

COMMISSION 27 OF THE I. A. U.  
 INFORMATION BULLETIN ON VARIABLE STARS

Number 1927

Konkoly Observatory  
 Budapest  
 1981 February 26

HU ISSN 0374-0676

HD 175742: A NEW RS CVn VARIABLE

The 8<sup>m</sup>.4 SB1 binary HD 175742 is known to display strong Ca II H & K emission lines (Joy and Wilson 1949, Fekel 1980) and to have a variable radial velocity (Wilson and Joy 1950). A spectroscopic orbital solution recently has been published by Imbert (1979), who gives the period as 2<sup>d</sup>.879395, the primary spectral type as KO V, and the secondary spectral type between K5 V and M2 V. He also predicts the possibility of a partial eclipse.

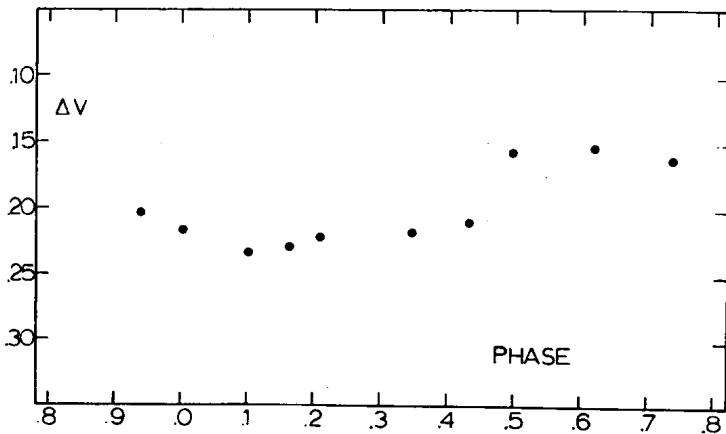
The author observed HD 175742 photoelectrically on ten nights with the 0.6 meter reflector at Dyer Observatory to look for optical variability.

Hel. J.D. (2,444,500+)	Phase	$\Delta V$	$\Delta B$
35.5800	0 <sup>P</sup> .1651	0 <sup>m</sup> .229	-0 <sup>m</sup> .556
36.5346	.4966	.156	
38.5914	.2109	.222	
45.5311	.6210	.153	-0.653
49.5138	.0042	.217	-0.566
50.5014	.3472	.218	
54.5072	.7384	.162	
55.5569	.1029	.233	
56.5096	.4338	.210	
69.4874	0.9410	0.204	

BD +23<sup>o</sup>3497 was observed as a comparison star. The table gives nightly means of the three differential magnitudes obtained each night. Correction has been made for differential extinction and transformation to the UBV system, and  $\Delta$  is in the sense variable minus comparison. The standard deviation of the nightly measures was usually  $\pm 0<sup>m</sup>.005$  or less. Phases were computed with the ephemeris

$$JD(\text{hel.}) = 2,443,677.045 + 2<sup>d</sup>.879395 E,$$

where the epoch is Imbert's time of conjunction with the cooler star in front.



The nightly means in  $V$  are plotted versus orbital phase in the figure and fit with the truncated Fourier series

$$l = A_0 + A_1 \cos\theta + A_2 \cos 2\theta + B_1 \sin\theta.$$

The resulting sine curve has an amplitude (maximum to minimum) of  $\Delta V = 0^m.079 \pm 0^m.012$  and a minimum at phase  $0^p.165 \pm 0^p.023$ .

This roughly sinusoidal light variation is clearly evident with its  $0^m.08$  amplitude and is typical of the wave seen in most RS CVn binaries. There is, however, no evidence of an eclipse near Imbert's time of conjunction.

Further photometry is being planned to determine the photometric period more precisely (to check for any migration of the wave through the light curve) and to look for variations in the wave amplitude.

The author acknowledges that this work was supported in part by N.A.S.A. research grant NSG-7543.

GREGORY W. HENRY  
Dyer Observatory  
Vanderbilt University  
Nashville, Tennessee 37235

References:

- Fekel, F.C. 1980, private communication.  
Imbert, M. 1979, A. A. Suppl. 38, 401.  
Joy, A.H. and Wilson, R.E. 1949, Ap. J. 109, 231.  
Wilson, R.E. and Joy, A.H. 1950, Ap. J. 111, 221.