THE INNER RIM OF POST-AGB CIRCUMBINARY DISKS RESOLVED WITH AMBER/VLTI

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SCIENTIFIC MOTIVATION

- While in the AGB stage mass-loss is spherically symmetric, post-AGB stars and PPNe present a wide variety of structures
- In the transition, binary interaction mechanisms are thought to act, triggering the formation of a circumbinary disk (Balick & Frank 2002)

- De Ruyter et al. (2006) post-AGB sample (51 sources out of $\sim$ 220 post AGB stars known) presents evidence of disks on all the objects surrounding sources
- In this proposal, we aim to study in more detail one of these sources using AMBER/VLTI

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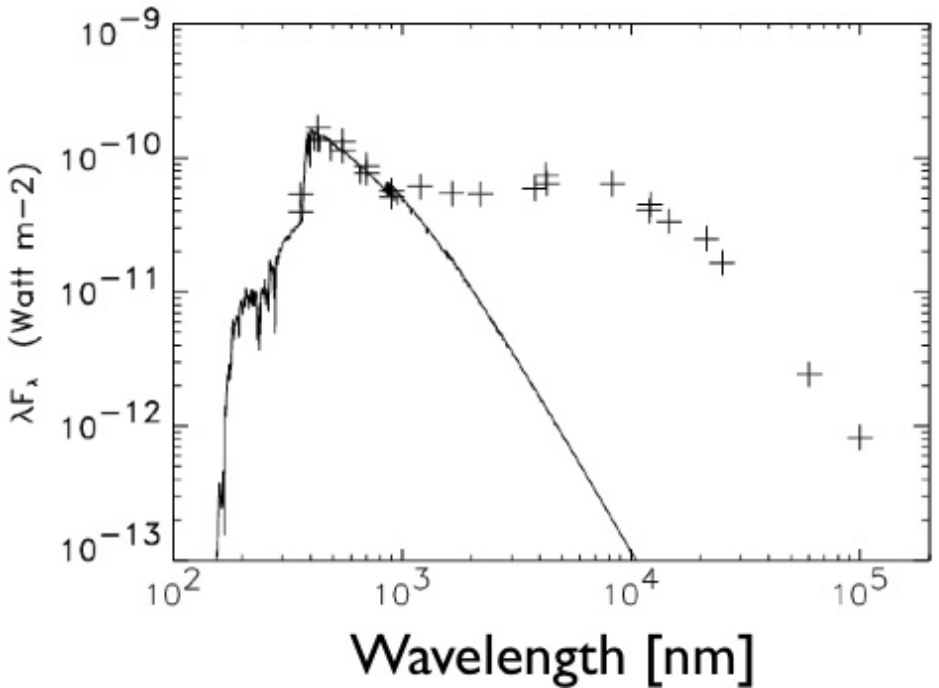
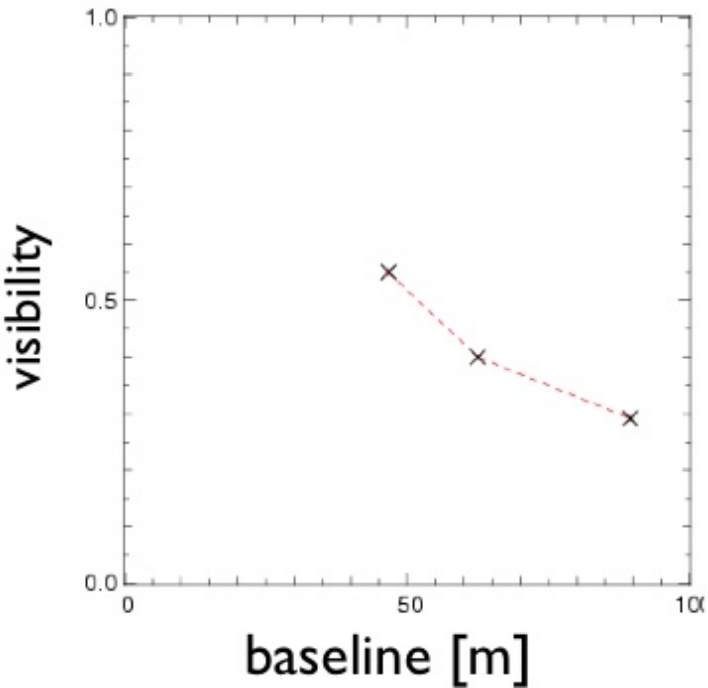
SCIENTIFIC MOTIVATION

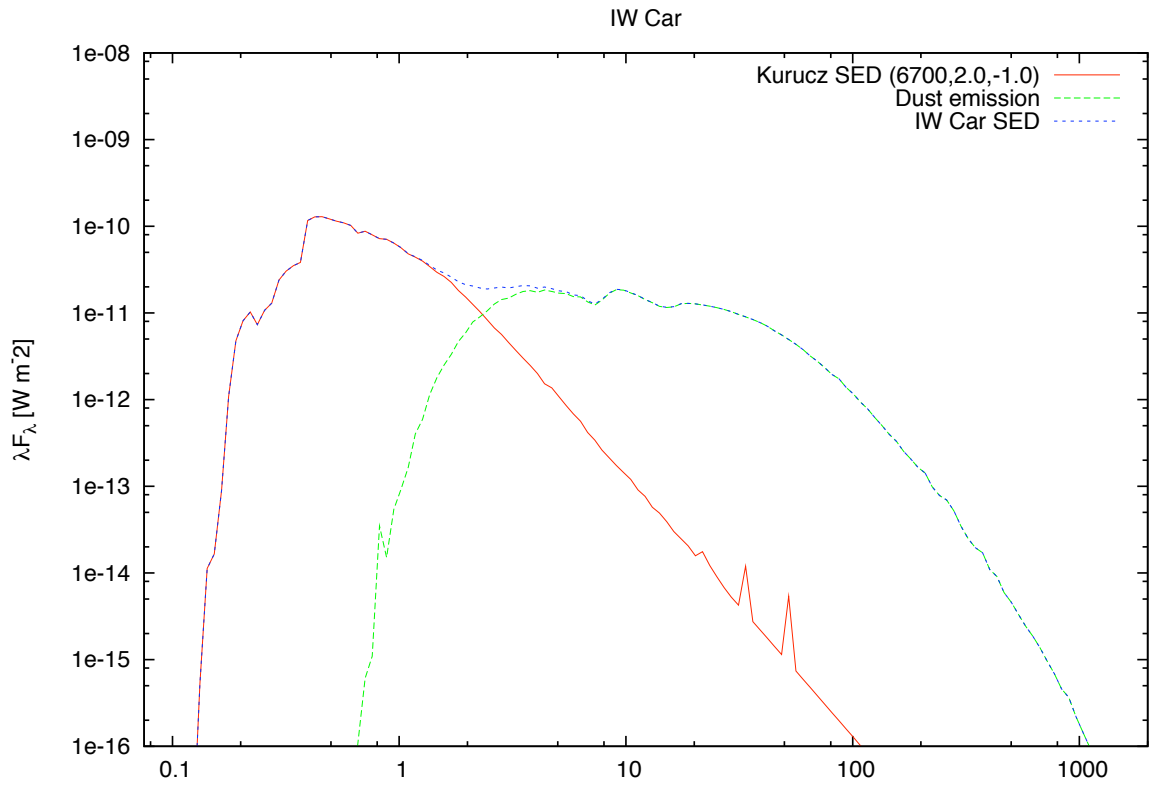
- A similar study was performed by Deroo et al. in IRAS 08544-4431. Large IR excess $\Rightarrow$ disk
- The K-band excess is interpreted as originating from the hot inner rim near dust sublimation temperature ($\sim$ 1000 K)
- AMBER covers the λs between the photosohere dominated regime and the hot dust dominated regime
- *We can resolve the geometry of the inner disk and probe the distance of this hot dust to the star*





THE TARGET SOURCE

IW Car
α =09 26 53.3027 $\delta = -63$ 37 48.894
Fluxes: B=9.07, V=8.22, J=5.875, H=5.151, K=4.367



SED model of source shows that at K-band disk emission starts being important

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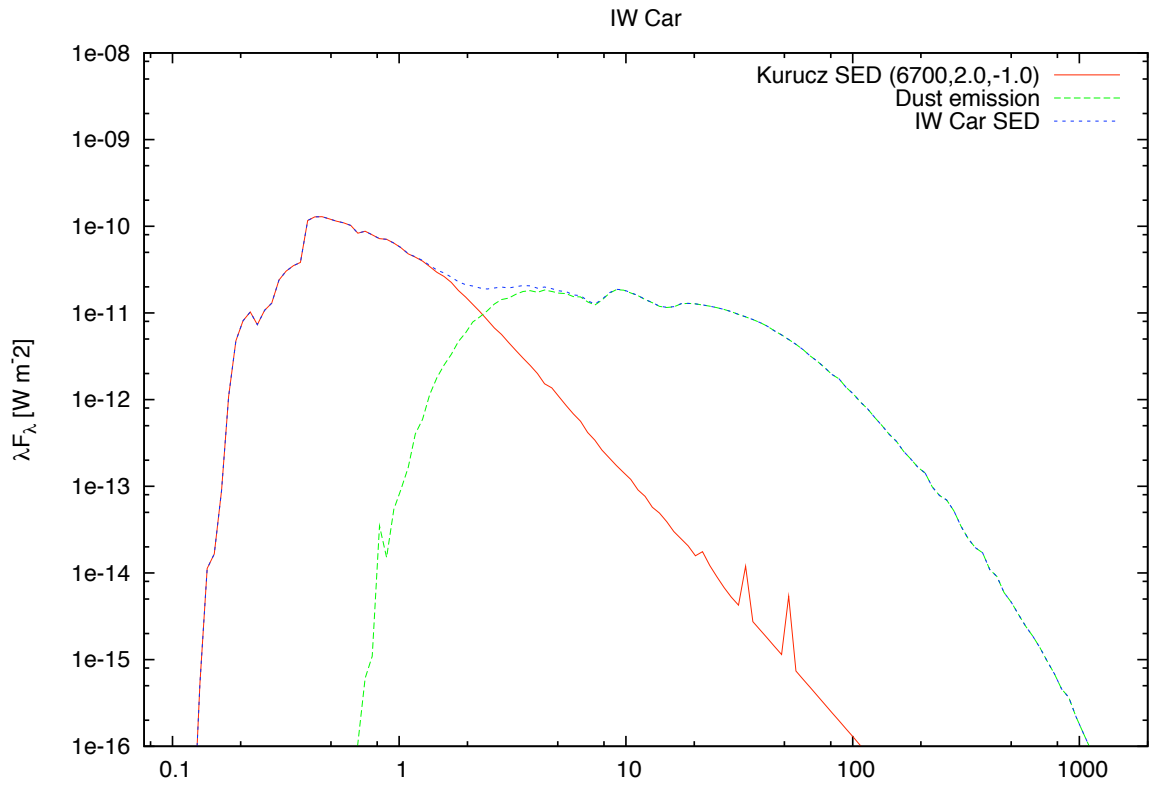

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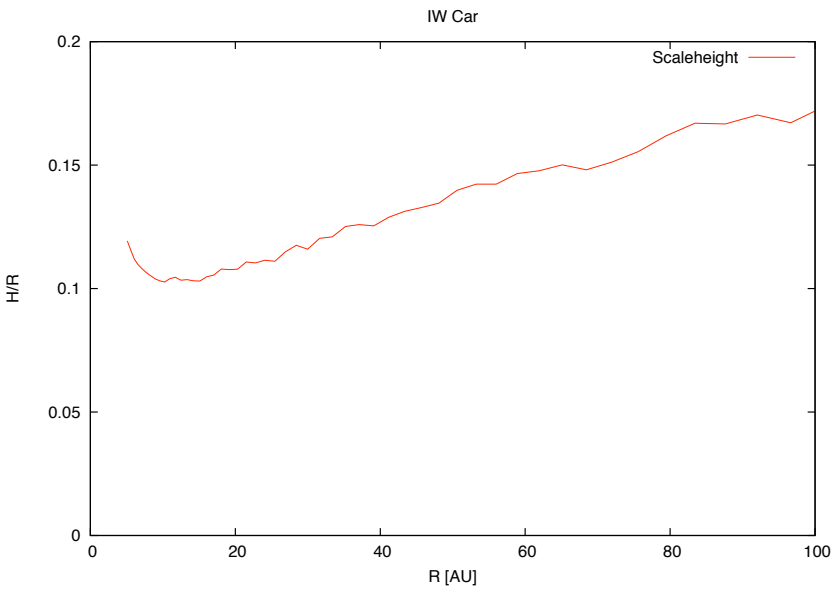
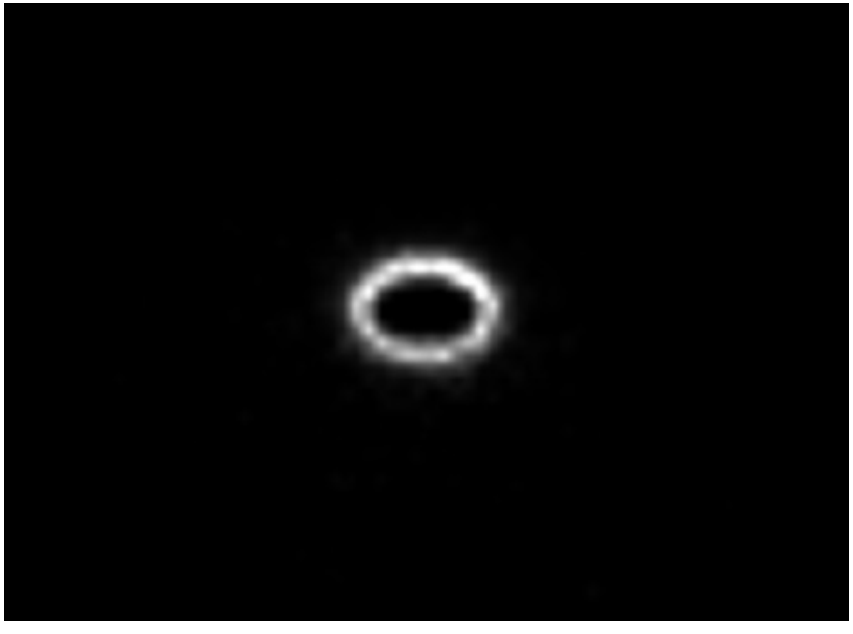
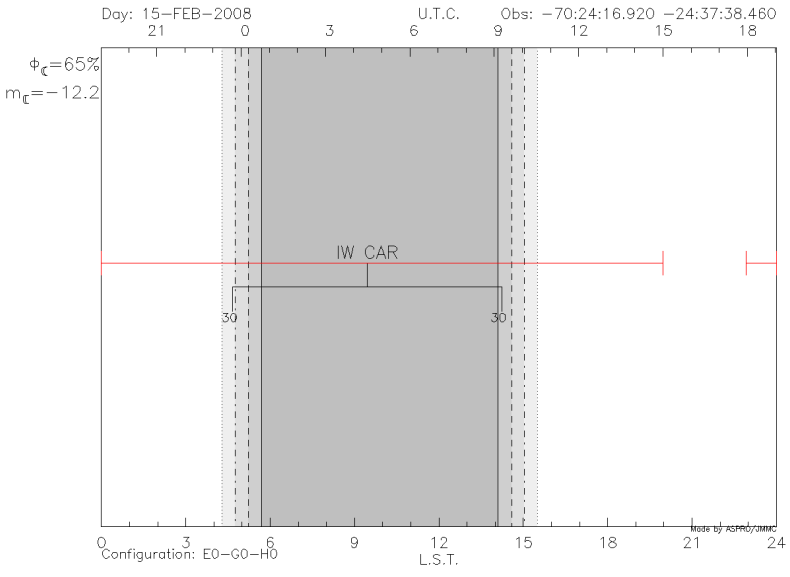
MODEL OF THE EMISSION

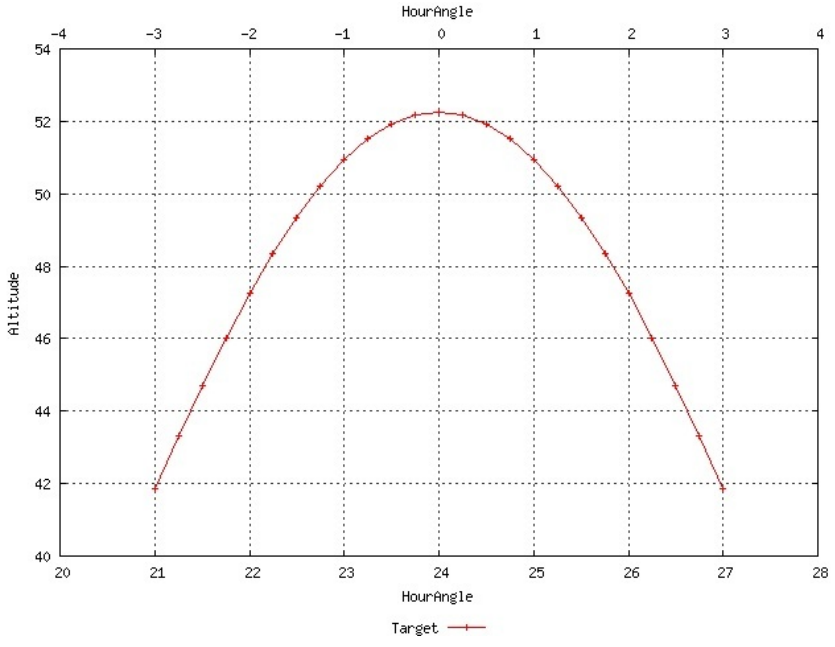
Left: Scaleheight of dust in the IW CAR circumbinary disk. Inner rim is at 5 AU
Right: 2.1 μm emission from the disk is dominated by the inner rim (input parameters taken from De Ruyter et al. 2006)





THE OBSERVATIONS

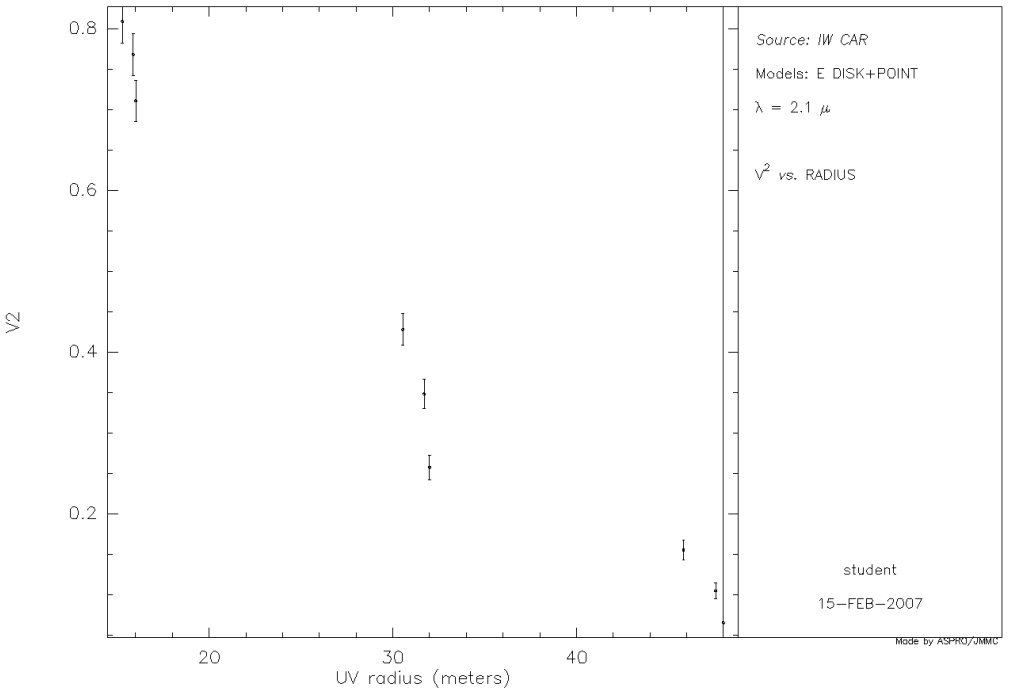




- The source can best be observed around Feb 15 2008
- We ask for 6 hours of MIDI/VLTI (K-band) around LST 9 hours. Including calibration

MODEL

- Model has the inner rim at 5 AU. With our source at $\sim$ 700 pc rim's angular diameter is 14 mas
- Our model should be a point source (70 % of flux at K-band) + an eliptical ring. Due to ASPRO limitations we used a uniform eliptical disk (short-B visibilities are similar to the ring's case)



the model was successfully calculated

Disk flux = 0.72698 ± 0.03133 Major axis = 0.01367 ± 0.00068 Minor axis = 0.00980 ± 0.00056 Point flux = 0.28372 ± 0.04496

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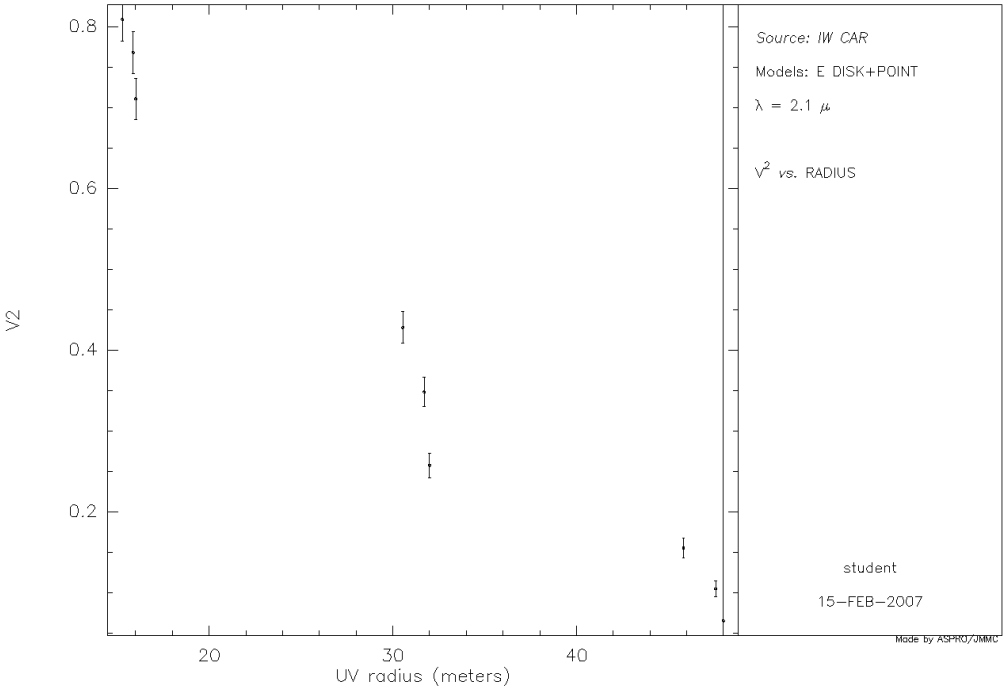

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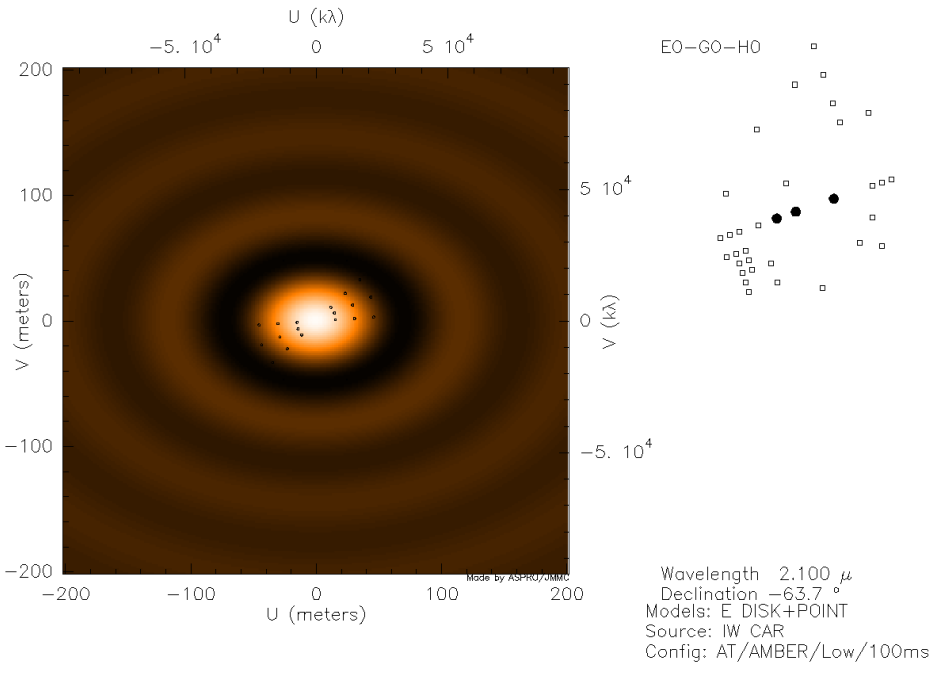
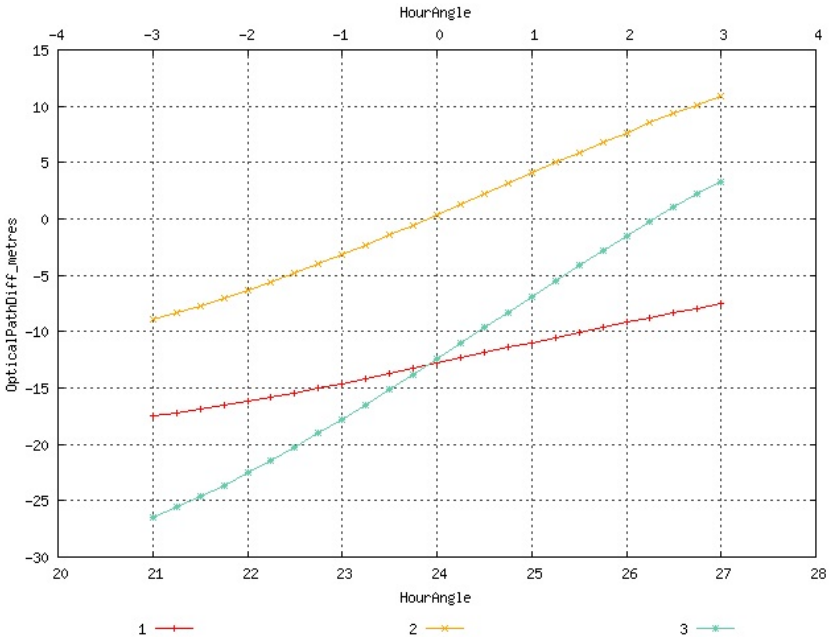
CONFIGURATION

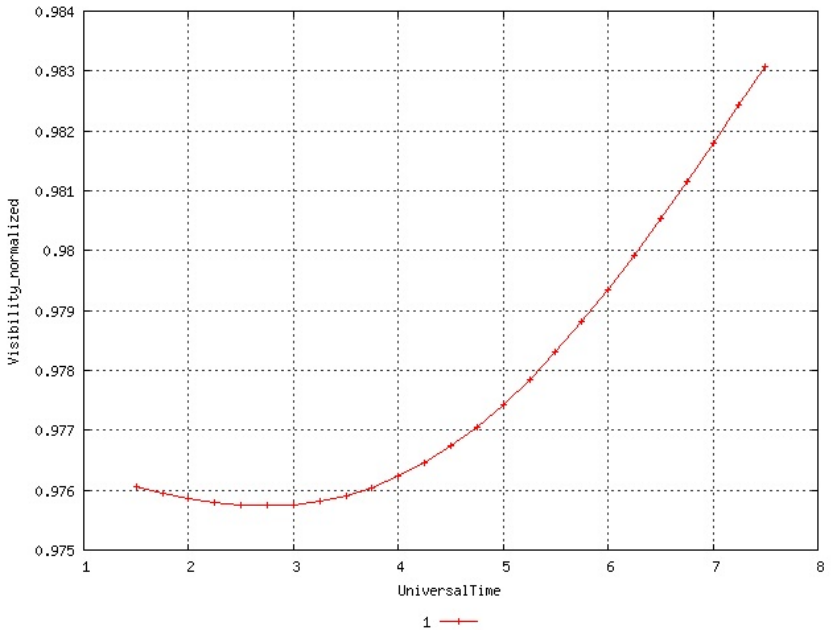
- ATs are enough
- E0-G0-H0 had the best compromise. It covers both the non-resolved (star+disk) and the resolved (only star) regions in the *uv* space
- 3 measurements at each baseline



RESTRICTIONS AND CALIBRATOR

- Delay lines are OK
- Our calibrator will be HD81502_M04 (3.4 deg away; m_K =3.1; and 1.2 mas diameter so at longer Bs its V is still 0.98)





THAT'S ALL