



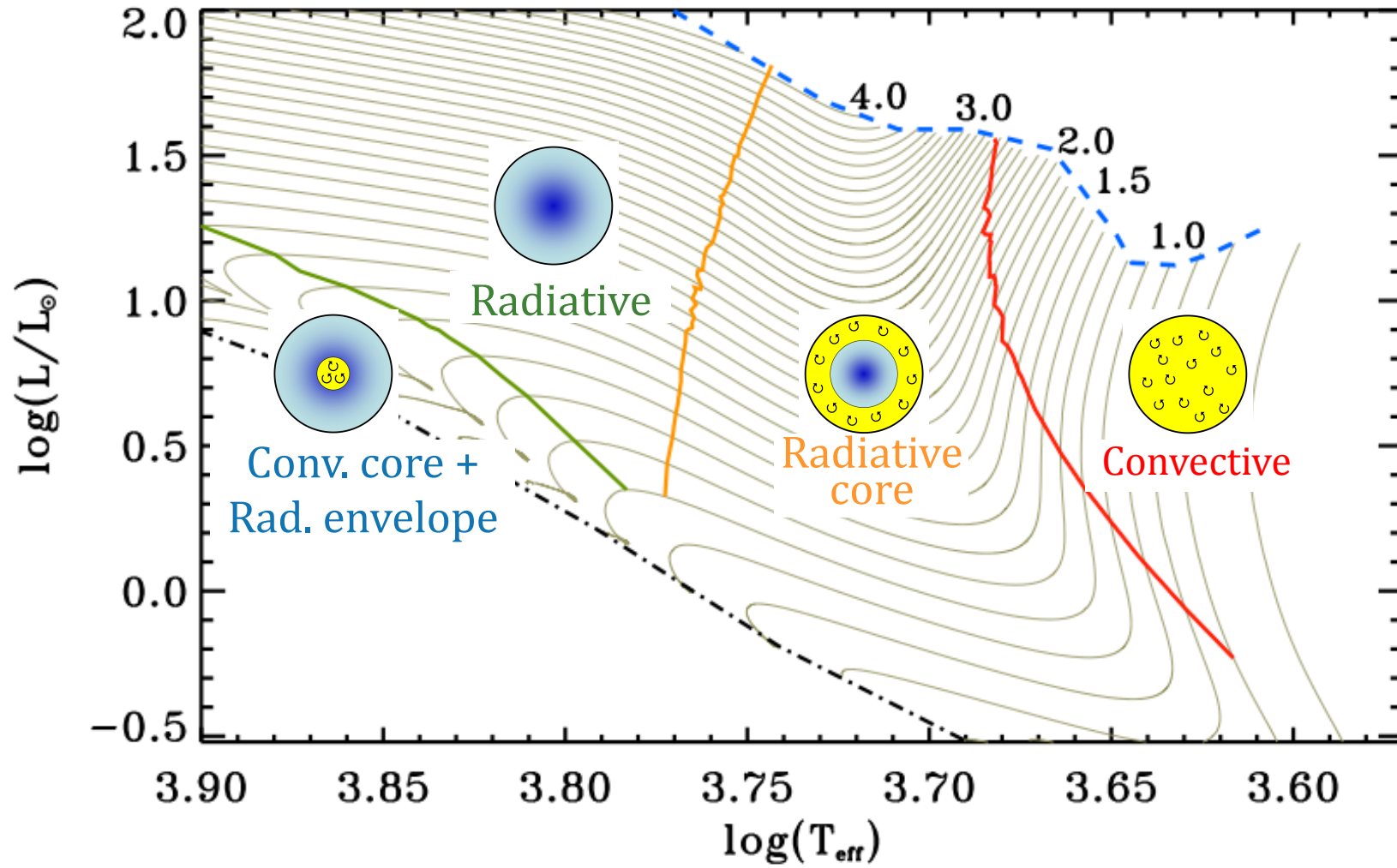
Magnetism in intermediate mass T Tauri stars

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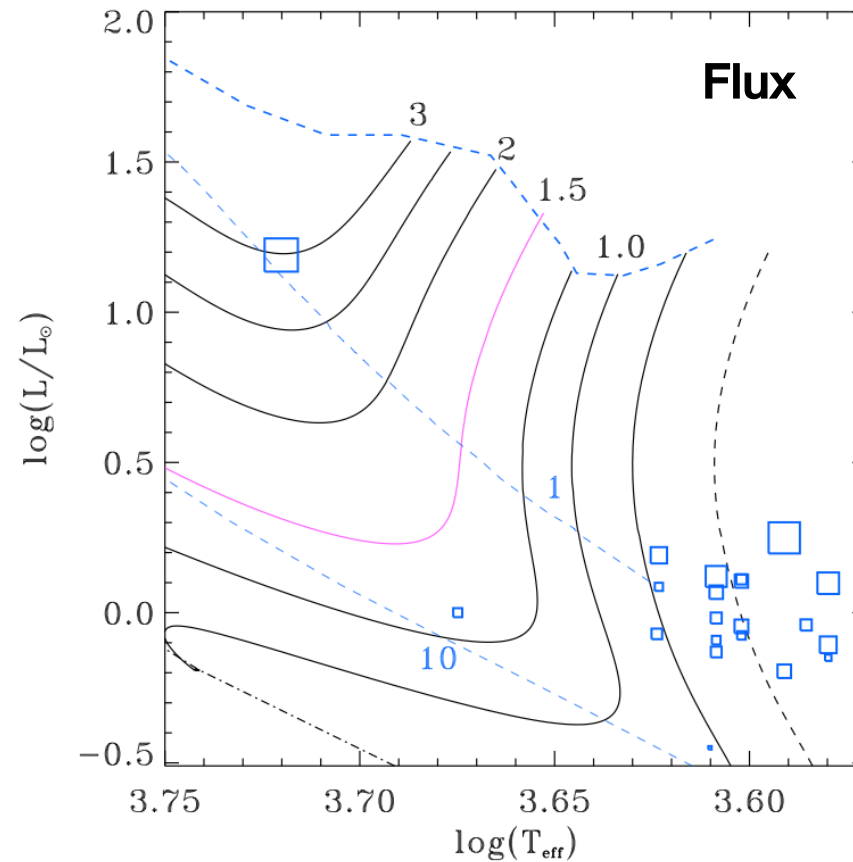
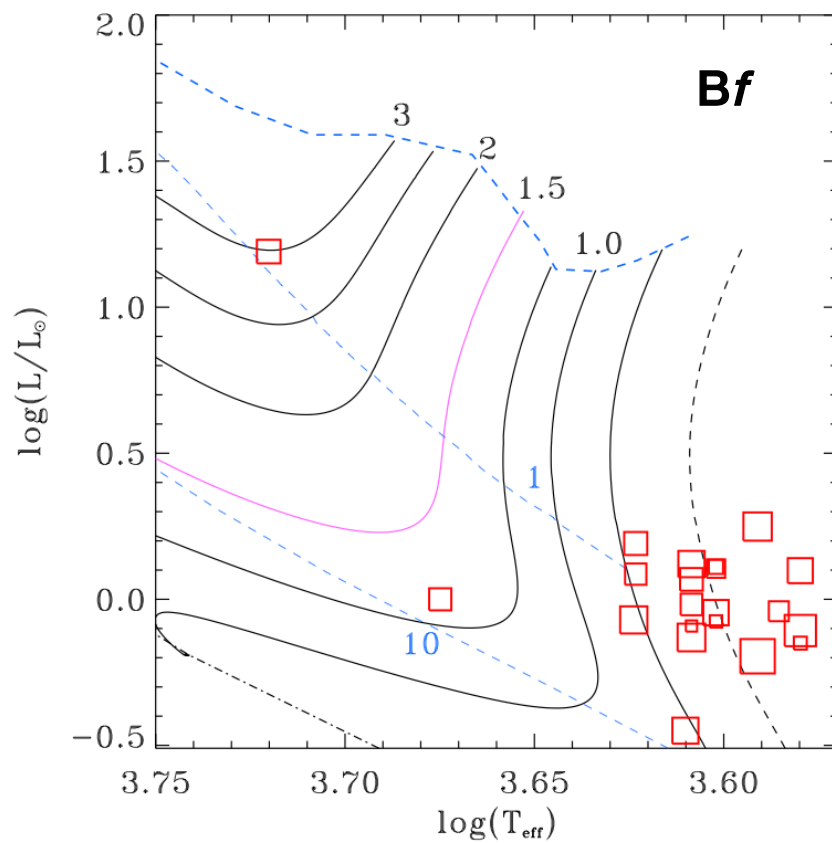
J.F. Donati, E. Alecian, M. Skelly, J. Bouvier, A. Cameron,
C. Dougados, C. Folsom, H. Gateau, S. Gregory, G. Herczeg,
J. Landstreet, M. Jardine, O. Kochukhov, R. Kurosawa,
T. Montmerle, F. Ménard, P. Petit, M. Romanova, G. Wade, ...

Introduction





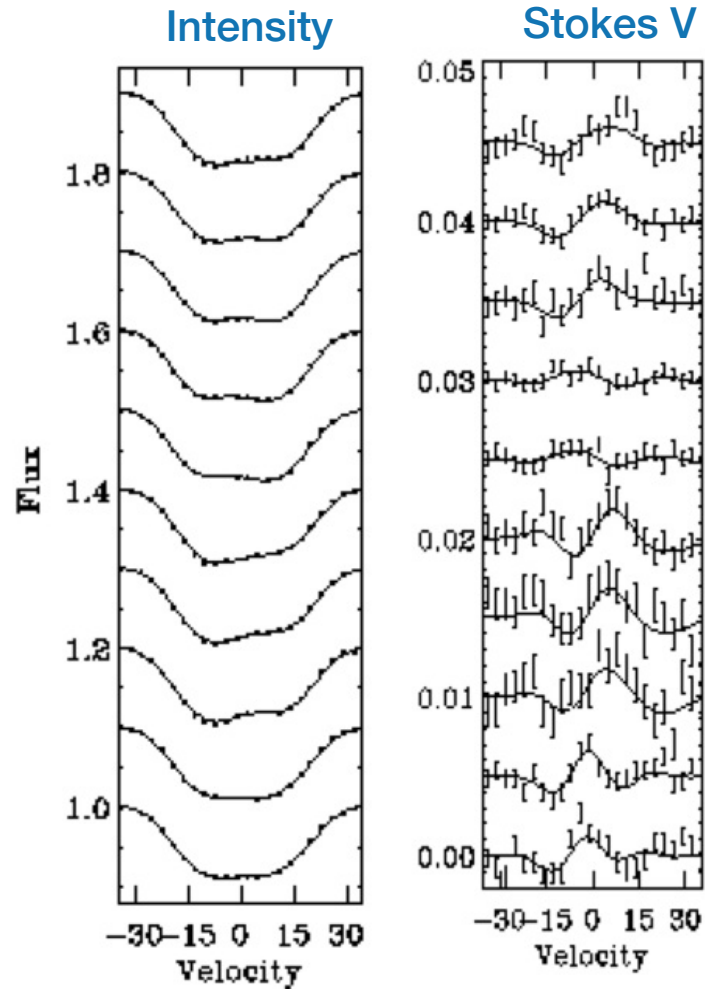
T Tauri star magnetic fields: Zeeman Broadening



Results from Yang et al. 2011, Johns-Krull et al. 2009



CV Cha: Mapping IMTTS

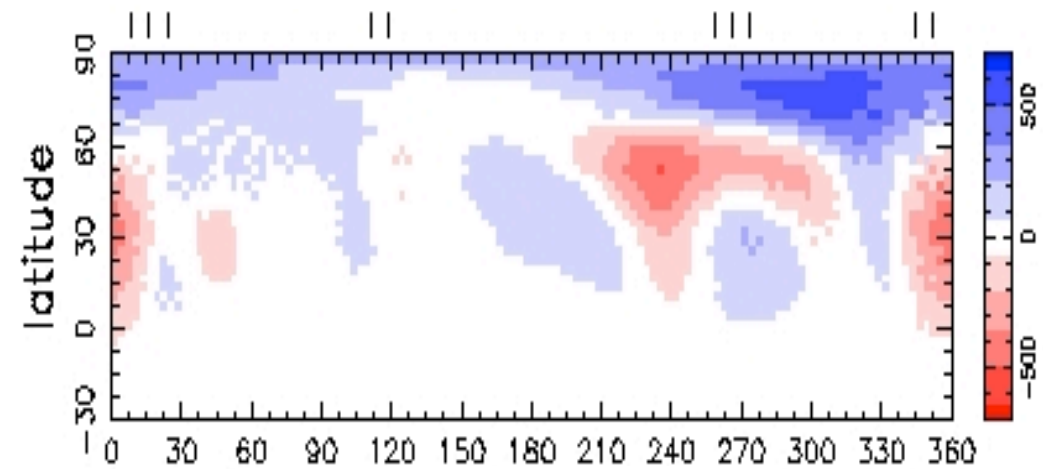
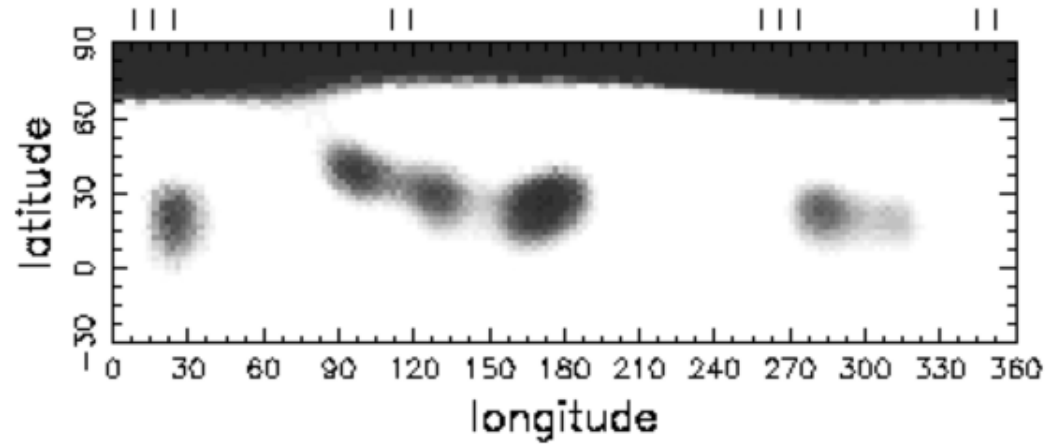
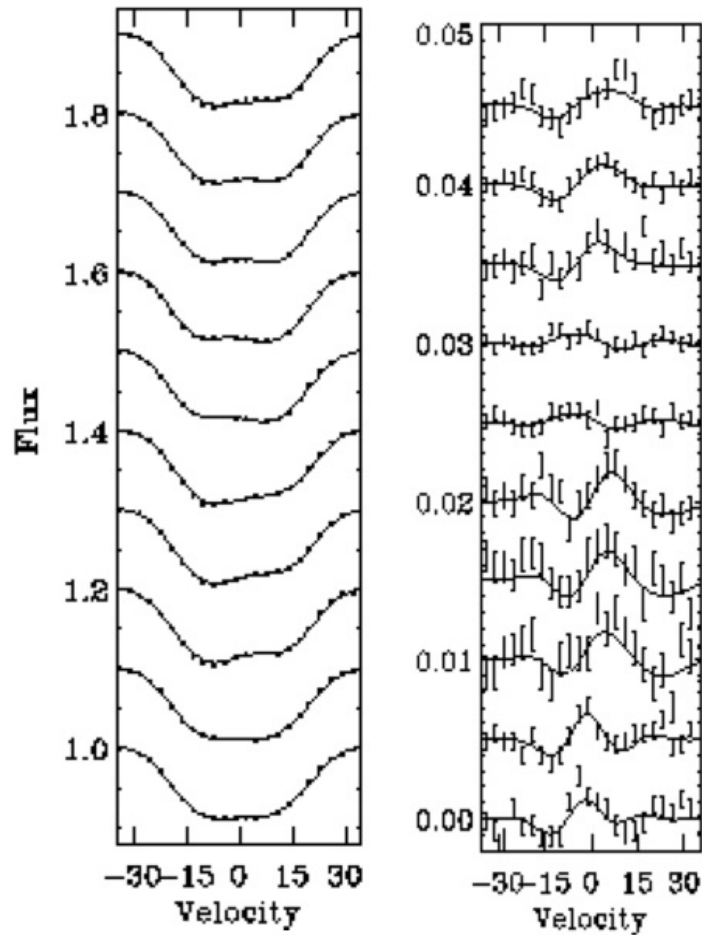


G8, 5500K, 2.0-2.2 M_{\odot}
 $P_{\text{rot}}=4.4\text{d}$, $M_{\text{core}}\sim 0.9-1M_{*}$
 $\log M_{\text{acc}} -7.5$

Hussain et al. 2007



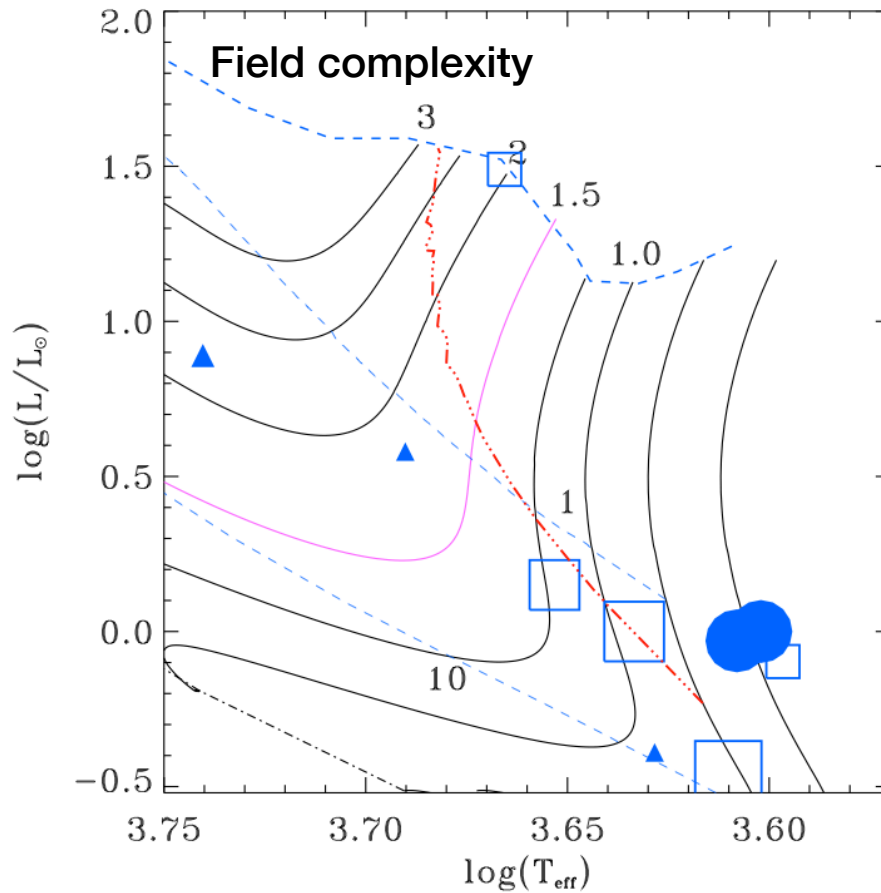
CV Cha: Mapping IMTTs



Hussain et al. 2007



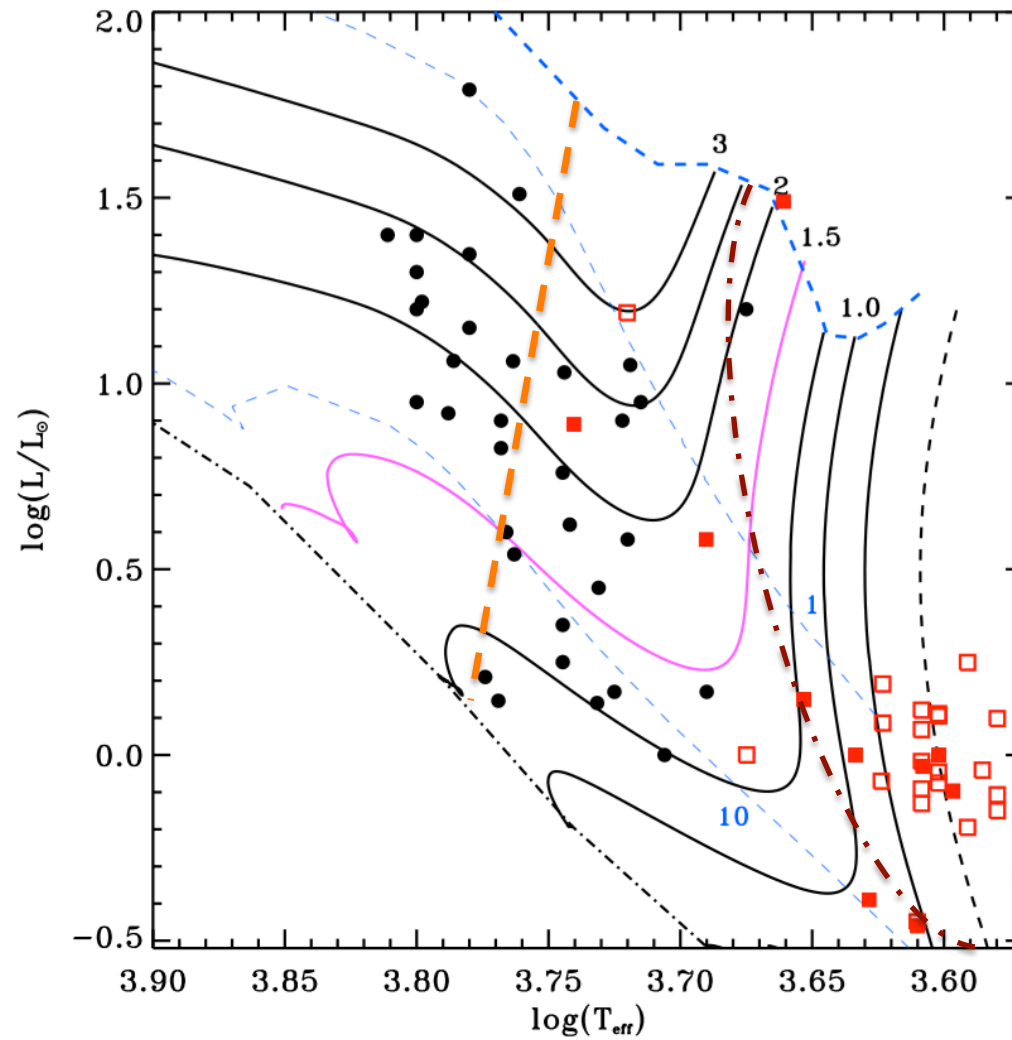
Magnetic fields in 10 accreting T Tauri stars



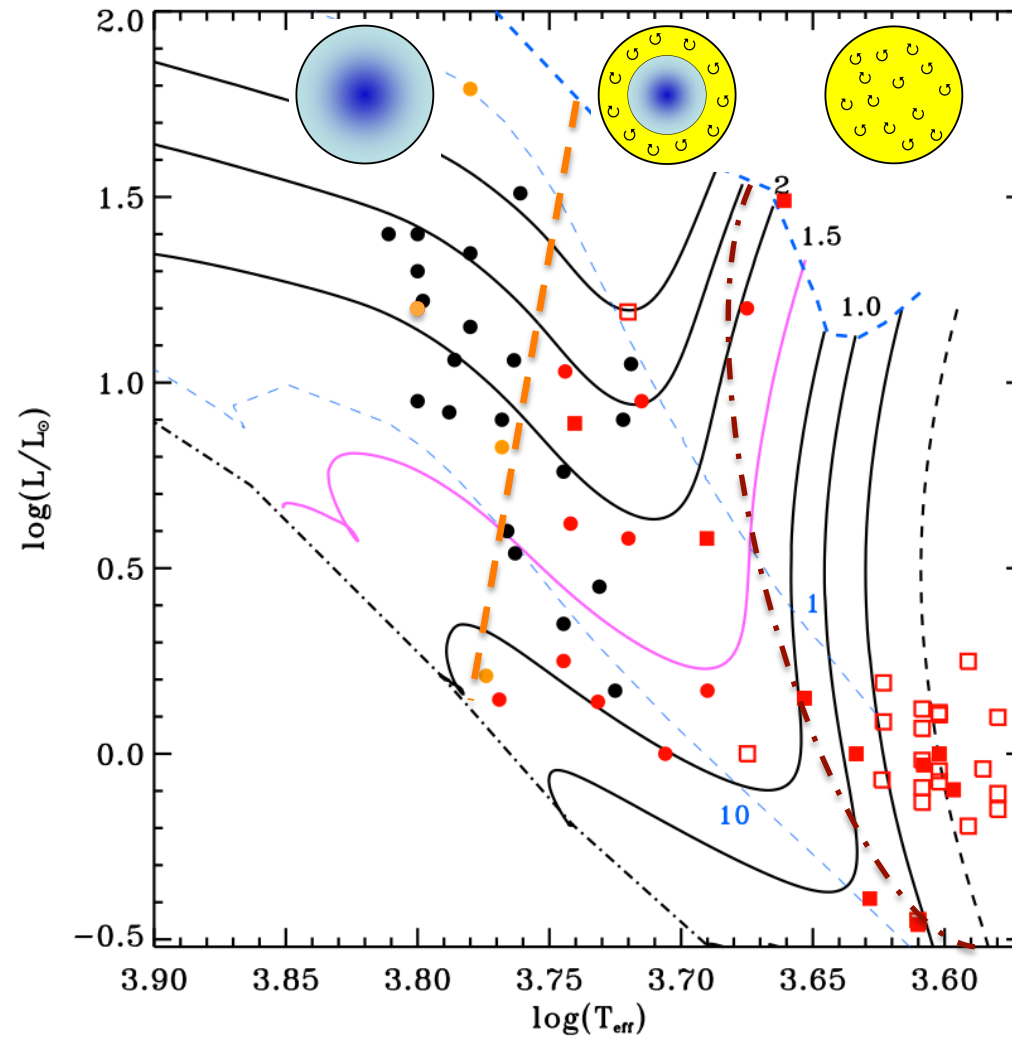
- Circles: dipole-dominated
- Squares: octupole-dominated
- Triangles: higher order multipole

See Gregory et al. 2013, Johnstone et al. 2014, Hussain & Alecian (arXiv:1402.7130)

Magnetic fields: intermediate mass

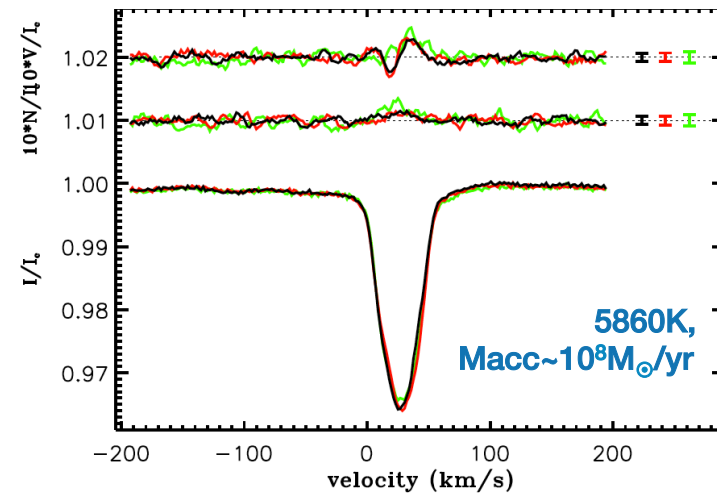
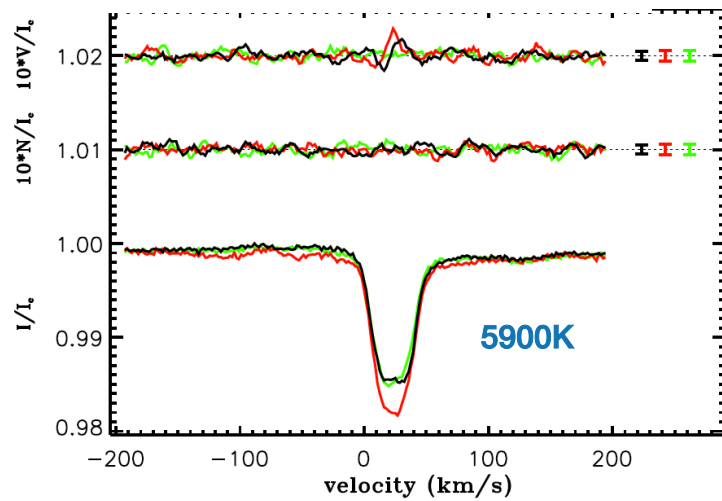
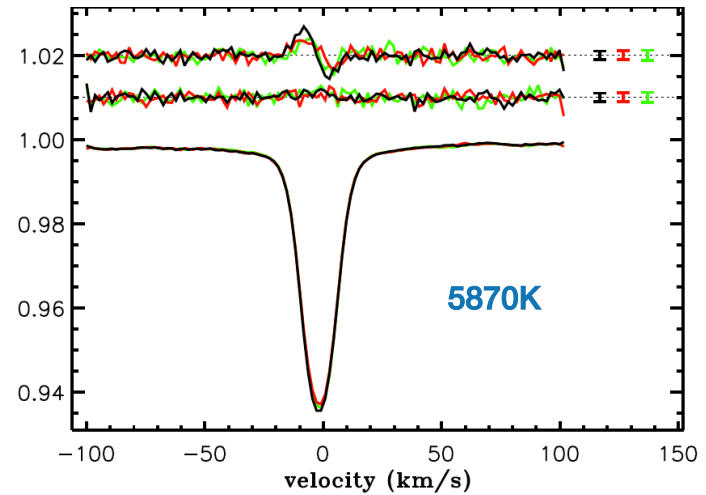
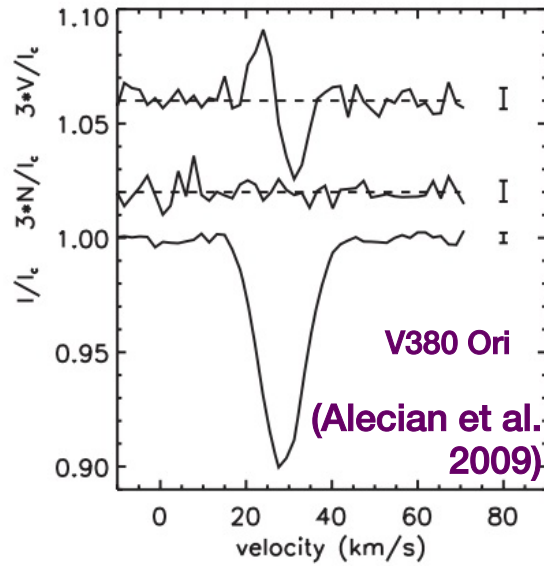


Magnetic fields: low-intermediate mass



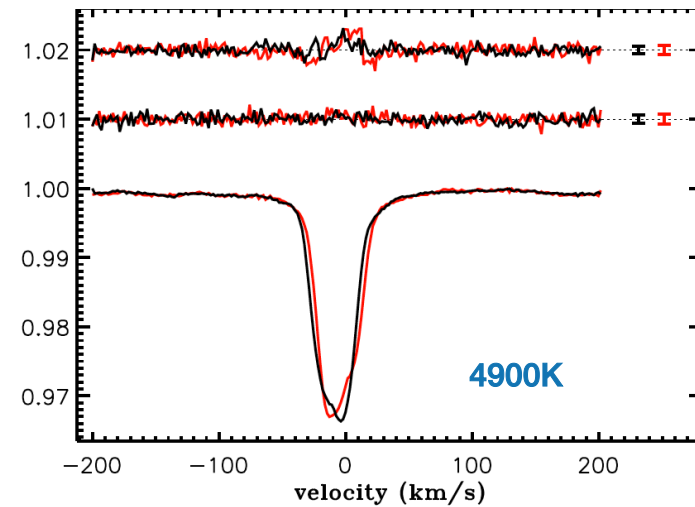
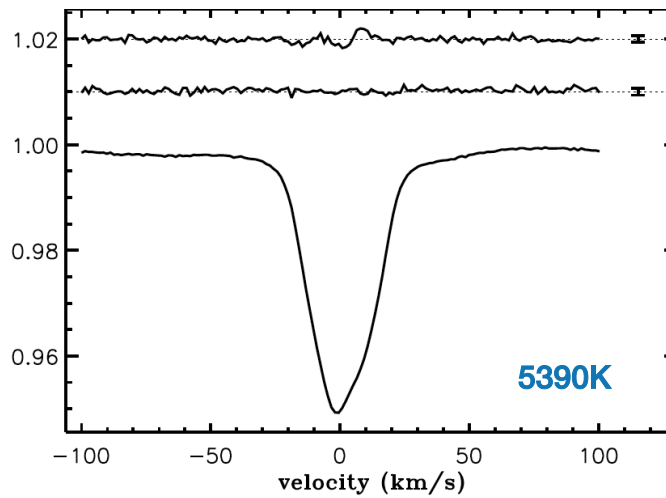
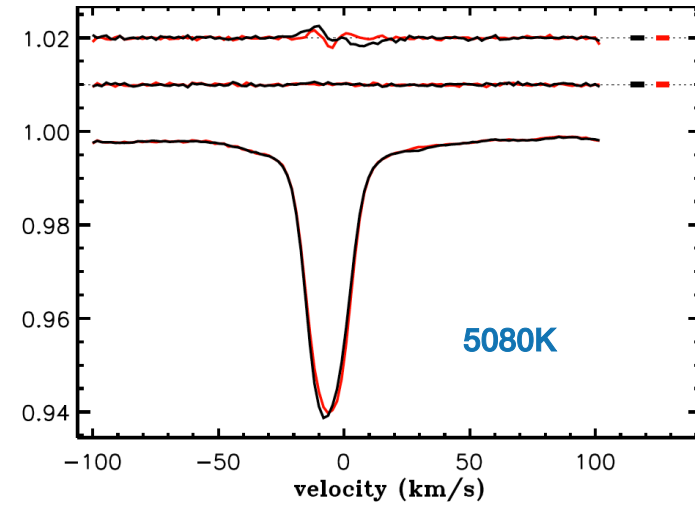
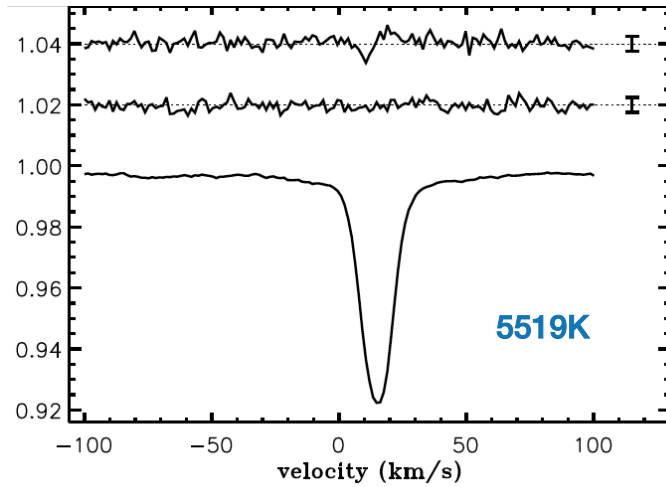


IMTTs “hot” detections (5800-6000K)





“Cool” IMTTs



Summary

- All stars $<5M_{\odot}$ undergo a T Tauri stage
- Magnetic field studies show:
 - Intermediate mass T Tauri stars can host magnetic fields
 - Range of field topologies – internal structure
 - Fully consistent with the magnetospheric paradigm
- Magnetic incidence drops quickly as PMS stars cross fully radiative boundary
- Further investigations underway:
 - Timescale of drop
 - Compare topologies with other TTS and more evolved hotter counterparts
 - Detailed comparison of emission diagnostics



Upcoming projects

MaTYSSE

- Magnetic fields on non-accreting T Tauri stars

BinaMIcS

- Magnetic fields in young binary systems

SPIRou

- NIR high resolution spectropolarimeter
- Probe magnetism/accretion in earlier stages of star formation

UVMag

- Stellar UV spectroscopy & spectro-polarimetry
(1.3m, 117-320 & 390-870nm, R~25000/35000+)
- Probe outer atmospheres of young stars & role of magnetism