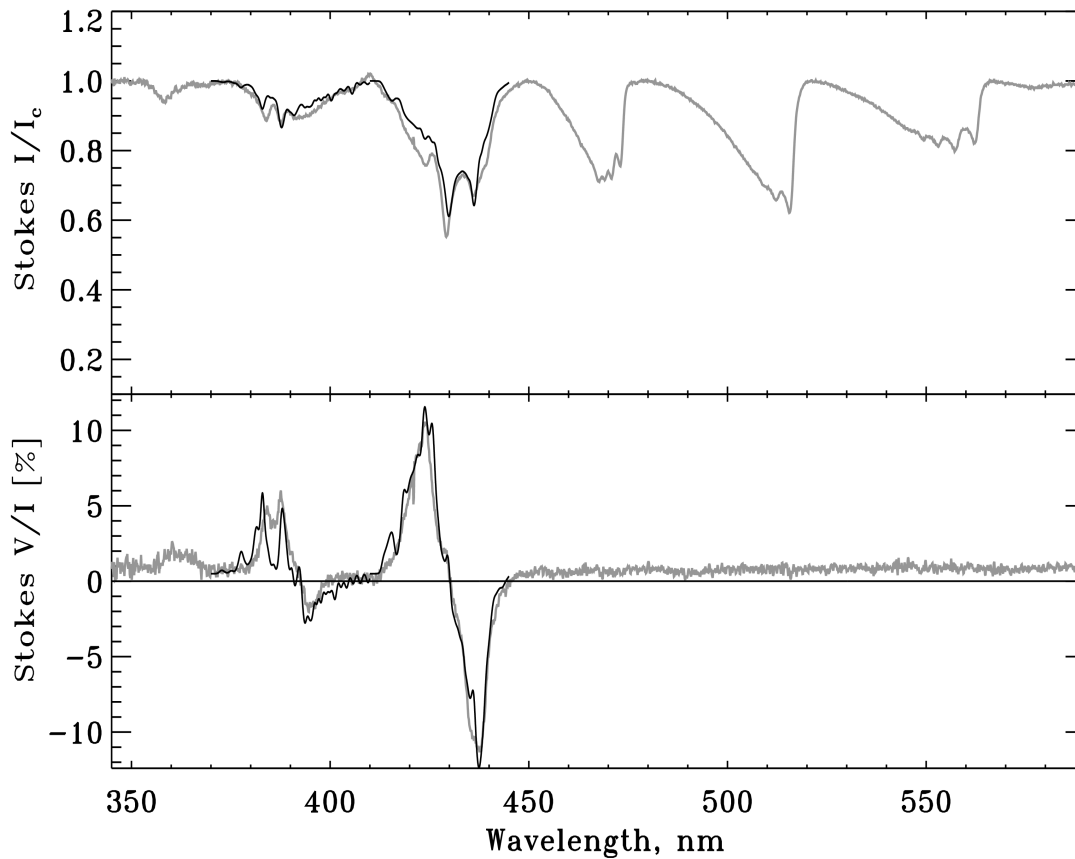
16.8.2010



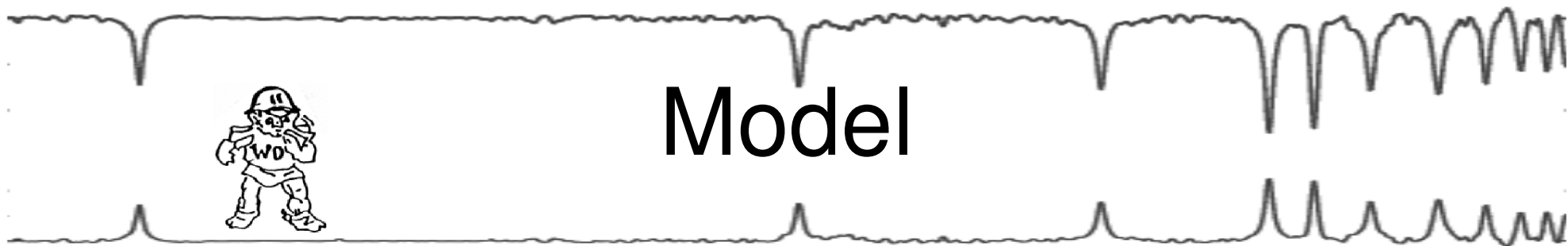
- Hydrogen WDs (DA) and Helium WDs (DO/DB)
- Metal WDs (DZ), boring WDs (DC) and Carbon WDs (DQ)
- Why do we study DQs?
 - Complimentary method to study atmospheres
 - Test of our theory of molecular behaviour in magnetic fields
 - Unexplained phenomena - the so-called peculiar DQs



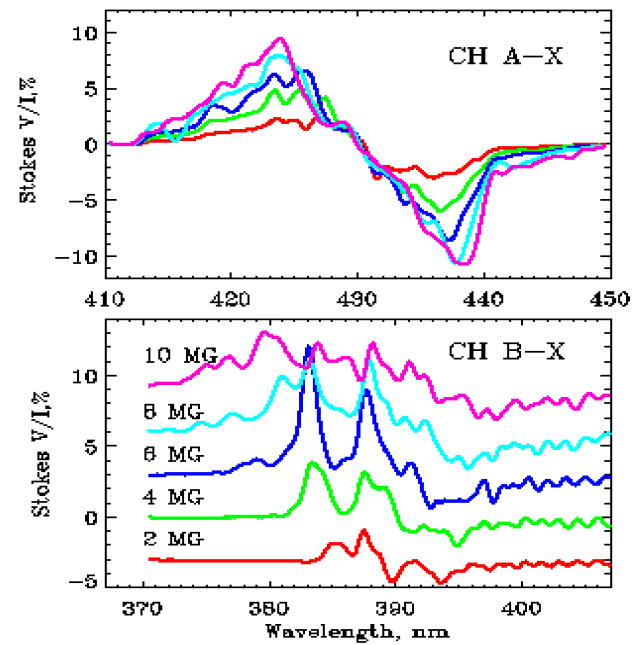
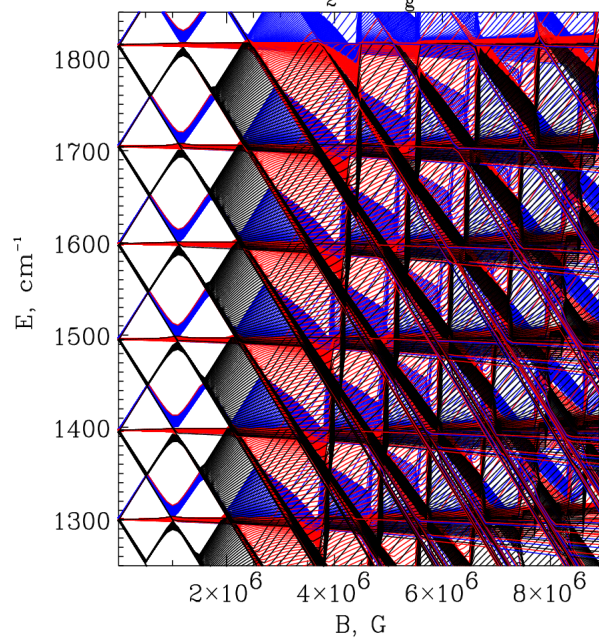
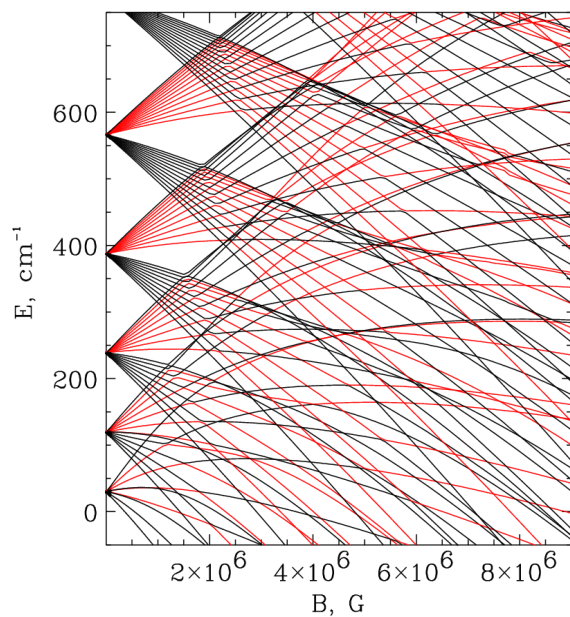
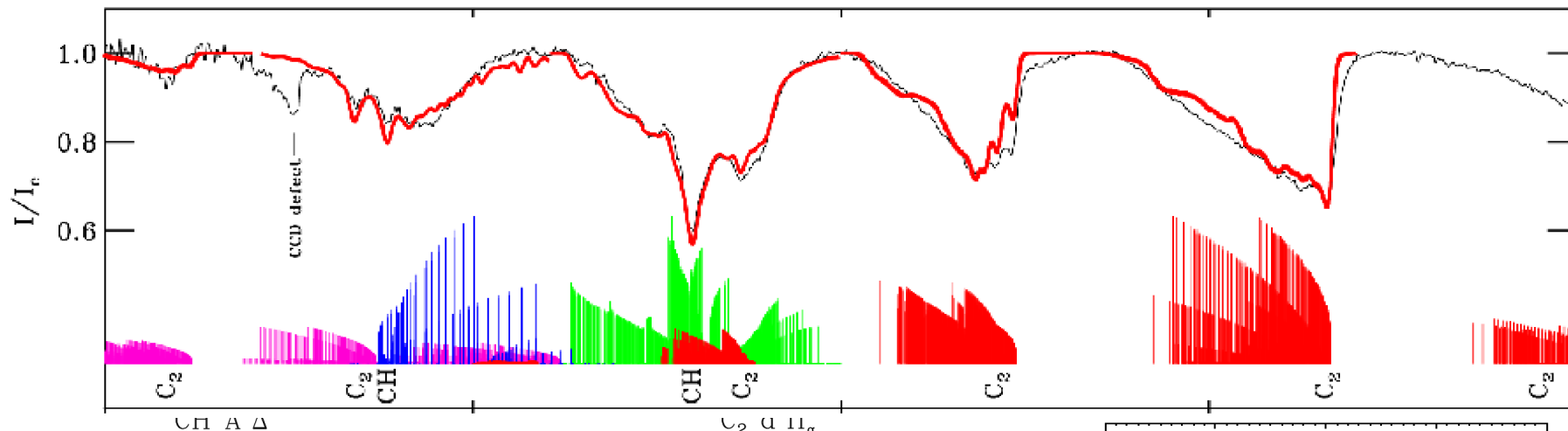
History



- G 99-37 (GJ 1086)
- Angel & Landstreet 1974
- Only known CH feature in a WD so far
- Polarization $\pm 10\%$
- $B=730\text{ T}$ (7.3 MG)
- $T=6200\text{ K}$



G99-37

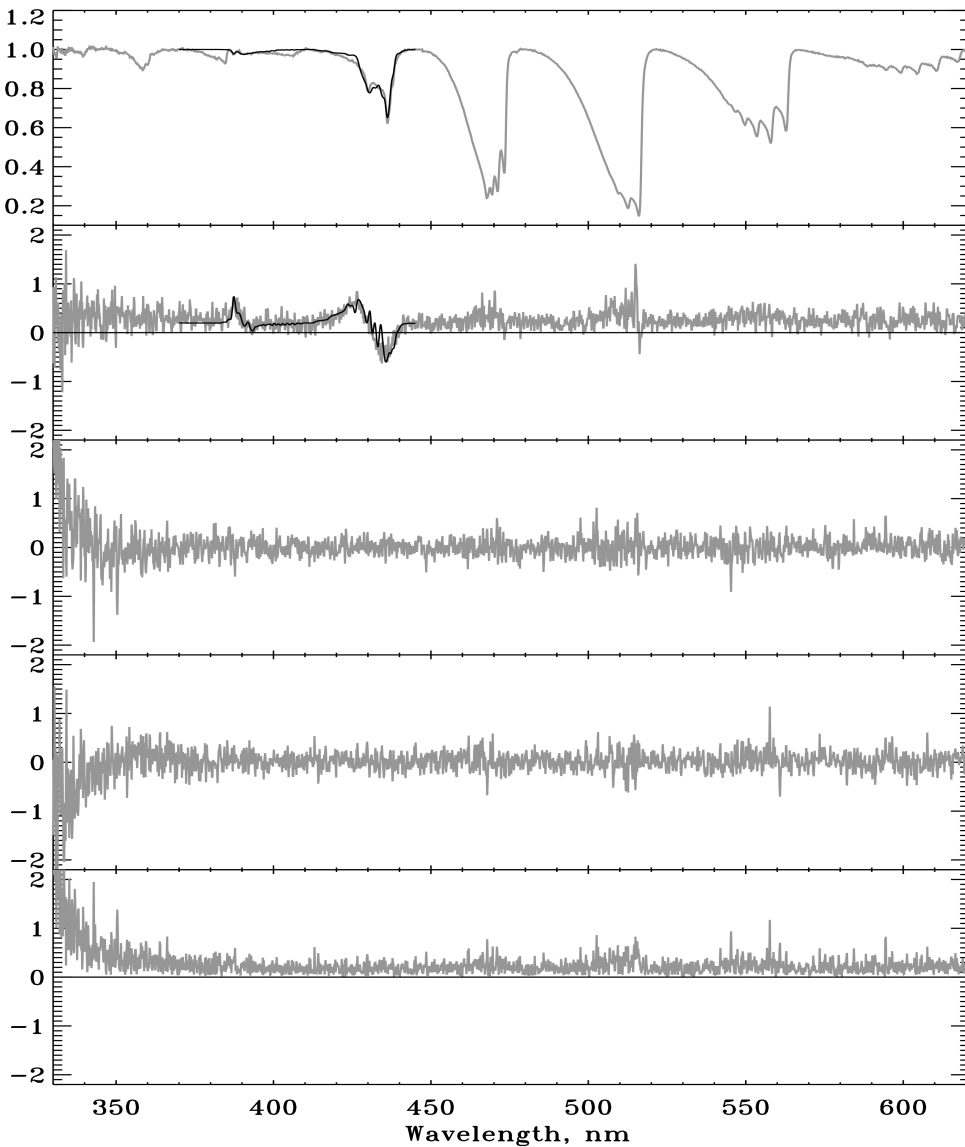




November 2008

- GJ 1037 = WD 0115+159
- GJ 151 = WD 0341+182
- GJ 3306 = WD 0435-088
- *G 99-37* = WD 0548-001
- WD 0935-371A
- *GJ 841B* = *WD 2154-511*
- GJ 893.1 = WD 2311-068 (August 2009)

GJ 841B



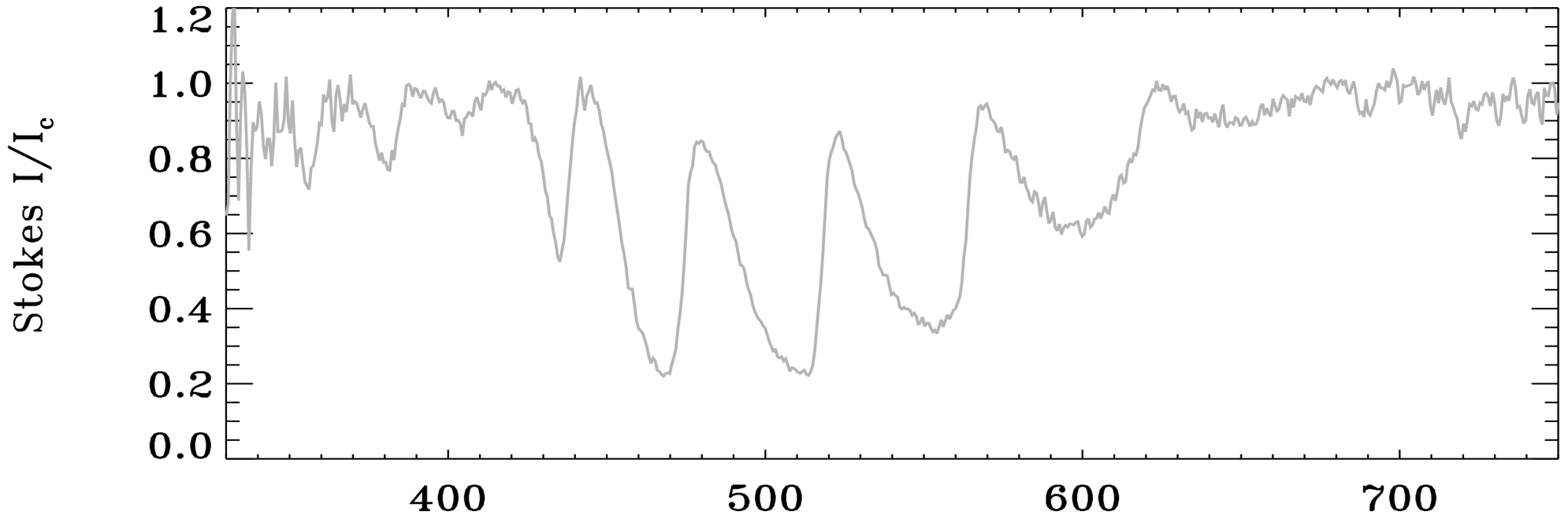
- Another object with CH features, also polarized
- First object with polarized C_2 features
- Polarization ± 1 %
- $B=130$ T (1.3 MG)
- $T=6100$ K
- Found through high S/N spectropolarimetry
- CH is clearly visible.

February 2010



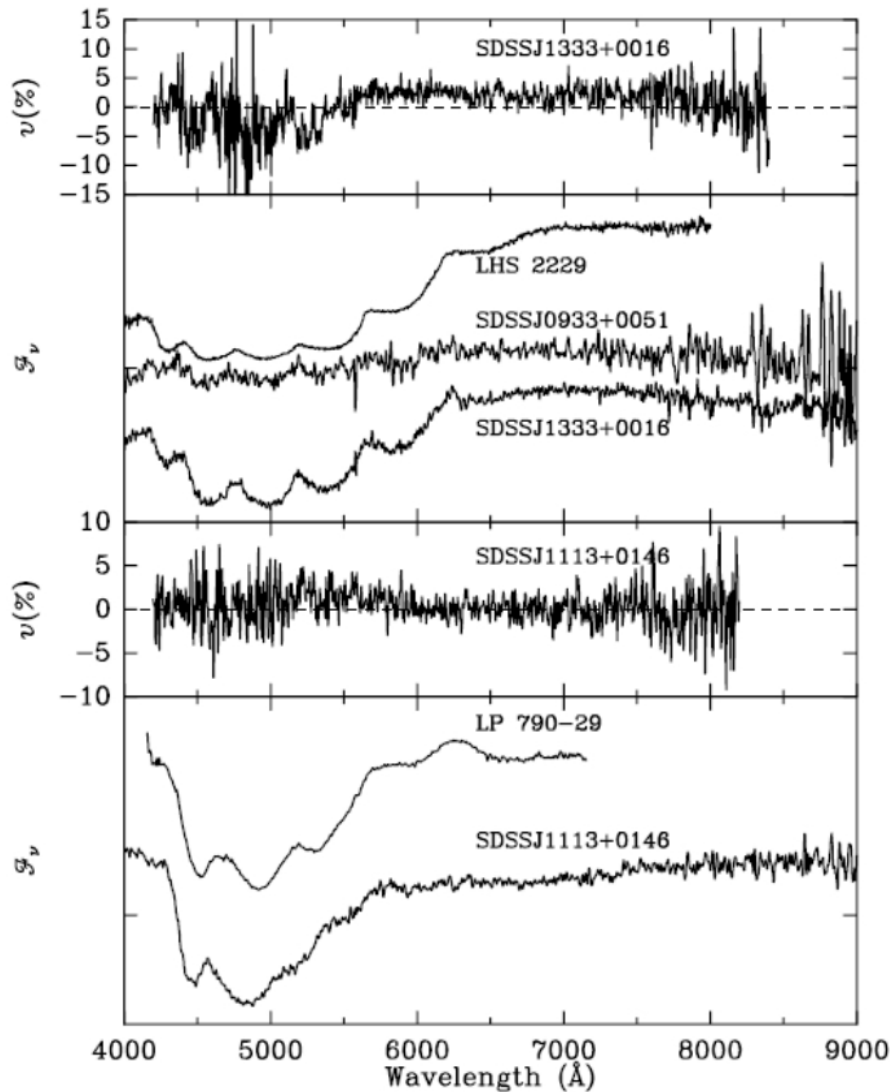
- G 99-37 = WD 0548-001
- GJ 3431B = WD 0706+374
- GJ 1117 = WD 0856+331
- WD 0913+103
- GJ 3569 = WD 0946+534
- EGGR 78 = WD 1115-029
- *WD 1235+422*

WD 1235+422

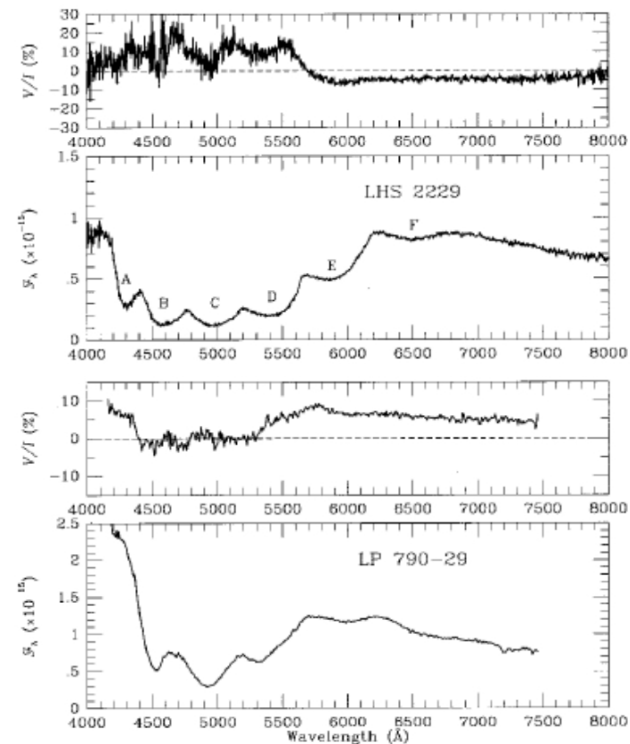


- Resembles
 - GSC2U J 131147.2+292348 (Carollo et al. 2002 & 2003)
 - SDSS 080843.15+464028.7 (Kleinman et al. 2004, Dufour et al. 2005)
- But...

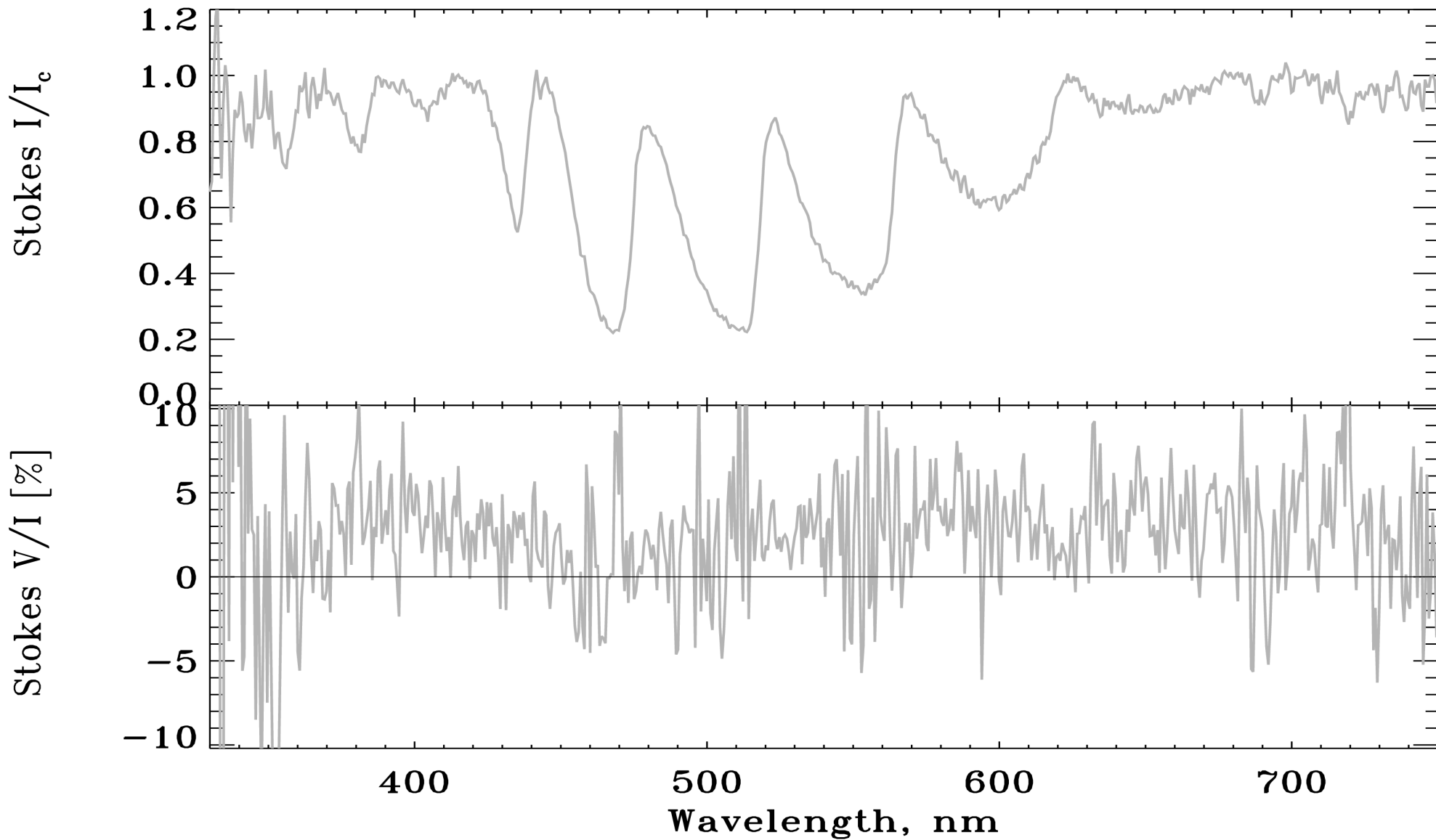
Peculiar DQs

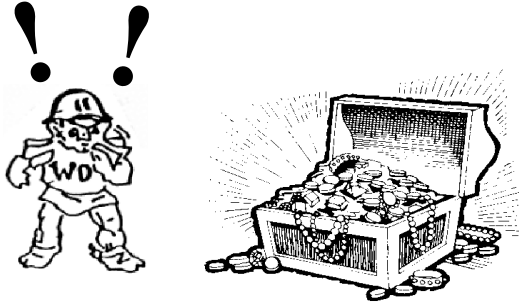


- Magnetic peculiar DQ WDs
- From Schmidt et al. (1999 & 2003)

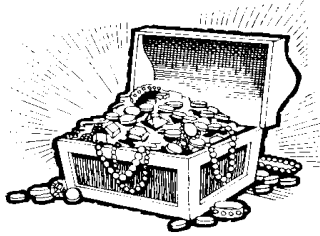


WD 1235+422





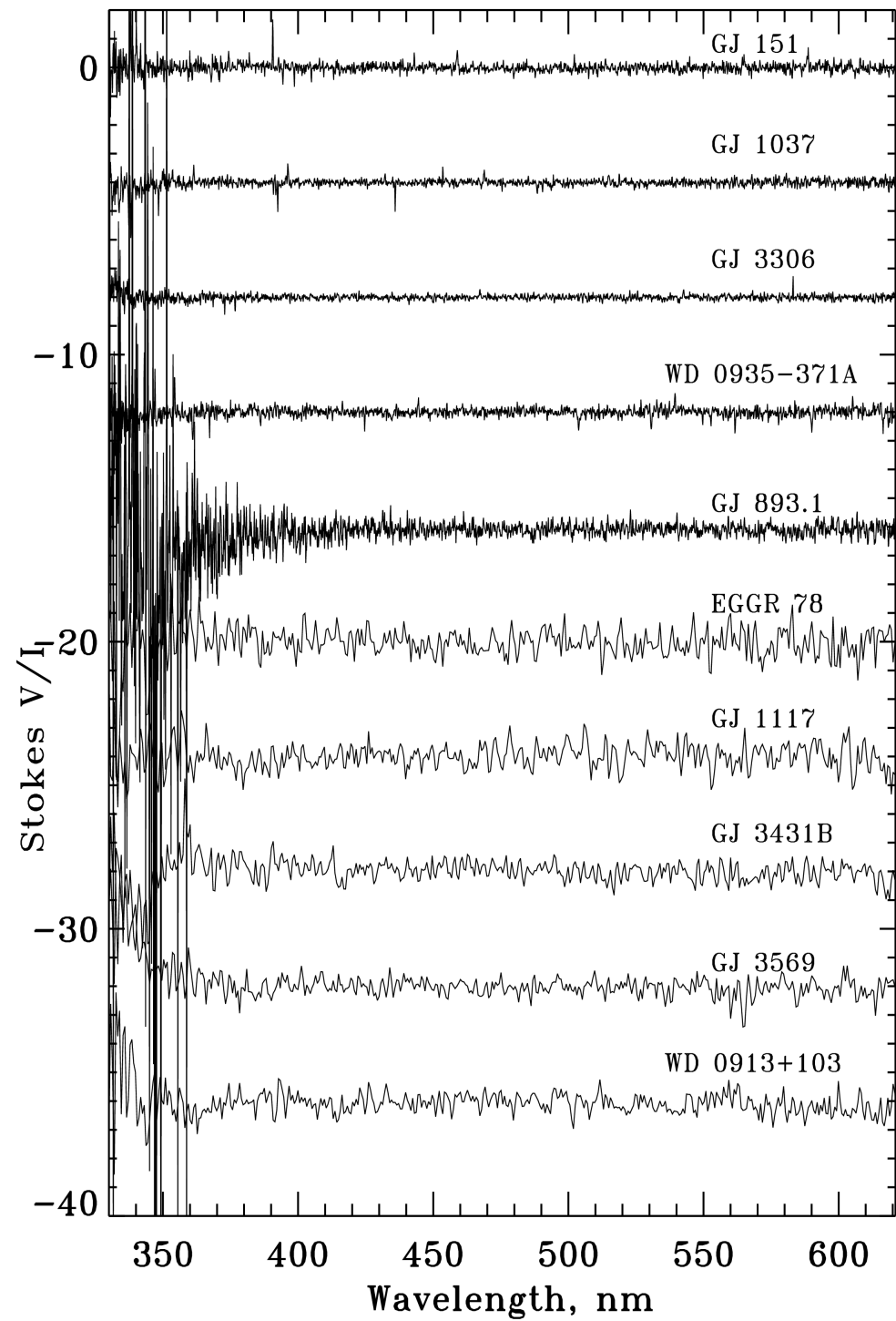
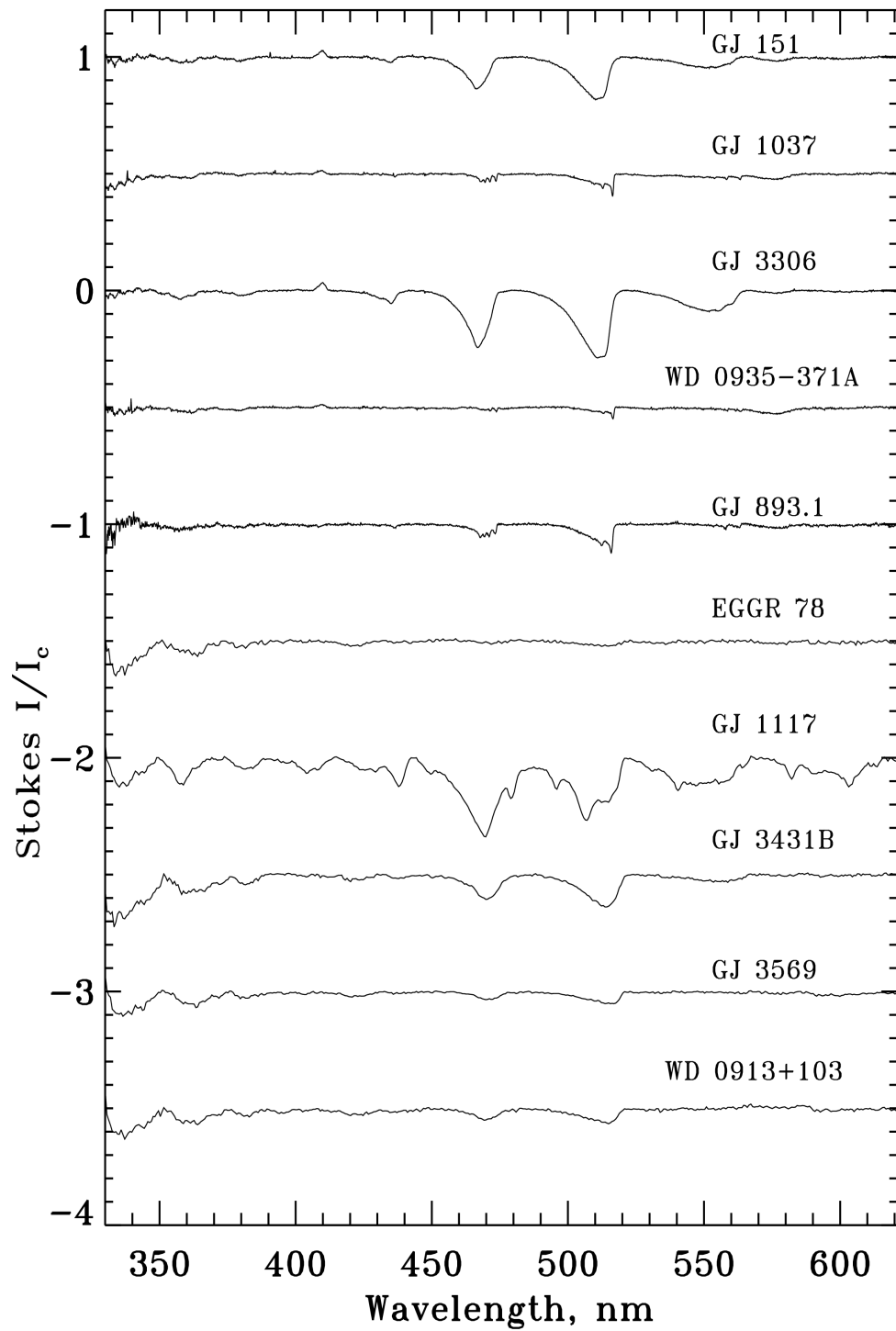
- Discovery of a new CH DQ WD GJ 841B
- On-going mission to boldly search where no one has searched before
 - High S/N spectropolarimetric observations
 - Test the model on peculiar DQs
 - Other objects (Brown Dwarfs for example)



Patterson (1994)

- Discovery of a new CH DQ WD GJ 841B
- On-going mission to boldly search where no one has searched before
- *Thank you for your attention!*

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Proposal

- International collaboration on DQs
- Sharing of data and modelling capabilities
- All the people working in the field
- Online workspace
- Solving the mystery of DQs/peculiar DQs/ Hot DQs

