

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 805

Konkoly Observatory
Budapest
1973 June 28

PHOTOELECTRIC OBSERVATIONS OF BETA LYRAE
IN 1967 AND 1969

In this note two series of photoelectric observations of Beta Lyrae are presented, taken at the Hamburg Observatory in June-July 1967 and August-September 1969. The total of individual observations is 179, normal points are given in the table.

The observed light curves remained rather fragmentary but it was possible to derive an epoch of primary minimum for each of the years. Later, the photometric Beta Lyrae program was discontinued as important, regular coverage of the light curve by several stations had been organized by the Dyer Observatory (Nashville, Tenn.)

1. Two-color observations in 1967 were carried out by Prof. A. Wachmann and the present writer, using the 60 cm reflector in Bergedorf. The instrumental b and v color are supposedly close to the UBV system. As comparison star HR 6997 was used, check star was 9 Lyrae. From 6 comparisons in as many nights, the magnitude difference between these stars turned out to

$$\Delta m = +0.179 \pm 0.003 \text{ in } v, \quad \Delta m = -0.023 \pm 0.004 \text{ in } b.$$

(in the sense comp-check). The standard deviations correspond to a mean error of ± 0.007 resp. ± 0.009 mag. of a single observation; all observations were taken near culmination.

On the basis of these observations the date of primary minimum can only be bracketed: it probably occurred between JD 2439677.2 and 2439677.3. This datum refers to E = 255, if we use the linear ephemeris

of Wood and Walker (1).

2. For the 1969 set of observations the 1 m reflector was used, diaphragmed to 40 or 45 cm. The team of observers consisted of Messr. U. Gehlich, T. Herczeg, J. Prölls and R. Wehmeyer. These were 3-color measurements, the instrumental ubv system again following the UBV prescription. No color transformation formula was established but we notice that the reference stars indicated slightly different Δm values:

$$+0.174 \pm 0.0035 \text{ in } v, -0.008 \pm 0.004 \text{ in } b, -0.575 \pm 0.009 \text{ in } u.$$

(Again in the sense comp-check, 8 measurements in 7 nights.) This time the zenith distances of the observed stars were much greater than in 1967, resulting in the mean errors ± 0.010 , ± 0.012 and ± 0.025 mag. for a single v, b or u observation.

The second series of measurements, especially the observations made on September 13 and 27, can define a more reliable epoch of minimum light: JD 2440479.04. Comparison with observations published by Lovell and Hall (2) reveals a difference of about three hours, our epoch being late. Part of this deviation may be ascribed to erratic changes in the light curve; such effects are clearly noticeable in the 1958 and 1959 campaign results, see Larsson-Leander (3). Also, the Chagrin Falls observations extended over two seasons and during this time, the rapid change of the period can shift the minimum epoch by about one hour.

The Wood-Walker ephemeris gave residuals already in excess of 0.6 day. For the years around 1970, the linear ephemeris

Min. I = JD 2440479.033 + $12^d.93386$ E gives reasonably small O-C values. No doubt this formula too will soon prove its "ephemeral" character; for the present season, residuals of the order of $0^d.05$ or $0^d.06$ are to be expected.

Table of observations (comp-var)

JD 2439657.513	n = 5	b = 1.532	v = 1.617	
658.502	4	1.611	1.700	
660.502	4	1.920	2.013	
665.501	4	1.600	1.719	
676.509	4	1.216	1.373	
677.506	4	0.924	1.082	
685.501	2	1.80	1.91	C
JD 2439694.448	n = 4	b = 1.848	v = 1.936	
JD 2440448.435	n = 3	u = 1.917	b = 1.799	v = 1.881
451.380	4	1.928	1.877	1.979
452.390	2	1.41	1.40(5)	1.51 C
456.413	5	2.059	1.959	2.054
477.345	4	1.855	1.807	1.899
478.344	6	1.195	1.232	1.378
.496	4	1.146	1.168	1.296
492.338(5)	2	1.019	1.020	1.145
.378(5)	2	1.025	1.008	1.178
.421	2	1.090	1.061	1.195 C
JD 2440493.351	n = 5	u = 1.749	b = 1.690	v = 1.768

C = measurements interrupted by clouds

T. J. HERCZEG

Department of Physics & Astronomy
 University of Oklahoma
 Norman, Oklahoma 73069
 and
 Hamburger Sternwarte
 Hamburg - Bergedorf, Germany

References:

- (1) Wood, D.B. and Walker, M.F. (1960) Ap. J. 131, 363.
- (2) Lovell, L.P. and Hall, D.S. (1970) P.A.S.P. 82, 345.
- (3) Larsson-Leander, G. (1970) Vistas in Astronomy (ed. A. Beer),
 Vol. 12, 183-197.