

Thirteen New Variable Stars in the Catalina Surveys Data Release 1

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#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	type	Sp	Comment	L.Curve	Find.Chart	Data
1		GSC 2038-01333	16 02 08.01, +27 03 32.2	RRAB	14.60	15.34		0.678888	2453560.7430	max			lc1.jpg	fch1.jpg	data1.txt
2		GSC 2050-00475	16 16 28.35, +27 52 01.6	RRAB	13.75	14.03		0.828084	2454567.9836	max			lc2.jpg	fch2.jpg	data2.txt
3		USNO-B1.0 1265-0243561	16 22 58.89, +36 34 24.3	RRC	15.05	15.48		0.3694	2455089.68	max		Comm. 3	lc3.jpg	fch3.jpg	data3.txt
4		USNO-B1.0 1320-0319252	16 26 34.20, +42 04 57.1	RRAB	14.65	15.70		0.508316	2454943.9381	max			lc4.jpg	fch4.jpg	data4.txt
5		USNO-B1.0 1296-0276060	16 31 22.64, +39 38 11.4	RRC	15.40	15.97		0.341532	2454279.8270	max		Comm. 5	lc5.jpg	fch5.jpg	data5.txt
6		USNO-B1.0 1297-0280283	16 31 37.52, +39 47 35.3	RRAB	15.35	16.60		0.465345	2454295.7942	max			lc6.jpg	fch6.jpg	data6.txt
7		GSC 3063-00047	16 31 58.88, +38 45 38.7	RRC	13.79	14.20		0.364224	2454239.8728	max		Comm. 7	lc7.jpg	fch7.jpg	data7.txt
8		GSC 3078-00455	16 47 39.42, +43 04 34.3	EA	13.82	14.77		0.599349	2455714.845	min		Comm. 8	lc8.jpg	fch8.jpg	data8.txt
9		USNO-B1.0 1306-0270949	16 52 49.92, +40 36 03.3	RRAB	16.20	17.25		0.612978	2454385.6150	max			lc9.jpg	fch9.jpg	data9.txt
10		GSC 2601-00092	16 55 48.50, +35 49 43.2	EA	13.3	14.0		4.97635	2451453.665	min		Comm. 10	lc10.jpg	fch10.jpg	data10.txt
11		USNO-B1.0 1258-0250074	16 56 00.19, +35 50 41.0	RRAB	15.70	16.73		0.511179	2455043.7204	max			lc11.jpg	fch11.jpg	data11.txt
12		USNO-B1.0 1258-0252047	17 03 02.21, +35 51 25.9	RRAB	15.06	16.10		0.608671	2454996.8756	max			lc12.jpg	fch12.jpg	data12.txt
13		USNO-B1.0 1316-0290409	17 03 56.83, +41 36 41.8	RRAB	15.87	17.03		0.521520	2454531.9845	max		Comm. 13	lc13.jpg	fch13.jpg	data13.txt

Comments:

3. Strong period changes. Two additional phased light curves for narrow JD intervals are presented in the Figure (lc3.jpg).

5. Period changes.

7. Period changes.

8. MinII = 14.38.

10. An Algol-subtype eclipsing variable with narrow minima ($D \sim 0.03$). The minima from plates of Moscow collection, ROTSE-I/NSVS database (Wozniak et al. 2004), and Catalina Sky Surveys were combined to determine the orbital period with higher precision. The NSVS and Moscow photographic data shows presence of a secondary minimum shifted from the phase 0.5 (orbital eccentricity). The phases of the secondary minima are 0.454 and 0.464 (Moscow plates) and 0.453 (NSVS data).

Minima:

HJD	Min	Source
2441804.515	I	Moscow plate archive
2441829.353	I	Moscow plate archive
2442364.184	II	Moscow plate archive
2442369.160	II	Moscow plate archive
2442869.471	I	Moscow plate archive
2445882.411	II	Moscow plate archive
2451286.721	II	ROTSE-I/NSVS
2451453.665	I	ROTSE-I/NSVS
2451463.659	I	ROTSE-I/NSVS
2454548.942	I	Catalina Surveys

13. Blazhko effect.

Remarks:

In the mid-1990s, I performed a search for new variable stars using plates of the Moscow collection in two fields centered at η Herculis and ξ Coronae Borealis (e.g., Antipin 1996a, Antipin 1996b). Some of the discovered variables could not be investigated at that time. A recent inspection of this old list of discoveries shows that thirteen objects still remained not announced as variable stars till present.

The new possibility of using the [online photometry](#) of the Catalina Surveys Data Release 1 (Drake et al. 2009) has allowed me to investigate the earlier suspected stars, to derive their light elements and variability types. A small number of bad data points that deviate strongly from the phased light curves were rejected from the analysis.

Surprisingly, all RRC-type stars in the sample indicate noticeable periods changes, while the RRAB-type stars show stable phased light curves.

The WinEfk software developed by Dr. V.P. Goranskij was used to search for periodicity. The coordinates in the Table are from the 2MASS catalog (Skrutskie et al. 2006).

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Skrutskie, M.F., Cutri, R.M., Stiening, R., et al., 2006, Astron. J., 131, 1163
Wozniak, P.R., Vestrand, W.T., Akerlof, C.W., et al., 2004, Astron. J., 127, 2436