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# PHOTOMETRIC OBSERVATION OF VISUAL DOUBLE STAR ADS 9537 (BV Dra , BW Dra) BY AREA SCANNING TECHNIQUE

The two W UMa-type stars, BV Dra and BW Dra, members of the visual binary system ADS 9537, have been observed during eleven nights between February 8, 1984 and April 24, 1984. Photoelectric B, V observations were made with the 45 cm reflector at the Urals University observatory with the aid of the area scanning technique,proposed by Rakosch (1965) and Franz (1966).

The diameter of the seeing disk of the star image during the observational nights was 8" - 15". The angular separation of the visual binary system being about 16".3 (Yamasaki,1979), the diameter of the seeing disk was of the same size or smaller than the separation of components. That is why it was necessary to use the area scanning technique.

The scanning of the stellar images was realized by rotation of the four-side glass prism. The slit width used was 15". The scans, each consisting of 64 ten ms integrations of pulses arriving from the pulse-amplifier, were stored in the computer's memory. The profile data were typically obtained by summing of 80 scans by the method adopted by Warner et al. (1983). Reduction of the profile was made by the method similar to that described by Franz (1970, 1973).

The comparison star was BD+62° 1385. A total of 171 observations in V and 108 in B for both BV Dra and BW Dra were obtained. The scatter of the individual magnitudes m = m(var.)-m(comp.) near their mean light curves corresponds to standard deviations of $\pm 0^m.015$ and $\pm 0^m.016$ magnitudes in V and B, respectively.

The times of minima that were obtained by present observations are represented in Table I for BV Dra and Table II for BW Dra respectively.

The successive columns contain the heliocentric JD, the type of minimum, the O-C residuals for our minima times in two cases: using Yamasaki's ephemeris, $O-C_I$ and our $O-C_{II}$.

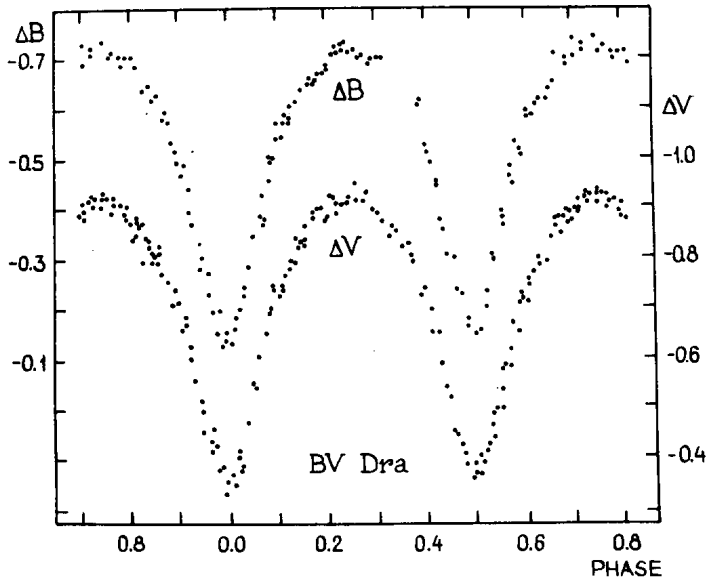


Figure 1

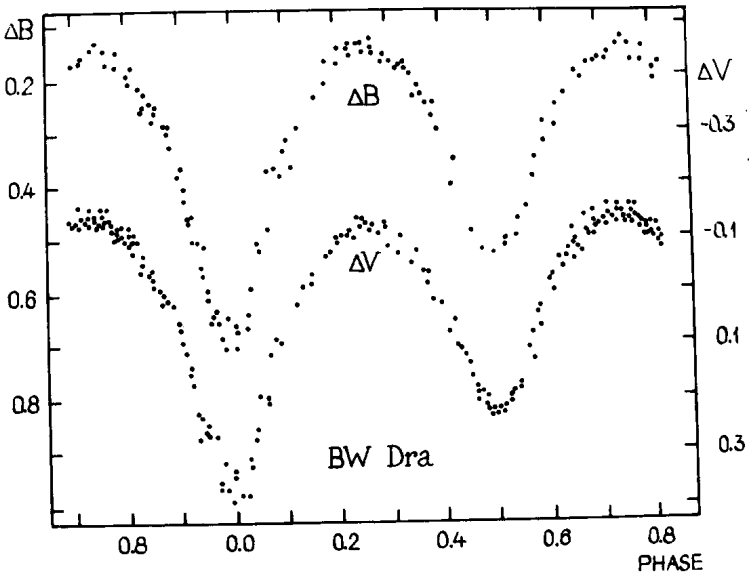


Figure 2

Table I

| $JD_\odot$ | type min. | $O-C_I$ | $O-C_{II}$ |
|---|---|---|---|
| 2445000 + | | | |
| 739.2897 | II | $+0^d.0052$ | $+0^d.0002$ |
| 740.3394 | II | +0.0046 | +0.0003 |
| 740.5131 | I | +0.0032 | −0.0017 |
| 753.2920 | II | +0.0048 | −0.0004 |
| 761.5191 | I | +0.0054 | +0.0001 |
| 762.2192 | I | +0.0054 | −0.0001 |
| 762.3937 | II | +0.0048 | −0.0006 |
| 763.2731 | I | +0.0091 | +0.0037 |
| 802.3026 | II | +0.0063 | +0.0003 |
| 813.3291 | I | +0.0057 | −0.0005 |
| 814.3792 | I | +0.0056 | −0.0006 |

Table II

| $JD_\odot$ | type min. | $O-C_I$ | $O-C_{II}$ |
|---|---|---|---|
| 2445000 + | | | |
| 740.3621 | II | $+0^d.0195$ | $+0^d.0016$ |
| 740.5052 | I | +0.0165 | −0.0014 |
| 753.3615 | I | +0.0175 | −0.0004 |
| 761.2500 | I | +0.0175 | −0.0003 |
| 762.2726 | II | +0.0175 | −0.0004 |
| 762.4190 | I | +0.0179 | −0.0001 |
| 763.2956 | I | +0.0180 | +0.0001 |
| 782.4332 | II | +0.0187 | +0.0008 |
| 802.3007 | II | +0.0190 | +0.0012 |
| 814.2782 | II | +0.0177 | −0.0001 |
| 814.4234 | I | +0.0168 | −0.0010 |

The times of minima do not agree well with the epochs given by Yamasaki (1979) for those two stars.

New period and epochs were determined as follows:

$$JD_{\odot}\text{minI} = 2445739.1145 + 0^{d}.350071\ E$$

for BV Dra and

$$JD_{\odot}\text{minI} = 2445740.2144 + 0^{d}.292165\ E$$

for BW Dra respectively. Figure 1 and 2 represent B and V light curves for BV Dra and BW Dra respectively.

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