

The putative dust torus
in NGC 1097:
MIDI observations

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Introduction – NGC 1097

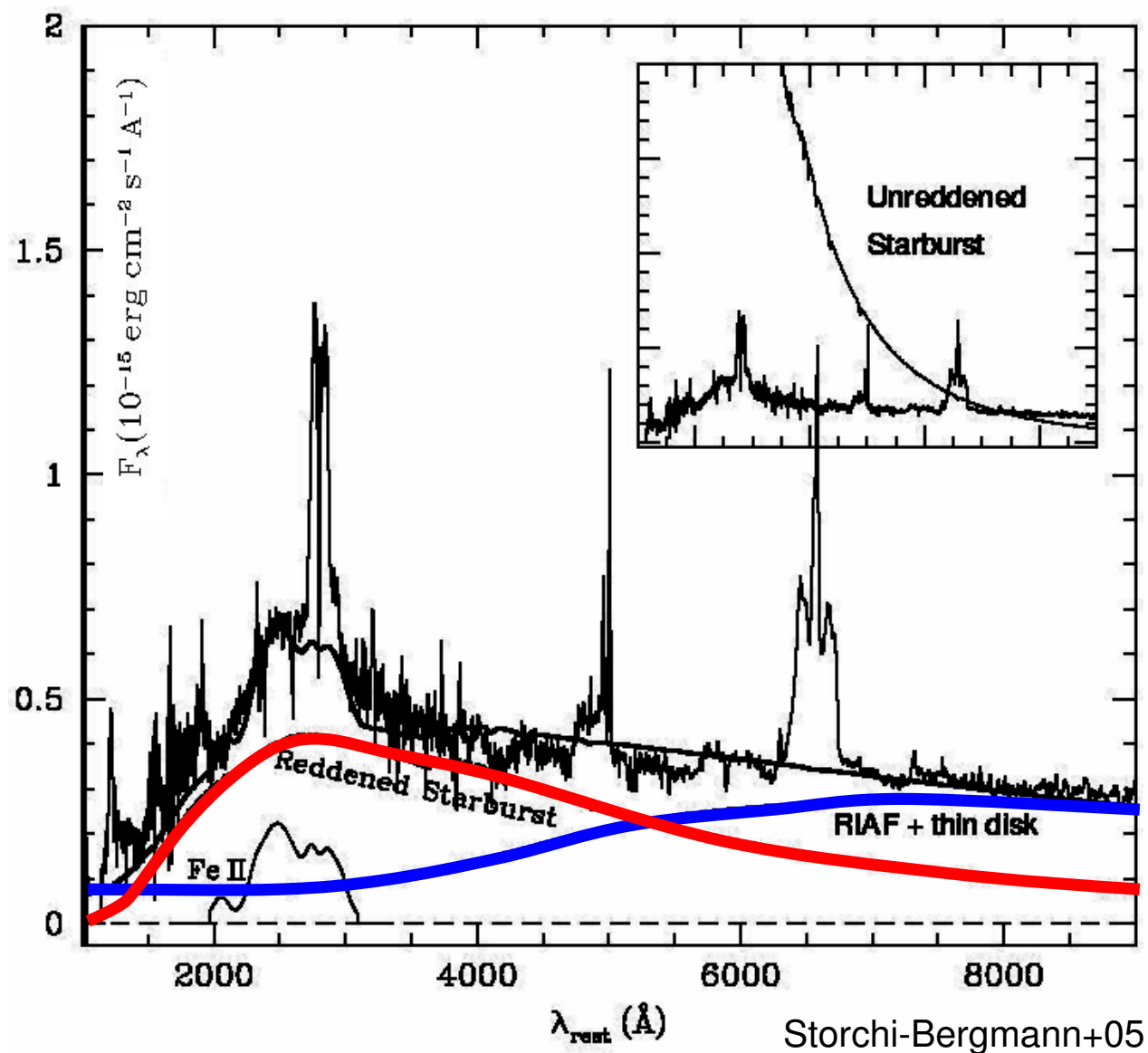
Why this target?

To reproduce UV continuum observed with HST: need 10^6 yrs old **starburst of $10^6 M_{\text{Sun}}$** reddened by $A_V = 3$ mag (dust)

Conjecture: *starburst* inside a *dusty torus* in the nucleus (closer than 9 pc from AGN)

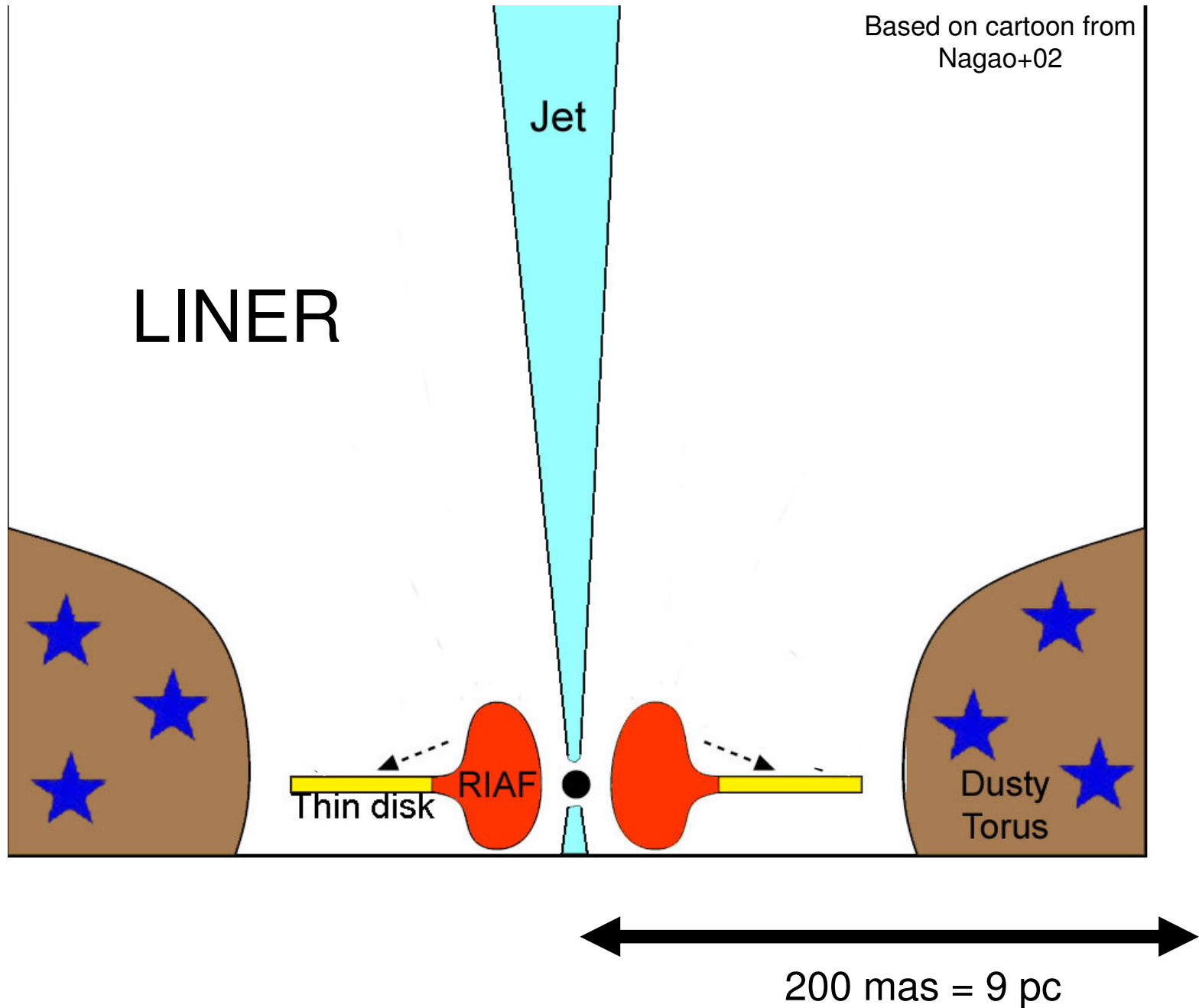
But are there dusty torus in low-luminosity AGN?
(Elitzur's lectures)

Plus: we cannot see directly the dusty torus in LLAGN!



Physical picture for NGC 1097

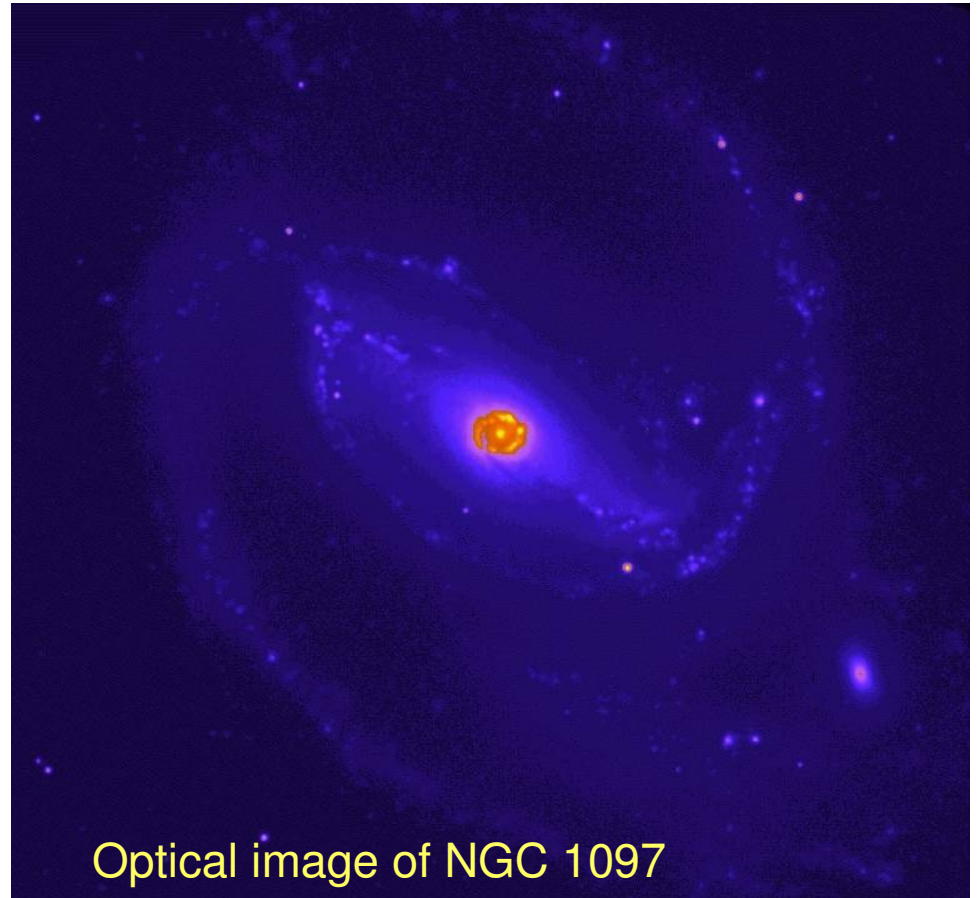
Storchi-Bergmann+03, SB+05, Nemmen+06, Mason+07



Science case

Possible science outcomes of this proposal

- ✓ Test unification scheme: low-luminosity AGNs harbor dusty tori? [Elitzur's lectures](#)
- ✓ Constrain physical properties of the torus: size, temp., orientation etc
- ✓ Orientations: *torus* vs. *accretion disc* and *galactic disc*



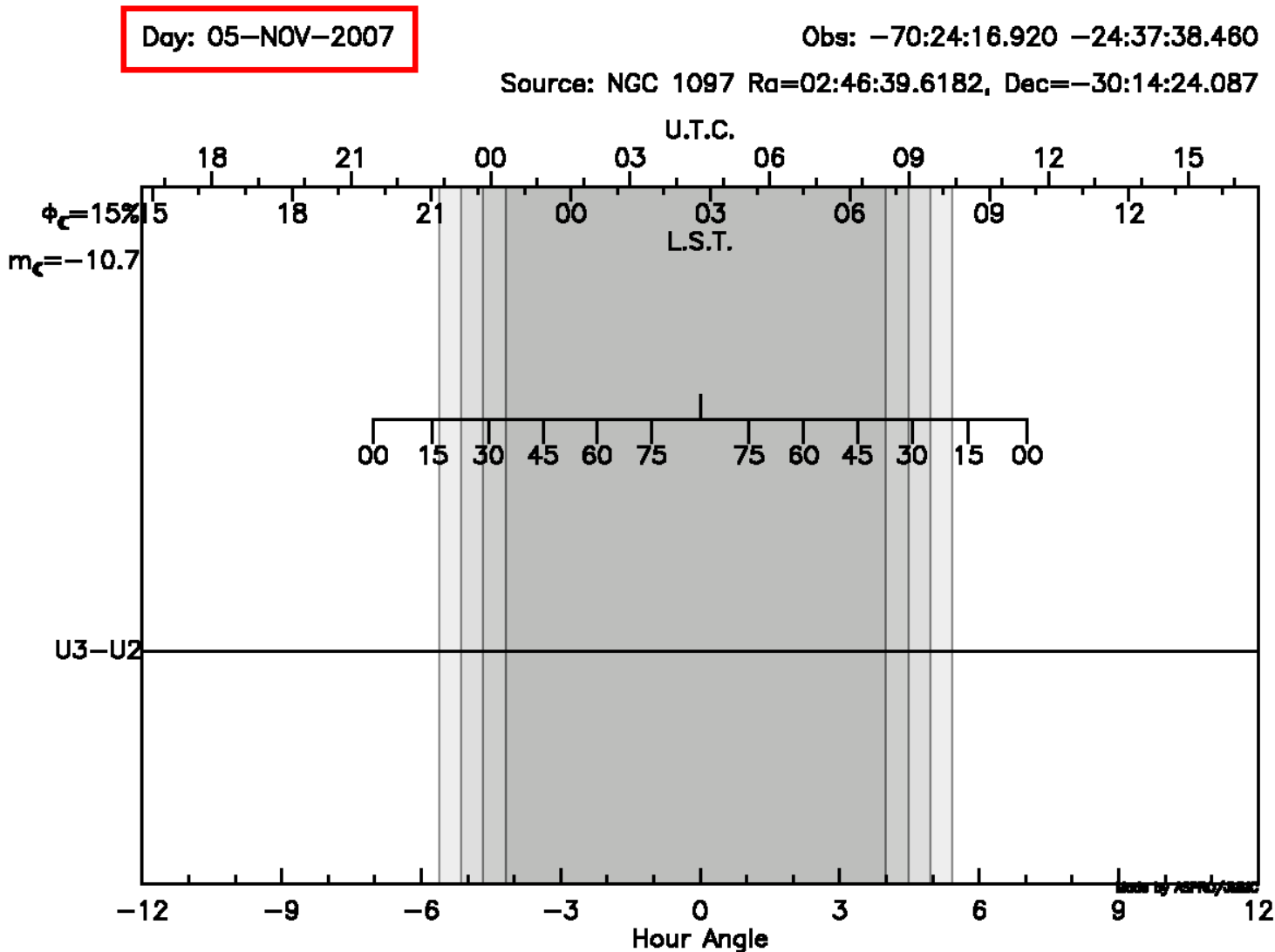
Optical image of NGC 1097

Observational proposal

Feasibility

Flux of object: 2.96 Jy at 12 μm (IRAS flux density, Brandl+06 - NED)

MIDI limiting flux = 1 Jy



Observational proposal

Details

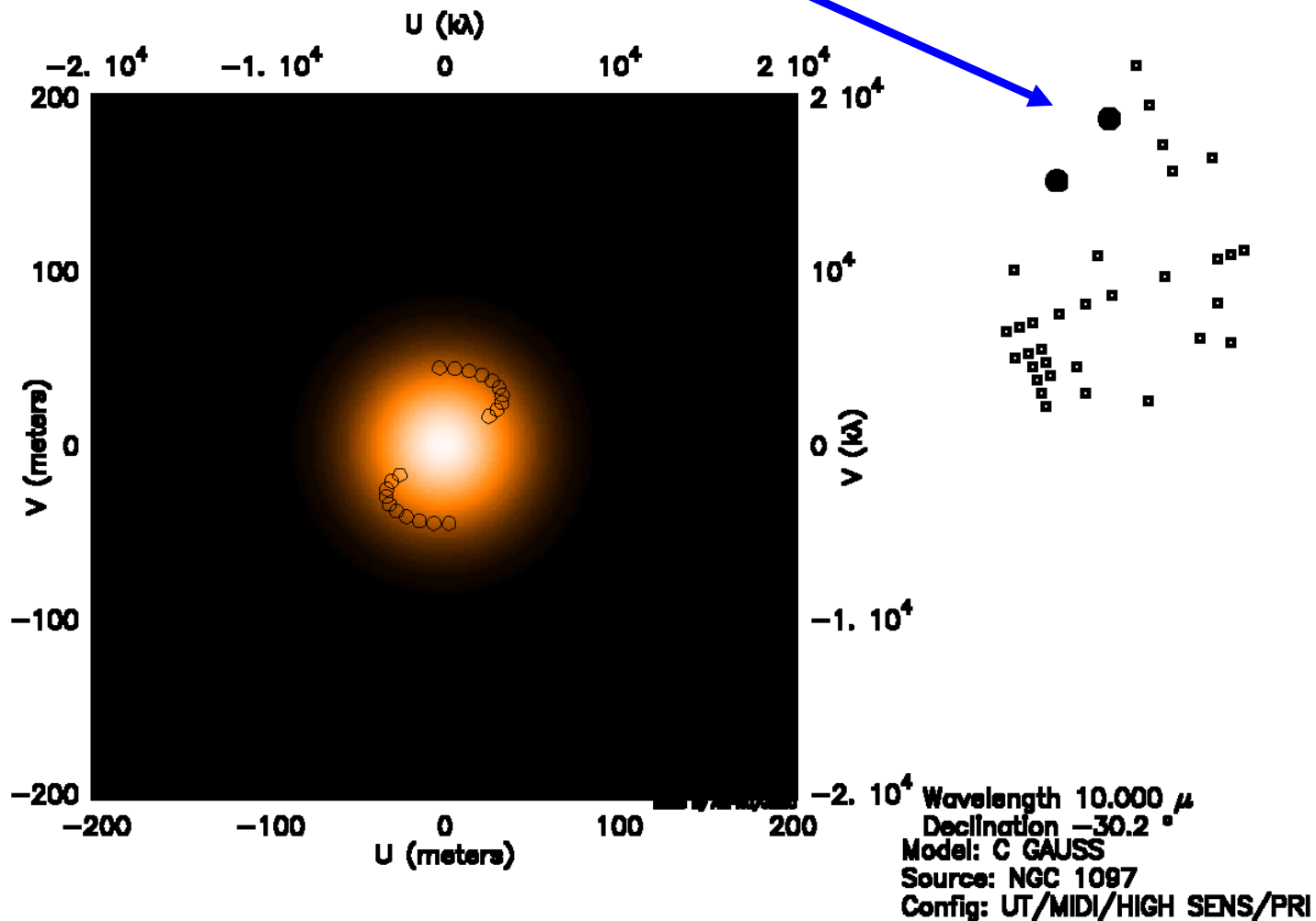
Model: gaussian disk (c_gauss), diameter = 24.5 mas, flux = 1

Wavelength = 10 μm

Telescope configuration:

U2 U3 (smallest baseline)

**UV
coverage**



Observational proposal

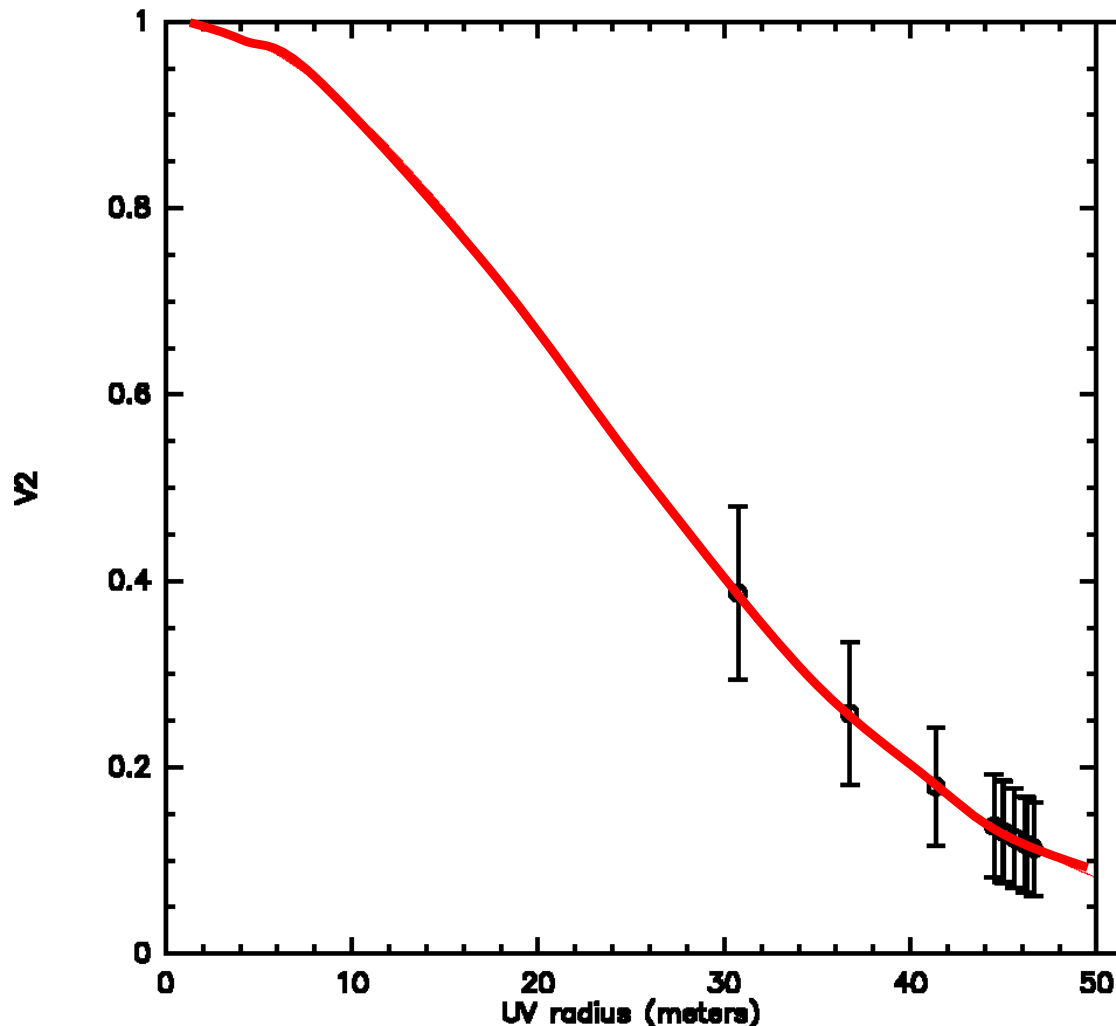
Details

Model: gaussian disk (c_gauss), diameter = 0".0245, flux = 1

Wavelength = 10 μm

Telescope configuration: U2 U3 (smallest baseline)

**Visibility
vs.
Baseline**



Observational proposal

Problems...

We used the flux 2.96 Jy at 12 μm (entire galaxy with IRAS)

But: 0.06 Jy (200 pc, 3.5" with Spitzer – Mason+07)

Limiting fluxes:

MIDI: 1 Jy (4 N mag)

PRIMA: 0.01 Jy (9 N mag)

Backup slides

Observational proposal

Details

Calibrator (CalvinExpert)

No.	Name	R.A. (h,m,s)	Dec. (d,m,s)	Ang. Dist. (deg ^o)	Ang. Diam. (mas)	Mag_N	Spec. Type	Lum. Class	Qual. Flag	Normalized Visibility ave ± err range	Loss of Correlated Magnitude ave ± err range	Normalized Visibility <i>FINITO</i> ave ± err range	RiseTime SetTime Duration	Culmination MaxAltitude	Shadowing
2 (253)	hd16815 simbad	2 40 40.03	-39 51 19.40	9.6	2.23 ± 0.05	1.72	K0III	III	1	1.00 ± 0.000 1.00-1.00 graph ascii	0.01 ± 0.00 0.01-0.01 graph ascii	0.89 ± 0.005 0.89-0.91 graph ascii	3.00UT 6.00UT 3.00hrs	4.25 UT max = 74° graph ascii	max = 0% graph ascii