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BP MUSCAE - UBV LIGHT CURVE AND EPHEMERIS

BP Mus (CPD $-71^{\circ}1392$, CoD $-71^{\circ}0884$) has been included in my programme of neglected Southern eclipsing binaries in 1975. At that time the depth of the primary minimum was not known and neither was the existence of the secondary minimum. First reasonably successful observations were made in 1978 and 1979. Present results are based on photoelectric measurements in the UBV system made with the 41 cm reflecting telescope and the 1P21 photomultiplier on Siding Spring. Observations during 13 nights in May 1978, February 1979 and June-July 1979 are of variable quality and many measurements had to be rejected as unreliable because of cloudiness, equipment malfunction or full moon at the time of primary minimum. Nevertheless, these observations of such a little known star as BP Mus yielded the following interesting results.

1. A possible variation in the length of period since the primary minimum occured 23 hours earlier than would be expected from the ephemeris in the GCVS (see Kviz 1979). Individual observations in the UBV filters are plotted in Fig. 1. using the ephemeris T-min(HJD) = 43928.138 + 3.32046.E .

2. A secondary minimum with depth of 0.1 magnitude in V has been detected close to the phase 0.5.

3. The brightness of the star outside minima seems to have dropped by nearly 1 magnitude since the first Hoffmeister (1943a,b) observations (1936-38).

4. The flat bottom of the primary minimum seems to be distorted. (See Fig. 2, 3, and 4). The distortion occured mainly in B and is probably an indication of gaseous streams or a disk in the system.

Table I

Filter	16/17 Feb. 1979		8/9 July 1979			
	a - b	BP Mus	a - b	BP Mus	Min I	Min II
V	0.433	10.200	0.433	10.190	12.97	10.27
B	0.570	10.525	0.568	10.491	14.23	10.54
U	1.272	10.785	1.278	10.786	15.45	10.79

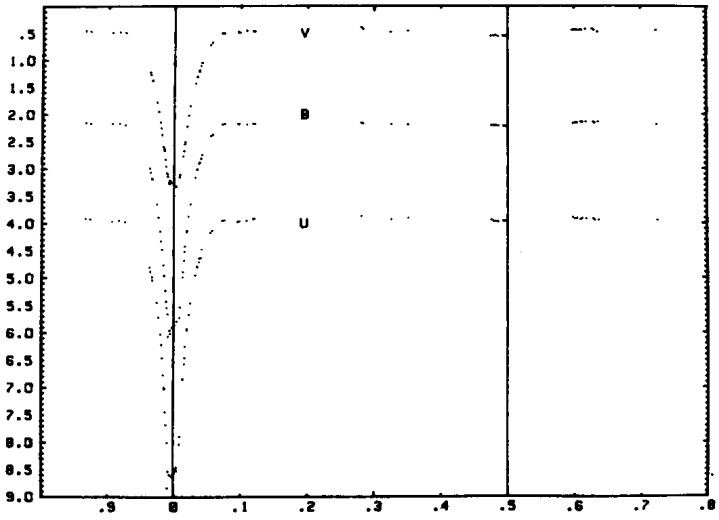

Fig.1. Light curve for BP Mus in the UBV system. Abscissae: Phase. Ordinates: Differential magnitudes (variable minus comparison a), scale is exact for B, -1.5 shift for V, +1.5 shift for U.

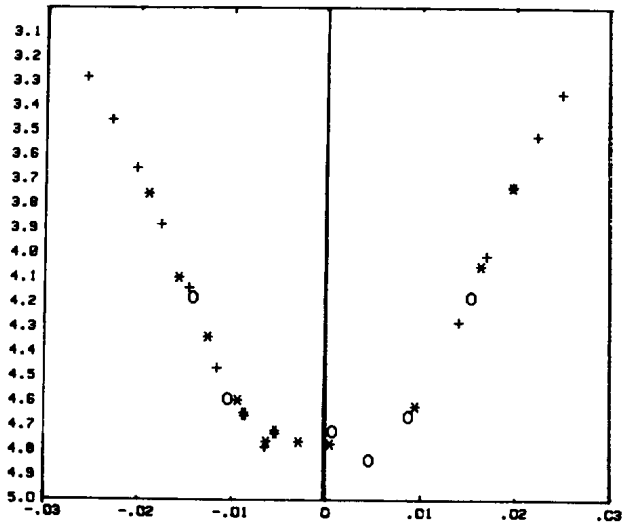

Fig.2. Minimum of BP Mus in V, # 13/14 Feb. 79, + 23/24 Feb. 79, * 26/27 June 79, O 6/7 July 79.

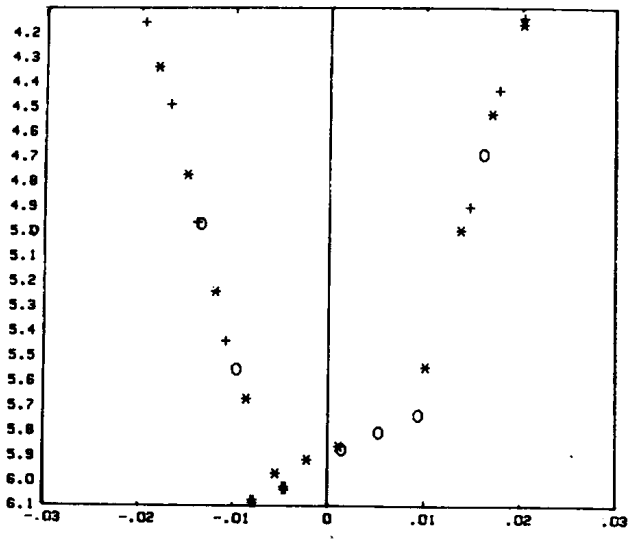

Fig.3. Minimum of BP Mus in B. Symbols as in Fig. 2. Distortion of the bottom is clearly visible.

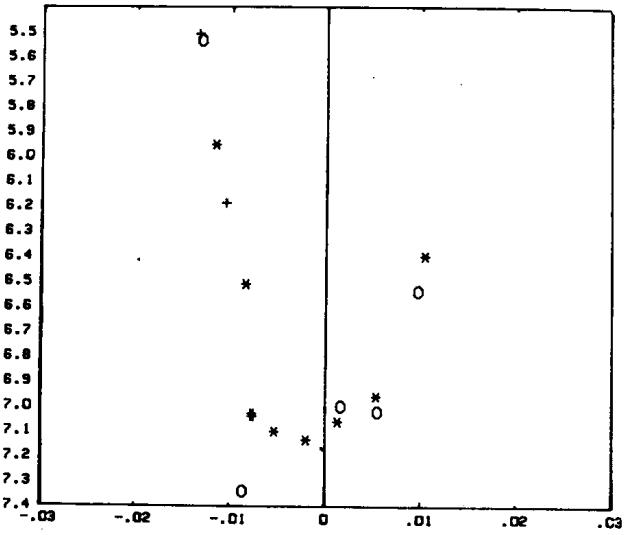

Fig. 4. Minimum of BP Mus in U. Symbols as in Fig. 2.

The measurements of BP Mus and comparison stars, a=HD111442, sp. B9.5 V and b=HD111290., sp. B1 Ib/II were tied-in to the UBV system by measurement of standard stars in the E and F Harvard regions. Table I shows the differences in magnitudes between comparisons a and b, UBV magnitudes for BP Mus on these two nights and the UBV magnitudes at primary and secondary minima.

The photographic magnitude given in GCVS is 9.6 and in the fifth edition of the Finding List (Wood et al. 1980) it is 9.5. Although during minimum the equipment used was working at its limits, the observations from 4 different nights agree reasonably well and in B they indicate the distortion of the flat part of the primary minimum. (Raw estimates of spectral types from colours give A5 V and K2 III).

Further observations of BP Mus are being carried out in other photometric systems (UBVRI, Geneva) and some have already been reduced. These will be published elsewhere. Individual numerical values of the observations used in this paper may be obtained from the author or from the archives in London (Royal Astronomical Society), Strassbourg (Centre de Donnees Stellaires) or Odessa (Odessa Astronomical Observatory). File numbers will be published in the PASP.

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