PHOTOMETRIC ANALISYS OF THE SEMIDETACHED BINARY SYSTEM S VELORUM

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RESUMEN: A partir del reanálisis de los datos fotométricos dados por Sisteró (1971), hemos obtenido los parámetros absolutos del sistema S Vel.
ABSTRACT: New absolute parameters of S Vel have been derived from a reanalysis of photometric data taken from Sisteró (1971).

Key Words:

PHOTOMETRIC ANALYSIS AND PHYSICAL PARAMETERS

S Velorum (HD 82829, $V=8^m$; $P=5\overset{d}{.}9$) is an eclipsing binary included in our long-term program for determination of absolute parameters of Algol-type systems. Photoelectric UBV light curves were obtained by Sisteró (1971) but the analysis of these observations was based in the old method by Merrill (1950). More recent discussions of the same data base were published by Giménez (1979), Cester et al. (1979) and Hall and Neff (1979). However no solutions had yet been attempted with methods based on accurate Roche potentials.

In our analysis, synthetic light curves were fitted to the observations in V and B colours by means of the computer code of Wilson and Devinney (1971 and updates to 1983; hereafter WD). Runs were made in mode 5, constraining the cool component to fill its Roche lobe. Several solutions for different values of the mass ratio were performed. The derived photometric mass ratio was $q_{phot}=0.17$ corresponding to the minimum value of the $\Sigma(O-C)$ residuals.

Absolute dimensions were calculated using q_{phot} together with the assumption that the primary component obeys the mass-luminosity relation. This hypothesis has been proved to be very satisfactory for a sample of double-lined Algol-type binaries (García and Giménez, 1988).

Although there are some differences in the mass ratio and in the shape of the secondary component, new dimensions are basically coincident with those given by Giménez (1979) and Hall and Neff (1979). Larger differences are found when masses and radii are compared with those given by Cester et al. (1979). In that work the q_{phot} derived from Wood's model is 0.26, which is not confirmed by our similar search for q with a model (WD) which is more reallistic in reproducing the expected distortion of the stars.

Velocity variations of higher accuracy for the primary component and in the near-infrared for the secondary are needed to confirm the absolute dimensions listed in Table 1.

Table 1. Physical parameters of the components of S Vel

	M/M⊙	R/R⊙	log g (cgs)	log Te	log L/L⊙
comp. A	1.8	1.5	4.331	3.927	1.012
comp. B	0.3	4.2	2.664	3.610	0.639

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