

New Variable Stars in the Field of V458 Vul

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#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	type	Sp	Comment	L.Curve	Find.Chart	Data
1		USNO-A2.0 1050-15350640	19 52 18.48, +20 53 28.7	EA	14.55	14.88	V	1.1674:	2454780.252	Min			01_PC-V.png	01_chart.jpg	01_data.txt
2		USNO-A2.0 1050-15373852	19 52 34.45, +20 57 33.9	EA/RS	13.84	14.32	V	0.821912	2454725.748	Min		Comm. 2	02_PC-V.png	02_chart.jpg	02_data.txt
3		USNO-A2.0 1050-15397773	19 52 50.65, +20 51 41.9	HADS	15.79	16.26	V	0.097301	2455504.1465	Max		Comm. 3	03_PC-V.png	03_chart.jpg	03_data.txt
4		USNO-A2.0 1050-15410765	19 52 58.97, +20 57 46.2	EB	15.26	15.92	V	1.28184	2454725.343	Min		Comm. 4	04_PC-V.png	04_chart.jpg	04_data.txt
5		USNO-A2.0 1050-15412914	19 53 00.34, +20 59 10.6	EW	15.41	16.17	V	0.361021	2454727.2910	Min		Comm. 5	05_PC-V.png	05_chart.jpg	05_data.txt
6		USNO-A2.0 1050-15419127	19 53 04.26, +20 30 35.6	EW	14.78	15.28	V	0.410283	2454781.2111	Min		Comm. 6	06_PC-V.png	06_chart.jpg	06_data.txt
7		2MASS 19531118+2106222	19 53 11.19, +21 06 22.3	EW	15.02	15.58	V	0.539269	2454781.2087	Min		Comm. 7	07_PC-V.png	07_chart.jpg	07_data.txt
8		USNO-A2.0 1050-15448201	19 53 23.19, +21 15 03.7	RRC	14.82	15.03	V	0.342724	2454725.301	Max		Comm. 8	08_PC-V.png	08_chart.jpg	08_data.txt
9		USNO-A2.0 1050-15452815	19 53 26.22, +21 15 33.2	EW	14.79	14.98	V	0.263344	2454725.3141	Min		Comm. 9	09_PC-V.png	09_chart.jpg	09_data.txt
10		2MASS 19533296+2038096	19 53 32.96, +20 38 09.7	EB	13.53	13.85	V	0.687446	2455516.1803	Min		Comm. 10	10_PC-V.png	10_chart.jpg	10_data.txt
11		USNO-A2.0 1050-15474787	19 53 40.39, +20 38 24.5	EA	14.43	15.40	V	1.91331	2455518.135	Min			11_PC-V.png	11_chart.jpg	11_data.txt
12		USNO-A2.0 1050-15501177	19 53 57.05, +21 04 27.0	EW	14.15	14.32	V	0.381042	2454726.3707	Min		Comm. 12	12_PC-V.png	12_chart.jpg	12_data.txt
13		USNO-A2.0 1050-15504756	19 53 59.31, +21 07 28.8	EB	14.43	14.68	V	1.04961	2454726.053	Min		Comm. 13	13_PC-V.png	13_chart.jpg	13_data.txt
14		USNO-A2.0 1050-15505037	19 53 59.50, +20 52 51.6	EA	15.55	16.24	V	1.106041	2454727.2950	Min		Comm. 14	14_PC-V.png	14_chart.jpg	14_data.txt
15		USNO-A2.0 1050-15548930	19 54 26.62, +20 34 14.4	EB	15.14	15.72	V	1.08087	2454725.843	Min		Comm. 15	15_PC-V.png	15_chart.jpg	15_data.txt
16		USNO-A2.0 1050-15563348	19 54 35.21, +20 59 22.4	EW	16.61	17.17	V	0.308726	2454726.726	Min		Comm. 16	16_PC-V.png	16_chart.jpg	16_data.txt
17		USNO-A2.0 1050-15564260	19 54 35.70, +20 44 17.6	SR:	12.16:	12.33	V	29.5:	2454725.3	Max		Comm. 17	17_PC-V.png	17_chart.jpg	17_data.txt
18		USNO-A2.0 1050-15564584	19 54 35.97, +21 09 43.4	EA	15.68	16.13	V	1.130206	2455516.2329	Min		Comm. 18	18_PC-V.png	18_chart.jpg	18_data.txt
19		USNO-A2.0 1050-15567439	19 54 37.74, +20 23 35.3	EW	16.01	16.47	V	0.311653	2454780.193	Min		Comm. 19	19_PC-V.png	19_chart.jpg	19_data.txt
20		USNO-A2.0 1050-15574432	19 54 42.12, +20 58 03.3	EW	16.31	16.95	V	0.424819	2455516.1861	Min		Comm. 20	20_PC-V.png	20_chart.jpg	20_data.txt
21		USNO-A2.0 1050-15579692	19 54 45.47, +21 02 13.0	SR:	14.14	14.39	V	50.8:	2454727.3	Max		Comm. 21	21_PC-V.png	21_chart.jpg	21_data.txt

22		USNO-A2.0 1050-15583526	19 54 47.89, +20 56 43.9	EW	16.29	16.82	V	0.3706	2454725.458	Min		Comm. 22	22_PC-V.png	22_chart.jpg	22_data.txt
23		USNO-A2.0 1050-15585370	19 54 49.01, +20 25 33.5	EB	13.59	14.00	V	0.591407	2454781.2294	Min		Comm. 23	23_PC-V.png	23_chart.jpg	23_data.txt
24		USNO-A2.0 1050-15586038	19 54 49.49, +20 50 40.7	EW	16.47	17.30:	V	0.345749	2454726.505	Min		Comm. 24	24_PC-V.png	24_chart.jpg	24_data.txt
25		USNO-A2.0 1050-15589037	19 54 51.23, +20 25 22.4	EA	13.87	14.04	V	1.7496	2455515.2541	Min		Comm. 25	25_PC-V.png	25_chart.jpg	25_data.txt
26		USNO-A2.0 1050-15611327	19 55 05.21, +21 17 30.7	HADS	14.82	15.06	V	0.097395	2454726.337	Max		Comm. 26	26_PC-V.png	26_chart.jpg	26_data.txt
27		USNO-A2.0 1050-15643194	19 55 25.48, +20 31 37.9	EW	16.22	16.94	V	0.318081	2455507.549	Min		Comm. 27	27_PC-V.png	27_chart.jpg	27_data.txt
28		USNO-A2.0 1050-15645954	19 55 27.33, +20 54 39.6	EA	15.78	16.57	V	3.2028	2454727.3230	Min		Comm. 28	28_PC-V.png	28_chart.jpg	28_data.txt
29		USNO-A2.0 1050-15648971	19 55 29.41, +21 05 34.7	EW	13.53	14.16	V	0.403969	2454725.3537	Min		Comm. 29	29_PC-V.png	29_chart.jpg	29_data.txt
30		USNO-A2.0 1050-15651690	19 55 31.21, +20 31 51.3	EB	15.40	16.20	V	0.436444	2454780.2127	Min		Comm. 30	30_PC-V.png	30_chart.jpg	30_data.txt
31		USNO-A2.0 1050-15654269	19 55 33.00, +20 41 42.9	EW	13.35	13.57	V	0.369939	2455518.2422	Min		Comm. 31	31_PC-V.png	31_chart.jpg	31_data.txt
32		USNO-A2.0 1050-15658359	19 55 35.89, +20 58 18.0	HADS	15.57	15.95	V	0.094878	2454727.3069	Max		Comm. 32	32_PC-V.png	32_chart.jpg	32_data.txt
33		USNO-A2.0 1050-15674001	19 55 47.78, +21 09 37.7	EB	15.92	16.38	V	0.563306	2455504.205	Min		Comm. 33	33_PC-V.png	33_chart.jpg	33_data.txt
34		USNO-A2.0 1050-15676746	19 55 49.99, +20 30 44.8	HADS	16.44	16.83	V	0.117380	2454781.292	Max			34_PC-V.png	34_chart.jpg	34_data.txt

Comments:

2. A close pair of two stars: 2MASS 19523437+2057335 and 2MASS 19523464+2057340. The angular resolution of our telescope is insufficient to determine which of the two stars varies. $\text{Min}_{\Pi}=14^{\text{m}}.22$.

3. Maxima:

HJD(TT)	\pm
2454727.295	0.002
2454780.225	0.001
2454781.198	0.001
2455504.1465	0.0007
2455504.247	0.001
2455507.2663	0.0009
2455511.252	0.001
2455512.2276	0.0007
2455515.2464	0.0009
2455516.2135	0.0003
2455518.264	0.002

4. $\text{Min}_{\Pi}=15^{\text{m}}.44$.

5. Primary minima:

HJD(TT)	±
2454727.2910	0.0005
2455504.2034	0.0006

Min_{II}=16^m.04.

6. Primary minima:

HJD(TT)	±
2454781.2111	0.0008
2455515.2105	0.0008

Min_{II}=15^m.28.

7. A close pair of two stars: 2MASS 19531118+2106222 and CMC14 195310.9+210618. 2MASS 19531118+2106222 varies. Infrared source IRAS 19510+2058. Primary minima:

HJD(TT)	±
2454727.2833	0.0005
2454781.2087	0.0007
2455516.2338	0.0010

Min_{II}=15^m.58.

8. Period 0^d.685447 and type EW are also possible.

9. Primary minima:

HJD(TT)	±
2454725.3141	0.0008
2454726.367	0.003
2454745.326	0.001
2455513.235	0.001
2455518.240	0.002

Min_{II}=14^m.95.

10. Primary minima:

HJD(TT)	±
2455516.1803	0.0009
2455518.2440	0.0006

Min_{II}=13^m.79.

12. Period 0^d.471026 is also possible. Primary minimum: HJD(TT) 2454726.3707 ± 0.0008. Min_{II}=14^m.32.

13. Min_{II}=14^m.65.

14. Primary minimum: HJD(TT) 2454727.2950 ± 0.0007 .

15. A close pair of two stars: USNO-A2.0 1050-15548930 and 2MASS 19542631+2034125. USNO-A2.0 1050-15548930 varies. $\text{Min}_{\text{II}}=15^{\text{m}}.42$.

16. Period $0^{\text{d}}.267441$ is also possible. $\text{Min}_{\text{II}}=17^{\text{m}}.17$.

17. Infrared colors $J-H=0.984$, $H-K=0.307$ and $J-K=1.291$ (2MASS) are consistent with M spectral type (Bessell and Brett 1988) and SR: classification.

18. Primary minimum: HJD(TT) 2455516.2329 ± 0.0007 . $\text{Min}_{\text{II}}=15^{\text{m}}.94$.

19. Period $0^{\text{d}}.269786$ is also possible. $\text{Min}_{\text{II}}=16^{\text{m}}.45$.

20. Primary minimum: HJD(TT) 2455516.1861 ± 0.0008 . $\text{Min}_{\text{II}}=16^{\text{m}}.86$.

21. Infrared colors $J-H=1.035$, $H-K=0.384$ and $J-K=1.419$ (2MASS) are consistent with M spectral type (Bessell and Brett 1988) and SR: classification.

22. Period $0^{\text{d}}.3098$ is also possible. $\text{Min}_{\text{II}}=16^{\text{m}}.62$.

23. A close pair of two stars: 2MASS 19544900+2025324 and 2MASS 19544893+2025359. The angular resolution of our telescope is insufficient to determine which of the two stars varies. Primary minima:

HJD(TT)	\pm
2454781.2294	0.0004
2455509.2522	0.0008

$\text{Min}_{\text{II}}=13^{\text{m}}.78$.

24. Periods $0^{\text{d}}.418246$ or $0^{\text{d}}.294669$ are possible. $\text{Min}_{\text{II}}=17^{\text{m}}.27$.

25. A close pair of two stars: USNO-A2.0 1050-15589037 and a faint star, not found in any catalogues. USNO-A2.0 1050-15589037 varies. Primary minimum: HJD(TT) 2455515.2541 ± 0.0007 . $\text{Min}_{\text{II}}=14^{\text{m}}.02$.

26. Maxima:

HJD(TT)	\pm
2454726.337	0.003
2454727.307	0.002
2454745.329	0.001
2454779.220	0.001

27. Period $0^{\text{d}}.274336$ is possible. $\text{Min}_{\text{II}}=16^{\text{m}}.86$.

28. A close pair of two stars: USNO-A2.0 1050-15645954 and a faint star, not found in any catalogues. USNO-A2.0 1050-15645954 varies. Period $1^{\text{d}}.60142$ is possible. Primary minima:

HJD(TT)	\pm
2454727.3230	0.0008

2455515.220	0.002
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Min_{II}=16^m.46.

29. The shape of the light curve for observations intervals JD 2454725–2454788 and JD 2455504–2455518 is different: we found change of the depth of primary and secondary minima. Primary minima:

HJD(TT)	±
2454725.3537	0.0006
2454727.3733	0.0004
2455504.2063	0.0002
2455512.2841	0.0002

Min_{II}=13^m.99.

30. Primary minima:

HJD(TT)	±
2454780.2127	0.0004
2455511.2564	0.0005
2455518.2398	0.0006

Min_{II}=15^m.68.

31. Primary minima:

HJD(TT)	±
2454727.3145	0.0009
2454780.2173	0.0004
2455504.1824	0.0003
2455518.2422	0.0003

Min_{II}=13^m.57.

32. Period 0^d.086636 is also possible. Maxima:

HJD(TT)	±
2454725.3186	0.0009
2454726.359	0.001
2454727.3069	0.0005
2454745.3359	0.0006
2454779.2080	0.0004
2454780.2520	0.0008
2454781.1970	0.0005
2455504.1698	0.0009

2455504.262	0.001
2455507.2961	0.0005
2455512.233	0.001
2455515.2677	0.0009
2455516.219	0.001
2455518.2094	0.0007

33. Primary minimum: HJD(TT) 2455504.205 ± 0.001 . $\text{Min}_{\text{II}}=16^{\text{m}}.20$.

Remarks:

During observations of the field of Nova V458 Vul, we discovered 34 new variable stars. Our observations were carried out at the Astrotel-Caucasus observatory, located at the Astronomical station of the Kazan Federal university, using the 300-mm Ritchey–Chretien telescope, equipped with Apogee Alta U9000 CCD camera with Johnson–Cousins V filter. A total of 619 images with 5-minute exposures were obtained on JD 2454725 – 2455518. For basic reductions for dark current, flat fields, bias, and for removing cosmic rays hits we used IRAF routines. For search and photometry of new variable stars, we applied VaST software by Sokolovsky and Lebedev (2005). The comparison star was USNO-A2.0 1050-15501592 ($\alpha = 19^{\text{h}}53^{\text{m}}57^{\text{s}}.35$, $\delta = +20^{\circ}52' 11''.5$, J2000; 2MASS); $V = 11^{\text{m}}.99$ from the FONAC catalogue (Kislyuk et al. 1999). The coordinates of the variable stars in the Table were drawn from the 2MASS catalogue (Skrutskie et al. 2006) except for the stars USNO-A2.0 1050-15373852 and USNO-A2.0 1050-15585370; their coordinates were drawn from the USNO-A2.0 catalogue (Monet et al. 1998). All times in the Table and Comments are expressed in the Terrestrial Time in accordance with IAU recommendations (resolution B1 XXIII IAU GA). For search for periods and epochs of extrema we use [Peranso](#) software.

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