The outer disk of the classical Be star $\psi$ Per

Robert Klement$^{1,2}$, Alex C. Carciofi$^3$, Thomas Rivinius$^2$, Lynn D. Matthews$^4$, Richard Ignace$^5$, Jon E. Bjorkman$^6$, Rodrigo G. Vieira$^3$, Bruno C. Mota$^3$, Daniel M. Faes$^3$, Stanislav Stefl†

$^1$Astronomical Institute of Charles University, Charles University, V Holešovičkách 2, 180 00, Prague 8, Czech Republic, email: robertklement@gmail.com
$^2$European Southern Observatory, Alonso de Córdova 3107, Vitacura, Casilla 19001, Santiago, Chile
$^3$Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo, Rua do Matão 1226, 05508-090, São Paulo, Brazil
$^4$MIT Haystack Observatory, off Route 40, Westford MA 01886, USA
$^5$Department of Physics & Astronomy, East Tennessee State University, Johnson City, TN 37614, USA
$^6$Ritter Observatory, Department of Physics & Astronomy, University of Toledo, Toledo, OH 43606, USA

†Deceased

Abstract. To this date $\psi$ Per is the only classical Be star that was angularly resolved in radio (by the VLA at $\lambda = 2$ cm). Gaussian fit to the azimuthally averaged visibility data indicates a disk size (FWHM) of $\sim 500$ stellar radii (Dougherty & Taylor 1992). Recently, we obtained new multi-band cm flux density measurements of $\psi$ 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 turnover, 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 $100^{+15}_{-15}$ 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 ($\psi$ 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 $100R_e$, which does not agree well with the interferometric data.

References

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