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# THE NEW ECLIPSING VARIABLE STAR USNO-A2.0 0825-18396733, A PROBABLE POLAR

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During observation of a field in Aquila, we found a new eclipsing variable star with an extremely short period, $0\overset{d}{.}0840$. Its USNO-A2.0 coordinates are: $\alpha = 20^{h}31^{m}37\overset{s}{.}59$, $\delta = -0°05'11\overset{''}{.}2$ (J2000). Our observations were carried out at the Astrotel–Caucasus observatory using an 0.3-m Ritchey–Chretien telescope, equipped with an unfiltered Apogee Alta U9000 CCD camera. A total of 98 images with 5-minute exposures were obtained on JD 2455384–2455397. For basic reductions for dark current, flat fields, bias and for removing cosmic rays hits, we use IRAF routines. For photometry of the new variable star, we applied VaST software by Sokolovsky and Lebedev (2005). The comparison star was USNO-A2.0 0900-18617527 = USNO-B1.0 0904-0528702 ($\alpha = 20^{h}30^{m}53\overset{s}{.}81$, $\delta = +0°25'33\overset{''}{.}7$ (J2000, 2MASS); $R_1 = 14\overset{m}{.}24$, $R_2 = 14\overset{m}{.}44$ (USNO-B1.0)). Unfiltered magnitudes were calibrated using the comparison star, assuming $R_{\rm comp} = 14\overset{m}{.}34$. To search for period and derive epochs of minima, we use Peranso software (`www.peranso.com`). During our observing campaign, we detected three primary minima, listed in Table 1.

**Table 1.** CCD minima of USNO-A2.0 0825-18396733

| **HJD(TT)** | ± |
|---|---|
| 2455387.3976 | 0.0004 |
| 2455388.4050 | 0.0006 |
| 2455397.398 | 0.002 |

All moments in the Table 1 are expressed in terrestrial time in accordance with IAU recommendations (resolution B1 XXIII IAU GA). The light curve of the star is presented in Fig. 1; Fig. 2 is the finding chart. The light elements are:

$$\mathrm{Min\,HJD(TT)} = 2455387.3976 + 0\overset{d}{.}0840 \times E.$$

Borisov and Shimansky (2010) have kindly made available to us their spectroscopy of the star performed on JD 2455412 with the 6-m telescope. They observed the one-peak H$\beta$ and HeII (4686Å) emission lines approximately of equal intensity, weaker HeI emission lines (4471,4921,5015 Å), and the CNO blend (4640-4650 Å). The general appearance of the spectra is characteristic of polars. Thus, the star is probably a magnetic cataclysmic variable. The spectra of the star are presented in Fig. 3.

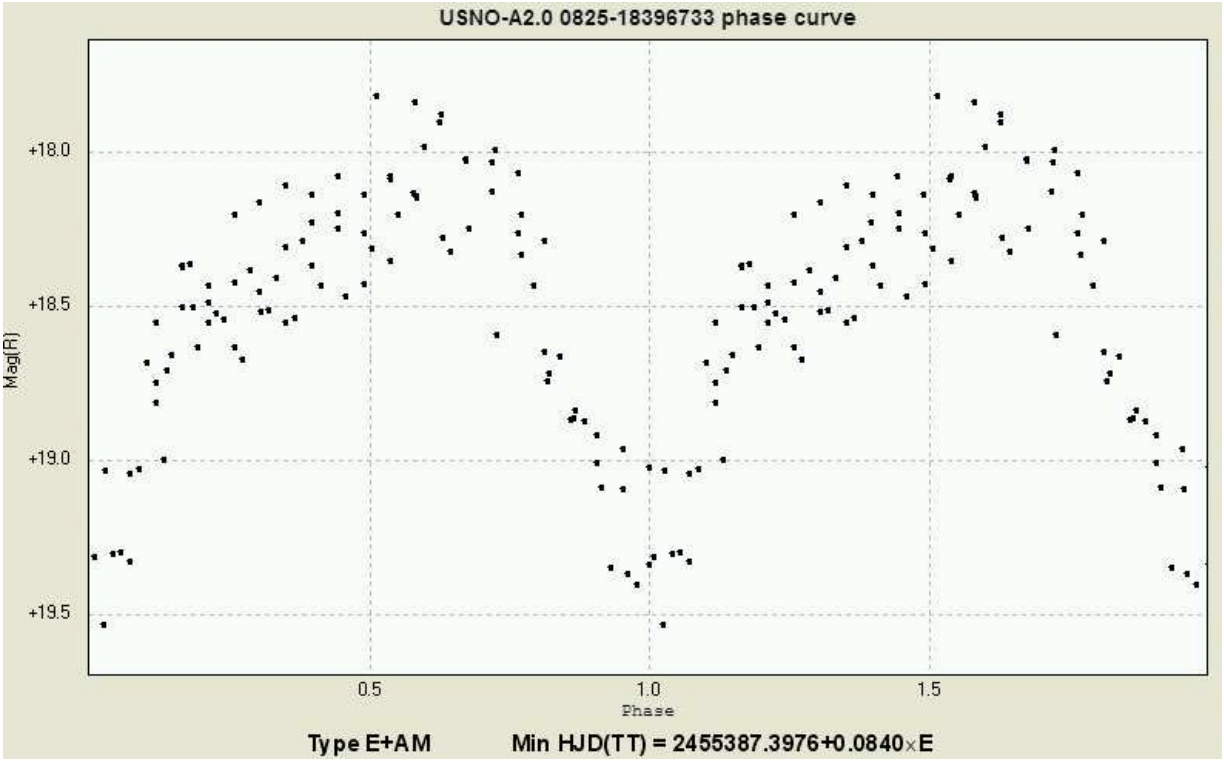


**Figure 1.**

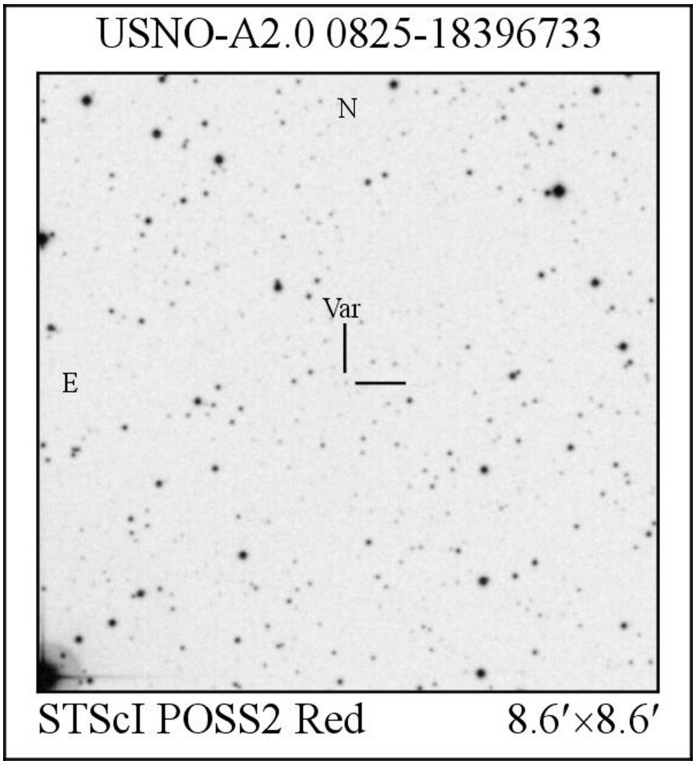


**Figure 2.**

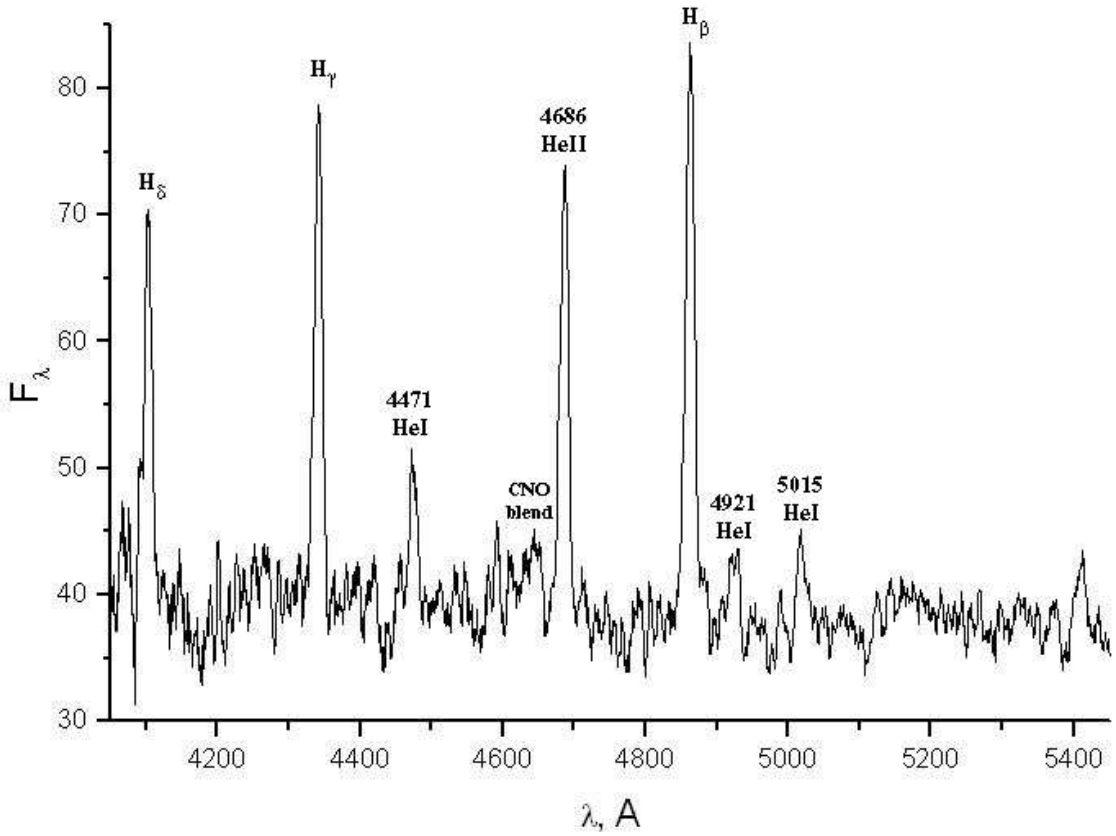


**Figure 3.**

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