COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 3265

Konkoly Observatory
Budapest
22 November 1988
HU ISSN 0374-0676

THE W UMa STARS AB Tel AND BF Pav

The two W UMa stars AB Tel and BF Pav have been observed by Hoffmann (1984) but he has not been able to undertake a detailed analysis of the light curves due to incompleteness in the data (Hoffmann, 1980, 1981). These two stars were included in a programme of photometry of W UMa stars that was commenced at SAAO, but in this case also the light curves are incomplete and cannot be analysed. The results are therefore discussed here in general terms in the light of Hoffmann's conclusions, and times of minima are presented which may be used in studying period changes in these stars.

The BV observations of AB Tel and BF Pav, which will be presented elsewhere, were obtained with the St Andrews Photometer on the 1.0 m telescope at SAAO, Sutherland and have been transformed on to the standard system through observations of E-region stars (Menzies et al. 1980). The comparison and check stars, all of which were constant to less than 0.01 mag over the periods of the observations, and their adopted magnitudes are listed in Table I.

AB Tel

Hoffmann (1980) obtained only a partial light curve for AB Tel, but from two timings of a minimum (2444435.5645 and 2444441.7580) derived a period of 0.32597 d. Using the method of Kwee and van Woerden (1956), the minimum covered by the SAAO observations is at HJD 2445885.45616 ± 0.00006, which corresponds to a phase of 0.930 using Hoffmann's ephemeris. The depth of the minimum is $\Delta V=0.63$ and $\Delta B=0.66$ mag. Assuming that the light curve has not changed in shape, this is not the minimum observed by Hoffmann which has depths $\Delta V=0.72$ and $\Delta B=0.72$ mag.

Hoffmann states that there are indications that the minimum he observed represents an annular eclipse, and concludes that the mass ratio (q) of the components is at least 0.5. Using the atlas of Anderson and Shu (1979), the SAAO observations taken in conjunction with Hoffmann's observations suggest $q \gtrsim 0.6$ and $i \sim 80^{\circ}$. The B-V colours of AB Tel are 0.76 at minimum and 0.73

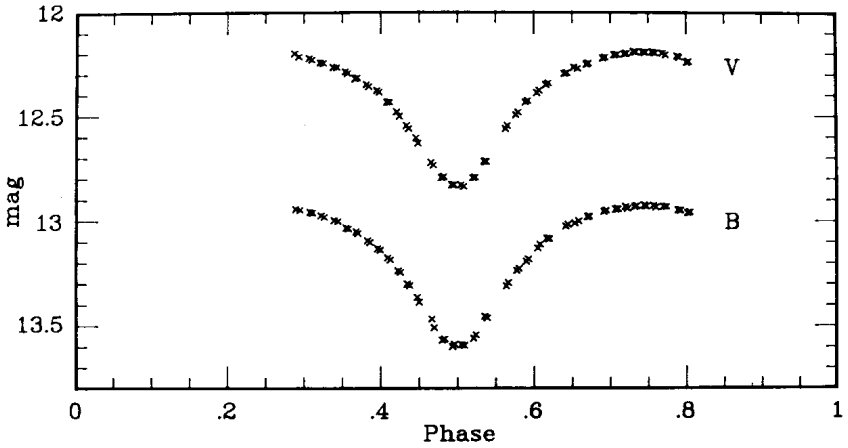

Figure 1. V and B light curves of AB Tel. The phase has been calculated using Hoffmann's period and the minimum has been arbitrarily shifted to phase 0.5.

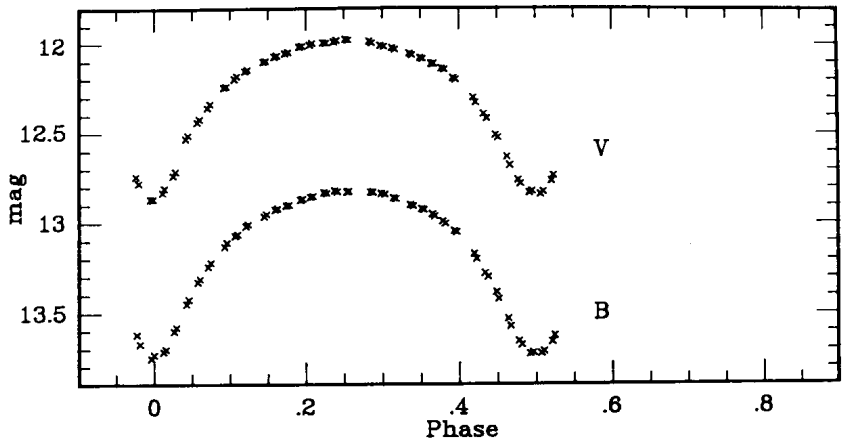

Figure 2. V and B light curves of BF Pav. The phase has been calculated using Hoffmann's period and the first minimum has been arbitrarily shifted to phase 0.0.

Table I

		V	B-V	n
AB Tel	HD 171456	9.822 ± 0.002	1.083 ± 0.003	36
	HD 171846	9.550 ± 0.005	0.533 ± 0.003	4
BF Pav	CPD-59°7353	10.100 ± 0.003	0.129 ± 0.003	35
	HD 172081	9.273 ± 0.003	0.783 ± 0.003	4

at quadrature. The reddening is not expected to be large (E(B-V)~0.10) (Burstein and Heiles, 1982) indicating that AB Tel is a W-type W UMa system.

BF Pav

Hoffmann (1981) obtained an almost complete light curve (excepting the portion around one of the minima) for BF Pav, from which he derived a period of 0.3056 d and a time of minimum at HJD 2444438.7611. The SAAO observations cover the two minima and the intervening quadrature. The minima are not well defined, but the method of Kwee and van Woerden (1956) gives times of HJD 2445886.40884 ± 0.00014 and 2445886.56152 ± 0.00036 (the times of minima have been calculated for both B and V, and averaged). The errors on these times do not allow a refinement of the period, but should nevertheless be useful in a future study of possible period changes in BF Pav.

The present data confirms Hoffmann's conclusion that q~0.8 and i >80° and would indicate that the shape of light curve is unlikely to have changed in the period between the two sets of observations. The B-V colours are ~0.88 at the minima and 0.85 at quadrature, which, with the low expected reddening (Burstein and Heiles, 1982), suggest that BF Pav is a W-type W UMa system.

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