Disentangling **the wind and the disk**

in the close surrounding of the

young stellar object MWC297
with **AMBER** on the VLTI

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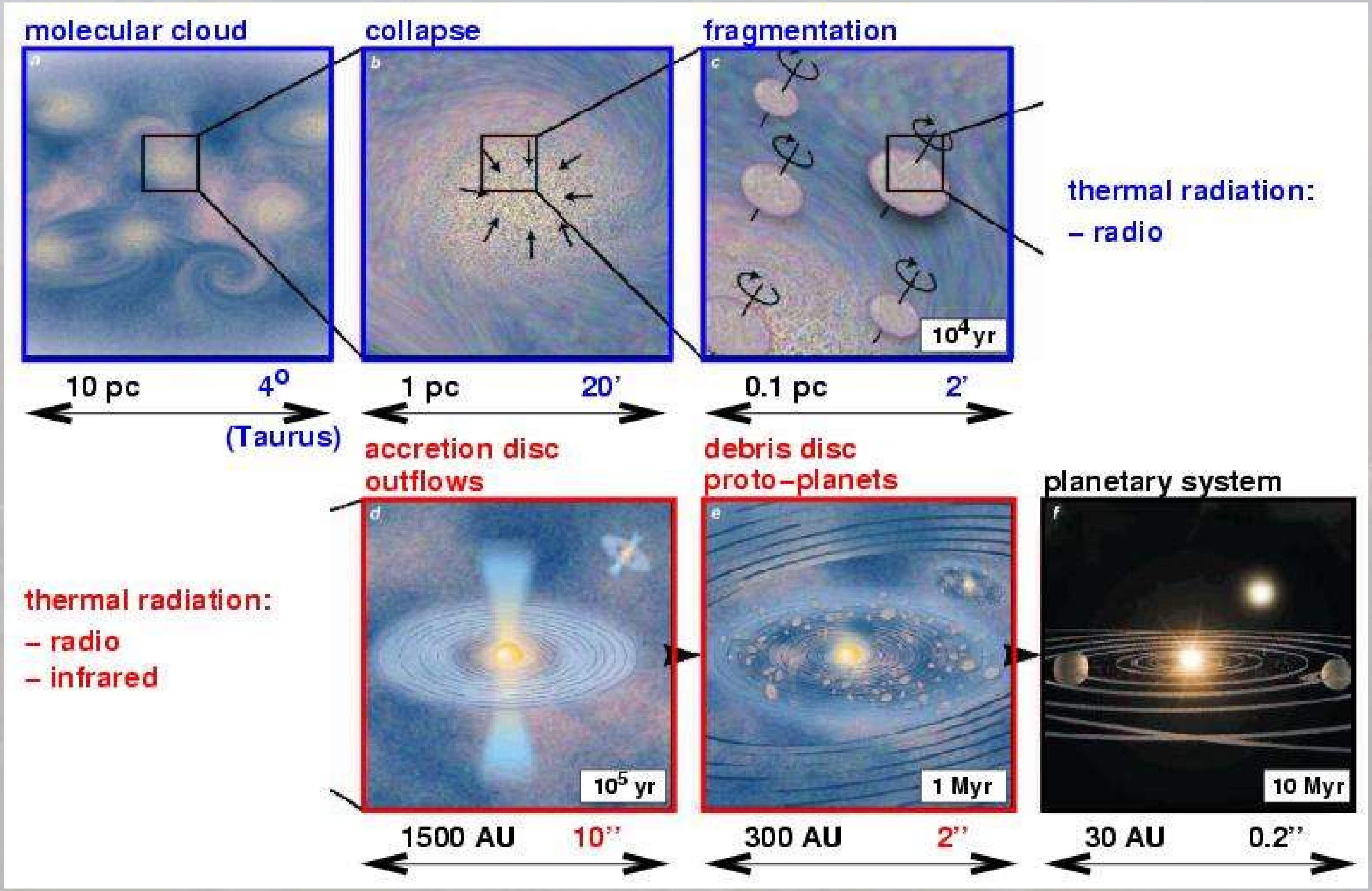
Benisty M., Berger J.-P., Chesneau O., De Wit W.-J., Hofmann, K.-H., Isella A., Kraus S., Meilland A., Millour F., Petrov R., Preibisch T., Stee P., Tatulli E., Testi L., Weigelt G.

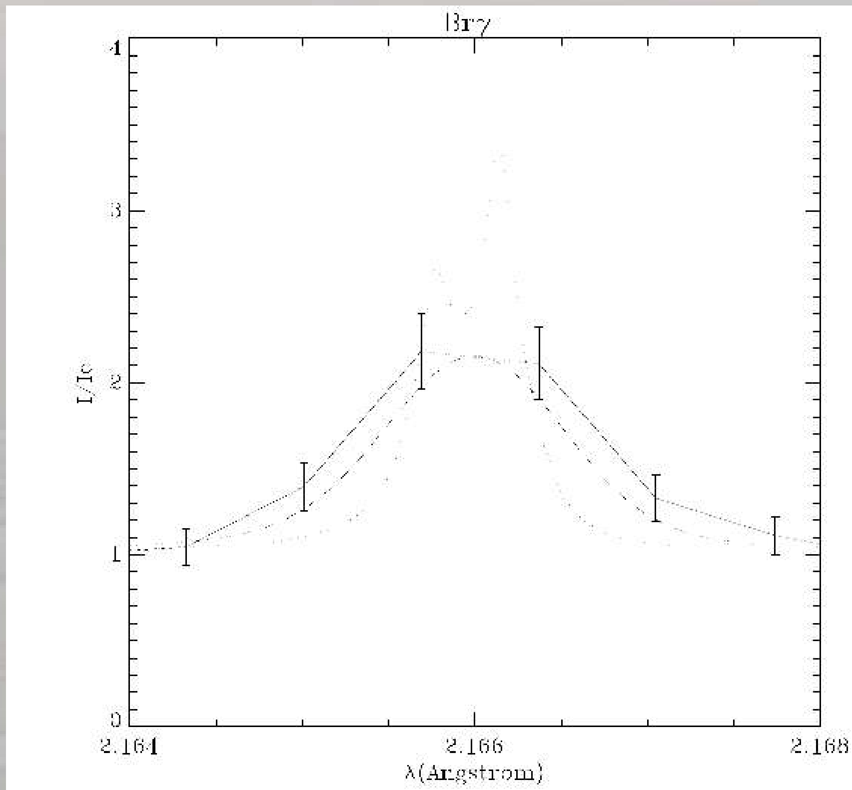
LAOG, LUAN, MPIfR, OAA, OCA

Petrov R., Malbet F., Accardo M., Acke B., Agabi K., Antonelli P., Arezki B., Baffa C., Beckmann U., Behrend J., Blöcker T., Bonhomme S., Bresson Y., Busoni S., Cassaing F., Chelli A., Clausse J.-M., Connot C., Delboulbé A., Driebe T., Dugué M., Duvert G., Ferruzzi D., Forveille T., Foy R., Fraix-Burnet D., Gennari S., Gentzlin A., Giani E., Gil C., Glück L., Heiden M., Heininger M., Hofmann K., Kamm D., Kern P., Lagarde S., Le Coarer E., Lisi F., Lopez B., Magnard Y., Marconi A., Mars G., Martinot-Lagarde G., Mathias P., Millour F., Monin J.-L., Mouillet D., Mourard D., Mège P., Nussbaum E., Ohnaka K., Perraut K., Puget P., Rabbia Y., Rebattu S., Reynaud F., Richichi A., Robbe-Dubois S., Roussel A., Sacchettini M., Schertl D., Solscheid W., Stee P., Stefanini P., Tallon M., Tallon-Bosc I., Tasso D., Tatulli E., Testi L., Vannier M., Weigelt G., Zins G. Rantakyro F., Kiekebush M., Licha T., Schoeller M.

MWC 297 in star formation scenario



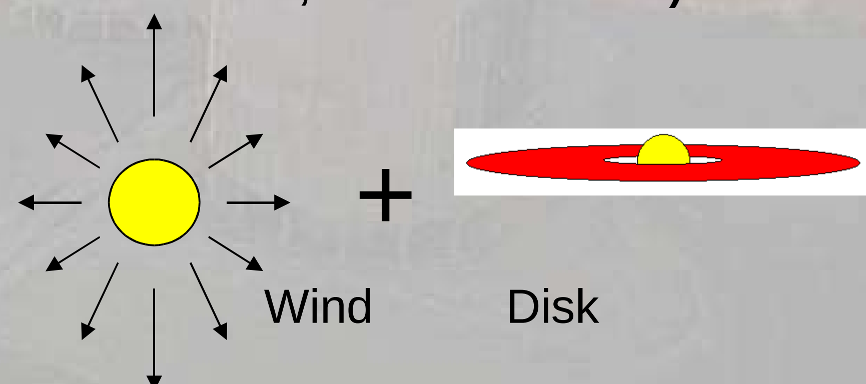
MWC 297: an emission-line star



- **B1.5Ve spectral type (Drew et al. 1997)**
- **Fast rotating star (*v*.sin *i* = 350 km/s)**
- **No spectro-polarimetry signal**

- **Hα, Hβ lines strong (~10-100:1) and broad**
- **Brγ is weaker (~2:1) and narrow**

- **Strong IR excess**
- **Resolved by NIR interferomety (Millan-Gabet et al. 2001; Eisner et al. 2004)**



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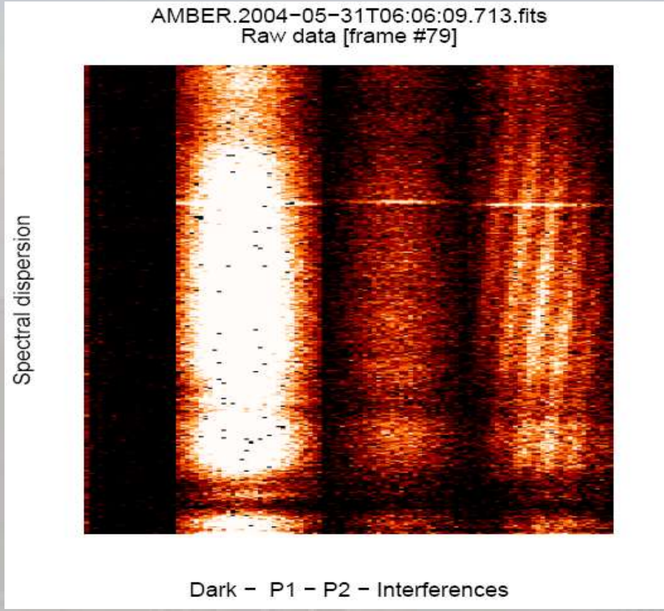
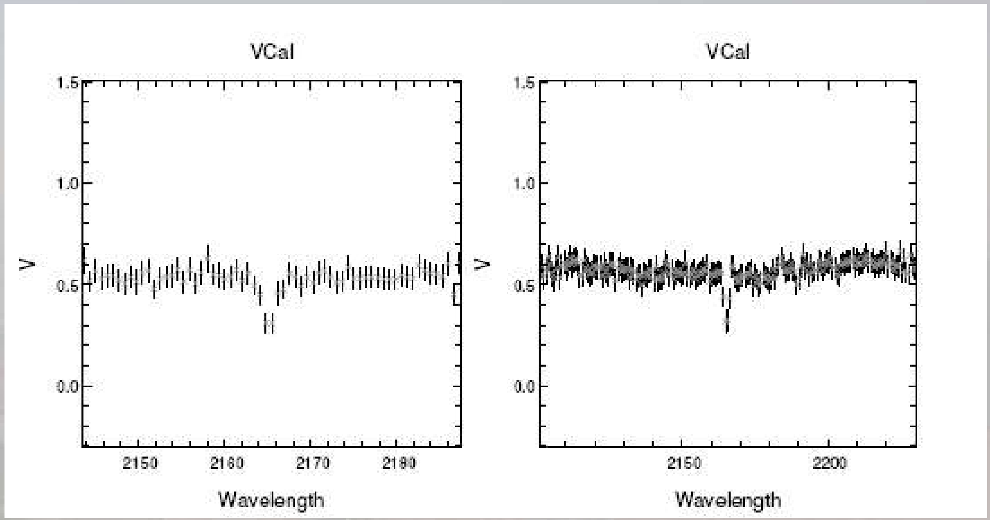
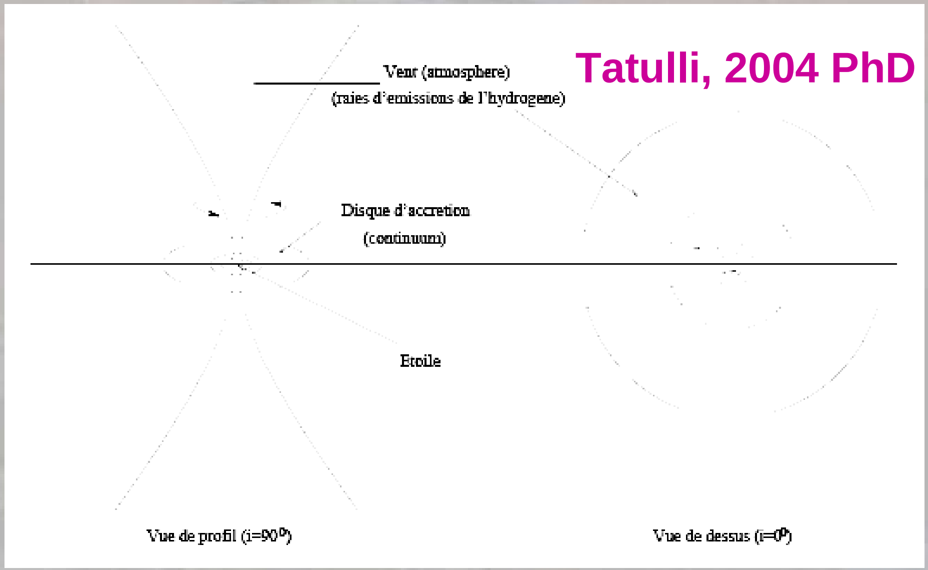
AMBER results on MWC 297

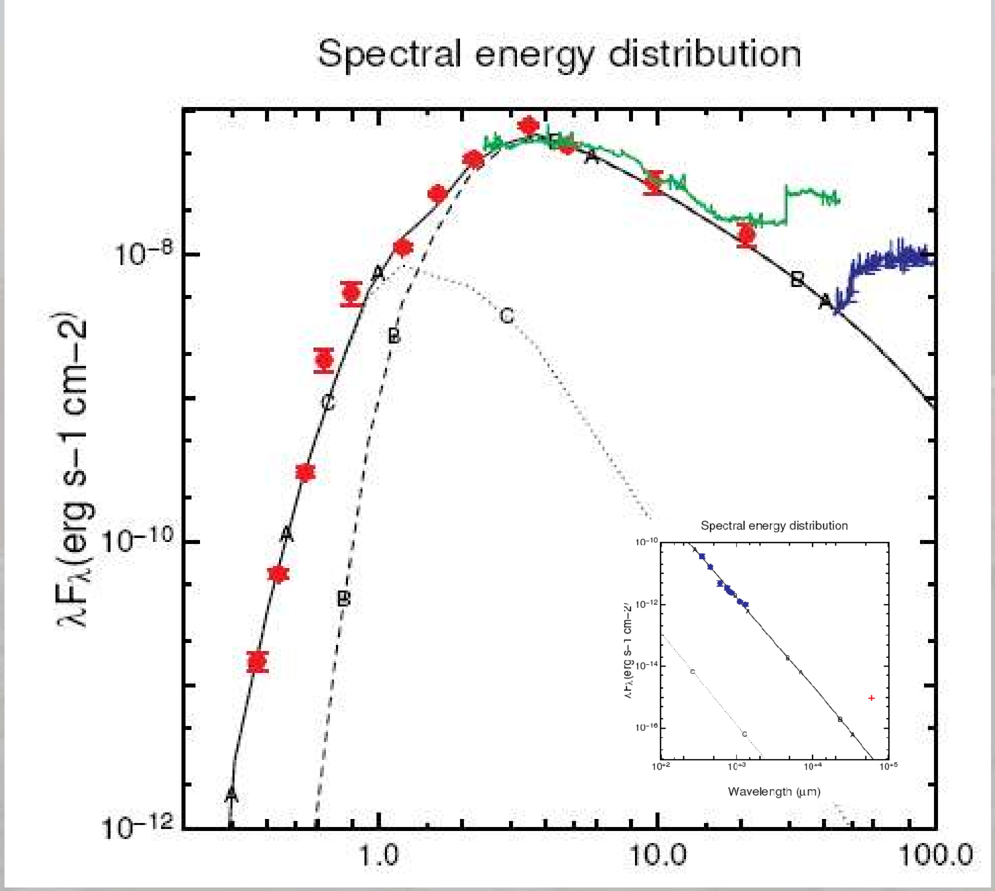


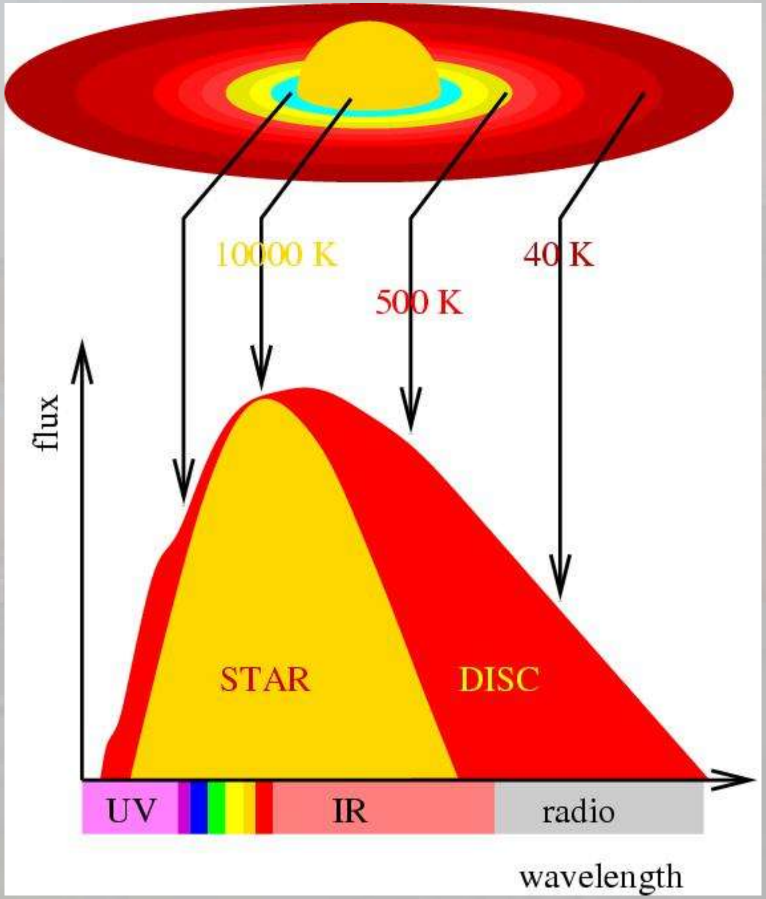




- Unexpected results from the first commissioning run (May 2004)
- Two data sets: 31ms and 107 ms

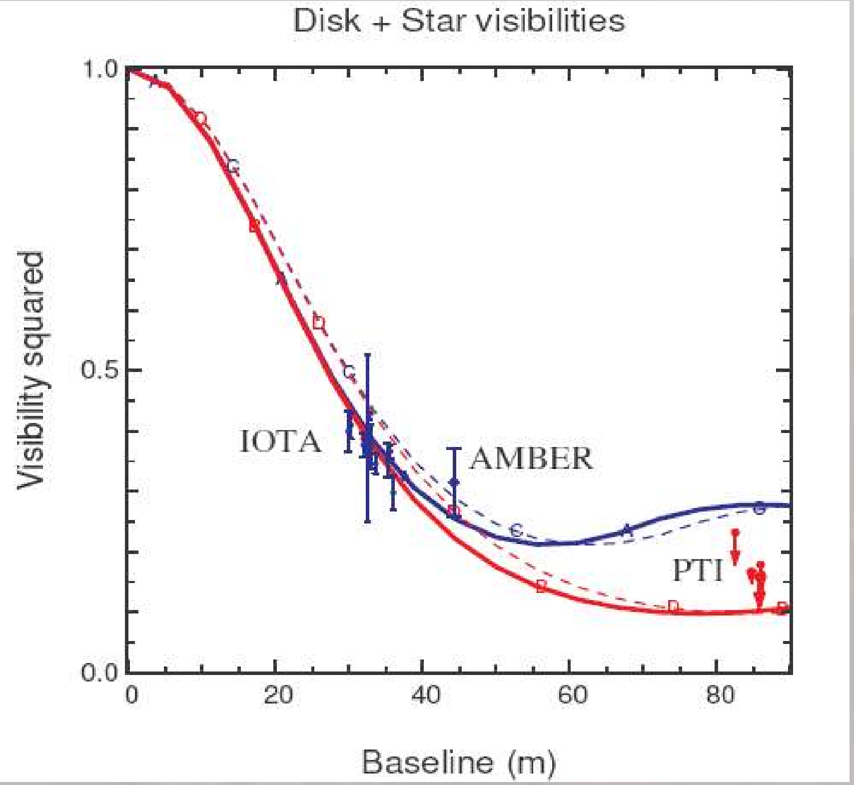
Spectral energy distribution

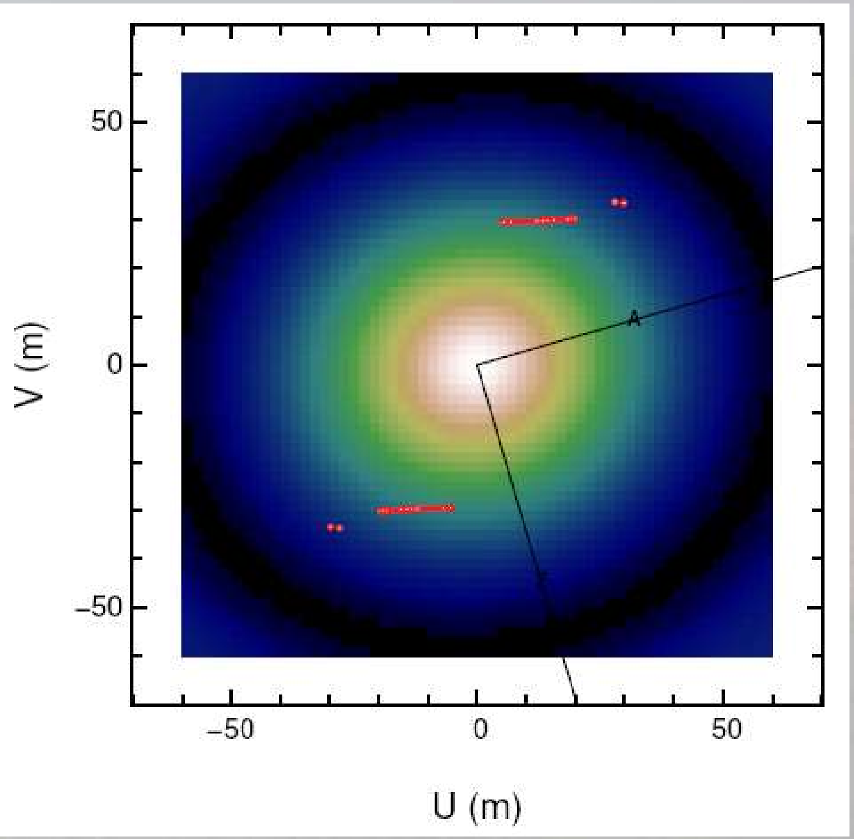




- Strong IR excess
- Geometrically thin optically, thick accretion disk

Continuum visibilities





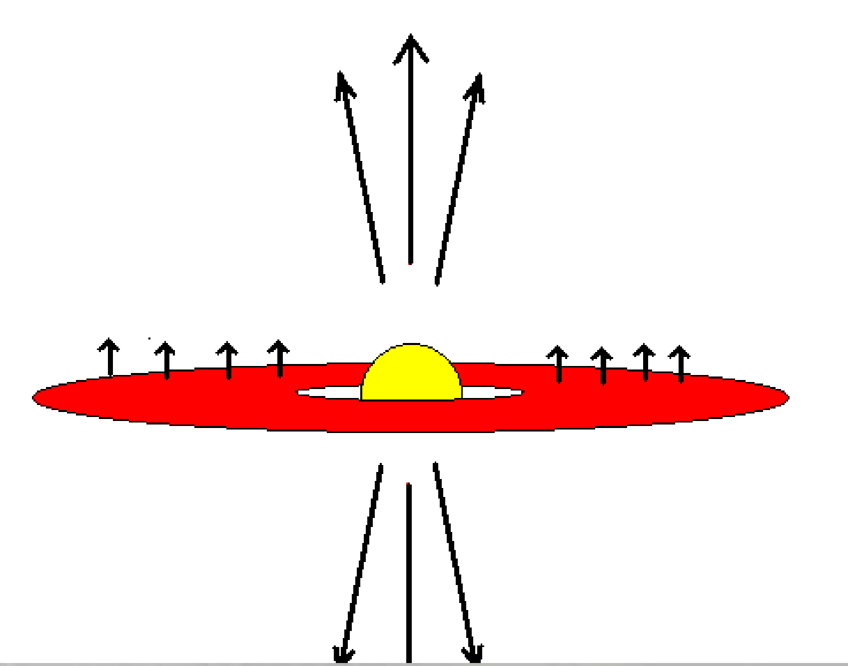
Visibilities are consistent with standard disk model

Understanding the spectral behaviour

- Global flux budget:

  Ftotal = Fstar + Fwind + Fdisk

- Visible (Hα, Hβ):
  - Fcont = Fstar (+ Fwind)
  - Fline = (Fstar) + Fwind
  - **ratio ~10:1, 100:1**
- NIR (Brγ):
  - Fcont = (Fwind) + Fdisk
  - Fline = Fwind (+ Fdisk)
  - **ratio ~2:1**

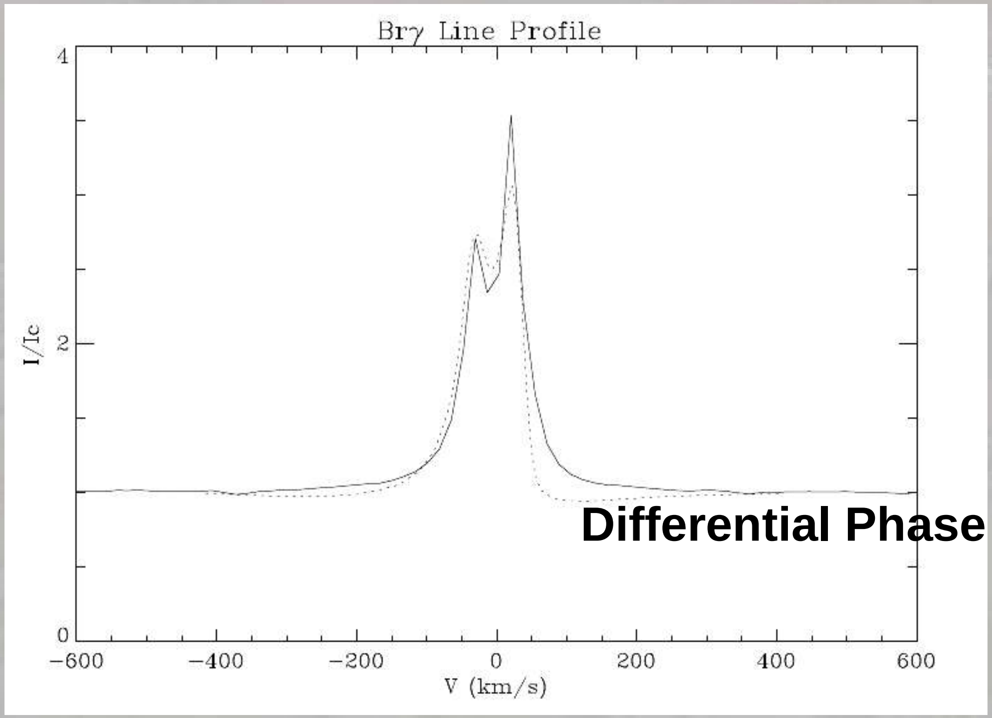


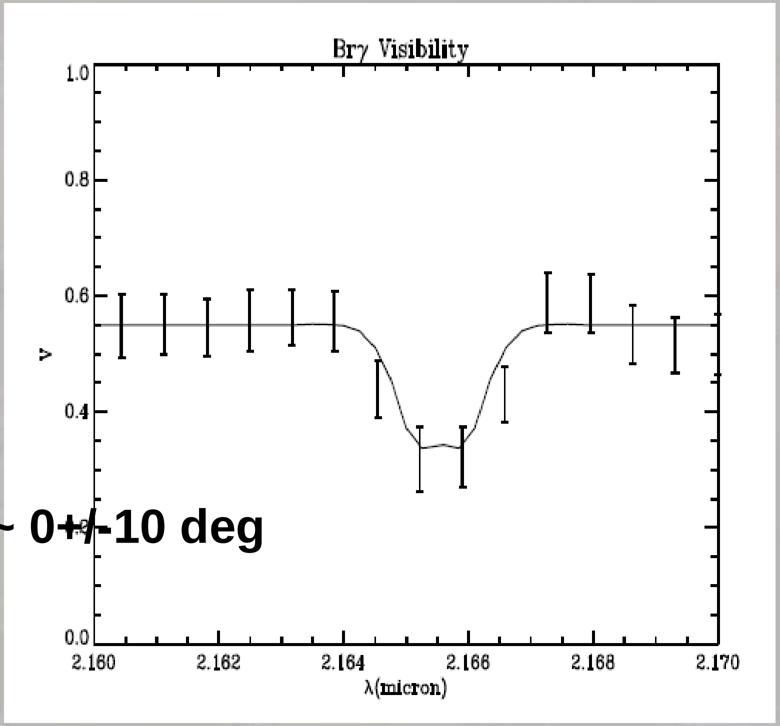
Since Fdisk/Fstar in NIR is 40:1 ➔ Fwind/Fstar in Brγ is ~ **80:1**

Reconciling spectrum and visibilities

- Large Hα and Hβ lines -> high velocities (600km/s)
- Narrow Brγ line -> small velocity (30km/s)

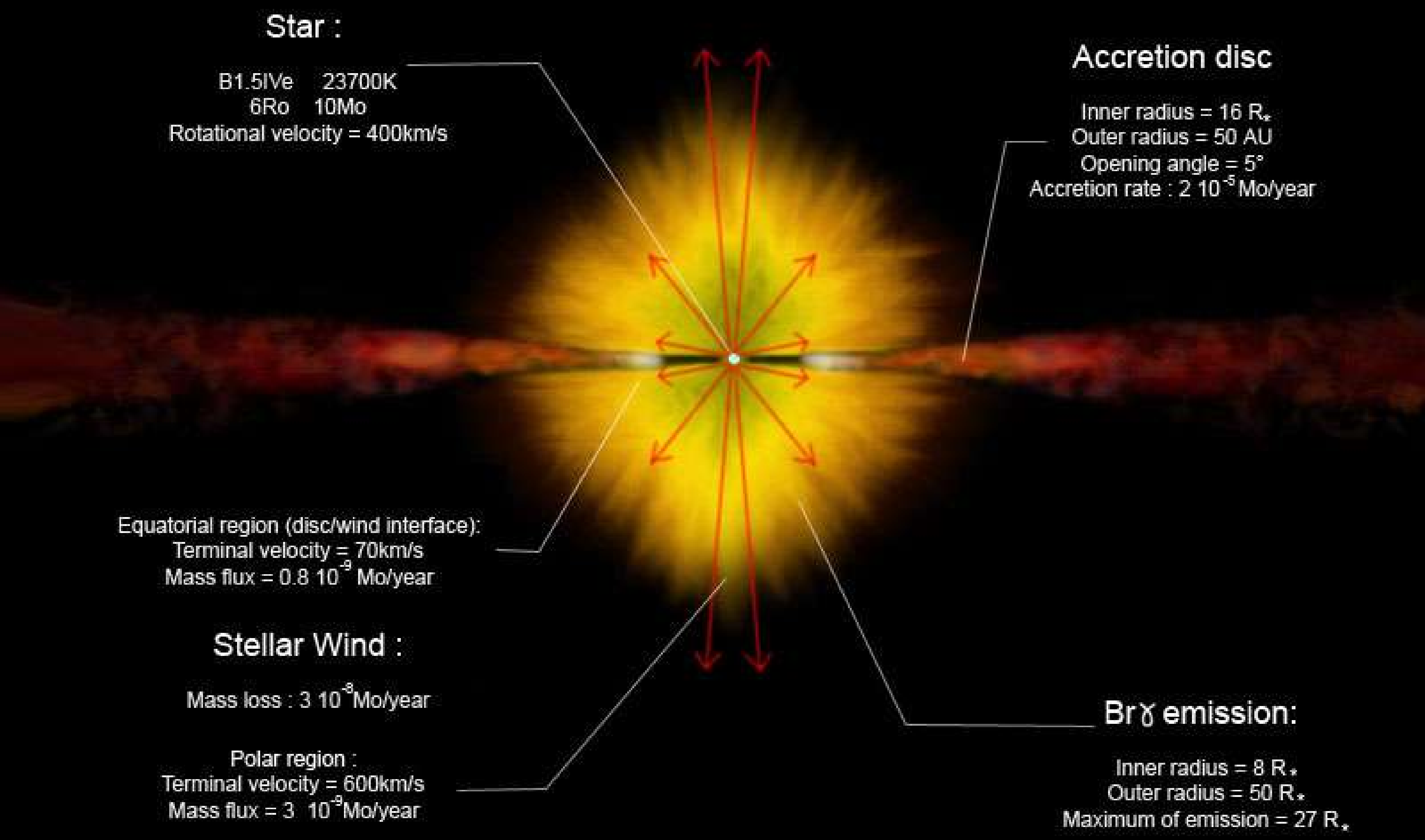
- Flat opaque disk and wind





Differential Phase ~ 0+/-10 deg

MWC297 model
(slice through an edge-on view)



Conclusion

- Global understanding on MWC 297
- Starting to **disentangle the wind and disk** processes
- No self-consistent model yet
- Next step with 10,000 spectral resolution will allow us to investigate the kinematics

- **AMBER is opening a new era by introducing spectral resolution in the YSO field**