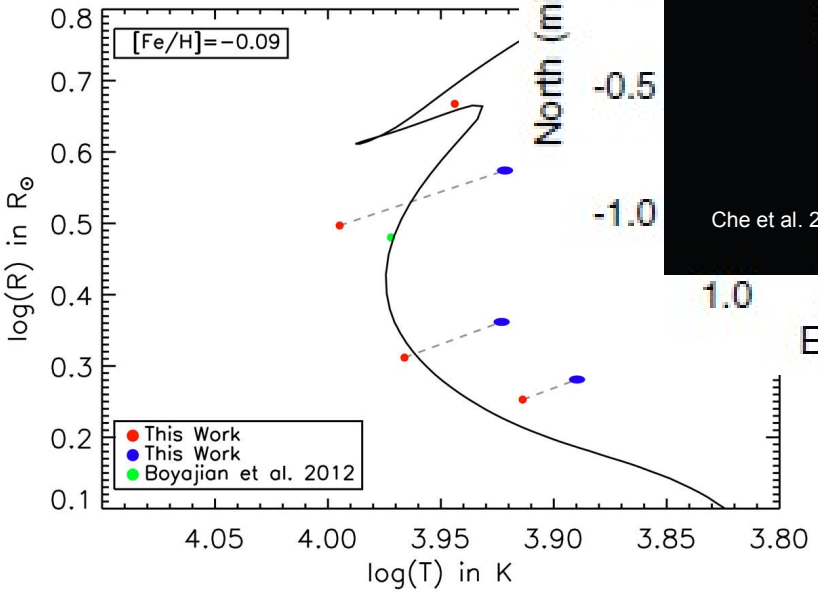
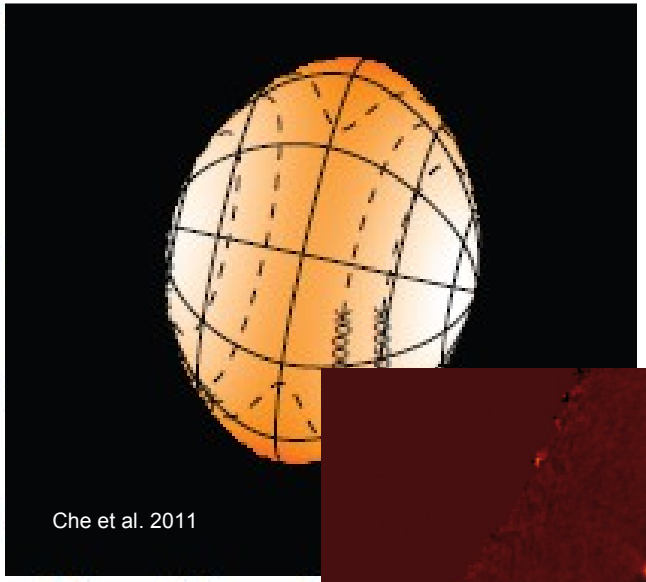
How Old are the A-Stars?

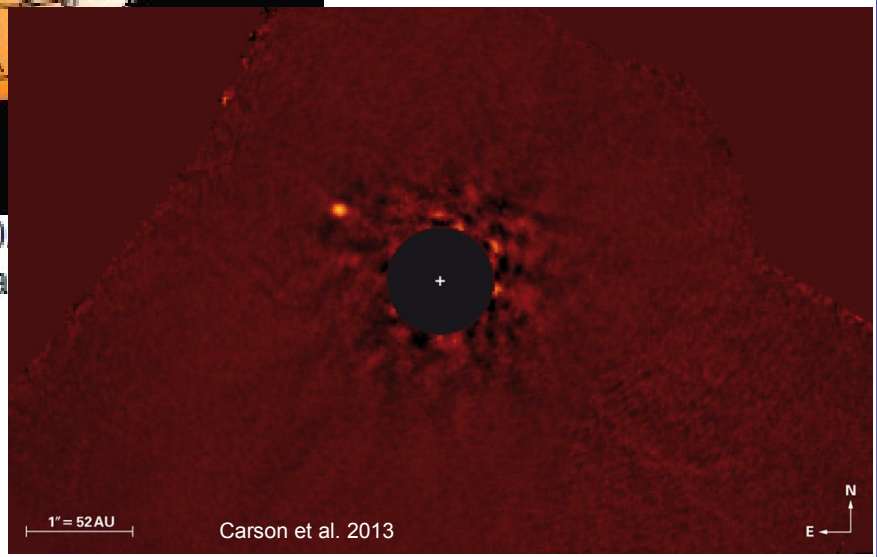
Jeremy Jones, GSU

with: Russel White and others

3/19/2013



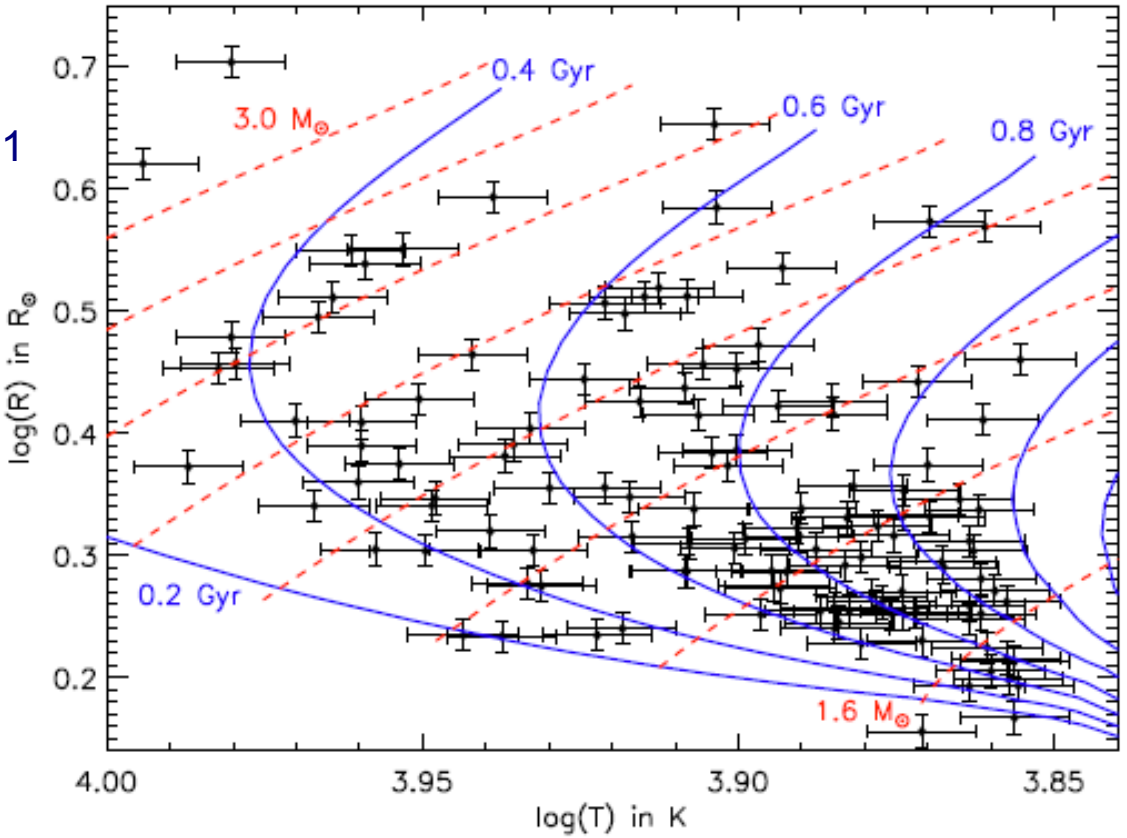




50 pc A-star Sample

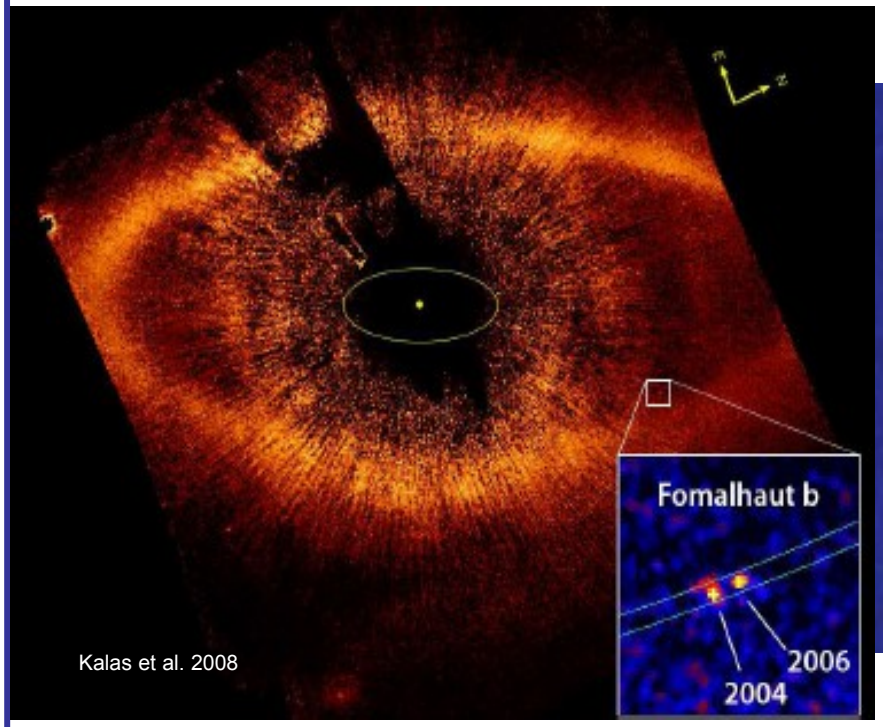
The Sample

- A-type stars: -0.06 < B-V < 0.31
- Volume limited: d < 50 pc
- Northern: δ > -10°
- Single
- Total: 129

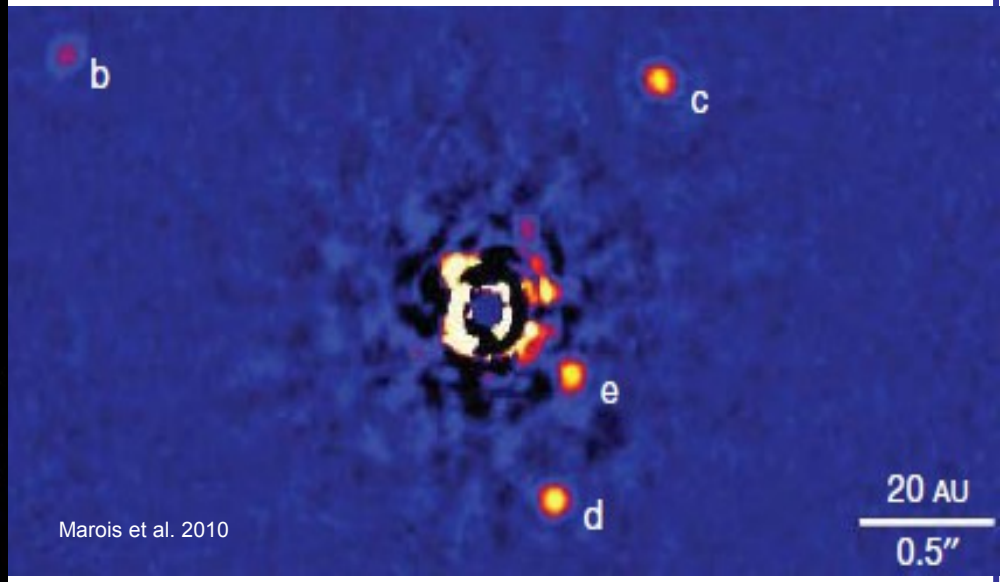


Motivation

Disks and Planets



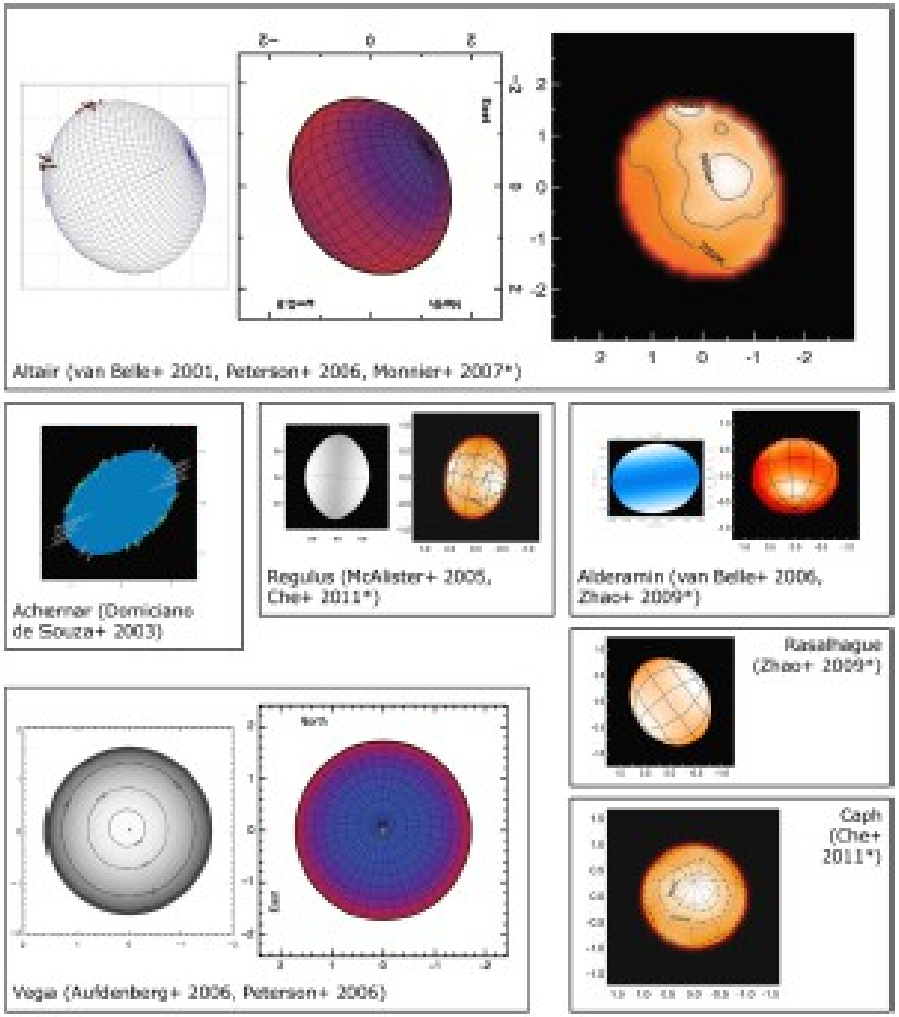
Fomalhaut with
Fomalhaut b



HR 8799 with
Its family

Motivation

Rapid Rotation



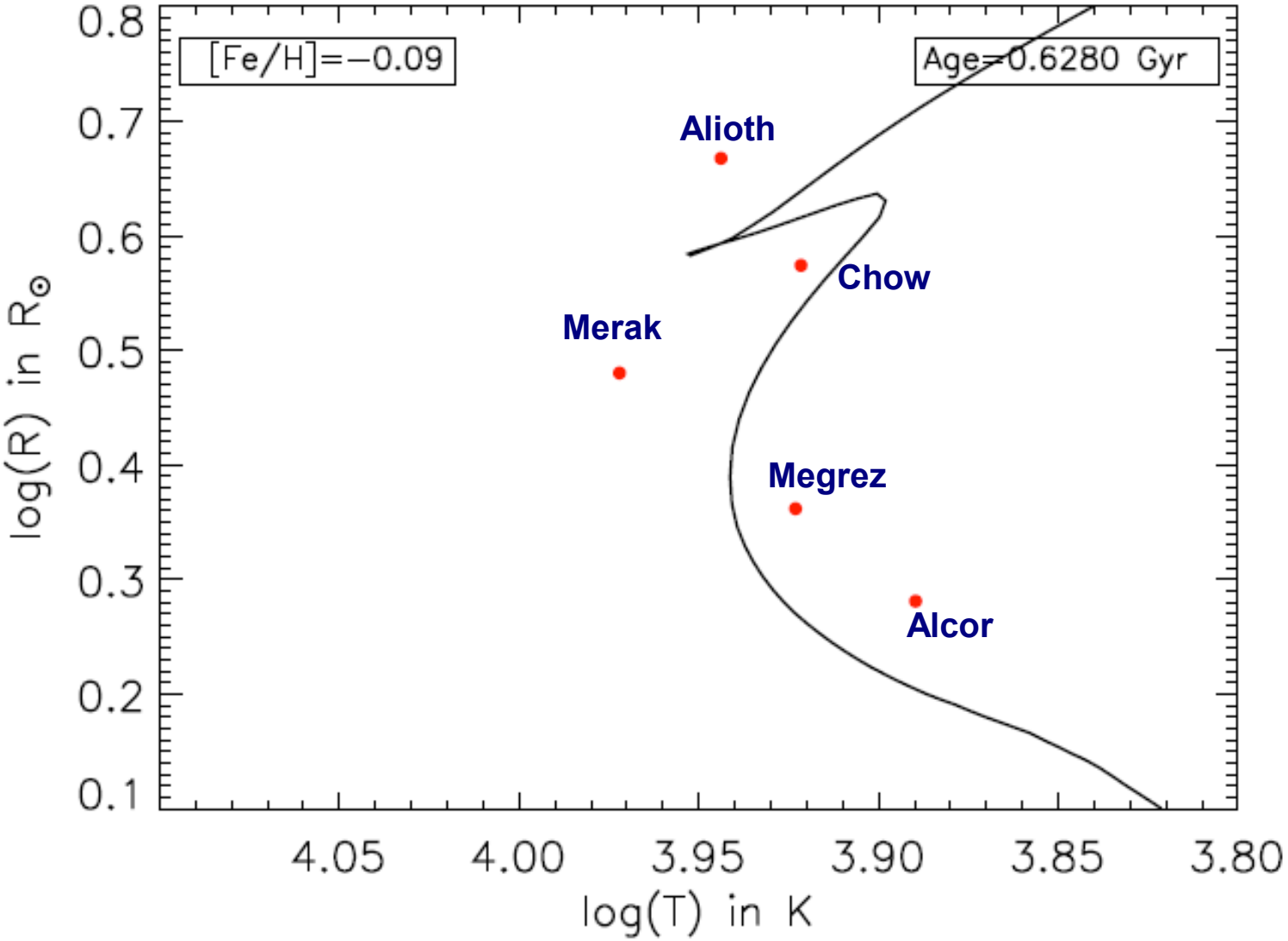
van Belle 2012

Clusters/Moving Groups

Praesepe

Quinn et al. 2012

UMa Moving Group



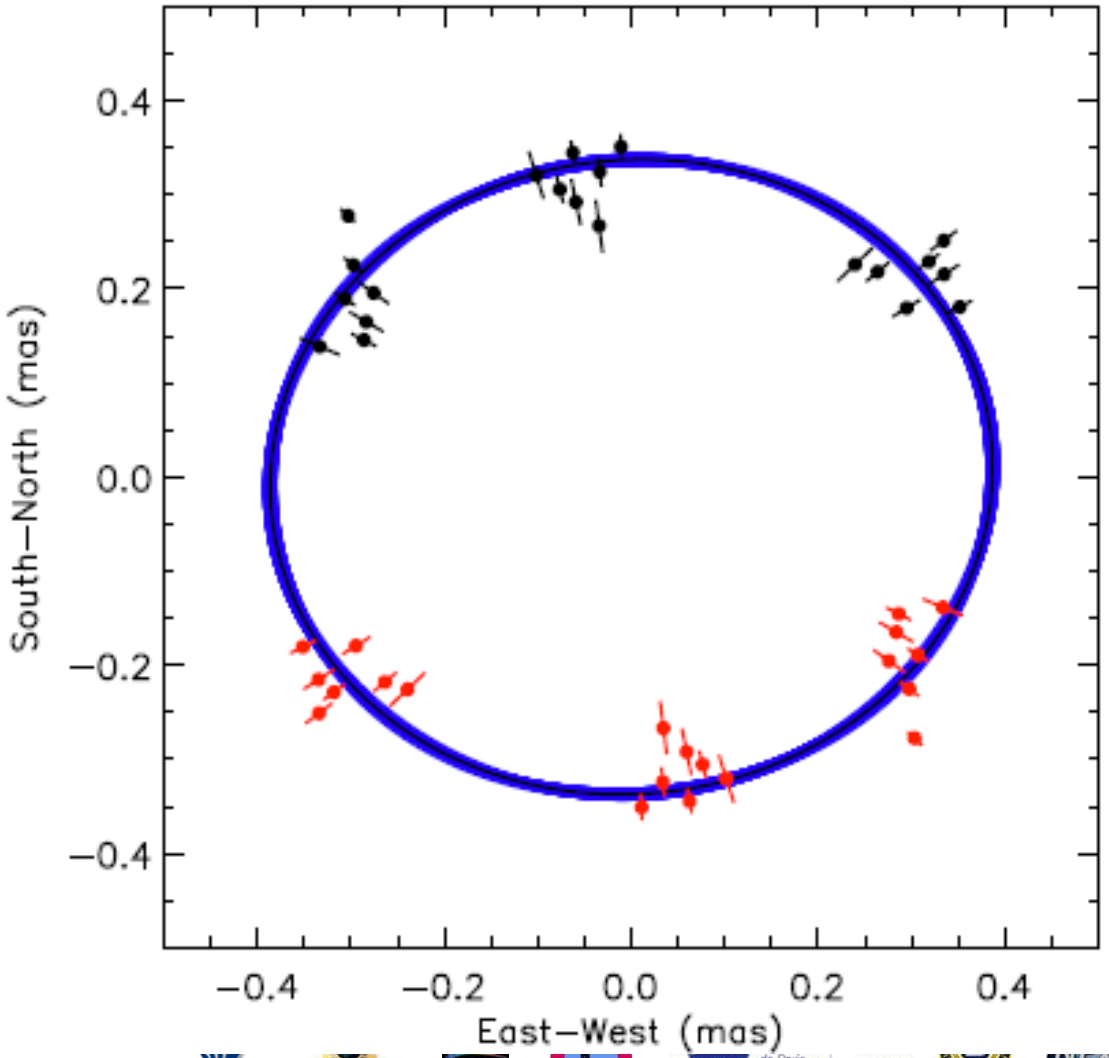
UMa Moving Group

Correcting for Rotation

- Stars rotating faster than average
  - Assume edge-on
- Fit limb-darkened ellipse

UMa Moving Group

Correcting for Rotation



Alcor

$\rho = 1.15 \pm 0.04$

$\theta_R = 0.361 \pm 0.004$ mas

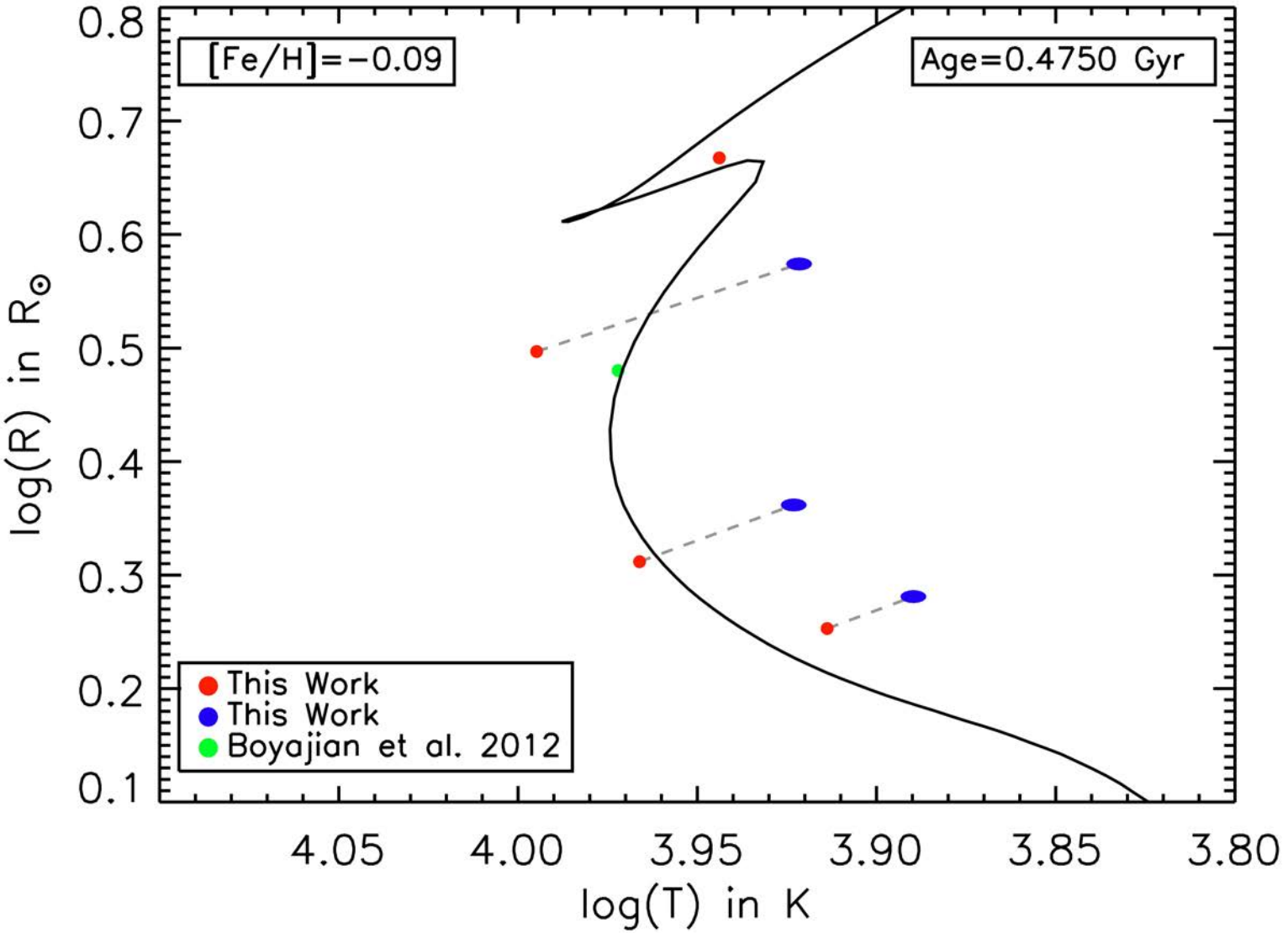
$\psi = 96 \pm 6°$

UMa Moving Group

Correcting for Rotation

- Stars rotating faster than average
  - Assume edge-on
- Fit limb-darkened ellipse
- Adjust model to fit ellipse
- Find R, L, T of non-rotating equivalent star

UMa Moving Group



PORRS

Vega

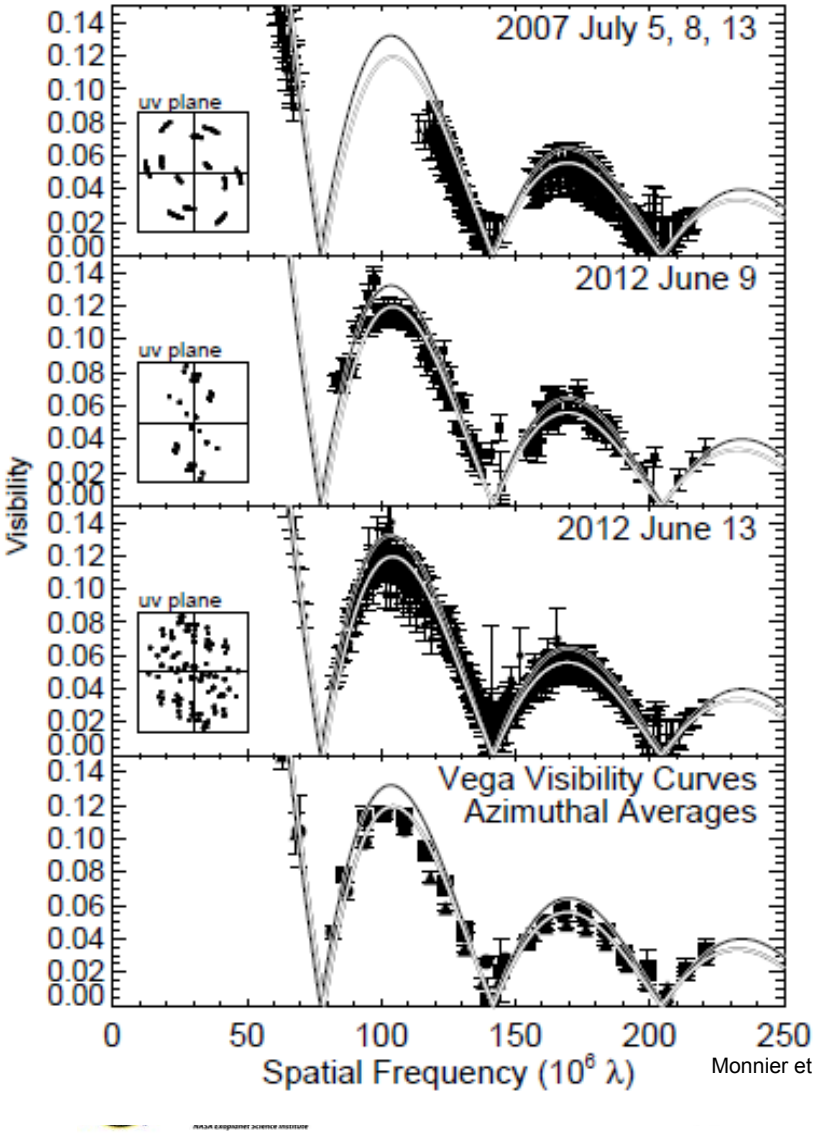
Pole-**O**n **R**apidly **R**otating **S**tar

Proposal

HDs 141795, 165777

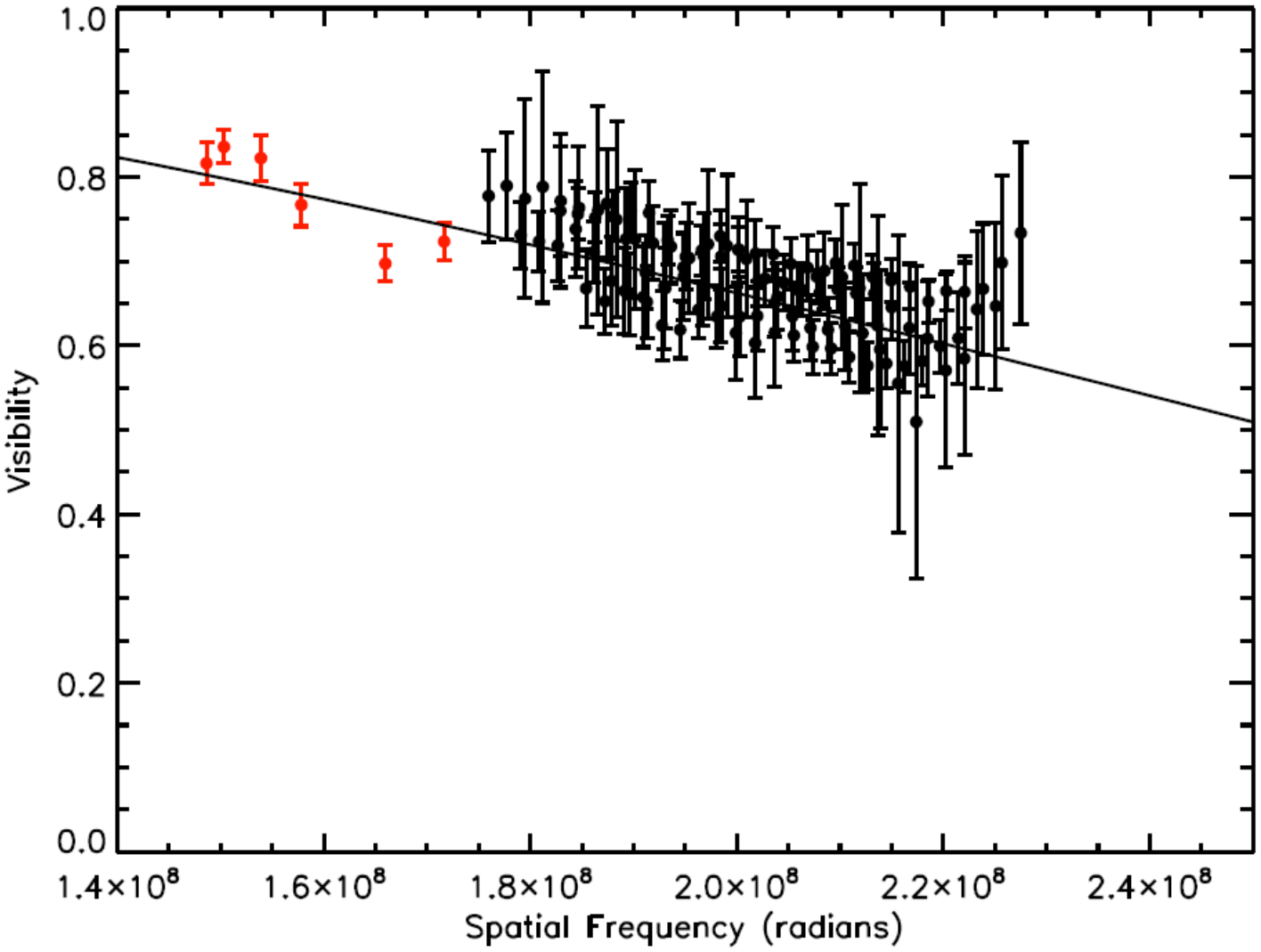
1st lobe: Classic

2nd lobe: PAVO

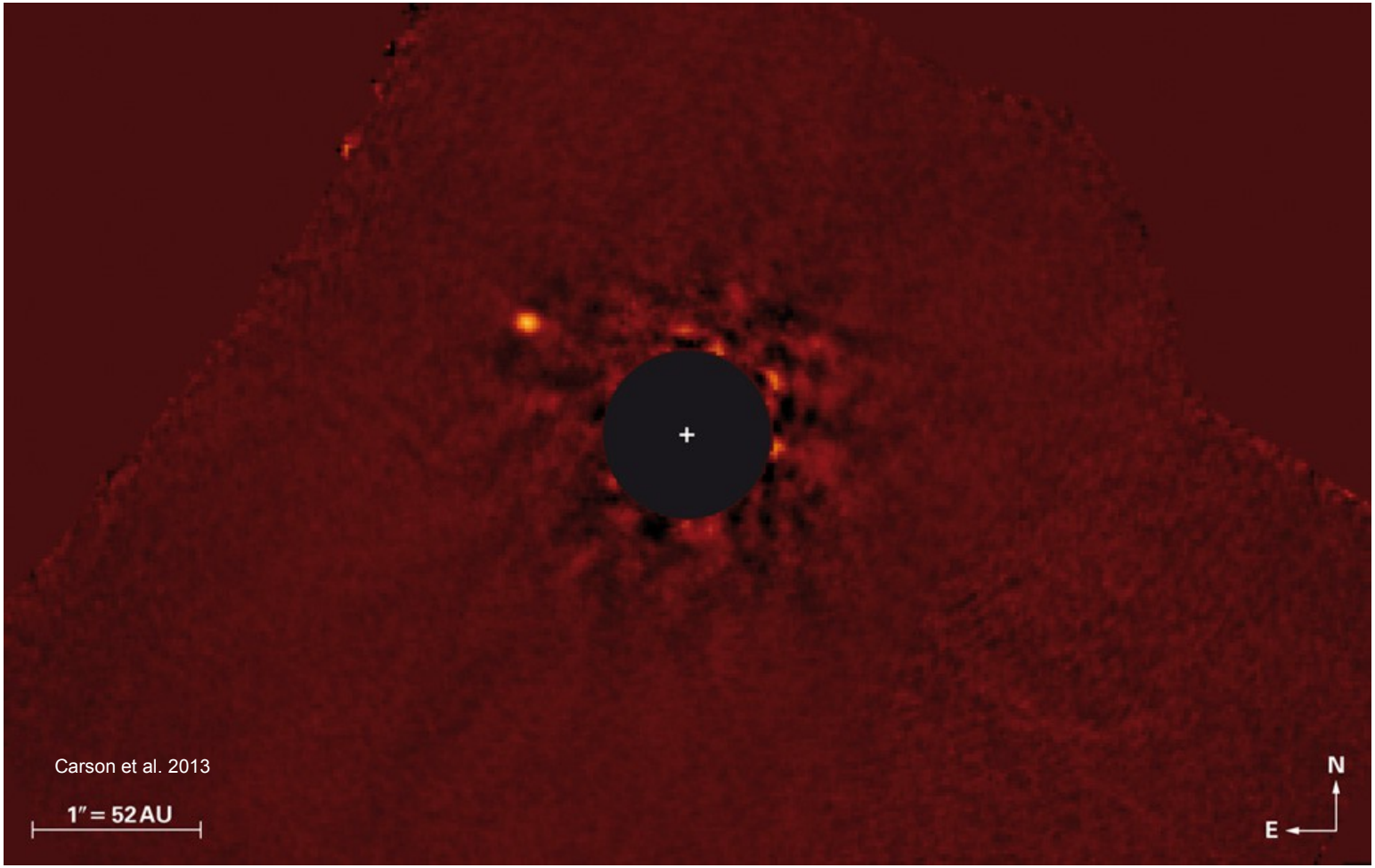


Monnier et al. 2012

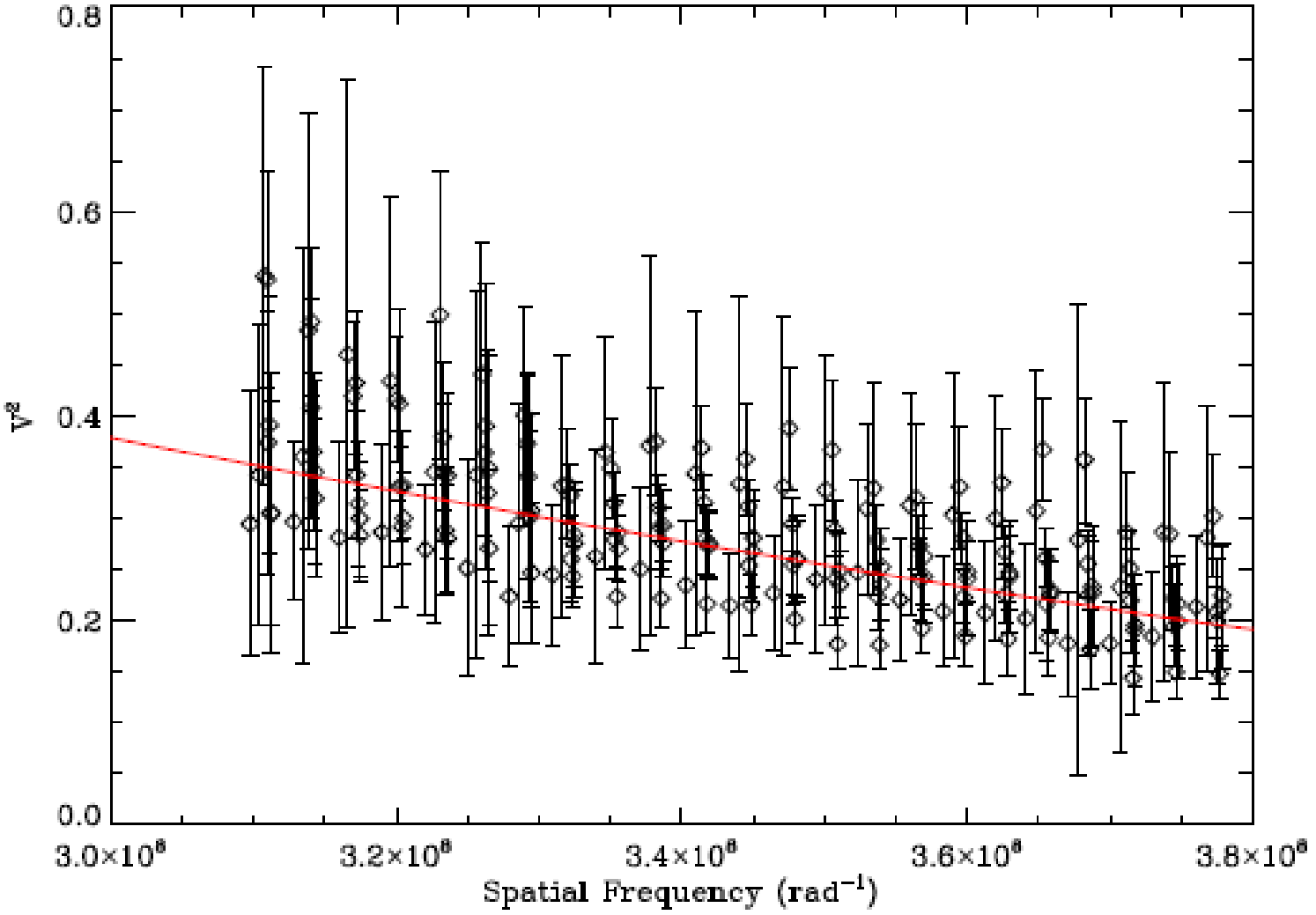
PORRS


1.0
0.8
0.6
0.4
0.2
0.0
Visibility
1.4×10^8
1.6×10^8
1.8×10^8
2.0×10^8
2.2×10^8
2.4×10^8
Spatial Frequency (radians)

κ Andromeda



κ Andromeda


0.8
0.6
0.4
0.2
0.0
V²
3.0×10⁸
3.2×10⁸
3.4×10⁸
3.6×10⁸
3.8×10⁸
Spatial Frequency (rad⁻¹)

50 pc Update

- 129 Total Stars
  - 47 oblate
- 25 Completed (19%)
  - Classic/CLIMB: 8 (6 oblate)
  - PAVO: 5
  - Classic/CLIMB + PAVO: 3
  - Previously Published: 9

Future Plans

- Cluster/Moving Group Studies
- Rapid Rotation Corrections
- Slow Rotators or PORRS?
- κ Andromeda
- 25-pc completion

Results

- 19% 50-pc sample complete
- Rapid Rotators in UMa Corrected
- Classic and PAVO agree!

Questions?

or Lunch?