Degenerate companions and extra-solar planets

Joana Gomes
University of Hertfordshire
United Kingdom

Searching for new age constraining companions to exoplanet host stars:

- New age constraints will allow a better understanding of the evolution of exoplanetary systems;

- Study wide companions to exoplanet host stars will allow to determine the ages and metallicities of the system;

L and T dwarfs

Study binaries with brown dwarfs will allow us to populate the cooler T_{eff} regime, expand the number of L and T dwarfs that are currently known and therefore place more constraints in brown dwarf birth rate and improve the IMF in the substellar regime.

Looking for L and T dwarfs:
-2MASS all sky survey, with J < 16 and color cuts in J-H, H-K and J-K
- Check also on SuperCOSMOS, DENIS and Sloan
- Exclude solar system objects and artifacts.

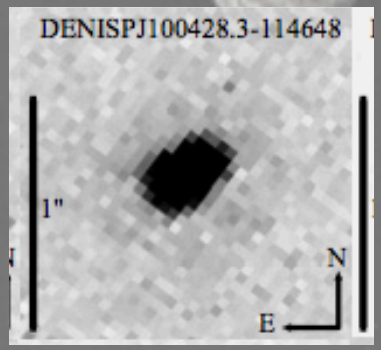
Look for binaries

Crossmatch with the main sequence stars.

-Separation smaller than 10′
-Using the star's distance, look for binaries with separation < 20 000 AU

- 4 possible T dwarf binaries

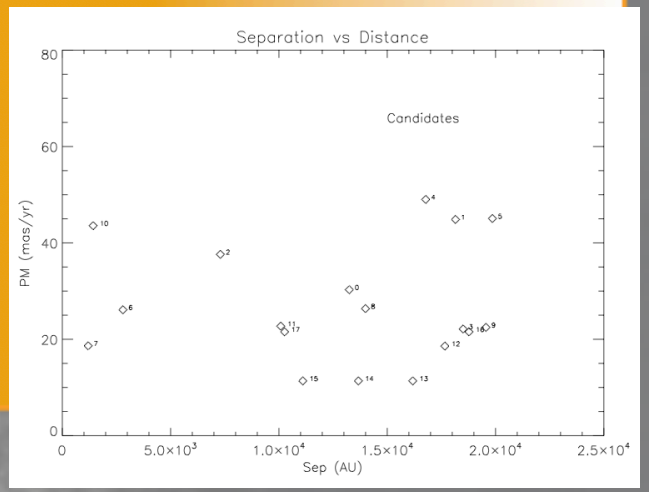
- 10 possible L dwarf binaries



White Dwarfs

Binaries with white dwarfs can yield accurate ages and surface gravities. Besides, the cooling age of high mass white dwarfs is essentially the age of the system.

Crossmatch with the main sequence stars showed 38 possible binaries



FUTURE WORK

-Follow up observations to confirm nature of objects
-More accurate proper motion measurements
-Spectroscopic study of white DZ white dwarfs in binaries to search for a possible connection between spectral lines in theirs atmospheres and the possibility of accretion by planetesimal remants.