

ON THE POSSIBLE TRIPLICITY OF THE BINARY SYSTEM UU SAGITTAE

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ABSTRACT. On the basis of the photographic observations of the Algol-type eclipsing variable UU Sge has been revealed the light-time effect in the O-C diagram. Probably, it has been evoked by the third close (1.6 AU) invisible companion.

Key words: Stars: Algol-type binary, light-time effect

According to a modern GCVS classification (Kholopov et al. 1987), this eclipsing variable belongs to the Algol type (EA). It consists a main sequence star (KV) and a subdwarf of the spectral type O. The degenerate companion is the nucleus of the planetary nebula Abell 63.

This variable has been investigated by Tsessevich (1976) and Bezdenezhnyi on the basis of the Moscow and Simeiz photographic plate collections. The mean curve shows the large reflection effect. To our 10 mean moments of the minimum brightness the epoch of minimum has been added according to Bond et al. (1978), these elements being given by Kholopov et al. (1987). O-C residuals are calculated from our elements:

$$\text{Min.H.J.D.} = 2432797.283 + 0.4650697 \cdot E \quad (1)$$

The O-C residuals seem to have a cyclic change with a long period (736 days) and an amplitude of about 0.02 days. The reduction of the O-C residuals to one cycle has been performed by the formula:

$$\Psi = \frac{E}{736} - N, \quad (2)$$

where N is the cycle number. This reduction is satisfactory. Table 1 and Figure 1 give the results of this study.

The light-time effect in the O-C diagram of UU Sagittae revealed has probably been evoked by the third close companion. The estimate of the semimajor axis of the eclipsing variable in the triple system is 1.6 AU.

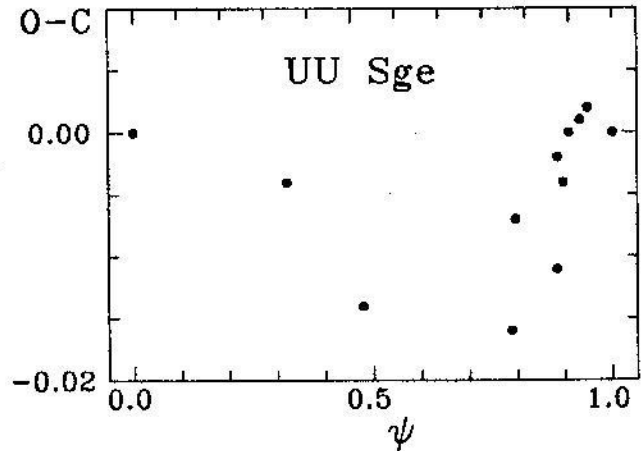


Figure 1. The reduction of the O-C residuals to one cycle according to formula (2).

Table 1.

<i>Min.H.J.D.</i>	E	O-C	Ψ
2432797.283	0	0.000	0.000
2433033.534	508	-0.004	0.321
2433447.439	1398	-0.011	0.883
2433448.379	1400	-0.002	0.884
2437163.358	9388	+0.001	0.931
2437176.381	9416	+0.002	0.948
2440512.310	16589	-0.014	0.479
2440819.266	17249	-0.004	0.896
2441475.468	18660	-0.016	0.788
2441564.312	18851	0.000	0.908
2442953.933	21839	-0.007	0.796

References

- Bond H.E., Liller W., Mannery E.J.: 1978, *Ap.J.*, **223**, 252.
- Kholopov P.N., Samus' N.N., Frolov M.S., Goransky V.P., Gorynya N.A., Karitskaya E.A., Kazarovets E.V., Kireeva N.N., Karkina N.P., Medvedeva G.I., Pastukhova E.N., Perova N.B., Shugarov S.Yu.: 1987, *General Catalogue of Variable Stars (GCVS)*, 4th ed., Nauka, Moscow.
- Tsesevich V.P.: 1976, *Studies of variable stars in selected regions of the Galactic field* (in Russian), 161-170, Kiev, Naukova Dumka.

DETECTION OF NONTHERMAL OPTICAL FLARES FROM A BURSTER MXB 1735-44 AND X-RAY NOVA PERSEI 1992 = GRO J0422+32

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ABSTRACT. During the observations on the 2.15 m telescope of CASLEO observatory (Argentina) two flares of about 0.25s duration were detected from a burster MXB 1735-44. Their forward fronts had steep regions with characteristic times of 0.05 - 0.06s and thin time structure within 0.005 - 0.006s with confidence probability > 95%. Brightness temperatures of these phases of the flares were more than $10^8 - 10^{10}$ K respectively. During the observations of Nova Per on the 6 m telescope of SAO stochastic flashes on a time scale from 10-20ms to 200s were recorded. The brightness temperature of the shortest flares were more than $(1.7-7.0) \cdot 10^8$ K. The events detected from these objects with high probability may be caused by nonthermal processes only. The results evidence probable departures from standard model of gasdynamic accretion on compact objects in MXB 1735-44 system and Nova Persei 1992.

Key words: Stars: Flares, Bursters, X-Novae