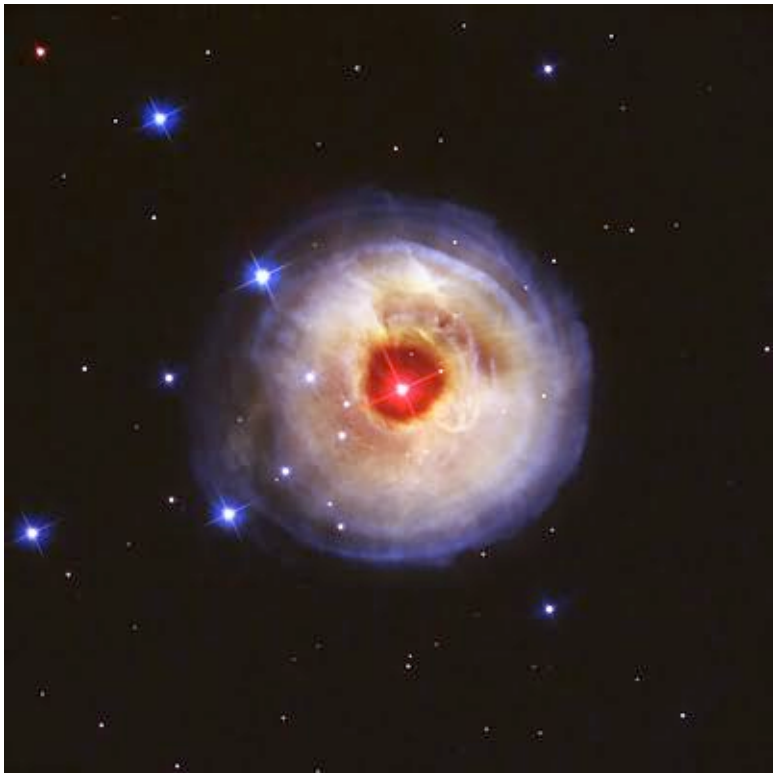
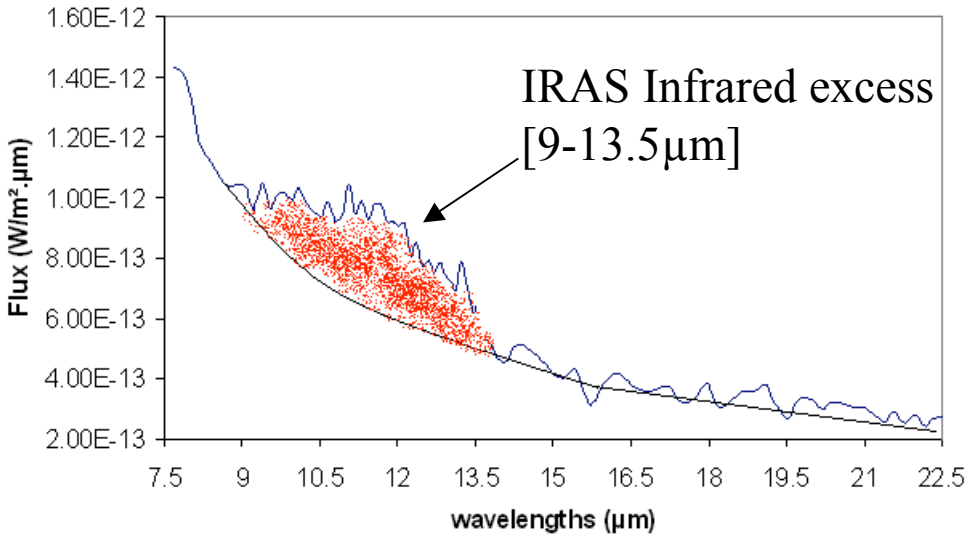
Observation of the Intrinsic S-type star Z ANT with VLTI/ MIDI

Stéphane Sacuto & Slimane Bensammar



- Semi-regular (P=104 d) intrinsic S star with : L = 3300 $L_{\odot;}$ D=580pc and F_{12}=30.5 Jy, m_v=11
- Silicated (Sloan and Price) or SiC (Skinner and Griffin, 1990) dust features



- Possible main sequence star companion

Why MIDI ?

❖ Cover the Mid-Infrared range including the dust composition features [9-13μm].

❖ Compare the inner distribution of the dust and of the IRed continuum region, by measuring the respective visibilities in the spectral channels of the dust emission.

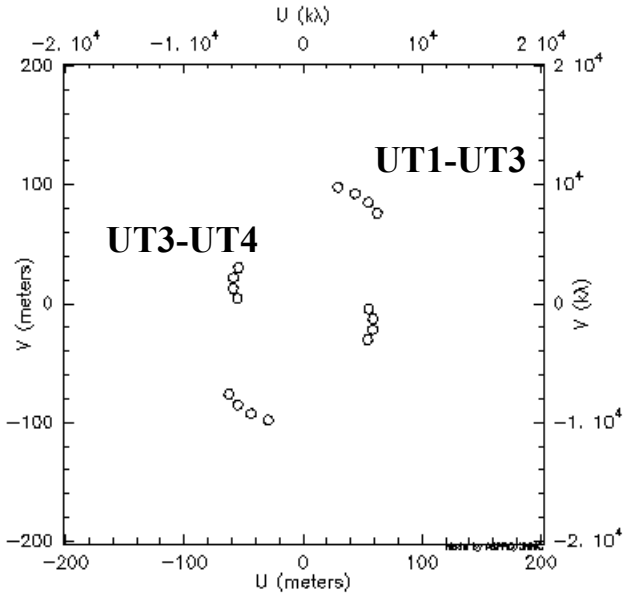
❖ Fill correctly the spatial UV coverage of this object in some directions, in order to detect asymetries of the envelope due to a possible companion.

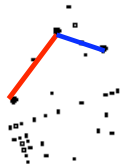
VLTI Configurations

UTs :

 F_{12}=30.5 Jy

✓Size of the target (naked photosphere) ~ **4 mas** (non resolved with MIDI)
but with an inner shell boundary radius located at ~ **14 mas** (LTE)





 Observability : February-March

 Baselines : UT1-UT3 and UT3-UT4 (~ ⊥) from –2h to 2h of hour angles

⎫ No constraints on the moon

⎫ Spectral configuration : GRISM (R=230) – HIGH-SENS (differential visibilities)

⎫ Visiblity accuracy < 20%

Calibrator : HD 100407

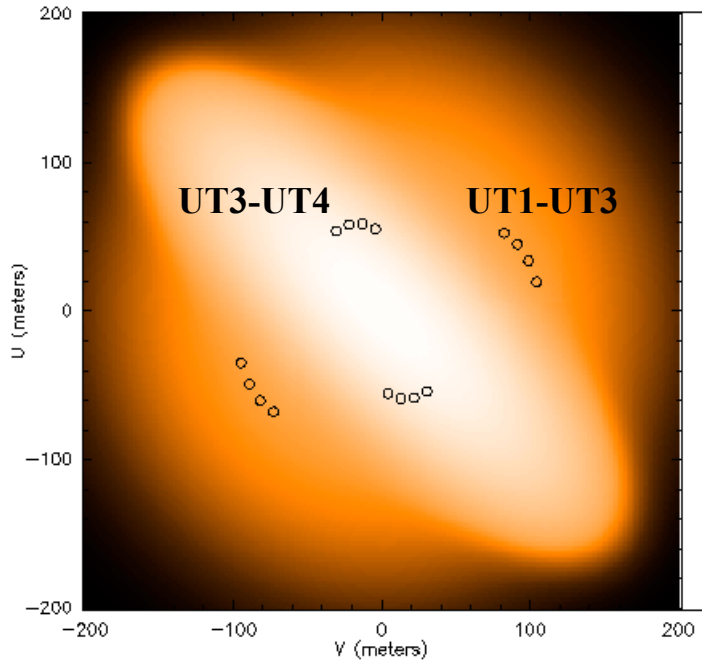
ϕ=2.4 mas (Non resolved star) with an expected visibility of 0.99

Modeling the object

2 components model :

- An uniform disk of **angular diameter = 4 mas** → **Central star**
- An elliptic gaussian of **minor axis = 10 mas** and **major axis = 30 mas**

With a position angle of 45° → **Envelope**



→

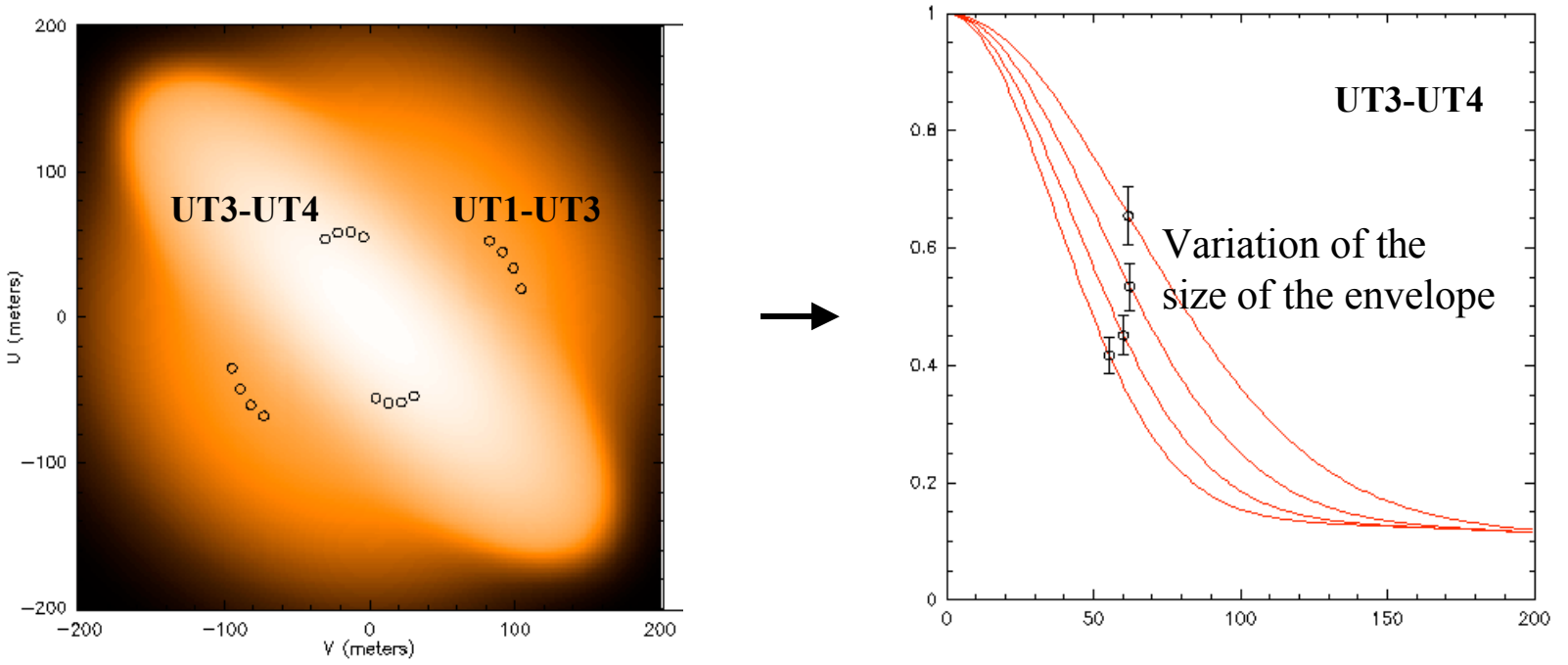
projected baseline (m)

Modeling the object

2 components model :

- An uniform disk of **angular diameter = 4 mas** → **Central star**
- An elliptic gaussian of **minor axis = 10 mas** and **major axis = 30 mas**

With a position angle of 45° → **Envelope**

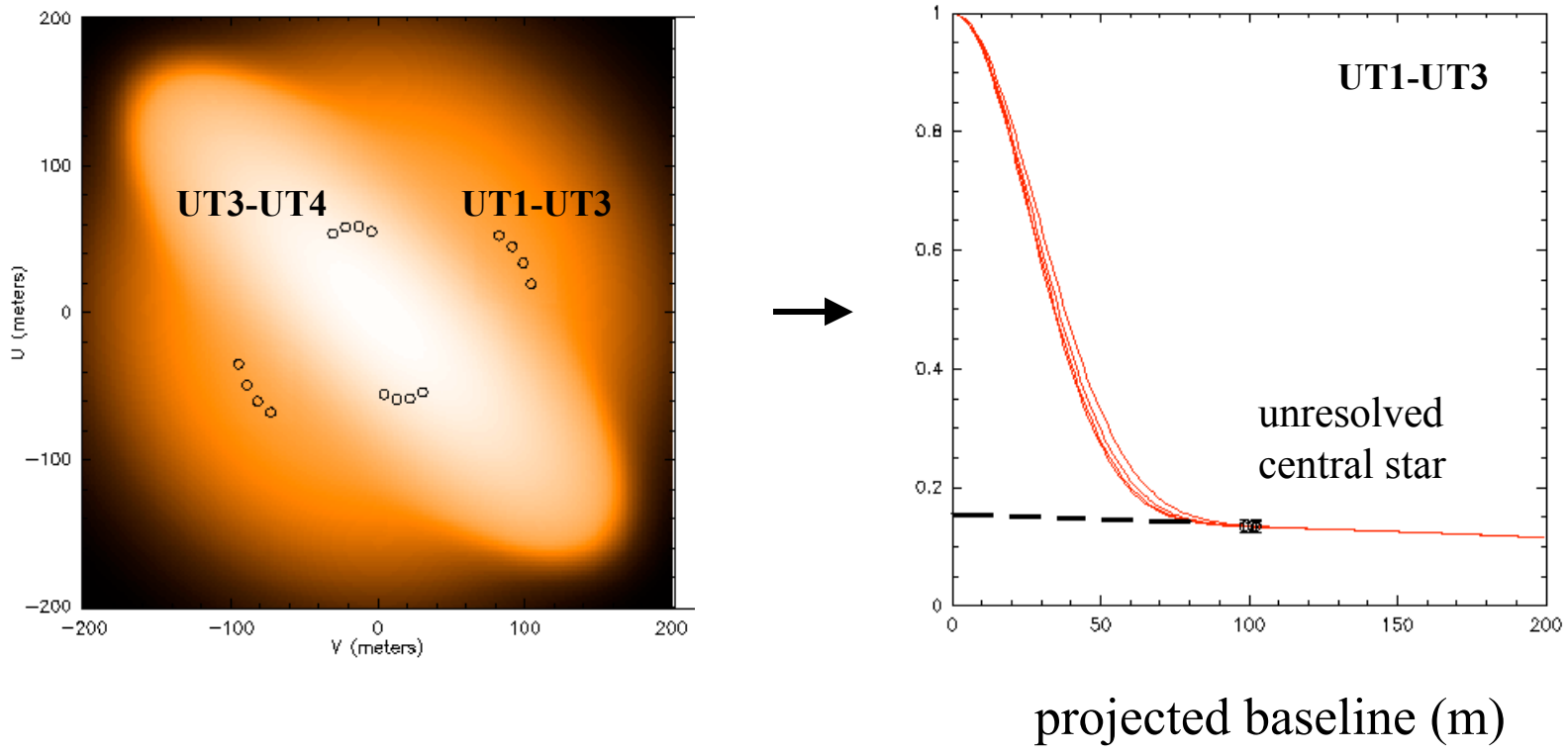


Modeling the object

2 components model :

- An uniform disk of **angular diameter = 4 mas** → **Central star**
- An elliptic gaussian of **minor axis = 10 mas** and **major axis = 30 mas**

With a position angle of 45° → **Envelope**



Conclusion

❖ Our observations concern the morphology of an S-type star.

❖ We have made the choise of a few UV-coverage associated with a high sensitivity spectral analysis of fringes.

❖ We proposed to measure the variations of the visibility and the differential visibilities between the continuum and the spectral emitting regions.

❖ This method permits to derive various dust shell asymetries and to detect a possible companion.