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1987 LIGHT CURVES OF BX ANDROMEDAE

BX And (BD+40° 4421), a near-contact binary with the β Lyrae type light curves is the brighter companion of the visual binary ADS 1671. The system has been observed frequently, since 1950's by many authors (see Samec, Fuller and Kaitchuck (1988), and Castelaz (1979) for the references). Chou (1959) and Ahnert (1975) reported that BX And has undergone around 1950, a major period change of about 0.925. A new abrupt period change in 1981 has been reported by Gülmen et al. (1988) who also obtained the new light curves (in B and V) of the system. Having late type (F2 V) active components in near contact, the system's total light at maximum and/or minimum is expected to vary in time. To study the light curve variations, we thus included the system in our observing program.

The present observations were made on two nights in October, four nights in November, and two nights in December, 1987 using an EMI 9789QB photomultiplier attached to the 30 cm Maksutov telescope of the Ankara University Observatory. The differential observations in three colors were made with respect to the comparison star BD+39°0476. BD+39° 0484 was used as the check star. The third light (from the other component of the visual binary ADS 1671) could not be excluded in the brightness measurements of the variable star. Thus, 175 differential observations were obtained in each V, B and U filters. The observations were corrected for differential extinction and light time effects, and are shown in Figure 1. as Δm -(var.-comp.) versus phase. The light elements used in phase calculation were given by Chou (1959), as

Hel. JD Min1-2436528.7777+0.461011534 E

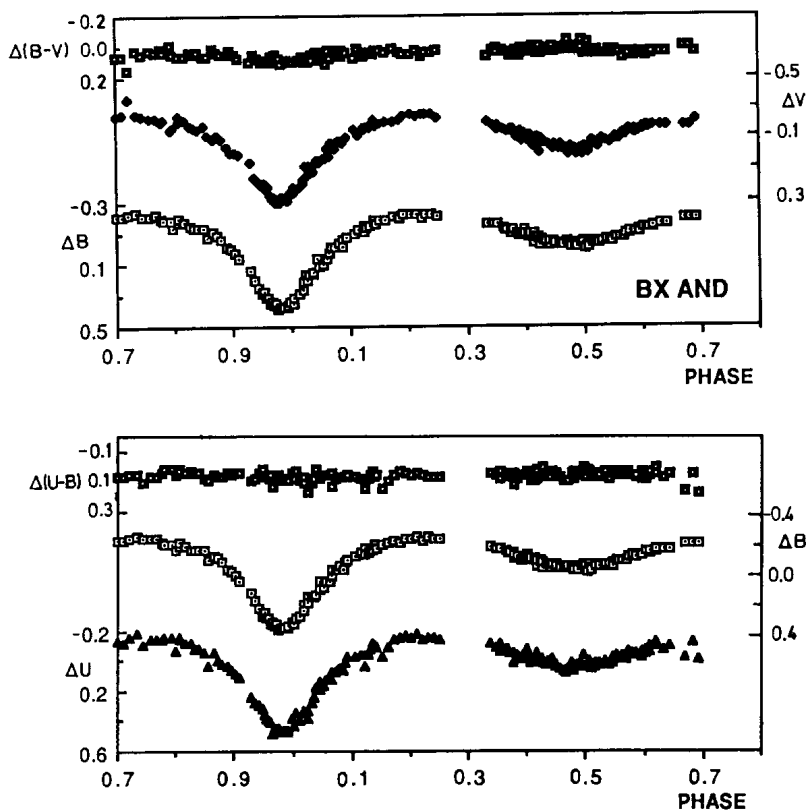


Figure 1. Light curves of BX And defined by the individual observations.

The times of two new primary and two new secondary minima (see Table.1) confirm the second abrupt decrease of 0.25 sec. in the period, which was reported by Gülmen et al. (1988). The light curve variation seems larger in the secondary minimum. The large difference between the depth of the minima and the reddening of the color curves in the primary minimum indicate considerably different temperatures for the component stars. Thus, at least one of the component stars of the system should not be completely contact with the first critical Roche lobe, and the common convective envelope (if present) around the component stars is not effective to equalize the temperatures.

Table 1. The new times of minima of BX And.

Hel.Min 244700+	No. of Obs.	Filter	Remark
093.5234 ± 0.0010	21	U	Min I
.5236 ± 0.0007	29	B	"
.5224 ± 0.0006	17	V	"
094.4408 ± 0.0023	35	U	Min II
.4409 ± 0.0010	33	B	"
.4367 ± 0.0006	34	V	"
116.4075 ± 0.0025	28	U	Min II
.4059 ± 0.0012	25	B	"
.4049 ± 0.0019	27	V	"
117.3202 ± 0.0004	16	U	Min I
.3185 ± 0.0005	16	B	"
.3191 ± 0.0007	16	V	"

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ETHEM DERMAN
AYVUR AKALIN
OSMAN DEMİRCAN

Dept. of Astronomy and Space Sciences,
University of Ankara,
06100 Tandoğan, Ankara, TURKEY.

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