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PHOTOELECTRIC TIMES OF MINIMUM OF THE ECLIPSING BINARY RT HYDRI

The eclipsing binary character of the thirteenth magnitude star RT Hydri ($\alpha = 1^h 10^m 18^s$, $\delta = -79^\circ 26'.8$, 1950.0) was discovered by Shapley and Hughes (1934). They classified this short-period variable as a W UMa-type eclipsing binary and obtained, on the basis of photographic measurements, the following ephemeris:

$$\text{Min I} = \text{J.D. hel } 2425480.50 + 0^d.284038 \quad E \qquad (1)$$

Although RT Hydri has been known to be a variable star for about 50 years, little attention has been paid to it, and neither photographic nor photoelectric light curves of this system have been yet published.

During an observational run at the Complejo Astronómico El Leoncito -CASLEO- (San Juan, Argentina) in September 1987, RT Hydri was observed photoelectrically in the UBV system using the 2.15 m reflecting telescope. Observations were carried out with the Vatican Observatory Polarimeter, VATPOL (Magalhães et al. 1984) used as a photometer. Two dry-ice cooled RCA 31034 Ga-As photomultipliers were used as detectors. A standard UBV set of filters and small diaphragms of 3 and 5 seconds of arc were also employed.

The measurements were made differentially with respect to the comparison star designated as number 1 in our finding chart (Figure 1).

All the observations were corrected for first and second order differential extinction. The comparison star is located ~3' north-west from RT Hydri, and consequently the corrections were small. A total of 540 individual observations (180 in each band) have been obtained. The bisection-of-chords procedure was utilized to determine six times of primary minimum and six of the secondary one. A linear least squares solution using our photoelectric data yields the following updated ephemeris

$$\text{Min I} = \text{J.D. hel } \underset{\pm 0.00026}{2447054.78679} + \underset{\pm 0.0000092}{0^d.2839975} \quad E \qquad (2)$$

Table I lists the 12 times of minimum light reported in this note. The last two columns give the epoch numbers and the O-C residuals calculated from equation (2). Because of the shortness of the period and the large amount of time elapsed without observations, it is difficult to join unambiguously our

Table I. Photoelectric times of minimum light of RT Hyi

Min	JD hel 2440000.+	E	O-C
I	7054.7863	0.0	-0.00048
I	7054.7864	0.0	-0.00042
I	7054.7866	0.0	-0.00016
I	7056.7748	7.0	-0.00001
I	7056.7764	7.0	0.00167
I	7056.7762	7.0	0.00146
II	7061.7436	24.5	-0.00111
II	7061.7439	24.5	-0.00086
II	7061.7435	24.5	-0.00120
II	7068.8448	49.5	0.00014
II	7068.8449	49.5	0.00025
II	7068.8454	49.5	0.00074

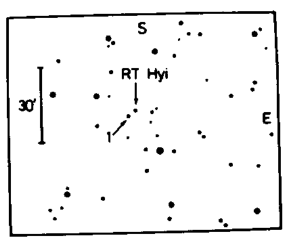

Figure 1. Finding chart of RT Hydri

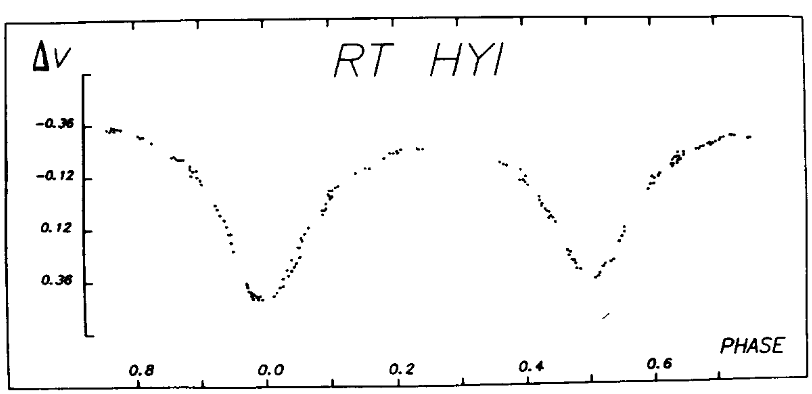

Figure 2. V light curve of the eclipsing binary RT Hydri

minima with the older photographic ones. Consequently, no variability of the period can be asserted.

Although the coverage of the light curve (Figure 2) is not complete, the light curve itself presents the typical characteristics of the W UMa-type systems. The maxima clearly show the variation due to the reflection and proximity effects of the components and the differences between the successive minima are only about 0.05 magnitudes.

The observations of the system will be continued in the next observational seasons in order to complete the light curves and analyze them using the Wilson and Devinney (1971) computer procedure.

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