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New and Improved Light Elements for Twenty Suspected Variable Stars

E. V. Kazarovets
Institute of Astronomy, Russian Academy of Sciences, Moscow, Russia

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(E-mail for contact: helene@inasan.ru)

#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	type	Sp	Comment	L.Curve	Find.Chart	Data
1		GSC 2.4 N8HZ016301	07 28 31.961 +23 08 53.40	EW	20.36	20.85	zr	0.241375	2459934.900	min		Comm. 1	lc_01.jpg	ch_01.png	V01.txt
2		USNO-A2.0 1125-05275724 SE	07 39 31.472 +23 45 37.60	EW	16.10	16.21	zr	0.254513	2459153.022	min		Comm. 2	lc_02.jpg	ch_02.png	V02.txt
3		USNO-A2.0 1125-05281753	07 40 06.096 +23 49 28.86	DSCTC	17.74	17.82	zr	0.0592048		max		Comm. 3	lc_03.jpg	ch_03.png	V03.txt
4		GSC 7110-02470	07 44 58.222 -31 54 29.56	ELL	10.26	10.35	g	105.1	2460217.0	min	WN6/WC4	Comm. 4	lc_04.jpg	ch_04.png	V04.txt
5		GSC 7125-04392	08 10 18.098 -31 54 21.34	SR	13.94	16.29	g	433.	2459130.	max	C	Comm. 5	lc_05.jpg	ch_05.png	V05.txt
6		GSC 8163-01081	08 40 23.852 -51 26 46.33	SR	11.01	12.54	g	353.	2458778.	max	S6,8	Comm. 6	lc_06.jpg	ch_06.png	V06.txt
7		GSC 8613-00832	10 33 38.500 -59 01 22.13	EA	10.20	10.29	g	21.538	2459156.902	min	Be	Comm. 7	lc_07.jpg	ch_07.png	V07.txt
8		USNO-A2.0 0225-09681745	10 52 02.392 -62 11 40.06	EA	15.45	15.92	V	2.04338	2458110.838	min		Comm. 8	lc_08.jpg	ch_08.png	V08.txt
9		GSC 9414-00812	11 06 04.903 -78 33 02.74	EA	14.36	14.59	g	3.45904	2460036.600	min		Comm. 9	lc_09.jpg	ch_09.png	V09.txt
10		USNO-A2.0 0075-02629942	11 08 14.750 -79 29 03.58	EW	15.54	15.71	g	0.334513	2460315.850	min		Comm. 10	lc_10.jpg	ch_10.png	V10.txt
11		GSC 9418-02392	11 11 20.834 -79 17 10.16	EA	14.97	15.20	g	0.685782	2460074.462	min		Comm. 11	lc_11.jpg	ch_11.png	V11.txt
12		USNO-A2.0 0150-08192388	11 12 23.571 -74 17 31.84	EW	15.37	15.72	g	0.317499	2460369.761	min		Comm. 12	lc_12.jpg	ch_12.png	V12.txt
13		GSC 9418-02402	11 14 01.321 -78 51 44.85	EA	15.12	15.62	g	1.97595	2460244.844	min		Comm. 13	lc_13.jpg	ch_13.png	V13.txt
14		USNO-A2.0 0075-02673744	11 14 55.201 -77 45 35.10	DSCT	16.38	16.60	g	0.1270786	2460373.847	max		Comm. 14	lc_14.jpg	ch_14.png	V14.txt
15		GSC 3013-00129	11 21 48.837 +40 59 38.72	EW	12.84	13.02	zr	0.371493	2459434.654	min		Comm. 15	lc_15.jpg	ch_15.png	V15.txt
16		USNO-A2.0 0225-12978702	12 00 50.648 -60 26 33.65	EW	15.07	15.35	g	0.405436	2460100.702	min		Comm. 16	lc_16.jpg	ch_16.png	V16.txt
17		GSC 8265-01229	13 31 36.156 -47 51 11.21	RVA	14.10	14.92	V	24.46	2460400.7	min		Comm. 17	lc_17.jpg	ch_17.png	V17.txt
18		USNO-A2.0 0900-07777357	14 44 24.479 +01 09 01.49	RRAB	19.12	19.87	zg	0.360017	2459478.612	max		Comm. 18	lc_18.jpg	ch_18.png	V18.txt
19		USNO-A2.0 0150-14048830	14 51 58.317 -72 36 40.92	EW	16.21	16.78	g	0.400008	2459758.370	min		Comm. 19	lc_19.jpg	ch_19.png	V19.txt
20		GSC 3481-01550	15 00 58.229 +46 55 36.09	EA	11.11	11.27	V	1.12963	2460436.680	min		Comm. 20	lc_20.jpg	ch_20.png	V20.txt

Comments:

1. = RAT J0728+2308. Min II = 20.76 zr. The sinusoidal type variability was suspected by Ramsay and Hakala (2005), no period.

2. = RAT J0739+2345. Min II = 16.20 zr. The variations with dips were suspected by Ramsay and Hakala (2005), no period.

3. = RAT J0740+2349. M – m = 0.45 P. The variability was suspected by Ramsay and Hakala (2005), no type or period.

4. = HD 62910 = HIP 037791 = WR 8 = LSS 731. Min II = 10.33 g; Min II – Min I = 0.45 P. O'Connell effect: Max II = 10.30 g. The variability with P = 114.6 d and without a type was suspected by Marchenko et al. (1998).

5. = IRAS 08083-3145 = CGCS 2095 = [W71b] 021-05. V = 12.09 – < 13.57. The ASAS-SN photometry in V and g bands, taken together, was used for period determination. Magnitudes in V were adjusted by +2 mag. The variability was discovered by Whitelock et al. (2006) with a type SR:, no period. The star was included in the ASAS-SN Variable Stars Database (Jayasinghe et al. 2018) with a type L without period.

6. = IRAS 08388-5116 = GCGSS 540 = He 4-51. V = 10.06 – 11.74. The variability was suspected by Van Eck et al. (2000). The star was included in the ASAS-SN Variable Stars Database (Jayasinghe et al. 2018) with a type L without period.

7. = HD 303004 = IRAS 10317-5845. Min II = 10.27 g, D = 0.05 P. In the reflection nebula GN 10.31.8 = BRAN 309D. The variability was suspected by Yudin and Evans (1998) according to observational data from literature.

8. = ASASSN-V J105201.92-621139.0. Min II = 15.63 V, D = 0.10 P. The variability was discovered by the ASAS-SN team (Jayasinghe et al. 2018) with the type EA and P = 4.0865791 d.

9. = 6771 in Chamaeleon I star-forming region. Min II = 14.58 g, D = 0.04 P. The short period variability was suspected by Carpenter et al. (2002).

10. = 12029 in Chamaeleon I star-forming region. Min II = 15.68 g. The short period variability was suspected by Carpenter et al. (2002).

11. = 19580 in Chamaeleon I star-forming region. Min II = 15.13 g, D = 0.12 P. The short period variability was suspected by Carpenter et al. (2002). The star is included in the ASAS-SN Variable Stars Database (Jayasinghe et al. 2018) with the type EW and P = 0.6857669 d.

12. = 22321 in Chamaeleon I star-forming region. Min II = 15.66 g. The short period variability was suspected by Carpenter et al. (2002). The star is included in the WISE catalogue (Chen et al. 2018) with the type EW and incorrect P = 0.3177814 d.

13. = 26688 in Chamaeleon I star-forming region. Min II = 15.20 g, D = 0.08 P. The variability with both short and long periods was suspected by Carpenter et al. (2002). The star is included in the WISE catalogue (Chen et al. 2018) with a type VAR and P = 1.9759512 d, as well as in the ASAS-SN Variable Stars Database (Jayasinghe et al. 2018) with the type EA and P = 3.951846 d.

14. = 29102 in Chamaeleon I star-forming region. The short period variability was suspected by Carpenter et al. (2002).

15. = ROTSE1 J112148.83+405938.0. Min II = 13.02 zr; zg = 13.29 – 13.47, Min II = 14.46 zg. The star was suspected by Kehoe et al. (2002) as pulsating variable candidate using NSVS photometric data (Woźniak et al. 2004), no period. Ferrante (2013) informed the VSX about the type EW and P = 0.371699 d for this variable. The object was included in the ZTF Catalogue of Variable Stars (Chen et al. 2020) with a type RSCVN and P = 0.1857474 d.

16. = Raf V102. Min II = 15.29 g. Twice shorter period and type DSCT are possible. Close fainter red companion (4" E-SE) and two brighter companions (15" N and 15" E). The variability was discovered by F. Hund in 2007 (RafV catalogue, 2005-2012), no type, period or magnitudes.

17. = UCAC4 211-079023. Min II = 14.75 V. The variability was discovered by Geffert et al. (2017), type SR without period. The star is included in the ASAS-SN Variable Stars Database (Jayasinghe et al. 2018) with the type EW and P = 24.4831 d.

18. = SDSS J144424.47+010901.5. M – m = 0.20 P; zr = 19.13 – 19.62. The ZTF photometry data combining zr and zg bands were used for period determination. The variability of RRAB type was suspected by Ivezić et al. (2000), no period. Sesar et al. (2017) confirmed type RRAB for the object PS1-3PI J144424.47+010901.5 and suggested incorrect P = 0.667676 d.

19. = Raf V123. Min II = 16.73 g. The variability was discovered by A. Paschke in 2007 (RafV catalogue, 2005-2012) with a type E, P = 0.3994 d, no magnitudes.

20. = TYC 3481-1550. Min II = 11.15, D = 0.08 P. The variability of this eclipsing star was reported by Hübscher (2017), no period and magnitudes.

Remarks:

I continue studying behavior of stars from my archive of suspected variables, accumulated since 1990s. I set a goal to create the Second Supplement to the NSV catalogue (Kazarovets et al., 2022) of the archival stars before obtaining variability confirmation using CCD photometric data from contemporary sky surveys. For each of the archival stars, I acquire accurate positions and identifications with different catalogues, and I do my best to determine variability types and light elements. Then I select stars confirmed as variable by myself in order to transfer them to the General Catalogue of Variable Stars (GCVS) (Samus et al., 2017) via the next Name-Lists. Today 41% of 1000 studied stars comply with GCVS rules. In the current paper, I present 20 stars from confirmed 415 stars that proved to be variable. The study of the presented variables was made using the publicly available electronic archives of CCD observations of the Sky Patrol All-Sky Automated Survey for Supernovae (ASAS-SN) project (Shappee et al., 2014; Kochanek et al., 2017) and the Zwicky Transient Facility (ZTF) photometric data (Bellm et al., 2019; Masci et al., 2019) via the SNAD ZTF viewer (Malanchev et al., 2023). To find periods, I applied the WinEfk software provided by Dr. V.P. Goranskij and the online light curve analysis tool developed by Dr. K.V. Sokolovsky. The coordinates of the stars were drawn from the Gaia DR3 catalogue (Gaia Collaboration, 2023).

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