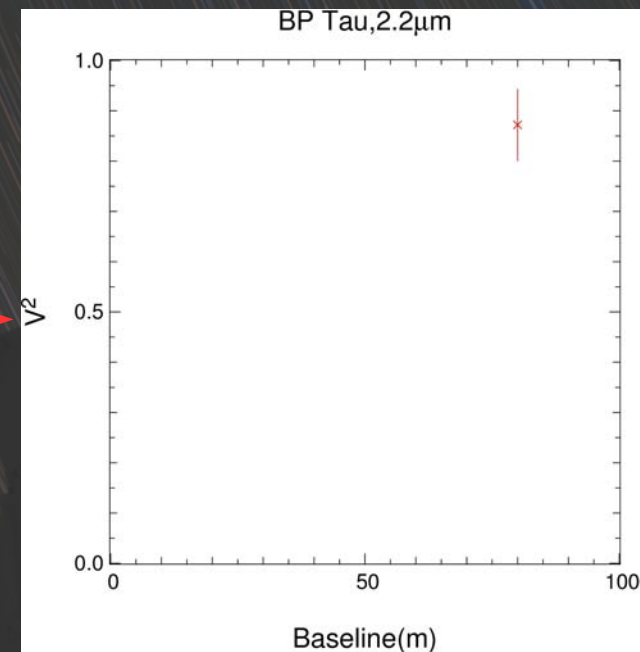
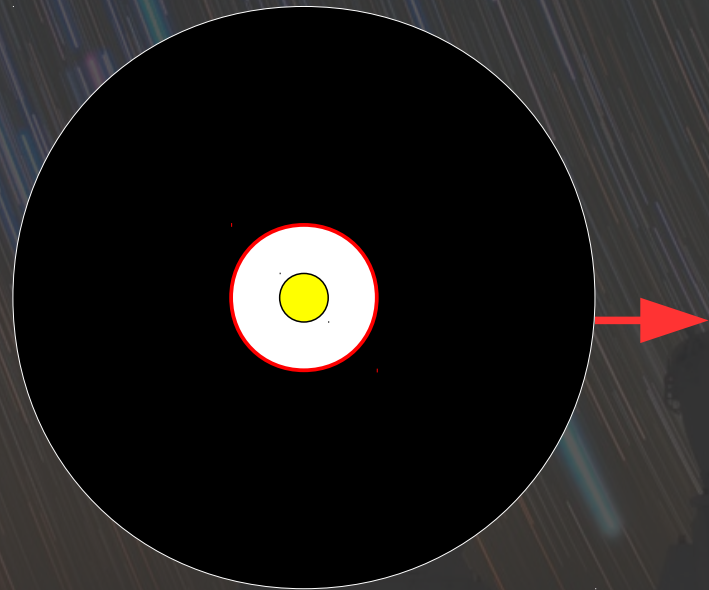


The PIONIER survey of southern T Tauri stars

F. Anthonioz, F. Ménard, C. Pinte, W-F. Thi, J.-B. Lebouquin,
J.-P. Berger, M. Benisty, O. Absil, W Traub, G. Zins G. Duchêne,
B. Lazareff, F. Malbet, & R. Millan-Gabet

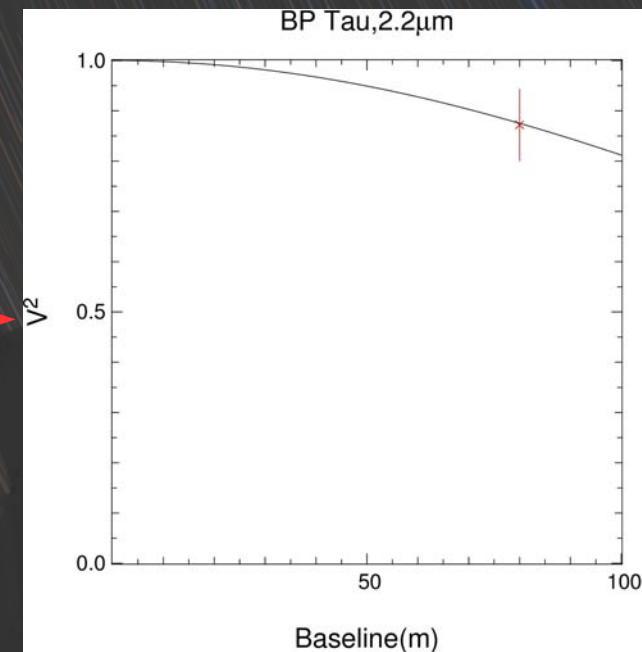
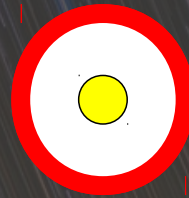
Before the VLTI : interferometers and models

- Lack of sensitivity
- Poor u-v coverage
- Ring Model (Eisner & al 2004) : Assume all emission is thermal
 - Ring like disk
 - Inner radius directly fitted



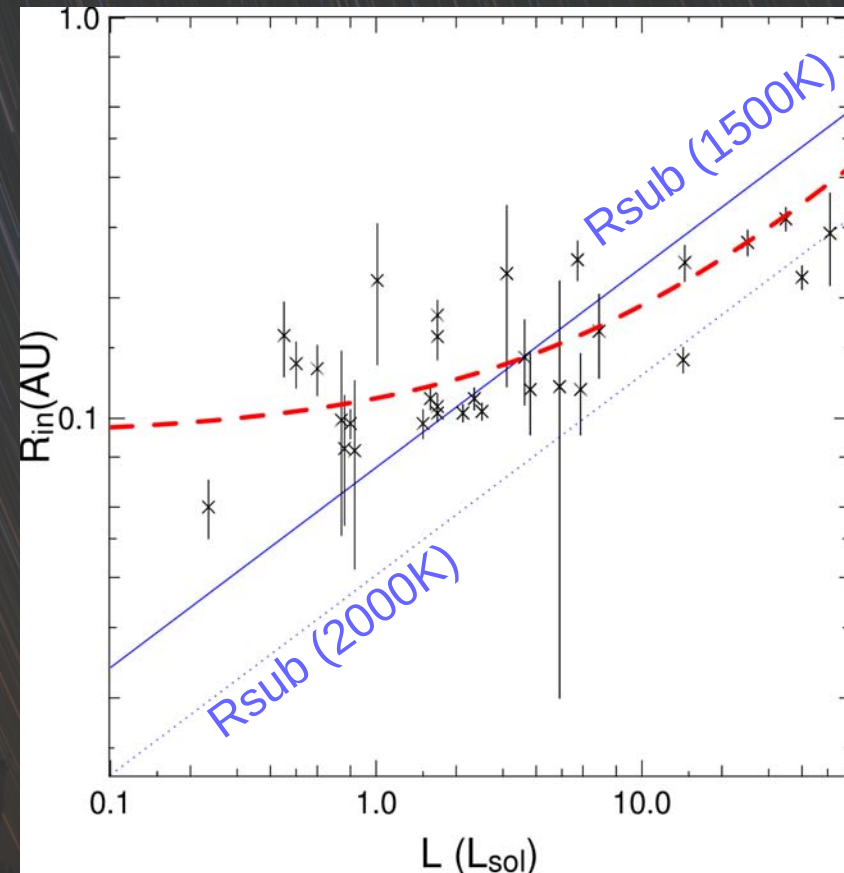
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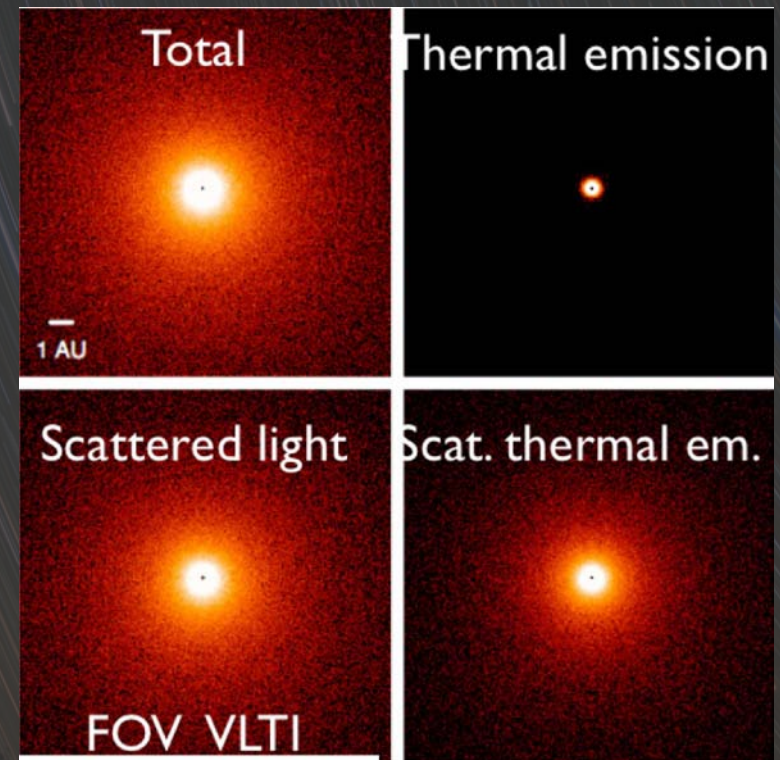
First models

- Thermal models consistent with sublimation radius for Bright stars but not for fainter stars.
- New physics needed, or something forgotten...



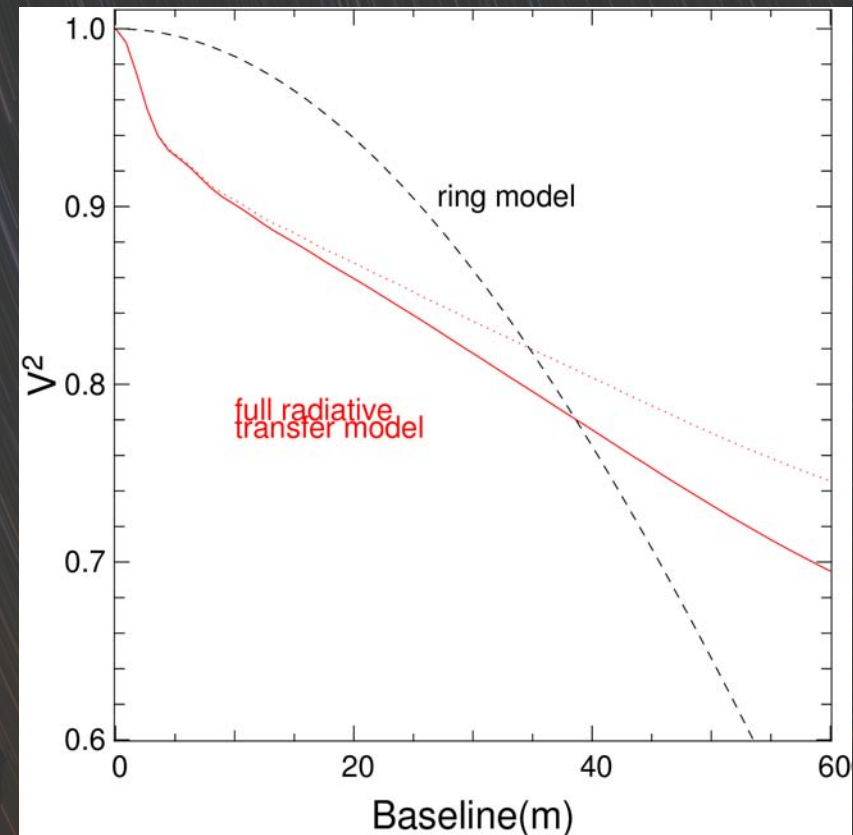
Scattering emission

- Pinte et al 2008 :
 - scattering dominant emission process for cool stars.
- =>The ring model overestimate the inner radius for cool star



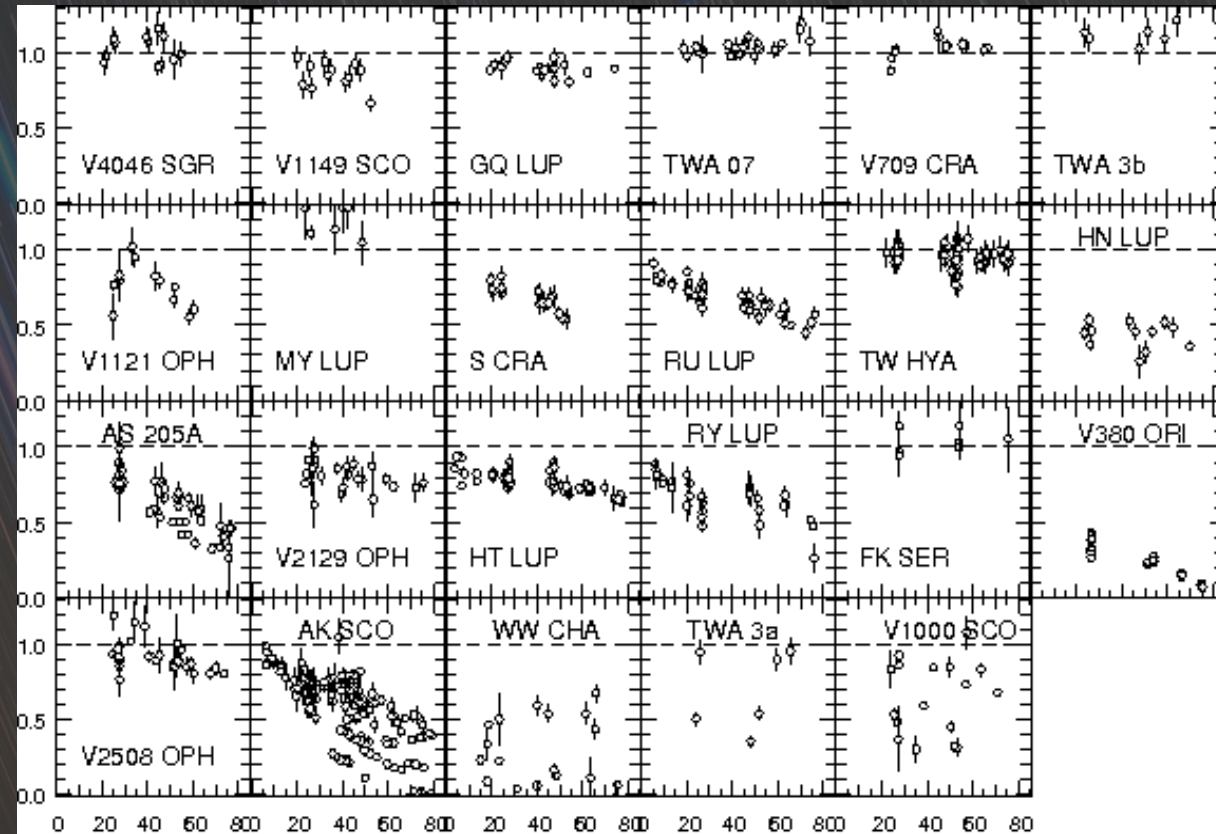
Scattering : Observables

- Scattering emission very large.
- quick drop of the visibility profile at short baseline.
- Need visibility profile to confirm/rule out this model.



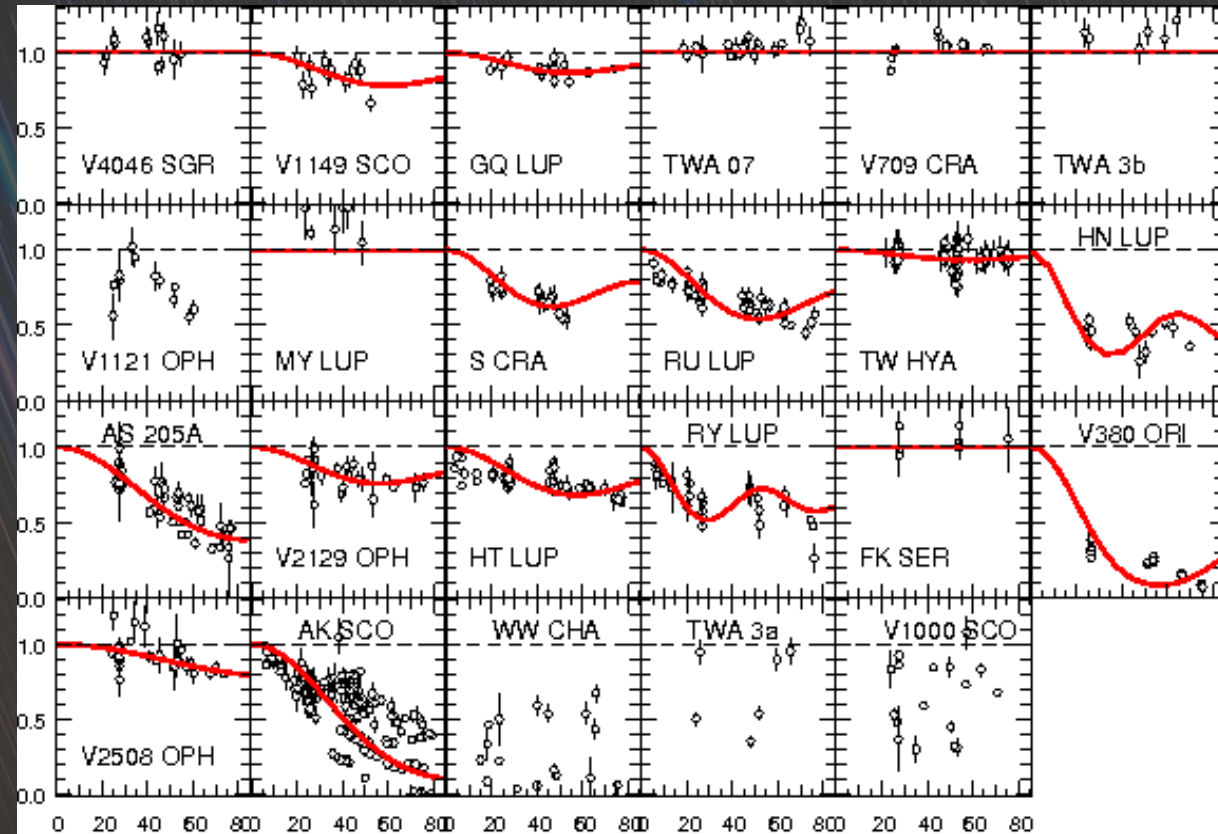
T Tauri survey : results and simple models

- 22 observed T tauri+1 herbig.
- 3 new binaries :
 - V1000 sco, twa 3a, WW cha.



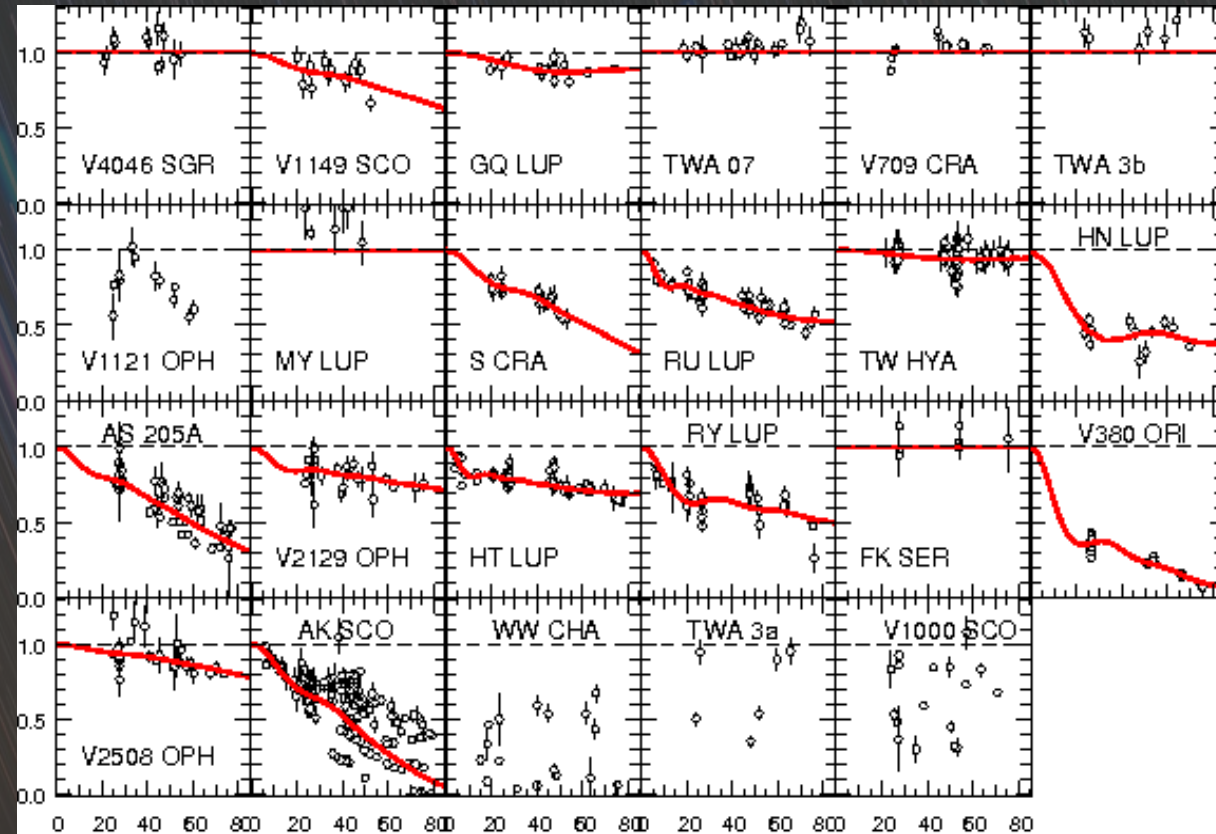
T Tauri survey : results and simple models

- 22 observed T tauri+1 herbig.
- 3 new binaries :
 - V1000 sco, twa 3a, WW cha.
- Simple Models :
 - Star+ thermal ring.



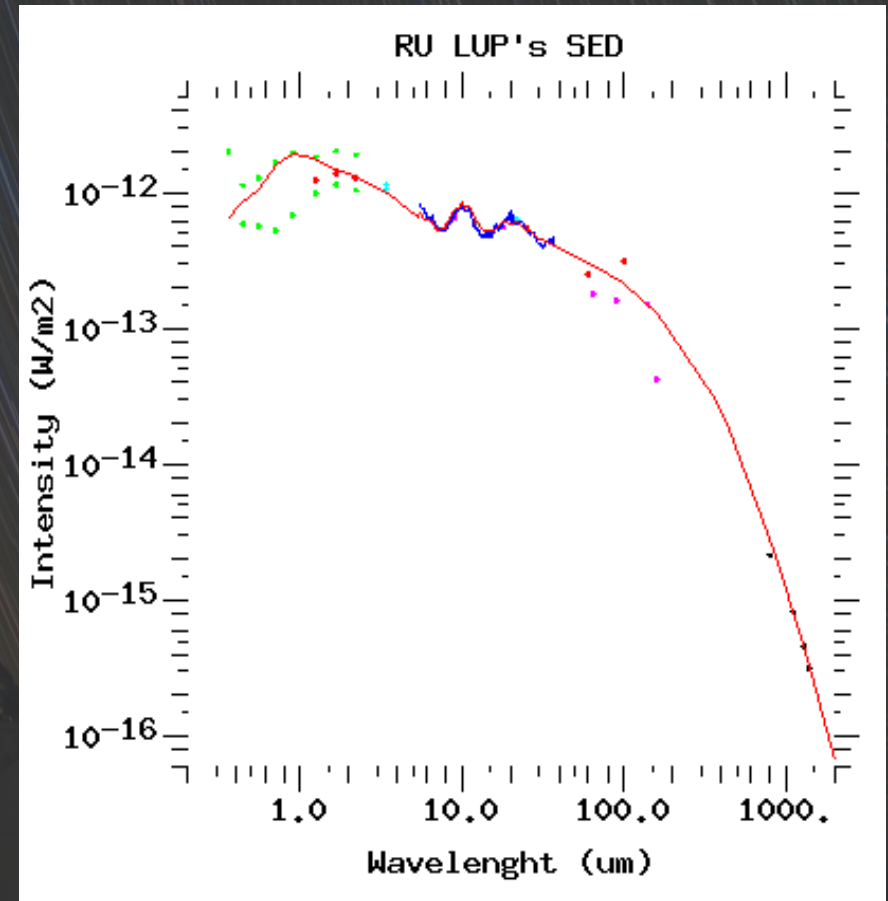
T Tauri survey : results and simple models

- 22 observed T tauri+1 herbig.
- 3 new binaries :
 - V1000 sco, twa 3a, WW cha.
- Simple Models :
 - Star+ 2 rings.

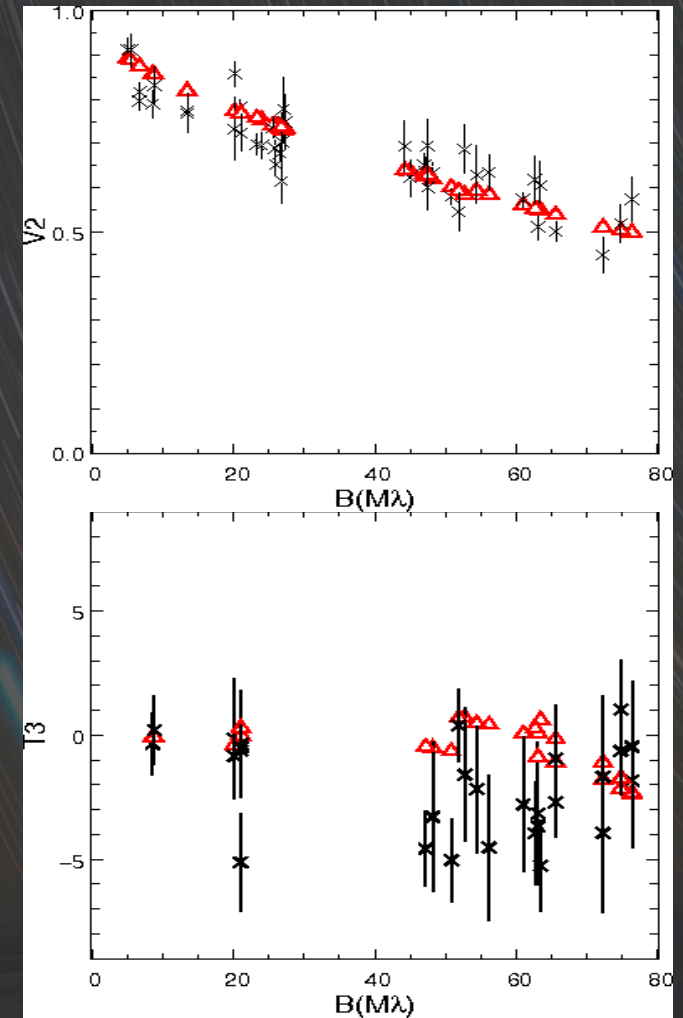


Fine Modelling : RU Lup

- Extreme CTTS
 - Photometric variation >1mag
 - Large, massive disk
 - Silicate features

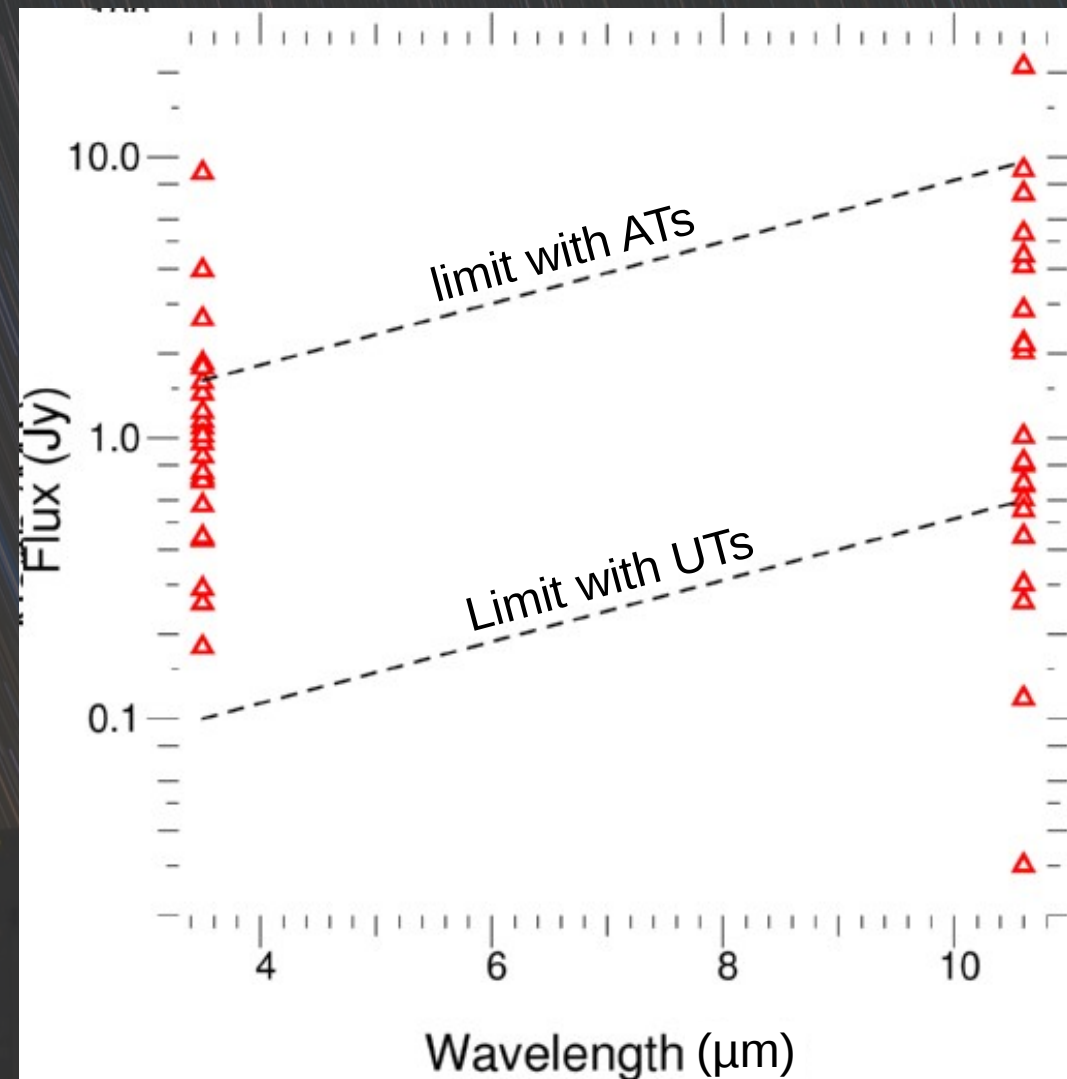


Fine Modelling : RU Lup



TTauris with MATISSE

- Assuming Unresolved objects
- With the star of our survey :
 - With the UTs :
 - All visible on L Band
 - 75% visible on N Band
 - With the ATs :
 - 25% visible on L Band
 - 1 visible on N band



TTauris with GRAVITY

- Fringe tracking (limiting $m_K \sim 10$ for fringe tracker)
- Limiting magnitude : $m_K \sim 19$ (with $m_K < 10$ reference within science star)
- Resolution up to 4000
- Maximum angular resolution : 3mas

Conclusions

- TTauri stars can now be « easily » observed
- TTauris cannot be approximated by ring models, scattering is not negligible
- Next generation of instruments will bring a lot of data (spectral dispersion, mid IR, fainter TTauris...)



Thank you !