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PHOTOELECTRIC OBSERVATIONS OF TX Cas

More than seventy years have elapsed since the eclipsing binary system TX Cas was discovered by Leavitt in 1907. However, the system was only observed visually and photographically until 1981. Recently some photoelectric minima times were given by Fernandes (1982) and Kreiner and Tremko (1984).

For this reason the system was observed photoelectrically at Beijing observatory in two intervals, from December 1982 to January 1983 and from October 1984 to January 1985 with the 60 cm reflector by using Strömgren four colour system. In the second interval a total of 367 photoelectric b and y observations were made on 13 nights and combined into the first photoelectric light curves.

The moment of the primary minimum was determined using Kwee and Van Woerden's method, and in addition, one time of primary minimum and three times of secondary minimum were determined by using the mean light curve. These moments are given in Table I.

Table I

J.D.Hel.244 0000 +	m.e.	Min.
5330.020	0.004	I
6003.1882	0.0007	I
6028.067	0.002	II
6030.991	0.002	II
6060.260	0.004	II

The star BD + 62^o478 was used as a comparison star and BD + 62^o481 as the check star. All observations were corrected for the differential extinction. Figure 1 gives the b and y light curves of the eclipsing binary TX Cas. Using the photoelectric minima given in Table II, the new ephemeris has been derived by the weighted least squares method as follow:

$$\text{J.D.Hel.Min.I} = 2446\ 003.1893 + 2^{\text{d}}.926\ 835 \cdot E$$

$$\pm .0014 \quad \pm .000\ 007$$

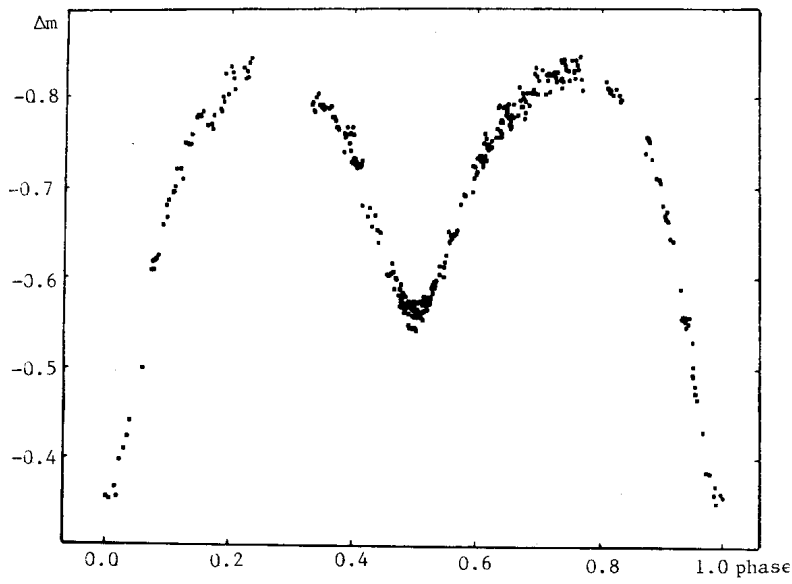


Figure 1.a The y light curve of TX Cas

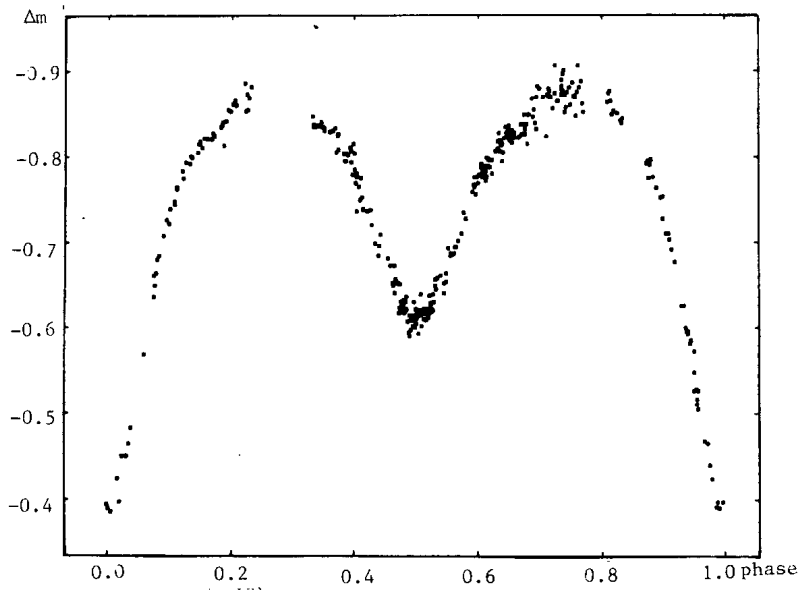


Figure 1.b The b light curve of TX Cas

Table II

J.D. Hel. 2400000 +	E	(O-C)	Min.	Method	Ref.
17551.6380	-9721.0	0.3144	I	v	(1)
19708.3750	-8984.0	-0.0333	I	v	(2)
20448.9230	-8731.0	0.0229	I	v	(3)
29677.2280	-5578.0	-0.0139	I	v	(4)
30224.5000	-5391.0	-0.0619	I	v	(5)
30350.4670	-5348.0	0.0508	I	v	(6)
30792.3120	-5197.0	-0.0578	I	pg	(7)
33186.4790	-4379.0	-0.0499	I	pg	(7)
33599.1550	-4238.0	-0.0590	I	-	(8)
35390.4280	-3626.0	-0.0151	I	pg	(7)
36596.3150	-3214.0	0.0119	I	pg	(7)
36824.5410	-3136.0	-0.0560	I	pg	(7)
37316.3400	-2968.0	0.0330	I	pg	(7)
37588.3940	-2875.0	-0.1096	I	pg	(7)
39672.4780	-2163.0	0.0609	I	pg	(7)
39827.4780	-2110.0	-0.0619	I	pg	(7)
39915.3330	-2080.0	-0.0122	I	pg	(7)
40619.2490	-1839.5	-0.0024	II	pg	(7)
40679.3280	-1819.0	0.0763	I	pg	(7)
40828.5170	-1768.0	-0.0038	I	pg	(7)
40831.5280	-1767.0	0.0803	I	pg	(7)
41166.4600	-1652.5	-0.1114	II	pg	(7)
41361.2990	-1586.0	0.0924	I	pg	(7)
41539.5280	-1525.0	-0.2161	I	pg	(7)
41677.3010	-1478.0	-0.0048	I	pg	(7)
41990.4730	-1371.0	-0.0052	I	pg	(7)
42988.5620	-1030.0	0.0297	I	pg	(7)
43477.2750	-863.0	-0.0404	I	pg	(7)
43749.4800	-770.0	-0.0320	I	pg	(7)
44712.4476	-441.0	0.0037	I	pe	(9)
45056.3510	-323.5	0.0028	II	v	(10)
45233.4340	-263.0	0.0117	I	pe	(5)
45280.2710	-247.0	0.0192	I	pe	(5)
45330.0200	-230.0	0.0118	I	pe	(11)
45593.4390	-140.0	0.0148	I	pe	(5)
46003.1882	0.0	0.0057	I	pe	(11)
46028.0670	8.5	0.0063	II	pe	(11)
46030.9910	9.5	0.0034	II	pe	(11)
46060.2600	19.5	0.0040	II	pe	(11)

(1) Pickering; (2) Zinner; (3) McDiarmid; (4) Gaposchkin; (5) Kreiner;
 (6) GCVS (1948); (7) Rätz; (8) SAC 54; (9) Fernandes; (10) Hübscher,
 Braune; (11) present paper

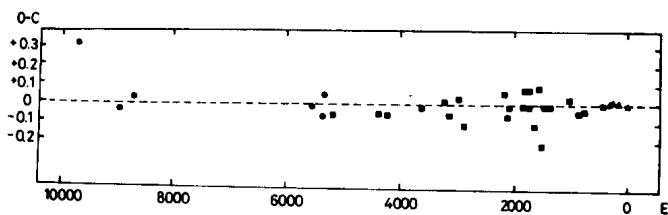


Figure 2. The O-C diagram of the times of minimum light of TX Cas
 ▲ photoelectric, ■ photographic; ● visual observations

Table II lists the historic minima and their O-C based on the above ephemeris. The O-C diagram (see Figure 2) shows that the period of TX Cas is not subjected to any long-term variation except for some probable short-term fluctuations.

A further detailed analysis of these light curves will be given elsewhere.

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