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NEW ELEMENTS FOR 80 ECLIPSING BINARIES VIII.

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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 another 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. Hipparcos observations have been transformed to V using a table by the author published electronically in IBVS No. 5482 (Otero, 2003). Saturated data in ASAS-3 and flagged observations in the Hipparcos Epoch Photometry and the NSVS dataset were discarded. The candidate stars were selected from the NSV catalogue (Kukarkin and Kholopov, 1982) and its supplement (NSVS) (Kazarovets et al., 1998) and the GCVS (General Catalogue of Variable Stars, Kholopov et al., 2005). Stars in the GCVS and 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. This list also include new eclipsing binaries randomly found in the ASAS-3 database and not published or published with wrong elements in the ASAS catalogue (Pojmanski, 2002). 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 or the GSC number if the star is not a known variable star. The following columns give another identifier; the brightness range of the variable (V= ASAS-3 V magnitudes; *= ROTSE1 magnitudes), with the magnitude of secondary eclipse between brackets; the epoch of minimum light derived from the complete dataset; 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/GSC	Star Name Other ID	Magnitude range (V)	Epoch (HJD2400000+)	Period (days)	Type	Spectral type
AE Ind*	GSC 8796 1142	13.22–14.6 (13.45)V	52087.752	3.6741	EA	A2+G6IV (59)
AF Oph	GSC 0408 0535	12.9–13.6: (13.0)V	52768.730	8.8981	EA	
AL Aps	GSC 9429 1348	12.90–13.95:(12.95:)V	51903.115	7.432	EA	
AS Hya*	GSC 6038 0018	12.02–14.8:(12.15)V	51913.747	1.063597	EA	A3+K2IV (59)
BB Per*	GSC 2357 0743	12.56–13.31 (13.2)*	51488.631	0.485594	EA	
BO Aps	GSC 9281 0157	13.2–14.5:(13.3:)V	52115.510	1.84995	EA	
DE Lyn	GSC 3803 1143	13.13–13.9:(13.7:)*	51630.631	0.40882	EW	
EF Aqr	HD 217512	9.88–10.5:(10.11)V	51483.622	2.85358	EA	G1V (5)
EI CMa	GSC 5952 0136	12.47–14.1 (12.64)V	53025.820	10.6102	EA	
EL And*	GSC 2825 1263	13.28–13.7:(13.7:)*	51473.615	5.242	EA	
EX CMa*	GSC 5391 1000	13.0–13.5:(13.4:)V	52737.330	74.111	EA	
FW Aqr	GSC 5803 1356	12.95–14.4:(13.15)V	53585.888	4.8865	EA	
FZ Aur*		12.55–12.8:(12.8:)*	51518.595	7.132	EA	
GN Aqr	GSC 5229 1615	11.72–12.16(12.1:)V	53244.640	4.40445	EA	
GSC 1158 0201*		12.00–13.2 (12.17)V	51463.840	1.242993	EA	
GSC 1684 0522*		11.77–12.08 (12.0)V	53521.877	0.415211	EW	
GSC 1721 1141*		12.70–13.1:(12.85:)V	52844.853	0.77973	EA	
GSC 1805 0750*	BD +26 0560	9.75–10.31(10.00)V	51475.670	0.993618	EB	F2 (61)
GSC 4678 0496*	HD 003399	9.81–10.26 (9.89)V	51466.870	3.4885	EA	F0V (5)
GSC 4685 1287*		12.88–14.5:(13.07)V	53400.508	2.71883	EA	
GSC 5451 1708*	HD 075338	10.05–10.41(10.09)V	53133.587	2.49447	EA	F0 (33)
GSC 5759 0110*	BD–11 5364	10.03–10.40(10.15)V	52040.825	7.3457	EA/RS	
GSC 6550 3021*		12.85–14.0:(12.95:)V	53459.653	3.5485	EA	
GSC 6816 0087*		11.46–12.49(11.58)V	53479.870	3.2864	EA	
GSC 6839 0257*	HD 315997	11.21–11.40(11.24)V	51961.875	2.8723	EA	A5 (9)
GSC 7102 1072*		12.20–13.25 (12.4)V	53121.520	4.0035	EA	
GSC 7133 3078*		11.93–12.8 (12.6)V	53449.625	2.81344	EA	
GSC 7194 0239*	CD–33 7169	10.33–10.67(10.63)V	52043.870	2.59549	EA	
GSC 7588 0403*	CD–37 2136	10.46–11.0(10.63:)V	52867.708	17.943	EA/RS	
GSC 7666 0960*		10.88–11.05(11.01)V	52196.855	0.525412	EW/KE	
GSC 7672 2238*		11.73–12.24(11.91)V	52997.792	0.972013	EB	
GSC 8198 1376*		12.05–13.3 (12.14)V	51908.748	3.24198	EA	
GSC 8296 2365*	HD 138517	9.86–10.08 (9.89)V	52922.493	5.8472	EA	A0IV (2)
GSC 9135 0268	HIP 002731	8.58–8.64 (8.61)V	52217.605	2.88083	EB/DM	A0V (1)
GSC 9517 0107*		11.37–12.09(12.04)V	52642.759	0.285878	EW/KW	
GW Aur	GSC 2423 0042	12.66–13.3 (12.7:)*	51492.665	2.49481	EA	
KK Gem*	GSC 1332 0569	12.78–14.0 (12.90)V	51503.873	2.5122	EA	
KP And*	GSC 3224 3322	12.43–12.9:(12.52)*	51408.708	1.40538	EA	A0 (14)
LL Oph	GSC 6818 1863	12.8:–13.6:(12.9:)V	52468.615	2.7925	EA	
LY And	GSC 2831 1925	13.8–14.65(14.45)*	51576.776	0.34505	EW	
MM Aps*	GSC 9268 0069	12.32–14.45:(12.46)V	52406.697	3.7300	EA	
MO Pup*	GSC 5404 0593	11.87–12.63(12.52)V	51886.762	3.671778	EA	
MV Car*	GSC 9196 1701	12.92–13.7 (13.17)V	52994.770	0.65776	EB	
MW And*	GSC 2836 1495	13.95–14.9 (14.4)*	51523.637	0.26375	EA/KW	
NSV 00042*	GSC 4022 0939	12.80–13.3:(13.3:)*	51378.760	1.18185	EA	
NSV 00608*	GSC 3283 1455	12.20–12.32(12.8)*	51515.897	2.2904	EA	
NSV 01226*	GSC 2355 0826	13.92–15.3 (–)*	51498.846	1.84755	EA	
NSV 07972*	GSC 7871 3750	13.05–13.6 (13.6)V	52900.495	1.46814	EA	
NSV 08269*		12.98–13.6:(13.6:)V	53491.810	2.69691	EA	
NSV 09226*		12.8–13.25:(13.0)V	53194.705	1.27748	EA	
NSV 09650*		13.4–14.1:(14.1:)V	53463.860	5.6303	EA	
NSV 10349	GSC 9449 1999	13.3–14.4:(13.4:)V	53581.740	10.195	EA	
NSV 10761	GSC 6278 1537	12.9–13.5:(13.5:)V	53460.725	2.4887	EA	
NSV 12109	GSC 3560 2589	12.38–12.6(12.42:)V	51363.770	9.727	EA	
NSV 12268	GSC 9092 1184	13.2–15.1: (13.4)V	52124.570	3.29298	EA	
NSV 12860	GSC 3567 1250	13.05–13.9: (13.7)*	51523.654	2.4021	EA	
NSV 14638*	SVS 1473	12.98–13.6 (13.6)*	51452.60	1.924	EA	
NSV 25852*	HIP 109642	7.73–7.85 (7.74:)V	48398.245	4.818025	EA/DM	F8V (1)
NSV 25943*	HIP 112068	8.15–8.25 (8.24:)V	48223.160	11.4456	EA	F8 (33)

Table 1. New elements for 80 eclipsing binary stars.

Star Name		Magnitude range	Epoch	Period	Type	Spectral type
Variable/GSC	Other ID	(V)	(HJD2400000+)	(days)		
SZ Pup*	GSC 7133 2812	13.0–13.8:(13.45)V	52637.715	1.1903	EA	
V0348 Cyg*	GSC 3179 1206	14.1–15.1:(15.0:)*	51336.887	0.28423	EW/KW	
V0355 Aur	GSC 2918 1961	11.14–11.76(11.38)*	51277.680	17.6445	EA	
V0404 Cen*	GSC 8991 2864	12.25–12.9:(12.85:)V	53578.530	4.54842	EA	
V0412 And*	GSC 3639 1081	11.95–12.40(12.35)*	51507.720	1.90871	EA	
V0468 Sco*	GSC 7374 1166	12.15–12.58(12.58)V	53644.570	11.0982	EA	
V0504 Cyg*		13.4–14.1 (14.1)*	51378.646	0.351694	EW	
V0517 Ori*	GSC 0718 0147	12.6:–13.1:(13.1:)V	51565.843	2.83378	EA	
V0529 Ara*	GSC 9057 2833	13.0–13.7: (13.6:)V	52033.740	1.90392	EA	
V0537 Cas*	GSC 3668 1411	11.80–12.50(12.15)*	51442.609	1.63234	EA	
V0600 Cen	GSC 7758 0909	12.85–14.7:(12.97)V	51555.025	1.60523	EA	
V0656 Cen	GSC 7263 1175	13.12–14.25:(13.23:)V	51274.800	2.50883	EA	A9 (63)
V0698 Sco*		13.15–13.97 (–)V	53212.582	4.1791	EA	
V0721 Cen	GSC 7282 1158	13.25–14.6 (13.38)V	51306.772	1.31566	EA	
V0864 Aql*	GSC 1076 1140	12.6:–13.2:(12.7:)V	53115.870	3.12105	EA	
V0887 Aql*	GSC 1051 1084	13.15–14.1: (13.3)V	53651.518	2.71606	EA	
V1021 Her	GSC 3493 1158	13.62–14.05:(13.75:)*	51439.722	1.22665	EA	
V1321 Cyg*		13.07–13.75(13.6:)*	51442.671	0.72818	EA	
V1455 Aql	HIP 095588	8.03–8.26 (8.11)V	48165.415	7.12616	EA	F0V (5)
V1879 Oph*		13.4–14.0: (14.0:)V	53606.615	4.8167	EA	
V1941 Cyg	GSC 3193 0477	12.5–13.2 (12.8)*	51483.638	1.0118	EB	

Sources of spectral type:

(1) Houk and Cowley, 1975. (2) Houk, 1978. (5) Houk and Swift, 1999. (9) Nesterov et al., 1995. (14) Kholopov et al., 2005. (33) Cannon and Pickering, 1993. (59) Svechnikov and Kuznetsova, 1990. (61) Heckmann and Dieckvoss, 1975. (63) Stock et al., 1984.

Notes on individual stars:

AE Ind = Wrong period of 2.5154: d. in the GCVS (Kholopov et al., 2005).

AS Hya = Wrong period of 15.99: d. in the GCVS

BB Per = L:-type in the GCVS.

EL And = Period might be half the value given. Primary eclipse might be the secondary.

EX CMa = Period might be half the value given.

FZ Aur = USNO-A2.0 1200-04342803 = 2MASS J06064357+3155190. Uncertain period of 7.17/N in the GCVS. NSVS results are for a blend of the eclipsing binary and the similar magnitude star 2MASS 06064378+3155561 so the amplitude is reduced. Period might be half the value given.

GSC 1158 0201 = USNO-A2.0 0975-21051931 = 2MASS J22440997+1446386. Classified as ED in the ASAS catalogue (Pojmanski, 2002) with a wrong period of 2.48594 days.

GSC 1684 0522 = USNO-A2.0 1050-20050780 = 2MASS J22014928+1759421. Classified as DSCT/EC in the ASAS catalogue with a period of 0.20761 days.

GSC 1721 1141 = USNO-A2.0 1050-20792957 = 2MASS J23471091+1720337. Classified as ED/ESD in the ASAS catalogue with a wrong period of 0.484597 days.

GSC 1805 0750 = Classified as RRC/EC in the ASAS catalogue with a period of 0.496812 days. Wrongly classified as a slow variable star with a period of 164 days in Wozniak et al. (2004b)

GSC 4678 0496 = Classified as ED in the ASAS catalogue with a wrong period of 6.975 days.

GSC 4685 1287 = USNO-A2.0 0825-00395744 = 2MASS J01441691-0218447.

- GSC 5451 1708 = Classified as ED/ESD in the ASAS catalogue with a wrong period of 9.946 days. Visual binary. A=10^m2; B=12^m2. Sep. 2^d4 (Dommanget et al., 2002)
- GSC 5759 0110 = Classified as DCEP-FU: in the ASAS catalogue with a period of 7.346002 days. RS period is 7.318 d.
- GSC 6550 3021 = USNO-B1.0 0613-0116999 = 2MASS J07243846-2837598. Classified as ED in the ASAS catalogue with a wrong period of 7.098 days. Possibly slightly eccentric.
- GSC 6816 0087 = USNO-A2.0 0600-25675250 = 2MASS J17170075-2508146. Classified as ED in the ASAS catalogue with a wrong period of 6.572593 days.
- GSC 6839 0257 = Classified as ED in the ASAS catalogue with a wrong period of 5.742958 days.
- GSC 7102 1072 = USNO-A2.0 0525-04042431 = 2MASS J07052289-3553203. Classified as ED in the ASAS catalogue with a wrong period of 8.009 days.
- GSC 7133 3078 = USNO-A2.0 0525-07791714 = 2MASS J08123183-3632282. Classified as ESD/RRAB/EC/ED in the ASAS catalogue with a wrong period of 0.73703 days.
- GSC 7194 0239 = Classified as ESD/ED in the ASAS catalogue with a wrong period of 6.5 days.
- GSC 7588 0403 = Classified as DCEP-FU/ESD with a period of 17.980 d. in the ASAS Catalogue. RS period is 17.83 d.
- GSC 7666 0960 = USNO-A2.0 0450-07213606 = 2MASS J08374338-3953354. Classified as ESD/RRC/EC/ED in the ASAS catalogue with a wrong period of 0.262705 days.
- GSC 7672 2238 = USNO-A2.0 0450-06325650 = 2MASS J08141863-4436357. Classified as ESD/ED in the ASAS catalogue with a wrong period of 0.492270 days.
- GSC 8198 1376 = USNO-A2.0 0375-12119576 = 2MASS J10461994-4557595. Classified as ED in the ASAS catalogue with a wrong period of 6.484 days.
- GSC 8296 2365 = Classified as ED in the ASAS catalogue with a wrong period of 11.694425 days.
- GSC 9517 0107 = USNO A2.0 0000-01324592 = 2MASS J15431380-8648072. Classified as DSCT in the ASAS catalogue with a period of 0.142939 days.
- KK Gem = NSVS amplitude strongly reduced by light from nearby stars.
- KP And = ISA:-type in the GCVS.
- MM Aps = M:-type in the GCVS.
- MO Pup = GCVS period is 1.06/N. New period of 1.8358908 d. in Baldwin et al. (1999) who comment on the possibility of similar eclipses.
- MV Car = EA-type in the GCVS.
- MW And = EW/KW-type in the GCVS.
- NSV 00042 = Primary eclipse might be the secondary.
- NSV 00608 = Lack of observations at primary minima.
- NSV 01226 = Classified as S: in the NSV catalogue.
- NSV 07972 = Period might be wrong or half the value given. Primary eclipse might be the secondary.
- NSV 08269 = USNO-A2.0 0600-24935651 = 2MASS J17115202-2354346. Primary eclipse might be the secondary.
- NSV 09226 = USNO-A2.0 0600-27776554 = 2MASS J17364494-2914271.
- NSV 09650 = USNO-A2.0 0375-33270705 = 2MASS J17470325-4633494.
- NSV 14638 = USNO-A2.0 1500-09874955 = 2MASS J23352404+6150122 at 23^h35^m24^s.04 +61°50'12".2 (2000.0). Correctly identified in Hanson et al. (2004). Position in the NSV catalogue is for GSC 4280 0772 which is not the variable star. Primary eclipse might be the secondary.
- NSV 25852 = Period might be twice the value given.

NSV 25943 = Wrong period of 1.7299 d. in Koen and Eyer (2002). Visual binary. A=8^m6; B=9^m9 Hp. Sep. 0'.2 (Perryman et al., 1997)

SZ Pup = S:-type in the GCVS.

V0348 Cyg = INS:-type in the GCVS.

V0404 Cen = Period might be half the value given. Primary eclipse might be the secondary.

V0412 And = Diethelm and Kroll (1999) give a period of 0.954326 days.

V0468 Sco = Period might be half the value given.

V0504 Cyg = USNO-A2.0 1200-15159209 = 2MASS J20280956+3254279. EB-type in the GCVS.

V0517 Ori = Primary eclipse might be the secondary. NSVS amplitude reduced by light from nearby stars.

V0529 Ara = GCVS gives an uncertain period of 0.610: d.

V0537 Cas = ISA:-type in the GCVS.

V0698 Sco = USNO-A2.0 0525-28033393 = 2MASS J17230117-3054570. Period of 258.0/N in the GCVS.

V0864 Aql = ASAS data contaminated. Values for the largest aperture were used and then adjusted to the mean V values for the smallest aperture. Amplitude is reduced by light from nearby stars.

V0887 Aql = Possibly slightly eccentric.

V1321 Cyg = USNO-A2.0 1275-13882879 = 2MASS J20232874+4131590. GCVS gives a period of 0.3640901 d. with a note indicating a possible double period of 0.7281802 d.

V1879 Oph = USNO-A2.0 0675-18818346 = 2MASS J17200288-2058130. L-type in the GCVS. Period might be half the value given. Primary eclipse might be the secondary.

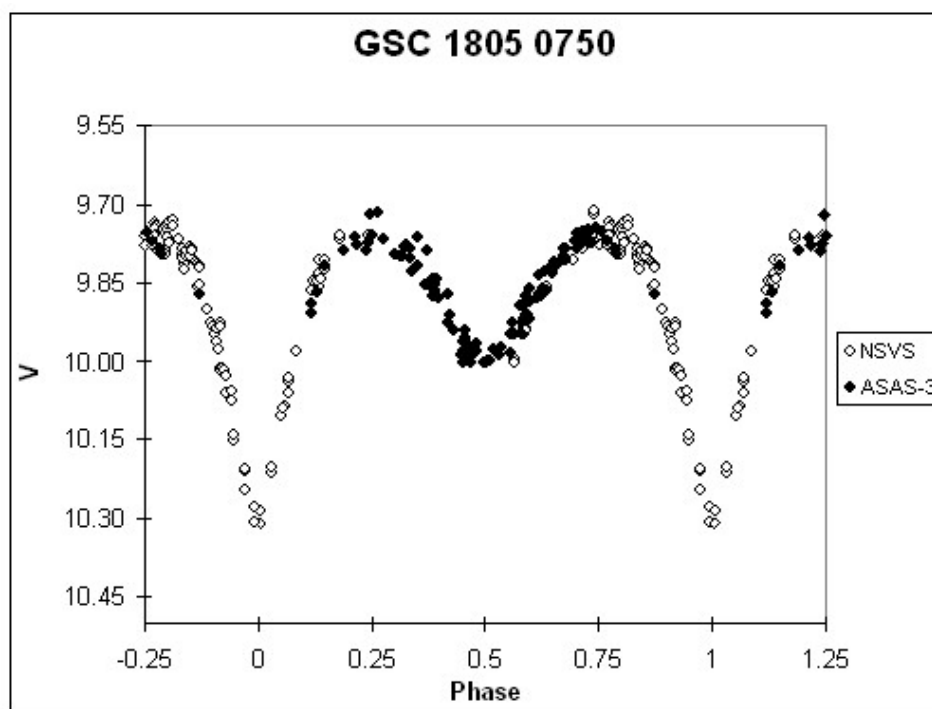


Figure 1. Light curve of GSC 1805 0750 showing ASAS-3 and NSVS observations.

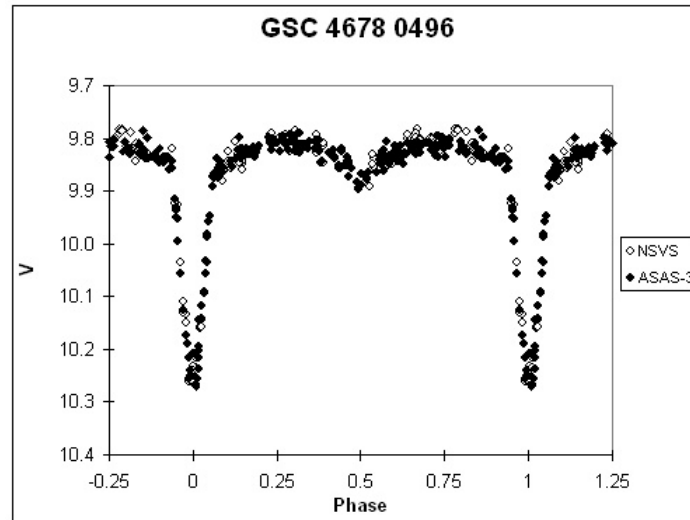


Figure 2. Light curve of GSC 4678 0496 showing ASAS-3 and NSVS observations.

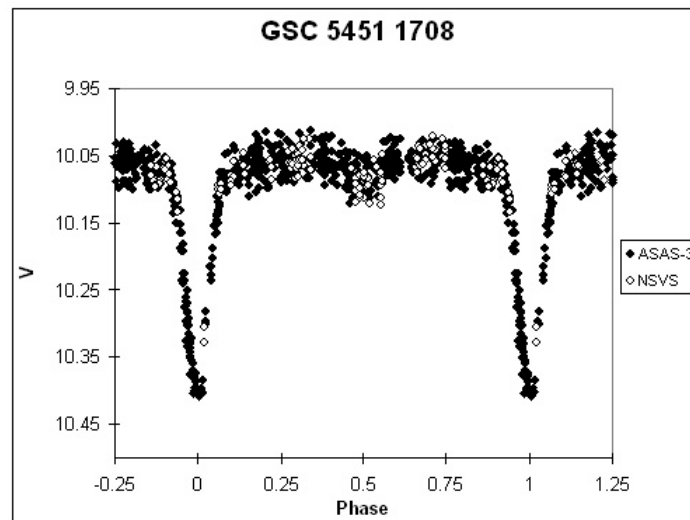


Figure 3. Light curve of GSC 5451 1708 showing ASAS-3 and NSVS observations.

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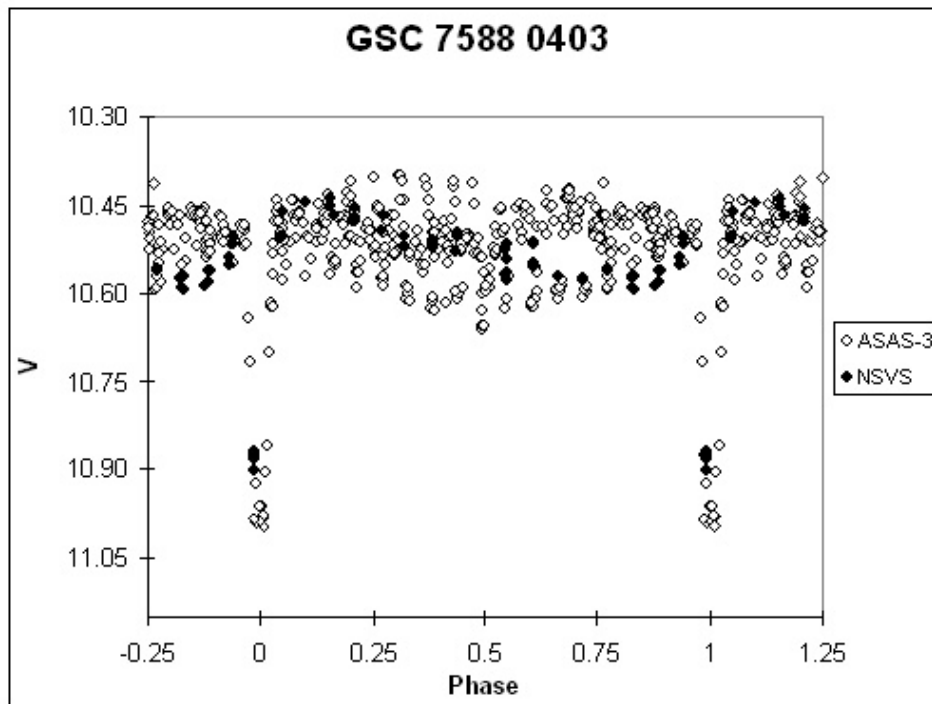


Figure 4. Light curve of GSC 7588 0403 showing ASAS-3 and NSVS observations.

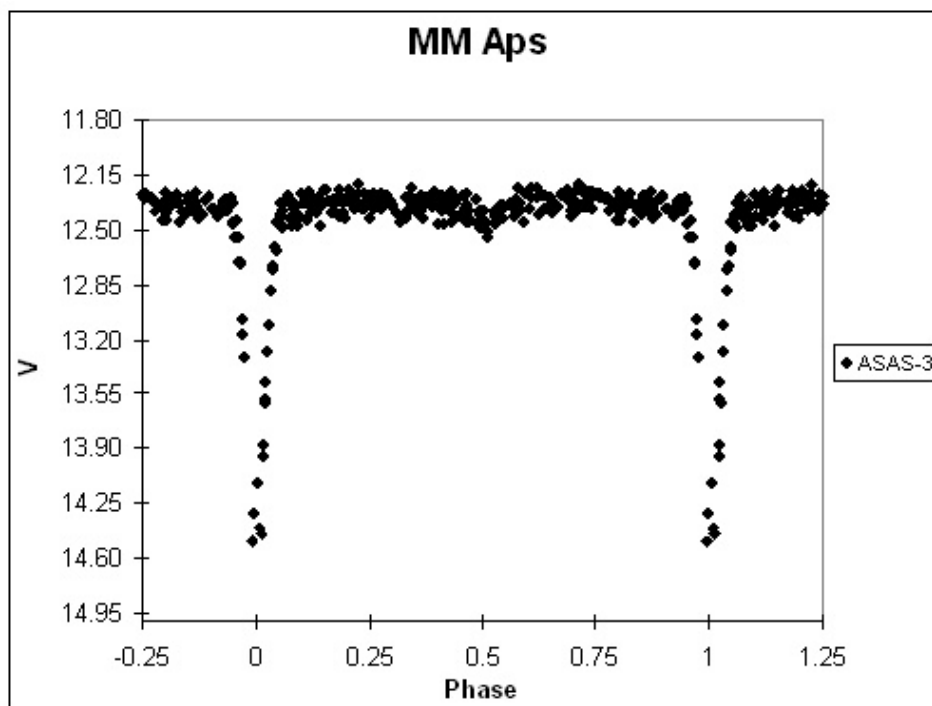


Figure 5. Light curve of MM Aps showing ASAS-3 observations.

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ERRATUM FOR IBVS 5652

The eccentricity (Min II phase) given for V983 Oph in Table 1 in IBVS 5652 should read 0.269 instead of 0.731.

ERRATUM FOR IBVS 5674

The epoch for GSC 7194 0239 should be 2452943.87 instead of 2452043.87 .

S. Otero