

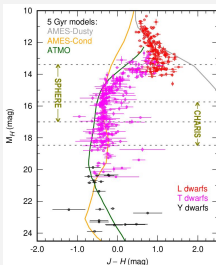
Accelerating Detached Eclipsing Binaries with Brown Dwarfs

Direct imaging of DEBs that show proper motion anomaly (PMA), and have parameters known with high precision.
Search for brown dwarfs (BDs) older than ~ 1 Gyr. Precise knowledge of the age, mass, distance and metallicity of the host allows for determination of those parameters for the companion.

These BDs will be benchmarks for evolutionary models of cool and ultracool dwarfs beyond 1 Gyr.

"Mature" BDs

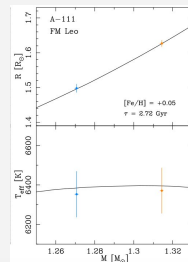
We need BDs older than ~ 1 Gyr, with precisely known crucial parameters, i.e. mass, metallicity, luminosity, distance



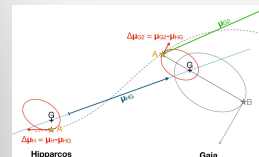
Well-studied DEBs and their ages

- Precise and accurate stellar parameters: mass, metallicity, and distance
- Ages with 5-10% accuracy

Accurate characterisation of the host will allow the same for the companion!



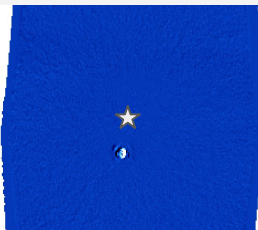
Proper Motion Anomaly (a.k.a. Acceleration)



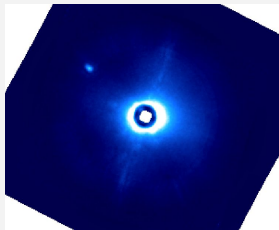
- Proper Motion (PM) measured by *Gaia* may be different than from *Hipparcos*

PMA is highly effective in target pre-selection for direct imaging surveys

Preliminary results



← Probable M dwarf, responsible for the observed long-term RV trend



← Double companion, probably M + BD

Massive BD (50-70 M_{Jup}) companion to a DEB of 3.24 Gyr, $[\text{Fe}/\text{H}] = -0.4$ dex. Binary's masses known to 0.2% precision.

**JUST CONFIRMED
YESTERDAY!**

