

ROYAL ASTRONOMICAL SOCIETY OF NEW ZEALAND.

VARIABLE STAR SECTION.

CIRCULAR No. 173.

BR PAVONIS.

Frank M. Bateson, A.F. Jones & B. Menzies.

SUMMARY: V and B-V magnitudes are given for a comparison star sequence for BR Pav. Observations from 2,437,671 to 2,440,100 are published. A list of observed maxima and minima is given. The elements, which best fit the observations are:-

EPOCH (Maximum) $2,437,865 + 244.6$. Mean visual range
9.99 to 13.72.

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CHARTS & SEQUENCE: Charts 204 & 205 were published (1), showing SPv magnitudes for comparison stars to magnitude 10.4. Fainter comparison stars were designated by letters on chart 205. V and B-V magnitudes have been determined by Menzies for these stars, using as standard HD 191095 for which the Cape (2) values are:-

V = 6.36; B-V +0.06; Spec. A0

The complete sequence is listed in Table 1, the final column of which gives the adopted magnitudes, to tenths, to be used by visual observers. No magnitude appears for star "p" which appears to be variable with a range of 0.3 (V).

OBSERVATIONS: Observations from 2,437,671 (1962 Jan. 5) to 2,440,100 (1968 Aug. 31) appear in Table 2 as ten day means.

DISCUSSION: From plots of the individual observations a list of preliminary dates of maxima and minima were found. From these phases were used to form a mean light curve. This is given in Table 3, where, for each twenty-fourth part of the period, the phase, in days, and magnitudes are shown.

The mean light curve was used to improve the preliminary curve and the dates of maxima and minima so derived are given in Table 4.

The elements found are:-

EPOCH (Maximum) $2,437,865 + 244.6$.
MAXIMA MAGNITUDE:- Mean 9.99. Range 9.5 to 10.4
MINIMA MAGNITUDE:- Mean 13.72. Range 13.4 to <14.0

Table 4 gives, for both maxima and minima, the observed J.D. and magnitude; the interval, in days, between successive maxima or minima and weight on the usual basis of 1 (poor) to 5 (good). The final column gives O-C residuals for the above elements. The mean O-C residuals are:-

Max. $\pm 5.5^d$. Min. $\pm 3.6^d$.

Mean period from maxima is 244.55^d ; from minima 244.62^d . These compare with Hoffmeister's period of 251 days, epoch 2,428,000.

V.S.S. CIRCULAR No. 173 (cont).

ACKNOWLEDGEMENTS: We wish to thank the Board of Trustees of the Auckland Observatory for the use of their 50cm Zeiss reflector and auxiliary equipment for the determination of the magnitudes of the sequence stars.

This paper follows the normal procedure in the publications of this nature. A.F. Jones has contributed the majority of the observations. B Menzies and assistants made the magnitude measurements of the sequence stars, whilst the reduction and discussion of the observational material is the work of Frank M. Bateson.

1971 January 12

18 POOLES ROAD,
GREERTON.
TAURANGA.
NEW ZEALAND.

REFERENCES:-

1. Bateson, F.M., Jones, A.F. & Stranson, I. "Charts for Southern Variables", Series 6. 1969. Published by F.M. Bateson.
2. Cousins, A.W.J. & Stoy, R.H. Royal Obs. Bull. 64, 1963.

TABLE 1.

COMPARISON STARS FOR BR PAVONIS.

<u>CHART LETTER</u>	<u>CPD or CoD.</u>	<u>SP_v</u>	<u>V</u>	<u>B-V</u>	<u>ADOPTED.</u>	
a	CPD -58°	7718	7.95	-	8.0	
b	-57	9596	8.93	8.77	+0.3	8.8
c	-58	7713	9.36	-	-	9.4
d	-58	7716	9.99	-	-	10.0
e	-58	7720	10.38	-	-	10.4
g	-57	9614	...	10.44	+1.2	10.4
k	CoD -57	7879	...	11.36	+1.1	11.4
l	CPD -57	9615	...	11.54	+0.5	11.5
n	...	...	...	12.30	+1.1	12.3
o	...	...	...	12.81	+0.4	12.8
p	...	...	...	Not determined; appears variable over 0.3m		
r	...	...	...	13.36	+1.4	13.4
s	...	...	...	13.76	+0.7	13.8

TABLE 2.

BR PAVONIS--TEN DAY MEANS.

2,430,000 +											
<u>MEAN JD</u>	<u>MEAN MAG_v</u>	<u>MEAN JD</u>	<u>MEAN MAG_v</u>	<u>MEAN JD</u>	<u>MEAN MAG_v</u>	<u>MEAN JD</u>	<u>MEAN MAG_v</u>	<u>MEAN JD</u>	<u>MEAN MAG_v</u>	<u>MEAN JD</u>	<u>MEAN MAG_v</u>
7671	10.4	7942	11.7	8197	12.6	8357	9.3	8616	9.9	8722	13.8
701	<10.4	8043	11.4	233	<13.8	367	9.3	626	10.2	735	<13.4
798	11.5	053	10.6	241	14.1	380	9.7	641	10.4	765	12.3
825	10.2	089	10.4	264	12.7	403	10.4	651	10.5	785	11.0
839	10.3	105	10.4	280	11.2	420	11.6	664	11.4	804	10.6
853	10.4	122	10.4	300	10.6	478	<13.4	671	11.5	820	10.4
868	9.8	140	10.3	309	10.4	534	11.7	679	12.1	848	10.4
883	9.7	153	10.6	318	10.4	554	11.5	695	13.5	864	10.3
906	10.4	168	10.8	335	9.9	567	10.5	703	<13.4	881	10.3
917	10.4	180	11.4	350	9.7	593	10.3	710	<13.4	888	10.3

V.S.S. CIRCULAR No. 173 (cont).

TABLE 2 (cont).

2,430,000 +							
<u>MEAN</u>	<u>MEAN</u>	<u>MEAN</u>	<u>MEAN</u>	<u>MEAN</u>	<u>MEAN</u>	<u>MEAN</u>	<u>MEAN</u>
<u>JD</u>	<u>MAG_v</u>	<u>JD</u>	<u>MAG_v</u>	<u>JD</u>	<u>MAG_v</u>	<u>JD</u>	<u>MAG_v</u>
8907	11.4	9233	13.7	9575	10.2	9910	12.2
918	11.5	263	12.0	599	10.35	919	12.3
932	12.4	271	11.5	616	10.4	939	12.7
952	13.4	285	10.3	628	10.4	975	12.0
971	13.8	294	10.20	646	11.4	985	11.8
977	13.7	306	9.9	656	11.63		
9023	12.1	320	9.3	670	12.2	2,440,000+	
034	11.2	329	9.85	760	11.40	003	11.7
047	10.4	345	10.3	772	10.4	013	11.2
056	10.4	358	10.1	785	10.1	038	10.1
067	10.1	379	11.2	791	10.05	067	9.9
095	10.1	394	11.2	800	9.75	083	9.9
113	10.0	410	11.80	817	9.8	094	10.2
141	10.4	419	11.7	832	9.8	100	10.4
152	11.1	506	11.2	851	10.25		
165	11.5	527	10.4	869	10.4		
205	<11.4	539	10.2	890	11.2		
217	13.8	563	9.6	900	11.6		

TABLE 3

BR PAVONIS--MEAN LIGHT CURVE

<u>24th PART</u>	<u>PHASE</u>	<u>MAG</u>	<u>24th PART</u>	<u>PHASE</u>	<u>MAG</u>	<u>24th PART</u>	<u>PHASE</u>	<u>MAG</u>
	<u>d</u>	<u>v</u>		<u>d</u>	<u>v</u>		<u>d</u>	<u>v</u>
0	0	9.99	8	82	12.10	16	163	12.26
1	10	10.02	9	92	12.57	17	173	11.77
2	20	10.10	10	102	13.03	18	184	11.14
3	31	10.23	11	112	13.30	19	194	10.75
4	41	10.46	12	122	13.40	20	204	10.48
5	51	10.81	13	133	13.28	21	214	10.23
6	61	11.20	14	143	13.10	22	224	10.10
7	71	11.62	15	153	12.79	23	235	10.03

TABLE 4.

BR PAVONIS--OBSERVED MAXIMA & MINIMA.

<u>J.D.</u>	<u>MAXIMA</u>				<u>J.D.</u>	<u>MINIMA</u>			
	<u>MAG.</u>	<u>INT</u>	<u>Wt.</u>	<u>Q-C</u>		<u>MAG</u>	<u>INT</u>	<u>Wt</u>	<u>Q-C</u>
	<u>v</u>	<u>d</u>		<u>d</u>		<u>v</u>	<u>d</u>		<u>d</u>
2,437,865	9.8	...	4	+ 0	2,437,993	13.4?	...	1	- 3
2,438,105	10.4	240	5	- 5	2,438,236	14.2	243	3	- 4
	356	251	3	+ 2	480	<14.0	244	1	- 5
	603	247	4	+ 4	724	<14.0	244	3	- 5
	849	246	4	+ 6	976	13.8	252	3	+ 2
2,439,092	10.1	243	4	+ 4	2,439,222	13.8	246	4	+ 3
	323	231	5	-10	456	13.4	234	4	- 7
	565	242	5	-12	710	<13.0	254	2	+ 2
	814	249	5	- 7	950	<12.8	240	2	- 2
2,440,066	9.9	252	2	+ 0					
	570	9.8	...	1	+14				
	803	10.0	233	3	+ 3				