

To be or Not to be: It is all
about spinning ?

ESO Science Release
20 September 2006

- History of Stellar rotation and accretion disks
- VLT AMBER MIDI
- Alpha Area

- photometric monitoring of light variations produced by larger star spot groups or bright surface area's
- measurements of periodic variation in strength of some emission lines

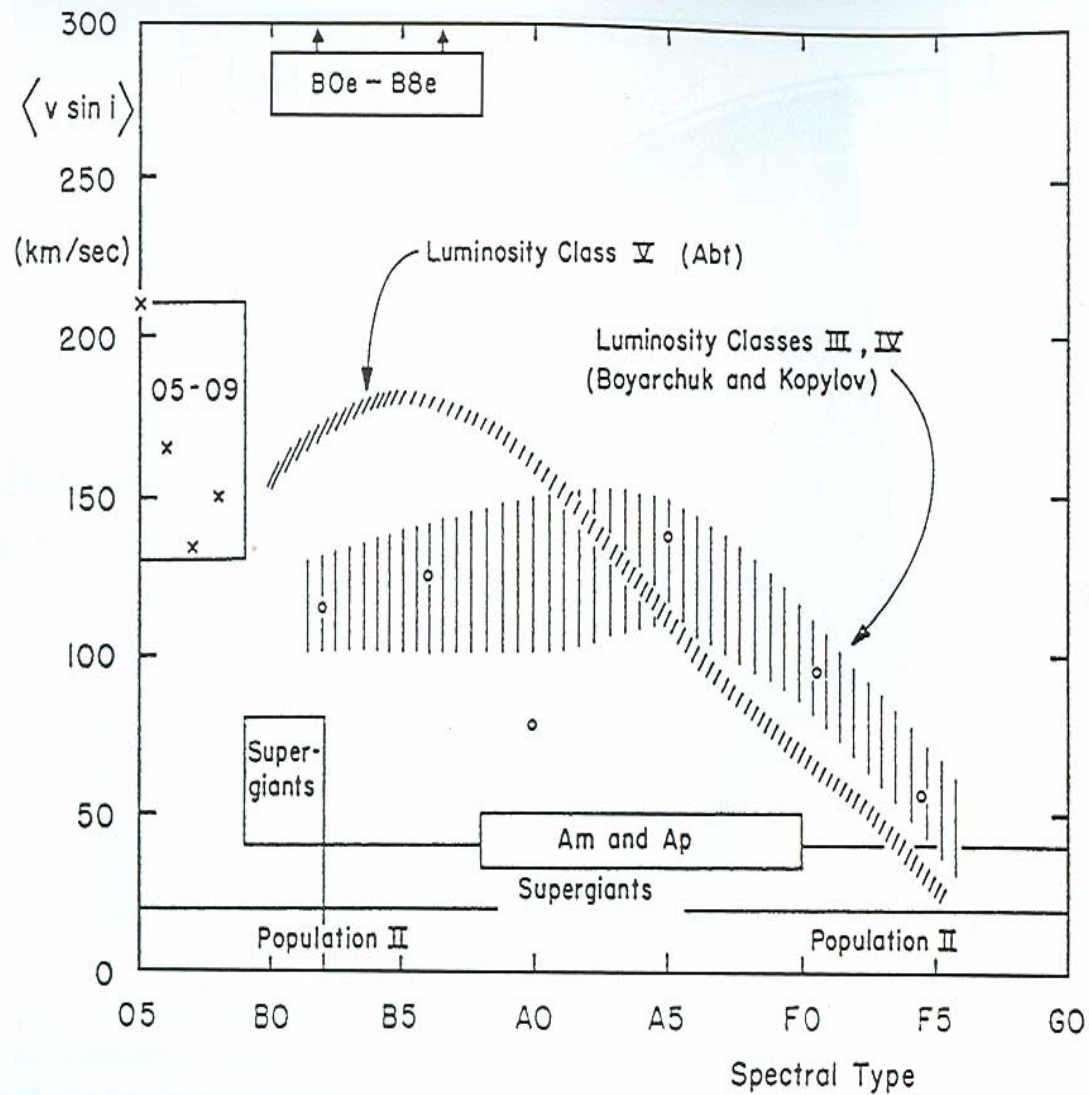
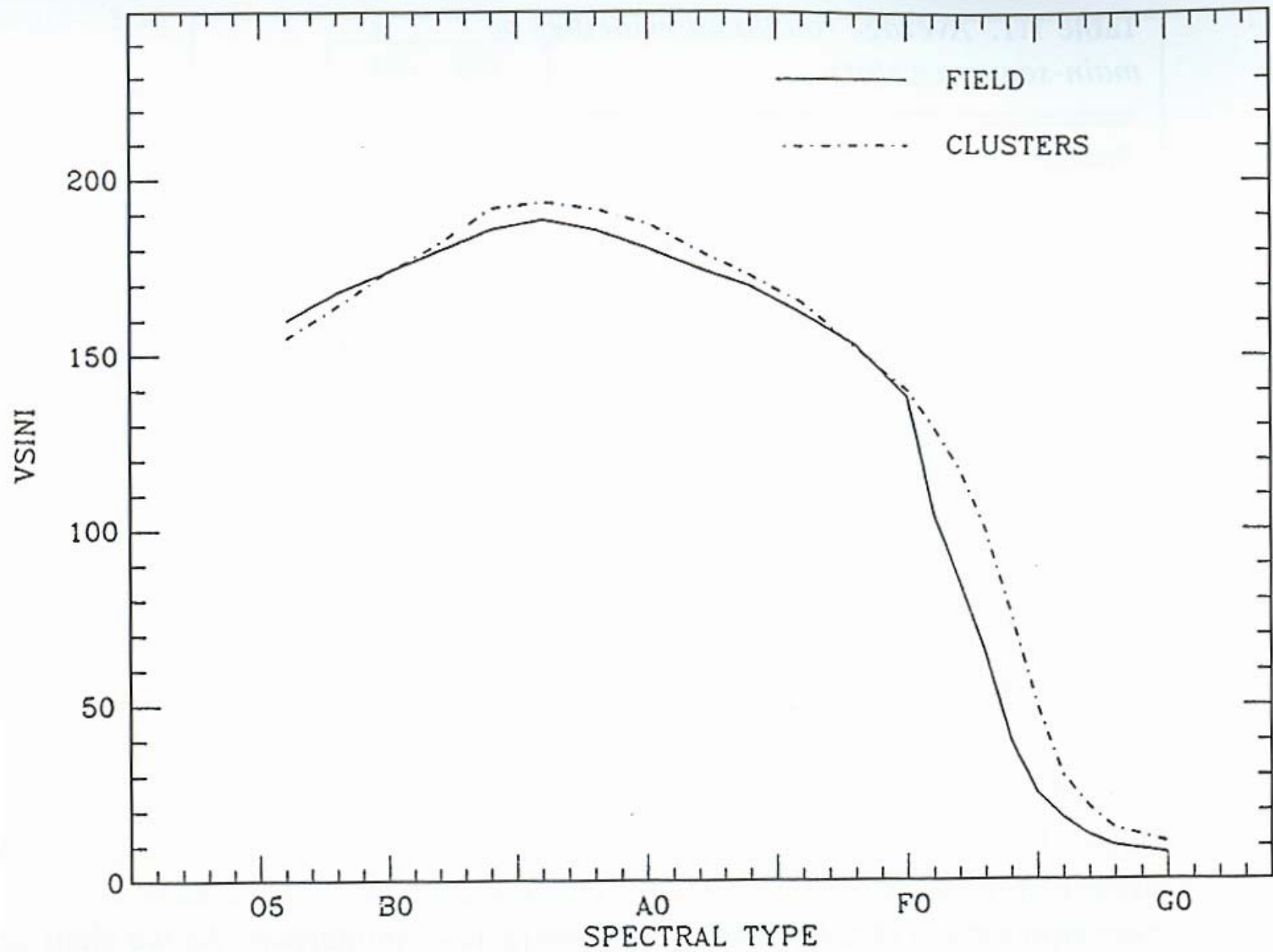
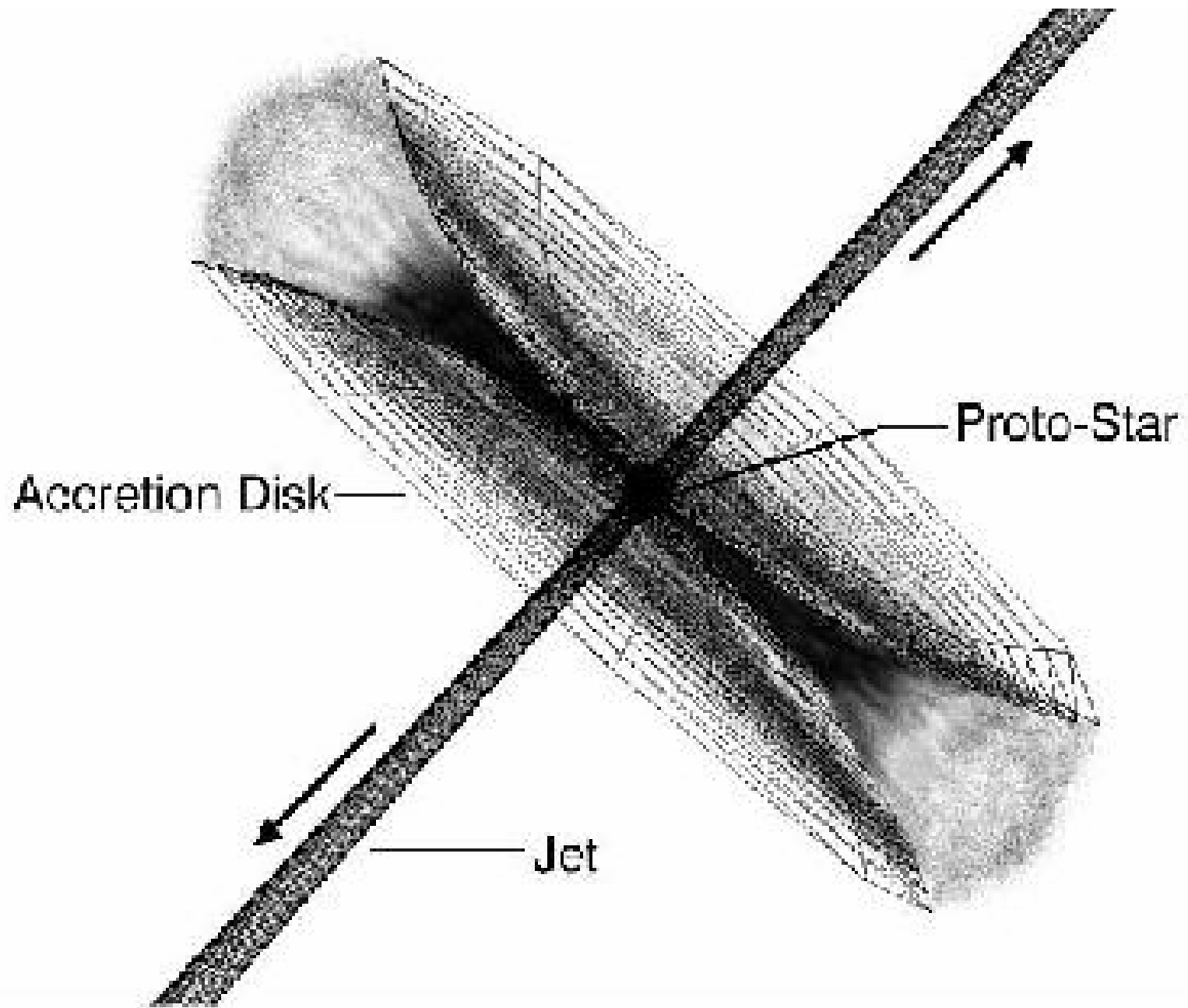
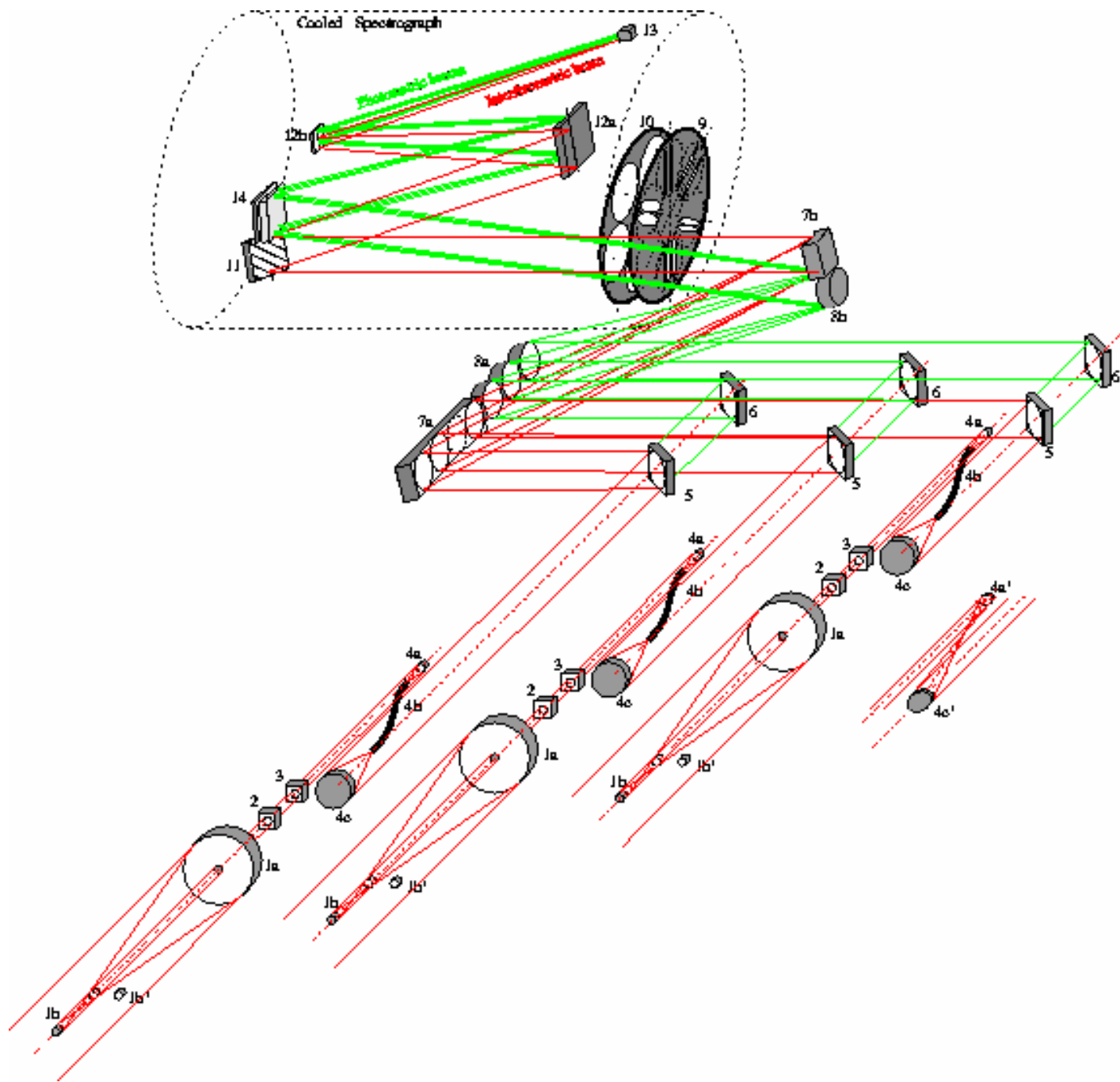


Fig. 1.5. Mean projected equatorial velocities for a number of different classes of stars as compared with normal main-sequence stars. *Source:* Slettebak, A., in *Stellar Rotation* (Slettebak, A., ed.), p. 5, New York: Gordon and Breach, 1970. (By permission. Copyright 1970 by Gordon and Breach Publishers.)









- VLT/AMBER observations
- Data reduction
- Study of envelope morphology
 - * envelope extension
 - * comparison MIDI and AMBER extension
 - * envelope geometry
 - * Equatorial disk perpendicular to polarization
 - * Polar axis along the B₃ baseline orientation
 - * Equatorial disk + polar enhanced winds

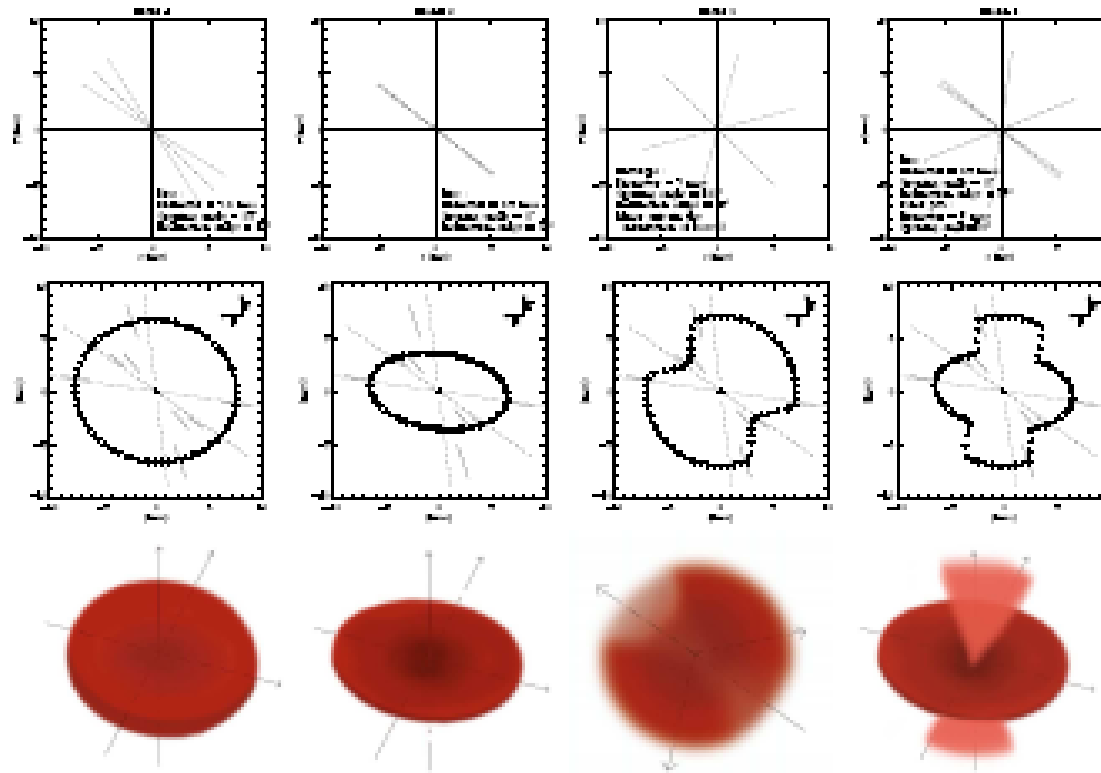


Fig. 5. “Toy” models used in order to fit the AMBER and MIDI measurements. The 4 upper pictures are a cut of the circumstellar disk in a plane defined by the observer line of sight and the stellar rotational axis (the observer is on the right for each picture), the corresponding projections into the sky-plane with over-plotted the interferometric data points from MIDI and AMBER are the central pictures whereas a “3D artist view” is plotted into the lower row for each model.

- SIMECA code
- Using SIMECA for modeling of alpha area
 - * fit of SED
 - * visibility modulus in the continuum
 - * line profiles
 - * differential visibility modulus across the balmer gamma emission line
 - * differential phase across the balmer gamma emission line

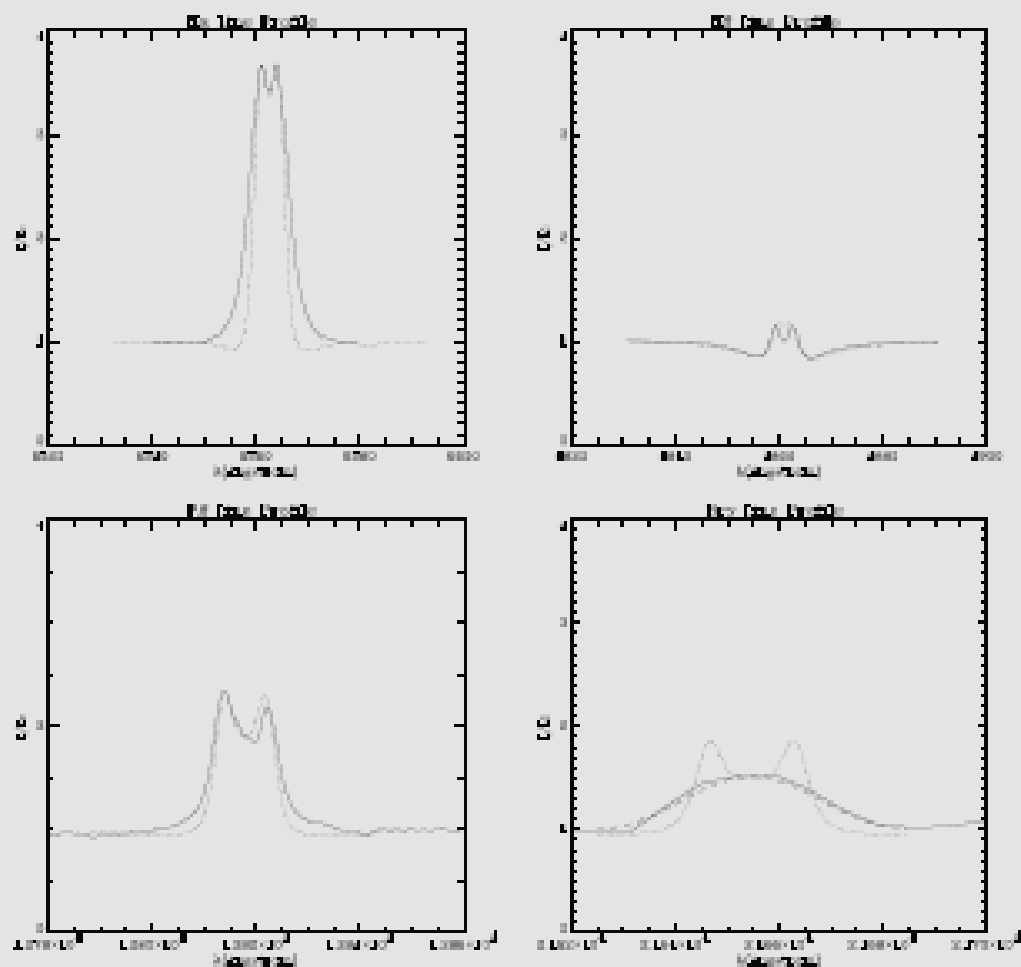
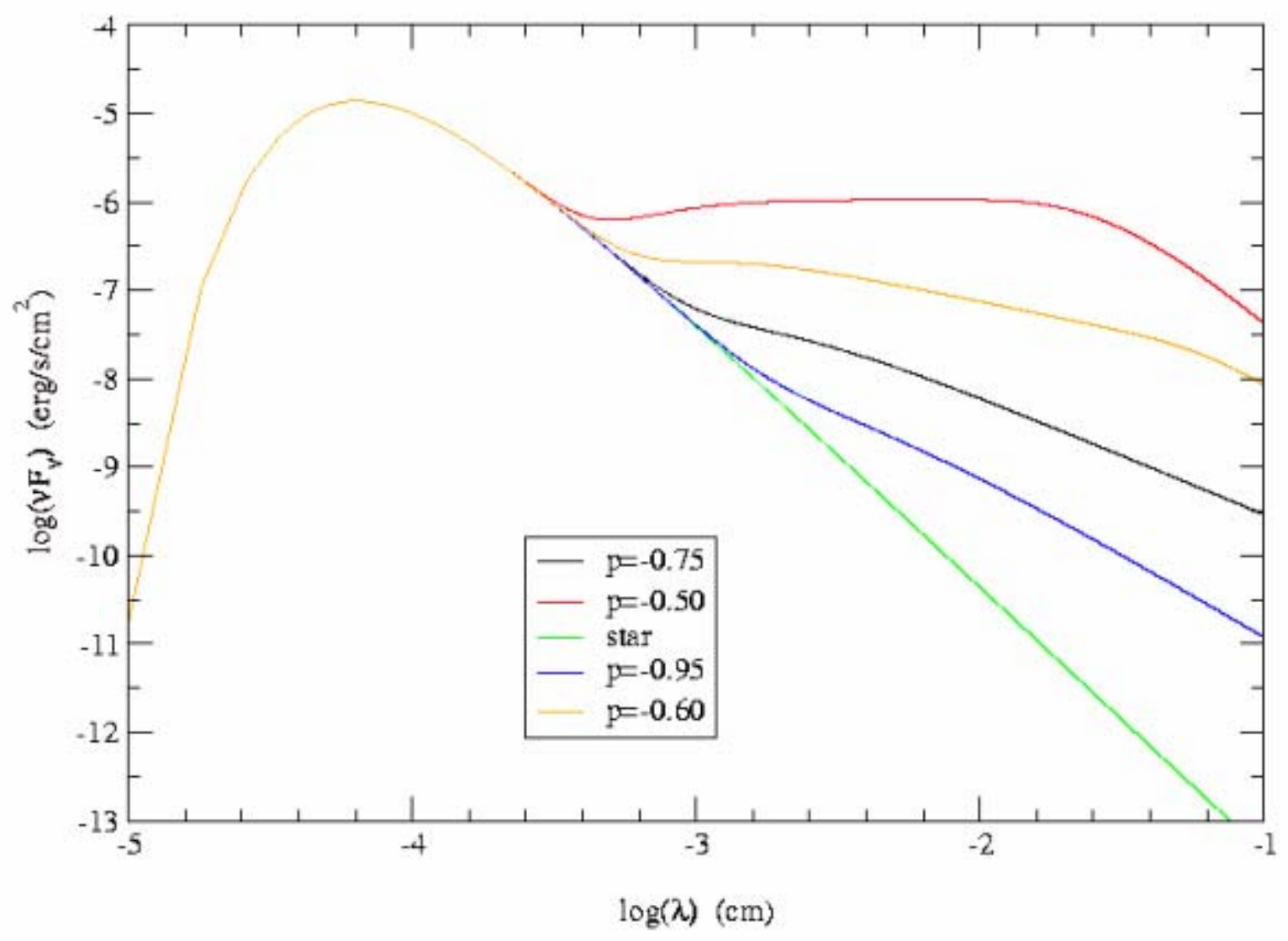


Fig. 9. Line profiles modeled with the SIMECA code using a thin disk + polar wind scenario. Modeled profiles are dotted lines whereas observed ones are in plain line. For $\text{Br}\gamma$ we have convoluted the modeled profile (dotted line) obtain with SIMECA with a 15 \AA gaussian, corresponding to the AMBER spectral resolution of 1500. The convoluted $\text{Br}\gamma$ profile we obtain is the dashed line superimposed with the observed one (plain line).

SED



- First detection of a Keplerian rotating disk around Be star alpha Area using VLT/AMBER instrument
- Stellar rotation – Jean-Louis Tassoul
- Theory of rotating Stars - Jean-Louis Tassoul
- Accretion discs, jets and high energy phenomena in astrophysics -
Les Houches