AN ULTRAVIOLET RADIAL VELOCITY ORBIT FOR WR140 (WC7+O4-5)

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Abstract. Ultraviolet high-resolution SWP images of the binary system WR140 (HD 193793, WC7+O4-5) were taken with *IUE* over the period 1979 - 1993. This poster presents a radial-velocity study of the absorption lines, attributed to the O-type component, applying the infrared period of $P = 2900$ days.

Key words: stars: stars: Wolf-Rayet – binaries – ultraviolet – individual: WR140

Since 1979, 34 high-resolution images of WR140, covering two periastron passages (in 1985 and 1993), have been obtained with the *IUE* short-wavelength spectrograph. Using these images we have determined the orbital parameters independently of the optical data, but adopting the period of 2900 d derived by Williams *et al.* (1990, here after WHPFWW) from infrared photometry. The photometrically corrected images were processed using the STARLINK program IUEDR. The resulting spectra were then analyzed using the DIPSO program, also from STARLINK.

The method used for measuring the radial velocity is the cross-correlation function method (CCF, Stickland & Lloyd 1990), after aligning the 34 spectra of WR140 on their interstellar lines. Cross-correlation was done with the *IUE* spectrum of the single O4V star HD 96715.

The orbital parameters of the WC7+O4-5 binary WR140 were derived by means of the program RVORBIT due to Hill (DAO, private comm.), using a least-squares procedure. The resulting parameters and the single-line velocity curve are shown in Fig. 1. An attempt to use the emission lines of the WC component to get a double-line solution failed. This is in part due to the lower flux of the WC component, by 0.7 magnitude at $\lambda\lambda$ 1300–1400Å with respect to that of the O star (WHPFWW), but is also due to the width and blending of the WC7 emission lines. Our solution gives a slightly more eccentric orbit and an earlier periastron passage than reported in earlier

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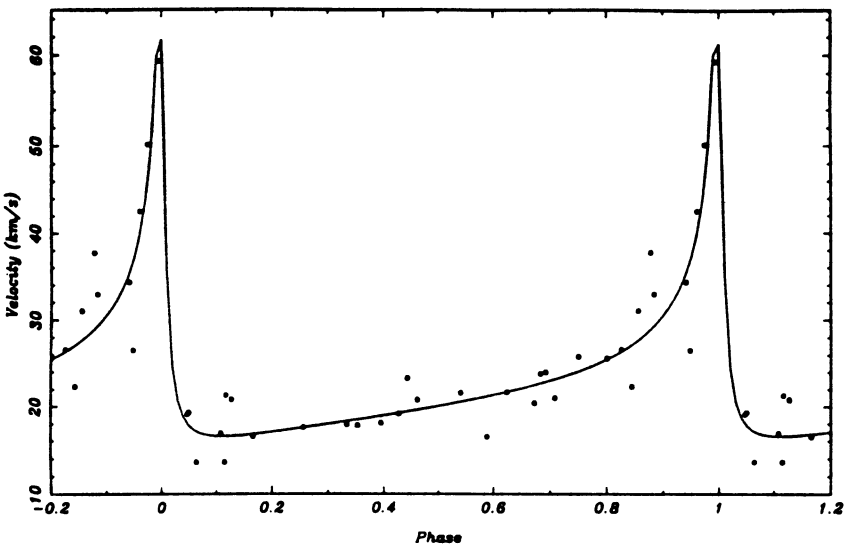
works. This may be due to the lack of data during periastron passage: in 1993 the position of the star was too close to the Sun. The higher systemic velocity may reflect the radial velocity of the O star HD 96715. (No radial velocity for this star has been published. By measuring its absorption lines we found $RV = +62 \pm 12$ km/s). Apart from the early-1993 periastron passage, the solution gives a very small rms error.



γ (km/s)	23.02	±	0.96	$T\ v_{max}$ (2440000+)	8945.73	±	93.27
K (km/s)	24.37	±	10.68	T peri (2440000+)	8954.82		
eccentricity	0.87	±	0.03	rms (km/s)	3.5		
ω (°)	31.31	±	7.11				

Fig. 1. Single-line radial velocity curve and orbital elements of WR140.

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