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OBSERVATIONS AND A TIME OF MINIMUM OF TV Cet

TV Cet (BD +02° 502), is one of the eccentric-orbit eclipsing binary systems suggested by Giminez and Delgado (1980), and by Giminez (1985), as candidates for possible observation of general-relativistic apsidal motion.

We have observed a secondary eclipse of TV Cet on the night of 1986 September 13-14 (JD 2446687), and have computed a time of minimum. The observations were made with the 46-cm reflector at Appalachian State University's Dark Sky Observatory. The photometer is a Kitt Peak National Observatory single-channel design employing a thermoelectrically cooled EMI 9865QB photomultiplier tube with matching UBVR filters. An Astronomical Time Mechanisms Model 240V amplifier provides a voltage-to-frequency output that is integrated by a microcomputer.

The observations were made through the R filter only, to optimize the signal-to-noise ratio, since the sky was illuminated by a nearly full moon. The observations have not been transformed to Johnson R, since they were only intended for timing analysis. In order to maximize the number of data points, no additional filters were used.

The comparison star used was BD +01° 566, located about 20

arc-minutes to the south of TV Cet. The star BD +02° 500 was used as a check star. The variable and comparison were alternately observed for 10-second integration periods.

The observations (V/C intensity ratio) are tabulated in Table I and plotted in Figure 1. The time of minimum light was

Table I. Observations of TV Cet

Hel. J.D -2446687	V/C	Hel. J.D -2446687	V/C
.75396	1.136	.81427	0.966
.75581	1.128	.81565	0.967
.75747	1.122	.81747	0.970
.76007	1.132	.81865	0.972
.76334	1.114	.81978	0.968
.76511	1.104	.82166	0.993
.76783	1.090	.82291	0.983
.77000	1.089	.82456	0.986
.77281	1.067	.82683	0.990
.77553	1.051	.83271	1.017
.77788	1.037	.83482	1.009
.77977	1.030	.83657	1.021
.78179	1.019	.83814	1.034
.78564	1.010	.84091	1.043
.78762	0.997	.84346	1.050
.79013	0.993	.84574	1.051
.79373	0.992	.84826	1.047
.79738	0.983	.85075	1.073
.79931	0.974	.85292	1.084
.80351	0.961	.85524	1.114
.80611	0.969	.85819	1.111
.80732	0.966	.86211	1.128
.80769	0.972	.86484	1.132
.81126	0.974	.86626	1.147
.81292	0.966	.86776	1.163

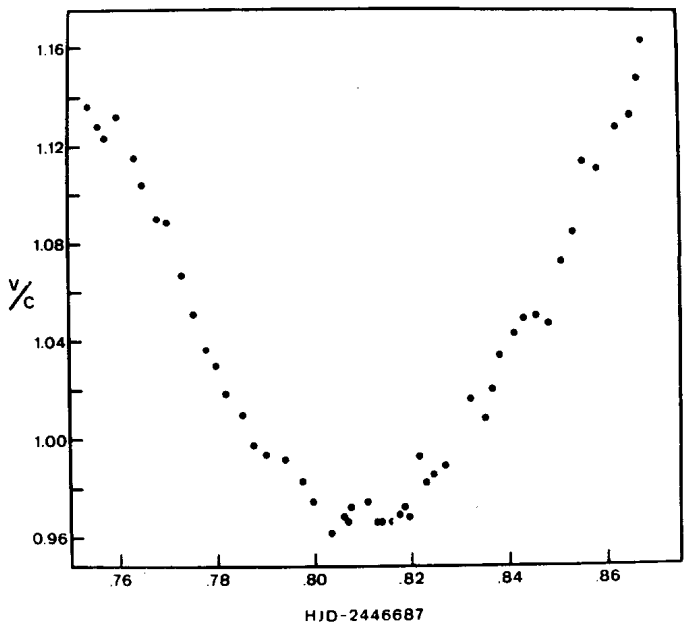

Figure 1. Secondary Eclipse of TV Cet

calculated using a quadratic least-squares fit, using only the data found in the bottom 0.2 magnitudes of the eclipse. This follows the suggestion of Andersen and Giminez (1985), that asymmetries in the eclipse curve can cause errors if too much of the eclipse width is used. The same data were also analyzed using the method of Kwee and van Woerden (1956), using a program written by Ghedini (1982). The two methods yielded results that agreed within the observational errors. The resulting time of minimum is

Min II = HJD 2446687.8101

$\pm$.0093

where the error is the mean error computed from the errors in the quadratic coefficients.

Using the elements of Jørgensen (1979) places this secondary eclipse at phase 0.498. This may be compared to the light curve solution of Popper and Etzel (1981), which shows secondary minimum at phase 0.494 during 1972-73 (using the same elements).

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