

The distribution of ejected brown dwarfs

Simon Goodwin
David Hubber
Estelle Moraux
Ant Whitworth

BDs as ejected embryos

Classic Reipurth & Clarke (2001) scenario

BDs and low-mass stars are ejected at ~ 1 km/s

Predominantly single

Wider spacial distribution? But core velocity dispersion is about 1 km/s....

Bate et al. 2002, 2003; Sterzik & Durisen 2003; Delgado Donate et al. 2004; Goodwin et al. 2004a,b; Hubber & Whitworth 2005

Simulations

Used Nbody6 (Aarseth 2004) to model the decay and interaction of small-N cores ($N_*=1$ to 4)

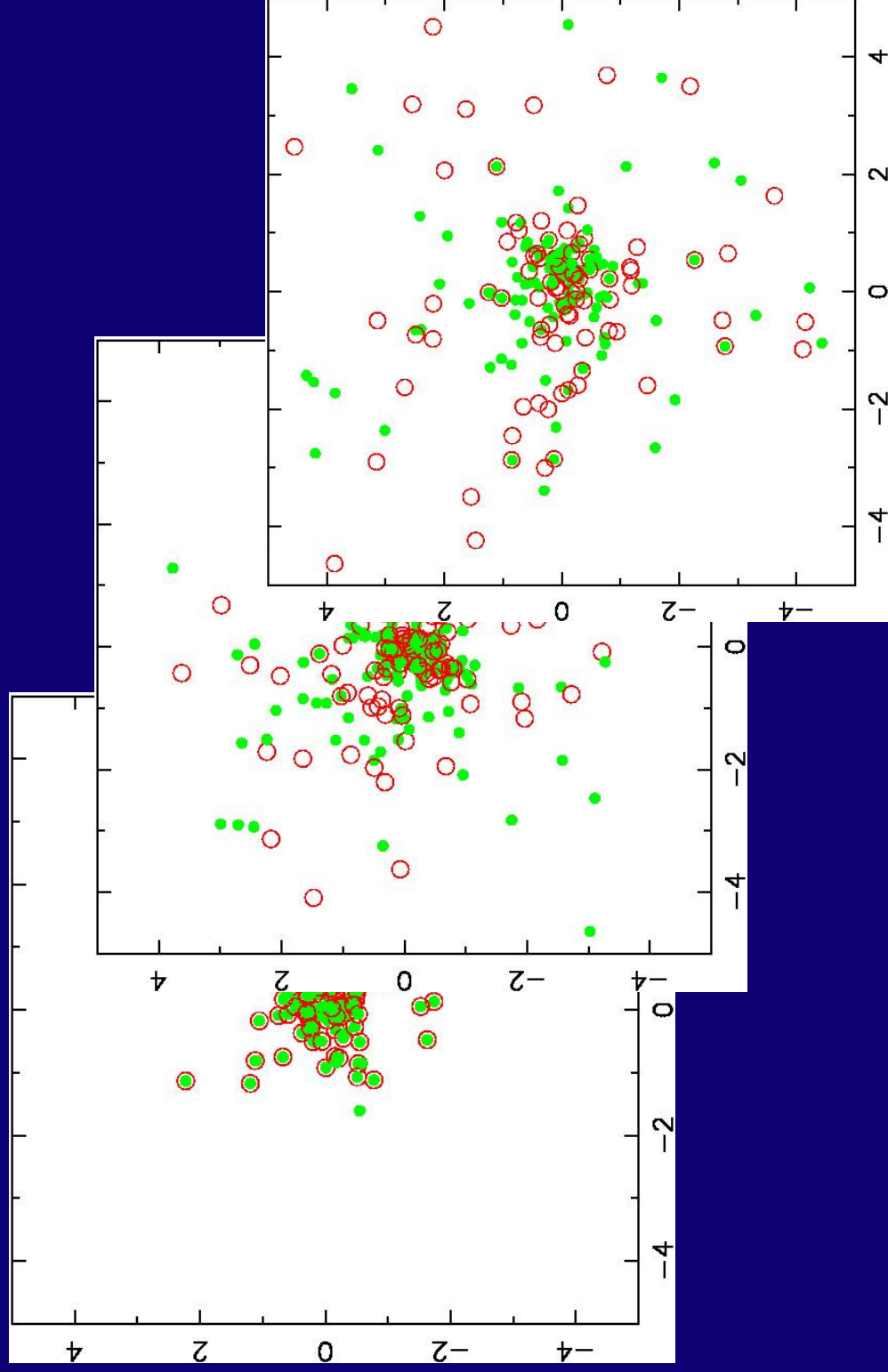
N_* Stars picked randomly from a Kroupa IMF

Placed in a virialised 200au sphere

Place cores in a virialised Plummer sphere

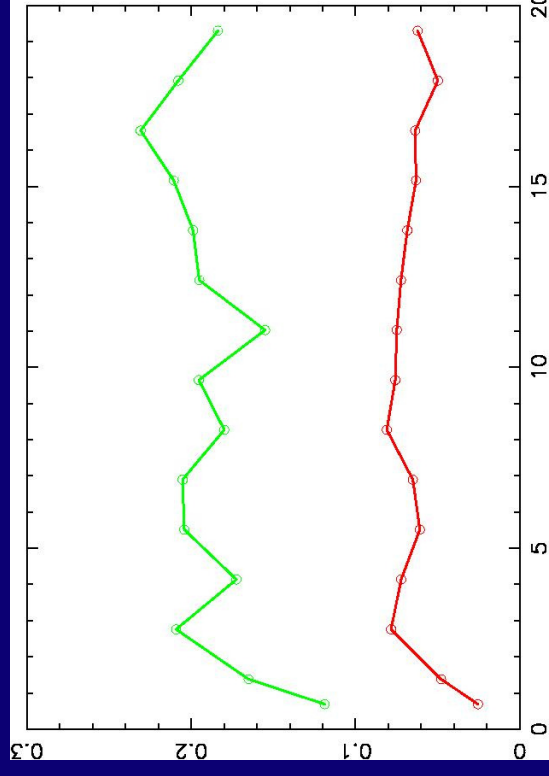
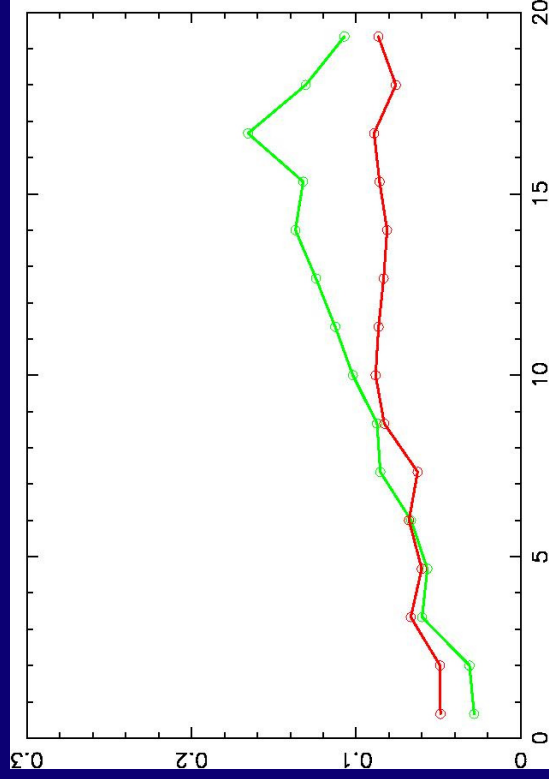
And run....

Evolution: $N_* = 4$



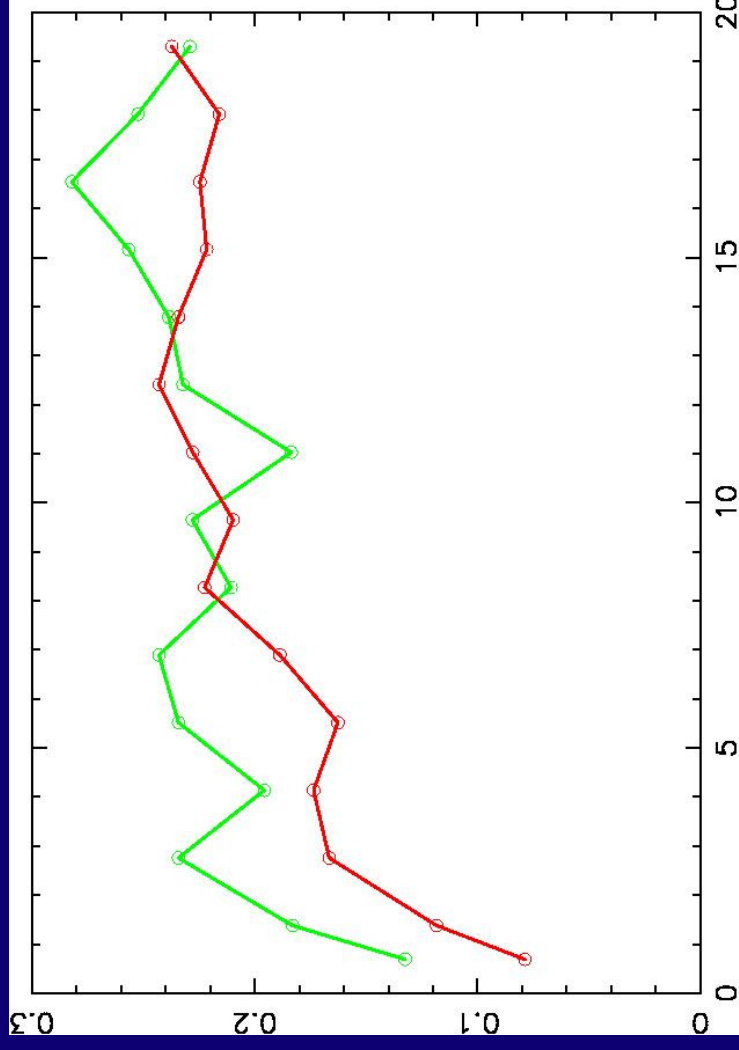
The distribution of BDs and stars

Compare using average distance to nearest neighbour (cf. Briceno et al. 2003, who found no significant difference between BDs and stars in Taurus)

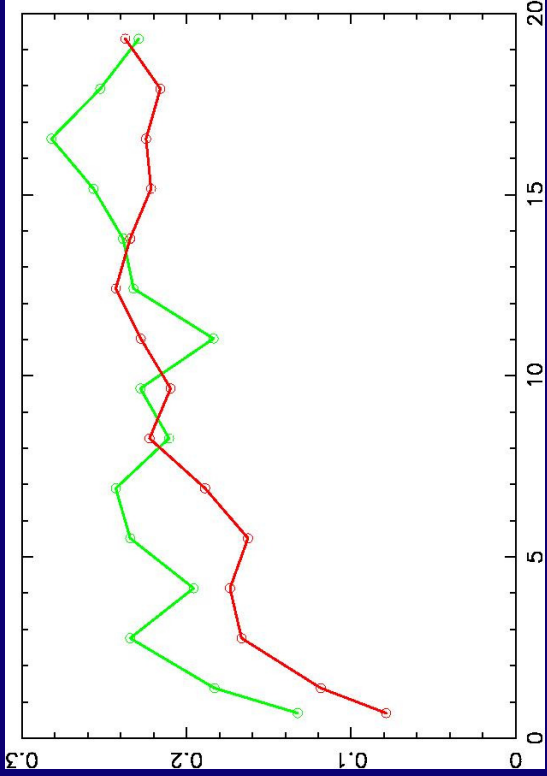
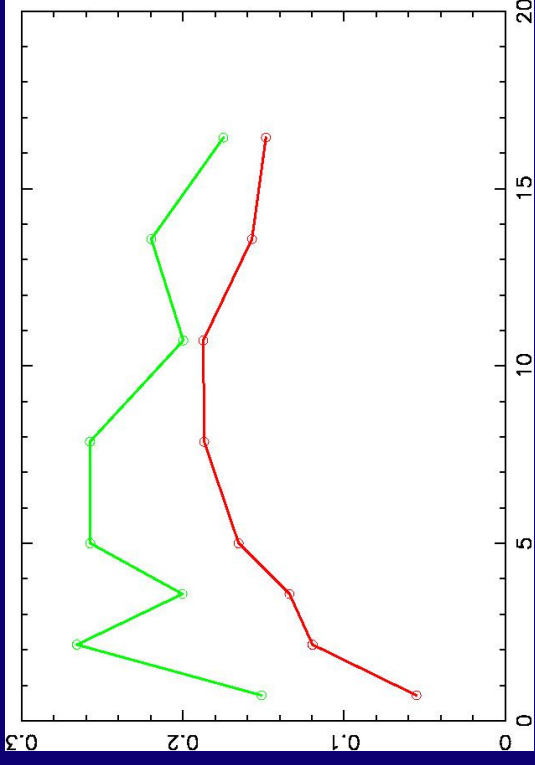
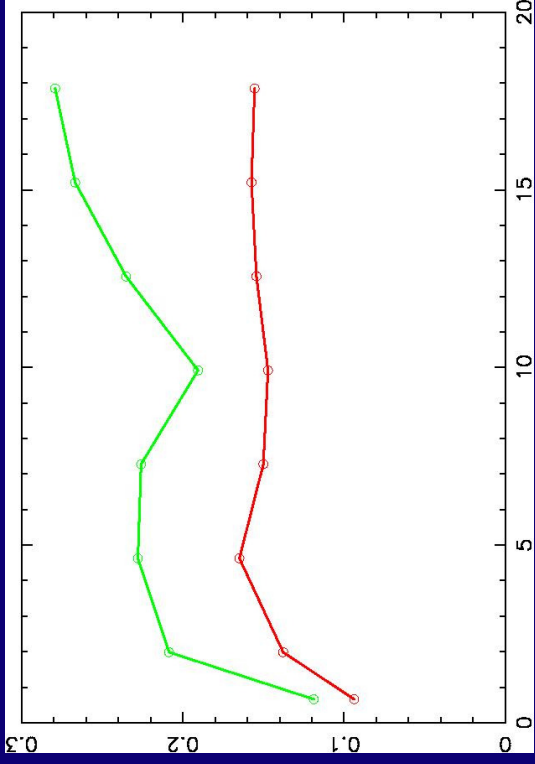


But...

This ignores unresolved binaries and limited survey areas: so we ignore secondaries within 150au and limit ourselves to the inner 5 pc radius



Ensembles



Conclusions

Brown dwarf spacial distribution does not always distinguish between ejection and core models

Big difference probably due to ejections

No difference could be either

Need to investigate change in low-mass IMF and binary statistics