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**NEW ELEMENTS FOR 80 ECLIPSING BINARIES VII.**

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The ASAS-3 (Pojmanski, 2002), NSVS (Wozniak et al., 2004) and Hipparcos (Perryman et al., 1997) databases have been used to find new elements for a seventh set of 80 eclipsing binaries. NSVS, ASAS-3 and Hipparcos data have been combined to improve the period determinations. Unfiltered NSVS ROTSE1 magnitudes were shifted to match the V magnitude of the stars. When neither ASAS nor Hipparcos observations exist, the original ROTSE1 magnitudes have been given. Saturated data in ASAS-3 and flagged observations in the Hipparcos Epoch Photometry and the NSVS dataset were also discarded. Hipparcos observations have been transformed to V using a table by the author published electronically in IBVS No. 5482 (Otero, 2003). The candidate stars were selected from the Hipparcos Variability Annex and the NSV catalogue (Kukarkin and Kholopov, 1982) and its supplement (NSVS) (Kazarovets et al., 1998). Stars showing mean Hp magnitudes close to the maximum Hp values in the Hipparcos Variability Annex were identified and their ASAS-3 and/or NSVS data subsequently obtained. Stars in the NSV catalogues that had no given classification or were classified as eclipsing binaries, S, L, I, CST or VAR with no spectral type published or spectral type K or earlier were also checked. The method of bisected chords was used to determine times of minima. The accuracy depends on the quantity and quality of the observations. Elements were found with AVE (Barberá, 1999) and a Microsoft Excel period search utility.

Table 1 shows the list of variables. The first column gives the variable star designation according to the GCVS. The following columns give another identifier; the brightness range of the variable (\* = ROTSE1 magnitudes), with the magnitude of secondary eclipse between brackets; the epoch of minimum light derived from all the data available; the period; the variability class and the spectral type with a note to the spectral type source.

**Table 1.** New elements for 80 eclipsing binary stars.

Variable	Star Name Other ID	Magnitude range (V)	Epoch (HJD2440000+)	Period (days)	Type	Spectral type
AL Dor*	HIP 022229	7.72–8.15:(8.1:)	8665.345	14.90532	EA/DM	F8V (1)
FV Vel*	GSC 7705 2098	10.81–12.20(10.89)	13418.774	1.52110	EA	
*	GSC 7705 1501	10.13–10.58(10.47)	12842.444	1.95847	EA	F5 (15)
NSV 00353*	HD 005513	9.51–9.92 (9.9:)*	11482.637	2.398	EA	A2V (36)
NSV 00651	GSC 3684 1954	12.24–12.7:(12.5:)*	11589.596	0.7961	EB	
NSV 00733	GSC 3289 0109	9.97–10.22(10.07:)*	11478.588	8.8695	EA	A0 (24)
NSV 01114*	GSC 3324 0639	11.32–11.80(11.8:)*	11455.805	4.50655	EA	B9 (14)
NSV 01652	GSC 4742 0018	13.23–14.2: (13.9)	13043.615	0.396604	EW/KW	
NSV 01668*	GSC 0094 0935	13.32–14.15(14.05:)	11609.717	1.188245	EA	
NSV 01677*	GSC 1830 0503	12.55–13.30(13.3:)	12661.589	2.04093	EA	
NSV 01687	GSC 8512 0414	11.45–12.12(11.7:)	13470.550	0.785242	EA	
NSV 02826*	HIP 028836	8.01–8.62 (8.16)	12939.825	10.3160	EA	A3(m)A7-A7 (3)
NSV 02850*	HD 042107	9.68–9.98:(9.97:)*	11464.843	1.9614	EA	A0 (33)
NSV 02889*		13.15–14.0:(13.9:)	11613.752	0.336611	EW:	
NSV 02962*	HD 288671	10.58–10.93(10.93)	12653.650	3.19669	EA	G0 (45)
NSV 03371	HD 053595	9.13–9.65: (9.14)	12776.580	123.21	EA	B5Vn (47)
NSV 03710*	GSC 0191 1523	12.86–13.45(13.45)	11629.654	4.01732	EA	
NSV 03754*	GSC 4531 0265	10.76–11.25(11.18)*	11589.757	0.255885	EW/KW	
NSV 04067*	GSC 6573 4986	11.73–13.0 (11.85)	13438.563	0.885933	EA	
NSV 04322	GSC 1950 1411	12.82–13.6 (13.5)	11603.767	2.35439	EA	
NSV 04537	GSC 6605 1593	13.55–14.6:(13.75)	11553.950	0.654531	EA	
NSV 04629*	HD 084482	9.14–9.7:(9.20)*	11284.615	3.28935	EA	G (24)
NSV 04881*	HIP 051425	6.19–6.36 (6.35)	8175.220	16.9330	EA	B4V (1)
NSV 04996*	GSC 8970 1236	10.90–11.30(11.3:)	11888.780	15.509	EA	
NSV 05154*	GSC 7206 1459	11.05–11.56(11.53:)	12406.540	4.67017	EA	
NSV 05435	HD 104649	8.09–8.18 (8.14)	12861.524	4.7470	EB	O9.5V (55)
NSV 05488*	GSC 7240 0891	12.85–13.5 (13.5:)	13068.750	3.10366	EA	
NSV 05504*	GSC 7236 0806	12.22–13.15:(12.3)	13108.757	2.34751	EA	
NSV 05648*	GSC 9412 0116	13.45–14.2 (–)	12638.790	3.0341	EA	
NSV 05849	GSC 7255 0127	13.65–14.3:(14.2:)	12736.810	0.51104	EB:	
NSV 06303*	GSC 3463 0561	10.92–11.40:(11.4:)*	11338.725	6.33448	EA	F7 (14)
NSV 06956*	HD 133766	7.80–8.30 (8.26:)	12705.750	28.877	EA	A9III/IV (1)
NSV 06989*	GSC 6178 0419	11.58–12.1 (11.63)	12095.567	2.44206	EA	
NSV 07164	GSC 6785 0001	13.1–13.7 (13.45)	13449.847	0.590394	EA	
NSV 07445*		13.4–14.5: (13.6)	12535.580	2.1315	EA	
NSV 07638	GSC 7344 0280	13.45–15.0:(13.65)	12521.630	3.35345	EA	
NSV 07730*	GSC 5626 0289	13.15–13.75:(13.35)	12749.804	0.424074	EB/KW	
NSV 07855	GSC 9278 0161	11.72–12.75(11.85)	12439.601	1.92834	EA	
NSV 07907*	GSC 9443 3629	12.31–12.64(12.45:)	13523.692	0.820805	EA:	
NSV 07931	GSC 5637 0258	13.75–14.35(14.35)	11352.790	0.479238	EW	
NSV 08010*	GSC 7371 0561	10.40–j11.2:(10.5)	11995.070	50.007	EA	
NSV 08017*	HD 152219	7.57–7.80 (7.73)	13182.567	4.24038	EA	O9.5IV (2)
NSV 08125*		13.37–14.2:(13.75)	13417.842	0.52382	EA:	
NSV 08194*	GSC 7869 0281	12.6–13.15 (13.1:)	13219.530	7.4158	EA	
NSV 08441*	GSC 5066 0736	12.15–12.6:(12.6:)	12720.838	0.43096	EW	
NSV 08472*	GSC 6237 0573	12.75–13.5 (13.5)	13544.686	3.3337	EA	
NSV 08486*	GSC 6241 0062	13.2–14.0: (13.9)	12841.670	1.87423	EA	
NSV 08629*	GSC 8736 1572	13.6–14.25:(13.8:)	12508.663	0.55277	EB:	
NSV 08766*	GSC 6235 2570	12.7–14.0:(12.85)	12756.768	1.70477	EA	
NSV 09542	GSC 8355 0968	11.41–12.0 (11.85)	13526.855	3.14535	EA	
NSV 09550	GSC 0997 0236	12.30–2.85:(12.40)	13077.904	3.3515	EA	
NSV 09637	GSC 0994 0998	12.57–13.2 (13.0)	11453.688	0.384055	EB/KW:	
NSV 09816*	GSC 6853 1925	12.43–13.1 (13.0:)	13263.542	4.4361	EA	
NSV 10161	GSC 8747 0760	13.5–14.15:(13.9:)	12548.610	0.96025	EA	
NSV 10993*	GSC 1032 1378	12.65–13.05(12.77)	11448.350	40.0	EA	
NSV 11107*	GSC 8745 1479	11.79–12.3 (12.28)	12739.824	3.45563	EA	

**Table 1.** New elements for 80 eclipsing binary stars.

Star Name	Magnitude range	Epoch	Period	Type	Spectral	
Variable	Other ID	(V)	(HJD2440000+)	(days)	type	
NSV 11441*	GSC 1034 0184	12.47–13.05 (13.0:)	12888.602	3.63592	EA	A5 (45)
NSV 12008	GSC 1063 0905	13.15–14.0 (13.9:)	12868.547	0.396110	EW	
NSV 12699	GSC 1621 0052	13.2–14.0 (13.9)	12918.604	0.395831	EW	
NSV 13304*	GSC 0520 1197	12.51–13.5 (12.80)	12930.625	0.558654	EA	
NSV 13492	GSC 4247 0864	11.39–11.87 (11.82)*	11481.644	2.5035	EA	
NSV 14149*	GSC 4476 0892	12.20–12.54 (12.40)*	11426.642	0.62455	EB	
NSV 14288*	GSC 4277 0789	11.40–11.85 (11.45)*	11338.882	1.25996	EA	
NSV 15208*	HD 005464	9.04–9.37 (9.33)	12627.610	0.439298	EW/KE	A2 (33)
NSV 15394	HIP 008472	8.45–8.63 (8.58)	8375.910	7.43367	EA	A2mA5-A7 (1)
NSV 16254*	SAO 131822	9.32–9.41 (9.36)	13085.591	0.533437	EB	F0 (24)
NSV 16801*	HD 043164	9.43–9.83 (9.70)	13517.483	2.23415	EA	F5/6IV/V (1)
NSV 17520*	HD 060941	9.13–9.65 (9.39)	12520.898	7.24816	EA	A0V (14)
NSV 19754*	CPD –61 3639	10.09–10.36 (10.30)	13474.580	31.029	EA	B1Ia (47)
NSV 20056	HIP 069358	7.67–7.80 (7.72)	8433.960	2.67096	EB	B4/5III/IV (1)
NSV 20247	HD 133950	8.54–8.69 (8.61)	13419.846	1.66703	EA	F0V (3)
NSV 20263*	HIP 074348	8.94–9.05 (9.03)	12878.610	6.14395	EA	A1mA3-A6 (2)
NSV 20802*	HD 326320	9.77–10.19 (10.07)	13478.825	1.317716	EA	B0V (45)
NSV 24327*	HIP 089218	8.40–8.55 (–)	12437.660	34.536	EA	O7.5If+O9I (60)
NSV 24452	HIP 090773	9.11–9.20 (9.12)	8528.814	5.64797	EA	F2IV (1)
NSV 24909*	HD 187601	8.78–8.96(¡0.01:)	11421.753	2.1774	EA	G5V (14)
NSV 25338*	HIP 102744	9.10–9.6: (–)	11995.160	20.8553	EA+SRD:	G6/G8III (2)
NSV 25881	HIP 110370	8.49–8.60 (8.60)	8367.865	3.69948	EA	F8 (33)
NSV 26112*	HIP 116475	8.81–8.93:(8.92:)	8077.581	10.28857	EA/DM	F7V (3)
V0392 Vul*	HIP 096228	9.82–10.18 (10.02)	12888.570	1.351425	EB	B8 (9)

Sources of spectral type: (1) Houk and Cowley, 1975. (2) Houk, 1978. (3) Houk, 1982. (9) Nesterov et al., 1995. (14) Kholopov et al., 2004. (15) Spencer and Jackson, 1939. (24) Ochsenbein, 1980. (33) Cannon and Pickering, 1993. (36) Jaschek et al., 1964. (45) Skiff, 2005. (47) Jaschek, 1978. (55) Cruz-Gonzalez et al., 1974. (60) Pourbaix et al., 2004.

Notes on individual stars:

AL Dor = Eccentric system. Few eclipses recorded. Primary eclipse might be the secondary.

FV Vel = Wrong identification in the GCVS (GSC 7705 1243) and in Dvorak, 2003 (GSC 7705 1501). GCVS period (3.04228 d.) is wrong. The ASAS catalogue (Pojmanski, 2003) gives a period of 1.52117 days.

GSC 7705 1501 = Wrongly identified as FV Velorum in Dvorak (2003). The ASAS catalogue (Pojmanski, 2003) gives a period of 1.9585 days.

NSV 00353 = Primary eclipse might be the secondary.

NSV 01114 = L-type in the NSV catalogue (Kukarkin and Kholopov, 1982). Period might be half the value given.

NSV 01668 = Slightly eccentric system.

NSV 01677 = IN:-type in the NSV catalogue.

NSV 02826 = Very eccentric system.

NSV 02850 = S:-type in the NSV catalogue. Primary eclipse might be the secondary.

NSV 02889 = USNO A-2.0 1125-03672692 = 2MASS J06161279+2539556.

NSV 02962 = Primary eclipse might be the secondary.

NSV 03710 = Period might be half the value given. Primary eclipse might be the secondary.

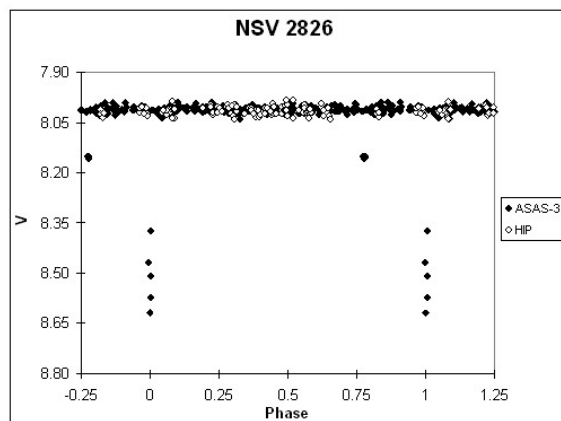
NSV 03754 = Strong O'Connell effect. Max II = 10.86. L-type in the NSV catalogue.

NSV 04067 = S:-type in the NSV catalogue.

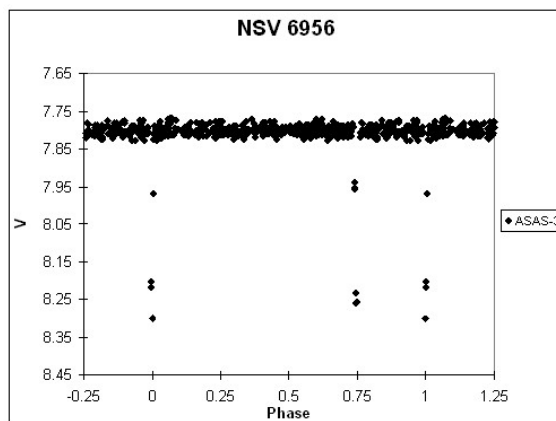
NSV 04629 = I-type in the NSV catalogue.

NSV 04881 = Eccentric system. Total eclipses.

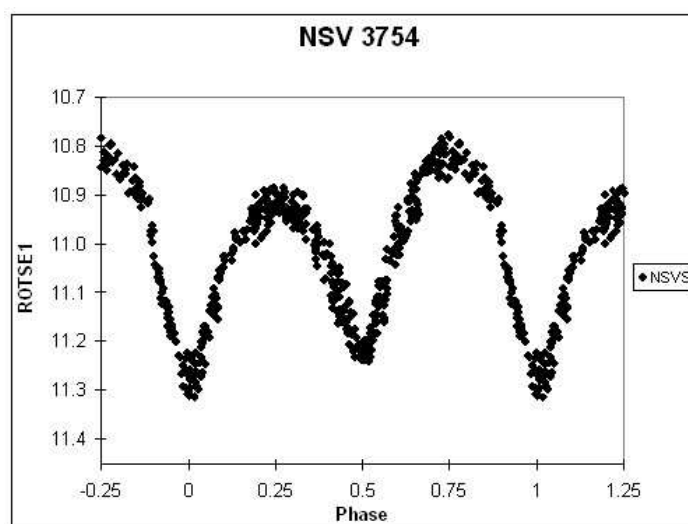
- NSV 04996 = Period might be half the value given. Primary eclipse might be the secondary.
- NSV 05154 = RR-type in the NSV catalogue. Period might be half the value given.
- NSV 05488 = Period might be half the value given. Primary eclipse might be the secondary. S-type in the NSV catalogue.
- NSV 05504 = S-type in the NSV catalogue.
- NSV 05648 = Period might be twice the value given.
- NSV 06303 = Slightly eccentric system. S:-type in the NSV catalogue.
- NSV 06956 = Eccentric system.
- NSV 06989 = L-type in the NSV catalogue.
- NSV 07445 = USNO-A2.0 0600-19625998 = 2MASS J16070488-2916480.
- NSV 07730 = Amplitude reduced by light from nearby stars.
- NSV 07907 = Might be EB-type. Slight O'Connell effect.
- NSV 08010 = Lack of observations at mideclipse I and II.
- NSV 08017 = In NGC 6231. Amplitude corrected for light contamination from nearby stars in ASAS data using the GCPD V-magnitudes (Mermilliod et al., 1997) as a reference. Spectroscopic periods of 4.1593 and 4.160 days listed in the SB9 catalogue (Pourbaix et al., 2004)
- NSV 08125 = USNO-A2.0 0225-26840934 = 2MASS J17035968-6324356.
- NSV 08194 = Period might be half the value given.
- NSV 08441 = S-type in the NSV catalogue.
- NSV 08472 = S-type in the NSV catalogue. Period might be half the value given. Primary eclipse might be the secondary.
- NSV 08486 = Period might be half the value given. L-type in the NSV catalogue.
- NSV 08629 = RR:-type in the NSV catalogue.
- NSV 08766 = The period given in Otero (2003b) was twice the real value.
- NSV 09816 = Period might be half the value given.
- NSV 10993 = EW:-type in the NSV catalogue.
- NSV 11107 = Period might be half the value given.
- NSV 11441 = NSVS amplitude is reduced by light from nearby stars. S-type in the NSV catalogue.
- NSV 13304 = S-type in the NSV catalogue. NSV position is wrong.
- NSV 14149 = S-type in the NSV catalogue.
- NSV 14288 = NSV position is wrong.
- NSV 15208 = Visual binary. A=  $9^m2$ ; B=  $10^m8$  Hp. Sep.  $1''01$  (Perryman et al., 1997).
- NSV 16254 = Strong O'Connell effect. Max II = 9.35.
- NSV 16801 = Visual binary. A=  $9^m7$ ; B=  $11^m1$  Vt. Sep.  $2''16$  (Fabricius et al., 2002).
- NSV 17520 = In NGC 2422.
- NSV 19754 = Eccentric system.
- NSV 20263 = Apsidal motion. Primary eclipse period given. Secondary eclipse period is 6.14416 d.
- NSV 20802 = In NGC 6231.
- NSV 24327 = Spectroscopic binary with period 34.54 d. in Pourbaix et al. (2004).
- NSV 24909 = Period might be twice the value given with similar minima.
- NSV 25338 = SRD period is 40.87 days with range  $9^m1$  -  $9^m3$  (V).
- NSV 26112 = Eccentric system. Visual binary. A=  $9^m1$ ; B=  $11^m8$ . Sep.  $3''0$  (Worley et al., 1997).
- V0392 Vul = ACV: in the GCVS based on the Hipparcos catalogue that classifies it as ACV with a period of 0.67571 d.



**Figure 1.** Light curve of NSV 2826 showing ASAS-3 and Hipparcos observations.



**Figure 2.** Light curve of NSV 6956 showing ASAS-3 observations.



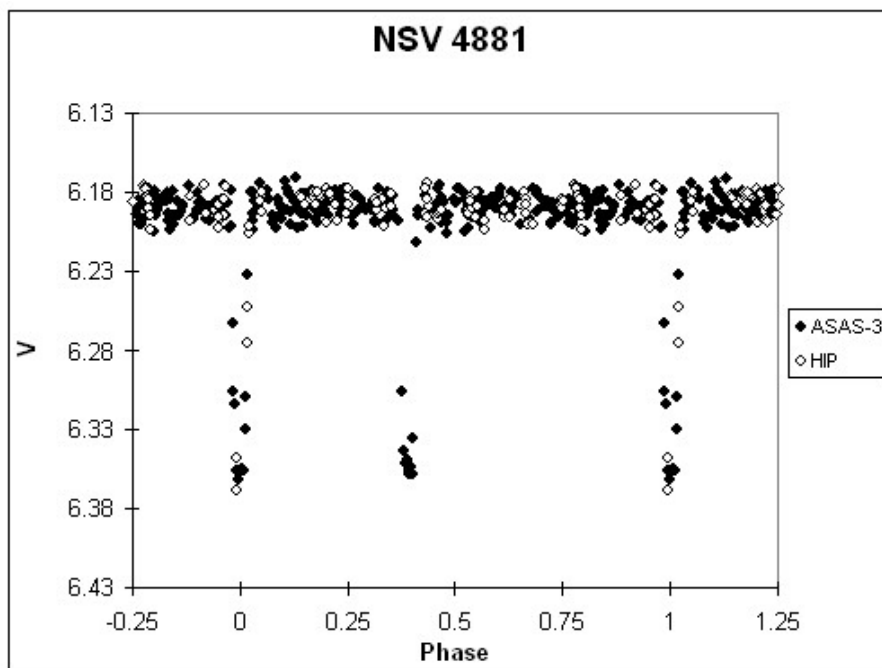
**Figure 3.** Light curve of NSV 3754 showing NSVS observations.

### Acknowledgements:

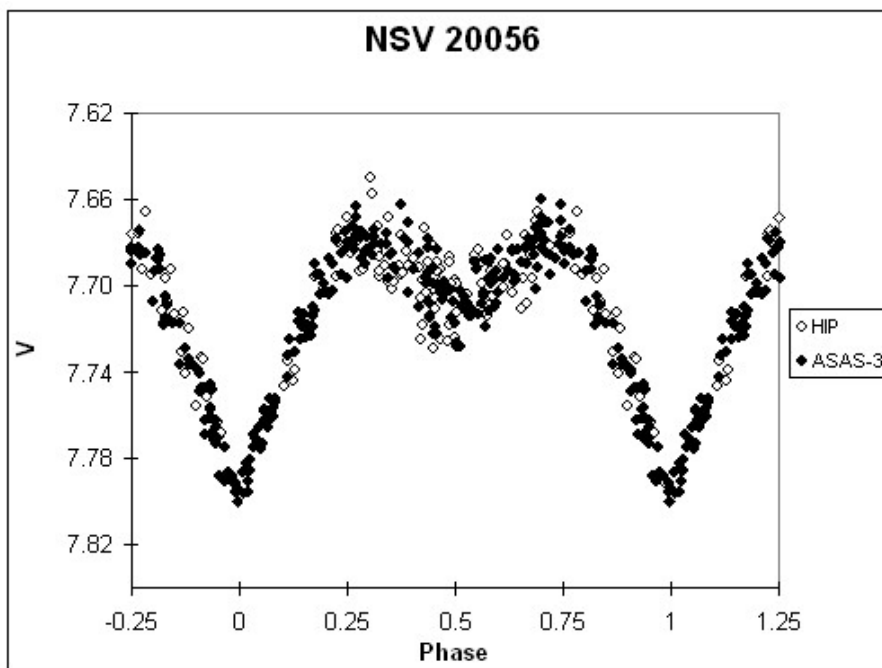
The authors want to thank John Greaves for his collaboration and suggestions. This research has made use of the SIMBAD and VizieR databases operated at the Centre de Données Astronomiques (Strasbourg) in France and the data from the Northern Sky Variability Survey created jointly by the Los Alamos National Laboratory and University of Michigan. The NSVS was funded by US Department of Energy, the National Aeronautics and Space Administration and the National Science Foundation.

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**Figure 4.** Light curve of NSV 4881 showing ASAS-3 and Hipparcos observations.



**Figure 5.** Light curve of NSV 20056 showing ASAS-3 and Hipparcos observations.

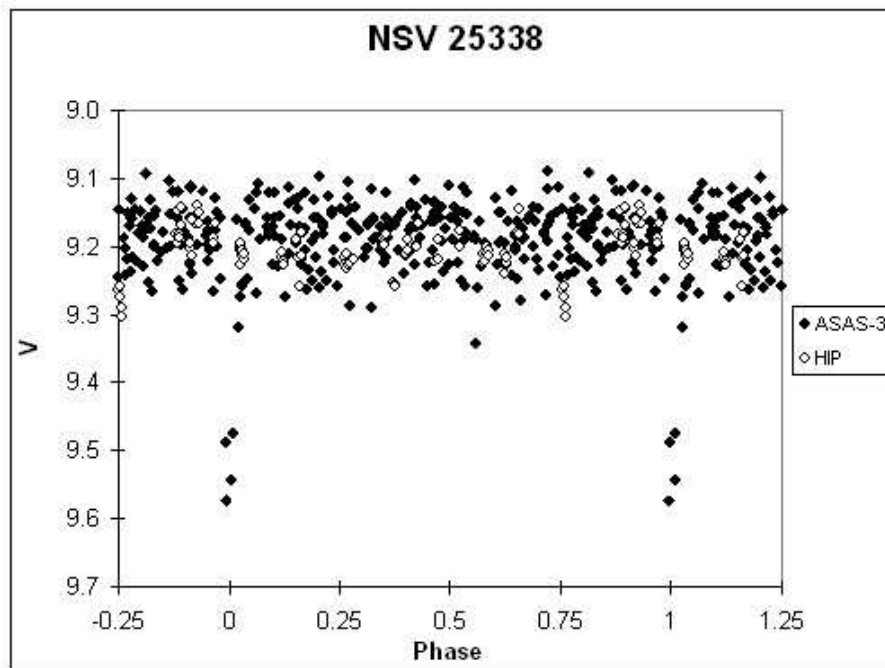


Figure 6. Light curve of NSV 25338 showing ASAS-3 and Hipparcos observations.

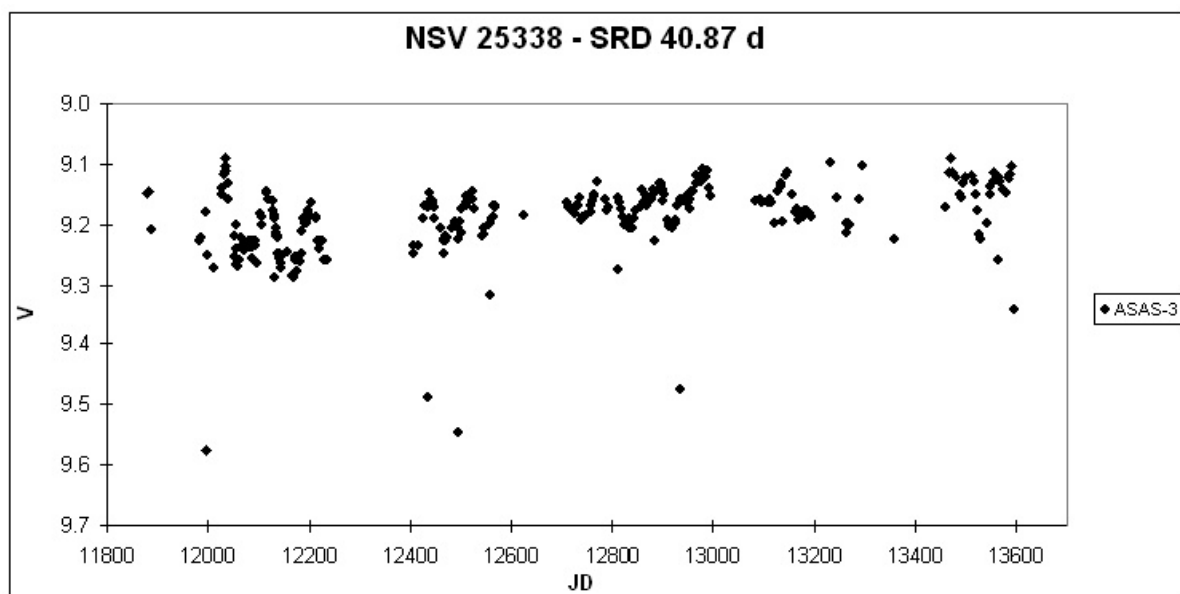


Figure 7. The semiregular light variability of NSV 25338 from ASAS-3 data.

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### ERRATUM FOR IBVS 5586

The EA/RS: star NSV 16225 published as HIP 32218 is actually HIP 23385 = HD 32218.