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BW BOOTIS - AN ALGOL TYPE ECLIPSING VARIABLE

The star BW Boo (HD 128661 = BD +36°2509) was reported by Jackisch (1968) and Harris (1969) to be probably an eclipsing variable. The solution of its spectroscopic orbit by Gorza (1971) gives $P = 3^d.33284(2)$ $\Phi^d_{II} = 1^d.51$ where P is the period of radial velocity variation and Φ^d_{II} is the phase in days of the eccentric secondary minimum.

Photoelectric observations were made on 10 nights in yellow and on 3 nights in blue colours with the 20 cm Grubb f/12 refractor at the Cracow Astronomical Observatory Fort Skała. An uncooled photomultiplier FEU-17 manufactured in USSR (antimony - caesium cathode) together with the standard Schott filters for blue and yellow were used. In the reduction to Johnson's BV system the formulae derived by Dworak and Winiarski (1972) were adopted. The comparison and check stars were BD+36°2568 and BD +36°2530, respectively. No variation has been noticed between them.

Two times of primary minimum were determined and listed in Table I together with moments published by Jackisch and Harris. The O-C values were calculated with the new elements

JD hel Min I = 2440 362.9026 + $3^d.332821$ E.

Table II contains the observations in V and Table III gives the results of observations in B made on 2 nights near the primary minimum and on one night on the constant maximum. All measurements were corrected for differential extinction. ΔV and ΔB represent the corresponding brightnesses in magnitudes of the variable minus those of the comparison. The phases are calculated using recently derived elements.

The light curve in V is presented on the Figure 1.

BW Bootis seems to be an Algol type eclipsing system with the following properties:

range of light variation

primary minimum	$\Delta V = 0^m.260$	$\Delta B = 0^m.290$
secondary minimum	$\Delta V = 0^m.035$	lack of data

total duration of minima

primary	D I = 4^h40^m
secondary	D II = about 4^h50^m

deplacement of secondary
from the phase 0.5 about $-0^d.166$
phase of secondary $= 1^d.50$

Because of the uneven distribution of the phases of our observations a more detailed discussion of the period is not possible. Observations of BW Boo carried out at different geographical longitude are necessary to complete our knowledge on this variable.

Table I. Times of primary minima

JD hel	O-C	E	Observer
2438 906.4578	$-0^d.0020$	-437	Jackisch
40 362.9070	+0.0040	0	Harris
41 682.6960	-0.0037	+396	Kurpińska
42 152.6267	-0.0027	+537	Kurpińska

Table II. Observations in V

JD hel	ΔV	JD hel	ΔV	JD hel	ΔV
2441680.5806	-0.155	2441683.6411	-0.169	2441767.4901	-0.131
681.5416	-0.166	.6468	-0.151	.4984	-0.118
.5450	-0.155	.6490	-0.160	.5231	-0.132
.5540	-0.167	.6550	-0.148	.5283	-0.128
682.5781	-0.162	.6570	-0.161	.5301	-0.136
.5812	-0.130	.6820	-0.165	.5565	-0.125
.5866	-0.120	.6843	-0.167	.5589	-0.129
.5896	-0.140	.6907	-0.146	.5707	-0.144
.5959	-0.163	.6927	-0.163	.5815	-0.134
.6133	-0.101	.7147	-0.164	.5870	-0.142
.6192	-0.103	709.5907	-0.147	.5947	-0.152
.6264	-0.135	.6097	-0.149	.5970	-0.161
.6327	-0.052	.6117	-0.162	.6030	-0.149
.6472	-0.022	.6240	-0.153	.6058	-0.156
.6500	+0.002	.6259	-0.141	.6134	-0.146
.6575	+0.041	.6361	-0.163	.6155	-0.155
.6687	+0.020	.6386	-0.149	2442152.4969	-0.173
.6766	+0.092	.6490	-0.149	.4981	-0.143
.6798	+0.101	746.4860	-0.155	.5005	-0.158
.6894	+0.068	.4966	-0.144	.5024	-0.142
.6942	+0.084	.4992	-0.160	.5062	-0.153
.6995	+0.063	.5076	-0.164	.5075	-0.161
.7023	+0.098	.5098	-0.159	.5148	-0.147
.7096	+0.073	.5194	-0.161	.5161	-0.134
.7200	+0.061	.5256	-0.138	.5225	-0.134
.7230	+0.040	.5385	-0.144	.5239	-0.153
.7252	+0.022	758.4037	-0.157	.5300	-0.142
.7323	+0.024	.4177	-0.168	.5314	-0.159
683.6142	-0.171	.4205	-0.153	.5366	-0.134
.6162	-0.150	.5052	-0.162	.5378	-0.145
.6222	-0.157	.5166	-0.152	.5429	-0.103
.6247	-0.144	767.4454	-0.130	.5441	-0.096
.6302	-0.138	.4516	-0.138	.5511	-0.086
.6332	-0.148	.4648	-0.123	.5529	-0.108
.6399	-0.145	.4732	-0.130	.5572	-0.068

Table II cont.

JD hel	ΔV	JD hel	ΔV	JD hel	ΔV
2442152.5597	-0.096	2442493.5597	-0.147	2442493.5799	-0.146
.5691	-0.061	.5608	-0.158	.5812	-0.148
.5701	-0.059	.5630	-0.153	.5835	-0.155
.5723	-0.031	.5642	-0.148	.5845	-0.157
493.5483	-0.155	.5663	-0.154	.5869	-0.148
.5494	-0.146	.5674	-0.152	.5882	-0.153
.5519	-0.141	.5697	-0.150	.5899	-0.154
.5532	-0.146	.5717	-0.160	.5911	-0.159
.5556	-0.156	.5752	-0.169	.5935	-0.148
.5567	-0.167	.5774	-0.154		

Table III. Observations in B

JD hel	ΔB	JD hel	ΔB	JD hel	ΔB
2441682.5781	-0.183	2442152.4981	-0.188	2442493.5494	-0.197
.5812	-0.220	.5005	-0.188	.5519	-0.188
.5866	-0.181	.5024	-0.183	.5532	-0.182
.5896	-0.186	.5062	-0.145	.5556	-0.190
.5959	-0.216	.5075	-0.170	.5567	-0.193
.6091	-0.150	.5148	-0.187	.5597	-0.185
.6133	-0.124	.5161	-0.179	.5608	-0.194
.6192	-0.114	.5226	-0.154	.5630	-0.182
.6327	-0.154	.5239	-0.164	.5642	-0.177
.6472	-0.038	.5300	-0.173	.5663	-0.179
.6500	-0.023	.5314	-0.176	.5674	-0.189
.6575	-0.034	.5366	-0.156	.5697	-0.184
.6590	+0.007	.5378	-0.172	.5717	-0.188
.6687	+0.097	.5429	-0.139	.5752	-0.177
.6690	+0.071	.5441	-0.124	.5774	-0.188
.6766	+0.090	.5511	-0.145	.5799	-0.177
.6798	+0.084	.5529	-0.116	.5812	-0.177
.6913	+0.106	.5572	-0.084	.5835	-0.171
.7023	+0.104	.5597	-0.104	.5845	-0.173
.7200	+0.019	.5691	-0.098	.5869	-0.181
.7230	+0.055	.5701	-0.081	.5882	-0.176
.7323	0.000	.5723	-0.046	.5899	-0.175
2442152.4969	-0.211	493.5483	-0.194	.5935	-0.179

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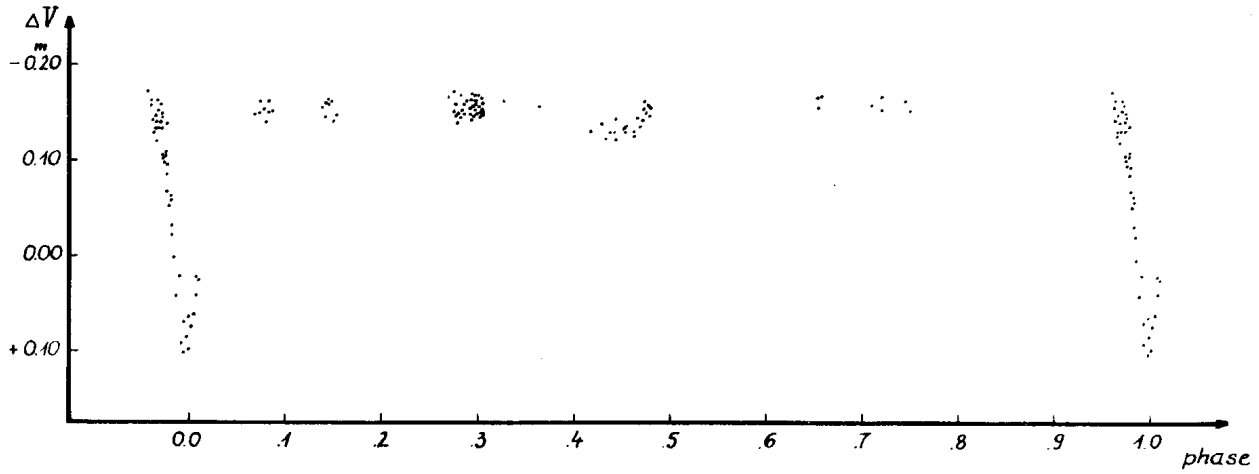

Fig. 1. Light curve of BW Bootis