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The outer disk of the classical Be star ψ Per

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Abstract. To this date ψ Per is the only classical Be star that was angularly resolved in radio (by the VLA at $\lambda = 2\,\mathrm{cm}$). Gaussian fit to the azimuthally averaged visibility data indicates a disk size (FWHM) of ~ 500 stellar radii (Dougherty & Taylor 1992). Recently, we obtained new multi-band cm flux density measurements of ψ Per from the enhanced VLA. We modeled the observed spectral energy distribution (SED) covering the interval from ultraviolet to radio using the Monte Carlo radiative transfer code `HDUST` (Carciofi & Bjorkman 2006). An SED turndown, that occurs between far-IR and radio wavelengths, is explained by a truncated viscous decretion disk (VDD), although the shallow slope of the radio SED suggests that the disk is not simply cut off, as is assumed in our model. The best-fit size of a truncated disk derived from the modeling of the radio SED is 100^{+5}_{-15} stellar radii, which is in striking contrast with the result of Dougherty & Taylor (1992). The reasons for this discrepancy are under investigation.

Keywords. stars: individual (ψ Per), stars: emission-line, Be, radio continuum: stars

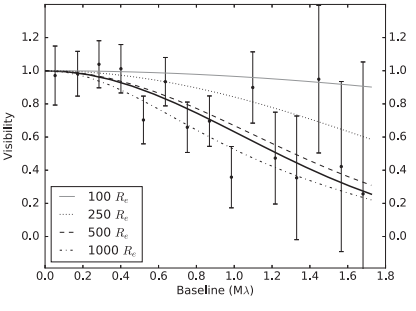

Figure 1. Azimuthally averaged visibility data of Dougherty & Taylor (points) and a Gaussian fit to them (thick line) overplotted with the visibility curves derived from our azimuthally averaged models with different disk sizes (in stellar equatorial radii R_e). The disk size best reproducing the radio SED is $100\,R_e$, which does not agree well with the interferometric data.

References

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