

PHOTOELECTRIC PHOTOMETRY OF OW GEMINORUM AT PHASE 0.5

David B. Williams
9270-A Racquetball Way
Indianapolis, IN 46260

Donald P. Pray
40 Hillcrest Drive
Cranston, RI 02921

James E. Wood
11732 Faun Lane
Garden Grove, CA 92641

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Abstract

Differential V photometry of the 3.45-year eclipsing binary OW Gem near phase 0.5 shows no indication of a secondary minimum. This result supports the earlier conclusion that OW Gem is a highly eccentric binary system with secondary minimum occurring at phase 0.23.

1. Introduction

Williams (1989) reported differential V photometry of the long-period eclipsing binary OW Geminorum on 20 nights during 1988 and 1989. These observations showed OW Gem at maximum except for an interval of 10+ days centered at JD 2447535 when the variable was about 0.1 magnitude fainter. He suggested that this might be the secondary minimum. If this proves to be correct, OW Gem is a binary system with a highly eccentric orbit, the secondary eclipse occurring at photometric phase 0.23.

Before Williams' (1989) paper appeared in print, R. A. Wade called attention to the approach of phase 0.5 in mid-December 1989 (JD 2447873) and asked observers to monitor OW Gem in the hope of detecting the secondary minimum (Mattei 1989).

2. Observations

We responded to this request by making differential V measures throughout the month of December. We used the same comparison star adopted by Williams (1989), HD 46198 = SAO 95810. Pray observed with a 25-cm Newtonian reflector, Williams with a 28-cm Schmidt-Cassegrain, and Wood with a 25-cm Schmidt-Cassegrain. All three used Optec SSP-3 solid-state photometers.

Table 1 lists the observations, which are means of three or more measures corrected for differential extinction and transformed to V of the UBV system. The table also includes observations after the critical interval, which extend the coverage begun by Williams (1989). The point at JD 2447877 is about 0.06 magnitude brighter than the overall mean of the observations, and the point at JD 2447910 is about 0.07 magnitude fainter. These two points differ from the mean by about the same degree and are most probably just the extrema of observational scatter resulting from atmospheric and instrumental sources. The rest of the data indicate that OW Gem was constant at maximum throughout the period of observation.

We also received photoelectric observations on four nights by D. R. Currott, Florence, Alabama. He used a different comparison star, and the magnitude and color differences between his comparison star and ours are not accurately known. While his observations cannot be linked to ours, they also show OW Gem constant at the ± 0.02 magnitude level and support our results.

Table 1. Differential V photometry, OW Gem - SAO 95810

<i>HJD</i>	ΔV	<i>s.d.</i>	<i>Observer</i>
2447862.942	+0.307	+0.000	J. E. Wood
2447863.936	0.290	0.033	J. E. Wood
2447865.916	0.319	0.012	J. E. Wood
2447867.825	0.341	0.015	J. E. Wood
2447869.802	0.291	0.009	D. B. Williams
2447874.638	0.29	0.00	D. P. Pray
2447875.611	0.30	0.02	D. P. Pray
2447877.588	0.25	0.04	D. P. Pray
2447877.760	0.284	0.022	D. B. Williams
2447879.624	0.31	0.02	D. P. Pray
2447883.844	0.282	0.004	J. E. Wood
2447890.909	0.298	0.012	J. E. Wood
2447891.892	0.271	0.012	J. E. Wood
2447898.715	0.321	0.009	D. B. Williams
2447910.764	0.381	0.016	J. E. Wood
2447911.876	0.269	0.010	J. E. Wood
2447913.854	0.321	0.005	J. E. Wood
2447915.876	0.323	0.011	J. E. Wood
2447920.921	0.339	0.010	J. E. Wood
2447931.820	0.273	0.003	J. E. Wood
2447937.737	0.343	0.011	J. E. Wood
2447942.623	0.295	0.017	D. B. Williams
2447942.846	0.320	0.008	J. E. Wood
2447943.641	0.333	0.029	D. B. Williams
2447953.603	0.309	0.005	D. B. Williams
2447962.667	0.330	0.016	J. E. Wood
2447968.742	0.252	0.004	J. E. Wood
2447971.571	0.298	0.021	D. B. Williams
2448178.860	0.302	0.016	D. B. Williams
2448233.824	0.322	0.011	D. B. Williams
2448309.585	0.317	0.014	D. B. Williams
2448323.611	0.320	0.022	D. B. Williams

Our observations near phase 0.5 do not reveal any convincing, or even suggestive, indication of a secondary minimum. This increases the probability that the secondary eclipse occurred at phase 0.23 as observed by Williams (1989).

References

- Mattei, J. A. 1989, *AAVSO Special Alert Notice to Photoelectric Photometrists*.
 Williams, D. B. 1989, *J. Amer. Assoc. Var. Star Obs.*, 18, 7.