

New eclipsing binaries found in the NSVS database II

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Abstract:

A search for eclipsing binaries in the NSVS database resulted in the discovery of 116 new such systems and the improvement or confirmation of the elements and types of other four.

Methodology

This paper is a continuation of the work published in IBVS 5570 (Otero et al., 2004). The variability of the stars listed in this study was found in the public data release from the Northern Sky Variability Survey (Wozniak et al., 2004) using the SQL interface available from the Skydot website (<http://skydot.lanl.gov/nsvs/nsvs.php>). Stars were selected on the basis of a number of statistical criteria. The stars needed to have at least 60 data points, and a significantly larger standard deviation compared to the average value for their magnitude. It was also required that the mean of squared successive magnitude differences for a star was larger than about 30% of the standard deviation, thus excluding long period variables. Finally, the skewness calculated from a star's magnitudes had to be positive, favouring stars spending more time at maximum than at minimum. Standard flagged data and data with the APINCOMPL mask set (Wozniak et al., 2004) were not taken into account during these calculations.

ASAS-3 (Pojmanski, 2005) observations have been combined with NSVS data when available. In those cases the original unfiltered NSVS ROTSE1 magnitudes were shifted to match the ASAS-3 V magnitude of the stars. The amplitude of the eclipses were the same for both datasets so the combination was successful. Saturated data in ASAS-3 and flagged observations in the NSVS datasets were discarded.

Elements were found with AVE (Barberá, 1996) and a Microsoft Excel period search utility kindly provided by Patrick Wils (Wils, 2003), who also discovered the variability of several of the stars in this paper. Periods and epochs were then improved by light curve fitting of all the datasets available. The uncertainties are those for when the folded light curve began to show systematic differences. The time span of the observations determines the accuracy of the periods and ranges from 1 (when only data from the NSVS database are available) to 7 years (when there are observations from the ASAS-3 database).

The aim of this paper is to present and classify these stars. Further study will help improve these elements.

Results

Table 1 gives positions and cross-identifications for all of the eclipsing binaries studied. The first column gives the star's number in this paper. The following columns give the NSVS identifier; the GSC number; other known identification and the star's position according to the NOMAD catalogue (Zacharias et al., 2005).

Table 1 – Positions and cross-identifications for the 120 eclipsing binaries studied.

#	Star Name			NOMAD position (J2000.0)
	NSVS ID	GSC ID	Other ID	
1	NSVS 1440541	GSC 4500-2022	2MASS J00063106+7911419	00 06 31.04 +79 11 42.0
2	NSVS 202757	GSC 4298-0062	BD+69 0001	00 07 48.63 +70 40 22.0
3	NSVS 251253	GSC 4496-1661	2MASS J00154235+7800288	00 15 42.33 +78 00 28.6
4	NSVS 307909	GSC 4504-0883	2MASS J00200262+8050437	00 20 02.64 +80 50 43.8
5	NSVS 1711909	GSC 3663-2527	2MASS J00452497+5805518	00 45 25.00 +58 05 51.9
6	NSVS 1733332	GSC 3669-1165	BD+52 0293	01 15 58.96 +52 46 40.0
7	NSVS 276091	GSC 4309-0507	2MASS J01223193+7345094	01 22 31.92 +73 45 09.6

8	NSVS 347731	GSC 4043-0508	2MASS J01321071+6634585	01 32 10.71 +66 34 58.6
9	NSVS 277760	GSC 4309-0387	2MASS J01334154+7445450	01 33 41.50 +74 45 44.8
10	NSVS 352636	GSC 4310-0005	2MASS J01362151+6852282	01 36 21.51 +68 52 28.3
11	NSVS 3837274	GSC 2814-1291	2MASS J01373609+3803570	01 37 36.10 +38 03 57.0
12	NSVS 282661	GSC 4322-1115	2MASS J01510818+7448315	01 51 08.18 +74 48 31.6
13	NSVS 364501	GSC 4318-0519	2MASS J01563920+7219473	01 56 39.21 +72 19 47.3
14	NSVS 372292	GSC 4315-0545	2MASS J02175780+7058122	02 17 57.77 +70 58 12.5
15	NSVS 281819	GSC 4499-0443	2MASS J02212664+7810214	02 21 26.58 +78 10 21.6
16	NSVS 1908568	GSC 3690-0485	2MASS J02220688+5607534	02 22 06.90 +56 07 53.5
17	NSVS 1912945	GSC 3698-3021	2MASS J02245389+5809154	02 24 53.89 +58 09 15.4
18	NSVS 1890411	GSC 4052-1795	2MASS J02552319+6316532	02 55 23.25 +63 16 53.1
19	NSVS 68794	GSC 4620-1830	2MASS J02584126+8449039	02 58 41.32 +84 49 04.1
20	NSVS 4080203	GSC 3322-0130	2MASS J03093756+5053311	03 09 37.56 +50 53 31.2
21	NSVS 431038	GSC 4508-2161	2MASS J03162248+7617187	03 16 22.45 +76 17 18.8
22	NSVS 431456	GSC 4517-1400	2MASS J03311146+7900157	03 31 11.46 +79 00 15.7
23	NSVS 503008	GSC 4330-1822	2MASS J03331694+6935339	03 33 17.00 +69 35 34.8
24	NSVS 503811	GSC 4330-1539	2MASS J03355743+6925587	03 35 57.45 +69 25 59.0
25	NSVS 4173126	GSC 2866-0563	2MASS J03384497+4014132	03 38 44.93 +40 14 12.7
26	NSVS 507549	GSC 4327-2766	2MASS J03504184+6734461	03 50 41.82 +67 34 46.0
27	NSVS 509486	GSC 4327-2777	2MASS J03545253+6738066	03 54 52.53 +67 38 06.5
28	NSVS 2089261	GSC 3725-1621	2MASS J03574808+5731274	03 57 48.09 +57 31 27.5
29	NSVS 2095888	GSC 3722-0650	ALS 7892	04 08 11.27 +55 50 11.6
30	NSVS 518791	GSC 4328-2023	2MASS J04144177+6750131	04 14 41.78 +67 50 13.1
31	NSVS 438422	GSC 4518-1102	2MASS J04193756+8035454	04 19 37.64 +80 35 45.7
32	NSVS 6803908	GSC 2377-1346	HD 282203	04 31 28.45 +32 52 12.7
33	NSVS 528217	GSC 4329-1686	2MASS J04344849+6835477	04 34 48.50 +68 35 47.8
34	NSVS 6809672	GSC 2381-1225	2MASS J04371525+3348488	04 37 15.25 +33 48 48.9
35	NSVS 6820327	GSC 2374-0055	HD 282465	04 47 29.24 +31 51 43.6
36	NSVS 540128	GSC 4354-0714	2MASS J05000916+7341076	05 00 09.19 +73 41 07.6
37	NSVS 543976	GSC 4346-0929	2MASS J05084206+7040439	05 08 42.05 +70 40 44.2
38	NSVS 73028	GSC 4621-0575	2MASS J05204578+8511558	05 20 45.91 +85 11 55.8
39	NSVS 4441585	GSC 3367-0909	2MASS J05323996+4934187	05 32 39.95 +49 34 19.0
40	NSVS 644072	GSC 4347-0299	2MASS J05353601+7103349	05 35 36.02 +71 03 34.9
41	NSVS 649047	GSC 4356-0426	2MASS J05364966+7341396	05 36 49.62 +73 41 39.7
42	NSVS 2195616	GSC 4344-0363	2MASS J05371451+6742217	05 37 14.52 +67 42 21.9
43	NSVS 645455	GSC 4348-0081	2MASS J05394182+7105305	05 39 41.81 +71 05 30.8
44	NSVS 9646470	GSC 0722-0457	ASAS 054035+1146.5	05 40 34.69 +11 46 32.4
45	NSVS 9728354	GSC 1317-0841	ASAS 060424+1800.7	06 04 23.74 +18 00 42.0
46	NSVS 587245	GSC 4533-0110	2MASS J06045328+7953419	06 04 53.32 +79 53 42.0
47	NSVS 7098810	GSC 1886-0642	ASAS 062001+2621.0	06 20 00.72 +26 20 59.4
48	NSVS 662820	GSC 4358-0151	2MASS J06372107+6804410	06 37 21.07 +68 04 40.9
49	NSVS 9788006	GSC 1333-1458	ASAS 063736+1747.5	06 37 36.03 +17 47 32.6
50	NSVS 667220	GSC 4362-0272	2MASS J06472503+6942154	06 47 25.04 +69 42 15.4
51	NSVS 669467	GSC 4122-0945	2MASS J06561759+6704489	06 56 17.60 +67 04 49.6
52	NSVS 672979	GSC 4122-0665	2MASS J07061377+6718140	07 06 13.75 +67 18 14.1
53	NSVS 707621	GSC 4527-1006	2MASS J07232086+7528214	07 23 20.87 +75 28 21.9
54	NSVS 707808	GSC 4527-1410	2MASS J07241251+7535021	07 24 12.53 +75 35 02.5
55	NSVS 682384	GSC 4365-0444	2MASS J07370882+7033451	07 37 08.81 +70 33 45.4
56	NSVS 12725240	GSC 0180-2135	ASAS 074653+0035.7	07 46 53.22 +00 35 44.2
57	NSVS 2432834	GSC 3796-0562	2MASS J08111745+5252352	08 11 17.45 +52 52 35.2
58	NSVS 719598	GSC 4380-0581	2MASS J08113174+7416262	08 11 31.73 +74 16 26.3
59	NSVS 766364	GSC 4374-1003	2MASS J08132954+6950339	08 13 29.53 +69 50 33.9

60	NSVS 2435987	GSC 3421-1871	BD+52 1296	08 17 27.32 +51 51 46.9
61	NSVS 714446	GSC 4546-1600	2MASS J08195236+8109462	08 19 52.37 +81 09 46.3
62	NSVS 773492	GSC 4378-0920	2MASS J08360562+7110220	08 36 05.63 +71 10 22.1
63	NSVS 771542	GSC 4375-0620	2MASS J08391823+6739424	08 39 18.24 +67 39 42.4
64	NSVS 100671	GSC 4631-2151	2MASS J08424128+8347143	08 42 41.24 +83 47 14.4
65	NSVS 774885	GSC 4134-0141	2MASS J08503159+6726251	08 50 31.59 +67 26 25.5
66	NSVS 756054	GSC 4544-1144	2MASS J08542436+7940539	08 54 24.34 +79 40 54.0
67	NSVS 720913	GSC 4547-0095	2MASS J08591851+8019497	08 59 18.51 +80 19 49.9
68	NSVS 726375	GSC 4541-1165	2MASS J09004690+7646031	09 00 46.90 +76 46 03.3
69	NSVS 727564	GSC 4541-0454	2MASS J09040006+7616318	09 04 00.04 +76 16 31.8
70	NSVS 726378	GSC 4544-0120	2MASS J09111384+7752233	09 11 13.81 +77 52 23.5
71	NSVS 839905	GSC 4541-1805	2MASS J09434292+7726497	09 43 42.91 +77 26 49.7
72	NSVS 824633	GSC 4391-1203	2MASS J10410153+7440578	10 41 01.54 +74 40 57.8
73	NSVS 7533694	GSC 2515-0839	2MASS J10444885+3321118	10 44 48.84 +33 21 11.9
74	NSVS 877180	GSC 4392-0717	2MASS J11320594+6957415	11 32 05.94 +69 57 41.5
75	NSVS 18197	GSC 4633-0796	2MASS J13125581+8341425	13 12 55.79 +83 41 42.6
76	NSVS 899459	GSC 4408-0436	2MASS J13275720+7256233	13 27 57.18 +72 56 23.3
77	NSVS 954791	GSC 4634-1925	2MASS J14152491+8403334	14 15 24.98 +84 03 33.4
78	NSVS 1051755	GSC 4579-1005	2MASS J16131991+8123353	16 13 19.86 +81 23 35.7
79	NSVS 1113840	GSC 4647-0555	2MASS J16460884+8315326	16 46 08.86 +83 15 32.7
80	NSVS 13570043	GSC 0388-1265	ASAS 164717+0238.8	16 47 17.26 +02 38 47.8
81	NSVS 13908965	GSC 0455-0839	ASAS 184256+0435.0	18 42 56.12 +04 34 59.3
82	NSVS 1132769	GSC 4595-1086	2MASS J19193145+8155350	19 19 31.48 +81 55 35.0
83	NSVS 11167557	GSC 1050-0137	2MASS J19221926+1215476	19 22 19.27 +12 15 47.6
84	NSVS 44401	GSC 4656-0458	2MASS J19571236+8645259	19 57 12.49 +86 45 26.0
85	NSVS 1256019	GSC 4649-2912	2MASS J20123973+8238212	20 12 39.52 +82 38 21.6
86	NSVS 5779961	GSC 3580-0308	BD+48 3115	20 24 11.89 +48 55 26.1
87	NSVS 5743528	GSC 3161-0815	2MASS J20345878+4136174	20 34 58.78 +41 36 17.4
88	NSVS 5795605	GSC 3165-0518	2MASS J20371308+4454538	20 37 13.09 +44 54 53.9
89	NSVS 11211242	GSC 1641-1312	ASAS 203748+1951.2	20 37 47.78 +19 51 14.5
90	NSVS 11599162	GSC 1660-0959	2MASS J21033819+2128083	21 03 38.20 +21 28 08.3
91	NSVS 8663264	GSC 2709-0907	2MASS J21055170+3514316	21 05 51.70 +35 14 31.7
92	NSVS 3269072	GSC 3965-1172	2MASS J21113196+5927240	21 11 31.97 +59 27 24.1
93	NSVS 5984064	GSC 3616-0390	2MASS J21473522+5137247	21 47 35.25 +51 37 24.9
94	NSVS 3384202	GSC 4267-0682	2MASS J22042657+6154003	22 04 26.58 +61 54 00.5
95	NSVS 1411824	GSC 4650-2560	2MASS J22130102+8320049	22 13 01.02 +83 20 04.9
96	NSVS 120476	GSC 4600-1820	2MASS J22134577+7543480	22 13 45.77 +75 43 48.0
97	NSVS 1375660	GSC 4475-0618	2MASS J22221025+7345556	22 22 10.26 +73 45 55.6
98	NSVS 1376837	GSC 4488-0376	2MASS J22261595+7406294	22 26 15.98 +74 06 29.5
99	NSVS 156318	GSC 4480-0334	2MASS J22310021+6952210	22 31 00.26 +69 52 21.3
100	NSVS 160429	GSC 4484-1192	2MASS J22313766+7153595	22 31 37.66 +71 53 59.4
101	NSVS 8922739	GSC 2749-2238	2MASS J22495205+3050566	22 49 52.06 +30 50 56.6
102	NSVS 168203	GSC 4485-1061	2MASS J22512796+7143209	22 51 27.97 +71 43 20.9
103	NSVS 166830	GSC 4477-0706	2MASS J22575892+6853534	22 57 58.92 +68 53 53.5
104	NSVS 1420036	GSC 4613-0149	2MASS J22584405+8149517	22 58 43.94 +81 49 52.1
105	NSVS 174282	GSC 4485-0988	2MASS J23022486+7248421	23 02 24.91 +72 48 42.2
106	NSVS 137356	GSC 4605-1469	2MASS J23030783+7759299	23 03 07.86 +77 59 30.2
107	NSVS 134842	GSC 4601-0559	2MASS J23054223+7518389	23 05 42.23 +75 18 39.1
108	NSVS 173432	GSC 4481-1535	BD+69 1306	23 06 41.69 +70 44 58.7
109	NSVS 3530969	GSC 4278-1180	2MASS J23075446+6010278	23 07 54.47 +60 10 27.9
110	NSVS 1403200	GSC 4481-0080	2MASS J23102709+6954483	23 10 27.06 +69 54 48.6
111	NSVS 9015679	GSC 2755-2136	2MASS J23113861+3210267	23 11 38.62 +32 10 26.7

112	NSVS 143072	GSC 4606-1601	2MASS J23235046+7814170	23 23 50.44 +78 14 17.1
113	NSVS 179535	GSC 4478-0658	2MASS J23242524+6838294	23 24 25.28 +68 38 29.6
114	NSVS 181796	GSC 4482-0673	2MASS J23243965+7113101	23 24 39.86 +71 13 09.7
115	NSVS 182033	GSC 4482-0981	2MASS J23271132+7008081	23 27 11.34 +70 08 08.4
116	NSVS 185812	GSC 4490-0777	2MASS J23285251+7425596	23 28 52.54 +74 25 59.6
117	NSVS 188752	GSC 4491-0535	2MASS J23365758+7420304	23 36 57.62 +74 20 30.2
118	NSVS 146367	GSC 4606-0340	2MASS J23382684+7724342	23 38 26.83 +77 24 34.5
119	NSVS 1428890	GSC 4614-0887	2MASS J23434356+8127519	23 43 43.58 +81 27 51.9
120	NSVS 1433325	GSC 4610-0904	2MASS J23451782+8004119	23 45 18.06 +80 04 12.3

Table 2 lists the elements and data for the stars. The first column gives the star's number in this paper. The other columns give the brightness range of the variable (magnitudes at maximum and at minimum I and II respectively); the passband of the observations (V for ASAS-V and R1 for ROTSE-I magnitudes); the variability type; the period; the epoch of minimum light derived from the complete dataset and the J-K colour as published in the 2MASS catalogue (Skrutskie et al, 2006).

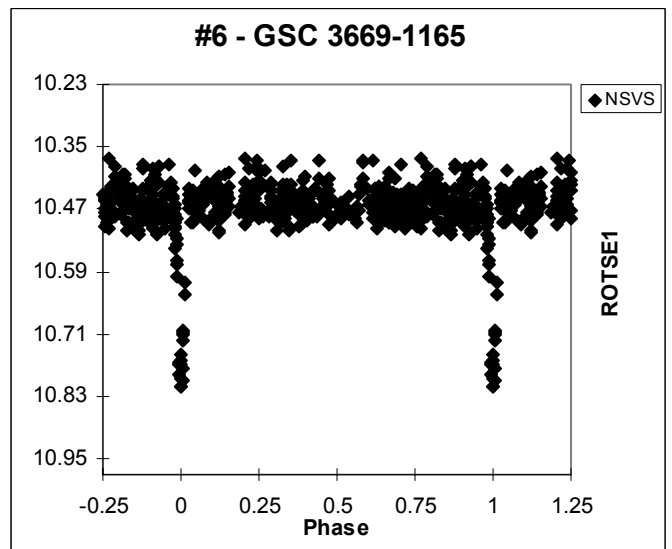
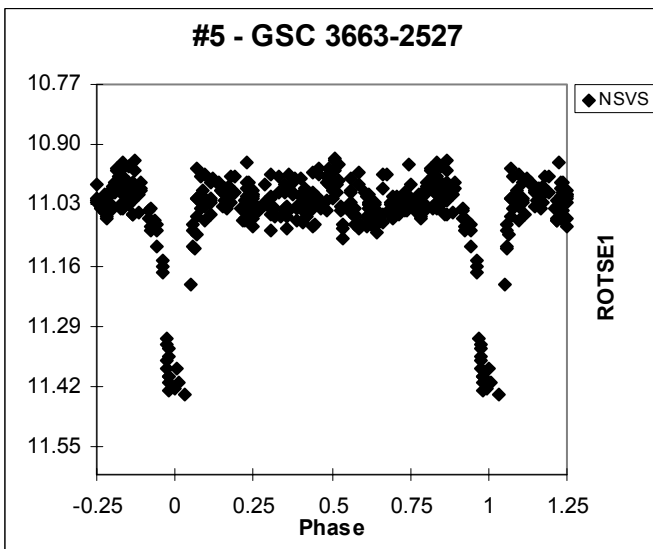
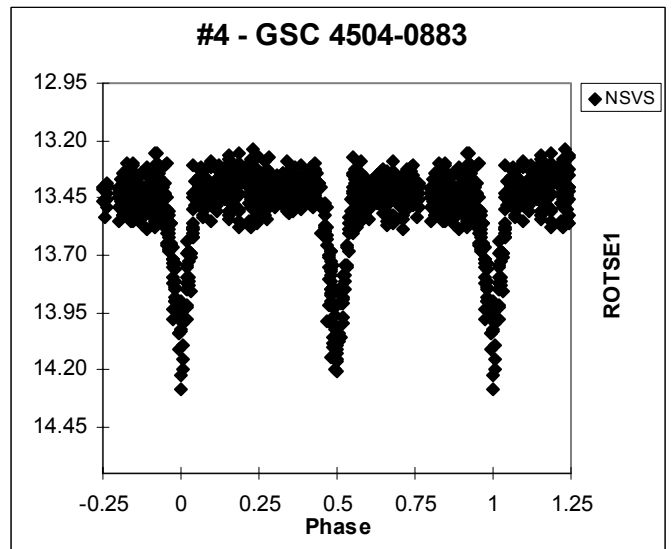
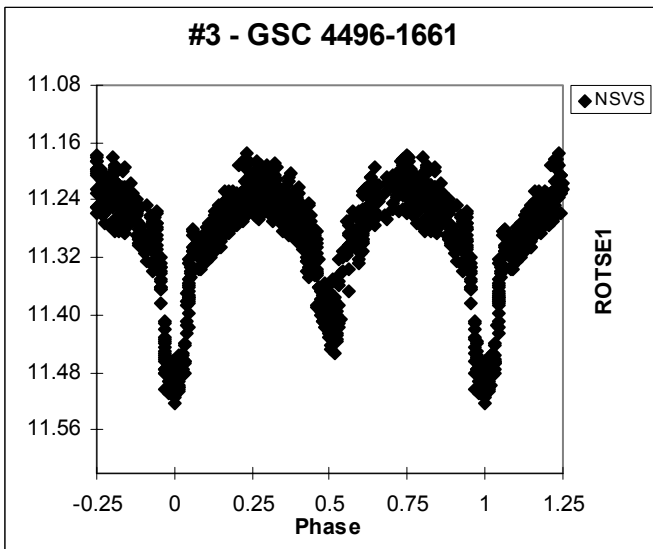
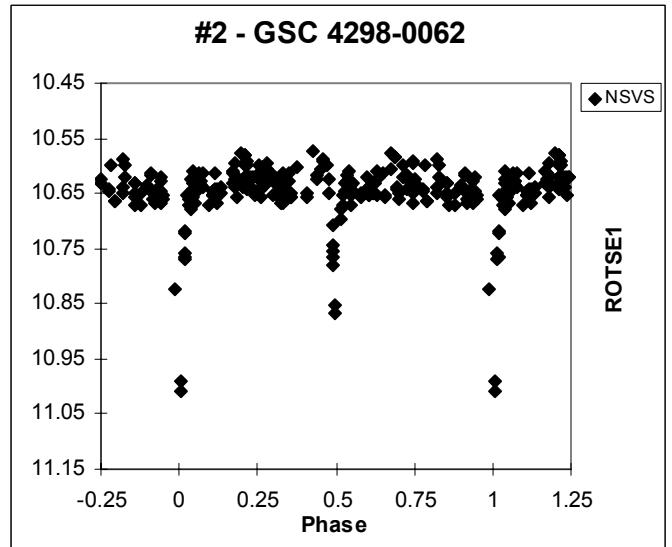
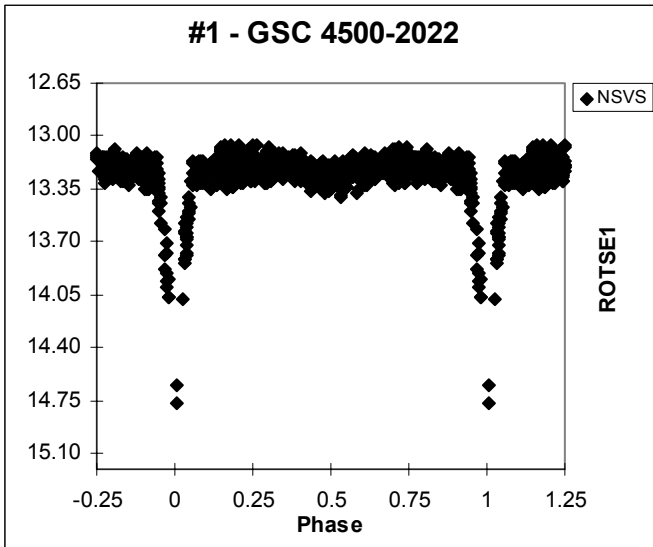
Table 2 – Elements and data for the 120 eclipsing binaries studied.

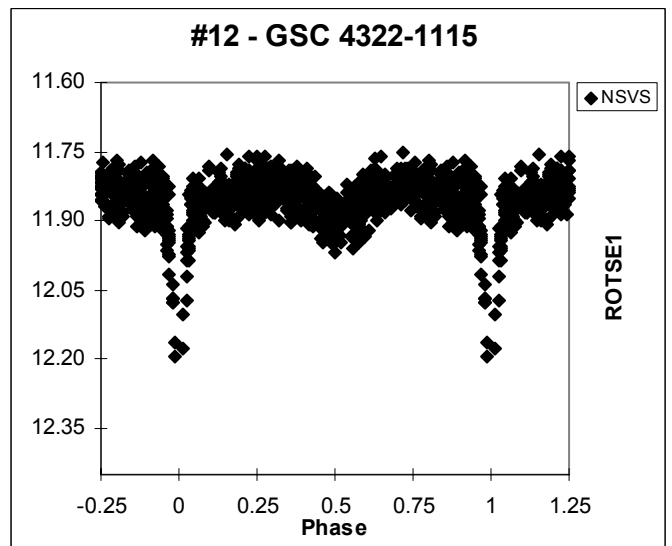
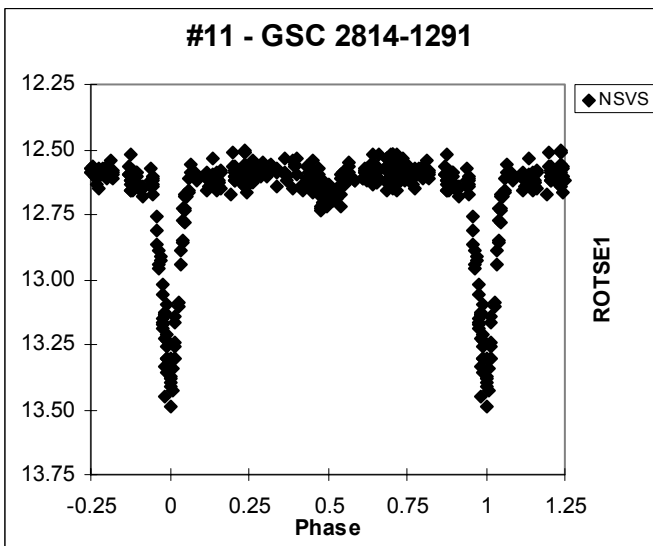
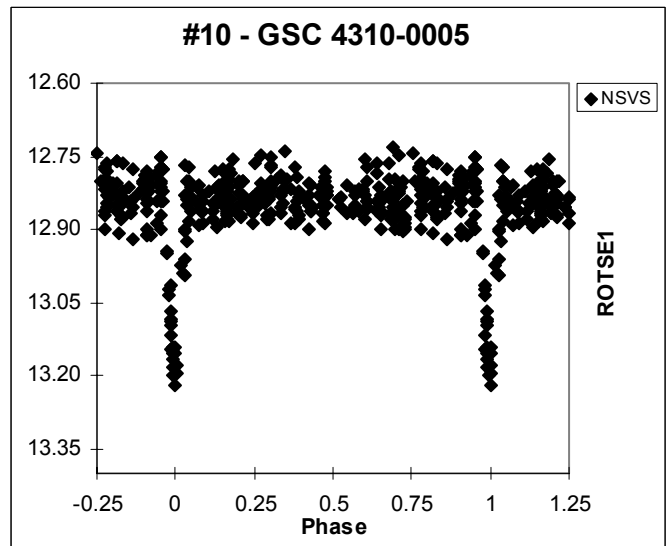
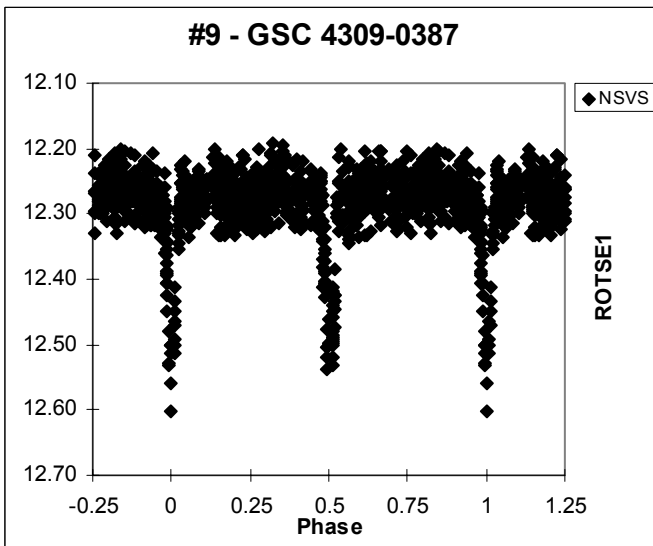
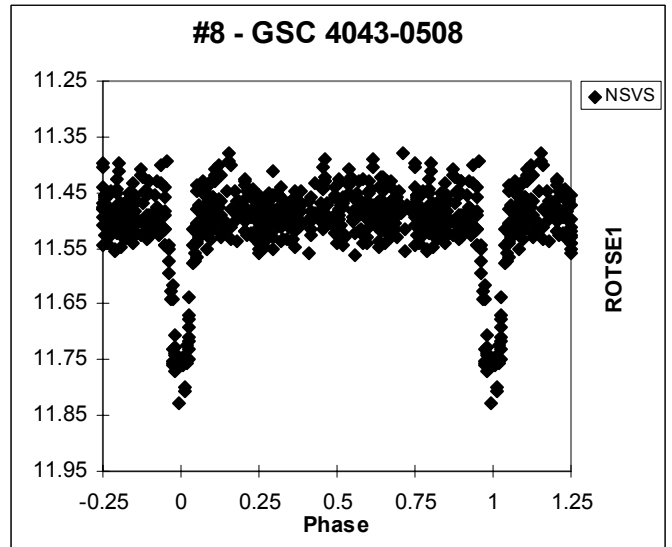
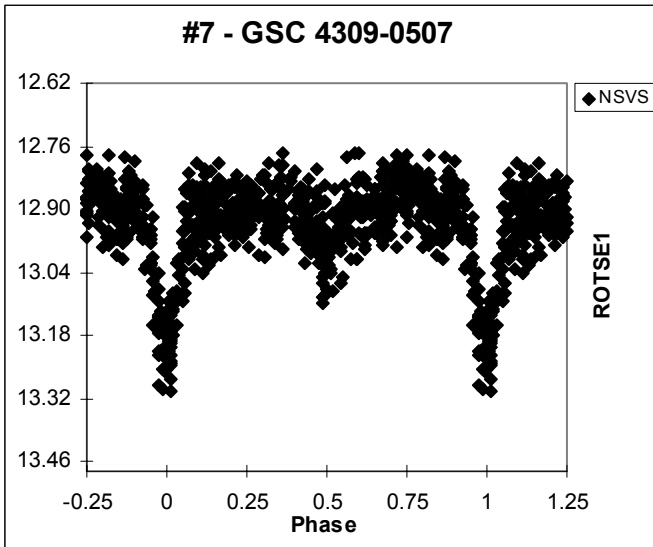
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	Max	Min I	Min II					
1	13.19	<14.7	13.28	R1	EA	2.50931(5)	2451465.569(5)	0.46
2	10.62	11.0:	10.9:	R1	EA	5.1398(1)	2451358.71(1)	0.16
3	11.22	11.51	11.45	R1	EA/GS	68.13(2)	2451454.66(2)	0.94
4	13.4	14.15:	14.15:	R1	EA	1.72267(2)	2451454.597(3)	0.45
5	11.00	11.43:		R1	EA	2.98128(4)	2451483.697(3)	0.07
6	10.44	10.80	10.47	R1	EA	4.4745(1)	2451460.635(2)	0.18
7	12.88	13.25	13.0	R1	EA	0.97410(2)	2451612.599(5)	0.43
8	11.48	11.85:		R1	EA	2.12893(5)	2451378.632(4)	0.19
9	12.25	12.6:	12.6:	R1	EA	9.7814(6)	2451532.61(1)	0.36
10	12.82	13.2		R1	EA	3.8347(2)	2451443.764(7)	0.37
11	12.58	13.47	12.70	R1	EA	3.9761(1)	2451415.866(3)	0.19
12	11.82	<12.2	11.91	R1	EA	14.068(1)	2451541.84(1)	0.72
13	11.68	12.0	12.0	R1	EA	2.13318(3)	2451490.875(4)	0.32
14	12.23	12.73	12.27:	R1	EA	3.7134(2)	2451582.61(2)	0.39
15	12.9	13.4:	13.1:	R1	EA	2.0153(1)	2451542.57(1)	0.39
16	10.65	10.90	10.90	R1	EA	11.3550(5)	2451609.48(5)	0.14
17	11.65	12.1		R1	EA/RS	3.9926(9)	2451470.625(8)	0.35:
18	12.58	13.25	12.8	R1	EA	9.3685(5)	2451409.87(1)	0.58
19	12.94	13.45	13.45	R1	EW	0.347592(2)	2451378.632(2)	0.45
20	11.38	12.07		R1	EA	5.4957(2)	2451612.66(2)	0.49
21	12.75	13.2	12.85	R1	EA	13.382(1)	2451576.59(2)	0.56
22	12.37	12.87	12.46	R1	EA	6.2966(1)	2451598.585(2)	0.59
23	12.50	13.38	12.92	R1	EA	8.662(1)	2451474.57(1)	0.87
24	12.9	<13.6	13.0	R1	EA	1.66859(3)	2451489.714(3)	0.54
25	12.88	13.56	13.17	R1	EA	8.5267(7)	2451555.78(2)	0.64
26	11.65	11.95		R1	EA	1.21565(2)	2451607.609(4)	0.46
27	11.88	12.28	12.13	R1	EA	4.0451(2)	2451482.655(5)	0.28
28	12.49	13.55	12.77	R1	EA	4.5534(1)	2451553.62(1)	0.15
29	12.10	12.8:	12.65:	R1	EA:	2.9060(1)	2451420.645(8)	0.20
30	11.62	11.9	11.66	R1	EA	1.24513(2)	2451378.998(3)	0.28
31	11.09	11.35	11.34	R1	EA	1.35263(2)	2451473.578(4)	0.17

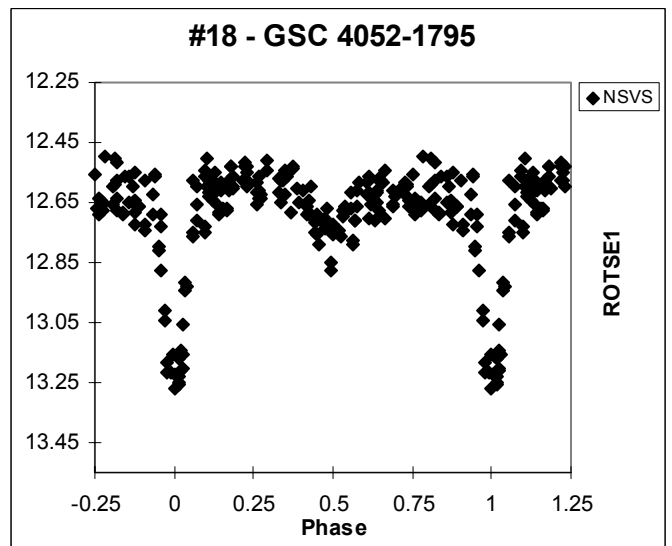
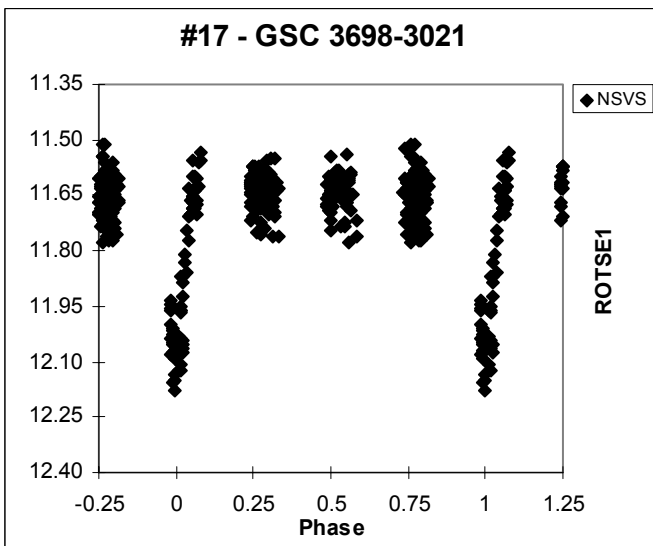
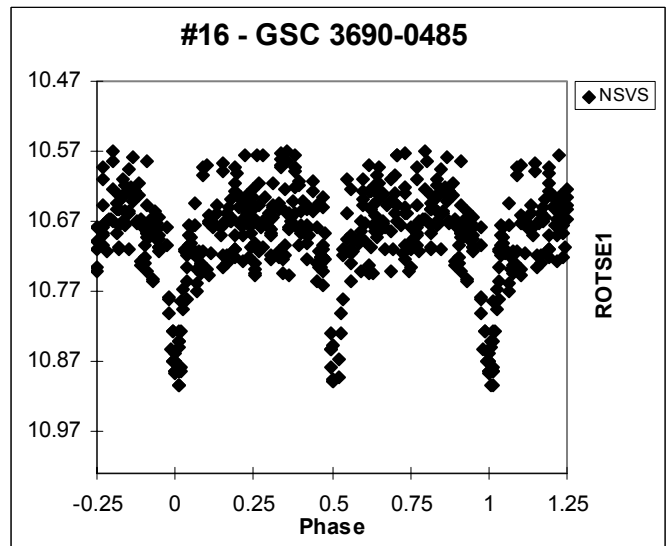
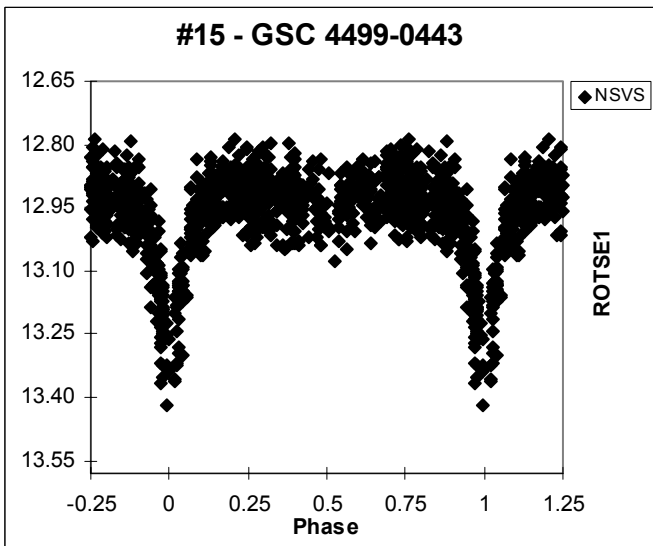
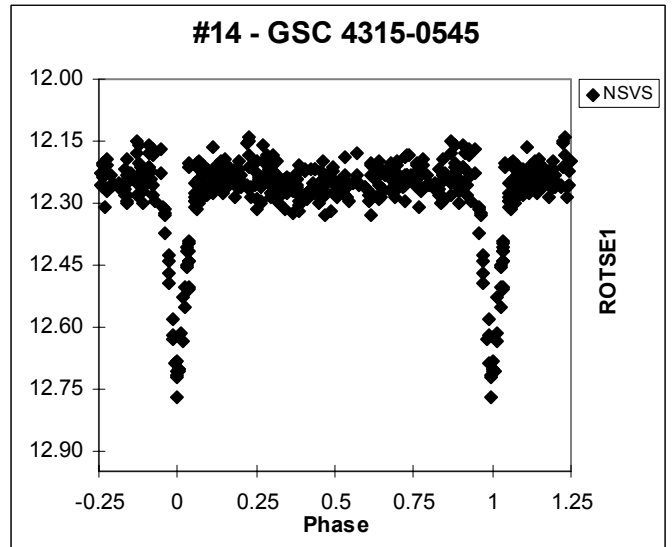
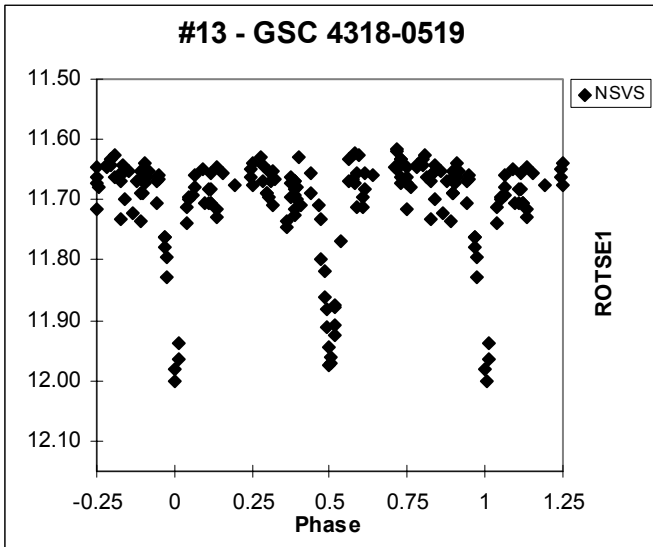
32	11.77	12.35		R1	EA	4.9002(1)	2451535.66(1)	0.24
33	12.87	13.9	13.18:	R1	EA	6.4150(5)	2451542.60(1)	0.67
34	11.66	12.78	11.83	R1	EA/GS	4.5265(1)	2451512.680(5)	0.81
35	11.05	11.45	11.30	R1	EB	0.535297(8)	2451601.666(3)	0.38
36	12.16	<12.7	<12.7	R1	EA	5.5577(1)	2451633.64(2)	0.30
37	12.50	13.1	12.75	R1	EB	0.458030(4)	2451599.730(3)	0.28
38	11.55	11.92	11.78:	R1	EB	0.484564(2)	2451352.350(4)	0.13
39	13.0	13.8:	13.7:	R1	EA	1.66134(2)	2451520.84(2)	0.37
40	12.30	12.91	12.39	R1	EA	2.7527(1)	2451459.747(5)	0.38
41	13.45	14.65	13.65:	R1	EA	1.83953(4)	2451400.858(4)	0.23
42	13.02	14.1	13.2	R1	EA	2.0872(1)	2451615.633(8)	0.33
43	13.40	14.35:	13.6	R1	EA	2.3588(1)	2451556.795(6)	0.27
44	10.04	10.7	10.12	V	EA	4.96652(6)	2451554.897(9)	0.27
45	12.00	13.0:	12.12	V	EA/GS	5.47535(9)	2451573.74(1)	0.54
46	12.83	13.5	13.5:	R1	EA	2.25303(8)	2451593.737(4)	0.40
47	10.06	10.37	10.37:	V	EA	5.4966(1)	2451465.85(2)	0.20
48	11.89	12.36	12.03	R1	EB	0.83614(1)	2451612.652(3)	0.17
49	11.32	12.12	11.90	V	EA	11.3053(1)	2451627.72(2)	0.05
50	10.88	11.33	11.05	R1	EA	1.66900(3)	2451537.601(2)	0.33
51	13.4	14.5	13.55	R1	EA	1.93653(9)	2451567.820(6)	0.24
52	12.60	<13.15	<13.05:	R1	EA	11.866(2)	2451531.85(1)	0.37
53	13.20	14.7:	13.40	R1	EA	3.0703(1)	2451461.695(5)	0.41
54	12.52	12.75	12.61	R1	EB	2.7404(1)	2451620.782(7)	0.44
55	13.3	<14.3		R1	EA	0.722543(9)	2451295.655(6)	0.64
56	12.05:	12.8:	12.1:	V	EA	2.30318(3)	2452713.563(5)	0.37
57	10.77	11.04	11.00	R1	EB	1.43543(2)	2451463.77(1)	0.49
58	13.25	14.0	13.9	R1	EA	6.2222(9)	2451517.60(2)	0.31
59	12.30	12.65	<12.4	R1	EA	14.215(4)	2451602.596(9)	0.44
60	9.73	10.22	10.18	R1	EW	0.373260(2)	2451578.812(1)	0.36
61	13.95	14.4:	14.4:	R1	EW	0.39289(1)	2451378.363(2)	0.27
62	10.78	11.7	11.10	R1	EA	9.2512(8)	2451631.63(1)	0.43
63	11.95	12.45	12.14	R1	EA	3.4832(1)	2451274.687(5)	0.44
64	13.50	14.05	14.0	R1	EW	0.554646(9)	2451518.790(5)	0.17
65	13.2	14.2	13.3	R1	EA	1.52803(2)	2451567.76(1)	0.36
66	10.52	10.9	10.56	R1	EA	2.93555(5)	2451318.730(5)	0.42
67	12.49	13.05	13.05:	R1	EA	3.78551(5)	2451577.753(5)	0.32
68	12.05	12.7:	12.6:	R1	EA	2.97703(3)	2451549.642(4)	0.22
69	11.66	11.9	11.9	R1	EA	19.971(4)	2451593.71(1)	0.32
70	11.74	12.13	11.81	R1	EA	2.21127(5)	2451502.792(5)	0.38
71	12.98	13.09	13.55	R1	EA	1.63993(4)	2451616.79(1)	0.26
72	12.85	13.4:	13.3:	R1	EA	1.05715(1)	2451348.757(3)	0.37
73	10.72	11.31	10.75:	R1	EA	0.679507(5)	2451526.875(3)	0.28
74	12.91	13.56	13.45	R1	EA	0.728091(6)	2451378.194(6)	0.48
75	11.92	12.50	12.08	R1	EA	3.6165(1)	2451325.750(7)	0.61
76	12.45	12.6	12.55	R1	EB:	0.60194(1)	2451608.784(6)	0.11
77	12.58	13.05	12.80	R1	EA	0.85026(1)	2451343.697(4)	0.24
78	12.65	<13.3	<12.9	R1	EA	0.643290(5)	2451453.603(1)	0.65
79	12.55	13.1	12.7	R1	EA	1.64465(2)	2451332.705(5)	0.20
80	12.9	13.65:	13.0	V	EA	1.47028(1)	2452750.833(8)	0.45
81	12.28	13.1:	12.32:	V	EA	3.91352(8)	2452782.814(9)	0.16
82	12.16	12.54	12.52	R1	EW	0.653555(6)	2451310.829(4)	0.20
83	11.67	12.3:	11.93	V	EA	5.00337(1)	2452552.553(3)	0.33

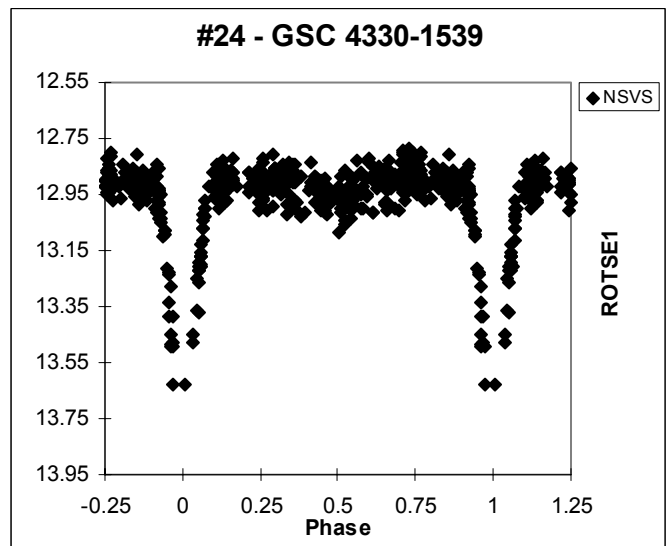
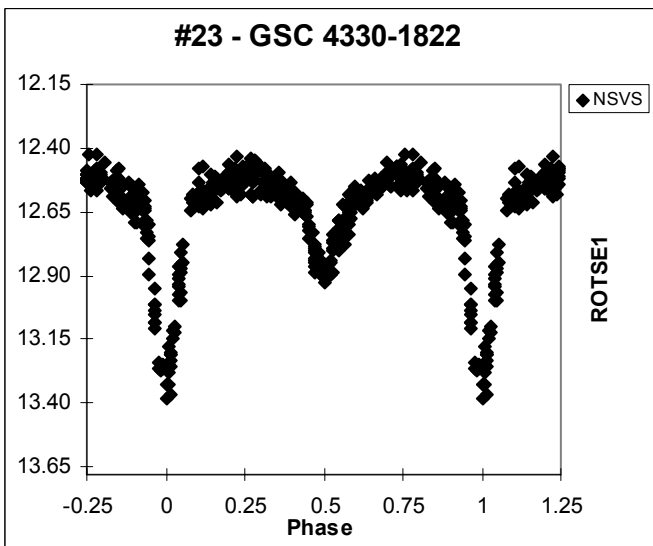
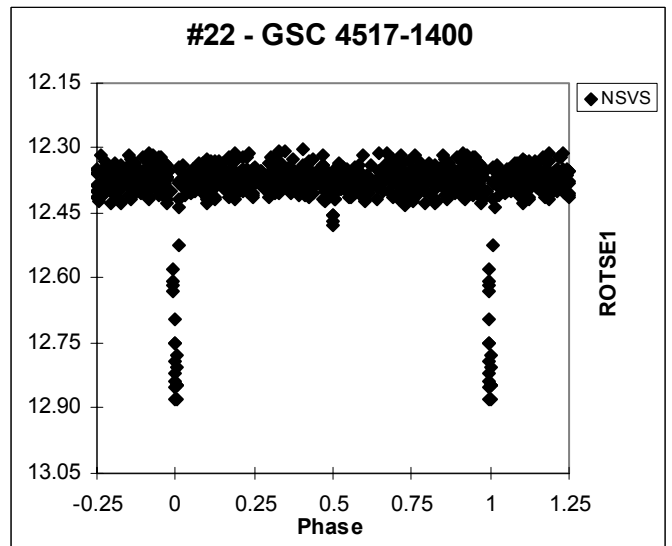
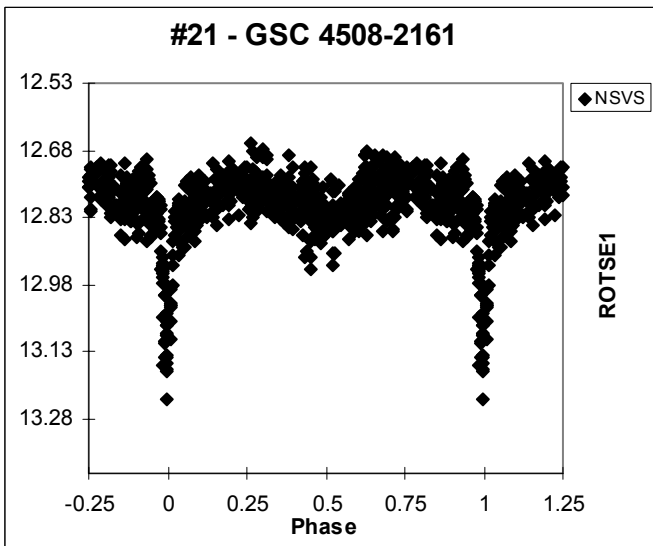
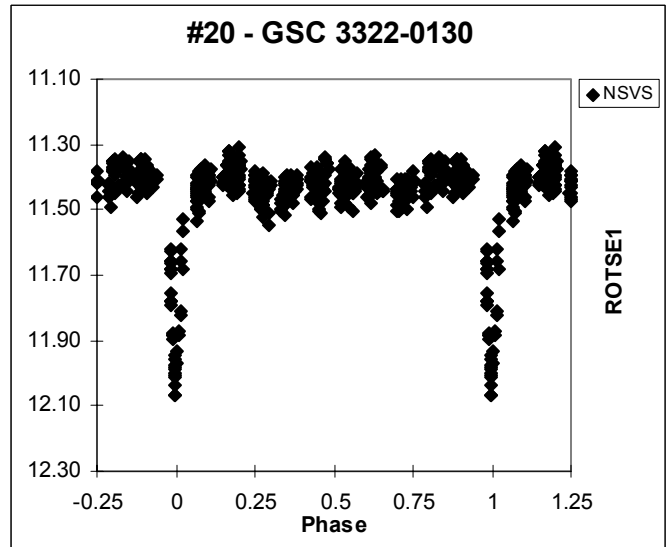
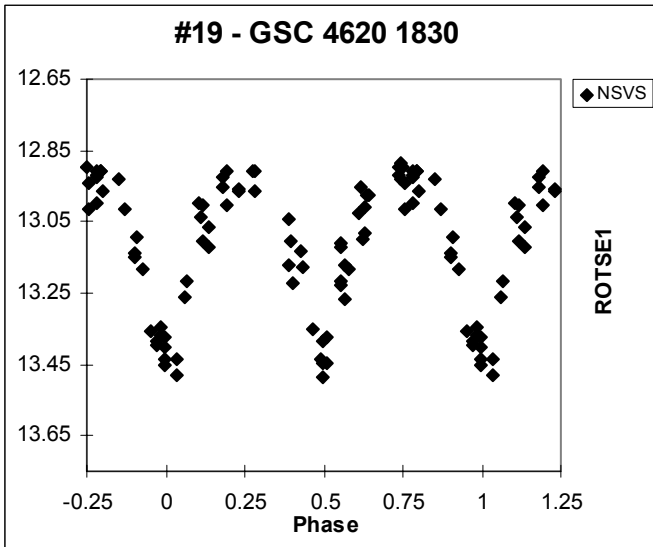
84	12.35	12.6:	12.6:	R1	EW	0.47687(1)	2451495.800(8)	0.45
85	12.45	12.75	12.75	R1	EA	2.90540(5)	2451338.683(5)	0.33
86	9.97	10.45:		R1	EA	2.3542(2)	2451421.73(2)	0.21
87	10.19	10.62	10.5	R1	EA	4.6760(2)	2451358.767(8)	0.84
88	10.88	11.73	11.07	R1	EA	1.71636(3)	2451341.882(7)	0.21
89	12.23	12.88	12.70	V	EB/GS	49.44(2)	2451339.4(7)	0.90
90	12.20	13.05	12.30	V	EA	4.38093(4)	2451362.77(1)	0.35
91	11.08	11.5	11.23	R1	EA	2.00819(8)	2451514.690(5)	0.38
92	13.4	14.1	13.55	R1	EA	2.7549(2)	2451449.827(6)	0.57
93	11.64	12.0		R1	EA	3.4150(2)	2451364.72(1)	0.42
94	10.93	11.17	11.15	R1	EW	0.301067(1)	2451299.985(1)	0.41
95	12.00	12.33	12.31	R1	EW	0.60703(1)	2451415.813(3)	0.27
96	11.70	12.16	<12.0	R1	EA	6.01927(5)	2451421.718(5)	0.46
97	12.5	12.7	12.65	R1	EW	0.305003(3)	2451452.602(2)	1.04
98	13.20	13.7	13.45	R1	EA	0.62448(2)	2451420.765(5)	0.40
99	12.50	12.9	12.9	R1	EA	1.69189(2)	2451612.585(4)	0.44
100	11.81	12.1:	12.05:	R1	EA	2.92473(9)	2451503.789(7)	0.32
101	13.10	13.8	13.7	R1	EA	0.65020(1)	2451323.885(2)	0.25
102	11.18	11.61	11.45	R1	EA	3.5697(1)	2451341.863(5)	0.03
103	12.88	13.25	13.2	R1	EW	0.411767(4)	2451383.775(4)	0.49
104	13.19	13.56	13.56	R1	EW	0.85353(2)	2451572.760(3)	0.35
105	11.57	12.00	11.85	R1	EA	2.94152(8)	2451403.677(4)	0.51
106	11.81	12.15	11.94	R1	EA	1.25771(2)	2451318.730(5)	0.34
107	11.64	11.95	11.69:	R1	EA	2.14718(5)	2451400.735(8)	0.40
108	9.60	10.05	10.05	R1	EA	2.57791(3)	2451426.62(1)	0.35
109	11.37	11.8:	11.8	R1	EA	7.0206(2)	2451340.81(1)	0.28
110	12.48	12.83	12.83	R1	EW	0.393725(2)	2451553.616(2)	0.43
111	13.0	13.6	13.15	R1	EA	1.27868(2)	2451449.813(4)	0.30
112	11.95	12.3	12.3	R1	EA	1.58145(3)	2451417.698(6)	0.24
113	12.76	13.25	12.88	R1	EA	2.72771(4)	2451421.760(4)	0.28
114	12.39	13.0	<12.9	R1	EA	5.5466(2)	2451457.76(2)	0.26
115	12.95	13.4	13.4	R1	EA	1.39409(2)	2451612.610(5)	0.50
116	13.43	14.05	13.95	R1	EA	1.69810(3)	2451532.589(2)	0.43
117	12.35	12.6	12.6	R1	EA	1.13502(1)	2451397.820(7)	0.36
118	12.35	12.8	12.45	R1	EA	1.067973(8)	2451413.641(3)	0.61
119	12.18	12.70	12.50	R1	EA	1.040474(5)	2451332.731(4)	0.36
120	12.41	12.92	12.9	R1	EA	6.0213(1)	2451287.83(1)	0.37

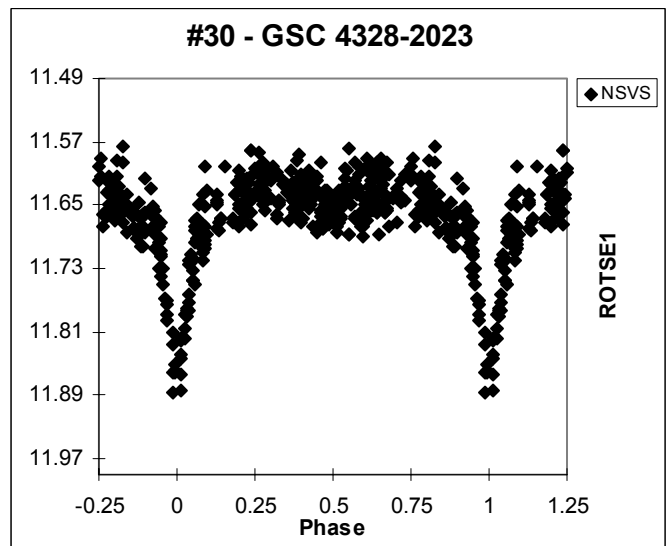
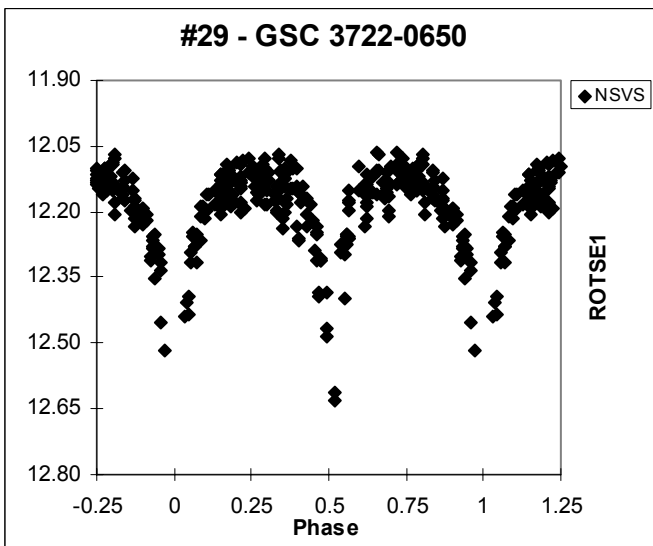
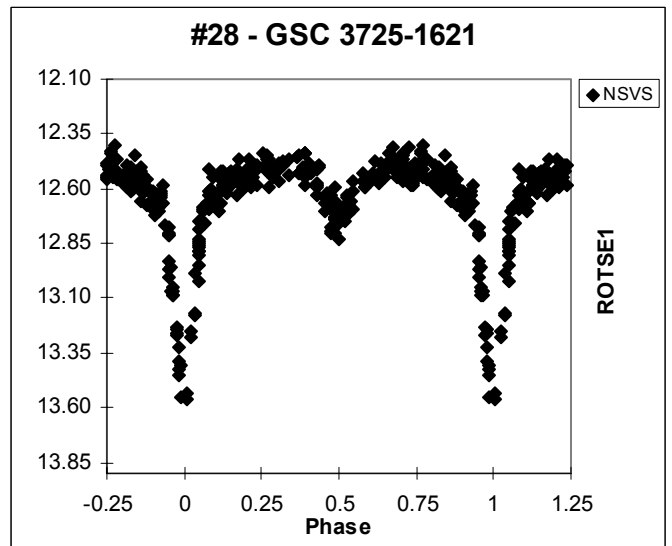
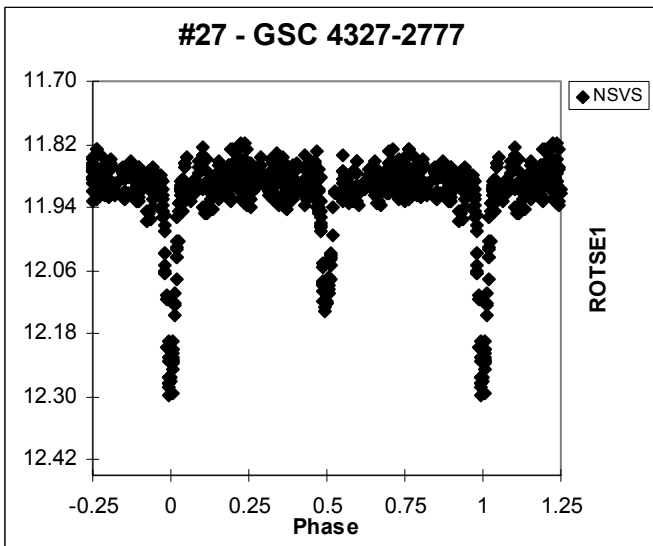
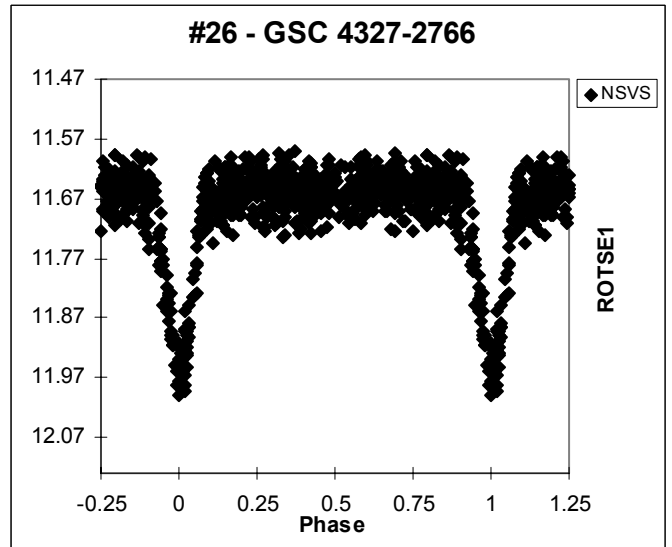
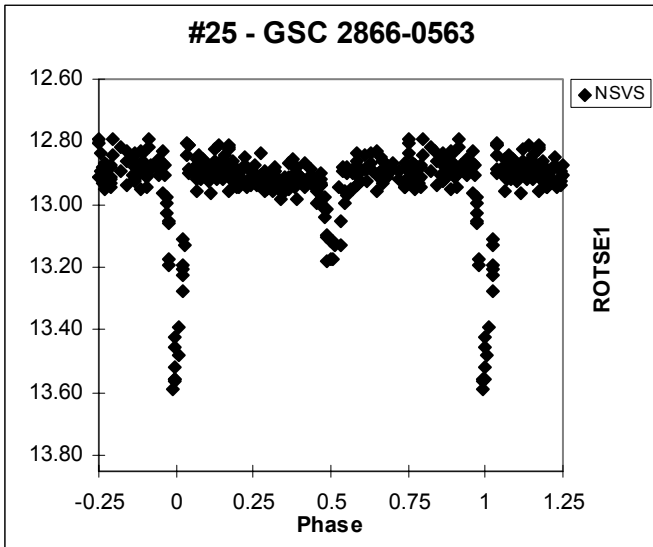
Figures 1 to 120 show the collection of light curves showing the eclipses of all the systems studied in this paper.

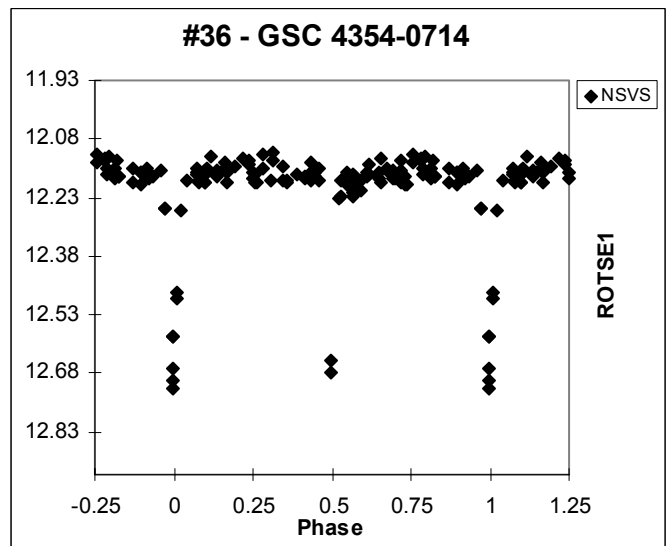
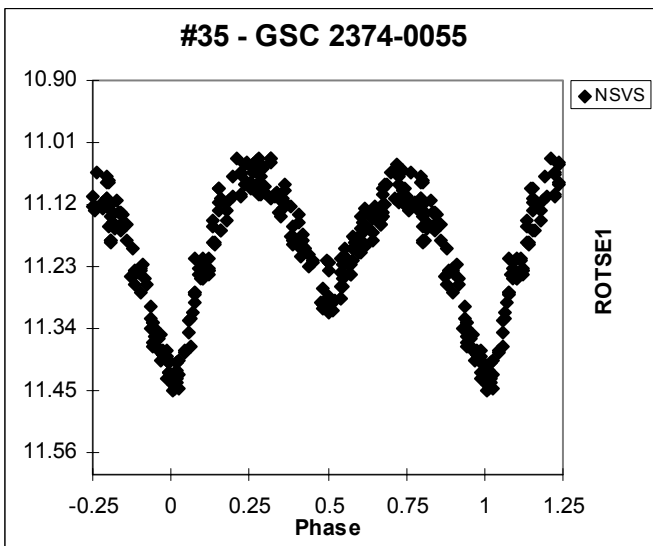
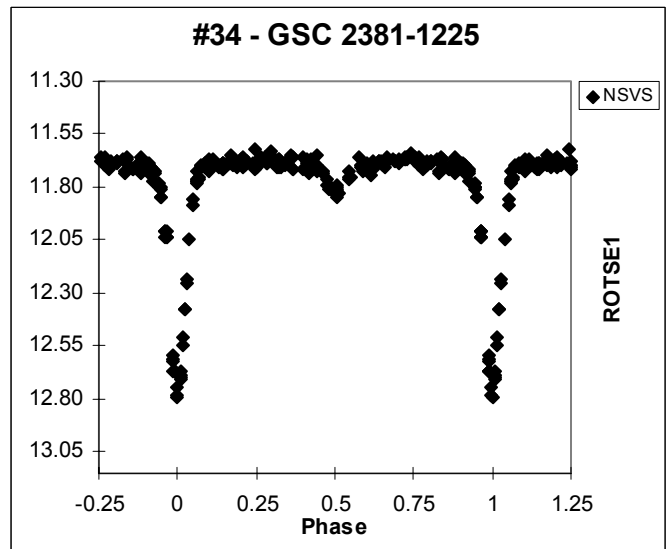
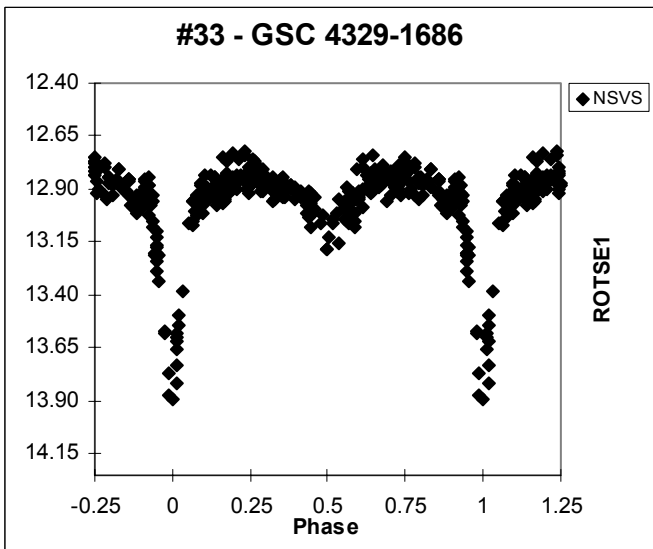
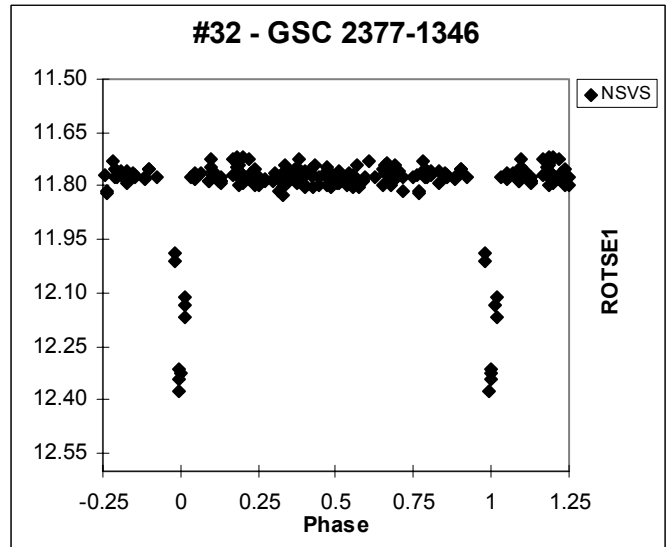
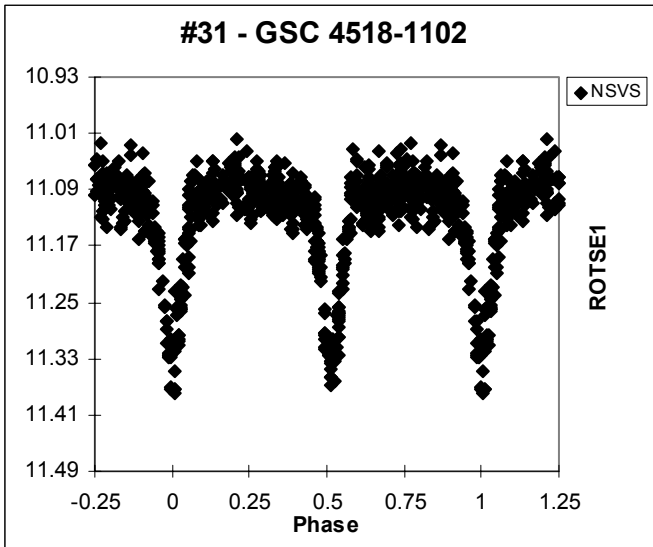


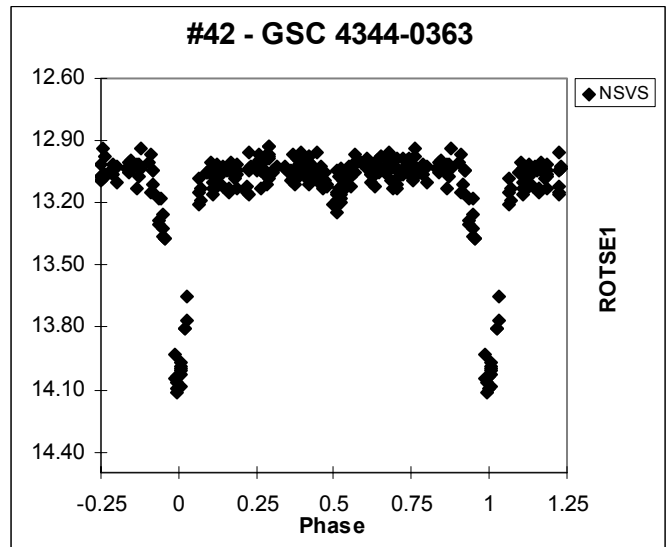
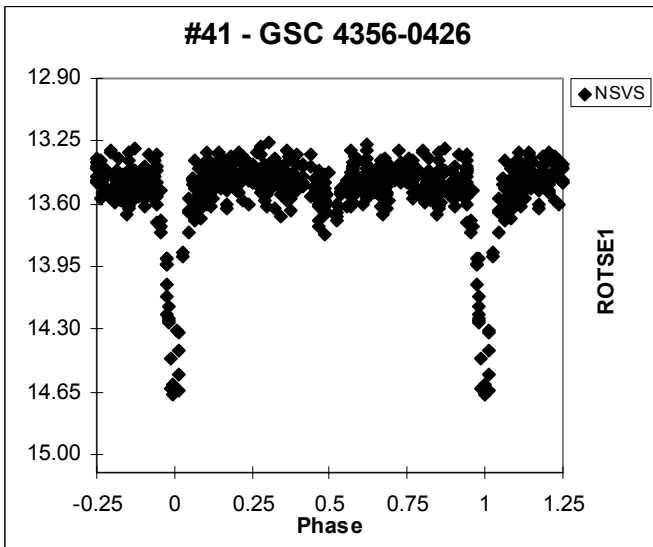
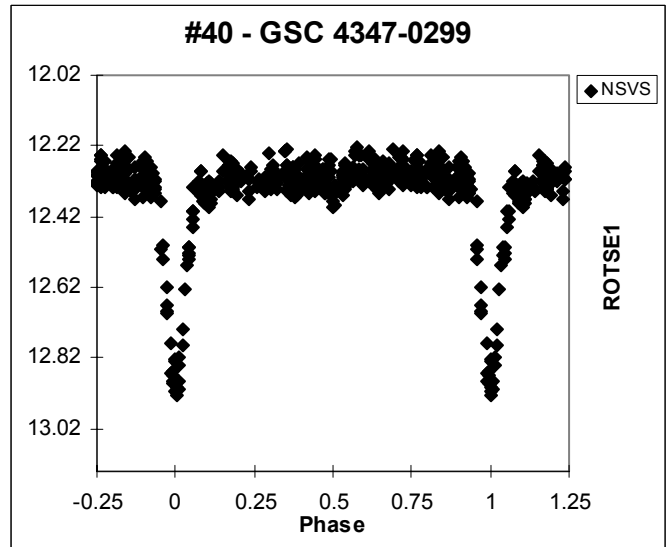
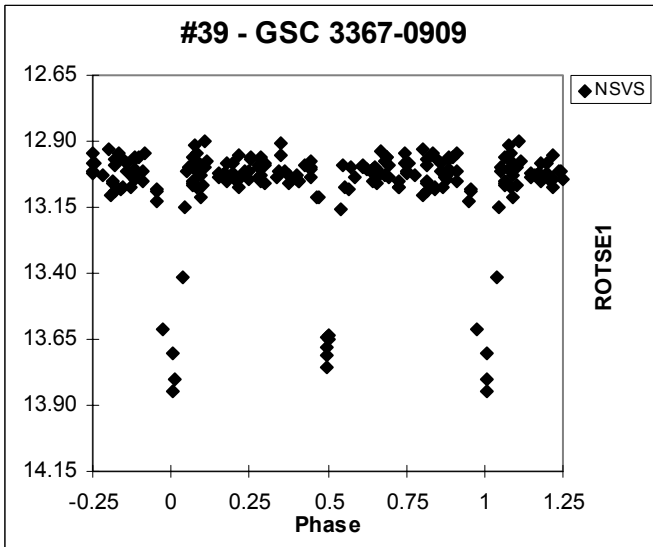
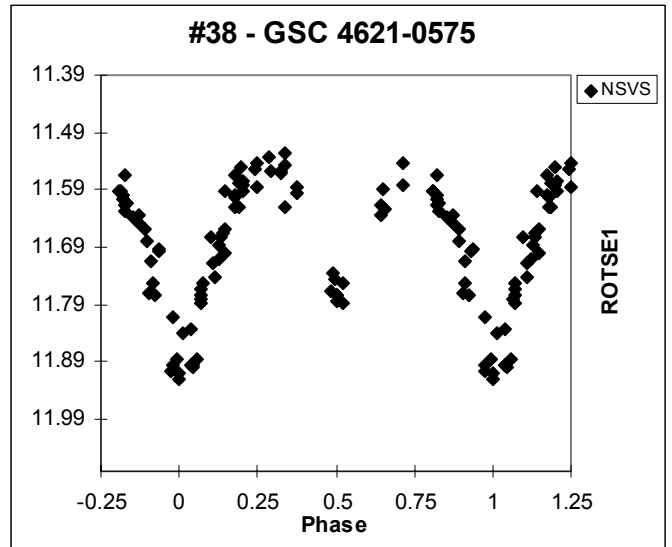
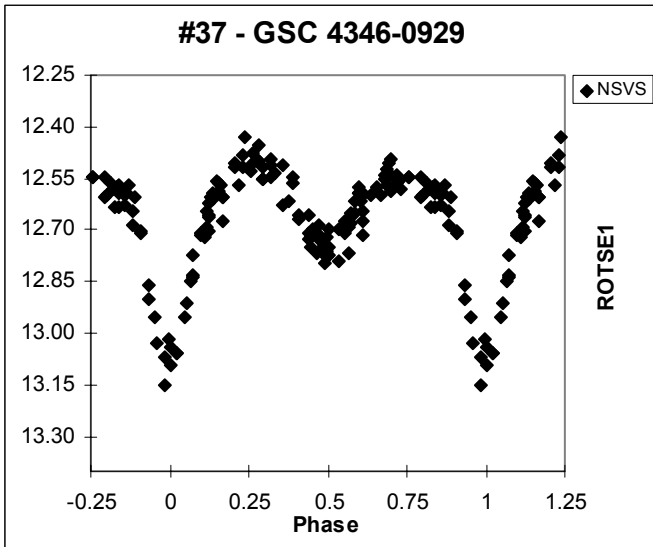


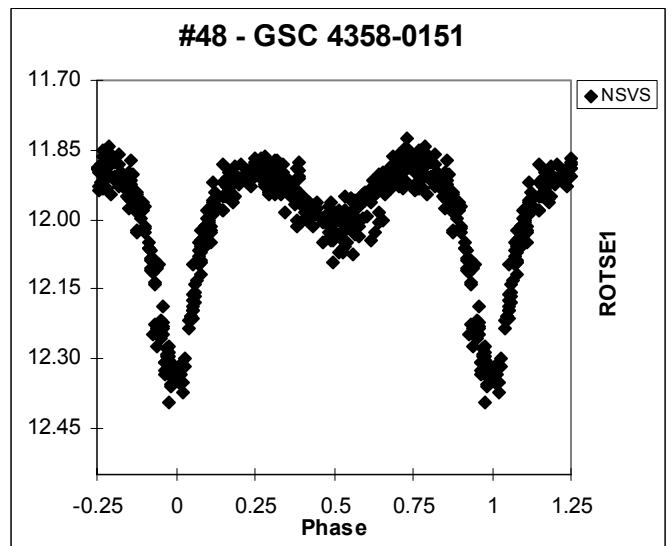
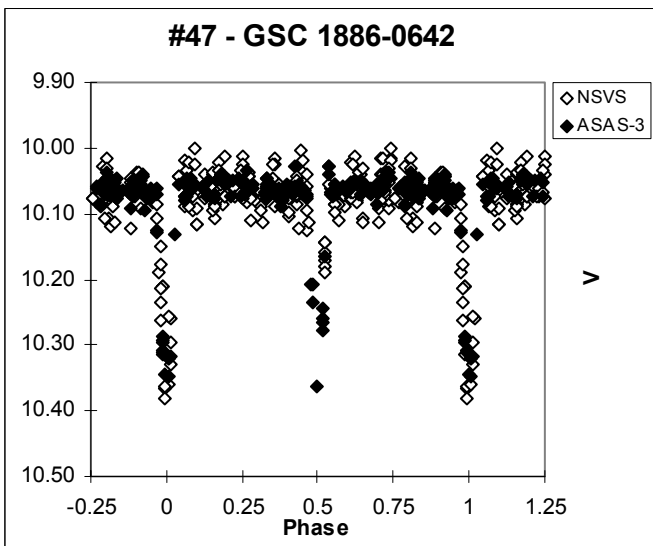
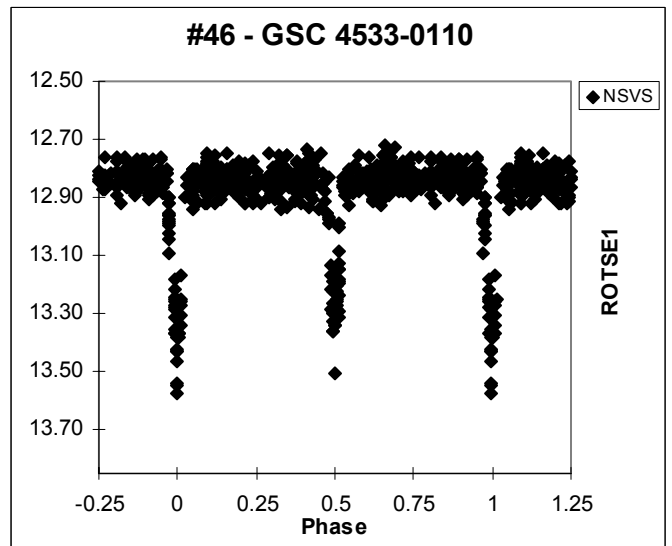
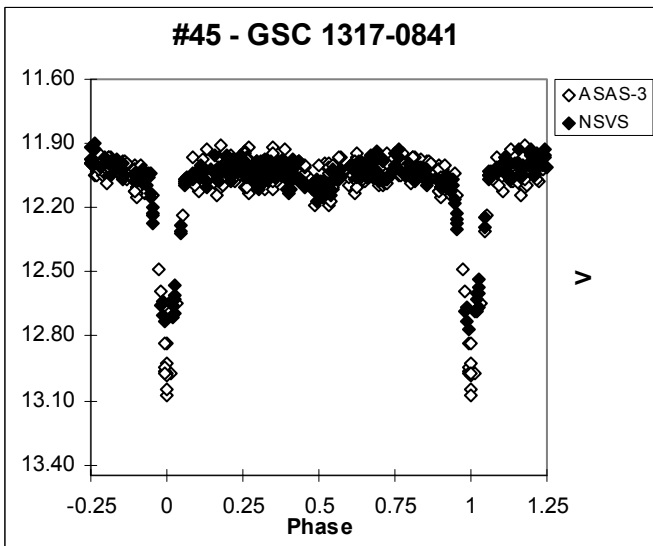
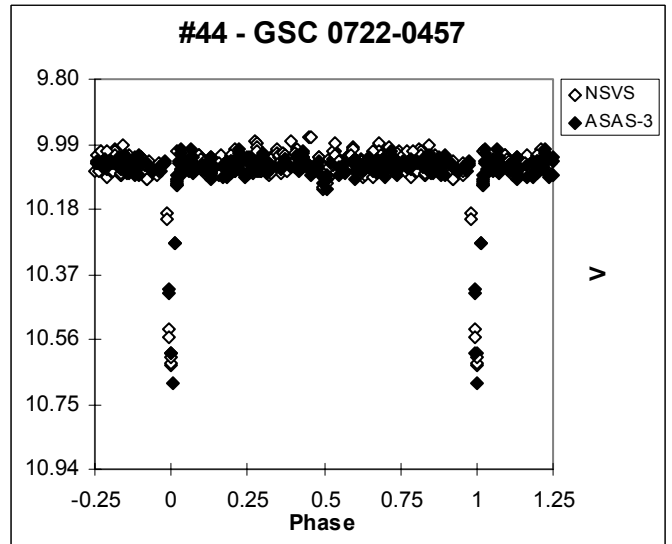
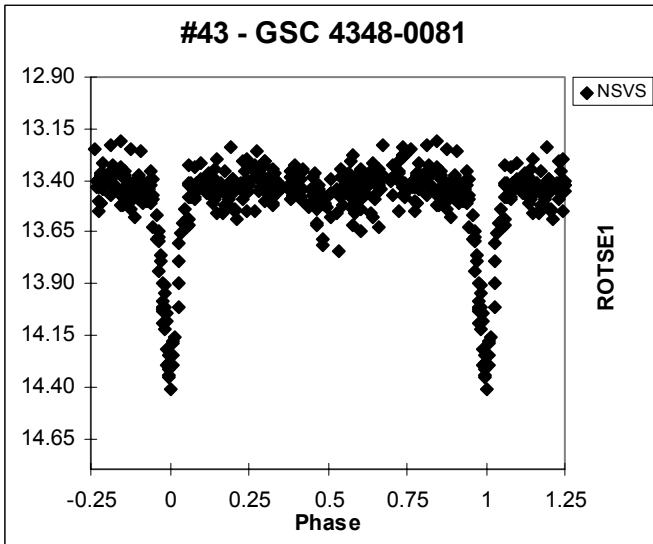


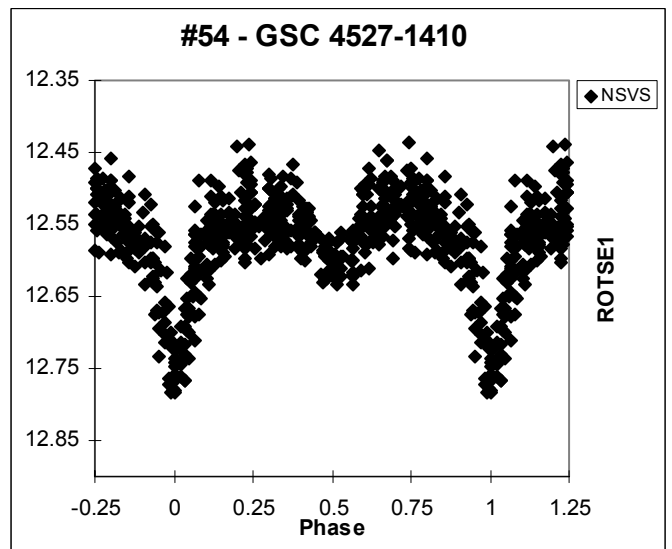
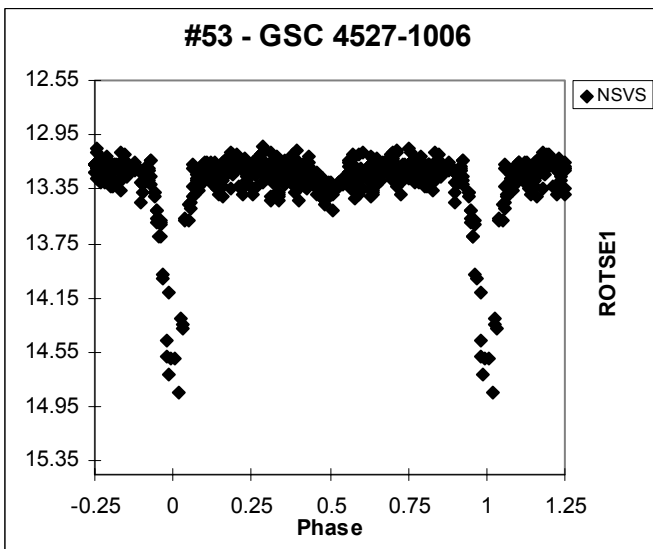
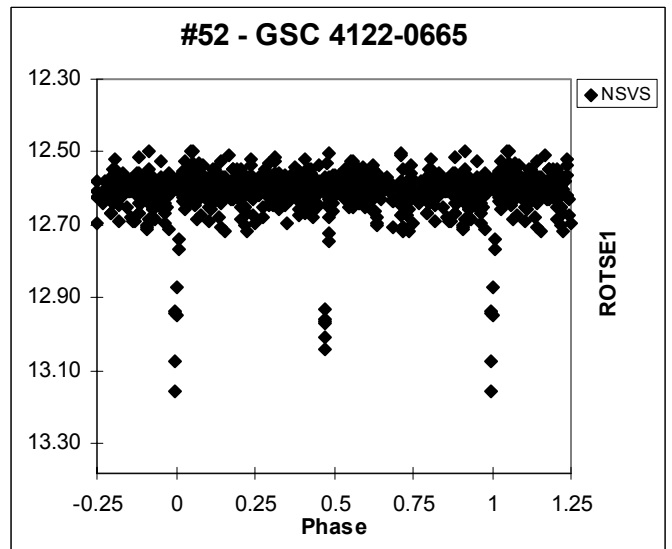
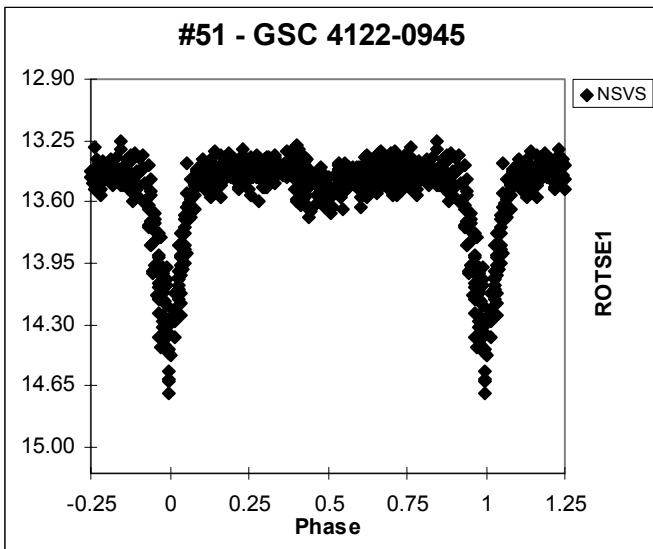
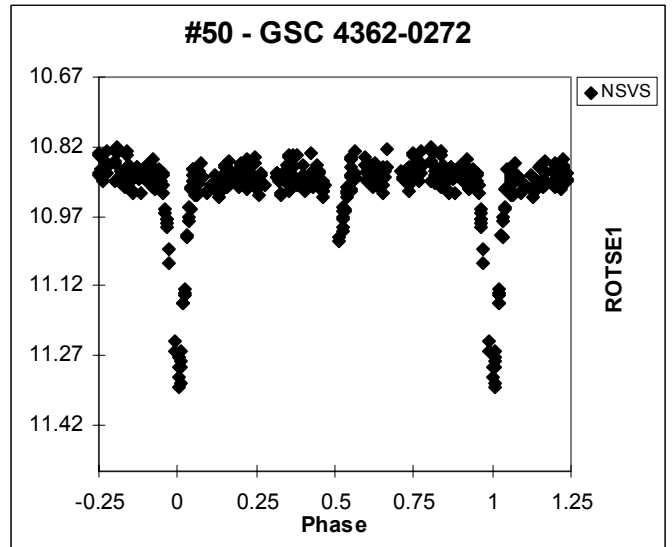
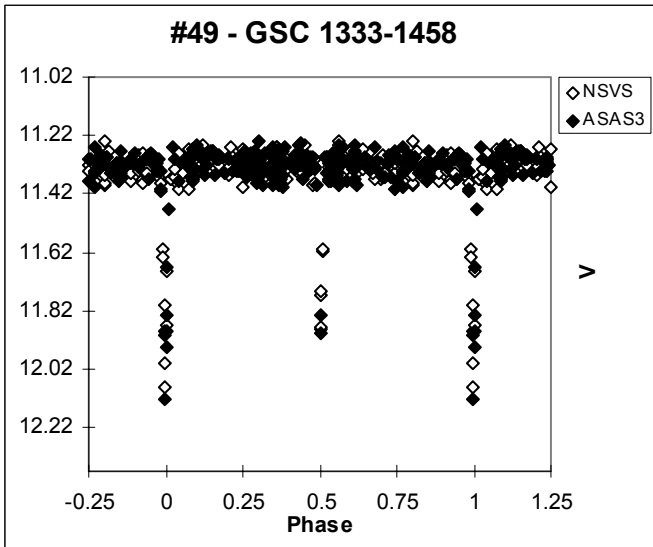


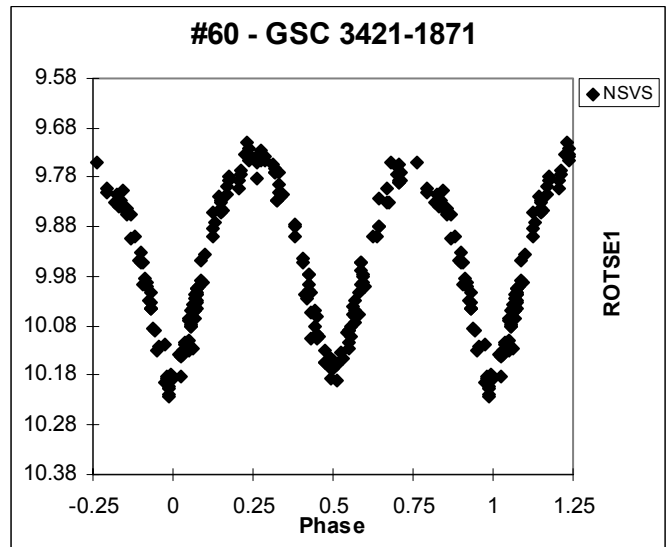
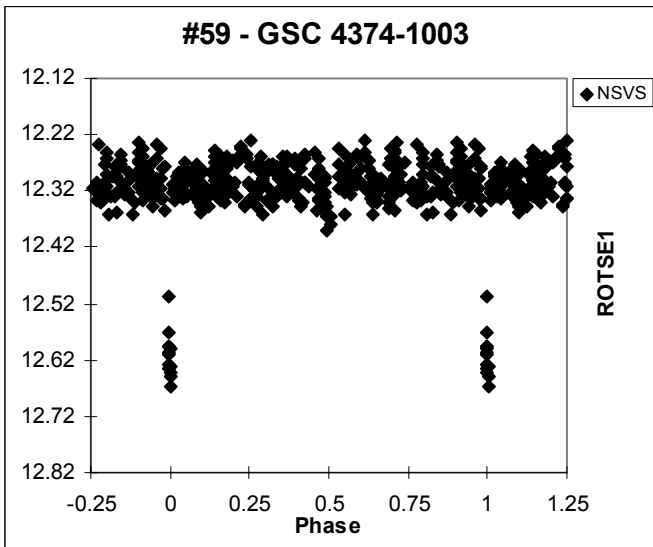
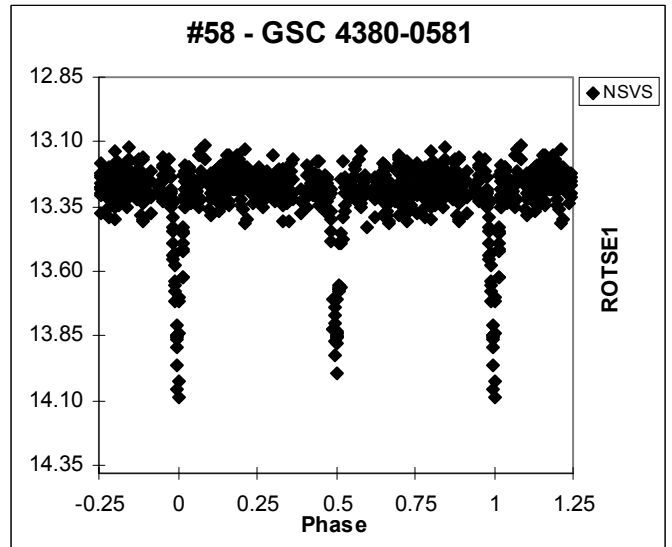
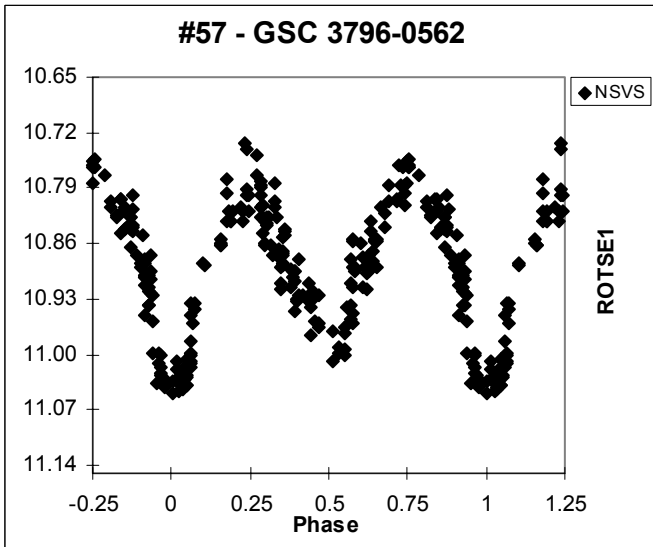
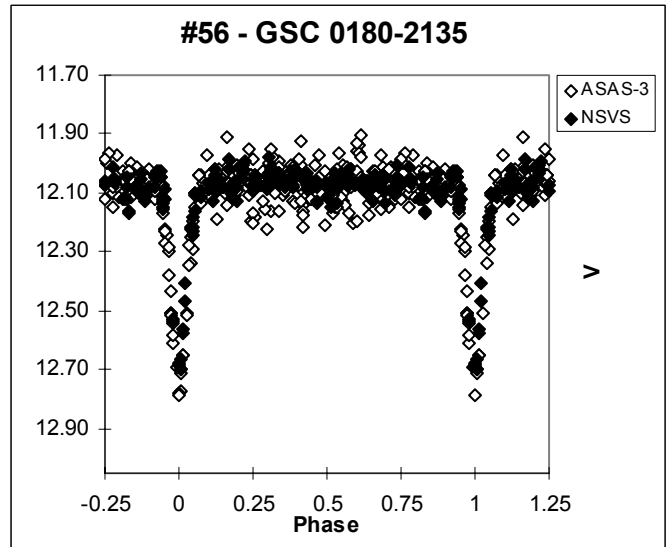
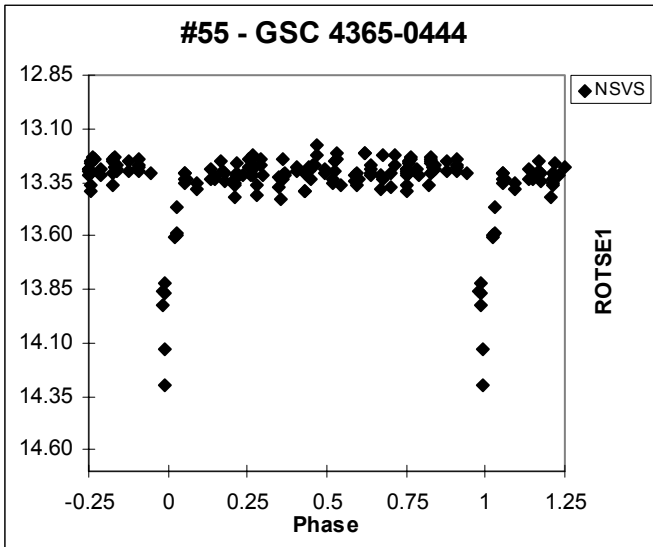


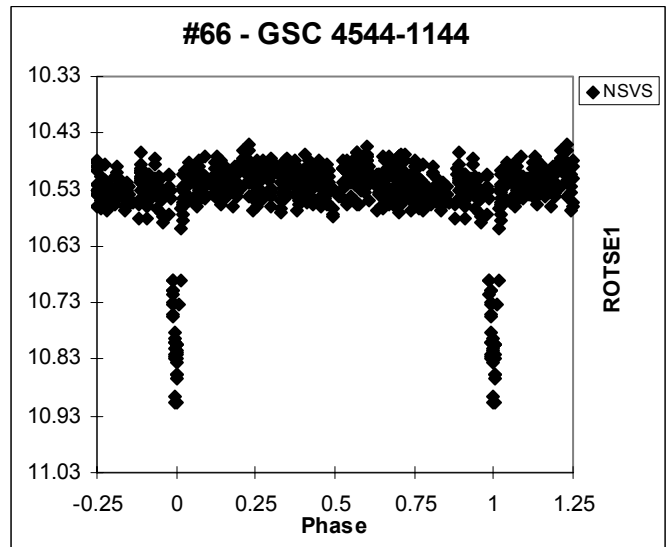
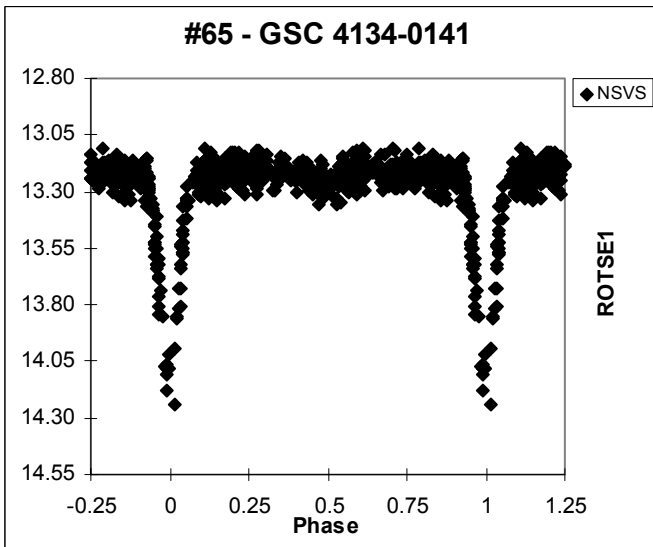
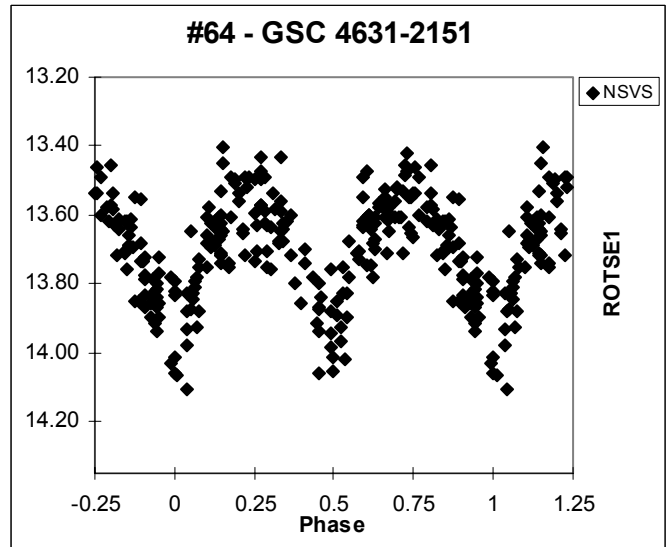
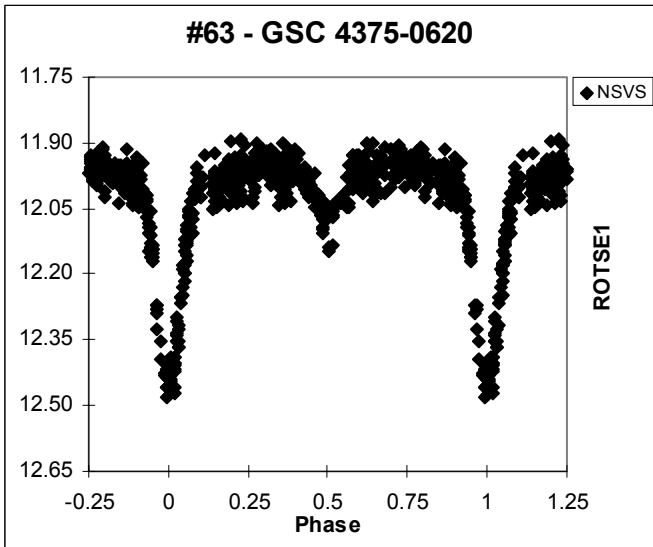
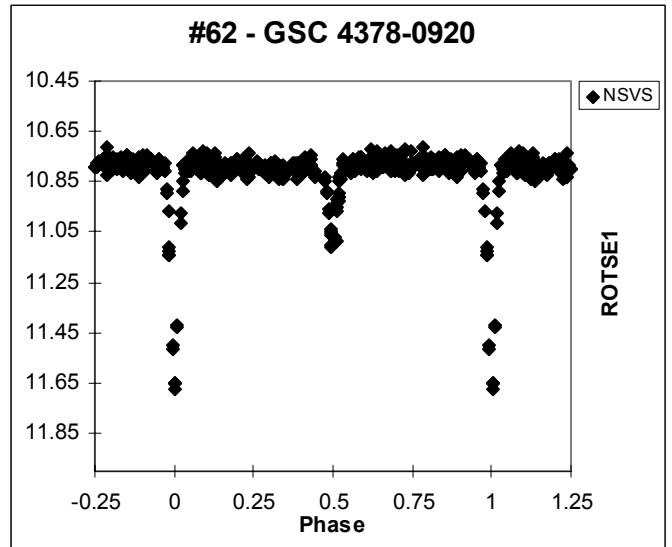
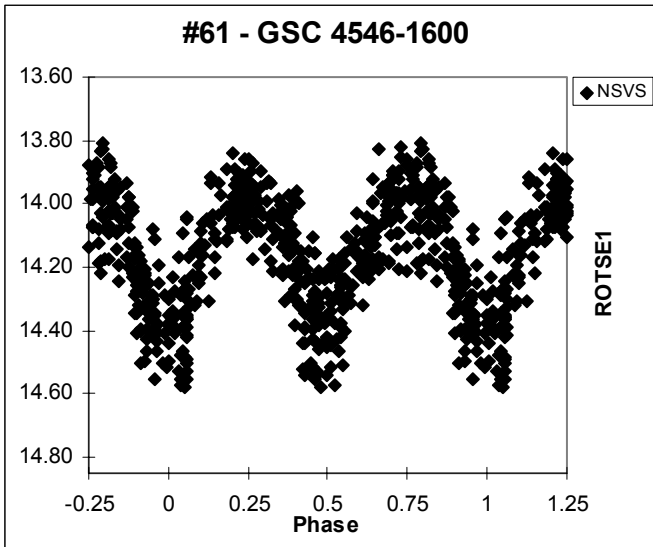


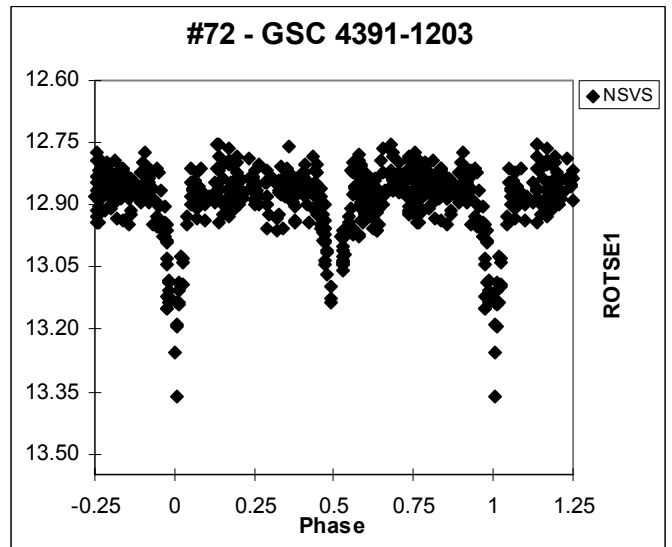
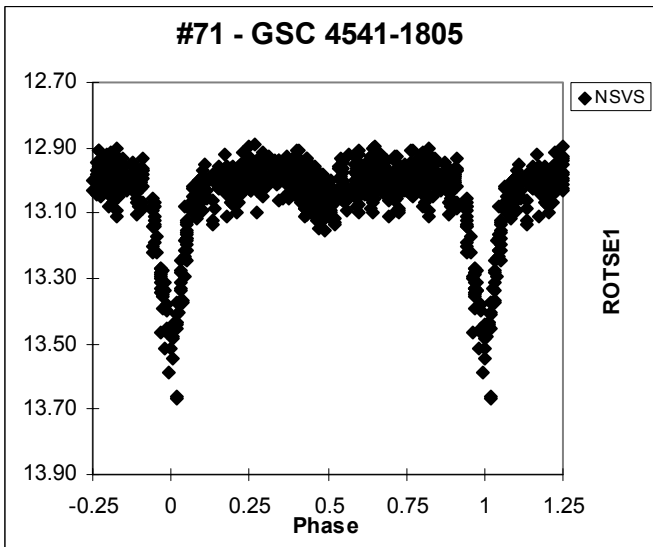
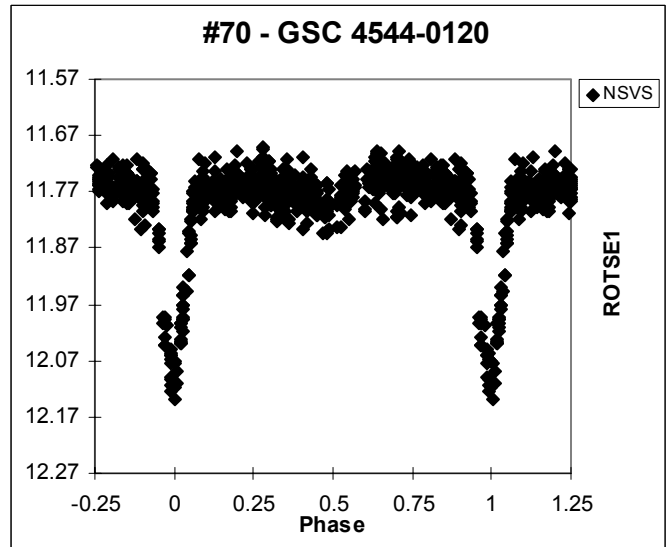
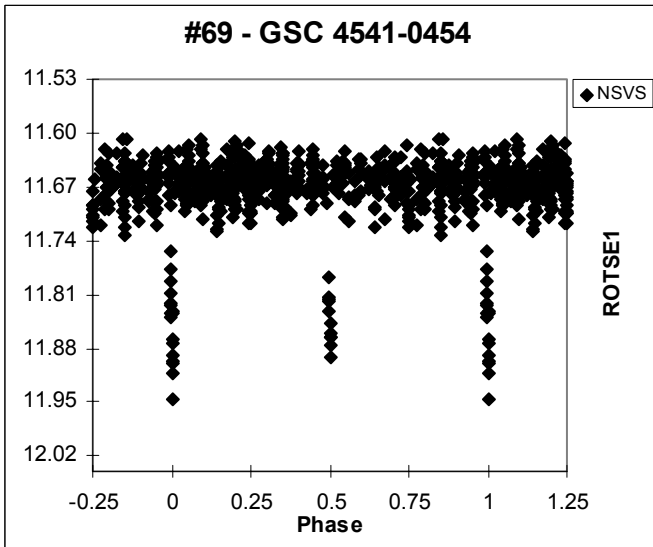
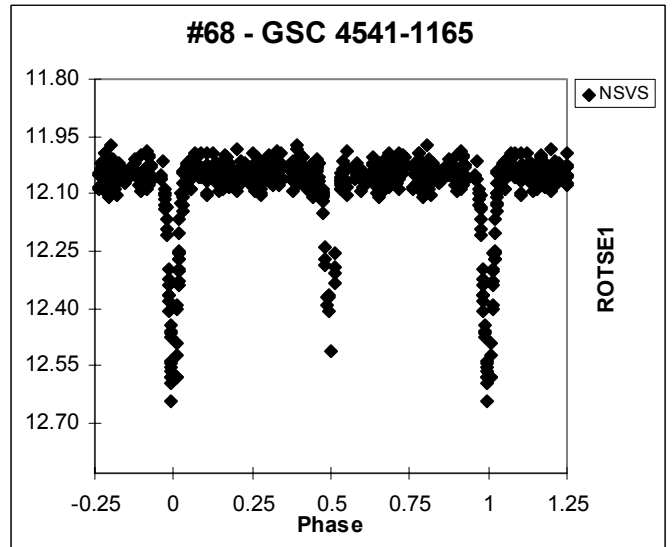
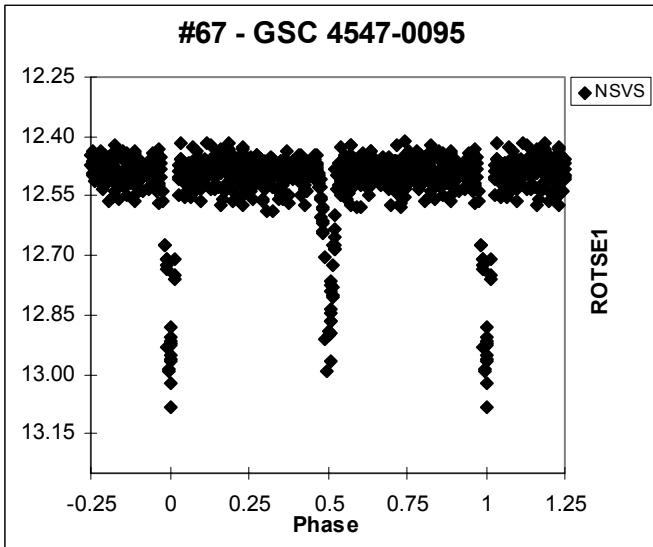


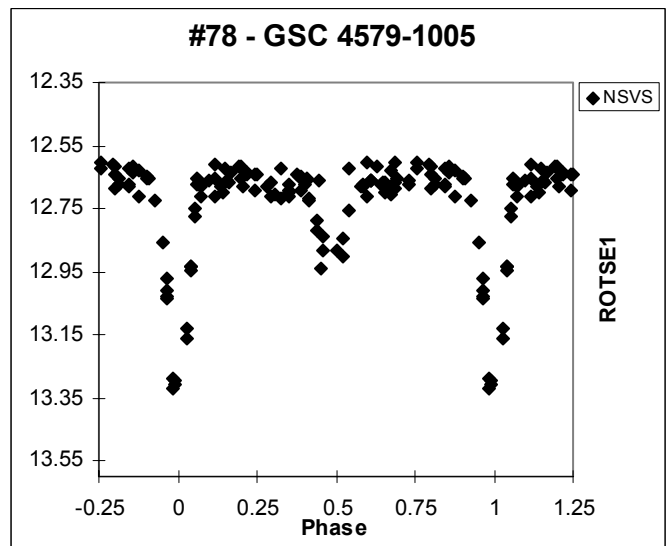
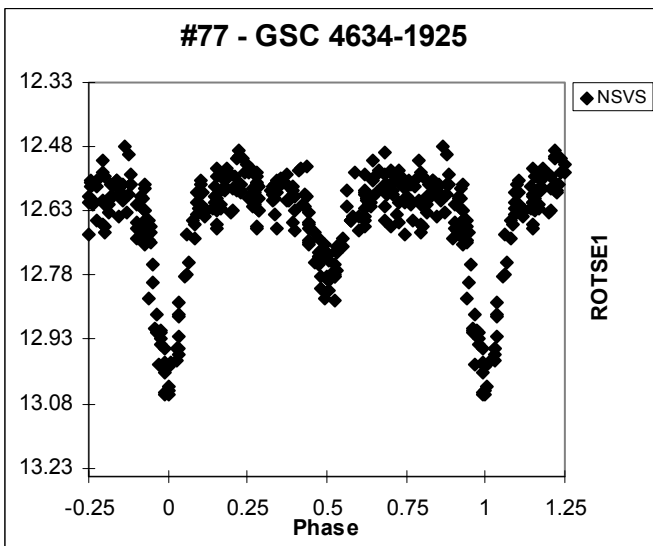
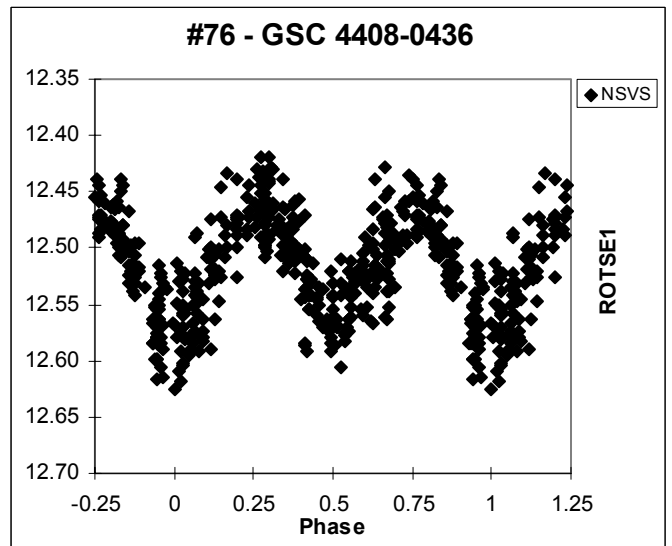
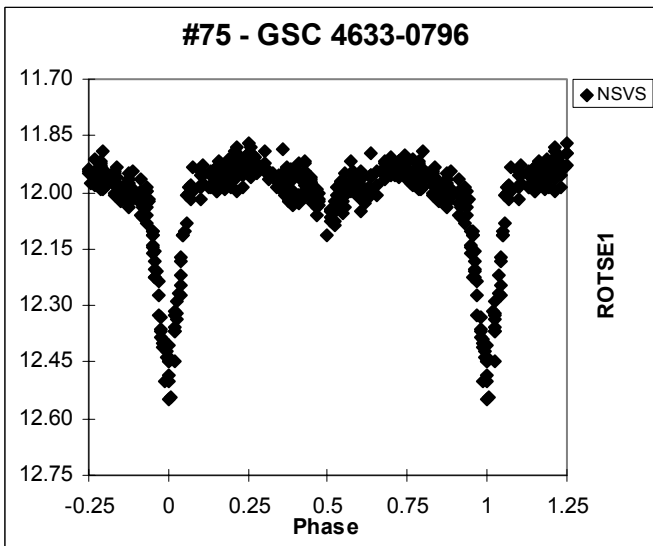
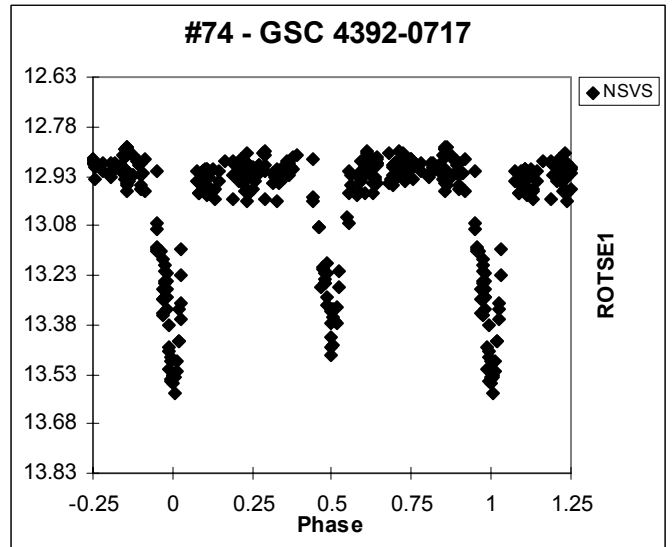
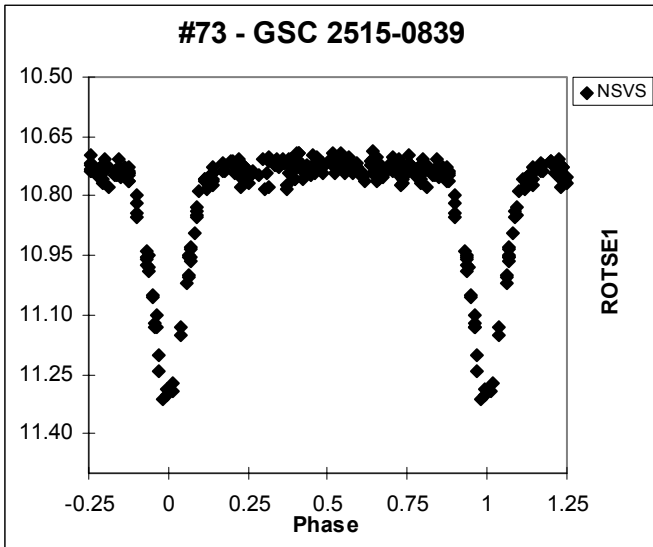


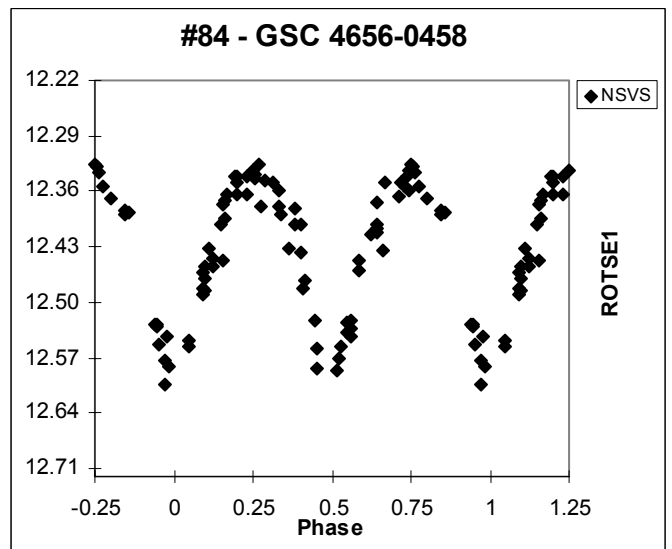
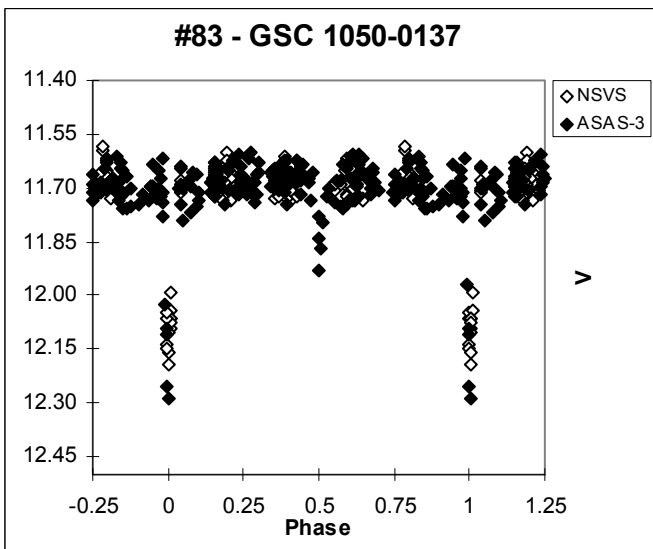
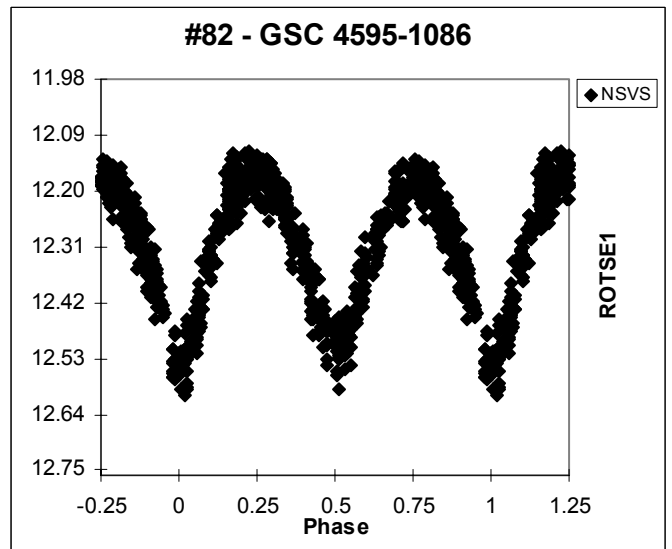
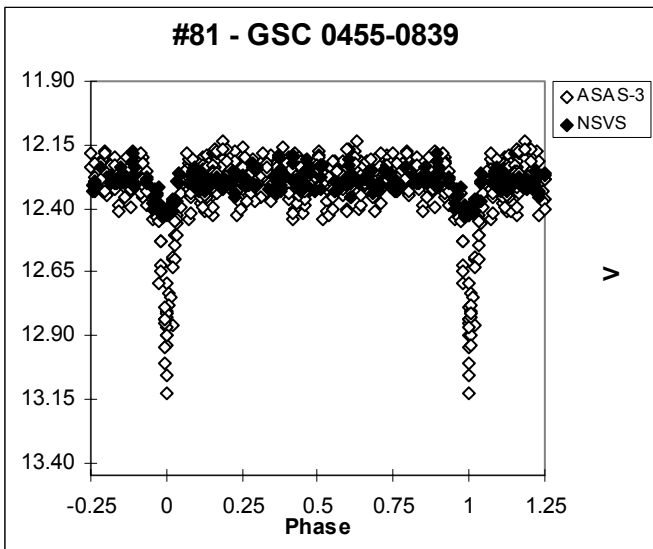
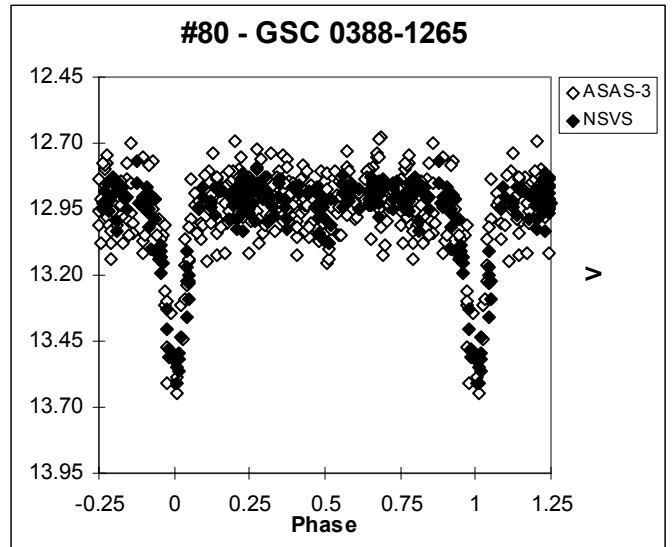
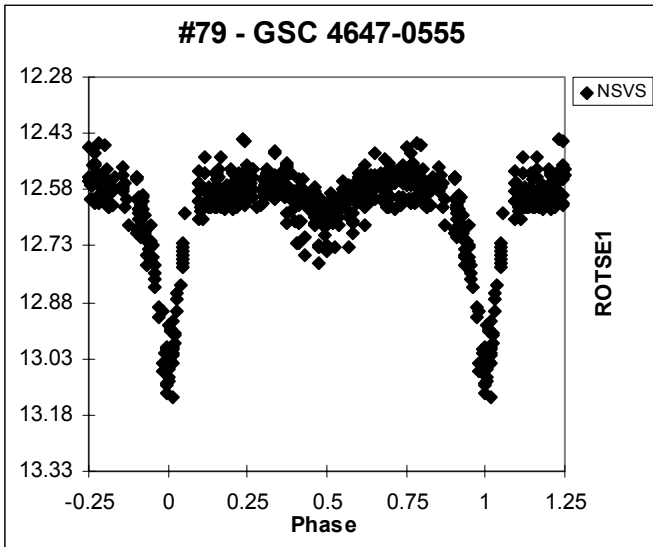


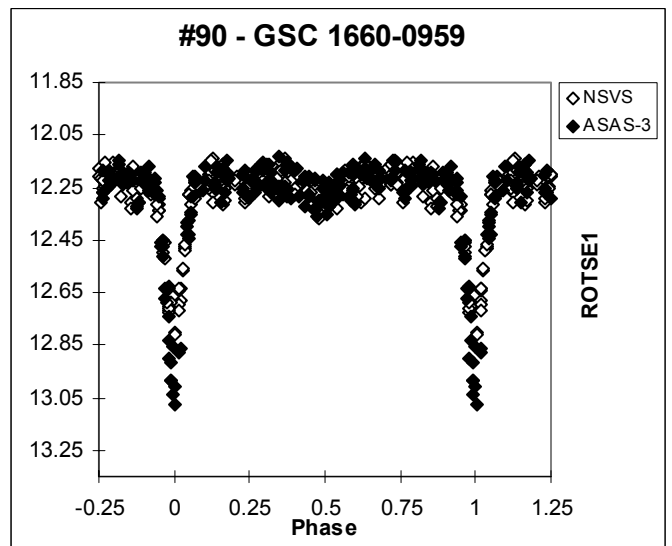
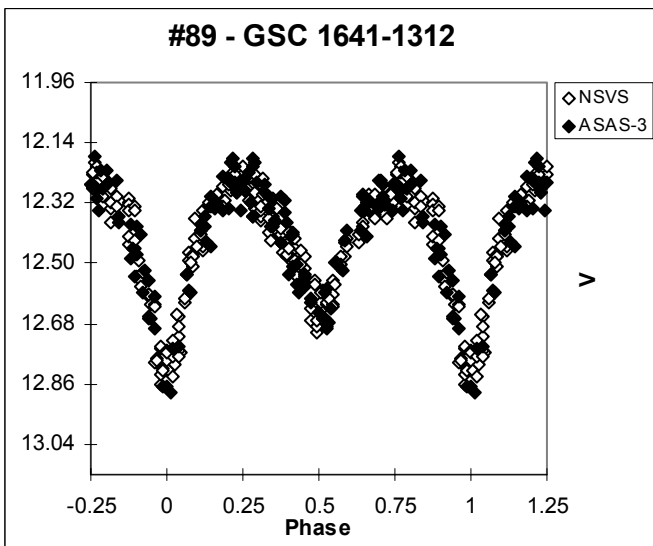
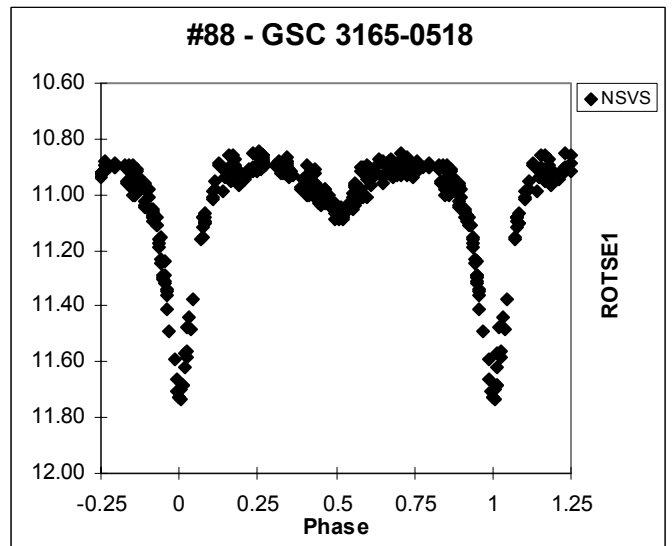
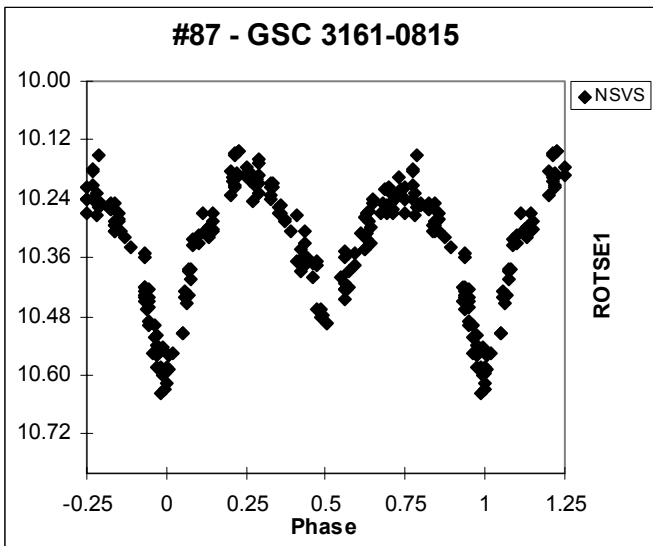
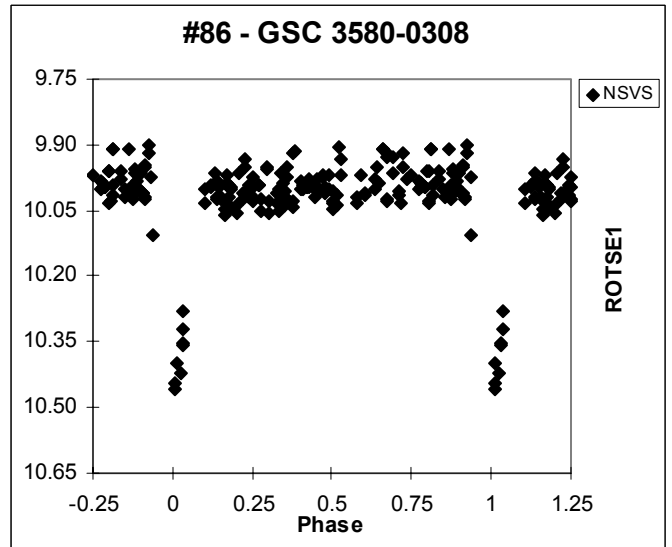
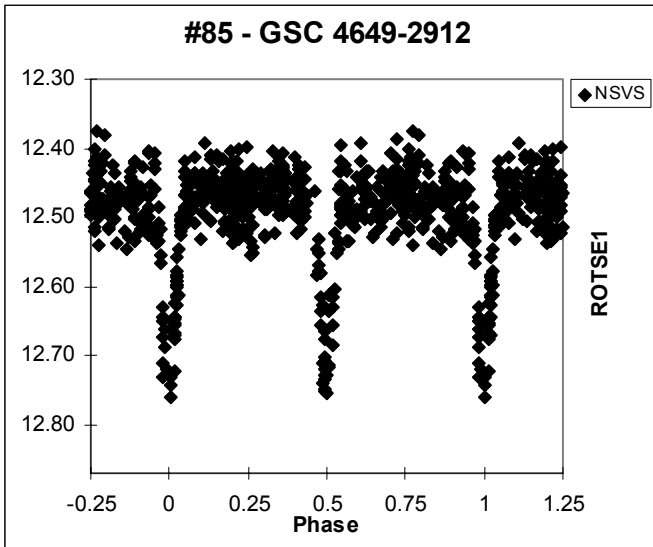


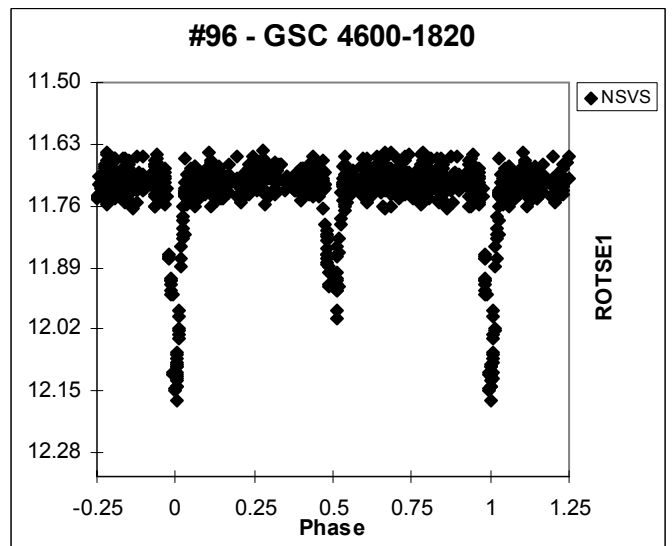
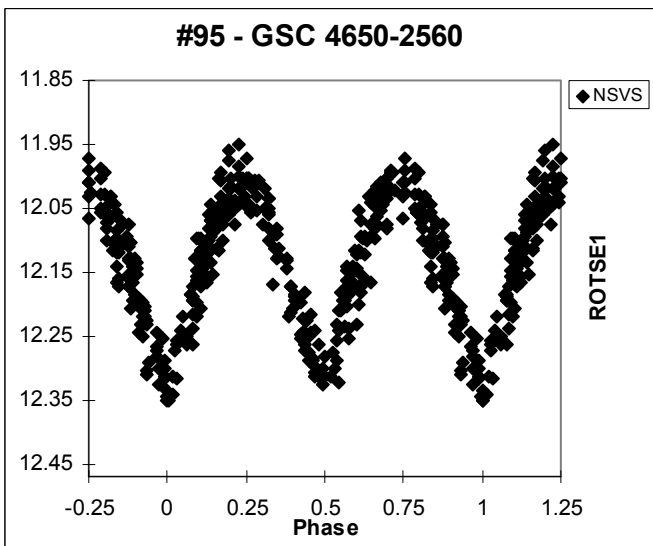
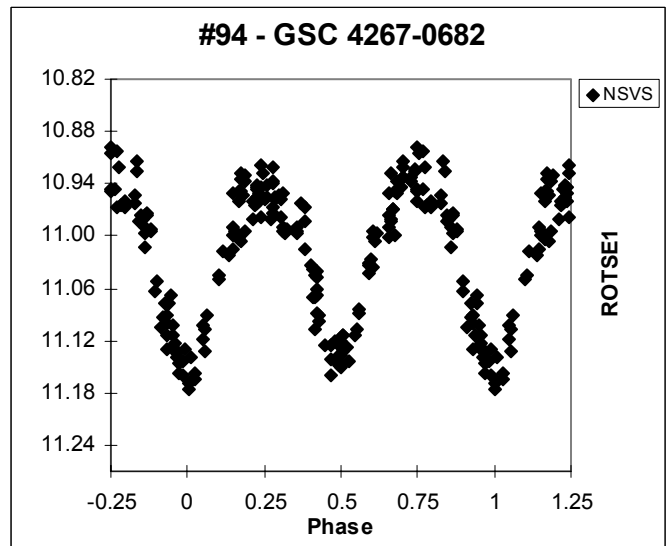
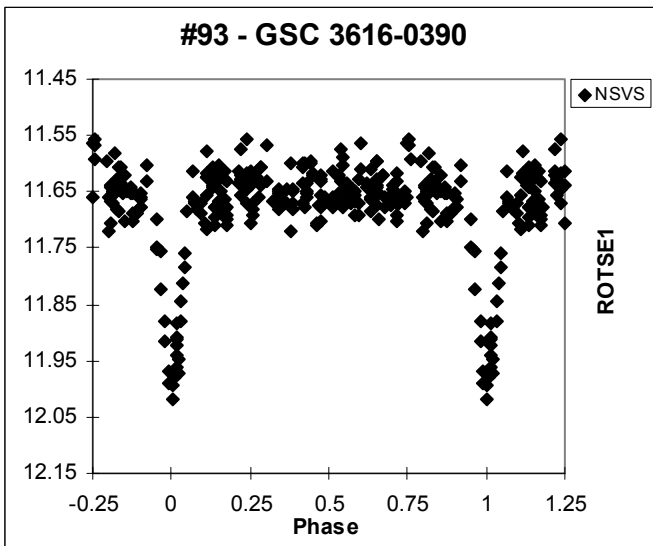
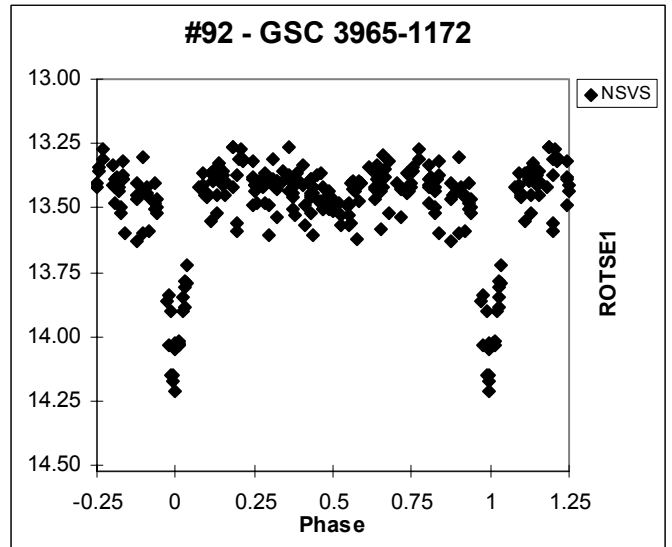
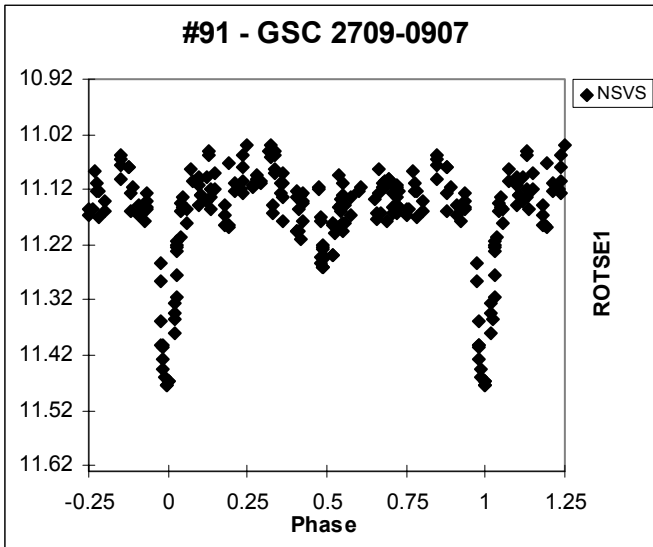


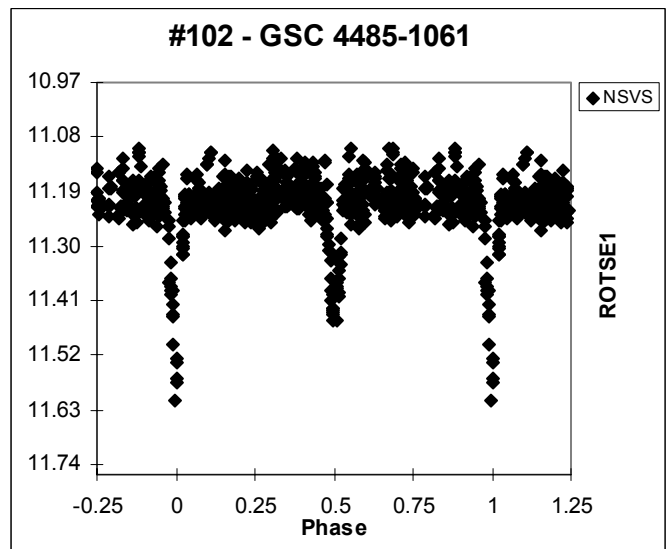
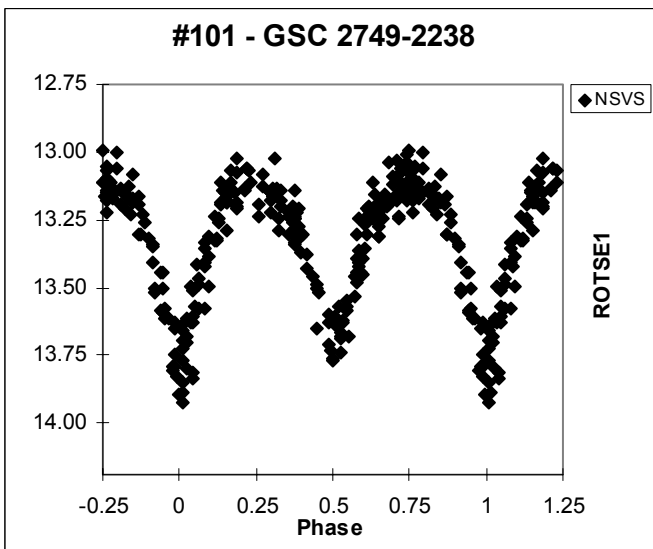
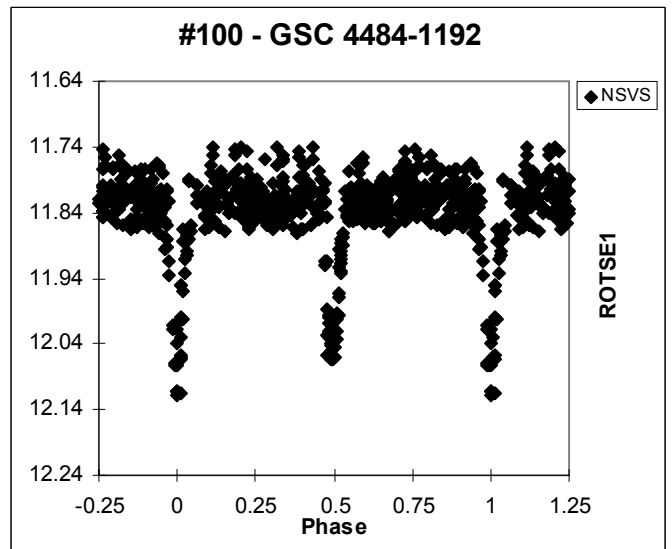
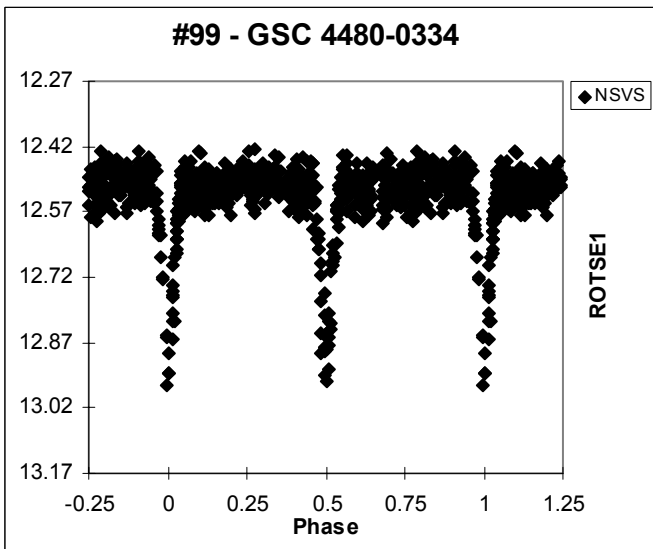
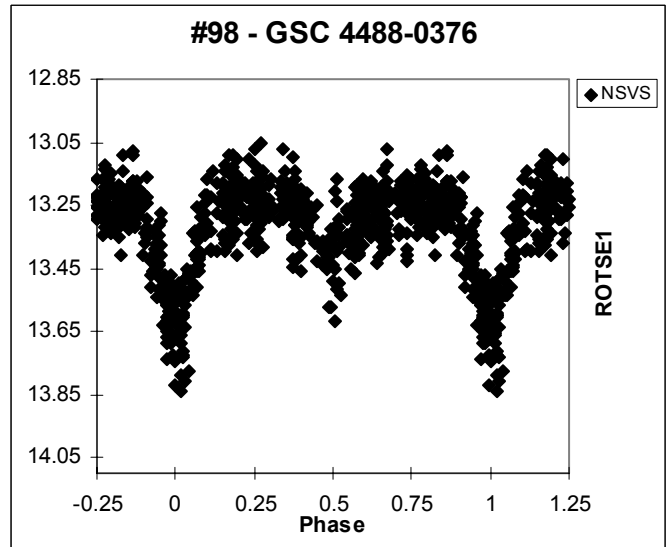
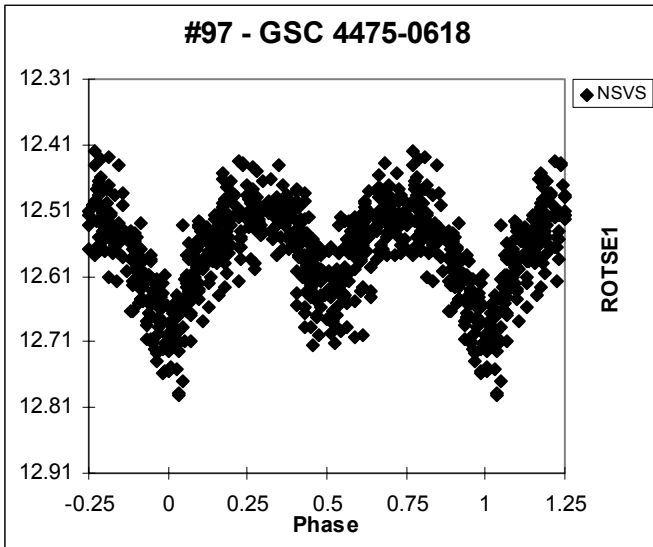


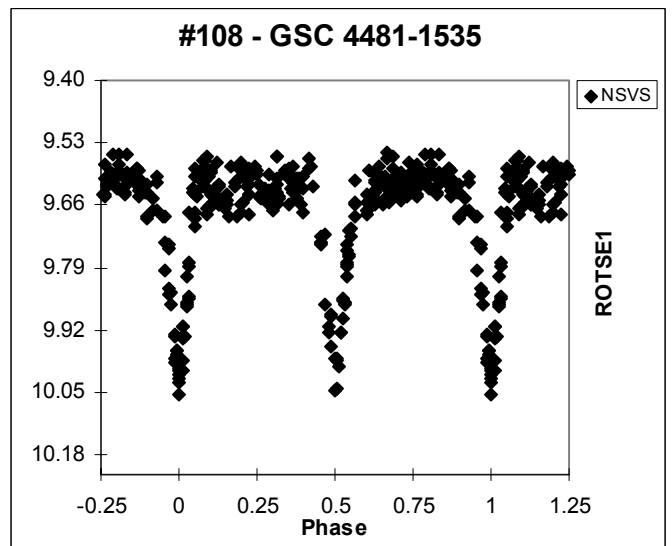
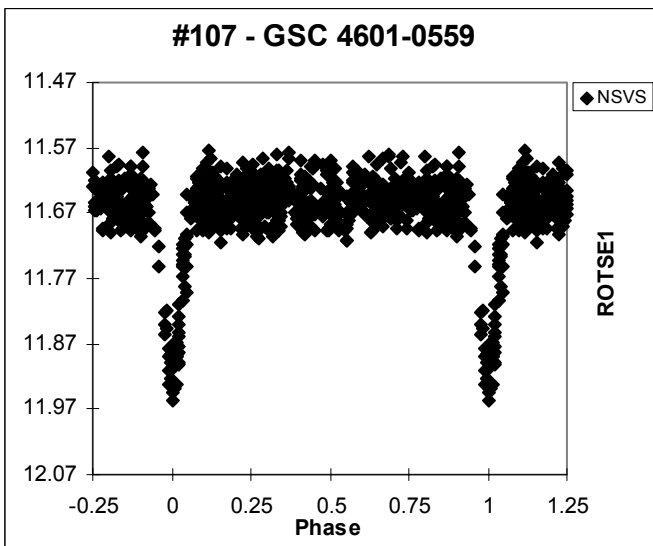
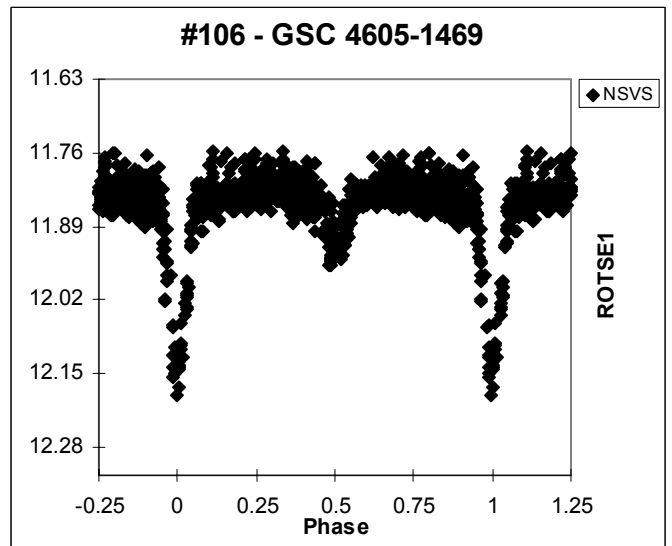
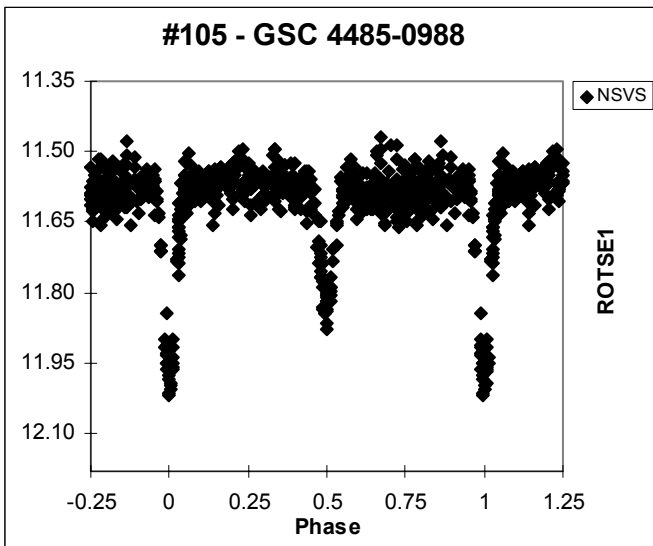
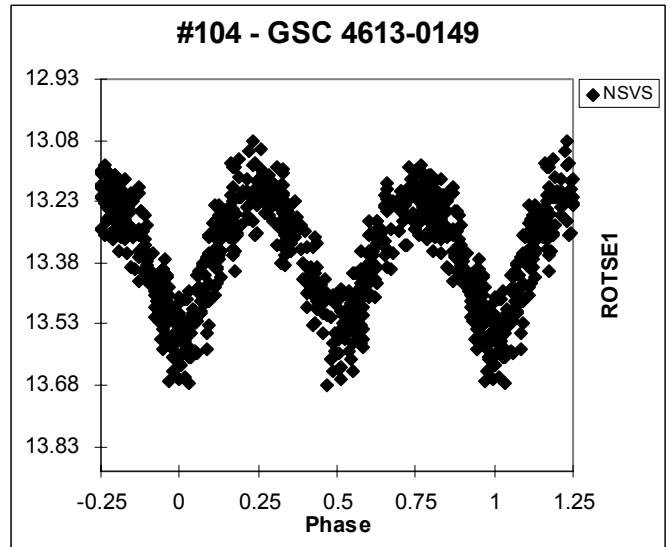
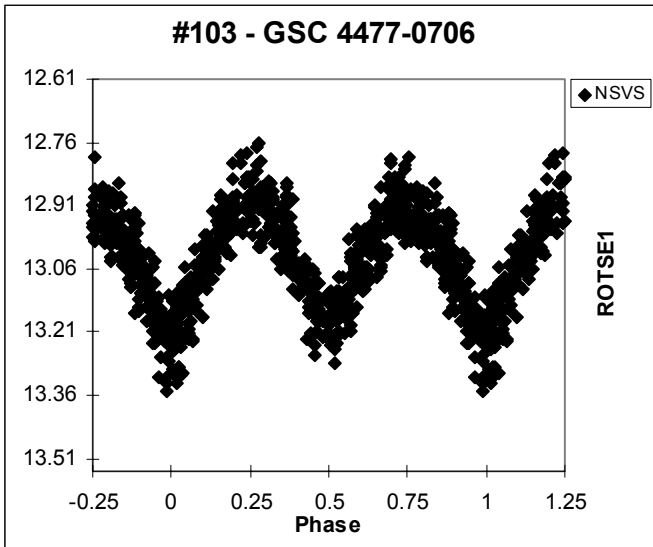


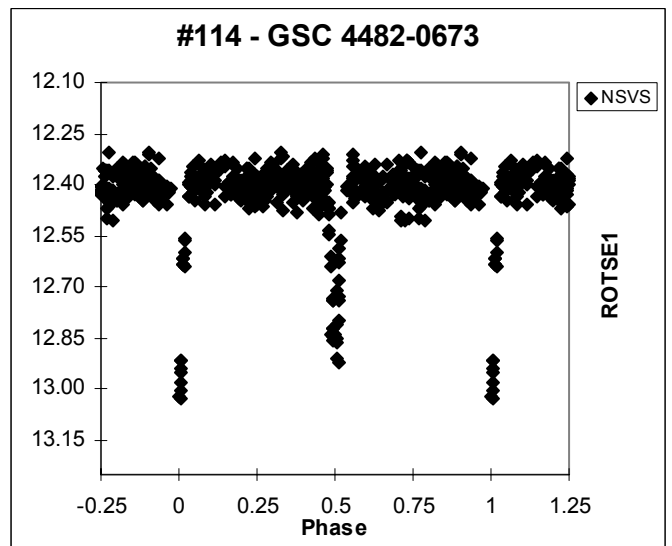
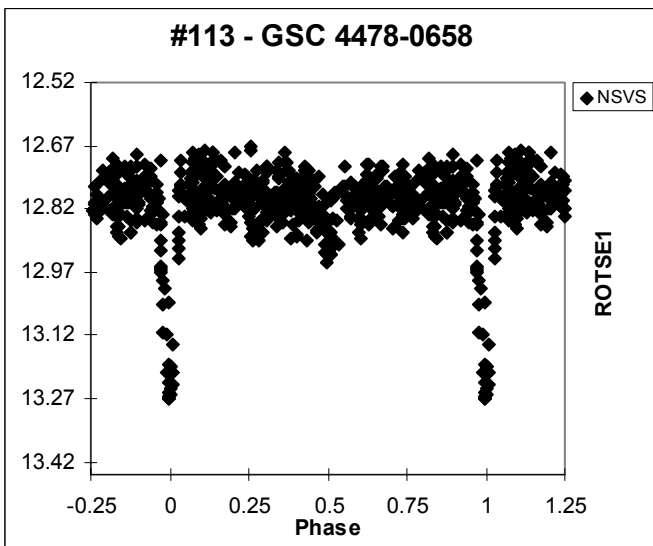
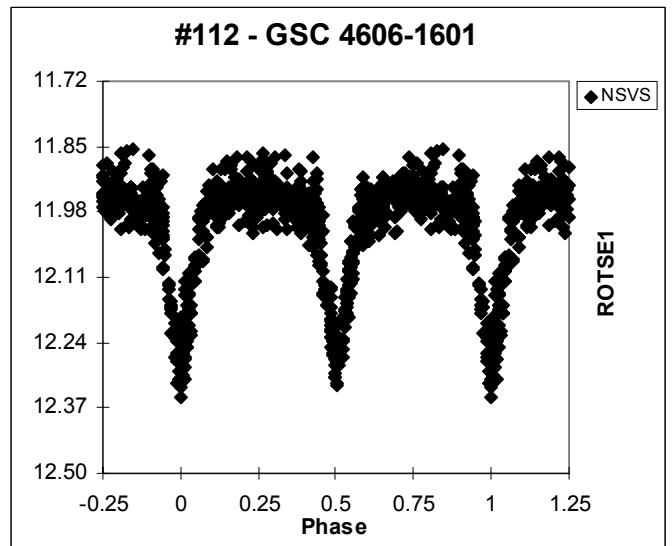
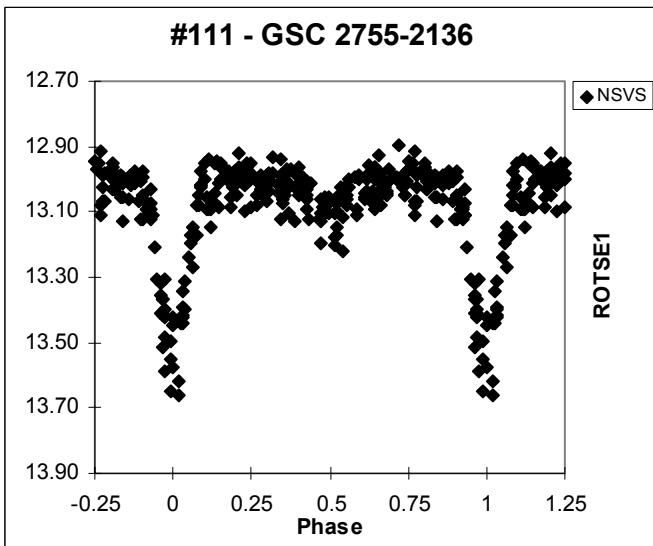
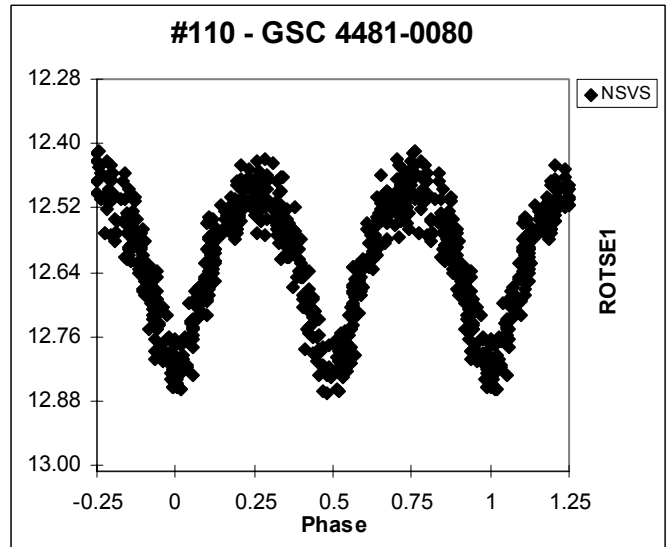
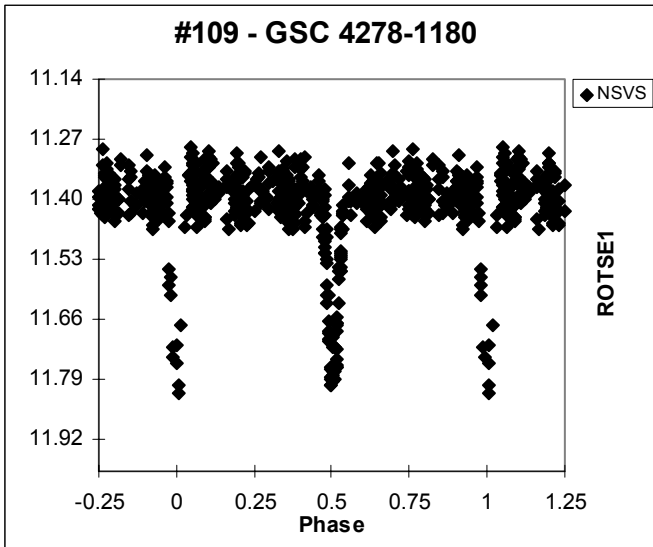


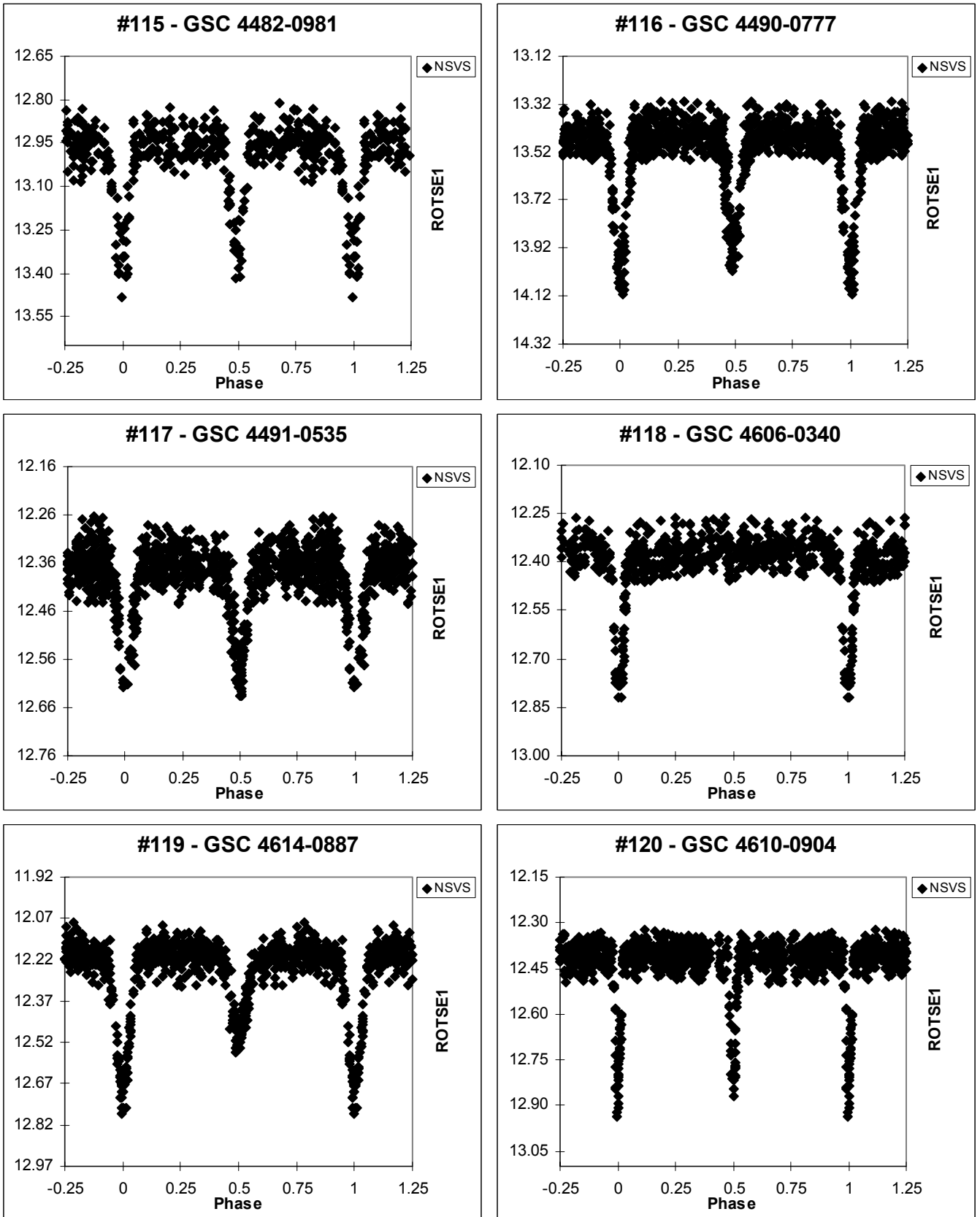












Notes for individual stars:

#5 - Period might be twice the value given with similar minima.

- #6 - Period might be twice the value given with similar minima.
- #8 - Period might be twice the value given with similar minima.
- #9 - Primary eclipse might be the secondary.
- #10 - Period might be twice the value given with similar minima.
- #12 - ROTSE-I amplitude strongly reduced by light from GSC 4322-0023.
- #13 - Period might be half the value given.
- #16 - Primary eclipse might be the secondary. Also possibly intrinsic short period variable.
- #20 - In alpha Per cluster. Period might be twice the value given. Also possibly intrinsic short period variable. Spectral type A3 (**Skiff, 2007**).
- #22 - 2MASS position given. NOMAD identification is doubtful.
- #24 - NSVS entry is for a blend of GSC 4330-1539 and GSC 4330-1168. The brighter star was identified as the eclipser but the ID might be wrong. Lack of observations at mid-eclipse I.
- #26 - Period might be twice the value given with similar minima. Included in the TSVSC1 catalogue of suspected variables (**Damerджи et al., 2007**) with a period of 1.2155 d. and no type.
- #29 - Spectral type OB- (**Hardorp et al., 2000**).
- #32 - Period might be twice the value given. Spectral type A7 (**Nesterov et al., 1995**).
- #34 - **Kelley and Shaw (2006)** give a period of 4.52804 d. in their list of EA/GS stars.
- #35 - Spectral type F5 (**Nesterov et al., 1995**).
- #36 - Primary eclipse might be the secondary.
- #37 - O'Connell effect. Max II= 12.55.
- #39 - Period might be half the value given.
- #44 - Spectral type A5 (**Cannon & Pickering, 1993**).
- #45 - **Kelley and Shaw (2006)** give a period of 5.47616 d. in their list of EA/GS stars.
- #46 - Period might be half the value given.
- #47 - Spectral type A2 (**Cannon & Pickering, 1993**).
- #49 - Spectral type A0 (**Cannon & Pickering, 1993**).
- #52 - Eccentric system.
- #55 - Few observations. Period might be wrong.
- #56 - Amplitude reduced by light from nearby stars.
- #57 - X-ray source.
- #59 - Period might be half the value given.
- #60 - Spectral type F8 (**Kharchenko, 2001**).
- #67 - Primary eclipse might be the secondary.
- #69 - Period might be wrong or the star could be also an intrinsic variable.
- #73 - Period might be twice the value given with similar minima.
- #74 - X-ray source.
- #81 - ROTSE-I amplitude strongly reduced by light contamination.
- #85 - Period might be half the value given.
- #86 - Period might be twice the value given with similar minima.
- #87 - Spectral type B0Ib(n). Possible member of Cygnus OB2 (**Hanson, 2003**). O'Connell effect. Max II= 10.23. Mean Tycho-2 V-magnitude is 11.3 (**Hog et al, 2000**).
- #89 - Classified as ESD with a wrong period of 2.078880 d. in the ASAS catalogue.
- #90 - ROTSE-I amplitude reduced by light contamination.
- #91 - ROTSE-I amplitude reduced by light contamination.
- #92 - Ambiguous identification in the NOMAD catalogue. 2MASS position given.
- #93 - Period might be twice the value given with similar minima.
- #94 - X-ray source. Slight O'Connell effect.
- #96 - Period might be half the value given.
- #97 - NSVS entry is a blend with GSC 4475-0618 at 22 22 09.25 +73 46 05.9 (J2000.0). Identification is uncertain. The redder star of the pair was chosen (J-K 1.04 Vs. 0.61). Amplitude is reduced by light contamination.
- #99 - Period might be half the value given. Primary eclipse might be the secondary.
- #103 - The NOMAD catalogue has two 12th magnitude (R band) close entries that come from USNO-B1.0: one at 22 57 58.92 +68 53 53.5 (J2000.0) (USNO-B1.0 1588-0204141 = NOMAD11588-0207143) that matches the 2MASS position and other at 22 57 58.76 +68 53 54.2 (J2000.0) (USNO-B1.0 1588-0204139 = NOMAD1 1588-0207141). However, the 2MASS magnitudes are given for the latter and not for the star measured in the 2MASS catalogue. Other IDs are: GSC2.2 N0131030182 at 22 57 58.912 +68 53 53.38 (J2000.0) (only one entry and it corresponds to the 2MASS star) and USNO-A2.0 1575-05365212 at 22 57 58.869 +68 53 53.18 (J2000.0) (only one entry at a slightly different position). DSS POSSII image shows a bright star centered at the 2MASS position so the 2MASS identification and position have been kept.
- #108 - Primary eclipse might be the secondary.
- #109 - Period might be half the value given. Primary eclipse might be the secondary.

- #110 - 2MASS ID used. In the NOMAD catalogue the 2MASS data corresponding to the eclipser is given to a nearby star.
#112 - Primary eclipse might be the secondary.
#114 - Period might be half the value given.
#115 - Primary eclipse might be the secondary.
#117 - Primary eclipse might be the secondary.
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