SAO 38830, A NEW ECLIPSING BINARY IN PERSEUS

MARVIN E. BALDWIN
Route 1
Butlerville, IN 47223

DANIEL H. KAISER
2631 Washington Street
Columbus, IN 47201

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Abstract

Visual observations indicate that a recently discovered eighth magnitude variable (SAO 38830) is an eclipsing binary with a period of 3.0461 or 6.0922 days.

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SAO 38830 (BD +39 784, HD 21155) is an 8.1 **V** star, spectral type B8, at RA $03^h\ 23^m\ 07^s.51$ DEC $+40^o\ 17'\ 02''.9$ (1950) (SIMBAD 1989). A search of the **General Catalogue of Variable Stars** (Kholopov et al. 1985) and the **New Catalogue of Suspected Variable Stars** (Kholopov et al. 1982) indicates that it is not known as a variable.

One of us (Kaiser), while conducting a photographic nova search by the PROBLICOM method supplemented by his own procedures (MacRobert 1988), noted that two photographs exposed near JD 2447502.61 indicated that the star SAO 38830 was approximately half a magnitude fainter than photographs he had taken on previous dates. He suspected that the star might be an eclipsing binary and notified Baldwin, who established a preliminary visual comparison star step sequence and proceeded to obtain 84 visual observations of this star on 54 nights from JD 2447531 through 2447749.

A finding chart for the variable and comparison stars are provided in Figure 1, and essential data are given in Table I.

On most occasions Baldwin found the suspected variable to be at step 23 or brighter, but it was found to be at step 24 or fainter on eight evenings. All episodes when the star was seen fainter than step 23 were found to fit to a period of a little more than three days. The resulting light curve is shown in Figure 2.

The following provisional elements should suffice for near-term prediction of times of minima:

$$JD_{(min)} = 2447502.566 + 3.0461\ E. \qquad (1)$$

The visual data are not sufficient to provide definitive information concerning secondary minima. The secondary minimum may be too shallow to detect visually or alternate minima reported here may be secondaries in which case the period must be doubled.

Answers to these questions await the participation of photoelectric observers. Since this variable is relatively bright amateurs with modest photoelectric equipment may be able to provide those answers.

REFERENCES

MacRobert, A. M. 1988, **Sky & Telescope 76**, 662.
SIMBAD, Strasbourg Astronomical Data Centre (CDS), Strasbourg, France, 1989.

TABLE I

Comparison Star Sequence for SAO 38830

Star	RA (1950)	DEC (1950)	Adopted visual step
V = SAO 38830	$03^h\ 23^m\ 7^s.51$	$+40^o\ 17'\ 2''.9$	**
A = SAO 38812	03 22 0.82	+40 46 40.5	10
B = SAO 38798	03 21 26.65	+40 35 5.6	20
C = SAO 38836	03 23 27.08	+40 25 2.4	25
D = SAO 38819	03 22 31.87	+40 17 28.7	35

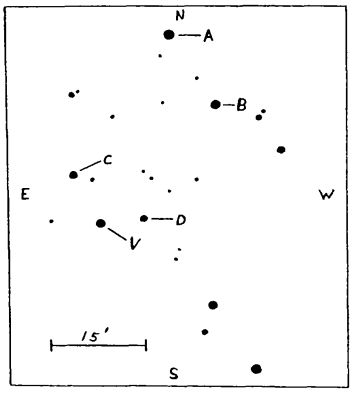

Figure 1. Finder chart for SAO 38830. Coordinates and adopted visual step values are listed in Table I.

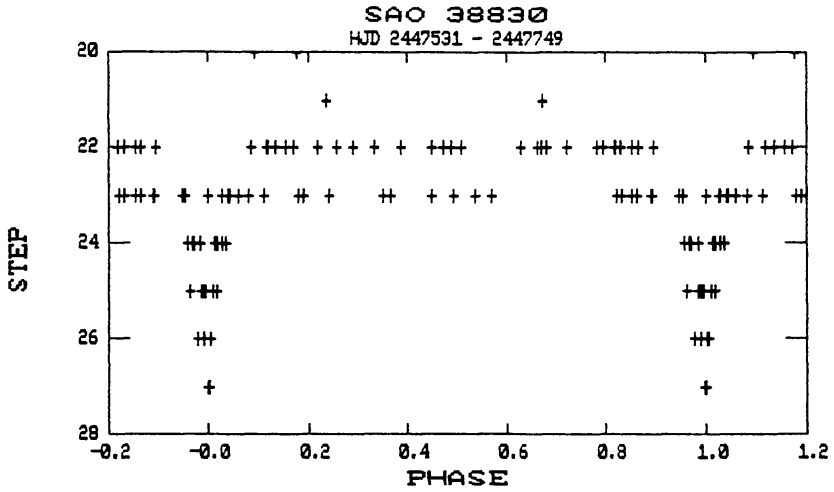

Figure 2. Visual light curve. Observations by Baldwin are reduced to heliocentric phase relative to provisional prediction elements: $JD_{(min)}$ = 2447502.566 + 3.0461 E.