UBV PHOTOMETRY OF BX And

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The short period eclipsing binary BX And (BD $+40°442$) is the brighter component of visual binary ADS 1671 and was discovered as an Algol type eclipsing binary by Soloviev (1945). Photographic studies by Ashbrook (1951) using 200 Harvard patrol plates confirmed the binary nature of BX And with a β Lyrae type light variation. Since then, the system has been observed frequently by many observers (see Rovithis et al. 1984, and Bell et al. 1990). Gülmen et al. (1988) published a period analysis, summarising the time of minima observed by many authors. Their analysis confirmed the occurrence of a period change about $0^{s}25$ already reported by Ahnert (1975) and suggested another change around 1981.

The system consists of a primary with spectral type F2V and a K type secondary. It has been classified as a near contact binary by Bell et al. (1990). To study the light curve variation, it has been included in our observing program. UBV photoelectric observations of BX And were made in October 1996, 1997, 1998 and 2000, at Khajheh Nassir Addin Observatory of Tabriz University (Iran). The observations were carried out using a 40-cm Cassegrain telescope. A single channel photometer equipped with an unrefrigerated photomultiplier tube RCA 1P21 and Johnson's standard UBV filters were employed during the observations. The output of the photometer was fed to a microcomputer enabling rapid data access. Two stars BD $+39°476$ and BD $+39°480$ were used as comparison and check stars, respectively. The data were corrected for differential extinction and light time effect.

The phases were calculated using the elements given by Derman et al. (1993):

$$\text{Hel. JD(Min I)} = 2447538.2967 + 0^{d}61011355 \times E.$$

During the observations three primary and three secondary minimum times were obtained in each color. These minima are given in Table 1 where $O - C$ residuals have been computed with the elements given above. Figures 1 and 2 show the light curves of BX And in U, B and V bands where $\Delta m = \text{Var.} - \text{Comp.}$ have been plotted versus phase. There is no asymmetry in the profiles of the minima and no displacement in the secondary minimum, and the maxima are equal.
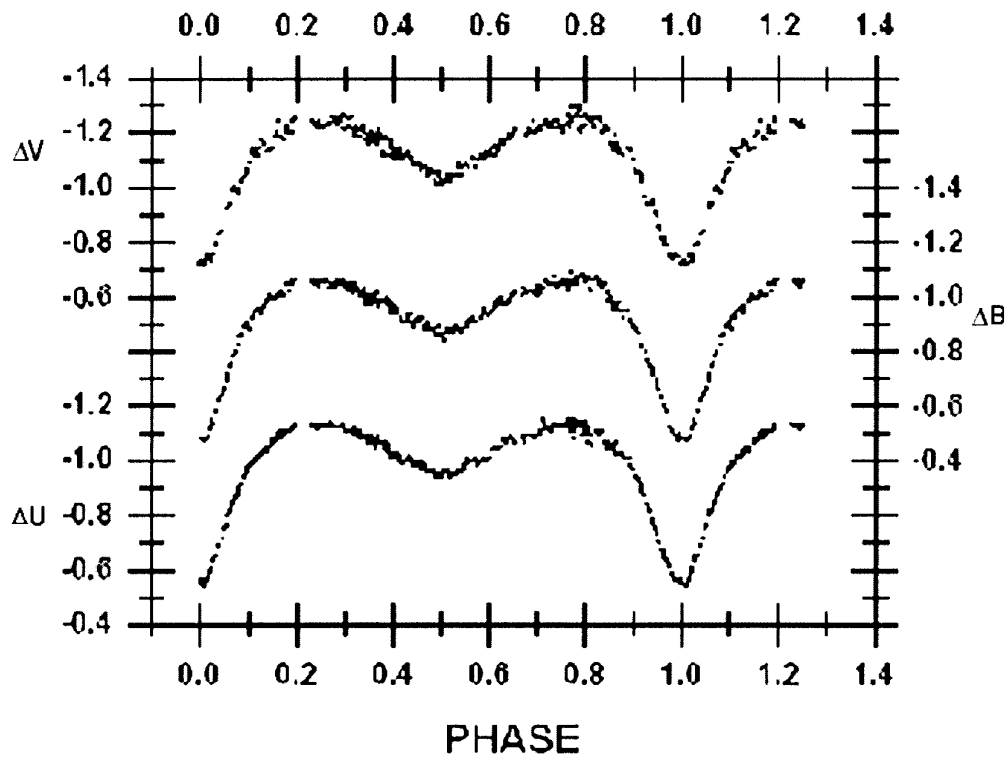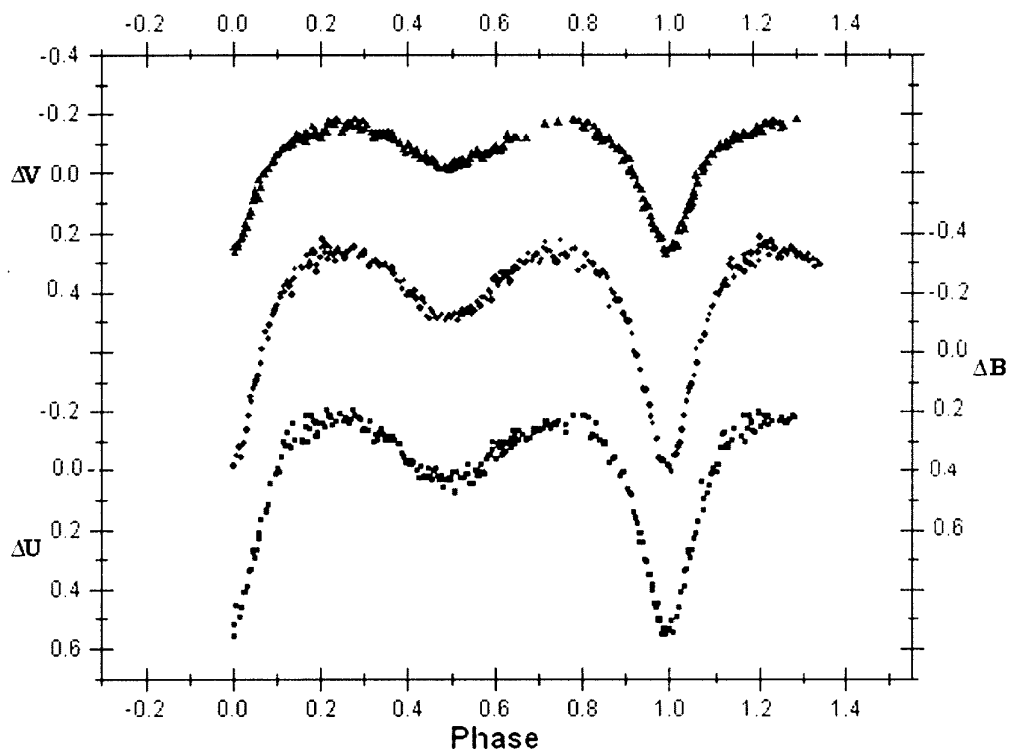
Figure 1. 1998 light curves of BX And

Figure 2. 2000 light curves of BX And

Table 1: Time of minima of BX And

Hel. JD 2450000 +	Filter	$O - C$	Remark	$O - C$ (average of three filters)
0392.4069	U	−0.0007	Min I	
0392.4045	B	−0.0033	Min I	−0.0019
0392.4030	V	−0.0048	Min I	
0731.3224	U	−0.0034	Min II	
0731.3220	B	−0.0039	Min II	−0.0028
0731.3258	V	−0.0001	Min II	
1105.3228	U	−0.0027	Min II	
1105.3214	B	−0.0039	Min II	−0.0033
1105.3221	V	−0.0034	Min II	
1109.2954	U	−0.0012	Min I	
1109.2950	B	−0.0037	Min I	−0.0025
1109.2940	V	−0.0027	Min I	
1823.7294	U	−0.0047	Min II	
1823.7251	B	−0.0090	Min II	−0.0046
1823.7338	V	−0.0003	Min II	
1824.9516	U	−0.0028	Min I	
1824.9516	B	−0.0028	Min I	−0.0027
1824.9518	V	−0.0026	Min I	

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