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B, V, R, I LIGHT CURVES OF EH HYDRAE

As a part of our current study of very short period eclipsing binary systems, we have obtained complete B,V,R,I light curves of the fourteenth magnitude W UMa variable, EH Hya (HV 11665). The system was discovered by Ashbrook (1942) in her study of fifty-nine variable stars in Milky Way field #355. The finding chart for this variable is found in the atlas by Tsesevich and Kazanasmas (1971). No further references are available on this neglected system. The ephemeris given by Ashbrook is:

$$\text{Jd Hel Min. I} = 2427870.515 + 0.29691d \cdot E$$

The present observations of EH Hya were made on 5 - 9 May, 1989 inclusive. The Yale 1M Ritchey-Cretien Telescope at Cerro Tololo Inter-American Observatory was used. The photometry was done in the Johnson-Cousins' system with standard B,V,R,I filters using the Automated Single Channel Aperture Photometer with a dry-ice-cooled Hamamatsu R943-02 (Ga-As) photomultiplier tube. The coordinates of the check, comparison and the variable star are given in Table I. Neither the check nor the comparison star has a catalogue identification. An average of 425 observations were obtained at each effective wavelength.

TABLE 1

Star	R. A. (1950)	Dec. (1950)
EH Hya	$12^h\ 02^m\ 17^s$	$-32^o\ 52'\ 54''$
Comparison	$12^h\ 02^m\ 16^s$	$-32^o\ 50'\ 35''$
Check	$12^h\ 02^m\ 16^s$	$-32^o\ 52'\ 20''$

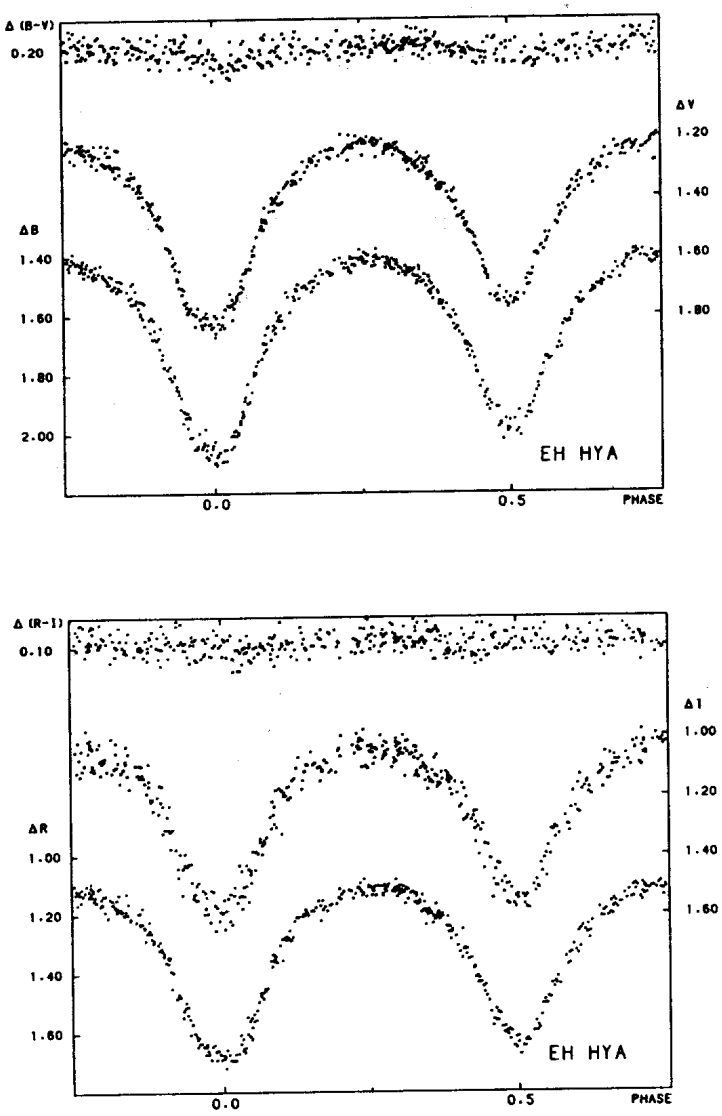

Fig. 1 - Light curves of EH Hya as defined by the individual observations.

Five mean epochs of minimum light were determined from the observations made during three primary and two secondary eclipses. Most epochs were determined from an iterative technique based on the Hertzsprung method (1928). The bisection-of-chords method was used to determine the earliest secondary epoch in I, and the latest primary epoch in B and V. The tracing paper method was used to obtain the latest primary epochs in R and I due to high scatter in these particular observations. The times of minimum light are given in Table II along with the epoch of Ashbrook (1942).

TABLE II

JD HEL. 2400000+	Minimum	Cycles	(O-C)
27870.515	I	-66644.0	0.0000
47655.6455(6)	I	-7.0	-0.0007
47656.5358(3)	I	-4.0	-0.0012
47656.6864(11)	II	-3.5	0.0010
47657.5770(8)	II	-0.5	0.0009
47657.7246(1)	I	0.0	0.0001

These times of minimum light along with a starting ephemeris consisting of the period by Ashbrook (1942) and our last epoch were introduced into a least squares solution to obtain the following ephemeris:

$$\text{JD Hel Min. I} = 2447657.7246 + 0.29690909\text{d} \cdot \text{E}$$

This ephemeris was used to calculate the O-C's in Table II and the phases of the present observations.

The B, V, R, and I light curves of EH Hya defined by the individual observations are shown in Figure 1 as Δm versus phase. Preliminary analyses of the observations reveal that this system is of W-type in shallow physical contact with a difference in component temperatures of $\Delta T \sim 300$ K and a small mass ratio, $q \sim 0.3$. Much of the preliminary analyses was done by Stephen

Charlesworth as a part of his undergraduate honors thesis. Further results and a complete analysis of the observations will be published elsewhere.

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