

PHOTOELECTRIC PHOTOMETRY OF V CEPHEI

GEORGE FORTIER
63 Devon Road
Baie d'Urfe, Quebec H9X 2W7
Canada

Received 23 October 1989

Abstract

The behavior of V Cep is examined by photoelectric photometry in the V and B bands and is found to be constant.

* * * * *

In the *Journal of the AAVSO* (Hoffleit 1985), Dorrit Hoffleit reviewed the question of the variability of V Cephei (HR 9056, HD 224309, SAO 3994, A3 V, $v=6.56$). This star had been studied by Harlow Shapley, amongst others, but the fact of its variability had apparently not yet been satisfactorily established. This seemed to be an excellent project for a photoelectric photometrist to undertake and this paper reports 26 observations in V and 22 in B made from July 31, 1988, to December 1, 1988.

My equipment consisted of a 30cm f/6 Newtonian with an SSP-3 photometer. The comparison star was HD 225019 (SAO #001, A0 V, $+7.2$ V, $+0.1$ B-V) and the check star was HD 4853 (HR 240, SAO #143, V=5.59, A2 V, $+5.5$ V, -0.01 B-V). The V observations are shown in Table I and are corrected for transformation. The mean differential V magnitude of V Cephei (with respect to HD 225019) is -0.732 with an S.D. of 0.007 and shows no evidence of variability within a range of less than 0.02 magnitude.

Reference must be made to a paper by Milton, Williams, and Hoffleit (1988), reporting their findings on the same star from October 10, 1986, to December 12, 1987. They conclude that V Cep was constant within a range of 0.02 magnitude. In addition their paper reviews the history of the studies of this star and offers an explanation for the apparent variability found by some observers. I was not aware of their work until mention was made of it in the *AAVSO Photoelectric Photometry Newsletter* (AAVSO 1988). The present paper extends their data and together both papers provide 75 photoelectric observations in V obtained on 58 nights with an overall interval of 783 days.

Since Milton *et al.* and I used the same check star I was able to transform my observations to theirs by adding the V magnitude of my check star relative to the comparison (-1.699) to the corresponding value of Milton *et al.* (-0.791) giving 0.909. Since the mean delta V magnitude of my variable/comparison is -0.715 , by adding 0.909 we derive a mean delta V magnitude of $+0.194$ for the Milton *et al.* system. This differs from their mean delta V magnitude by 0.008 magnitude which is probably insignificant, and both sets of data show no evidence of variability within the limits of accuracy of the systems employed. My results are presented in Table I.

In addition to the above, 22 observations were made with the B filter over the same time interval, and are reported here in Table II (corrected for transformation). The mean differential B magnitude = -0.782 , with a standard deviation of 0.005, again showing no evidence of variability.

I thank Dr. John Percy, of the Department of Astronomy of the

University of Toronto, for his considerable help in preparing this paper.

REFERENCES

- Hoffleit, D. 1985, *Journ. Amer. Assoc. Var. Star Obs.* **14**, 64.
AAVSO Photoelectric Photometry Newsletter **9**, No. 1, p. 1, 1988.
 Milton, R. E., Williams, D. B., Hoffleit, D. 1988, *Journ. Amer. Assoc. Var. Star Obs.* **17**, 133.

TABLE I

Photoelectric Photometry of V Cephei - HR 158
 July 31 - December 1, 1988
 Photoelectric Mean Differential \mathbf{V} Magnitudes (Variable-Comparison)

JD	(n)	Visual	$\Delta\mathbf{V}$	S.D.
2447374.6660	3		-0.740	0.006
7384.6500	3		-0.721	0.006
7390.5882	3		-0.743	0.008
7395.6049	3		-0.727	0.003
7410.5646	3		-0.736	0.007
.6125	3		-0.733	0.010
7412.5368	3		-0.732	0.009
.5972	3		-0.730	0.003
.6549	3		-0.741	0.004
7413.5792	3		-0.742	0.003
7417.5194	3		-0.729	0.004
7418.5660	3		-0.737	0.009
7419.5896	3		-0.729	0.002
.6646	3		-0.733	0.005
7420.5653	3		-0.735	0.004
7424.5813	3		-0.727	0.006
.6549	3		-0.716	0.007
7427.5229	3		-0.733	0.008
7428.5299	3		-0.734	0.005
7429.5333	3		-0.743	0.002
7438.6174	3		-0.730	0.001
7444.6056	3		-0.733	0.010
7446.6042	3		-0.729	0.011
7465.5437	3		-0.725	0.008
.6472	3		-0.730	0.001
7497.5444	3		-0.727	0.004

Mean delta magnitude (\mathbf{V}) = -0.732, S.D. = 0.007

Note

$\Delta\mathbf{V}$ is corrected for transformation coefficient

TABLE II

Photoelectric Photometry of V Cephei - HR 158
 July 31 - December 1, 1988
 Photoelectric Mean Differential B Magnitudes (Variable-Comparison)

Blue			
JD	(n)	ΔB	S.D.
2447373.6806	3	-0.790	0.006
7310.5799	3	-0.789	0.007
.6250	3	-0.781	0.003
7412.5486	3	-0.787	0.009
.6111	3	-0.791	0.002
.6674	3	-0.782	0.009
7413.5924	3	-0.778	0.002
7417.6042	3	-0.772	0.014
7418.5799	3	-0.780	0.008
7419.6014	3	-0.774	0.009
.6764	3	-0.781	0.004
7420.5792	3	-0.785	0.003
7424.5944	3	-0.780	0.003
.6660	3	-0.791	0.008
7428.5437	3	-0.779	0.002
7429.5458	3	-0.784	0.010
7438.6306	3	-0.775	0.002
7444.6194	3	-0.785	0.010
7446.6167	3	-0.781	0.010
7465.5576	3	-0.787	0.005
.6618	3	-0.784	0.009
7497.5583	3	-0.778	0.009

Mean delta magnitude B = -0.782, S.D. = 0.005

Note

ΔB is corrected for transformation coefficient