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FIRST EPHEMERIS FOR THE W UMa-TYPE STAR NSV 12040

NSV 12040 (CSV 8172, BV 313, BD+52° 2426) discovered by Strohmeier and Knigge, (1960) is listed as a rapid variable star, with spectral type F, in the New Catalogue of Suspected Variable Stars (Kukarkin et al., 1982). Its coordinates are: $\alpha = 19^{\text{h}} 24^{\text{m}} 55^{\text{s}}$, $\delta = +52^{\circ} 20'.8$ (1950.0).

Visual observations led to the possibility that the star was a close binary system (Boninsegna, 1984; Wils, 1984). A first ephemeris has been computed using 85 visual times of minimum obtained by a dozen of GEOS observers from 1983 to 1985. Both minima are of almost equal value in brightness.

$$\text{Min I or II} = \text{Hel. J.D. } 24\ 45825.389 + 0.342437 \cdot E \quad (1)$$
$$\qquad\qquad\qquad + 4 \qquad + 7$$

To confirm the visual observations, NSV 12040 was monitored photoelectrically jointly with other stars of the GEOS and Hipparcos programme. The Jungfrau-Joch Observatory's 76 cm telescope was used. The measurements were made using the cooled photometer with BV filters of the Geneva Observatory. 23 BV measurements of NSV 12040 were obtained during 5 nights in 1985 and 1986 (see Table I) by the GEOS members H. Boithias, M. Dumont, E. Joffrin, P. Louis, P. Rousselot and the author. Reductions of the observations were made using the method described by Dumont (1983). Transformation of the B-V values from the Geneva system into Johnson and Morgan's one was made using Meylan's and Hauck's formulae (1981).

A V and B-V light-curve is constructed using ephemeris (1) (see Fig. 1). No variation of the B-V index greater than 0.03 mag. appears. The V magnitude at maximum is 10.65 and 11.10 at minimum. The mean B-V value, not corrected for reddening, is +0.43. The period obtained using visual observations is confirmed.

Approximate times of minimum were computed from the composite light-curve. These are listed in Table I along with the number of cycles and O-C's according to ephemeris (1). It was not possible to discriminate the primary minimum from the secondary one.

Table I: photoelectric measurements of NSV 12040

H.J.D 24 46000+	V	B-V
268.4371	10.71	0.42
268.4628	10.85	0.42
644.4163	10.65	0.43
644.4413	10.74	0.43
644.4701	10.89	0.44
644.4917	11.06	0.45
644.5101	11.08	0.44
644.5437	10.82	0.47
644.5913	10.66	0.43
646.4754	10.60	0.40
646.5122	10.76	0.43
646.5281	10.86	0.43
646.5427	11.00	0.42
646.5608	11.11	0.44
649.4052	10.74	0.43
649.4306	10.95	0.41
649.4545	11.09	0.43
649.4702	11.10	0.43
649.4872	10.98	0.44
649.5129	10.81	0.43
649.5469	10.66	0.42
649.5858	10.66	0.41
655.5733	10.65	0.42

Table II: Times of minimum of NSV 12040 using the composite V light-curve of fig. 1.

Hel J.D.	E	O-C (d)
2446644.503	2392	+0.005
2446649.462	2406.5	-0.002

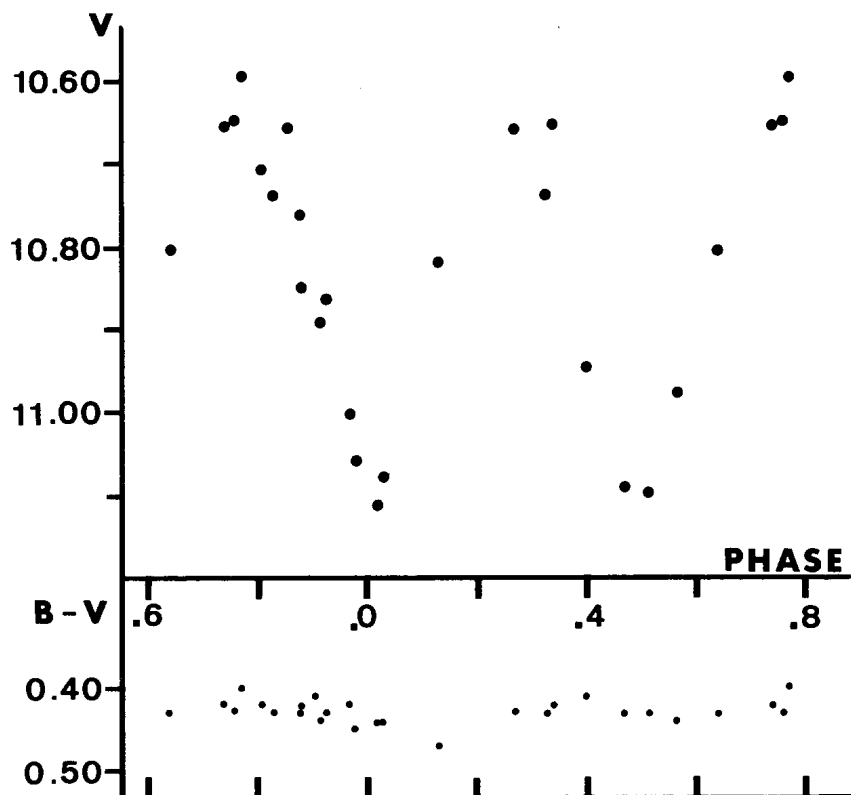


Figure 1: V and B-V light curve of NSV 12040.
Phase according to ephemeris of this paper.

The quasi-constancy of the B-V index, along with the 0.34 day period and the spectral type, allow us to catalogue NSV 12040 as a probable new W UMa type variable. It is, however, noteworthy that NSV 12040 lies near the upper boundary of the period-color diagram for contact binaries, described by Eggen (1967), see also Giuricin et al. (1983). More observations are needed for this particularly interesting object. A more accurate ephemeris will be published (Boninsegna, 1987).

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References:

- Boninsegna,R., 1984, GEOS NC 422
- Boninsegna,R., 1987, GEOS Circular on Eclipsing Binaries
(to be published)
- Dumont,M., 1983, GEOS Circular on RR LYR type variables 7
- Eggen,O.J., 1967, Mem.R.Astr.Soc., 70, 111
- Giuricin,G., Mardirossian,F., Mezzetti,M., 1983. Astron.
Astrophys., 119, 218
- Kukarkin,B.V., Kholopov,P.N., Artiukhina,N.M., Fedorovich,V.P., Frolov,M.S.,
Goranskij,N.P., Gorynya,N.A., Karitskaya,E.A., Kireeya,N.N.,
Kukarkina,N.P., Kurochkin,N.E., Medvedeva,G.I., Perova,N.B.,
Ponomareva,G.A., Samus,N.M., Shugarov,S.YU, 1982, New
Catalogue of Suspected Variable Stars, ("Nauka", Moscow)
- Meylan,G., Hauck,B., 1981, Astron.Astrophy,Suppl.Ser., 46,281
- Strohmeier,W., Knigge,K., 1960, Bamb.Ver., 5, No 5
- Wils,P., 1984, Heelal, 29,242