

**Proposal for observing
the PMS binary
Haro 1-14c**

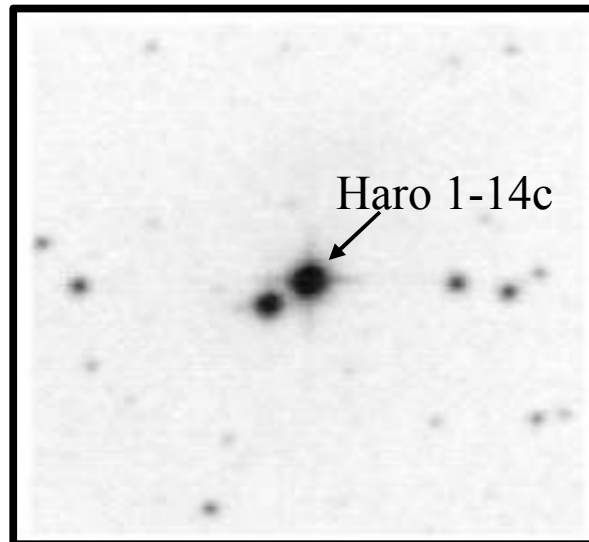
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Why we want to observe this PMS binary?

- * The binary frequency is at least as high among young PMS stars as it is on the MS
- * Contribution in the mass/radius of the PMS binaries
- * Testing the theoretical models of PMS formation and evolution

Why the VLTI?

- * Since the binary is fairly away (140 pc, Simon & Prato 2004) the orbit will be resolvable with the VLTI
- * It is possible to complete the spectroscopic data previously obtained (Rupert 2002, Simon & Prato 2004)



Characteristics of the WTTau SB1 Haro 1-14c=HBC 644

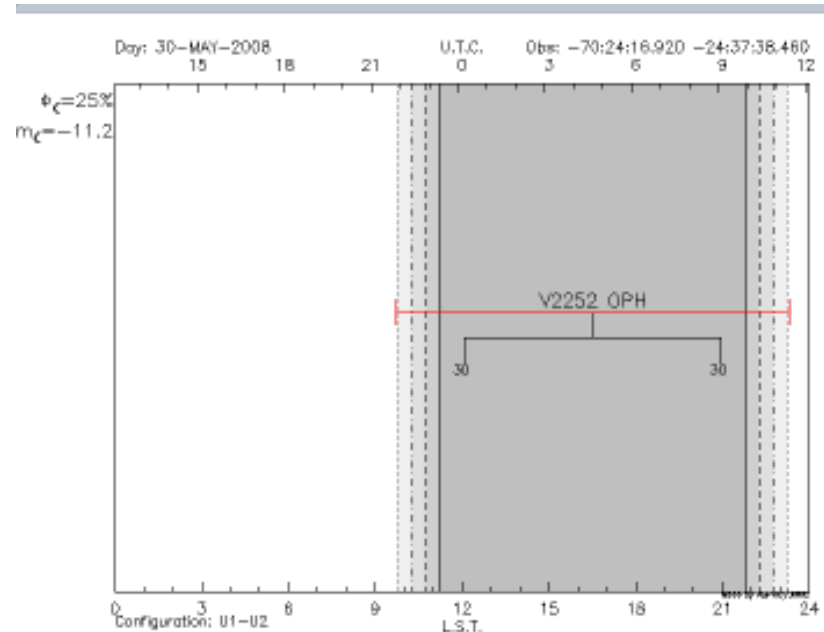
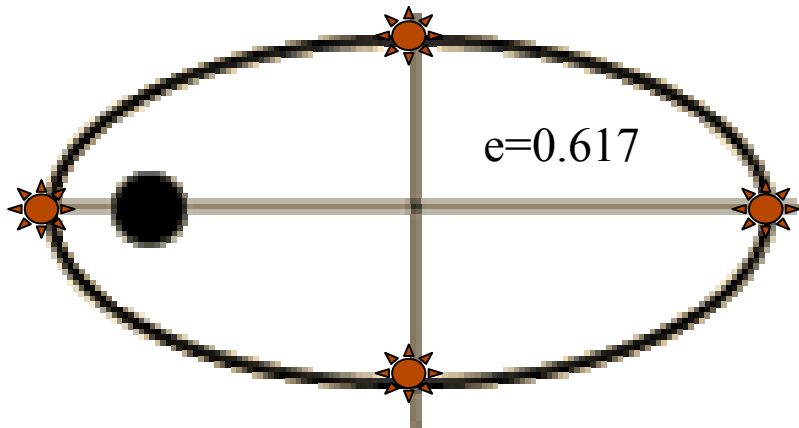
- * Ophiuchus SFR member
- * Sp. Type of the primary: K3
- * Probable Sp. Type of the secondary: M1.5
- * $\alpha = 16:31:04.4$
- * $\delta = -24:04:34$
- * $V \sim 14$ mag
- * $K = 7.784$ mag (2MASS)
- * Very weak emission at $H\alpha$; no other emission
- * $P_{\text{orb}} = 591$ days (from V_{rad} ; ^{1,2})
- * $a_1 \sin i = 54.2$ Gm (²)
- * $a_2 \sin i = 174.8$ Gm (²)
- * $M_1 \sin^3 i = 0.98 M_0$ (²)
- * $M_2 \sin^3 i = 0.30 M_0$ (²)
- * $e = 0.617$ (²)
- * $f(m) = 0.018 M_0$ (¹)

¹ Reipurth et al. (2002)

² Simon & Prato (2004)

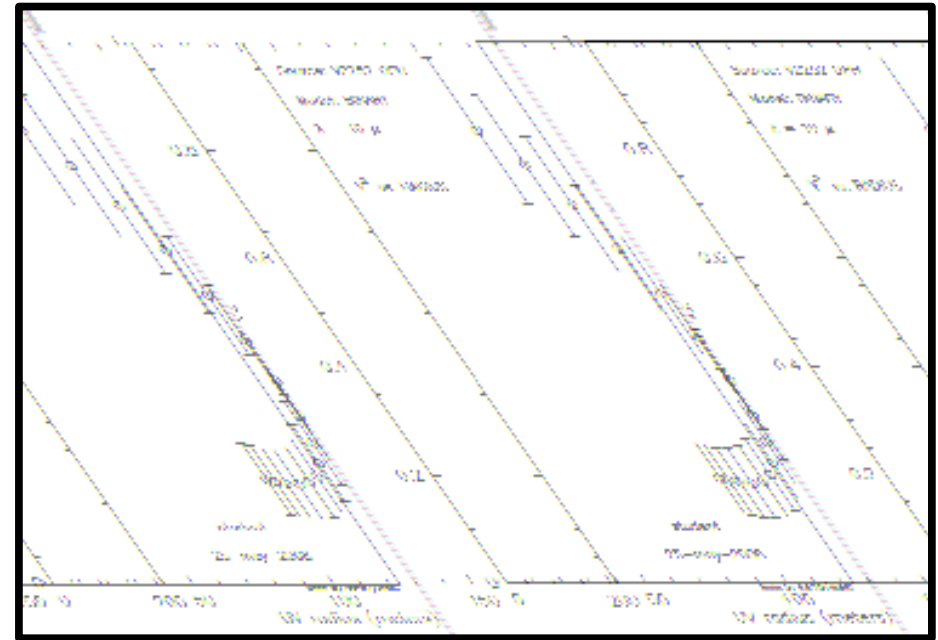
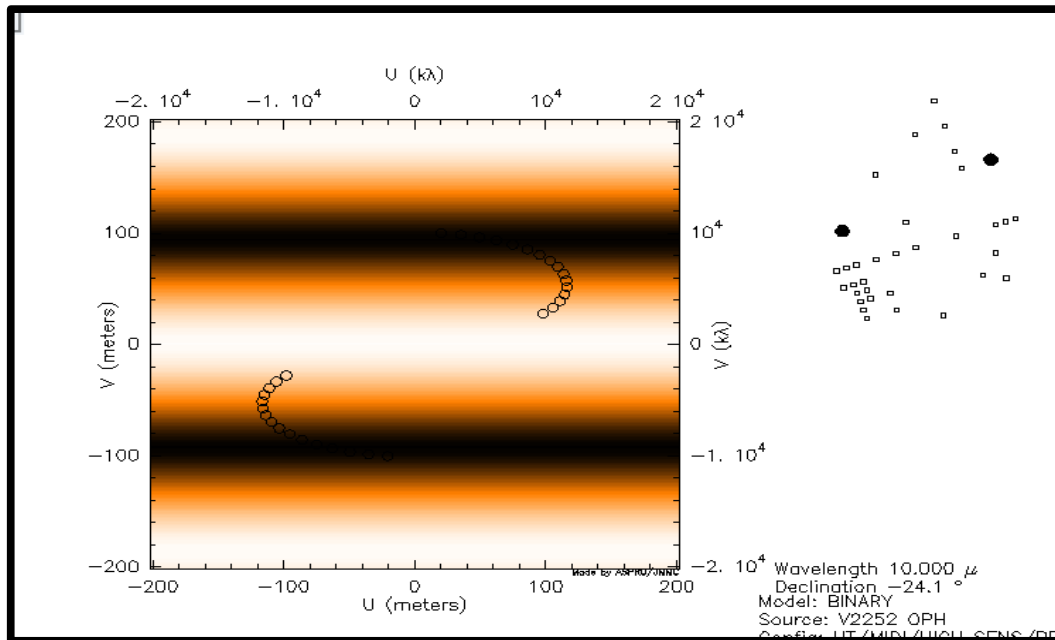
Time justification

- × Period of the star: 591 days → 4 observations of 60 minutes separated by 5 months → 20 hours (considering the calibrator HD 150052 with V-K=4.535 and D0-G1)
- × Observability:
 - $\alpha = 16:31:04.4$, $\delta = -24:04:34$
 - end of May (February-July)
Example of possible observations: beg. Apr 08 (3-10 U.T.), mid Aug 08 (0-4 U.T.), end Feb 09 (6-9 U.T.), end Jul 09 (0-6 U.T.) → 80B, 81A



Telescope and instrument justification

- * $V \sim 14 \text{ mag}$ & $K = 7.784 \text{ mag}$ \rightarrow MIDI
- * Flux ratio ~ 0.4
- * $d = 11 \text{ marcsec}$
- * Best UV coverage: U1-U4, D0-G1



Objectives

- × Interferometry → inclination
- × Combined with spectroscopy:
 - masses
 - radii
 - distance
 - effective temperature
- × Age → testing the validity of theoretical models of PMS evolution

