PHOTOMETRIC OBSERVATIONS OF A NEW ECLIPSING BINARY NSVS 8213217

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ABSTRACT. The photometric CCD observations for new suspected eclipsing binary NSVS 8213217 in Astronomical stations near Odessa (Ukraine) have been carried out. The light curves in V system were obtained and new adjusting period and light element was received. This star is identified as Algol-type eclipsing binary EA.

Key words: Stars: eclipsing binary variables: Algol-type - stars: individual: NSVS 8213217.

1. Introduction

NSVS 8213217 (UCAC4-574-077687, GSC 2126-2113), \((\alpha, \delta_{2000.0} = 19^h 04^m 43^s, \delta_{2000.0} = 24^\circ 43' 01'')\) was suspected as possible eclipsing binary systems by Hoffman, Harrison, McNamara (2009) using automated variable star classification of Northern Sky Variability Survey. They determined the primary period as \(P=3^{d}.26268\).

2. Observations

The photometric CCD observations in Astronomical stations near Odessa for this star were carried out together with others variable stars in Vulpecula constellation (in the field of Y Vul) during observational seasons 2011, 2012 and 2016 years. The 48 cm reflector AZT-3 with the f/4.5 Newtonian focus \((F=2024\ mm)\) equipped with CCD photometer UAI CCD (Sony ICX429ALL, 600x800 pixels) with V filter and Peltier cooler were used (Udovichenko, 2012). The exposure time for variable and comparison stars for the most part were chosen to except a saturation of frame and consist 90-120 sec. Two stars were chosen as comparison and check stars \((\text{comp}=\text{UCAC4-574-074580}, \ mV=12.93; \ \text{check}=\text{UCAC4-574-074571}, \ mV=14.15)\). More then 2800 CCD frames with this star and comparison/check stars were gathered during 28 nights of observations. The reductions of the CCD frames were carried out using the CMUNIPACK (Motl) software. The standard procedure for the aperture photometry are composed of the dark-level and flat-field corrections and determination of the instrumental magnitude and precision. The all set of observations are shown in Table 1. The errors on individual data points vary between 0.005 mag to 0.015 mag.

At attempt to construct a phase curve it was found out, that the period \(P=3^{d}.26268\) offered by authors (Hoffman et al., 2009) is not absolutely exact. It was required to pick up new value of the period \(P=3^{d}.262215\) that individual light curves of primary eclipse, received throughout 6 years have coincided (Vstar software, Benn). The summary phase light curve NSVS 8213217 with new adjusted period are shown on Figure 2.

This curve was computed from elements:
\[
\text{Min HJD}=2455700.196 + 3.262215 \times E
\]
and belonged to eclipsing binary variable EA. The initial epoch was measured from individual and summary curves of minima. The primary minimum is deep (about 0.7 mag), the secondary is not deep (about 0.1 mag) in V filter. There are 165 observations of NSVS 8213217 in Northern Sky Variability Survey (Woz-
3. Conclusions
From photometric CCD observations it is found out:
1. The new suspected variable star NSVS 8213217 is Algol-type eclipsing binary EA.
2. New adjusting period and light element was received.
3. The period of light variation is stable during last 16 years.

References
Motl D.: http://sourceforge.net/projects/c-munipack/files