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), ($\alpha_{J2000.0} = 19^h04^m43^s$; $\delta_{J2000.0} = 24°43'01''$) 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 (comp=UCAC4-574-074580, mV=12.93; check=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
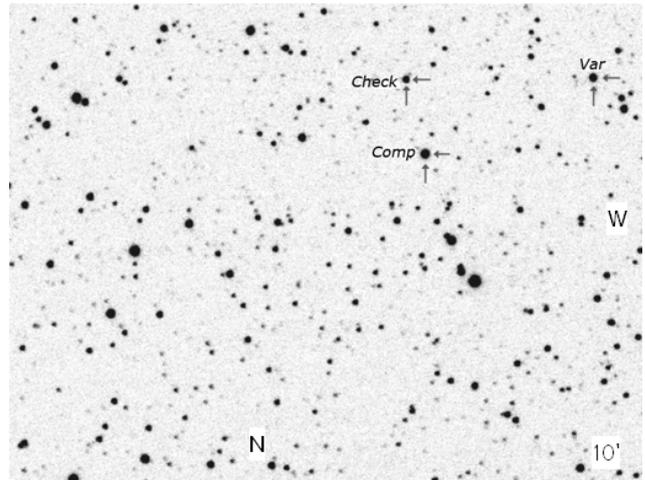

Figure 1: The finding chart NSVS 8213217 with the comparison and check stars marked.

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:

Min HJD=2455700.196 + 3.262215 × 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-
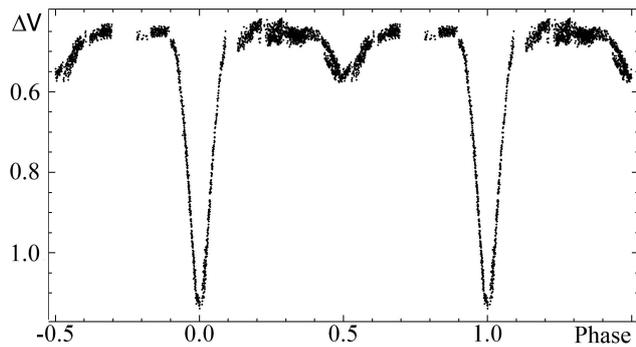
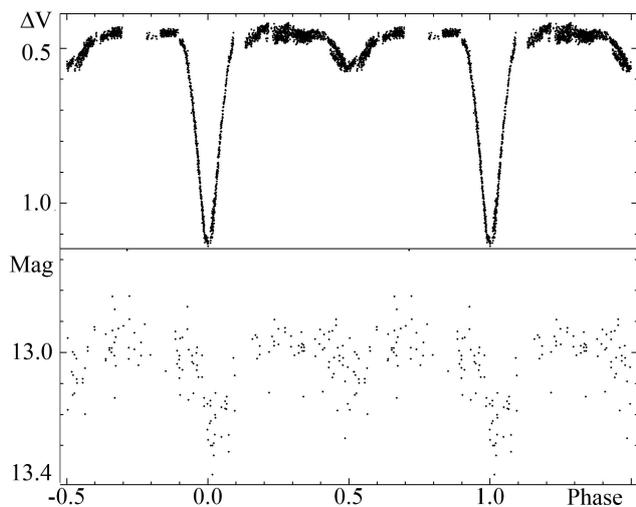Figure 2: The phase light curve of NSVS 8213217.

Figure 3: The phase light curve of NSVS 8213217 from this papers (top) and from NSVS data (bottom).

niak, 2004). The joint phase variation light curves from NSVS data of 1999-2000 years and our 2011-16 years, plotted with the same adjusted light elements are shown on Figure 3. This period has appeared available for all observations.

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.

Table 1: The times of observations NSVS 8213217

Time HJD	Number of frames
2455733.328 - 2455733.423	66
2455735.374 - 2455735,483	26
2455792.312 - 2455792.475	129
2455793.316 - 2455793.514	137
2455802.361 - 2455802.417	86
2455821.331 - 2455821.387	88
2455822.316 - 2456822.448	85
2455824.214 - 2455824.456	176
2455825.224 - 2455825.377	115
2456156.358 - 2456156.561	140
2456158.289 - 2456158.493	151
2456180.316 - 2456180.477	95
2456181.232 - 2456181.458	163
2457547.396 - 2457547.532	85
2457548.334 - 2457548.530	119
2457592.319 - 2457592.355	23
2457593.297 - 2457593.465	105
2457594.302 - 2457594.533	138
2457595.376 - 2457595.502	79
2457596.294 - 2457596.544	135
2457606.341 - 2457606.521	112
2457608.341 - 2457608.546	144
2457655.244 - 2457655.359	70
2457657.198 - 2457657.409	99
2457658.199 - 2457658.227	14
2457665.188 - 2457665.413	133
2457666.193 - 2457666.319	69
2457667.192 - 2457667.370	97

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