

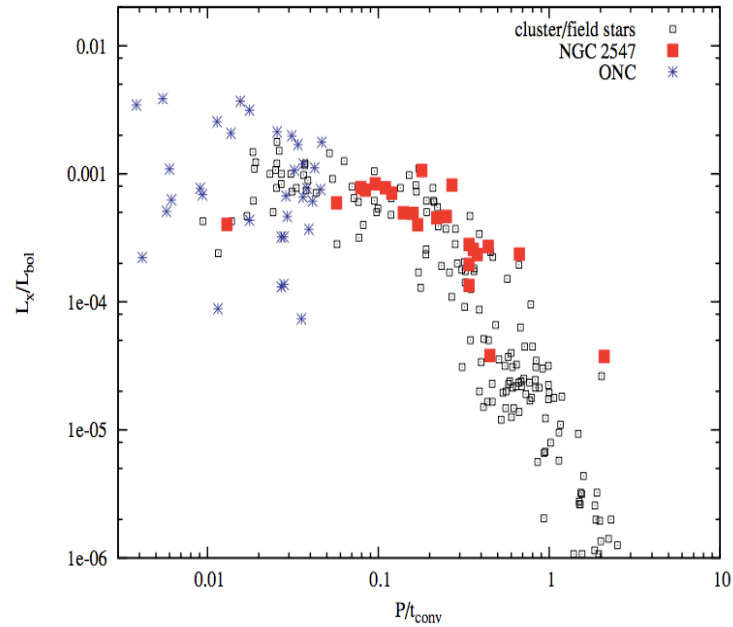
Magnetic fields and binarity in the ONC

Gaitee Hussain, ESO

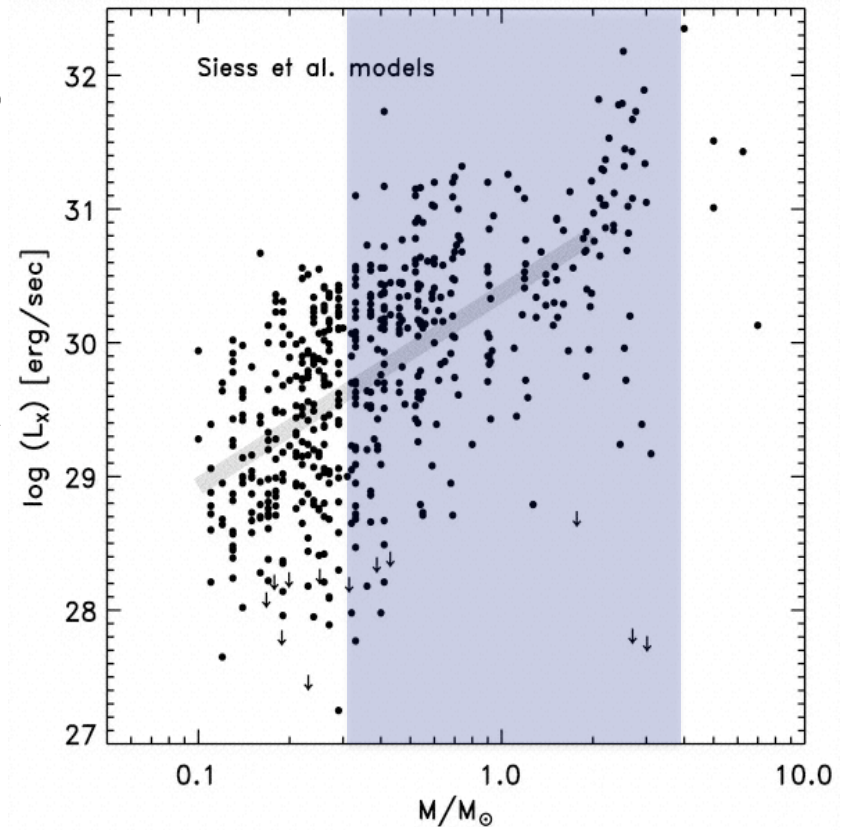
Stempels & Hussain, submitted to A&A

Hussain et al. 2009, AIP Conf. Proc., 1094, 604

Magnetic activity evolution in T Tauri stars

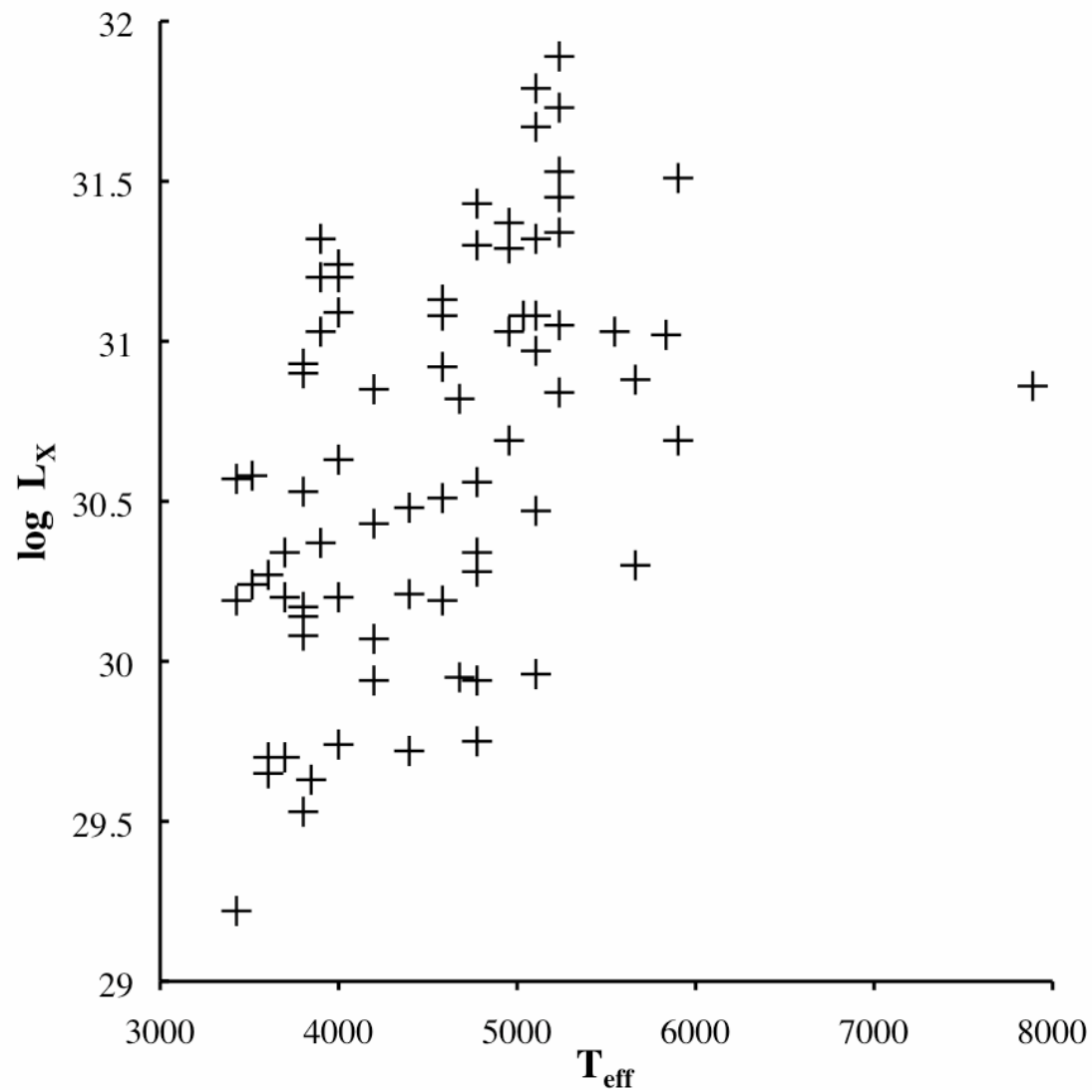


Jeffries et al. 2006

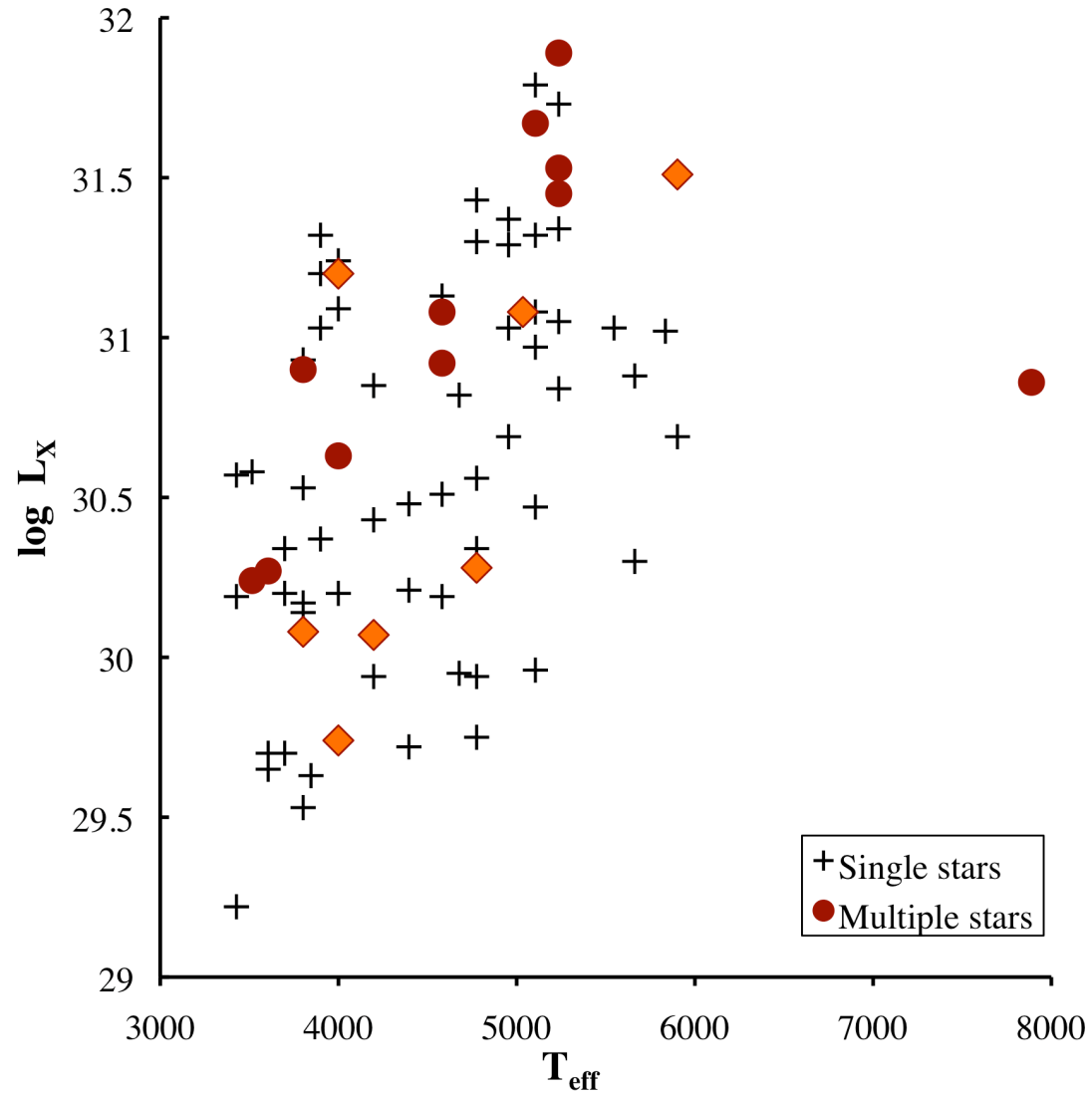


Preibisch et al. 2005

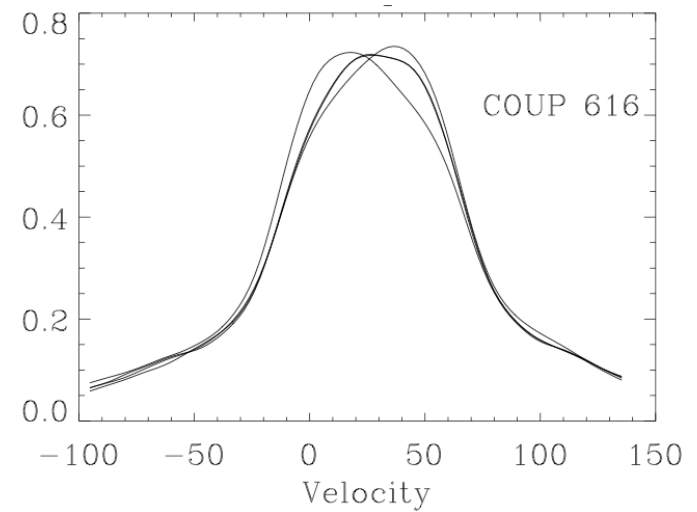
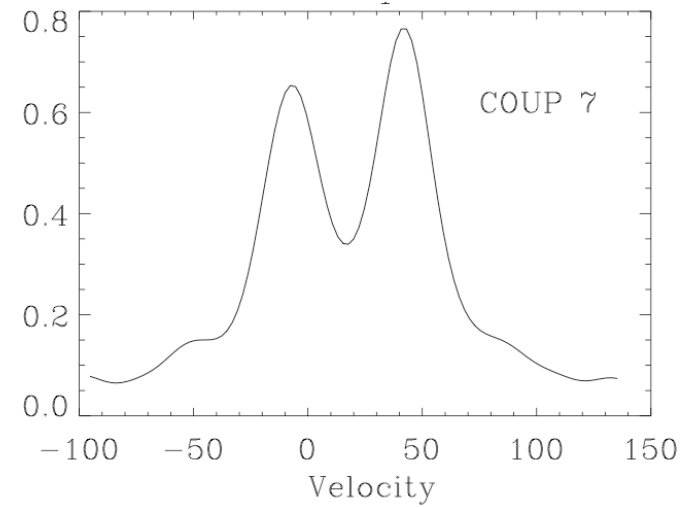
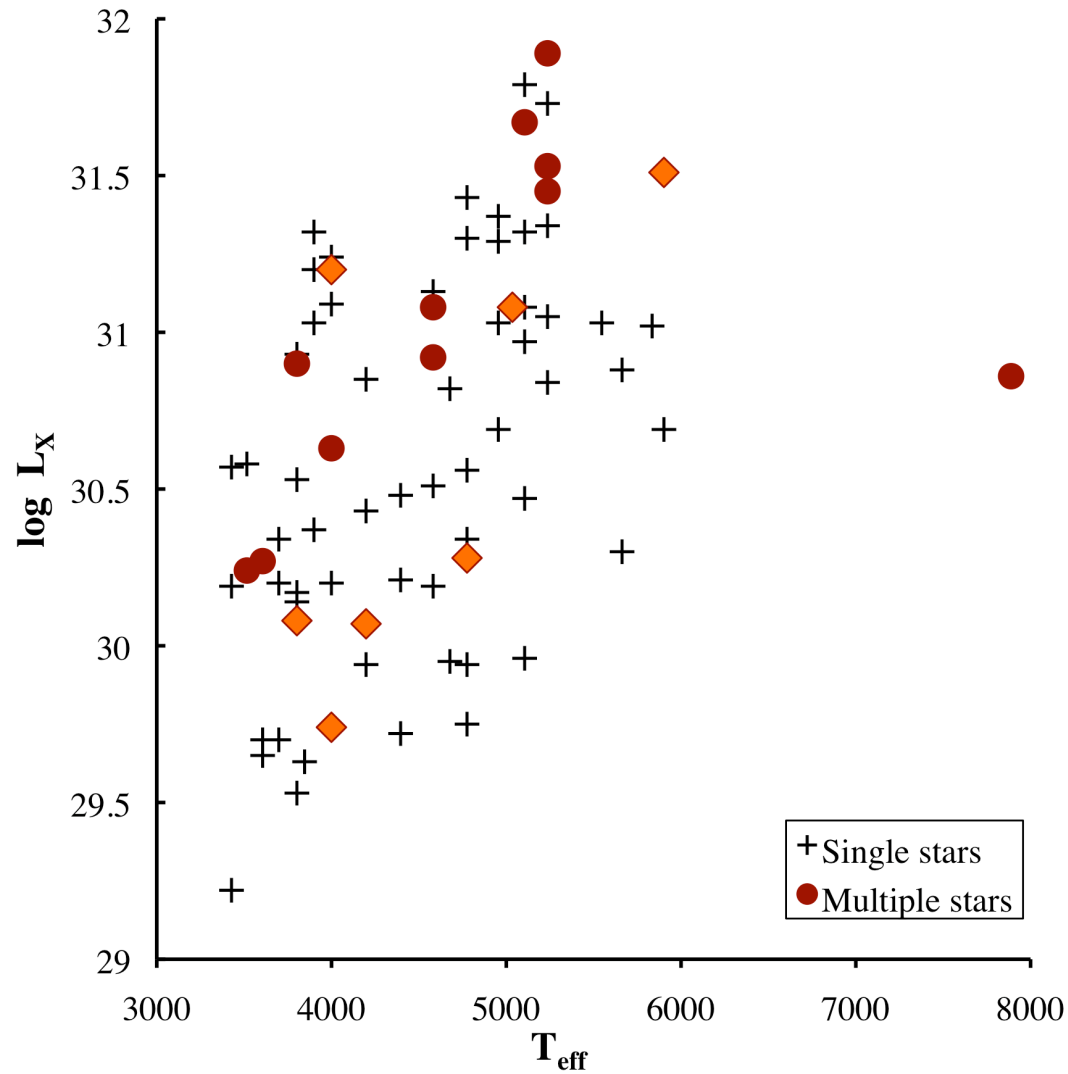
ONC-FLAMES: the sample



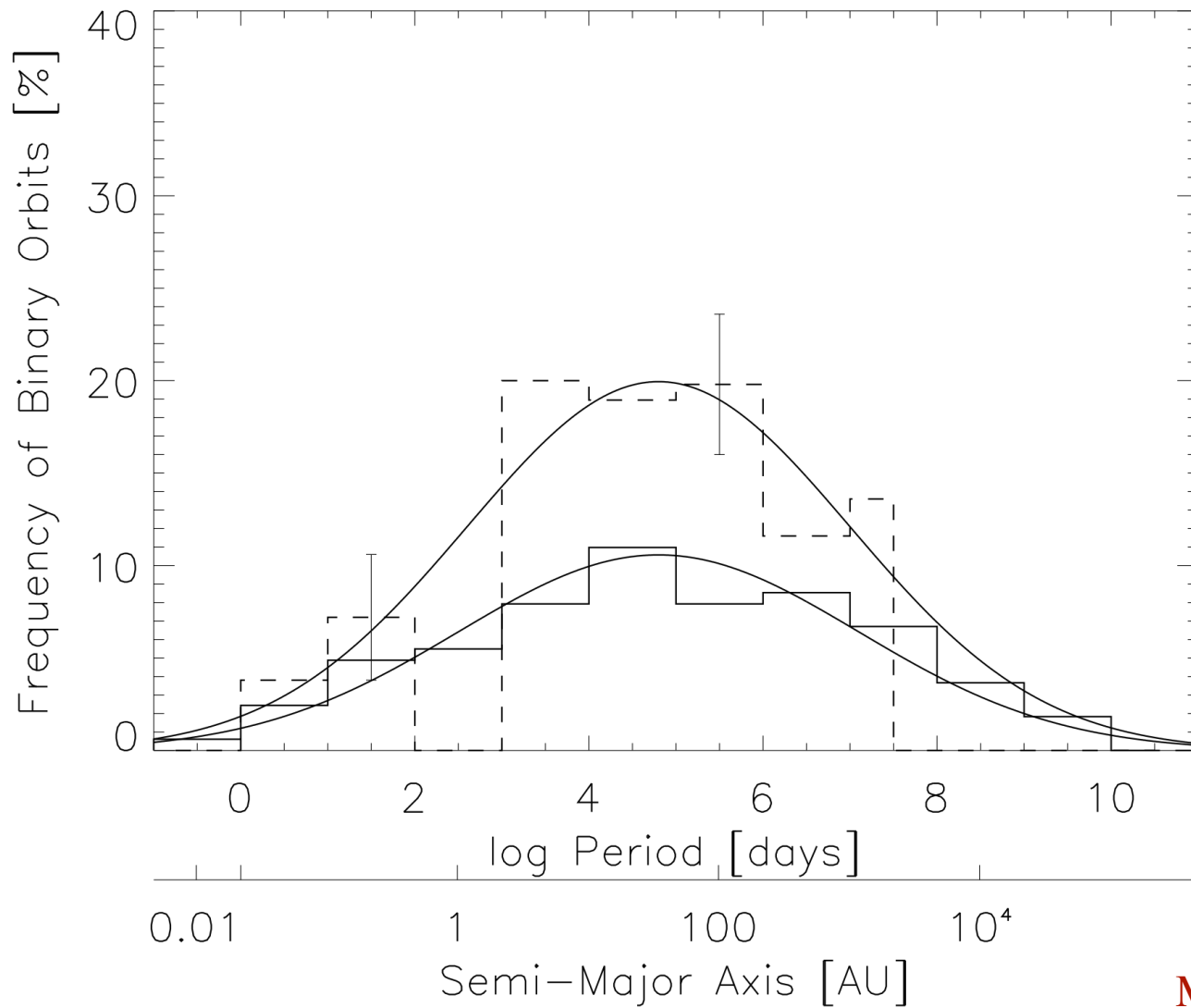
ONC-FLAMES: multiple systems



ONC-FLAMES: multiple systems



Binary frequency for solar-mass stars

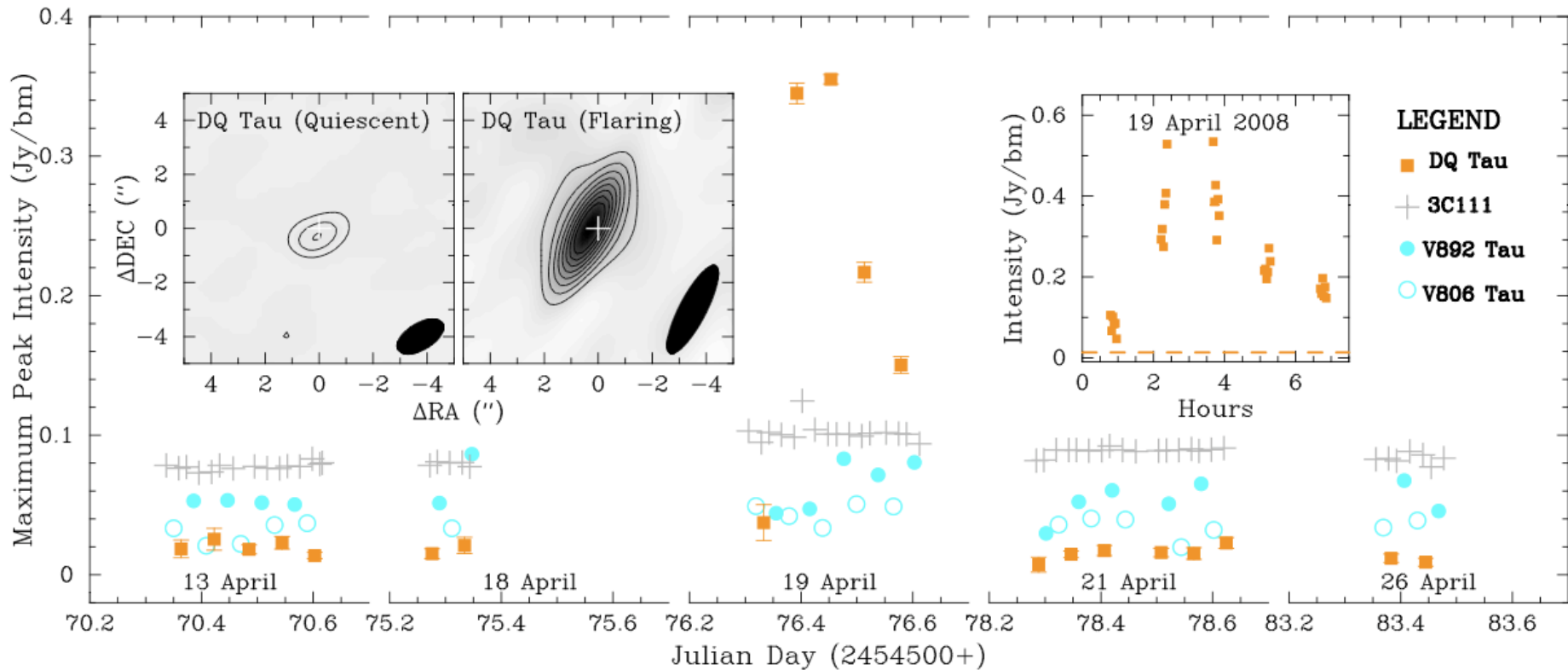


Mathieu 1994,
Petr-Gotzens

Binary stars: flares & NIR excess

	No. stars	Strong flares	NIR excess	NIR XS & flare	Ha emission
Single stars	67	33	31	15	20
SB1+SB2	13	8	6	6	3
SB2 binaries	10	7	5	5	2

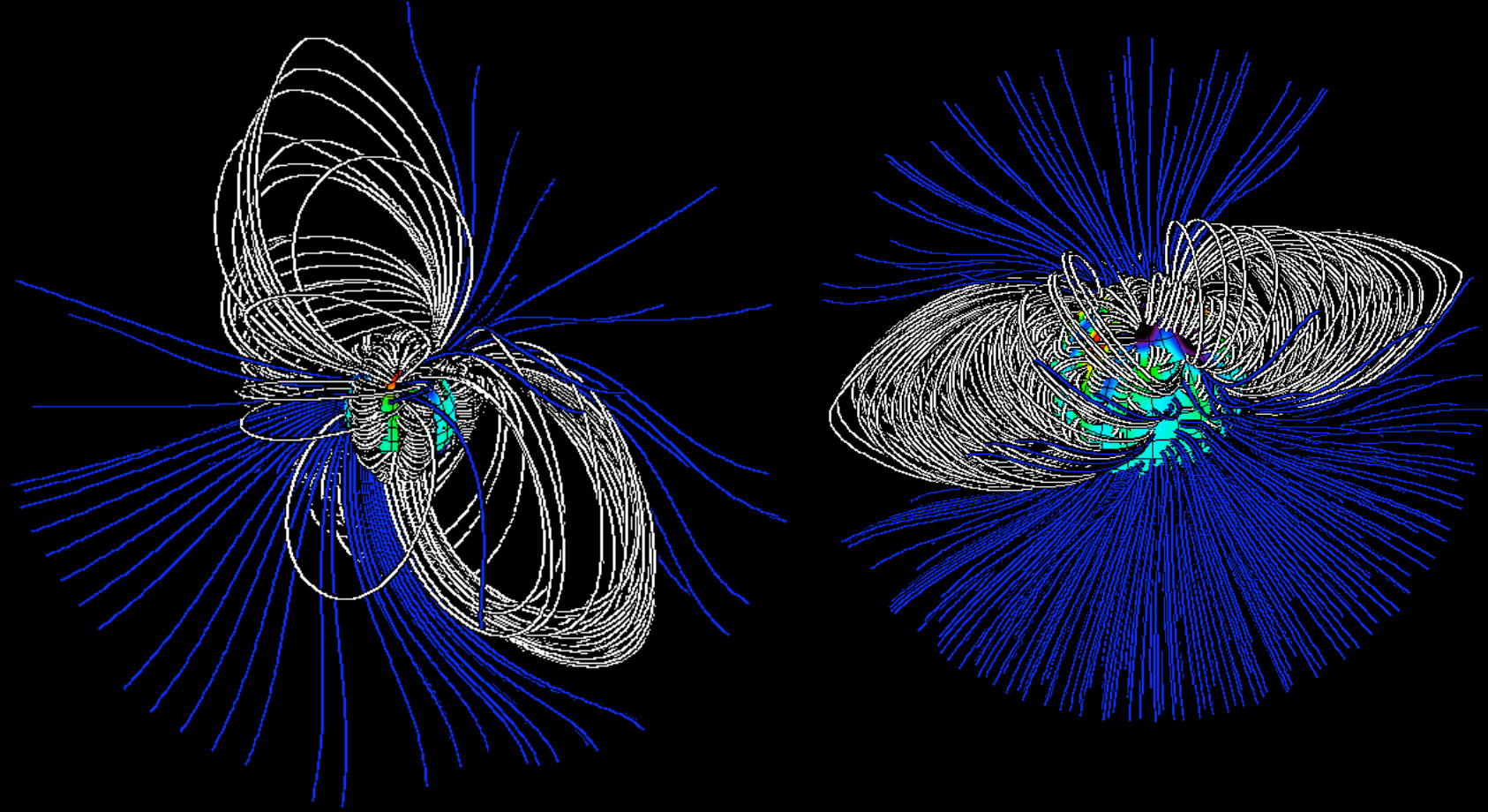
Flares in binary systems



- $P_{\text{rot}}=15.804$ d; K7-M1; binary separation: $8R_*$
- Circumbinary disk + NIR excess ($5 \cdot 10^{-10}M_{\text{sun}}$); $dM/dt=5 \cdot 10^{-8}M_{\text{sun}}\text{yr}^{-1}$

Salter et al. 2008

Magnetospheres of PMS stars: HD 155555



Dunstone et al. 2008

Summary

- Binaries:
 - 16-20% frequency in our sample → effect of bias or genuine differences between close & wide binary population in the ONC?
 - Flaring frequency in SB2 binaries higher than in general sample
 - 50% have disks; Tobin find 30% have disks in ONC
 - disk clearing timescales
 - relationship between NIR disks and flaring frequency?
- Single stars:
 - highest $v \sin i$ stars show **decline in L_x**
 - stellar activity relationships hindered by variability & binarity

Bibliography

- Hussain, G.A.J., Stempels, H.C.S., Jardine, M., Cameron, A.C., Favata, F. 2009
Proceedings of the 15th Workshop on Cool Stars, Stellar Systems & the Sun, AIP
Conf. Proc. Vol. 1094, p. 604
- Jeffries, R.D., Evans, P.A., Pye, J.P., Briggs, K.R., 2006
MNRAS, 367, 781
- Mathieu, R.D., 1994
ARAA, 32, 465
- Preibisch, T. et al. 2005
ApJS, 160, 401
- Salter, D.M., Hoogerheijde, M.R., Blake, G.A., 2008
A&A, 492, L21