HR 8799: Final Results

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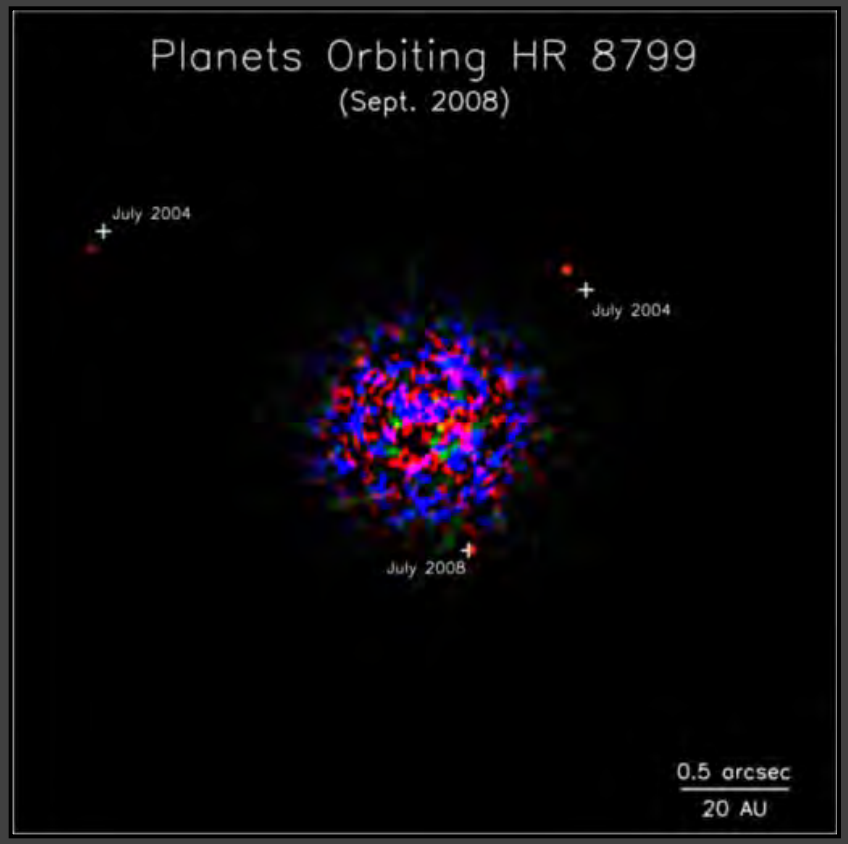
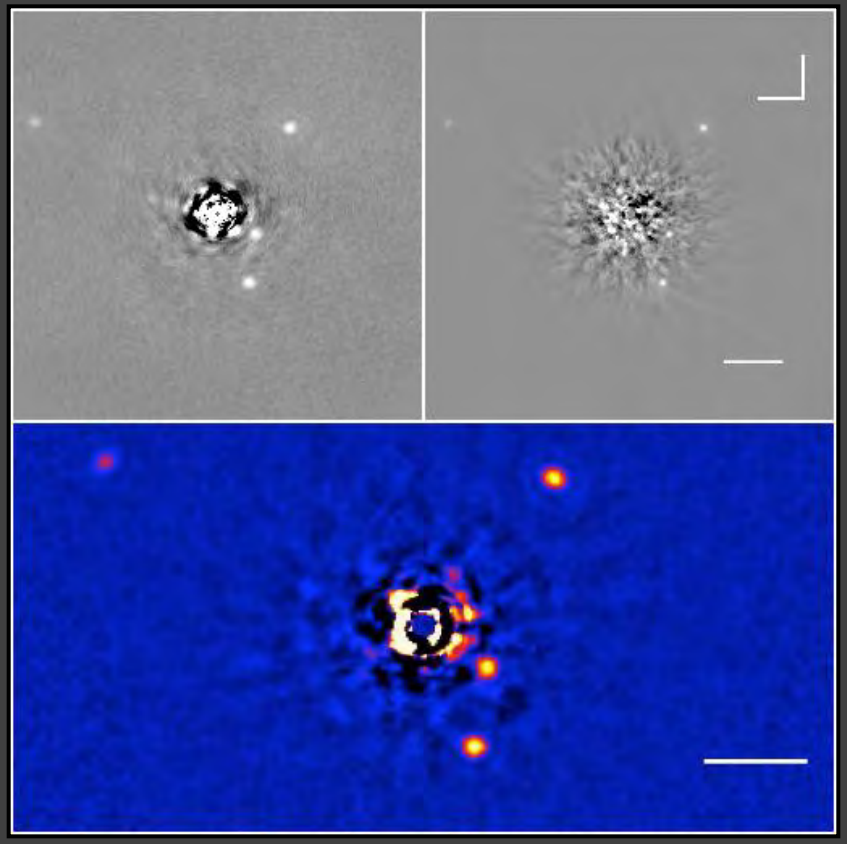
Imaged Companions



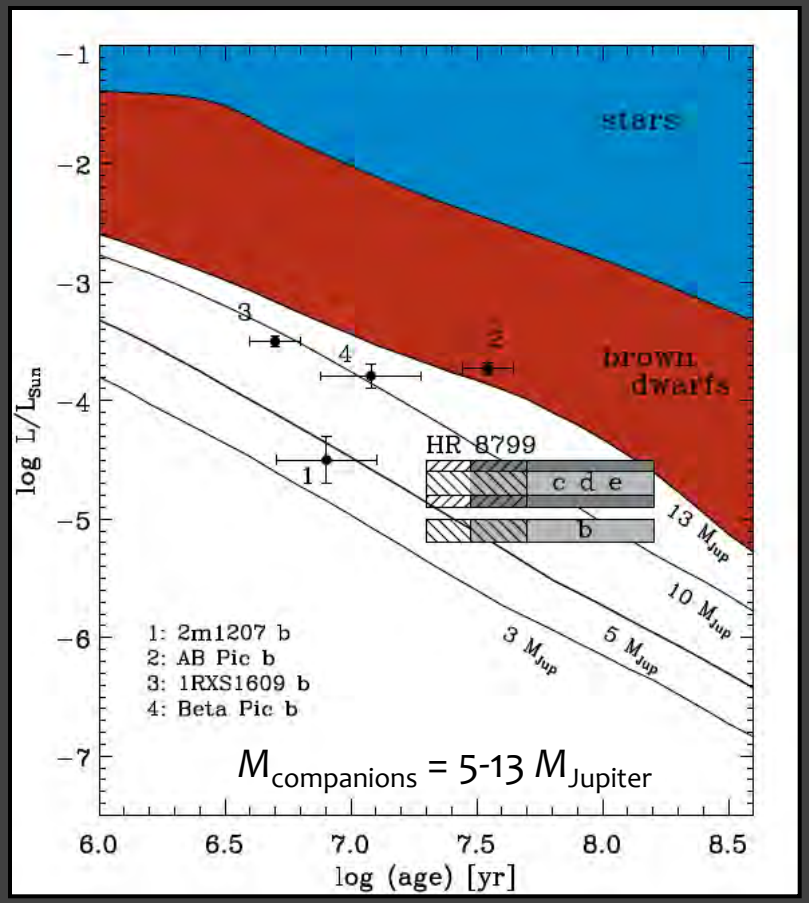
Marois et al. (2008)



Marois et al. (2010)

System Parameters

- γ Doradus star:
  - Small amplitude variations
- λ Bootis star:
  - Pop I A-type stars
  - Metal deficiencies in Fe-peak elements with solar C, N, O, S abundances
- M_{star}: 1.2 – 1.6 $M_{\odot}$
- Inclination: 0 – 65°
- Age: 20 – 1623 Myr



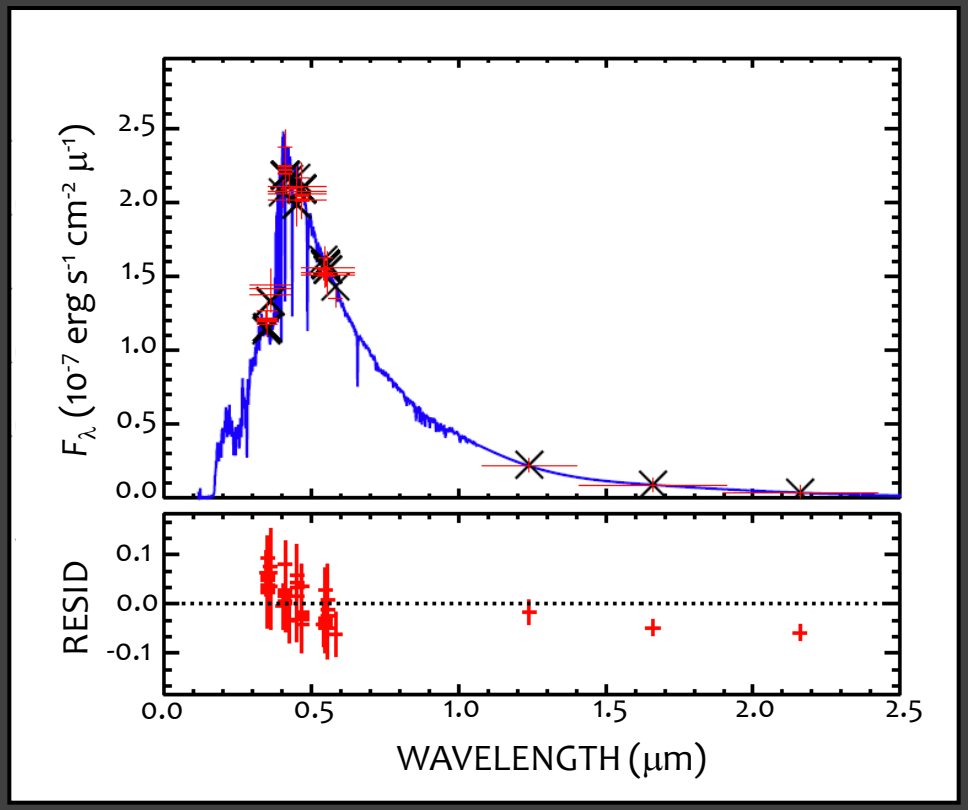
Large σ_{age} = Large σ_{mass}

CHARA Observations

- Data from 9 nights from 7/2010 – 9/2011
- Used PAVO, S2-W2, S1-E1 baselines
- Observed using 5 cals, minimum of 2 per night simultaneously

Calibrator	Type	θest (mas)	Notes
HD 213617	F1 V	0.288±0.043	
HD 214698	A2 V	0.189±0.028	
HD 218235	F6 V	0.371±0.056	Too large
HD 218261	F7 V	0.384±0.058	Too large
HD 219487	F5 V	0.304±0.046	Iffy

SED Fit Results



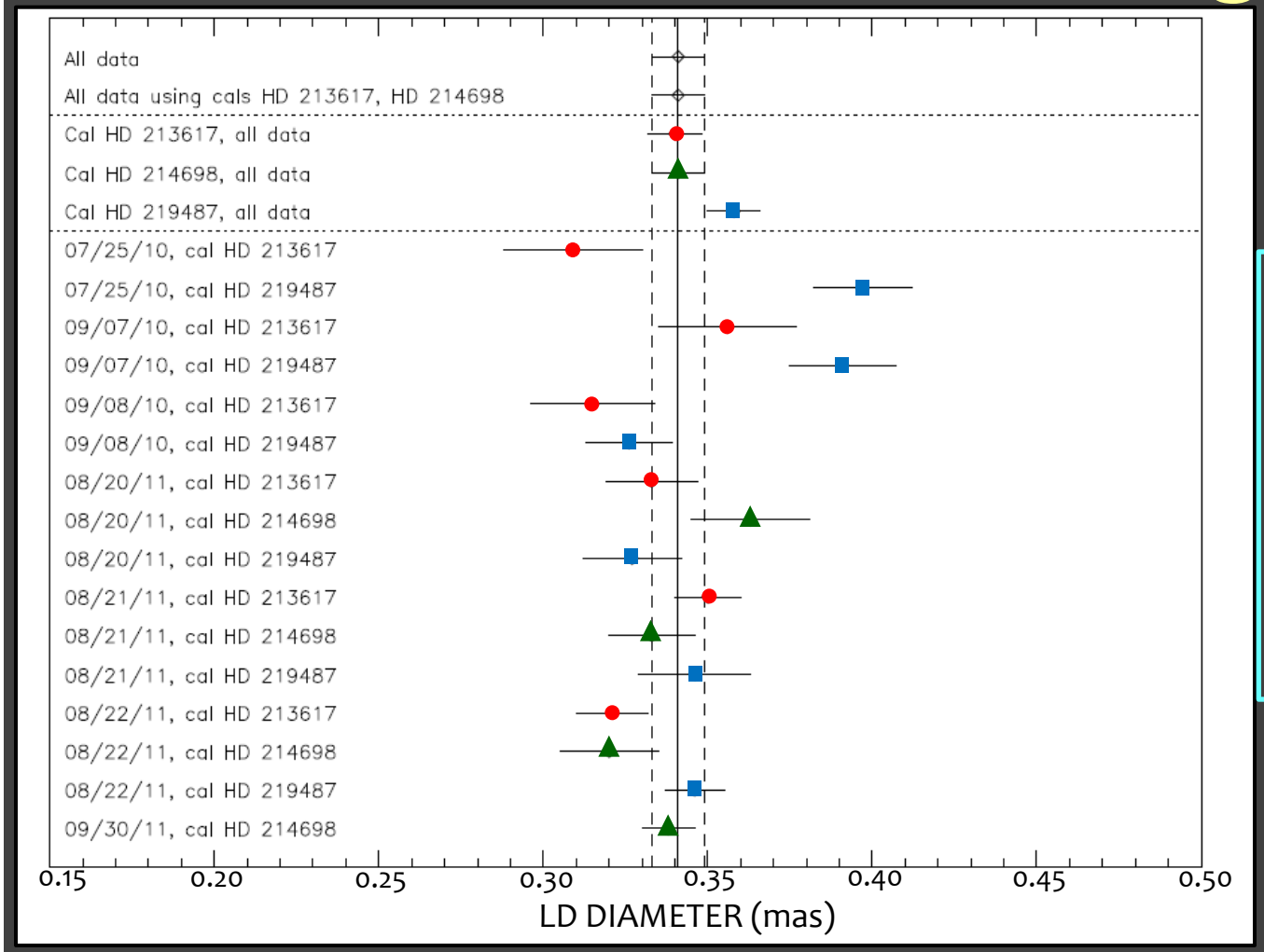
$A_V = 0.00$

$F_{BOL} = 10.47 \pm 0.01 \times 10^{-8}$ erg s^{-1} cm^{-2}

$T_{eff,est} = 7211 \pm 90$ K

$\theta_{LD,est} = 0.341 \pm 0.009$ mas

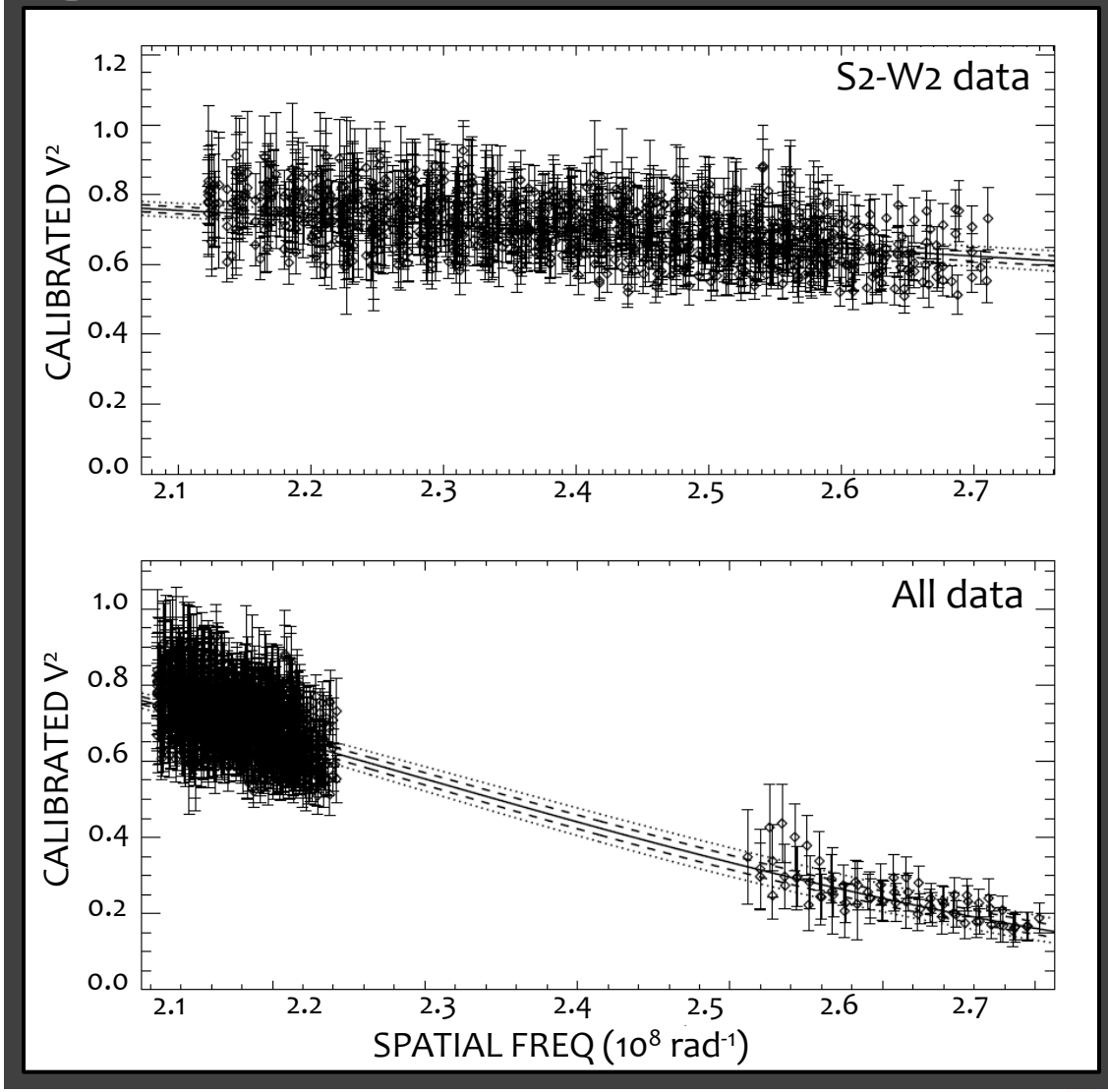
Diameter Fits by Night/Cal



Colors show which cal was used to measure θ_{LD}:

- HD 213617
- HD 214698
- HD 219487

Diameter Fits

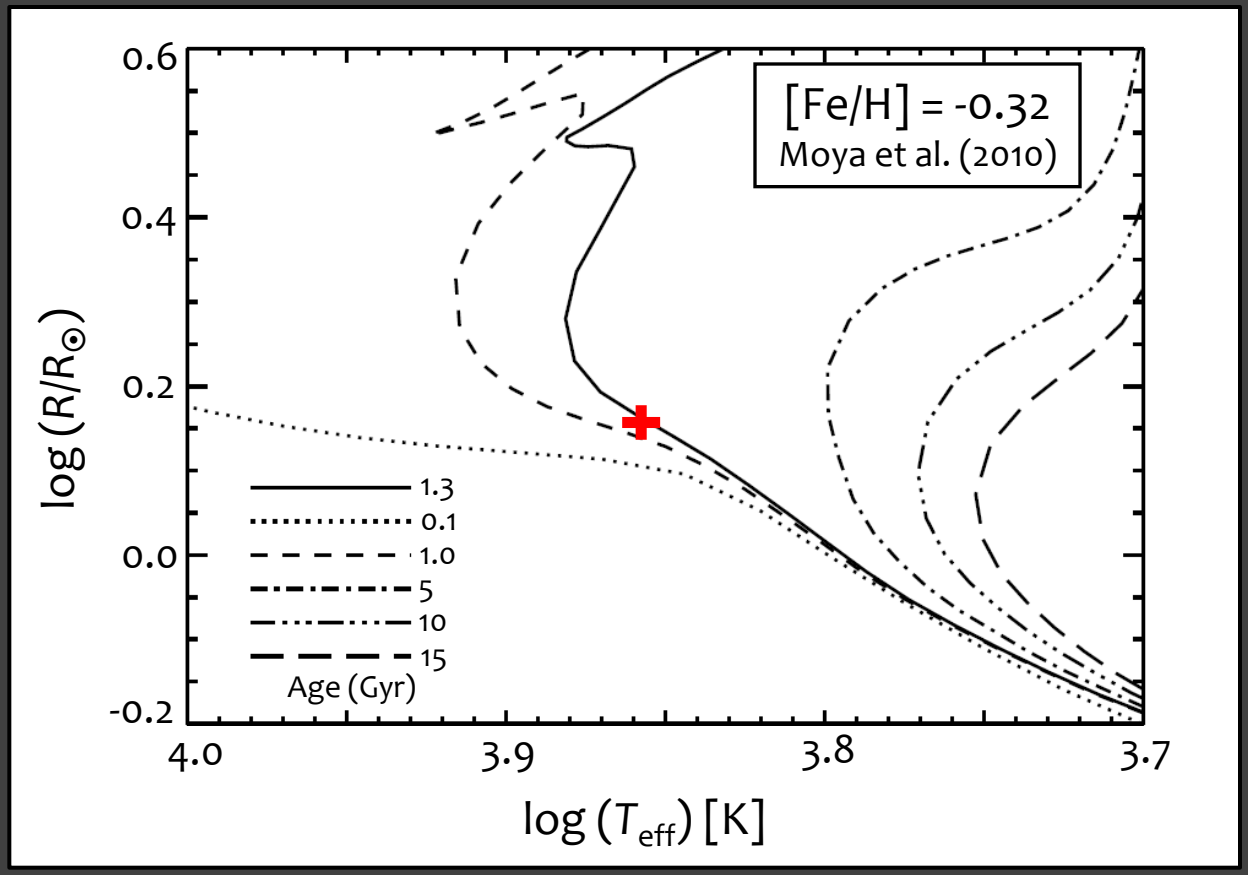


θ_{LD}:
0.341 ± 0.008 mas

T_{EFF}:
7210 ± 85 K

Radius:
$1.44 \pm 0.05\ R_{\odot}$

Radius vs. Temperature



[Fe/H]	Age (Gyr)
0.00	(0.1)
-0.10	0.4
-0.20	0.8
-0.32	1.3
-0.50	1.9
-0.68	2.4

Final Results

Parameter	SED Estimate	Measured Value
θ_{LD} (mas)	0.341 ± 0.009	0.341 ± 0.008
R ($R_\odot$)	–	1.44 ± 0.05
T_{eff} (K)	7211 ± 90	7210 ± 85
Age* (Gyr)	–	1.3 ± 0.1
L ($L_\odot$)	–	5.8 ± 0.1
M ($M_\odot$)	–	1.37
HZ (AU)	–	1.73 – 3.55

*[Fe/H] has a big impact on age determination