

ROYAL ASTRONOMICAL SOCIETY OF NEW ZEALAND.

VARIABLE STAR SECTION.

CIRCULAR No. 178.

RZ INDI.

Frank M. Bateson & A.F. Jones.

SUMMARY: Visual observations of RZ Indi are published for the interval 1957 to 1970. Eighteen observed maxima are tabulated. Elements derived are:-

EPOCH (Max). J.D. 2,436,454 + 255d. Mean max. mag. 9.05 visual; min. mag. <14.0.

RZ Indi is a typical Mira Ceti variable with a light curve characteristic of stars with periods around 250 days.

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INTRODUCTION: RZ Indi was discovered by Hoffmeister (1), who gave its range as 10.0 to <13.5 ptg. He assigned it to Mira Ceti class but gave no period. The G.C.V.S. (1970) gives the range as 10.0 to 15.0 ptg. but no period.

CHARTS & SEQUENCE: Hoffmeister (2) published an identification chart; Bateson, Jones & Stranson (3) published charts 218 and 219, on which comparison stars were identified by letters, pending determination of their magnitudes. These have now been published by Bateson, Gordon & Menzies (4).

OBSERVATIONS: Visual observations from J.D. 2,436,110 (1957 Sept. 28) to 2,440,922 (1970 Nov. 30) are given in Table 1. The individual observations, with observers' abbreviations omitted, are listed as they are too scattered in time to warrant ten day means.

DISCUSSION: The observed maxima derived from the observations are given in Table 2. Successive columns list the number for each maximum; observed date; visual magnitude; interval between successive maxima; O-C residuals and weight on the usual scale of 1, poor, to 5, good.

The O-C residuals are based on Epoch (Max.) 2,436,454 + 255 days. The mean O-C difference is + 5.8 days. Mean visual magnitude at maximum is 9.05, ranging from 8.4 to 10.4. Minimum have been unobserved and the star is then probably < 14.0.

RZ Indi is a typical Mira Ceti type variable with a curve resembling S Hya with steep rise and decline and a short, sharp maximum. The shape of the curve down to the observed limits suggests that minima are also brief and sharp.

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1971 July 30

18 POOLES ROAD,
GREERTON.
TAURANGA.
NEW ZEALAND.

V.S.S. CIRCULAR No. 178 (cont).

REFERENCES:

- (1) 1949. Hoffmeister, C. Erg. A.N. 12, 1.
- (2) 1957. Hoffmeister, C. M.V.S. 321.
- (3) 1969. Bateson, F.M., Jones, A.F. & Stranson, I. "Charts for Southern Variables" Series 6. Published by F.M. Bateson.
- (4) 1971. Bateson, F.M., Gordon, P. & Menzies, B. Circ. 177, V.S.S., RASNZ.

TABLE 1.

RZ INDI--VISUAL OBSERVATIONS.

2,430,000 +

<u>J.D.</u>	<u>MAG.</u>	<u>J.D.</u>	<u>MAG.</u>	<u>J.D.</u>	<u>MAG.</u>	<u>J.D.</u>	<u>MAG.</u>	<u>J.D.</u>	<u>MAG.</u>
6,110	12.3	6,843	<12.8	7,571	12.6	8,384	<12.6	9,228	10.4
114	12.3	851	<12.8	580	12.6	405	<12.1	237	9.2
123	11.9	864	<12.8	601	<12.4	471	10.7	238	9.6
133	11.7	893	12.7	614	<12.6	495	10.4	263	9.0
141	11.2	900	12.6	638	<12.4	508	10.3	275	8.6
153	10.9	931	11.0	662	<12.1	526	10.3	288	9.3
171	9.4	968	9.2	671	<12.1	536	10.4	299	10.4
185	8.3	986	9.6	728	9.9	553	11.0	306	11.1
225	10.5	7,000	10.6	734	9.9	568	11.3	320	11.9
261	12.7	026	11.9	761	10.5	588	12.1	321	11.4
283	<12.6	042	12.6	768	10.7	623	12.5	330	12.2
312	<12.6	058	<12.1	796	12.6	637	<12.6	347	12.4
341	<12.6	081	<12.8	824	12.5	650	<12.6	358	12.6
354	<12.8	101	<12.8	839	<12.6	665	<12.6	402	<12.6
365	<12.8	113	13.1	857	<12.1	679	12.9	414	12.5
375	<12.8	130	12.8	867	<12.4	695	12.0	440	12.6
384	<12.8	144	12.7	883	<12.4	703	11.7	443	12.8
398	13.1	159	12.0	906	<12.4	716	11.1	452	12.6
410	12.3	172	12.0	917	12.9	727	9.9	463	11.3
422	11.0	189	11.1	943	11.8	736	9.1	474	10.9
432	10.4	202	9.3	946	11.5	752	9.3	506	9.2
450	9.3	205	9.2	962	10.7	757	9.0	544	10.7
461	9.3	218	8.5	973	9.6	765	9.3	563	11.3
484	10.3	229	8.8	997	9.2	773	10.0	597	12.5
498	11.6	239	8.6	8,006	9.3	806	10.7	627	<12.6
507	12.1	246	9.2	015	9.6	823	11.0	630	<12.8
517	12.2	251	9.6	023	10.1	864	12.6	656	<12.1
525	12.4	258	10.2	029	10.6	877	13.2	652	<12.8
543	12.5	262	10.6	034	10.7	888	13.0	670	<12.1
550	<12.6	281	11.3	048	11.2	916	<12.6	671	<12.8
570	<12.4	287	12.1	084	<12.1	941	11.9	678	<12.6
576	<12.1	313	12.5	116	<12.6	952	11.1	709	12.3
649	12.1	372	<12.1	140	12.8	973	10.5	735	10.9
662	11.0	388	12.6	155	12.6	979	10.4	757	9.2
680	10.4	408	12.0	168	12.7	9,001	8.7	765	8.9
697	9.6	419	11.5	179	12.5	008	8.9	772	9.0
711	8.7	437	11.0	202	10.7	023	9.2	775	9.0
720	8.8	457	9.3	210	11.0	034	9.3	787	9.4
727	8.7	465	7.9	236	9.5	048	10.7	788	9.6
736	9.2	476	8.4	245	9.3	049	10.6	795	9.7
751	9.9	492	9.0	254	10.0?	064	10.9	807	10.7
760	10.9	506	9.4	264	9.2	095	12.9	816	11.3
767	11.3	522	10.6	271	9.3	106	12.8	832	12.3
782	12.0	530	11.1	290	10.4	141	<12.4	843	13.0
791	12.3	545	12.0	301	11.1	183	12.2	851	<12.4
806	12.7	558	12.7	309	11.3	200	11.6	876	<12.4
820	<12.6	559	12.5	318	11.9	217	10.6	939	12.6

V.S.S. CIRCULAR No. 178 (cont).

TABLE 1. (cont).

2,430,000 + 2,440,000 +

<u>J.D.</u>	<u>MAG.</u>	<u>J.D.</u>	<u>MAG.</u>	<u>J.D.</u>	<u>MAG.</u>	<u>J.D.</u>	<u>MAG.</u>
9,953	12.4	015	9.6	464	12.1	823	10.6
971	12.0	038	9.7	464	12.0	832	11.3
984	11.4	055	10.8	470	12.1	858	11.9
999	10.9	068	11.3	495	10.4	867	12.5
		093	12.4	527	9.6	881	12.2
		116	12.7	538	9.2	890	<12.1
		144	<12.8	555	10.0	891	<12.1
		158	<12.6	771	9.0	910	<12.1
				791	9.0	916	<12.1
						918	<12.1
						922	<12.1

TABLE 2.

RZ INDI---OBSERVED MAXIMA.

<u>MAX. No.</u>	<u>OBSERVED. J.D.</u>	<u>MAX. VIS. MAG.</u>	<u>INT. d</u>	<u>O-C d</u>	<u>Wt.</u>
- 1	2,436,185	8.4	...	-14	3
± 0	454	9.3	269	± 0	5
+ 1	712	8.8	258	+ 3	5
2	965	9.2	253	+ 1	3
3	2,437,219	8.6	254	± 0	5
4	470	8.5	251	- 4	3
5	713?	9.6?	243	-16	1
6	984	9.1	271	± 0	4
7	2,438,247	9.0	263	+ 8	5
8	514	10.0?	267	+20	3
9	751	8.8	237	+ 2	3
10	2,439,000	8.7	249	- 4	4
11	257	8.6	257	- 2	4
12	502	9.0	245	-12	2
13	765	8.9	263	- 4	3
14	2,440,022	10.4	257	- 2	4
15
16	538?	9.2?	...	+ 4	2
17	780?	8.8?	242	- 9	2