

ROYAL ASTRONOMICAL SOCIETY OF NEW ZEALAND.

VARIABLE STAR SECTION.

CIRCULAR No. 174.

SU PAVONIS.

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

SUMMARY: V and B-V magnitudes for a sequence of comparison stars are given. Visual observations from 2,437,701 to 2,440,100 are published together with ten maxima found from these observations. Minima were not observed being below the limits of the instruments used.

SU Pav is of Mira Ceti type with a mean range of 9.14 to <14.2 visual. Using Shapley's original Epoch (Maximum) of 2,411,153 the best period is 245.25 days.

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CHART & SEQUENCE:

Chart 206 (1) designates comparison stars by letters. V and B-V magnitudes have now been determined by Menzies for these stars, the values being given in Table 1. The final column of this Table gives the V magnitude, rounded off to tenths, to be used in future by visual observers.

Procedures in determination of sequences have been detailed elsewhere (2).

One star, lettered "s" on chart 206, appears to be variable over 1.0 mag. at least in V. Observers should not use this star for comparison purposes.

OBSERVATIONS:

Visual observations from 2,437,701 to 2,440,100 are listed in Table 2. Forty-one observations by A.F. Jones in which "s" was used have been omitted because of its variability.

DISCUSSION:

Shapley (3) gave elements for SU Pav as:-

EPOCH (max). 2,411,153 + 245 days. Range 9.4 to <13.4 ptg.

The G.C.V.S. (1970) gives:-

EPOCH (MAX). 2,430,037 + 244.8 days. Range 9.6 to <14 ptg.

Combining these two results the best period is 245.25 days from 77 maxima between these dates. This agrees with the period given by Gaposchkin (4).

The best value from the present observations is:

EPOCH (Max). 2,438,685 + 245.^d.3. Range Mean Max. 9.14
(8.6 to 9.6). Min. <14.2 visual.

O-C residuals for these elements average $\pm 2.^d.9$. If Shapley's original epoch is used the best period, fitting the present observations, is 245.82 days with O-C residuals averaging ± 3.0 days.

V.S.S. CIRCULAR No. 174 (cont).

Minima have not been observed because the variable decreases to well below the limit of the instruments used.

When the Epoch of 2,430,037 from the G.C.V.S. (1970) is compared with the present observations a period of 247.1 days fits best leaving O-C residuals of ± 5.5 days. It seems that a slightly longer mean period operated for at least part of the time between 2,430,037 and the present observations.

Observed maxima are listed in Table 3, in which the first column gives the reference number to each maximum counted from Shapley's original maximum as No. 1. Successive columns give observed dates of maxima; visual magnitude; interval in days between successive maxima and the weight attached to each maximum on the usual basis of 5 (good) to 1 (poor). The O-C residuals in columns six and seven refer respectively to Epoch 2,438,685 ± 245.3 days and Epoch 2,411,153 ± 245.82 days.

ACKNOWLEDGEMENTS:

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This paper follows the normal procedure in the publications of this nature. A.F. Jones has contributed the main observations; B. Menzies, assisted by P. Gordon, made the magnitude measures of the sequence stars, while the reductions and discussion of the observational material is the work of Frank M. Bateson.

1971 January 12

18 POOLERS 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. Bateson, F.M. & Menzies, B. Circ. 148, VSS, RASNZ, 1970.
3. Shapley, H. HB 803, 1924.
4. Gaposchkin, S. HA 115, 2, 1945.

TABLE 1.

		COMPARISON STARS FOR SU PAVONIS.			
CHART LETTER	CPD or CoD	CPD or CoD	V	B-V	ADOPTED.
a	CPD	-60° 7367	8.07	+ 1.0	8.1
c		-60 7387	8.97	+ 0.7	9.0
b		-60 7371	9.10	+ 0.5	9.1
d		-60 7376	9.22	+ 1.0	9.2
e		-60 7373	9.37	+ 1.2	9.4
g		-60 7377	9.55	+ 1.5	9.6
f		-60 7379	9.88	+ 0.7	9.9
h		-60 7385	10.08	+ 1.4	10.1
k	CoD	-60 7394	10.25	+ 1.3	10.3
l	CoD	-60 7398	10.54	+ 1.1	10.5
m	CoD	-60 7386	10.76	+ 1.2	10.8
n	CoD	-60 7393	11.38	+ 0.9	11.4
p		...	11.98	+ 1.3	12.0
s	Not determined; appears variable in V over 1.0m at least				
u		...	13.45	+ 0.7	13.5

V.S.S. CIRCULAR No. 174 (cont).

TABLE 2.

VISUAL OBSERVATIONS OF SU PAVONIS.

2,430,000 +				2,440,000+			
J.D.	MAG.	J.D.	MAG.	J.D.	MAG.	J.D.	MAG.
7701	9.1	8335	<12.0	8907	10.9	9329	<13.5
753	10.3	403	<12.0	918	9.6	330	<13.5
766	11.4	420	11.9	932	9.6	345	14.1
917	11.5	462	10.2	943	9.6	358	13.7
943	9.0	478	10.9	952	9.4	394	10.8
959	9.1	493	11.9	971	10.2	401	9.8
972	9.4	534	<13.5	977	10.5	414	9.2
990	10.3	593	<13.5	9001	11.5	419	9.2
8001	10.7	616	14.1	008	11.9	440	9.4
012	11.6	626	14.1	047	13.8	442	9.1
022	12.2	651	11.6	056	<13.5	459	10.0
034	<12.0	664	10.2	067	<13.5	467	10.3
053	13.7	671	9.8	095	<13.5	474	10.8
089	<13.5	679	9.6	141	10.4	527	<13.5
168	11.3	695	9.2	152	9.7	539	<13.5
180	9.4	703	9.6	165	9.0	563	<13.5
197	8.8	710	9.9	190	8.7	575	<13.5
208	9.2	722	10.0	201	9.4	596	<13.5
233	9.8	735	10.4	217	10.3	602	<13.5
241	10.4	752	11.4	233	11.4	628	13.4
254	10.7	765	11.7	249	12.1	646	10.3
264	11.9	804	<13.5	285	<13.5	656	9.7
290	13.7	820	<13.5	295	<13.5	657	9.8
309	<13.5	848	<13.5	306	<13.5	670	9.5
318	<13.5	864	13.7	320	<13.5	681	9.6

TABLE 3.

SU PAVONIS--OBSERVED MAXIMA.

No.	J.D.	MAG _v	INT. d	Wt.	O-C(1) d	O-C (2) d
109	2,437,705	9.1	...	1	+ 1	+ 3
110	946	9.0	241	3	- 3	- 1
111	2,438,193	8.8	247	3	- 1	± 0
112	447	9.4?	254	1	+ 7	+ 8
113	685	9.2	238	5	± 0	± 0
114	933	9.6	248	4	+ 3	+ 2
115	2,439,172	8.6	239	3	- 4	- 4
116	420	8.8	248	4	- 1	- 2
117	670	9.5	250	4	+ 4	+ 2
118	906	9.4	236	4	- 5	+ 8

N.B.

O-C (1) 2,438,685 ± 245.3 days

O-C (2) 2,411,153 + 245.82 days