

## Chromospherically active stars in the ASAS-3 database: Paper 3. 25 new variables

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**Abstract:** Another 25 new chromospherically active stars are presented, which were found in the ASAS-3 database:

GSC 07528-00257, GSC 08034-00251, GSC 07533-00380, GSC 08032-01102, GSC 08483-01210,  
GSC 08054-00859, GSC 08508-00663, GSC 08082-00357, GSC 07589-01602, GSC 08517-00957,  
GSC 08094-00919, GSC 08529-01246, GSC 07625-01623, GSC 08545-01235, GSC 08131-01761,  
GSC 08550-01650, GSC 07658-01345, GSC 07654-03725, GSC 07128-00437, GSC 08573-01902,  
GSC 08582-01705, GSC 07680-01454, GSC 08171-00157, GSC 07703-00931, GSC 08195-00762

During a programme of optical identification of X-ray sources from the ROSAT All-Sky Bright Source Catalogue (1RXS) (Voges et al. 1999) in the ASAS-3 database (Pojmanski, 2002) (<http://www.astrouw.edu.pl/asas/?page=main>) another 25 new chromospherically active stars have been found. This research continues the search for new chromospherically active stars in the ASAS-3 database (Bernhard et al., 2010).

The criteria for including a star in this list of chromospherically active stars after an analysis of the available data with Period 04 (Lenz and Breger, 2005) were:

i) the X-ray identification: Only those variable ASAS-3 objects were chosen, which were within the error ellipse of the ROSAT All-Sky Bright Source Catalogue. Therefore it is very likely that the X-ray identifications of the variable stars given in this paper are correct and types of variables like Cepheids or semiregular variables can be ruled out because of their low X-ray emission (see the more detailed discussion in Bernhard and Lloyd, 2008).

ii) period, amplitude and shape of the light curve are consistent with the definition of RS CVn, BY Dra and young stellar objects (YN) stars in the GCVS (<http://www.sai.msu.su/groups/cluster/gcvs/gcvs/iii/vartype.txt>), for a detailed description and sample light curves of the various types of chromospherically active stars see Berdyugina, 2005. Due to the shapes of the light curves other types of chromospherically active and X-ray emitting objects like W UMa variables and Algol stars can be ruled out.

iii) appropriate 2MASS J-K (Skrutskie et al. 2006, Table 8 in Gonzalez-Solares et al. 2008) and B-V (Høg et al. 2000) colour indices if available.

iv) Further information like

- spectral types including the lithium content as indicator of young stellar objects,
- the ratios of X-ray to optical flux  $f_X / f_{opt}$  (Voges et al., 1999),
- proper motions,
- the relation of the maximum amplitude vs. periods of main sequence stars given in Messina et al., 2003 and
- an investigation of the respectively star fields using ALADIN (<http://aladin.u-strasbg.fr/aladin.gml>) to check, if there are nearby open star clusters or known young stellar objects

was also used for the classification of the objects.

The resulting list of variables (Table 1) contains with a very high likelihood chromospherically active stars of the types RS CVn (spectral types F-K), BY Dra (spectral types F-K) or young stellar objects (spectral types F-M).

The light variability of these objects is caused by axial rotation of a star with a variable degree of nonuniformity of the surface brightness (spots). Some of these variables are also eclipsing systems. Secular variations of the light curves, which are typical for many RS CVn, BY Dra variables and young stellar objects (see the detailed light curves below) can be explained by the existence of a long-period stellar activity cycle similar to the 11-year solar activity cycle, during which the number and total area of spots on the star's surface vary.

The ASAS-3 telescopes are situated at Las Campanas Observatory in Chile, V and I filters are used in combination with 200/2.8 lenses and AP-10 CCD cameras. The aperture suggested by the ASAS-3 system (first row of the ASAS-3 V data) was taken for the calculations of the ephemeris and the figures. The ranges given in Table 1 are derived from the time span of the ASAS-3 V observations, due to secular variations (activity cycles) the full ranges could be somewhat larger.

The values of the column "var" denote the extent of secular variations: "0" for no secular variation, "1" for weak secular variation, "2" for strong secular variation of amplitude and/or mean magnitude. The epochs are given for the minima as HJD-2450000, figures in brackets denote errors ( $\sigma$ ) in units of the last decimal.

Table 1: Positions, identifications and photometric data for the new chromospherically active stars

No.	GSC	RA (2000)	Dec	1RXS	Range (ASAS3-V)	Epoch (Min)	Per. (d)	var
51	07528-00257	00 27 42.87	-41 26 15.5	J002743.2-412612	10.40-10.75	4454.6(1)	16.94(4)	2
52	08034-00251	00 55 25.29	-49 56 57.3	J005525.8-495649	10.00-10.20	2972.63(2)	2.5669(5)	2
53	07533-00380	01 00 12.30	-38 18 38.5	J010013.6-381840	10.40-10.80	2552.6(1)	20.35(3)	2
54	08032-01102	01 01 16.69	-45 56 37.5	J010117.7-455632	11.65-12.00	2082.895(4)	0.373786(6)	1
55	08483-01210	02 10 07.91	-54 30 40.2	J021008.2-543036	9.75-10.25	3736.60(6)	5.919(1)	2
56	08054-00859	02 51 11.38	-47 53 07.9	J025111.7-475314	11.65-12.20	3365.6(1)	13.28(1)	2
57	08508-00663	04 11 55.66	-58 01 47.3	J041155.1-580154	9.90-10.05	3414.63(2)	2.617(1)	1
58	08082-00357	04 37 00.41	-51 50 26.7	J043700.1-515012	8.30-8.60	4399.7(7)	76.5(2)	2
59	07589-01602	04 43 14.91	-41 06 19.0	J044315.6-410607	10.15-10.55	1979.498(4)	0.46634(4)	2
60	08517-00957	05 05 36.49	-57 55 36.0	J050534.5-575526	11.25-11.75	2201.838(6)	0.63176(7)	2
61	08094-00919	05 36 00.73	-49 51 53.1	J053600.6-495200	11.45-11.80	2725.5(1)	11.255(5)	0
62	08529-01246	06 13 05.99	-56 20 25.2	J061305.2-562023	9.30-9.70	2636.7(1)	17.97(2)	2
63	07625-01623	06 20 43.46	-43 49 45.5	J062043.1-434937	10.45-10.80	4461.7(3)	31.365(7)	1
64	08545-01235	07 05 12.32	-57 34 13.8	J070512.3-573402	9.85-10.00	5123.83(7)	7.41(1)	1
65	08131-01761	07 08 54.25	-50 57 49.5	J070854.3-505757	9.65-9.85	4167.6(2)	24.434(8)	2
66	08550-01650	07 12 24.96	-53 56 42.1	J071225.6-535636	11.20-11.75	1877.77(4)	4.6135(8)	2
67	07658-01345	07 51 28.41	-43 28 22.7	J075128.1-432810	11.30-11.65	1871.74(6)	6.834(7)	1
68	07654-03725	07 56 36.12	-41 45 25.9	J075636.8-414506	8.70-8.95	4493.7(8)	84.17(5)	2
69	07128-00437	07 58 57.90	-35 22 17.1	J075858.1-352210	10.70-11.10	3644.86(2)	2.372(1)	2
70	08573-01902	08 45 08.25	-55 58 04.0	J084507.4-555816	9.80-10.05	4472.7(5)	53.31(6)	2
71	08582-01705	08 58 48.72	-53 03 25.1	J085849.4-530320	10.60-11.05	4883.76(3)	3.009(1)	2
72	07680-01454	08 59 52.40	-41 07 17.9	J085952.3-410703	8.90-9.15	1948.6(5)	55.66(8)	2
73	08171-00157	09 23 39.93	-47 11 13.6	J092339.4-471104	10.45-10.70	2071.4(2)	20.31(2)	1
74	07703-00931	09 25 06.19	-43 27 58.0	J092505.9-432752	11.20-11.85	3787.7(1)	9.985(7)	1
75	08195-00762	10 11 04.08	-51 19 47.3	J101104.8-511944	10.50-10.90	2989.81(4)	4.543(1)	2

**Light curves, folded light curves (with the period given above) and comments:**

Almost all of the following stars showed a clear variation of the shape of the light curves, which is somewhat typical of chromospherically active stars.

The folded light curves are given for a distinct time period with only small changes in amplitudes and mean magnitudes, therefore a special detrending was not necessary (described in figure as HJD 245 .....). The time periods used for the folded light curves are marked as open circles in the original light curves.

**No. 51: GSC 07528-00257**

Period: 16.94(4) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/002743-4126.3,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/002743-4126.3,asas3,0,0,500,0,0)

2MASS J-K: 0.762

Johnson B-V = 1.340 (derived from Tycho-2)

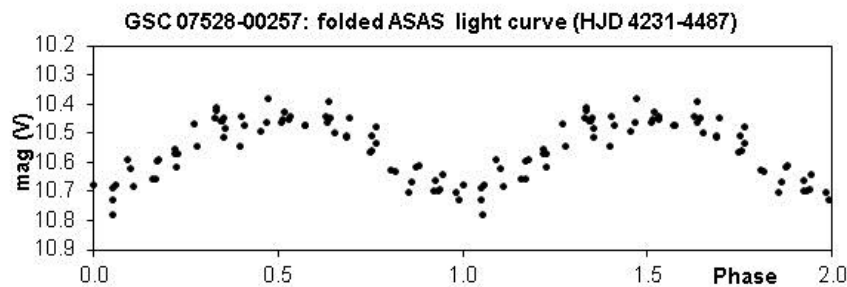
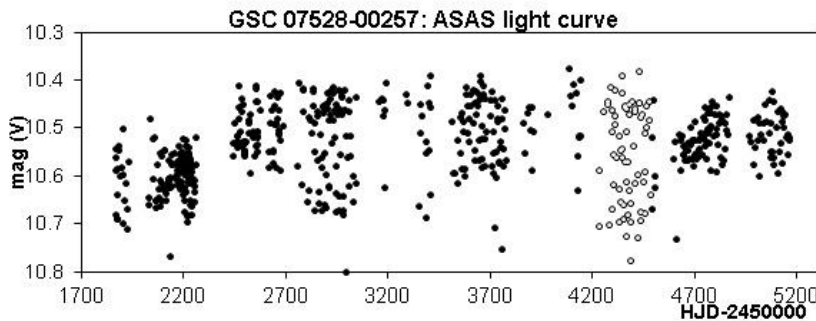
ROSAT: HR1 = 0.17, HR2 = -0.02, fxfopt = -1.58

Proper motion: pmRA: 22.66 mas/yr, pmDE: -12.45 mas/yr (Roeser et al., 2008)

Spectral type: K2III(e), Li: 160 (0.1pm, Torres et al., 2006)

ASAS variable (type DCEP-FO/SR)

Likely an RS CVn variable



**No. 52: GSC 08034-00251**

Period: 2.5669(5) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/005525-4957.0,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/005525-4957.0,asas3,0,0,500,0,0)

2MASS J-K: 0.468

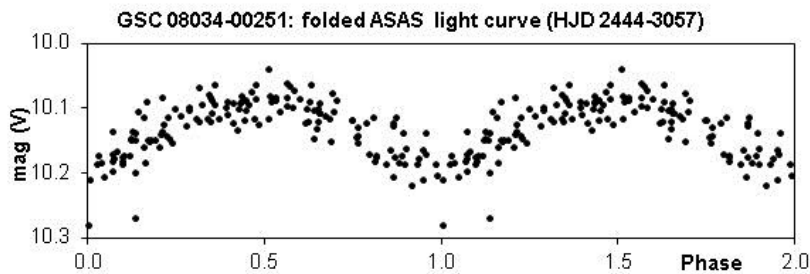
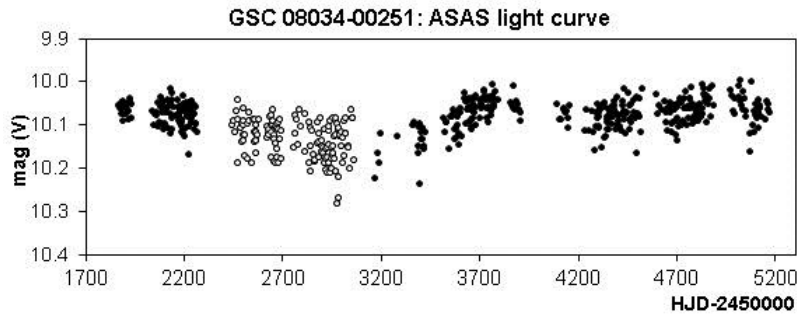
Johnson B-V = 0.734 (derived from Tycho-2)

ROSAT: HR1 = -0.02, HR2 = 0.08, fxfopt = -2.08

Proper motion: pmRA: 42.76 mas/yr, pmDE: 30.44 mas/yr (Roeser et al., 2008)

Spectral type: G9V, Li: 172 (0.1pm, Torres et al., 2006)

Likely an RS CVn variable

**No. 53: GSC 07533-00380**

Period: 20.35(3) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/010012-3818.6,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/010012-3818.6,asas3,0,0,500,0,0)

2MASS J-K: 0.738

Johnson B-V = 1.253 (derived from Tycho-2)

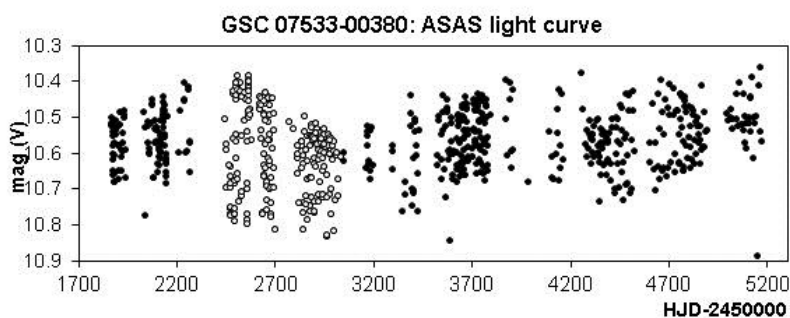
ROSAT: HR1 = 0.05, HR2 = 0.19, fxfopt = -1.93

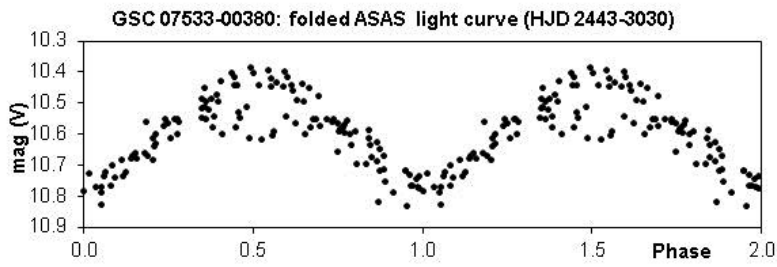
Proper motion: pmRA: -10.57 mas/yr, pmDE: 8.29 mas/yr (Roeser et al., 2008)

Spectral type: K0IIIe SB2, Li: 60 (0.1pm, Torres et al., 2006)

ASAS variable (type DCEP-FU)

Likely an RS CVn variable



**No. 54: GSC 08032-01102**

Period: 0.373786(6) d

ASAS data: [http://www.astrow.edu.pl/cgi-asas/asas\\_variable/010117-4556.6,asas3,0,0,500,0,0](http://www.astrow.edu.pl/cgi-asas/asas_variable/010117-4556.6,asas3,0,0,500,0,0)

2MASS J-K: 0.773

Johnson B-V = 0.873 (derived from Tycho-2)

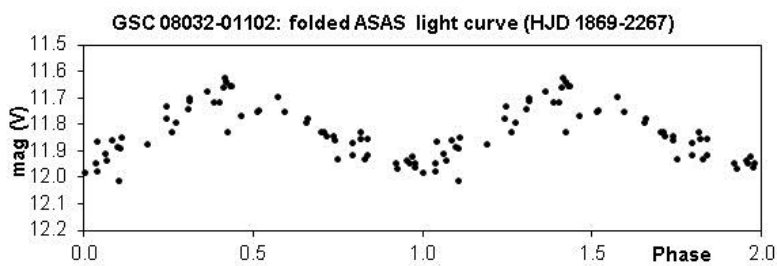
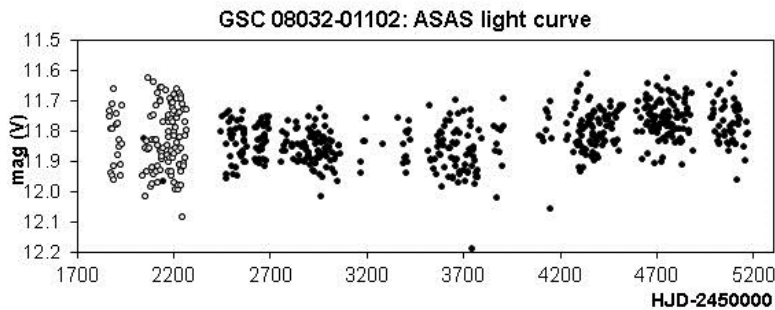
ROSAT: HR1 = 0.09, HR2 = -0.23, fxfopt = -1.62

Proper motion: pmRA: 33.39 mas/yr, pmDE: 22.40 mas/yr (Roeser et al., 2008)

Spectral type: K6Ve, Li: 100 (0.1pm, Torres et al., 2006)

ASAS variable (type RRc)

Probable BY Dra variable



**No. 55: GSC 08483-01210**

Period: 5.919(1) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/021008-5430.6,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/021008-5430.6,asas3,0,0,500,0,0)

2MASS J-K: 0.782

Johnson B-V= 1.089 (derived from Tycho-2)

ROSAT: HR1=0.13 , HR2=0.14 , fxfopt= -1.55

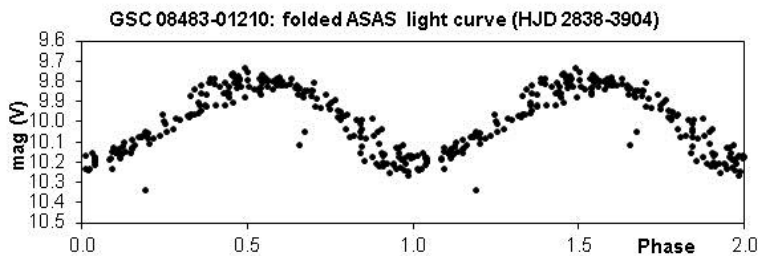
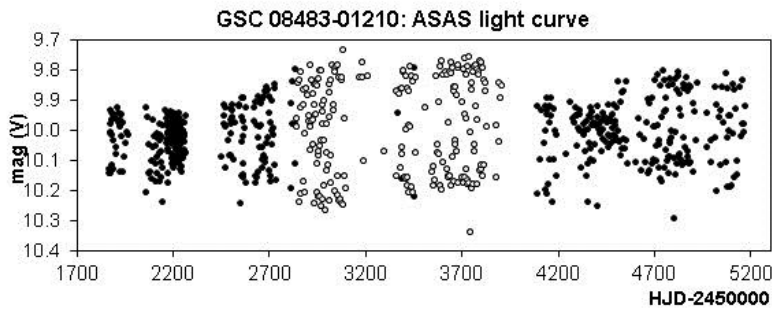
Proper motion: pmRA: 35.87 mas/yr, pmDE: 24.76 mas/yr (Roeser et al., 2008)

Spectral type: K1IIIe SB2, Li: 175 (0.1pm, Torres et al., 2006)

ASAS variable (type MISC)

GCVS: ER Eri, type UV Ceti

Likely an RS CVn variable

**No. 56: GSC 08054-00859**

Period: 13.28(1) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/025112-4753.1,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/025112-4753.1,asas3,0,0,500,0,0)

2MASS J-K: 0.834

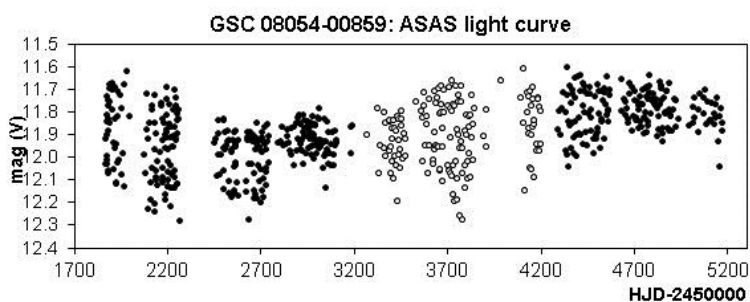
ROSAT: HR1 = 0.41, HR2 = 0.11 , fxfopt = -1.86

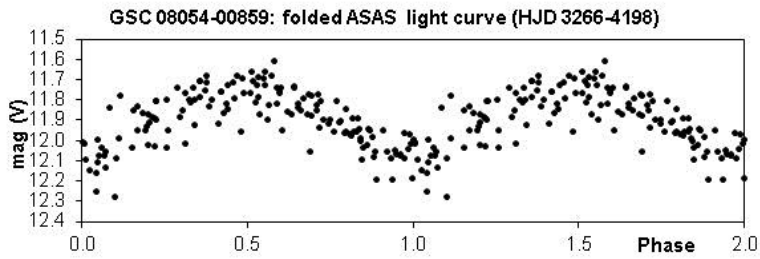
Proper motion: pmRA: 3.20 mas/yr, pmDE: -2.19 mas/yr (Roeser et al., 2008)

Spectral type: K5 (Riaz et al., 2006)

ASAS variable (type DCEP-FU )

Likely an RS CVn variable



**No. 57: GSC 08508-00663**

Period: 2.617(1) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/041156-5801.8.asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/041156-5801.8.asas3,0,0,500,0,0)

2MASS J-K: 0.427

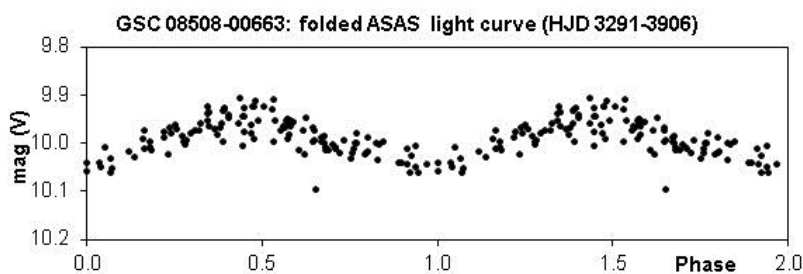
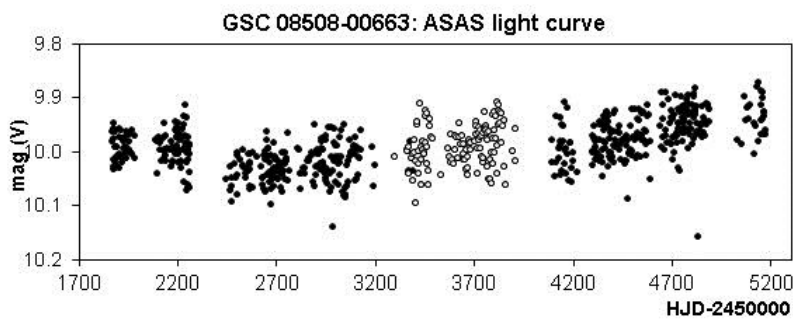
Johnson B-V = 0.670 (derived from Tycho-2)

ROSAT: HR1 = -0.08, HR2 = -0.11, fxfopt = -2.63

Proper motion: pmRA: -3.64 mas/yr, pmDE: 34.38 mas/yr (Roeser et al., 2008)

Spectral type: G6V, Li: 225 (0.1pm, Torres et al., 2006)

Likely an RS CVn variable



**No. 58: GSC 08082-00357**

Period: 76.5(2) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/043700-5150.4,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/043700-5150.4,asas3,0,0,500,0,0)

2MASS J-K: 0.566

Johnson B-V = 0.857 (derived from Tycho-2)

ROSAT: HR1 = 0.27, HR2 = 0.06, fxfopt = -3.06

Proper motion: pmRA: 2.83 mas/yr, pmDE: -22.59 mas/yr (Roeser et al., 2008)

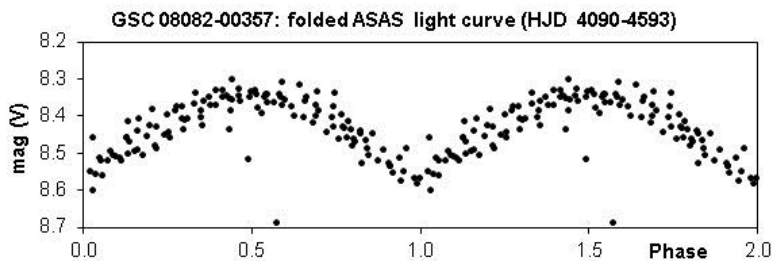
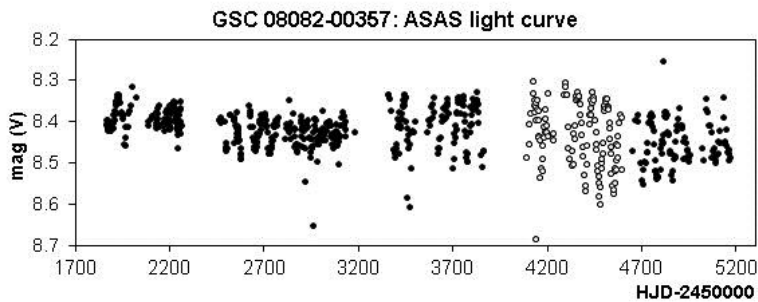
Spectral type: G9III, SB3?, Li: 0 (0.1pm, Torres et al., 2006)

NSV catalogue: NSV 16127

Data inferred from the Hipparcos catalog:

Distance:  $145 \pm 15$  parsecs ( $473 \pm 47$  light-years)Luminosity:  $7.7 \pm 1.5$  times that of the sunAbsolute magnitude:  $2.58 \pm 0.22$ 

Likely an RS CVn variable

**No. 59: GSC 07589-01602**

Period: 0.46634(4) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/044315-4106.3,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/044315-4106.3,asas3,0,0,500,0,0)

2MASS J-K: 0.643

Johnson B-V = 0.847 (derived from Tycho-2)

ROSAT: HR1 = 0.07, HR2 = 0.14, fxfopt = -1.79

Proper motion: pmRA: 51.36 mas/yr, pmDE: -135.39 mas/yr (Roeser et al., 2008)

Spectral type: K1Ve SB2, Li 50 (0.1pm, Torres et al., 2006)

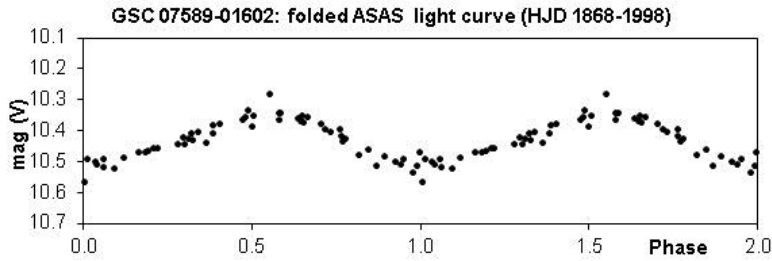
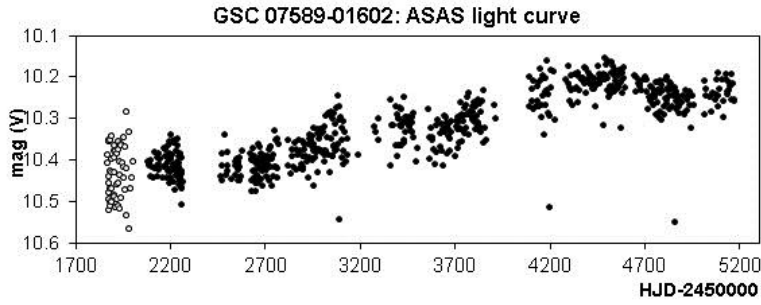
ASAS variable (type DCEP-FO)

Data inferred from the Hipparcos catalog:

Distance:  $74.5 \pm 7.2$  parsecs ( $243 \pm 24$  light-years)Luminosity:  $0.370 \pm 0.072$  times that of the sunAbsolute magnitude:  $5.88 \pm 0.21$ 

Probable BY Dra variable



**No. 60: GSC 08517-00957**

Period: 0.63176(7) d

ASAS data: [http://www.astrow.edu.pl/cgi-asas/asas\\_variable/050536-5755.6,asas3,0,0,500,0,0](http://www.astrow.edu.pl/cgi-asas/asas_variable/050536-5755.6,asas3,0,0,500,0,0)

2MASS J-K: 0.76

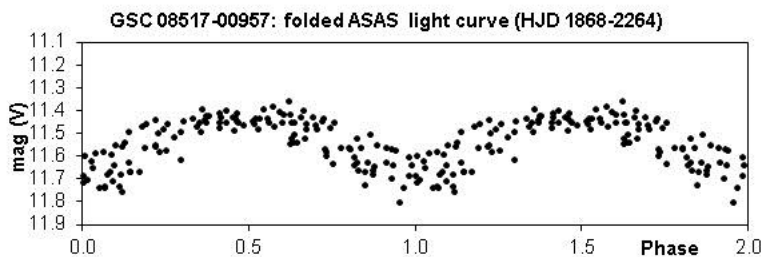
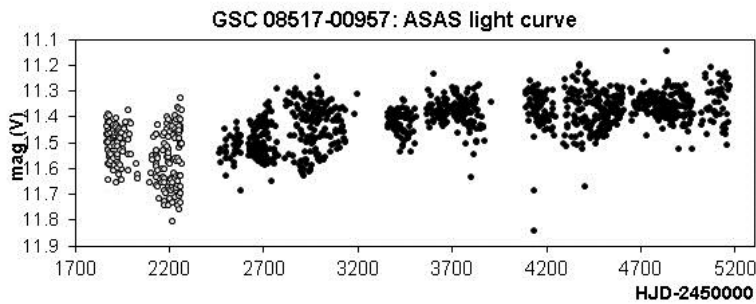
Johnson B-V = 0.606 (derived from Tycho-2)

ROSAT: HR1 = 0.17, HR2 = 0.47, fxfopt = -1.73

Proper motion: pmRA: 25.36 mas/yr, pmDE: 22.05 mas/yr (Roeser et al., 2008)

ASAS variable (type EC)

Likely an RS CVn variable



**No. 61: GSC 08094-00919**

Period: 11.255(5) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/053601-4951.9,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/053601-4951.9,asas3,0,0,500,0,0)

2MASS J-K: 0.714

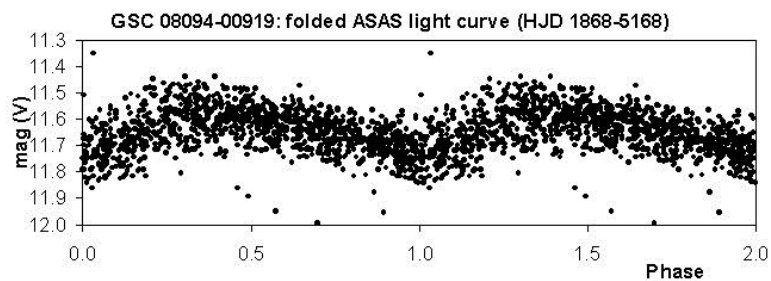
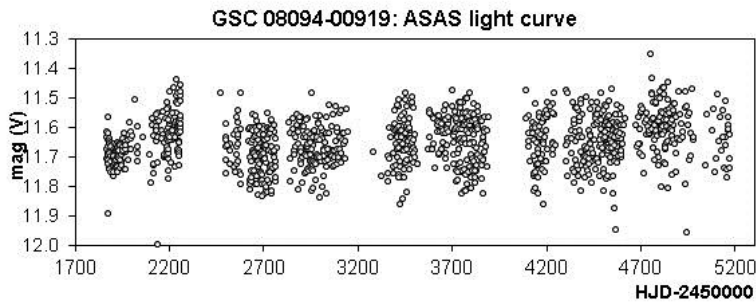
Johnson B-V = 0.972 (derived from Tycho-2)

ROSAT: HR1 = 0.22 , HR2 = -0.02 , fxfopt = -1.96

Proper motion: pmRA: 18.40 mas/yr, pmDE: 4.79 mas/yr (Roeser et al., 2008)

Spectral type: K1III(e) SB2, Li: 80 (0.1pm, Torres et al., 2006)

Likely an RS CVn variable

**No. 62: GSC 08529-01246**

Period: 17.97(2) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/061306-5620.4,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/061306-5620.4,asas3,0,0,500,0,0)

2MASS J-K: 0.723

Johnson B-V = 0.952 (derived from Tycho-2)

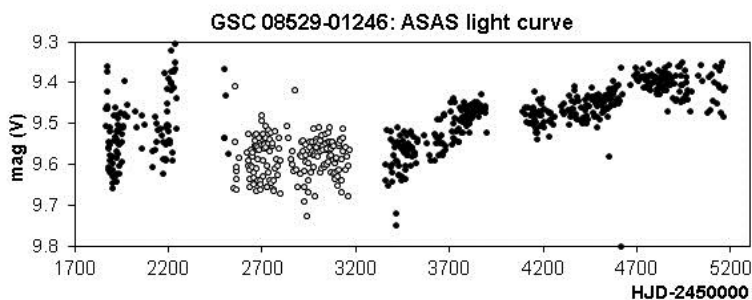
ROSAT: HR1 = 0.29, HR2 = 0.18, fxfopt = -2.61

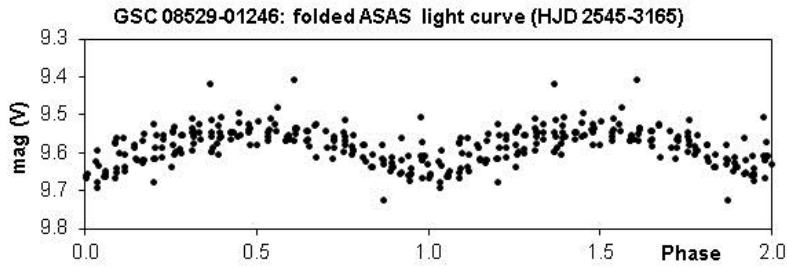
Proper motion: pmRA: -7.33 mas/yr, pmDE: -10.63 mas/yr (Roeser et al., 2008)

Spectral type: K0III, Li: 90 (0.1pm, Torres et al., 2006)

ASAS variable (type MISC/EC/ESD)

Likely an RS CVn variable



**No. 63: GSC 07625-01623**

Period: 31.365(7) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/062043-4349.8,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/062043-4349.8,asas3,0,0,500,0,0)  
2MASS J-K: 0.709

Johnson B-V = 0.826 (derived from Tycho-2)

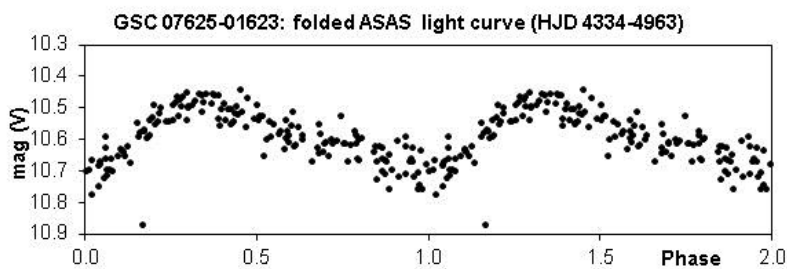
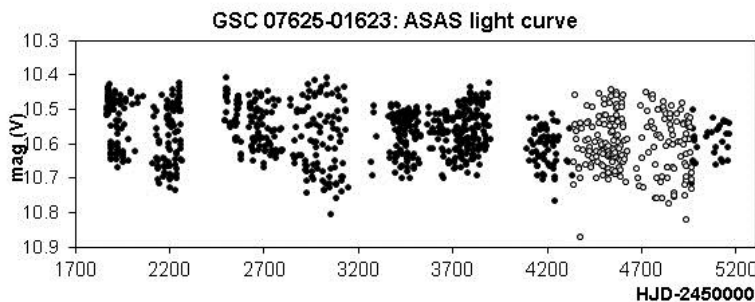
ROSAT: HR1 = 0.87, HR2 = -0.05, fxfopt = -2.37

Proper motion: pmRA: -0.28 mas/yr, pmDE: 0.88 mas/yr (Roeser et al., 2008)

Spectral type: K0III, Li: 40 (0.1pm, Torres et al., 2006)

ASAS variable (type DCEP-FU/EC/ESD)

Likely an RS CVn variable

**No. 64: GSC 08545-01235**

Period: 7.41(1) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/070512-5734.2,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/070512-5734.2,asas3,0,0,500,0,0)  
2MASS J-K: 0.556

Johnson B-V = 0.822 (derived from Tycho-2)

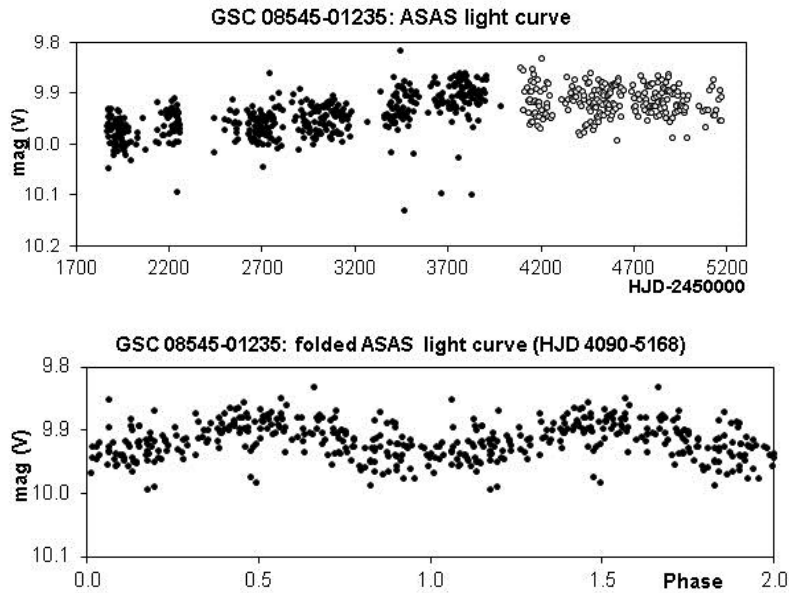
ROSAT: HR1 = 0.37, HR2 = 0.03, fxfopt = -2.59

Proper motion: pmRA: 3.18 mas/yr, pmDE: -19.54 mas/yr (Roeser et al., 2008)

Spectral type: G8V SB2, Li: 70 (0.1pm, Torres et al., 2006)

ASAS variable (type MISC)

Likely an RS CVn variable

**No. 65: GSC 08131-01761**

Period: 24.434(8) d

ASAS data: [http://www.astrow.edu.pl/cgi-asas/asas\\_variable/070854-5057.8,asas3,0,0,500,0,0](http://www.astrow.edu.pl/cgi-asas/asas_variable/070854-5057.8,asas3,0,0,500,0,0)

2MASS J-K: 0.701

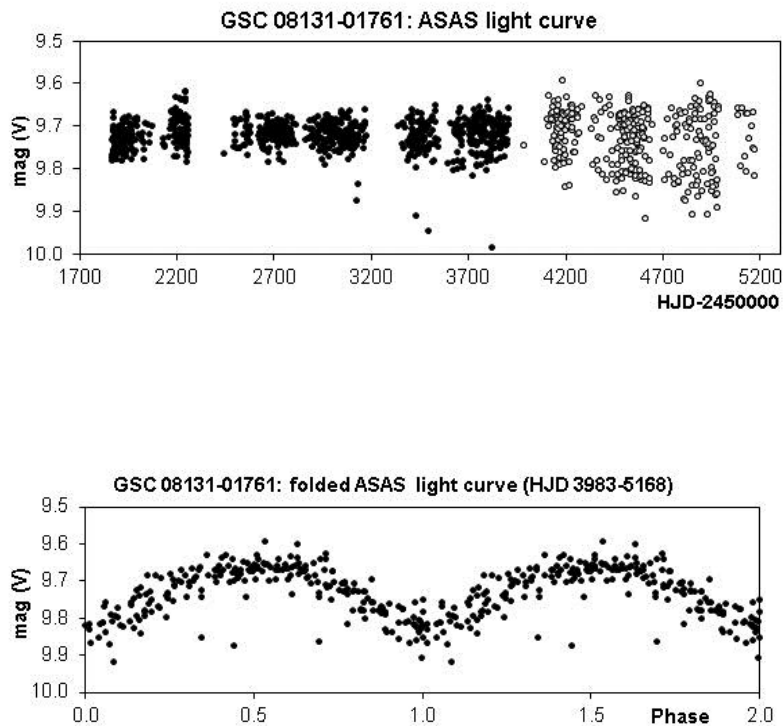
Johnson B-V = 0.632 (derived from Tycho-2)

ROSAT: HR1 = 0.86 , HR2 = 0.38 , fxfopt = -2.25

Proper motion: pmRA: 1.37 mas/yr, pmDE: -4.44 mas/yr (Roeser et al., 2008)

Spectral type: G6III, Li: 60 (0.1pm, Torres et al., 2006)

Likely an RS CVn variable



**No. 66: GSC 08550-01650**

Period: 4.6135(8) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/071225-5356.7,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/071225-5356.7,asas3,0,0,500,0,0)

2MASS J-K: 0.733

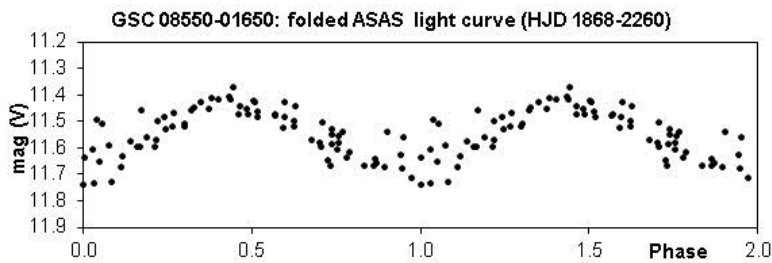
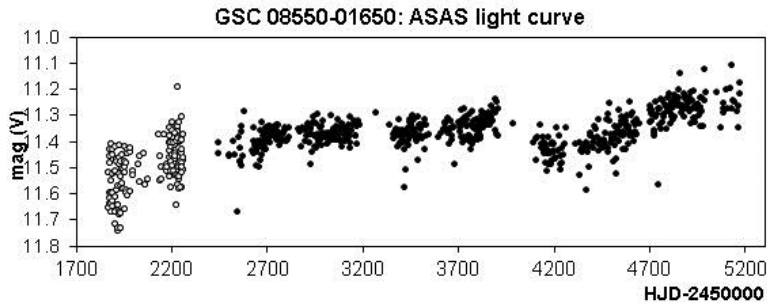
Johnson B-V = 0.579 (derived from Tycho-2)

ROSAT: HR1 = -0.08, HR2 = 0.35, fxfopt = -2.10

Proper motion: pmRA: -0.31 mas/yr, pmDE: 17.63 mas/yr (Roeser et al., 2008)

ASAS variable (type MISC)

Likely an RS CVn variable

**No. 67: GSC 07658-01345**

Period: 6.834(7) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/075128-4328.4,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/075128-4328.4,asas3,0,0,500,0,0)

2MASS J-K: 0.69

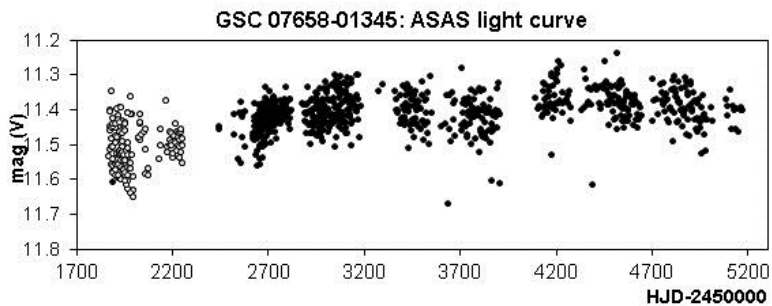
Johnson B-V = 0.696 (derived from Tycho-2)

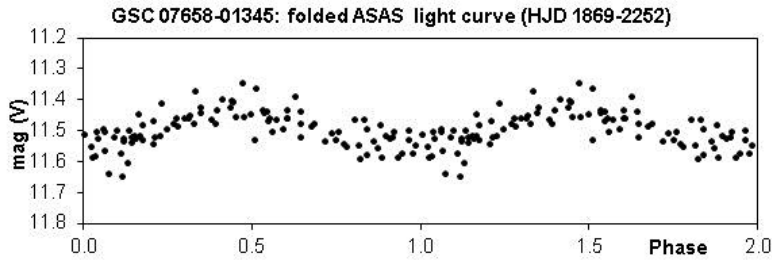
ROSAT: HR1 = 0.47, HR2 = 0.01, fxfopt = -1.06

Proper motion: pmRA: -25.48 mas/yr, pmDE: 8.39 mas/yr (Roeser et al., 2008)

Spectral type: G8IIIe SB2, Li: 70 (0.1pm, Torres et al., 2006)

Likely an RS CVn variable



**No. 68: GSC 07654-03725**

Period: 84.17(5) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/075636-4145.4,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/075636-4145.4,asas3,0,0,500,0,0)

2MASS J-K: 0.72

Johnson B-V = 1.165 (derived from Tycho-2)

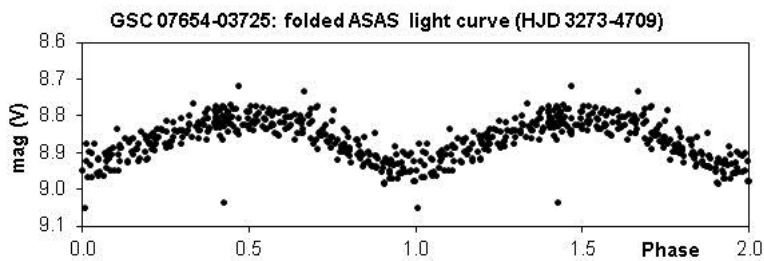
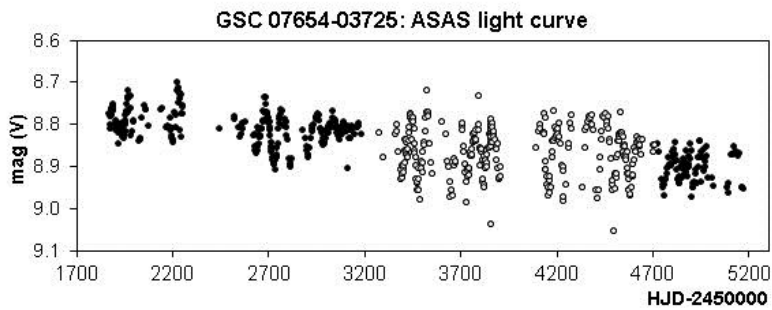
ROSAT: HR1 = 0.81 , HR2 = -0.08 , fxfopt = -1.01

Proper motion: pmRA: -5.90 mas/yr, pmDE: 5.50 mas/yr (Roeser et al., 2008)

Spectral type: K1III, Li: 0 (0.1pm, Torres et al., 2006)

ASAS variable (type MISC)

Likely an RS CVn variable



**No. 69: GSC 07128-00437**

Period: 2.372(1) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/075858-3522.3,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/075858-3522.3,asas3,0,0,500,0,0)

2MASS J-K: 0.764

Johnson B-V = 0.971 (derived from Tycho-2)

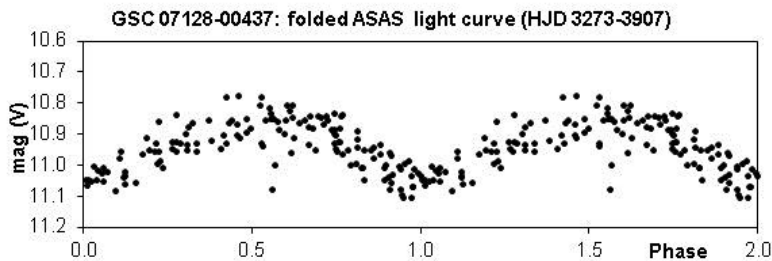
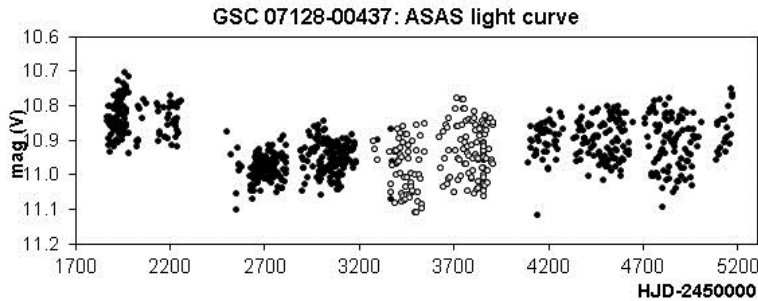
ROSAT: HR1 = 0.47, HR2 = 0.29, fxfopt = -1.98

Proper motion: pmRA: 35.07 mas/yr, pmDE: -9.05 mas/yr (Roeser et al., 2008)

Spectral type: G8IIIe, Li: 50 (0.1pm, Torres et al., 2006)

ASAS variable (type MISC)

Likely an RS CVn variable

**No. 70: GSC 08573-01902**

Period: 53.31(6) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/084508-5558.1,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/084508-5558.1,asas3,0,0,500,0,0)

2MASS J-K: 0.766

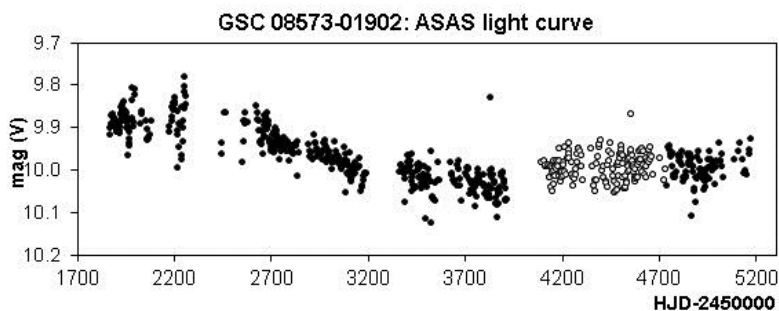
Johnson B-V = 1.373 (derived from Tycho-2)

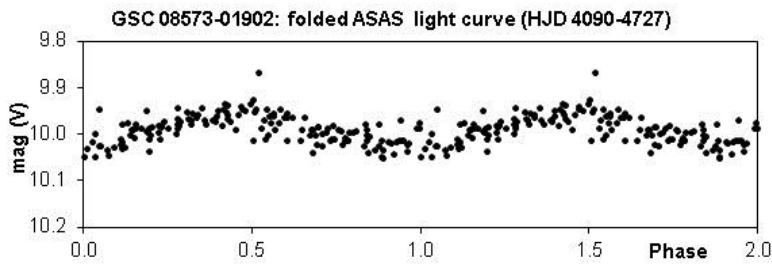
ROSAT: HR1 = 0.72, HR2 = 0.57, fxfopt = -2.27

Proper motion: pmRA: -11.31 mas/yr, pmDE: 9.62 mas/yr (Roeser et al., 2008)

Spectral type: K1III, Li: 20 (0.1pm, Torres et al., 2006)

Likely an RS CVn variable



**No. 71: GSC 08582-01705**

Period: 3.009(1) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/085849-5303.4,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/085849-5303.4,asas3,0,0,500,0,0)

2MASS J-K: 0.682

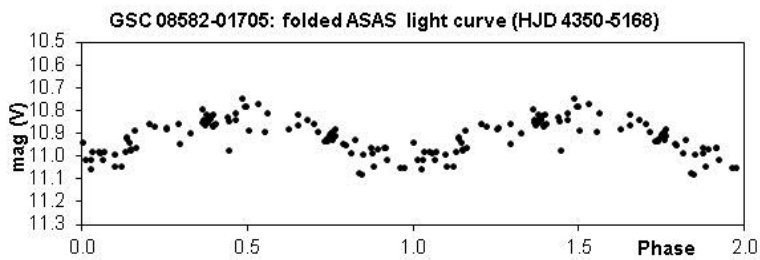
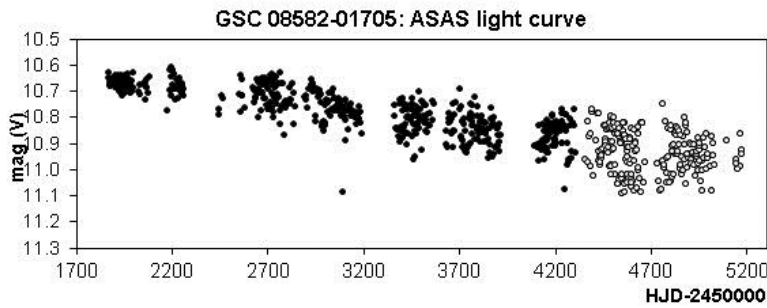
Johnson B-V = 1.005 (derived from Tycho-2)

ROSAT: HR1 = -0.09, HR2 = 0.03, fxfopt = -2.40

Proper motion: pmRA: -64.95 mas/yr, pmDE: 100.43 mas/yr (Roeser et al., 2008)

Spectral type: K4V, Li: 160 (0.1pm, Torres et al., 2006)

Probable BY Dra variable





**No. 72: GSC 07680-01454**

Period: 55.66(8) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/085952-4107.3.asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/085952-4107.3.asas3,0,0,500,0,0)

2MASS J-K: 0.722

Johnson B-V = 1.123 (derived from Tycho-2)

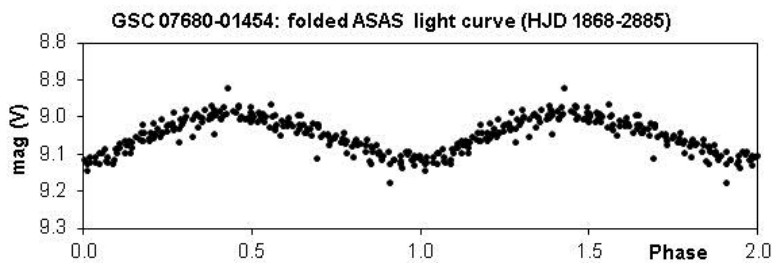
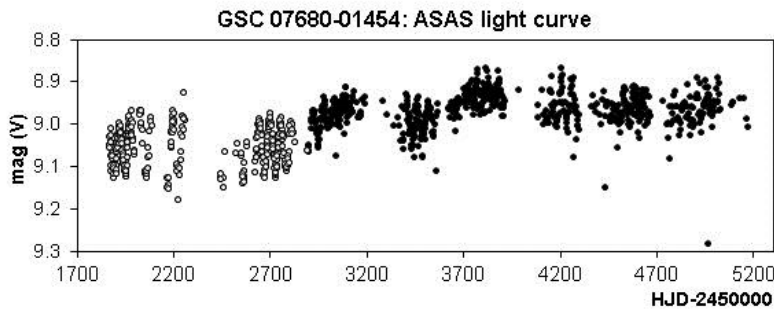
ROSAT: HR1 = 0.51, HR2 = 0.08, fxfopt = -3.00

Proper motion: pmRA: 16.70 mas/yr, pmDE: -43.62 mas/yr (Roeser et al., 2008)

Spectral type: K2III, Li: 0 (0.1pm, Torres et al., 2006)

ASAS variable (type EC / DCEP-FU / ESD)

Likely an RS CVn variable

**No. 73: GSC 08171-00157**

Period: 20.31(2) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/092340-4711.2.asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/092340-4711.2.asas3,0,0,500,0,0)

2MASS J-K: 0.621

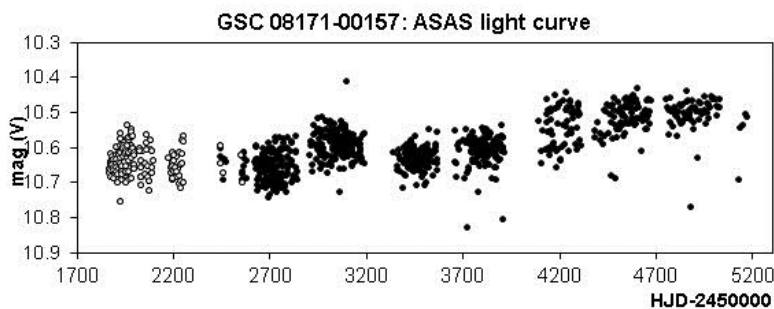
Johnson B-V = 0.921 (derived from Tycho-2)

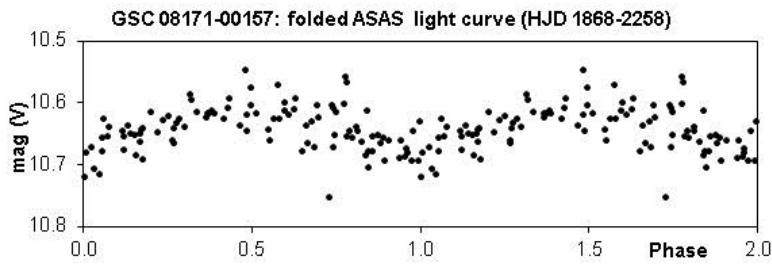
ROSAT: HR1 = 0.52, HR2 = 0.29, fxfopt = -2.36

Proper motion: pmRA: 82.88 mas/yr, pmDE: 48.04 mas/yr (Roeser et al., 2008)

Spectral type: K0III(e) SB2, Li: 0 (0.1pm, Torres et al., 2006)

Likely an RS CVn variable



**No. 74: GSC 07703-00931**

Period: 9.985(7) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/092506-4328.0,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/092506-4328.0,asas3,0,0,500,0,0)

2MASS J-K: 0.754

Johnson B-V = 0.925 (derived from Tycho-2)

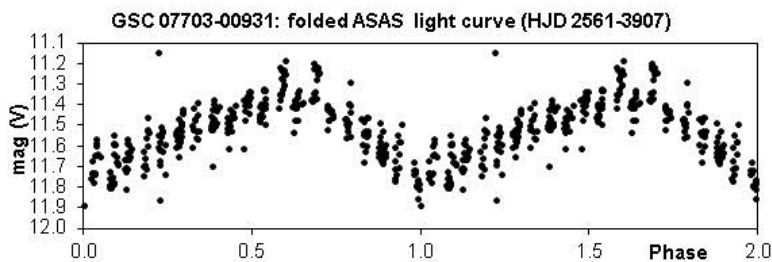
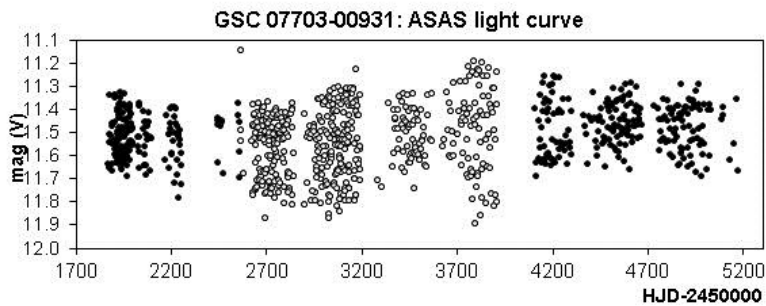
ROSAT: HR1 = 0.59 , HR2 = 0.14 , fxfopt = -1.45

Proper motion: pmRA: 12.79 mas/yr, pmDE: -3.45 mas/yr (Roeser et al., 2008)

Spectral type: M0IIIe, Li: 100 (0.1pm, Torres et al., 2006)

ASAS variable (type DCEP-FU)

Likely an RS CVn variable

**No.75: GSC 08195-00762**

Period: 4.543(1) d

ASAS data: [http://www.astrouw.edu.pl/cgi-asas/asas\\_variable/101104-5119.8,asas3,0,0,500,0,0](http://www.astrouw.edu.pl/cgi-asas/asas_variable/101104-5119.8,asas3,0,0,500,0,0)

2MASS J-K: 0.817

Johnson B-V = 0.971 (derived from Tycho-2)

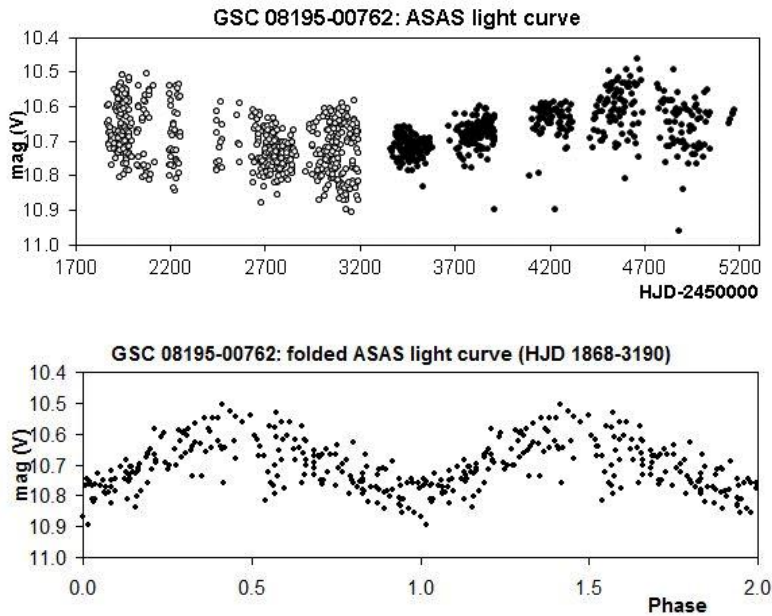
ROSAT: HR1 = 0.46 , HR2 = 0.29 , fxfopt = -1.79

Proper motion: pmRA: 51.58 mas/yr, pmDE: -33.79 mas/yr (Roeser et al., 2008)

Spectral type: K1IIIe, Li: 100 (0.1pm, Torres et al., 2006)

ASAS variable (type MISC)

Likely an RS CVn variable



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