

Probing the inner disk and gap

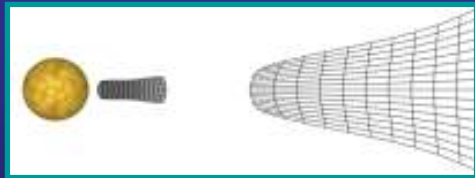
- Scientific background :

- Spitzer/IRS observations (5-35 μm)

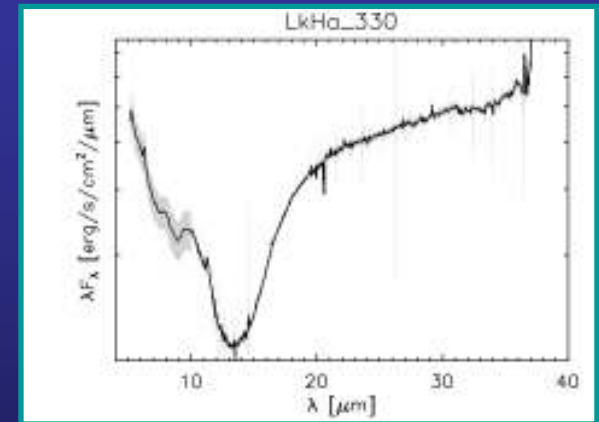
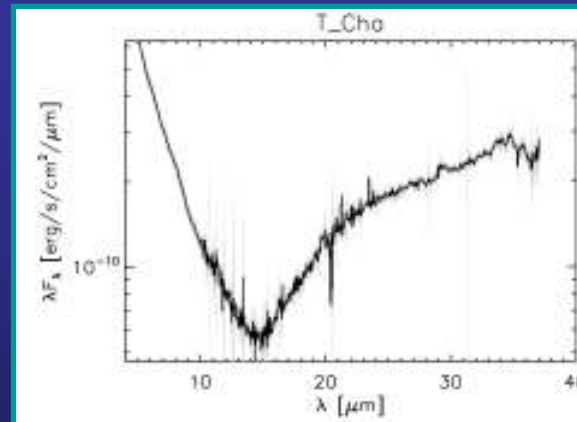
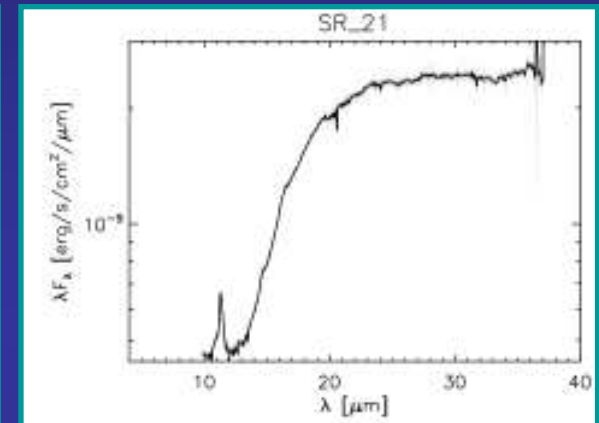
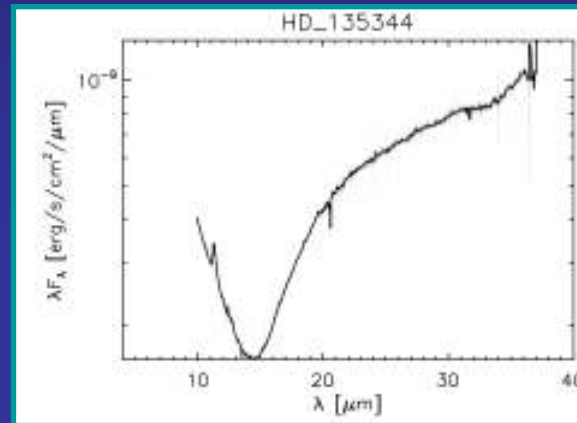
- 4 sources selected on their spectra

- Optically thin to optically thick disk (see Alexander's talk)

- Possible explanation : a large gap in the disk

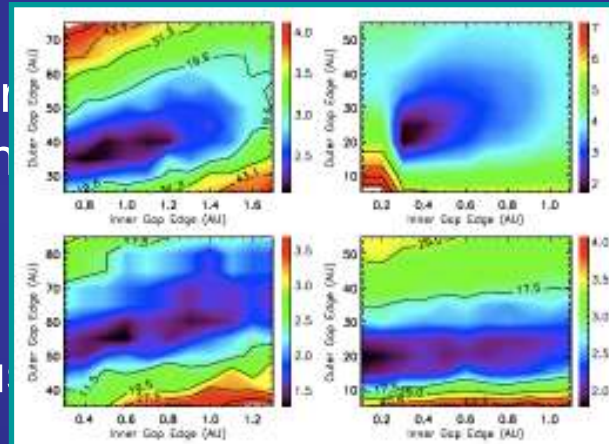


- Question: can a disk model reproduce the SED ?

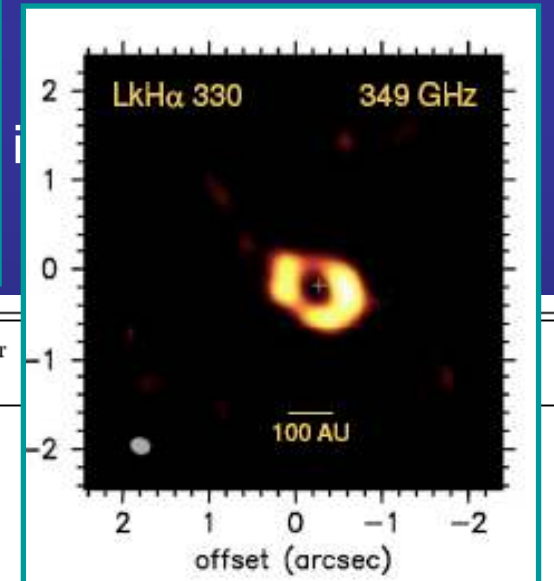


Scientific background

- Modeling done by Brown et al. (2007), using 2D radiative transfer code RADMC (Dullemond & Dominik 2004)
- χ^2 minimization process on the SED of each source
 - Derivation of the parameters of the possible gaps (R_{\min} , R_{\max} and inclination)
- For LkH α 330, confirmed by ALMA observations (Brown et al. 2015)
- Does interferometry ($R < \text{Gap}_{\text{inner}}$) and thus does not resolve the gap



millimeter

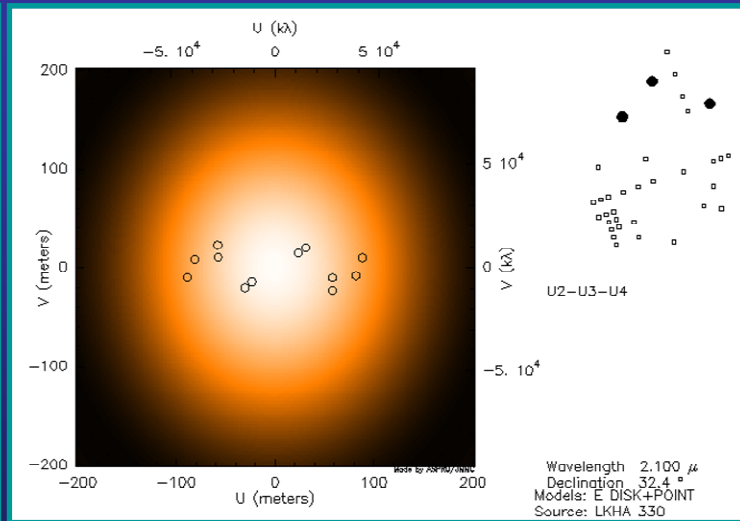
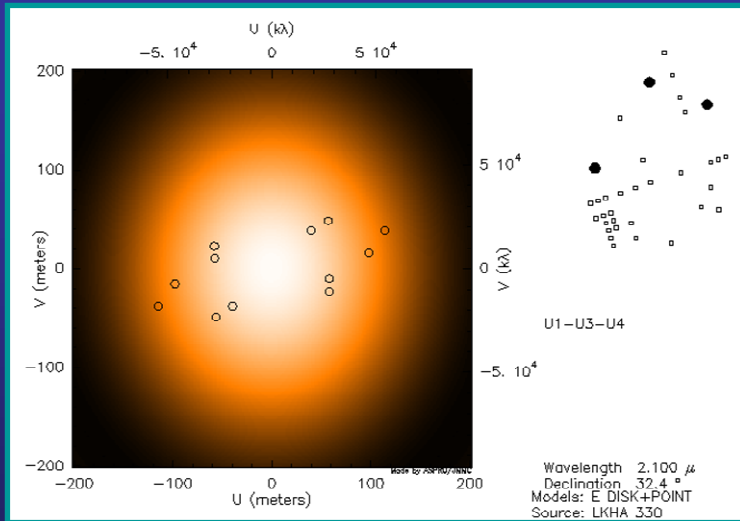
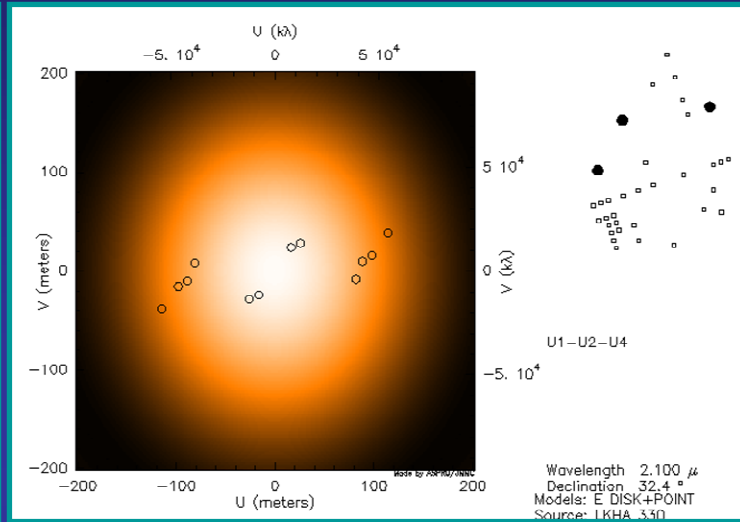
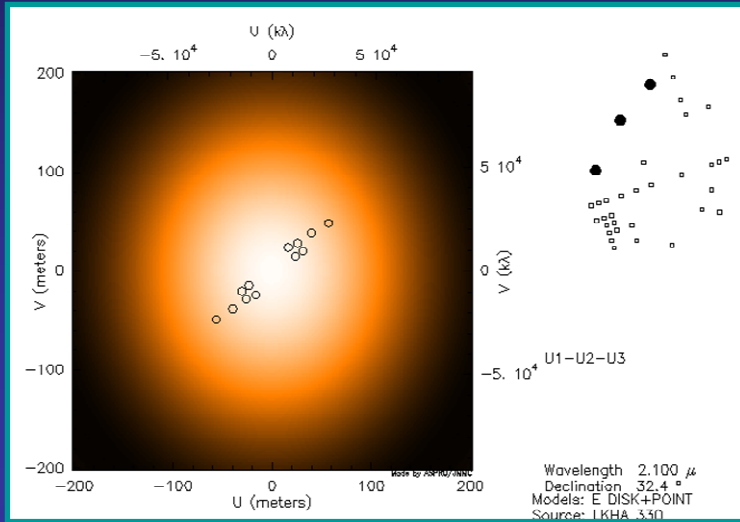


Source	Spectral Type	A_v (mag)	Distance (pc)	M_{star} (M_{\odot})	T_{eff} (K)	R_{star} (R_{\odot})	$\text{Gap}_{\text{inner}}$ (AU)	$\text{Gap}_{\text{outer}}$ (AU)
LkH α 330	G3 ^a	1.8 ^a	250 ^b	2.5	6200	3.3	0.8	35
T Cha	G8 ^c	1.5 ^c	66 ^d	1.5	5900	1.1	0.15	20
HD 135344	F4 ^e	0.47 ^f	84	1.8	6600	1.9	0.55	55
SR 21	G2.5 ^g	9 ^g	160	2.5	6300	2.6	0.35	20

How ?

- AMBER with UTs : why ?
 - Direct imaging is not possible
 - Sources too faint for MIDI and for AMBER with ATs
- ⇒ AMBER with UTs is the only instrument at VLTI for these observations
- Details :
 - Observable from Paranal
 - Magn K : 5.84 - 6.9, Magn V : 8.6 - 14.2 (<17)
 - Low resolution (magnitude limit)
 - 3 hours of observation (H.A.: -2 to +1)
 - Model used :
 - Point = star (flux : 0.7)
 - E-disk = inclined disk to reproduce the parameters inferred from the modeling (inclination known, flux : 0.3)
 - Calibrators found for each stars

Which baselines ?



Final choice :

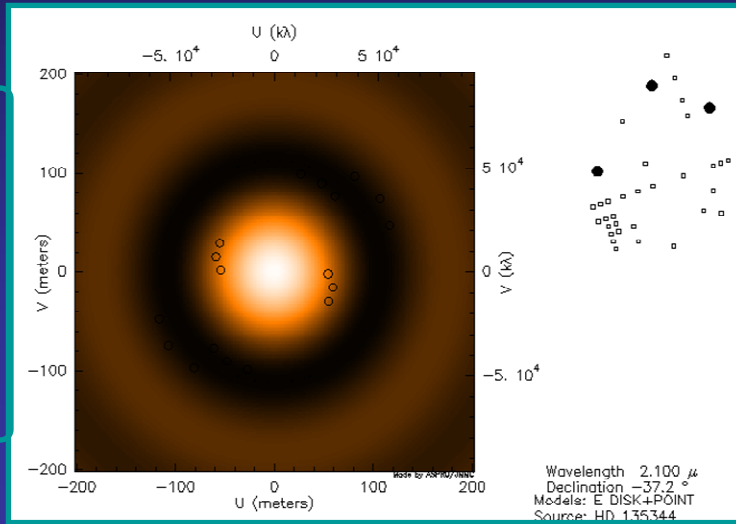
U1

U3

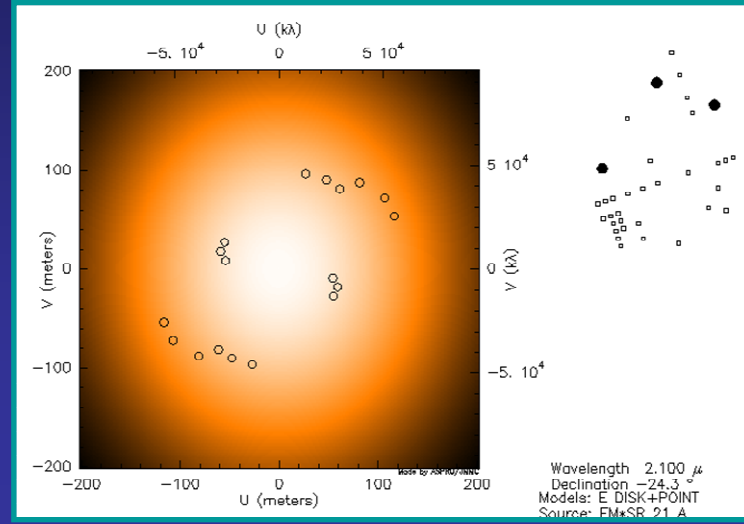
U4

UV coverage

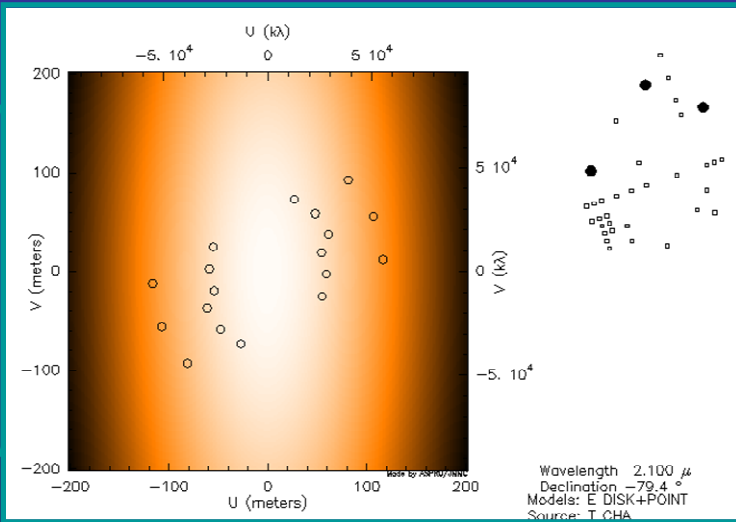
HD 135344



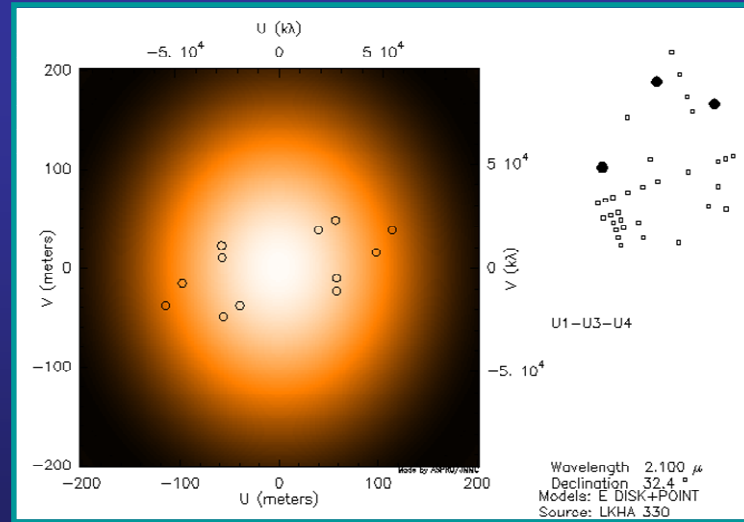
SR 21



T Cha

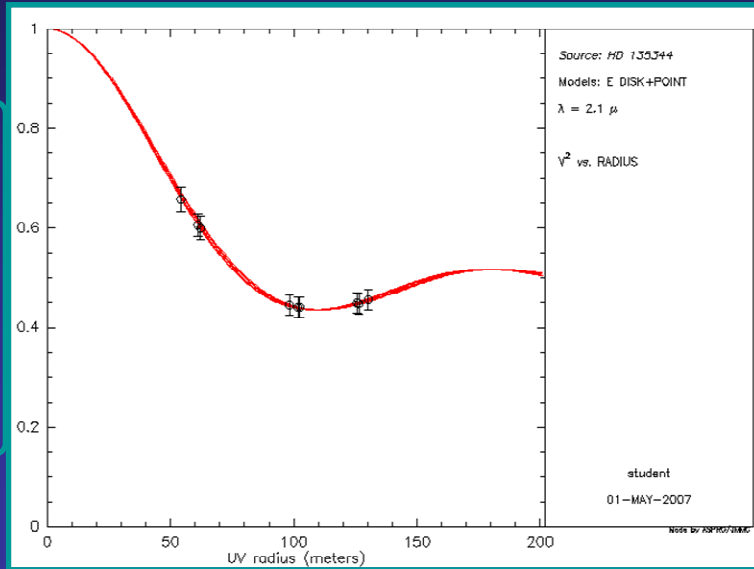


LKHa 330

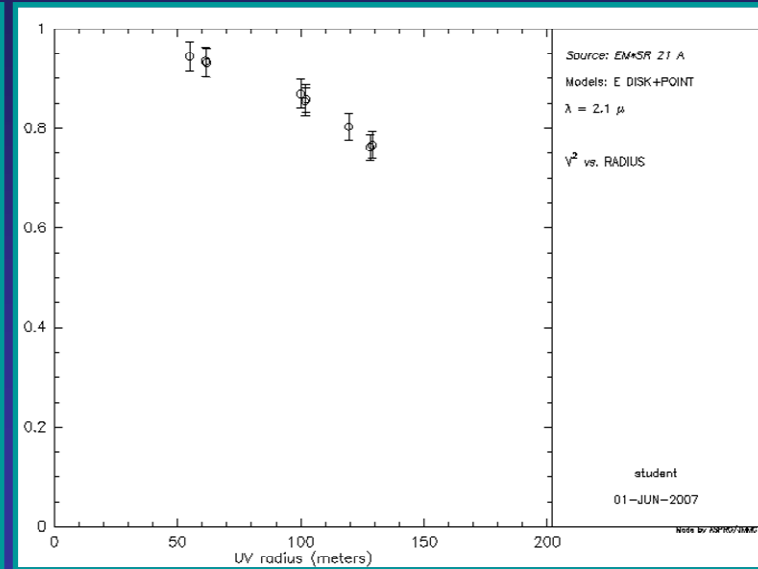


Visibilities

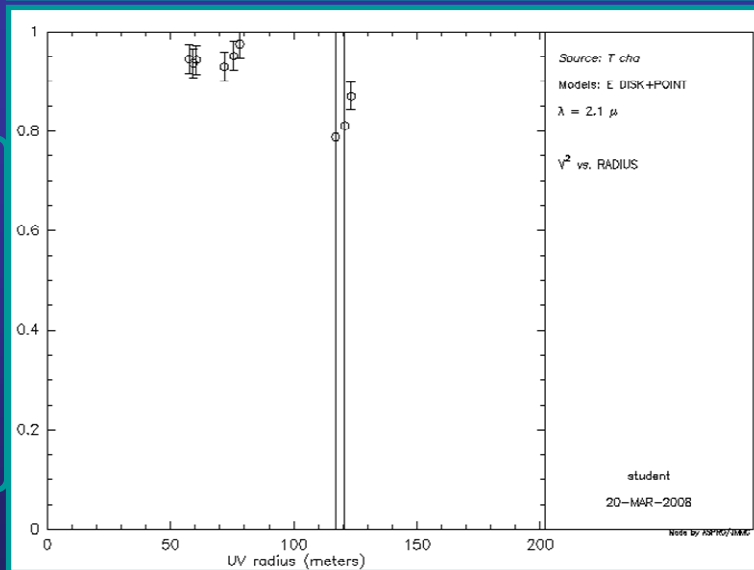
HD 135344



SR 21



T Cha



LKHa 330

