Studying K-dwarf star
Radius and Binarity measurements

Objective

We propose interferometric measurement for the K dwarf HD 4628.

This star is single and does not show any sign of variability.

It's an excellent target to constrain the temperature scale of K dwarf stars!!!

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June 10, 2006

Scientific Rationale

Many indirect techniques have been developed for determining stellar physical parameters.

BUT:

➢ The stellar temperatures scale from these methods can differ by several hundred degrees.

➢ Theoretical models of stellar structure and evolution can only be applied in binary systems.

What we know:

For main sequence stars (1-10 $M_\odot$), as well as M dwarfs, stellar models are well constrained.

What we don't know:

➢ K dwarfs have "missed the boat", because they are relatively faint, although their atmospheres are relatively easier to study as compared to M dwarfs.

➢In addition, their long lifetime as compared to solar type stars avoid to account for any evolutionary effect.

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Why VLTI?

✓ Because direct measurements of K dwarf radii are not extensively done in the past.

✓ Proper motion suggests a possible binarity. If so, resolving the components via VLTI would allow us to determine their masses and constrain the stellar model in this mass range.
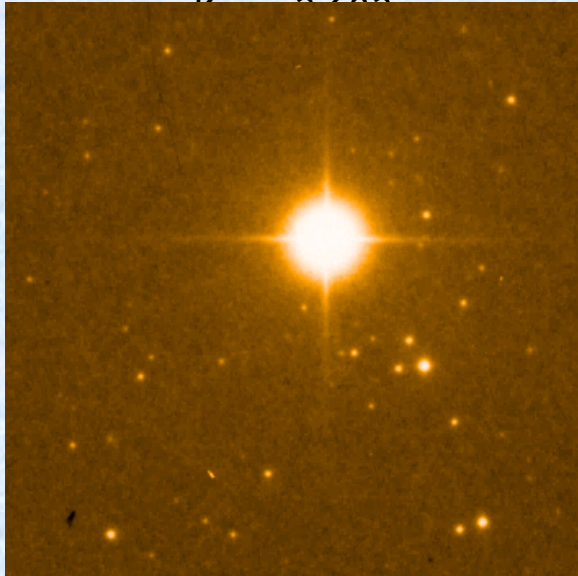
Target:

HD 4628

RA: 00^{h}48^{m}23^s

Dec: +05^{d}16^{m}50^s

Vmag:5.720

Jmag:4.367

Hmag:3.722

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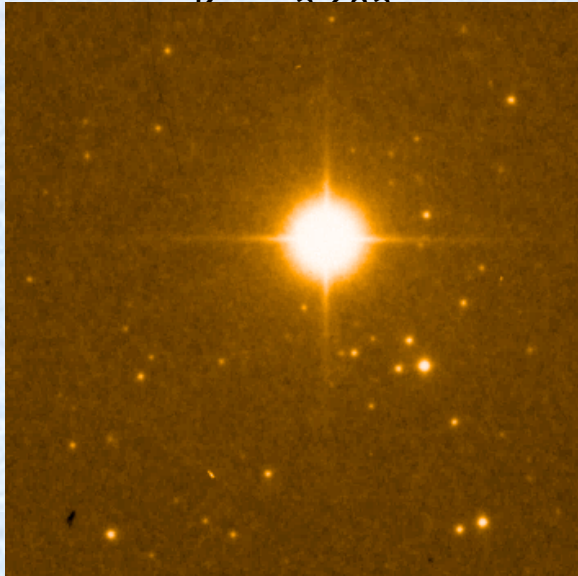**Telescope configuration:**

UT1-UT3-UT4

9 visibility points, [HA: -4, 0], 90 min sampling
Wavelength 1.46 _m

Low spectral resolution

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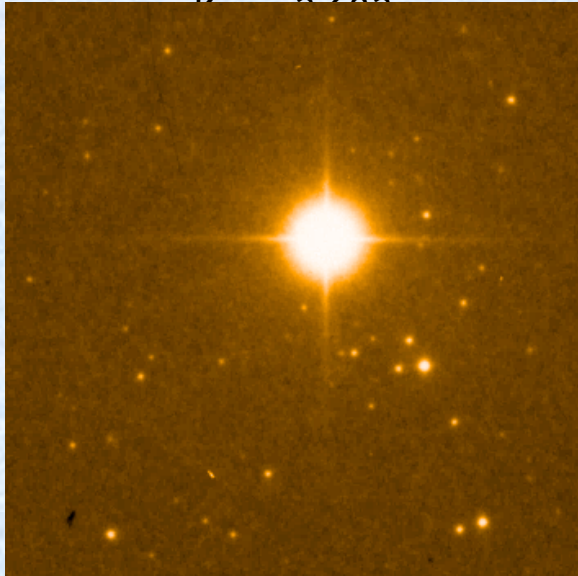
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Date:

20-30 September

(new moon – first quarter)

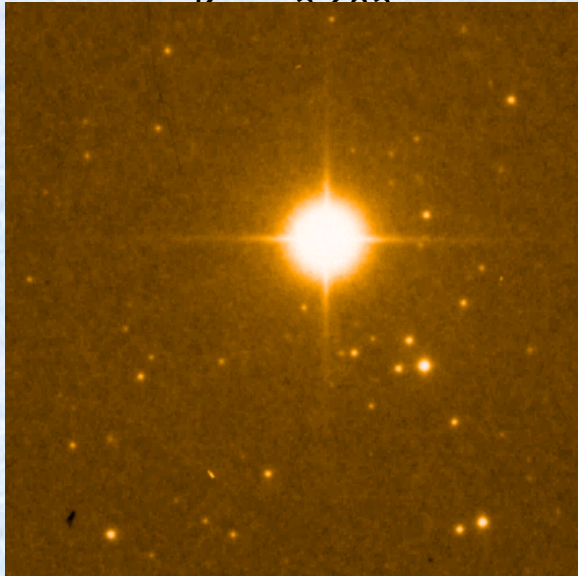Beginning of the night (4 hours)

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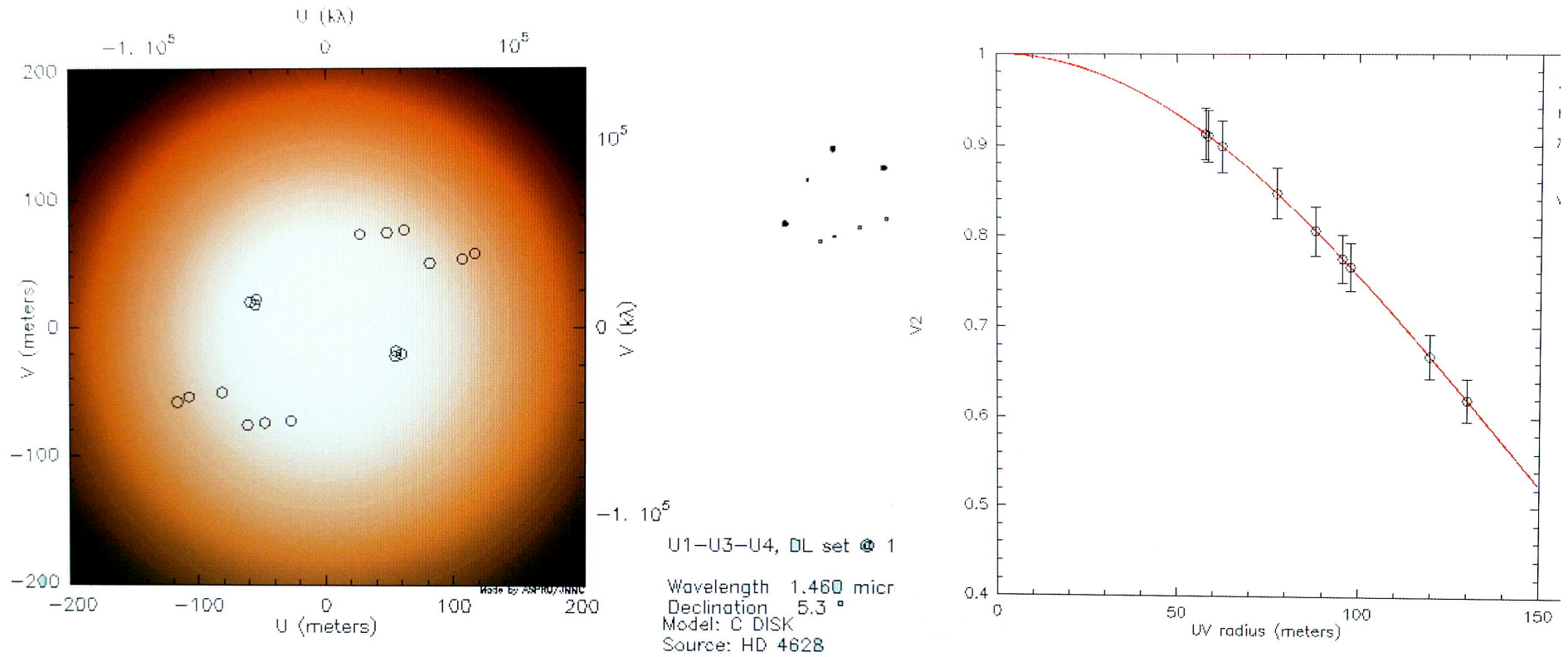
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Calibrator:

HD 6734, K0 IV, Kmag:4.306, Vis=0.940

UV coverage and Visibilities

We assumed a uniform disk 1mas wide