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A NEW BETA LYRAE VARIABLE SAO 56342, AND TWO NEW POSSIBLE IRREGULAR STARS: BD+32°0599 AND SAO 56366

SAO 56342 (= HD 20511 = PPM 68334 = BD+32°0602 = AGK3+32°0318 = GSC 2345.1896) with a spectral type A0 is one of the variables discovered with the TYCHO instrument of the European satellite HIPPARCOS. Its light variation was announced by Makarov et al. (1994), indicating that its raw magnitude fluctuated between 7.90 and 8.33 without giving any further information.

From 3 November 1995, SAO 56342 was visually monitored by one of us to obtain more information about this object. These preliminary observations indicated that it might be a Beta Lyrae type eclipsing binary star with a period close to 1.47 days. This star was subsequently observed in the V band from 9 July 1996 to 1 December 1996 using a CCD camera, and a 6-cm finder telescope from Mollet del Valles Observatory and Esteve Duran Observatory (Spain). As comparison stars SAO 56376, SAO 56377, SAO 56355, and GSC2345.1462 were used. Photometric observations were also performed using a photoelectric photometer attached to the Cassegrain focus of the 0.6-m telescope at Esteve Duran Observatory.

Our CCD observations show that SAO 56342 is a Beta Lyrae type eclipsing binary star. Its light curve (Figure 1), shows a conspicuous O'Connell effect (O'Connell, 1951) that amounts to Δm=Max. II–Max. I=0.03 magnitudes, where Max. II is the maximum following secondary minimum. According to photometric measurements, SAO 56342 is a 7.63 $\pm$ 0.02 magnitude object at Max. I. In addition, the star fades 0.41 magnitudes at primary minimum and 0.20 at secondary minimum. The following ephemeris was also computed:

$$\text{HJD Min. I} = 2450401.594 + 1^{\text{d}}.46975 \times \text{E}$$
$$\pm\ 0.001 \pm 0.00020$$

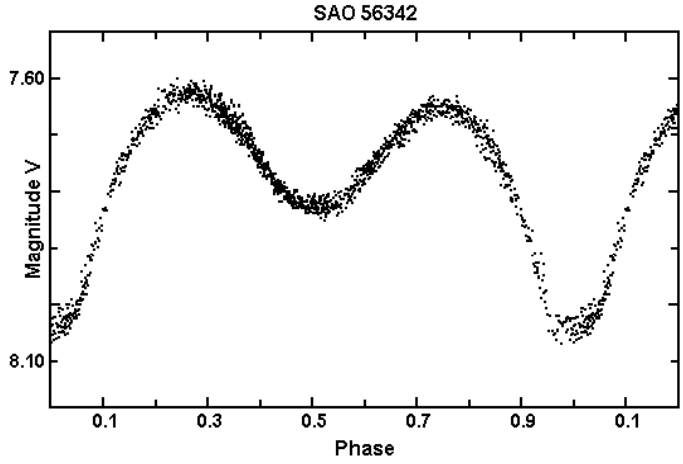

Figure 1

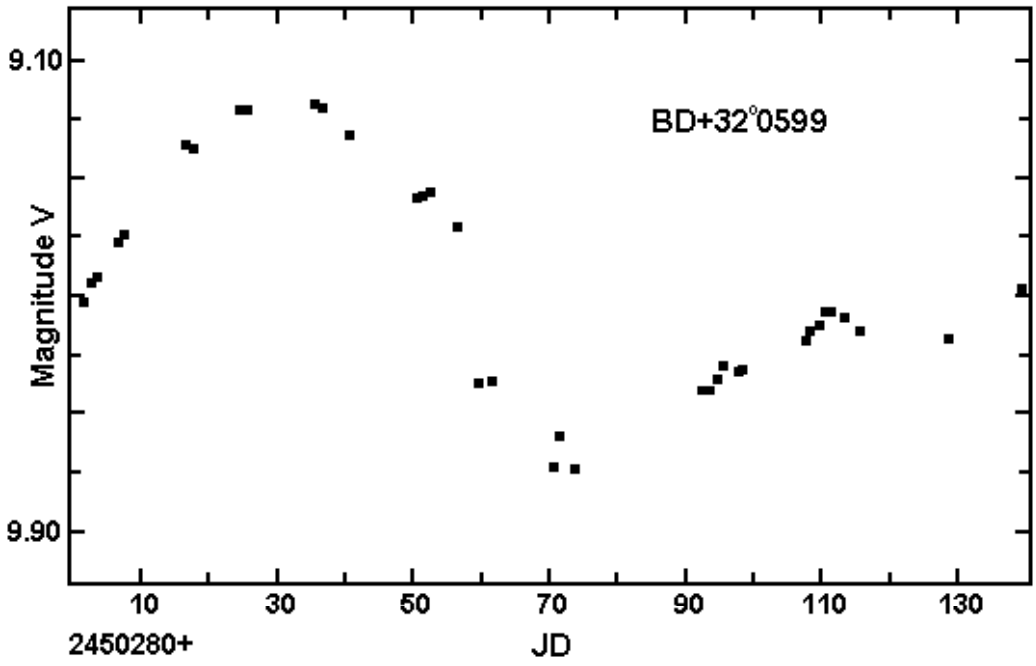

Figure 2

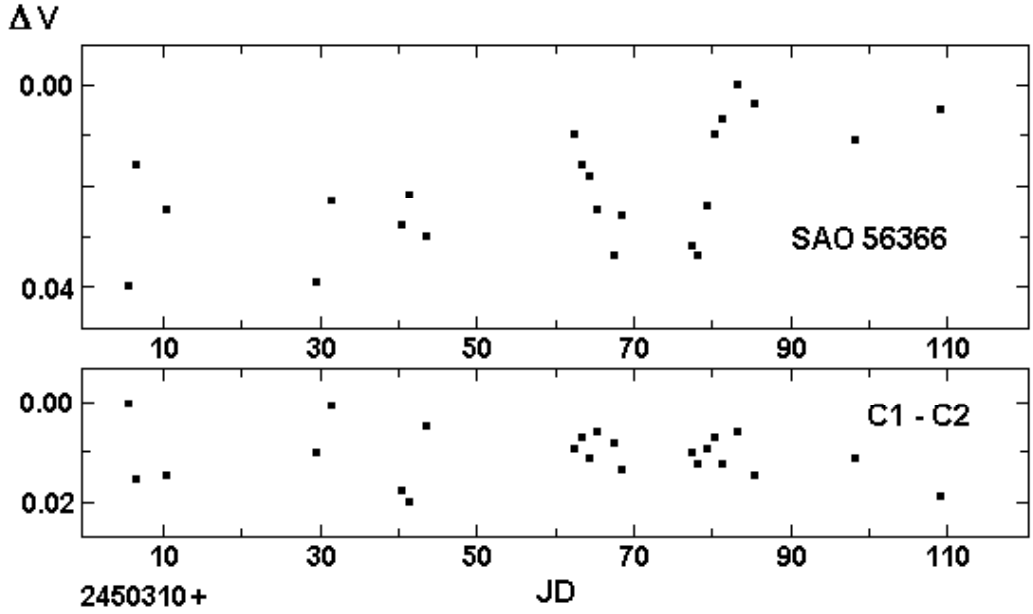

Figure 3

Photometric reductions also showed that the star BD+32°0599 (= PPM 68311 = AGK3+32°0315 = GSC 2345.1366) with a spectral type M8, is also variable. During the observation period BD+32°0599 underwent light changes in the V band between $9\overset{m}{.}2$ and $9\overset{m}{.}8$ (Figure 2). Its light curve indicates that it is probably irregular, although more photometric observations should be performed to ascertain its exact nature.

Furthermore, the star SAO 56366 (= HD 20678 = PPM 68634 = BD+32°0608 = AGK3+33°0316 = GSC 2345.1400) with a V magnitude of 7.9 and spectral type K0 was used as a check star. Photometric reduction suggests that this object is slightly variable with a maximum observed amplitude of 0.04 magnitude. Figure 3 depicts the mean magnitude of SAO 56366 for every night and also the mean magnitude of SAO 56376 (C1) with respect to SAO 56377 (C2). Variability of SAO 56366 is probably real and not due to differential color extinction: the comparison star SAO 56355 is also a K0 spectral type object but shows no detectable light variations beyond light curve scatter. However, more photometric observations should be performed to confirm the variability of SAO 56366.

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