GSC 01621-02192: A NEW W UMa ECLIPSING BINARY

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During a campaign of photometry on the outburst of WZ Sge in the summer of 2001, we discovered one of the stars in the field to be an eclipsing variable star of the W UMa type. We observed the star on 15 nights between July 25 and September 4, 2001, at the RIT Observatory (latitude +43.0758 North, longitude 77.6647 West, altitude 168 m). We made all measurements with a 25-cm Meade LX200 Schmidt-Cassegrain telescope at f/6.3 and SBIG ST-8E CCD camera equipped with BVI_C filters made to the prescription of Bessell (1990) to match the Johnson-Cousins system. Our exposure times ranged from 10 to 20 seconds. We performed aperture photometry with radii of 8.8 arcsec at early times (before August 16) and 6.6 arcsec at later times.

The raw instrumental magnitudes were combined using the inhomogeneous ensemble method of Honeycutt (1992), so that all the stars in the field (roughly 100) were used as comparisons. The ensemble method yields differential magnitudes with an arbitrary zero-point; we used HD 191083 to set the zero point of the magnitude scale, adopting the calibration of Henden and Landolt (2001). The data are available upon request from the author.

The position of the system appears in the GSC2.2 as (J2000) RA = 20:07:55.39, Dec = +17:31:16.5. Comparing positions from USNO-A2.0, GSC2.2, and 2MASS, we find a proper motion in Declination of $-0\rlap{.}''022 \pm 0\rlap{.}''003$ per year. A finding chart appears in Figure 1.

We used the PERIOD analysis package within STARLINK to determine the period of the system. Combining V-band data from 5 nights spanning a month yields 0.3690 ± 0.0006 days. See Figure 2 for light curves in B, V and I. The time of primary minimum is difficult to determine from our measurements, due to the low signal-to-noise ratio in each measurement. We estimate one time of primary minimum to be HJD 2452122.660 ± 0.002.

Our measurements of the magnitudes of the system at maximum light and the depth of the primary eclipse are shown in Table 1. The secondary minima are only slightly shallower than the primary minima: the difference is at most 0.1 mag.
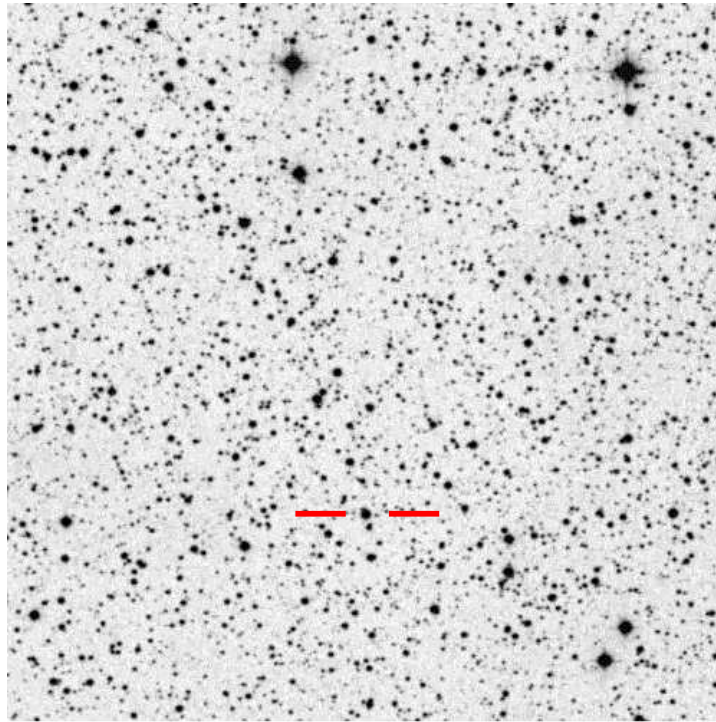
Figure 1. Finding chart for new variable; N up, E left, field is $14' \times 14'$.
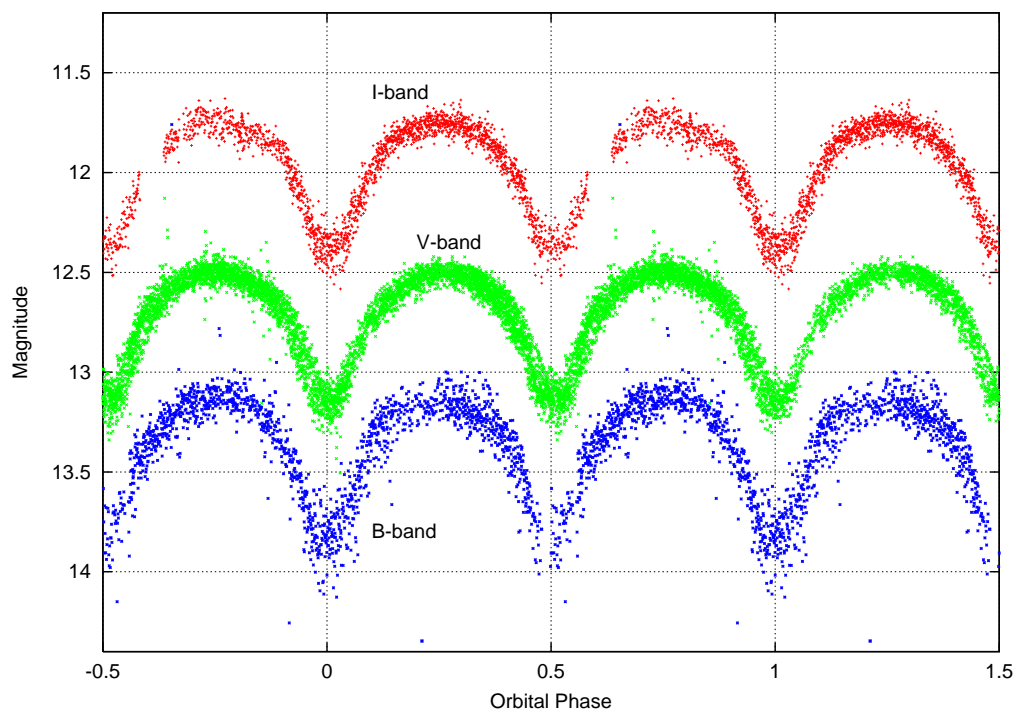
Figure 2. Light curves of new variable star

Table 1: Photometric properties of the light curve.

Passband	Max. brightness	Depth of primary eclipse
B	13.11 ± 0.03	0.70 ± 0.03
V	12.50 ± 0.02	0.69 ± 0.02
I_C	11.76 ± 0.02	0.65 ± 0.02

References:

Bessell, M. S., 1990, *PASP*, **102**, 1181
Henden, A. A., Landolt, A. U., 2001, *IBVS*, 5166
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