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PHOTOELECTRIC UVB LIGHT CURVES AND PERIOD  
DETERMINATION OF BX ANDROMEDAE

The variable nature of BX Andromedae (=ADS1671A=HD 13078 =BD+40°442=SVS 995 And) was announced by Soloviev (1945). Observed times of minima have been published by Soloviev (1945), Ashbrook (1951, 1952, 1953), Svolopoulos (1957), Chou (1959), Oburka (1965), Robinson (1965), Pohl and Kizilirmak (1970, 1974), and Meyer (1972). Light elements have been published by Ashbrook (1951), Svolopoulos (1957), and Chou (1959).

Kukarkin (1969) listed BX And as a W Ursae Majoris type system. W UMa systems are defined as close eclipsing binaries that have periods less than one day. They often show period variations and variation in maximum and minimum magnitude from cycle to cycle. Furthermore, VW Cephei, another W UMa star has recently found to be an X-ray source (Crudace, Dupree and Carroll, private communication).

BX And is a relatively bright W UMa system well placed for northern observers. Chou (1959) reported that BX And apparently underwent a period increase in 1952. To study this effect, new UVB observations of BX And were obtained on October 26/27 and 27/28, 1978 and all available previous observational material collected. Because BX And shows some of the same characteristics as VW Cephei, observations are published at this time.

UVB photoelectric observations were made with the Yerkes Observatory 61cm reflector using a refrigerated 1P21 photomultiplier and pulse counter. BD+39°476 was used as the comparison star. BD+39°481 and BD+39°484 were used as check stars. One primary minimum and one secondary minimum were observed. The Julian dates were, respectively, 2443809.8873 and 2443809.5705 ( $\pm 0.0005$ ).

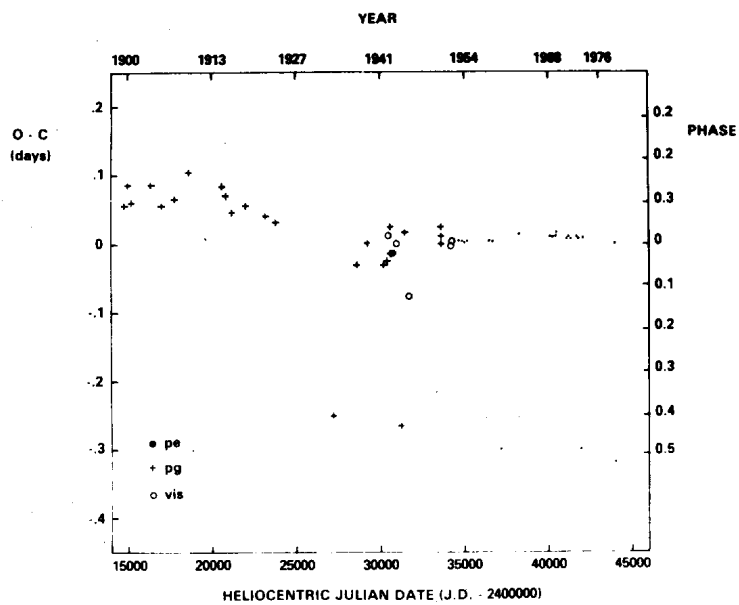


Fig. 1. O - C diagram for the times of minima calculated using the period  $0.61011508^d$

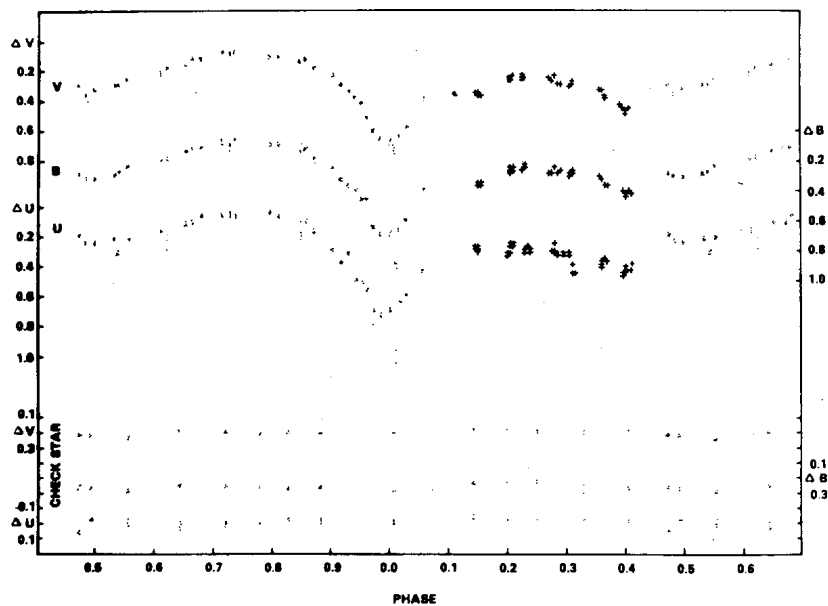


Fig. 2. UBV observations of BX And on 1978 Oct. 26/27 (crosses) and Oct. 27/28 (dots)

The new times of minima allow the period and ephemeris to be improved. Combining these observations with the previous material gives the following elements:

$$\text{Hel JD MinI} = 2443809.8873 + 0^{\text{d}}.61011508 \cdot E$$

Figure 1 shows the residuals of observed minima for BX And computed from the above elements. The few available secondary minima timings are also shown, displaced 0.5 in phase. It is seen that a definite period change occurred between JD 2424000 (1924) and JD 2427360 (1936). There is some indication, especially from the secondary minima, of a period variation around 2433500 (1950).

Figure 2 shows the magnitude difference between BX And and the comparison star BD+39<sup>o</sup>476 versus phase. The light curves indicate depths of the two minima of about the two minima of about 0.<sup>m</sup>65 and 0.<sup>m</sup>30 in each color. Comparison of the two nights of observation shows apparent variation in the magnitude at maximum. No similar difference between the two nights was found for the check star. Also, anomalous spikes near primary minimum were observed in all colors. The large decrease in magnitude (about 0.<sup>m</sup>1 in the V, 0.<sup>m</sup>2 in the B, and 0.<sup>m</sup>3 in the U) occurred in less than one minute. No instrumental problem could be found and the effect was apparently real.

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