Wolf-Rayet Phenomena in Massive Stars and Starburst Galaxies
Proceedings IAU Symposium No. 193, ©1999 IAU
K.A. van der Hucht, G. Koenigsberger & P.R.J. Eenens, eds.

Eclipses in V444 Cygni: analysis of the continuum λ 4244 Å light-curve on a class of non-negative monotonically decreasing concaved/convex functions

Igor I. Antokhin and Anatol M. Cherepashchuk

Sternberg State Astronomical Institute, Moscow State University, 119899, Universitetskij pr., 13, Moscow, Russia

Abstract. A continuum λ 4244 Å light-curve of the eclipsing binary V444 Cyg (WN5+O6) is solved. The results generally agree with the previous ones obtained by Antokhin *et al.* (1997), with the exception that the conclusion on the slowness of the acceleration in the extended atmosphere of the WR component must be 'softened'.

Antokhin *et al.* (1997, ACY) solved a set of Fredholm's integral equations describing the light-curve of an eclipsing WR+O binary, for the continuum λ 4244 Å light-curve of V444 Cyg (WN5+O6). The brightness distribution was assumed to be a monotonically decreasing non-negative function, while the opacity distribution was taken to be a monotonically decreasing convex function. Combined with a spectrophotometric estimate of the relative luminosity of the components (Cherepashchuk *et al.* 1995) the model resulted in the following parameters of the system: $i = 78°.6$, $R_{O6} = 7.6\,R_\odot$, $R_{core}^{WR} \simeq 4\,R_\odot$. The (slow) velocity law in the extended photosphere of the WN5 component was also obtained.

In this paper we repeat the study of ACY, this time assuming that both brightness and opacity distributions are motonically decreasing non-negative concaved/convex functions. These *a priori* restrictions, while being quite general, are more specific than those used by ACY and seem to better reflect the possible real brightness and opacity distribution. The results generally agree with the previous ones, except that the previous conclusion on the slowness of the acceleration in the WN5 wind need to be 'softened'. The current study shows that the acceleration of the material in the wind may vary from moderate to slow (the corresponding β–values are from $\sim$ 1.1 to 2).

Acknowledgments. This work was financially supported by the Russian Foundation for Basic Research through the Grants no. 96-02-19017 and 96-15-96489.

References

Antokhin, I.I., Cherepashchuk, A.M., Yagola, A.G. 1997, ApSS 254, 111 (ACY)

Cherepashchuk, A.M., Koenigsberger, G., Marchenko, S.V., Moffat, A.F.J. 1995, A&A 292, 142