

THE PERIOD OF GU ORIONIS

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Abstract

Times of minima observed over eight years permit the period of GU Orionis to be determined. The nature of this variable is yet unresolved.

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The Third Edition of the General Catalogue of Variable Stars (Kukarkin et al. 1969) (GCVS) lists GU Orionis as an Algol variable with a photographic magnitude range of 12.9 - 14.3. An Epoch of JD 2429306.34 is listed with no period.

A visual observing program was started in October 1976 at the Milwaukee Astronomical Society (MAS) Observatory. A magnitude sequence from Kurochkin was adapted for visual use. It became immediately evident that GU Orionis is continuously variable, similar to a W UMa variable. Within 100 days, eight times of minimum were obtained, permitting a rough period to be established. These observations are plotted by phase in Figure 1 using Equation 1.

Additional minima were observed in the following years to refine the period. The following elements were produced from these minima:

$$JD(\text{min}) = 2443069.903 + 0.470681 E. \quad (1)$$

Kurochkin (1948) published two times of minimum from photographic observations. Both of these minima show a large O-C using the elements in Equation 1. This large O-C indicates that the period of this star has not been constant over the past 50 years.

Although this paper treats GU Orionis as a W UMa variable, the distinction between the light curves of W UMa and RRc variables can be difficult to make. The light curve in Figure 1 indicates the possibility that the ascending branch may be steeper than the descending branch. The possibility exists that this star is an RR Lyr variable. In this case the period should be divided by 2 and the Epoch offset to predict times of maximum.

REFERENCES

- Kukarkin, B. V. et al. 1969, General Catalogue of Variable Stars, 3rd Edition, Moscow.
- Kurochkin, N. E. 1948, Perem. Zvezdy 6, 6, 303.

TABLE I

Visual Times of Minima Determined at the MAS Observatory

JD(hel)	E	O-C	Observer
2443069.914	0	0.011	G. Samolyk
3083.794	29.5	0.006	G. Samolyk
3100.729	65.5	-0.004	G. Samolyk
3100.976	66	0.008	G. Samolyk
3112.728	91	-0.007	G. Samolyk
3123.801	114.5	0.005	G. Samolyk
3131.790	131.5	-0.008	G. Samolyk
3165.679	203.5	-0.008	G. Samolyk
3165.688	203.5	0.001	G. Wedemayer
3436.801	779.5	0.002	G. Samolyk
3556.596	1034	0.009	G. Samolyk
3571.638	1066	-0.011	G. Samolyk
3879.705	1720.5	-0.005	G. Samolyk
4133.873	2260.5	-0.004	G. Samolyk
4236.731	2479	0.010	G. Samolyk
4520.775	3082.5	-0.002	G. Samolyk
4608.791	3269.5	-0.004	G. Samolyk
4634.683	3324.5	0.001	G. Samolyk
4670.692	3401	0.003	G. Samolyk
4957.809	4011	0.005	G. Samolyk
5060.652	4229.5	0.004	G. Samolyk
5298.805	4735.5	-0.008	G. Samolyk
5405.652	4962.5	-0.005	G. Samolyk
5762.665	5721	-0.004	G. Samolyk
6068.621	6371	0.009	G. Samolyk
6091.661	6420	-0.014	G. Samolyk
6144.640	6532.5	0.013	G. Samolyk

Note: E and O-C are calculated using Equation (1).

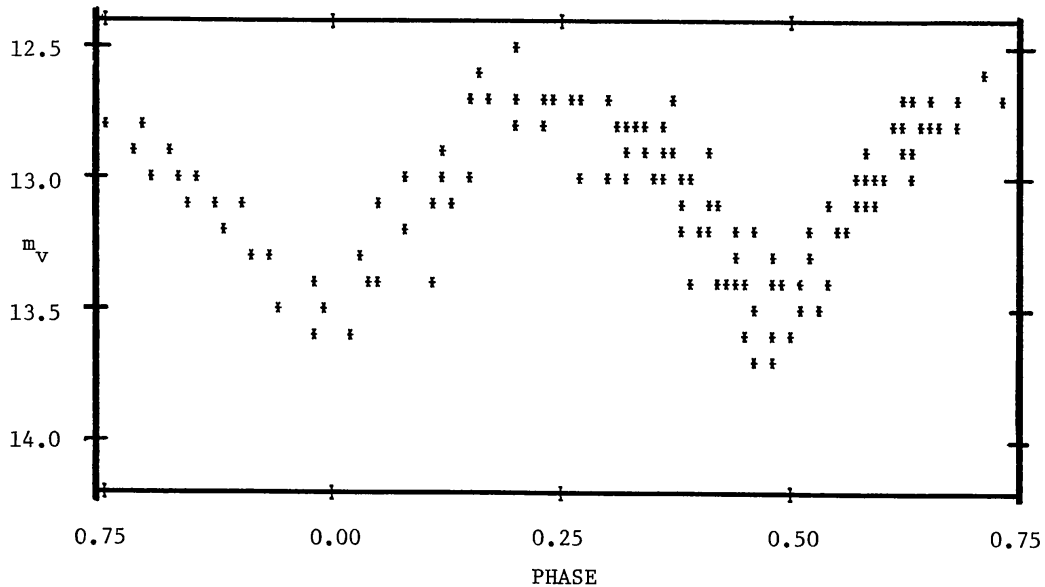


Figure 1. Observations of GU Orionis from 1976-1977 plotted by phase.

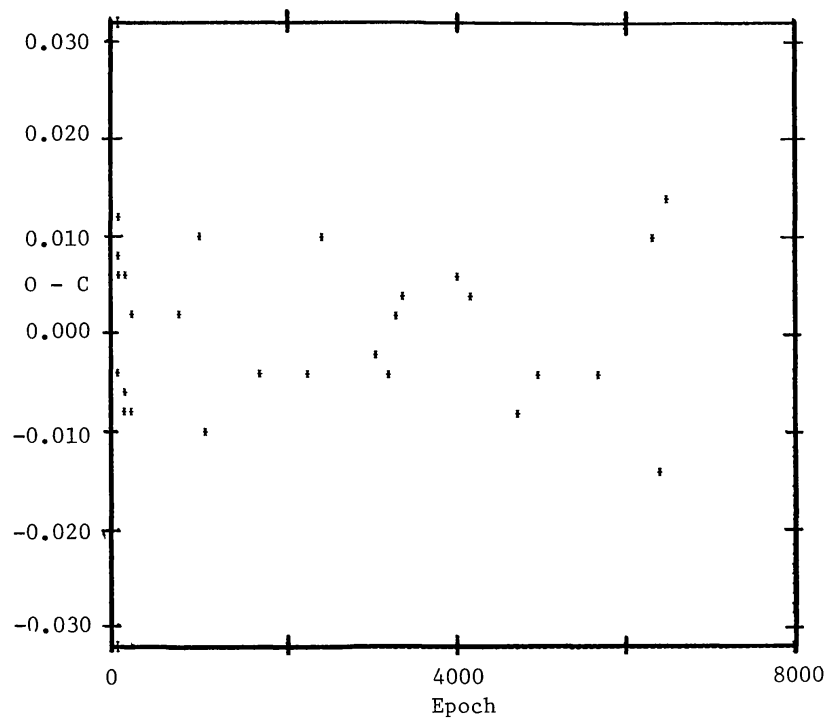


Figure 2. O-C plot for minima of GU Orionis observed at the MAS Observatory per Equation (1).

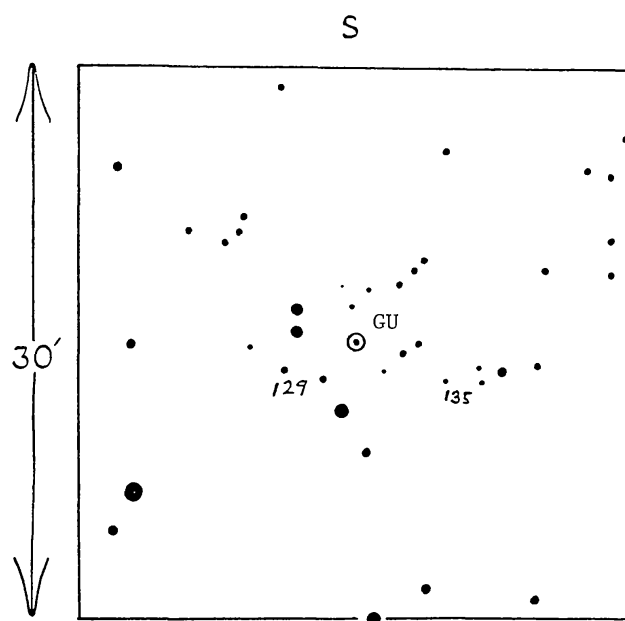


Figure 3. Comparison sequence used for GU Orionis. The variable is located at $\alpha = 06^{\text{h}} 10^{\text{m}}$, $\delta = +12^{\circ} 50'$ (2000).