

New Variable Stars in Auriga III

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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 1275-04559856	05 14 39.03, +39 14 48.5	EA	16.75	17.05	*	1.9337	2455512.4298	Min		Comm. 1	01_PC-R.png	01_chart.jpg	01_data.txt
2		USNO-A2.0 1275-04562638	05 14 44.18, +39 22 41.6	EW	16.36	16.84	*	0.40011	2455502.3248	Min		Comm. 2	02_PC-R.png	02_chart.jpg	02_data.txt
3		USNO-A2.0 1275-04566255	05 14 51.12, +39 13 09.0	EW	14.38	14.78	*	0.33413	2455496.2931	Min		Comm. 3	03_PC-R.png	03_chart.jpg	03_data.txt
4		USNO-A2.0 1275-04571286	05 15 00.71, +38 58 57.8	EW	18.50	19.00	*	0.29221	2455502.456	Min		Comm. 4	04_PC-R.png	04_chart.jpg	04_data.txt
5		USNO-A2.0 1275-04572953	05 15 03.90, +39 18 46.5	EA	16.70	17.05	*	1.1269	2455571.2139	Min		Comm. 5	05_PC-R.png	05_chart.jpg	05_data.txt
6		USNO-A2.0 1275-04581447	05 15 20.21, +39 29 44.2	RS:	14.11	14.22	*	0.7319	2455502.410	Max		Comm. 6	06_PC-R.png	06_chart.jpg	06_data.txt
7		USNO-A2.0 1275-04582456	05 15 22.12, +39 20 31.8	EW	17.90	18.52	*	0.28560	2455538.2660	Min		Comm. 7	07_PC-R.png	07_chart.jpg	07_data.txt
8		USNO-A2.0 1275-04601357	05 15 58.52, +39 10 57.7	EB	16.39	16.70	*	1.5409	2455573.232	Min		Comm. 8	08_PC-R.png	08_chart.jpg	08_data.txt
9		USNO-A2.0 1275-04606912	05 16 09.22, +38 40 56.1	EW	15.91	16.03	*	0.31835	2455512.434	Max		Comm. 9	09_PC-R.png	09_chart.jpg	09_data.txt
10		USNO-A2.0 1275-04608344	05 16 11.90, +39 03 51.8	EA	16.60	17.04	*	2.3015	2455540.2057	Min		Comm. 10	10_PC-R.png	10_chart.jpg	10_data.txt
11		USNO-A2.0 1275-04611838	05 16 18.65, +38 55 11.2	DSCT	14.06	14.12	*	0.090465	2455521.3565	Max		Comm. 11	11_PC-R.png	11_chart.jpg	11_data.txt
12		USNO-A2.0 1275-04613751	05 16 22.20, +38 50 54.9	BY:	14.30	14.49	*	6.82	2455496.54	Max		Comm. 12	12_PC-R.png	12_chart.jpg	12_data.txt
13		USNO-A2.0 1275-04614435	05 16 23.61, +39 04 45.6	BY:	14.68	14.76	*	0.9238	2455496.621	Max		Comm. 13	13_PC-R.png	13_chart.jpg	13_data.txt
14		USNO-A2.0 1275-04617579	05 16 29.76, +38 41 25.1	EW	16.81	16.98	*	0.39481	2455497.273	Min		Comm. 14	14_PC-R.png	14_chart.jpg	14_data.txt
15		USNO-A2.0 1275-04625798	05 16 45.66, +39 16 25.0	EW	17.91	18.68	*	0.33107	2455571.2574	Min		Comm. 15	15_PC-R.png	15_chart.jpg	15_data.txt
16		USNO-A2.0 1275-04635509	05 17 04.80, +39 04 20.7	EA	16.45	16.98	*	2.530:	2455538.2000	Min		Comm. 16	16_PC-R.png	16_chart.jpg	16_data.txt
17		USNO-A2.0 1275-04641543	05 17 16.70, +38 49 05.5	EW	17.88	18.31	*	0.43607	2455571.221	Min		Comm. 17	17_PC-R.png	17_chart.jpg	17_data.txt
18		USNO-A2.0 1275-04641818	05 17 17.22, +39 08 42.4	EA	17.24	17.76	*	0.79373	2455520.4077	Min		Comm. 18	18_PC-R.png	18_chart.jpg	18_data.txt
19		USNO-A2.0 1275-04642211	05 17 17.91, +39 14 53.4	BY:	14.53	14.59	*	4.84	2455511.2	Max		Comm. 19	19_PC-R.png	19_chart.jpg	19_data.txt
20		USNO-A2.0 1275-04654181	05 17 42.00, +39 06 34.5	EA	14.97	15.71	*	2.5293	2455521.3620	Min		Comm. 20	20_PC-R.png	20_chart.jpg	20_data.txt
21		USNO-A2.0 1275-04658709	05 17 51.27, +38 46 28.7	BY:	14.91	14.98	*	11.6	2455497.3	Max		Comm. 21	21_PC-R.png	21_chart.jpg	21_data.txt

22	USNO-A2.0 1275-04660491	05 17 55.04, +38 44 06.7	SR:	14.00	14.18	*	55	2455483.5	Max	Comm. 22	22_PC-R.png	22_chart.jpg	22_data.txt
23	USNO-A2.0 1275-04661963	05 17 57.90, +39 15 12.9	EB	14.17	14.25	*	0.73726	2455574.622	Min	Comm. 23	23_PC-R.png	23_chart.jpg	23_data.txt
24	USNO-A2.0 1275-04681687	05 18 38.01, +38 41 50.7	EB	14.10	14.81	*	1.3587	2455496.605	Min	Comm. 24	24_PC-R.png	24_chart.jpg	24_data.txt

Comments:

1. Primary minimum: HJD(TT) 2455512.4298 ± 0.0006 . $\text{Min}_{\text{II}} = 16^{\text{m}}.93$.

2. Primary minimum: HJD(TT) 2455502.3248 ± 0.0003 . $\text{Min}_{\text{II}} = 16^{\text{m}}.80$.

3. Primary minima:

HJD(TT)	\pm
2455496.2931	0.0002
2455502.3091	0.0003
2455503.3100	0.0004
2455521.3565	0.0002
2455529.3730	0.0004

$\text{Min}_{\text{II}} = 14^{\text{m}}.76$.

4. $\text{Min}_{\text{II}} = 19^{\text{m}}.00$.

5. Primary minimum: HJD(TT) 2455571.2139 ± 0.0009 . $\text{Min}_{\text{II}} = 17^{\text{m}}.03$.

6. Despite its infrared colors ($J-H = 0.122$, $H-K = 0.027$ and $J-K = 0.149$, 2MASS), we tentatively suggest the RS: classification.

7. Primary minimum: HJD(TT) 2455538.2660 ± 0.0008 . $\text{Min}_{\text{II}} = 18^{\text{m}}.32$.

8. O'Connell effect. Primary minimum: HJD(TT) 2455573.232 ± 0.002 . $\text{Min}_{\text{II}} = 16^{\text{m}}.60$.

9. Primary minima:

HJD(TT)	\pm
2455512.434	0.001
2455538.221	0.001
2455573.236	0.001
2455574.195	0.001

$\text{Min}_{\text{II}} = 16^{\text{m}}.03$.

10. Primary minimum: HJD(TT) 2455540.2057 ± 0.0003 . $\text{Min}_{\text{II}} = 17^{\text{m}}.04$.

11. Maxima:

HJD(TT)	\pm
2455496.2950	0.0005
2455521.3565	0.0005
2455537.1876	0.0005
2455538.1874	0.0006
2455538.2742	0.0003
2455540.2642	0.0005
2455571.2042	0.0004
2455572.1990	0.0004
2455573.1954	0.0005
2455574.1877	0.0005
2455596.1746	0.0002

12. Infrared colors J-H = 0.659, H-K = 0.207 and J-K = 0.866 (2MASS) are consistent with the K spectral type (Bessell and Brett 1988) and BY: classification.

13. Infrared colors J-H = 0.329, H-K = 0.178 and J-K = 0.507 (2MASS) are consistent with the G or K spectral type (Bessell and Brett 1988) and BY: classification.

14. $\text{Min}_{\text{II}} = 16^{\text{m}}.97$.

15. Primary minima:

HJD(TT)	\pm
2455571.2574	0.0007
2455572.2489	0.0006
2455573.2453	0.0004

$\text{Min}_{\text{II}} = 18^{\text{m}}.68$.

16. Primary minimum: HJD(TT) 2455538.2000 ± 0.0008 . $\text{Min}_{\text{II}} = 16^{\text{m}}.84$. If the tabulated period is correct, then the orbit is eccentric, with the secondary minimum at phase 0.47.

17. Primary minimum: HJD(TT) 2455571.221 ± 0.001 . $\text{Min}_{\text{II}} = 18^{\text{m}}.28$.

18. Depth of primary minimum varies. Primary minima:

HJD(TT)	\pm
2455520.4077	0.0007
2455540.2486	0.0006
2455571.2015	0.0001

$\text{Min}_{\text{II}} = 17^{\text{m}}.56$.

19. Infrared colors J-H = 0.460, H-K = 0.073 and J-K = 0.533 (2MASS) are consistent with the K spectral type (Bessell and Brett 1988) and BY: classification.

20. Primary minimum: HJD(TT) 2455521.3620 ± 0.0003 . $\text{Min}_{\text{II}} = 15^{\text{m}}.39$.

21. Infrared colors $J-H = 0.233$, $H-K = 0.173$ and $J-K = 0.406$ (2MASS) are consistent with the K: spectral type (Bessell and Brett 1988) and BY: classification.

22. Infrared colors $J-H = 1.214$, $H-K = 0.404$ and $J-K = 1.618$ (2MASS) are consistent with the M spectral type (Bessell and Brett 1988) and SR: classification.

23. $\text{Min}_{\text{II}} = 14^{\text{m}}.25$.

24. $\text{Min}_{\text{II}} = 14^{\text{m}}.42$.

Remarks:

During observations of the field in Auriga, we discovered 24 new variable stars. Our observations were carried out at the Astrotel-Caucasus observatory using the 300-mm Ritchey–Chrétien telescope, equipped with an unfiltered Apogee Alta U9000 CCD camera. A total of 571 images with 5-minute exposures were obtained on JD 2455503–2455601. For basic reductions for dark current, flat fields, bias, and for removing cosmic-ray 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 1275-04592684 = USNO-B1.0 1287-0109706 ($\alpha = 05^{\text{h}}15^{\text{m}}41^{\text{s}}.84$, $\delta = +38^{\circ}42' 02''.3$ (J2000, 2MASS)), $R_1 = 13^{\text{m}}.97$, $R_2 = 13^{\text{m}}.85$ (USNO-B1.0). Unfiltered magnitudes were calibrated using the comparison star, assuming $R_{\text{comp}} = 13^{\text{m}}.91$. The coordinates of the variable stars in the table were drawn from the 2MASS catalogue (Skrutskie et al. 2006). We searched for periods and epochs of extrema using [Peranso](#) software.

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