ROYAL ASTRONOMICAL SOCIETY OF NEW ZEALAND.

VARIABLE STAR SECTION.

CIRCULAR NO. 97.

The U Geminorum Variable 080976 Z Chamaeleontis.

by

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SUMMARY. Observations of 080976 Z Cha from J.D. 2,434,873 to 2,436,658 are published. Observed dates of maxima are listed.

Z Cha is a U Geminorum type variable with an average cycle between maxima of 96.2 days. The visual range is 11.5 to fainter than 14.0. The rise is extremely steep for all maxima, but generally maxima brighter than 12.5 exhibit a much slower decline than those fainter than 12.5. For these latter maxima the decline is as steep as the rise.

INTRODUCTION. Z Chamaeleontis (1900:- R.A. 08h 09m 56s. Dec.-76° 14.6') was listed as No. 1244 (1) on the basis of Hoffmeister's observations (2). A Jones (3) confirmed variability and in the Second Edition of Kukarkin's Catalogue (4) the star is classified as of U Geminorum type with a photographic range of 12 to fainter than 13.5. The mean cycle is given as 66 days.

A diagram of the field, identifying the variable appeared in MVS 317 (5). Jones produced a field sketch and selected a number of comparison stars. Using this information the Director of Mount Stromlo Observatory kindly photographed the field and determined photo-electrically the visual apparent magnitudes of the comparison stars on the Johnson-Morgan system. In doing so the sequence was extended at its brighter end. A chart based on the Mount Stromlo photograph and details of the comparison stars will appear in the Third Series of charts to be issued by this Section (6). The Mount Stromlo magnitudes have been used for the present Circular.

DISCUSSION. Jones has kept this star under observation since 1954 May 10. The observations from that date to 1959 March 31st are published in this Circular in the usual form. The initials of the observer have been omitted to save space, as apart from 32 observations by Bateson, all the records are from Jones.

The extreme visual range is 11.5 to fainter than 14.0. Average cycle 96.2 days. Variability of U Geminorum type. The rise to maxima is invariably very steep, taking approximately a day to increase from fainter than 14.0 to 11.5 for the brightest maxima. The average maximum magnitude is 12.2. For maxima fainter than 12.5 the decline is almost, but not quite, as steep as the rise.

For maxima brighter than 12.5 the decline to invisibility is much slower than the rise, and occupies approximately 12 days. There is some evidence to show that bright(exceeding 12.5) and faint maxima alternate. However, this evidence is not conclusive since it is quite probable that several maxima have been missed due to the faintness of this variable and the steepness of its rise and fall.

Table 1 lists the dates of maxima observed. Much uncertainty exists as observations are generally not well distributed on both sides of maxima.

In Table 1 the columns give:-

(1) Dates of maxima.
(2) Magnitudes of maxima. A question mark indicates that the magnitude is uncertain.
(3) Weight; 5, being considered a very well determined maximum with well placed observations on both branches of the curve; 1, being unreliable and largely surmise.
(4) Interval. The intervals, in days, between successive maxima.

CIRCULAR NO. 97 (cont).

ACKNOWLEDGEMENTS.

My appreciation is due to the Director of Mount Stromlo Observatory for the photographic chart and magnitudes of the comparison stars.

Mr. A.F. Jones not only made the bulk of the observations but provided the preliminary field sketch and preliminary comparison stars. That the star has been followed so well is due entirely to his painstaking and assisduous observing.

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TABLE 1.

OBSERVED MAXIMA OF 080976 Z Cha.

J.D.	Mag.	Wt.	Int.d
2,434, 920.0	12.3	3	...
973.0	12.6	1	53.0
2,435, 040.1	12.8	2	67.1
119.0	12.5	1	78.9
171.7	12.1	3	52.7
216.8	12.7	3	45.1
379.2	12.5	1	162.4
474.0	11.5?	3	94.8
520.0	12.5?	1	46.0
558.0	12.7	1	58.0
688.0	12.4	4	130.0
814.5	11.5	3	126.5
2,436, 010.9	12.5	2	196.4
109.0	11.5	4	98.1
200.5	12.5	3	91.5
378.8	11.5	4	178.3
498.5	12.5	2	119.7
559.0	12.4	1	60.5
652.5	11.7	1	93.5

Circ. 97. OBSERVATIONS. EXTRACTED LIST OF PROLONGED MAXIMA.
Very short maxima (single positive observations) not included. Most negative observations (about 90% of total observations) are not included. Most records are due to A.F. Jones.

JD: 2,434,000+	Mv	JD: 2,435,000+	Mv	JD: 2,436,000+	Mv
915.86	(12.6	470.12	(12.8	008.75	(12.8
919.80	12.1	470.94	12.5	010.80	12.6
919.86	12.3	470.97	12.5	010.94	12.7
919.87	12.3	471.11	12.5	011.77	14.1
919.88	12.3	471.13	12.5	013.00	(14.0
919.92	12.3	471.92	12.5		
920.25	12.3	471.96	12.1	105.92	(13.8
920.96	12.3	472.11	11.5	106.89	12.5
921.83	12.2	476.16	12.5	106.92	12.5
922.00	12.3	477.02	12.8	109.85	11.7
924.81	12.6	477.92	12.6	110.03	11.8
925.85	12.7	478.94	12.7	110.84	12.1
926.84	12.7	479.94	13.0	112.19	12.5
928.83	12.8	480.10	12.8	112.84	12.5
929.79	13.0	480.96	12.8	113.87	12.5
931.27	(12.6	481.14	13.2	114.20	12.5
		482.00	(14.0	114.84	12.4
971.89	(12.6			117.17	12.8
972.89	12.6	518.20	(12.8	121.84	(13.4
972.95	12.6	518.20	13.4?		
974.80	(12.3	518.90	13.1	377.92	(13.4
974.99	(13.4	518.99	13.1	378.78	11.5
		521.93	(14.0	378.82	11.5
2,435,000+				379.26	11.5
037.90	(13.4	555.21	(14.0	381.26	11.9
040.08	12.8	556.18	13.7	381.82	11.7
040.14	12.9	556.22	13.0	382.21	11.5
040.98	13.5	557.90	(12.6	382.28	11.5
041.16	13.7			382.82	12.1
041.97	(13.4	685.83	(13.4	383.24	12.1
		687.89	13.2	383.78	12.5
116.15	(12.3	687.95	12.4	384.28	12.5
118.92	12.5	688.00	12.5	384.79	(12.3
118.97	12.5	688.27	12.5	385.88	12.5
120.12	12.9	688.79	13.2	386.84	13.0
124.94	(14.0	688.87	13.4	387.78	13.2
		688.95	13.1	390.84	14.0
163.94	(13.4	689.25	13.8	393.81	(13.8
169.87	12.5	690.82	(13.4		
170.13	12.6			497.16	(12.6
171.20	12.1	813.10	(13.4	497.92	13.4
172.13	12.6	814.96	11.5	498.17	12.8
173.17	12.1	815.01	11.6	498.98	(12.3
173.20	12.3	815.91	11.9	499.13	12.7
173.94	12.2	822.07	12.7	499.90	(12.6
175.89	12.7	825.93	13.4	500.17	14.0
176.21	12.7	827.13	(13.4	500.90	(12.6
181.87	(14.0				

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