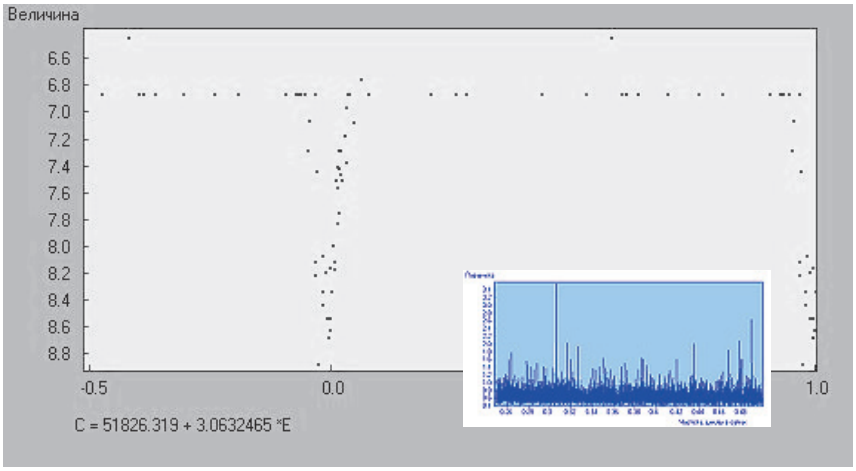
Eclipsing variable TX UMa: my observations

TX UMa is an eclipsing binary system. This article presents a summary of my visual observations, made from the city of Pavlodar, Kazakhstan. The measurements were made time-to-time throughout several years, so the task was mostly an interesting challenge and eye training at the same time. The result has a good match with the known period.

The eclipsing binary TX Ursae Majoris is located 13 degrees south-west from the famous Big Dipper, between Lambda and Psi UMa, and one degree from a 5m star in its vicinity. This allows the star to be found visually quite easily. Precise coordinates are the following:



TX Uma (J2000.0)

RA = 10h 45m 20.5s

DEC = +45d 33m 58.8s

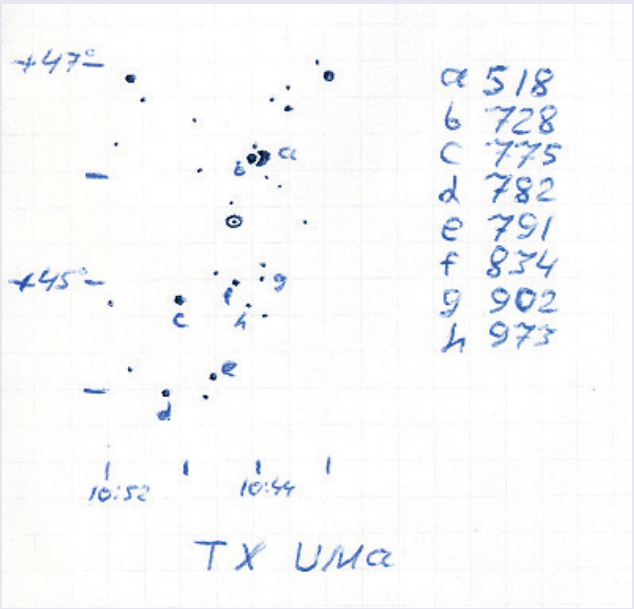
A location chart along with the comparison stars is given below. As TX Uma is an eclipsing detached binary, it spends most of its time in “out-of-the-eclipse” state, having an average brightness of 6.9m. Every 3 days 1 hour and 32 minutes its brightness dims to 8.8m. The star is a good target to look at with binoculars. A light curve built from my observations can be seen just above. The eclipse lasts for 8 hours 50 minutes, so every 15-18 minutes the star adds 0.1m to its brightness.

Based on my observations, the minimum of TX UMa can be calculated using the following equation:

$$T = 2451912.095 + 3.0632465 \times E.$$

Due to the fact that the period of TX UMa is close to 3 days, every 45 days there is a sequence of 3-4 nights with the eclipse phase visible every night. This is very convenient for observers.

The main purpose of this note is to encourage amateur astronomers to observe the eclipsing variable star TX Uma, and other variables, and create a more dense series of observations. This will allow to find a more reliable period value.



Historical reference

In 1925, the star HD 93033 was discovered as a spectroscopic binary. Rugemer, in 1931, proved its eclipsing nature and later found that its period was not constant (Kreiner & Tremko, 1980). A detailed analysis of the photometric material was carried out by Plavec (1960) who substantiated the conclusions concerning the existence of the apsides line rotation. This caused the shape of the light curve of the primary minimum to change.

More detailed analysis of possible motion of the line of apsides in the system of TX UMa is published in (Kreiner & Tremko, 1980; BAICz, 31, 343).

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