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TX SCUTI - A MYSTERY SOLVED

TX Sct was discovered by Hubble (1920) who estimated that it varies from 12.5 to 14.5 pg. On the basis of only 9 plates he assumed it to be a long period variable. In the summer of 1978 at the Maria Mitchell Observatory I assigned this star to an undergraduate research participant, Wendy Whiting (1978), to identify and, if possible, determine a period. However, we were unable to find any star close to the given position which varied appreciably.

An inquiry to Dr. K. Cudworth at Yerkes Observatory led to his resolving the mystery. He succeeded in locating the plates on which Hubble had marked the variable. Cudworth measured its position and found that it disagreed with the approximate position Hubble had estimated from a BD chart. The correct position is

(1950)  $18^{\text{h}}25^{\text{m}}27^{\text{s}}.5$   $-11^{\circ}17'.1$   
(1900) 22 40 18.8

Whereas Hubble had given

(1900) 18 23 25  $-11^{\circ}15.1$ .

The spectral class given in the GCVS is M6:. This stems from Cameron and Nassau (1956) who were uncertain as to the identification of the variable TX Sct. Dr. Bidelman kindly supplied a marked print and references, also indicating that the IR source at  $18^{\text{h}}24^{\text{m}}09^{\text{s}}$   $-11^{\circ}13'.8$  (1900) identified as the M7 type star BD  $-11^{\circ}4642$  (Nassau and Blanco 1954) might be the variable. The stars Bidelman indicated, however, do not correspond with the one Cudworth found marked on Hubble's plate.

I have now examined Hubble's TX Sct (Fig.1) relative to surrounding stars on 22 available Harvard plates of the MC series (16-inch Metcalf telescope) taken between 1915 and 1974, and on 132 RB and RH plates (3-inch Ross-Fecker lenses) taken between

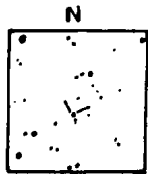


Figure 1. Finder chart for TX Sct, approximate 10'x 10'.

1935 and 1951. These observations are reasonably represented (Fig.2) by

$$\text{Max} = \text{JD } 2425830 + 24^d344n.$$

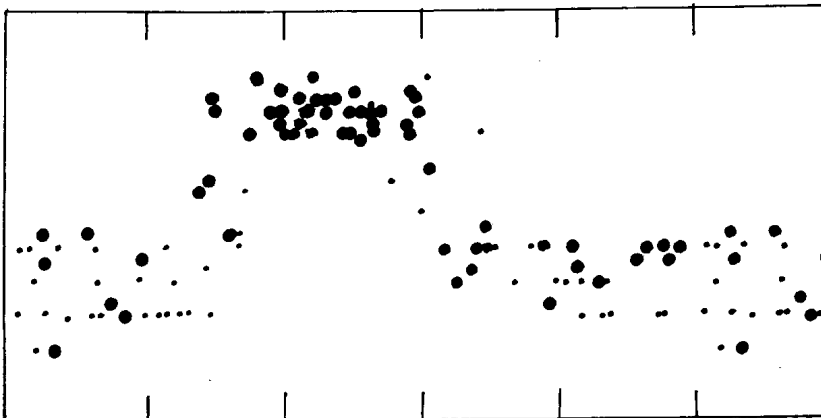


Figure 2. Observations of TX Sct (on arbitrary scale) fitted to a period of  $24^d344$ . Small dots for the less reliable observations. On some of the plates the image was partially blended with the star S prec by about  $0'.4$ . Abscissa markers at intervals of 0.2 period.

Figure 2 also includes Hubble's maximum discovery plate and non-maximum observations on Barnard's Atlas plates 24 July and 1 August 1905. For its period the light curve resembles a W Virginis star. On the other hand, the variable appears red relative to its neighbors on the Palomar sky survey, and might therefore be a semi-regular variable of exceptionally short period. A spectral type is needed for definitive classification.

I am grateful to Drs. Bidelman and Cudworth for their very helpful correspondence.

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