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Observations of Hα line profiles in Be stars using 45 cm cassegrain telescope at the Arthur C Clarke Institute

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Hα line profiles of 13 Be starts ($m_v \leq 6.9$) were observed using 45 cm Cassegrain telescope at the Arthur C Clarke Institute, Sri Lanka during the period of August 2005 to March 2006. The dispersing element of 1200 lines/mm reflective grating was used in the first order with spectral resolution $R=\lambda/\Delta\lambda=22000$ to obtained high resolution spectra of Be stars. Data reduction was carried out using IRAF(Image Reduction & Analysis Facility).

The profile HR5941 is previously observed by R. Hanuschik (1986), Dachs & W. Hummel (1992) and Banerjee (2000). All these observations showed the V/R < 1 but the present study shows V/R > 1 (2.12), a drastic change in V/R ratio. i.e. the violet and red peak intensities are reversed. This cyclic variation of V/R ratio is ascribed slow apsidal motion of the gas in the elliptical ring.

The observation made by R. Hanuschik (1986), Dachs & W. Hummel (1992) showed HR 6118 has a triple peak profile and according to Banerjee (2000) this is a wine – bottle type profile. Present observations shows this profile has a symmetric Gaussian profile. The low Vsini (140 km/s) implies this should be a pole-on star and our profile clearly shows this fact. Observed HR2284 profile is a winebottle-type profile (Hummel 1994) which caused by the non-coherent scattering broadening (NSB) of the optical thickness of H-alpha line radiation. We used a peak reconstruction line profile derivative method described by W. Hummel & M. Vrancken (1995) and developed a software code to detect the hidden peaks on wine bottle type line profiles. This method was applied to the spectra HR 2284, HR 6712 to find the peak separations.

We also found a good correlation (0.8) between FWHM and Vsini (D.P.K. Banerjee 2000). This can be explained by the keperian motion of the gas in the ring and the kinematic broadening is the major factor to the profile width. Projected velocity vsini and the keplerian velocity of the disk increase with the stellar rotation velocity v, thereby increasing the width of the profile. The strong correlation (0.96) between the Ip/Ic and the equivalent width of the profile clearly aggress with the definition of the equivalent width.

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