

Variable Stars Discovered at the Maidanak Observatory: Field Center $\alpha=21^{\text{h}}50^{\text{m}} \delta=+59^{\circ}00'(2000.0)$

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#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	t _{type}	Sp	Comment	L.Curve	Find.Chart	Data
1		2MASS 21494762+5903068	21:49:47.637 +59:03:06.81	EA	16.71	17.21		9.975	2459442.438	min		Comm. 1	out07706_LC.png	ch07706.png	out07706.dat
2		2MASS 21495389+5917479	21:49:53.927 +59:17:47.78	EA:	14.8	15.01				min		Comm. 2	out04237_LC.png	ch04237.png	out04237.dat
3		2MASS 21495706+5859170	21:49:57.059 +58:59:17.12	EA:	15.54	15.77				min		Comm. 3	out03438_LC.png	ch03438.png	out03438.dat
4		2MASS 21501845+5919368	21:50:18.444 +59:19:36.87	EA:	14.25	14.42				min		Comm. 4	out03774_LC.png	ch03774.png	out03774.dat
5		2MASS 21503341+5849595	21:50:33.410 +58:49:59.41	EA	17.02	17.5		3.833	2459444.657	min		Comm. 5	out00405_LC.png	ch00405.png	out00405.dat
6		2MASS 21510036+5906509	21:51:00.365 +59:06:50.95	EA:	15.39	<15.7				min		Comm. 6	out08312_LC.png	ch08312.png	out08312.dat
7		2MASS 21513321+5906075	21:51:33.210 +59:06:07.51	EA:	16.22	16.45				min		Comm. 7	out08630_LC.png	ch08630.png	out08630.dat
8		2MASS 21513430+5917039	21:51:34.282 +59:17:03.86	EA	16.89	17.40		2.821	2459443.964	min		Comm. 8	out04554_LC.png	ch04554.png	out04554.dat
9		2MASS 21515214+5850243	21:51:52.135 +58:50:24.35	EA	16.17	16.70		6.012	2459446.472	min		Comm. 9	out00453_LC.png	ch00453.png	out00453.dat
10		2MASS 21520457+5853584	21:52:04.562 +58:53:58.40	BY:	15.58	15.64		4.9	2459442.5	max			out01654_LC.png	ch01654.png	out01654.dat
11	V1059 Cep	2MASS 21520880+5904357	21:52:08.787 +59:04:35.71	EA	14.83	15.25		2.5561	2459442.939	min		Comm. 11	out08495_LC.png	ch08495.png	out08495.dat
12		2MASS 21533095+5912299	21:53:30.947 +59:12:29.85	EA:	15.73	16.21				min		Comm. 12	out06485_LC.png	ch06485.png	out06485.dat

Comments:

1. $\text{Min}_{\text{II}} = 17^{\text{m}}.28$.

2. It was not possible to determine the period because only one minimum was observed. $\text{JD}_{\text{min}} = 2459446.227$.

3. It was not possible to determine the period because only one minimum was observed. $JD_{\min} = 2459447.390$.
4. It was not possible to determine the period because only one minimum was observed. $JD_{\min} = 2459450.191$.
5. Twice longer period is possible.
6. It was not possible to determine the period because only one minimum was observed.
7. It was not possible to determine the period because only one minimum was partially covered with observations. $JD_{\min} = 2459446.175$.
8. $Min_{II} = 17^m.3$.
9. $Min_{II} = 16^m.68$.
11. $Min_{II} = 15^m.22$. The orbit of the star is possibly slightly eccentric.
12. It was not possible to determine the period because only one minimum was observed. $JD_{\min} = 2459451.287$.

Remarks:

We present the results of searching for variable stars in a field in Cepheus with the center $\alpha=21^h50^m$, $\delta=+59^\circ00'$ (2000.0). 11 stars from our sample are not mentioned as variables in the available star databases: [GCVS](#) (Samus et al. 2017), [VSX](#), ZTF (Chen et al. 2020), and [ASAS-SN Variable Stars Database](#). V1059 Cep was discovered by Lapukhin, Veselkov, and Zubareva (2015). We have monitored the star in order to improve the light curve. The coordinates were extracted from Gaia DR3 (Gaia Collaboration 2022).

Observations were carried out at the Maidanak Astronomical Observatory of the Ulugh Beg Astronomical Institute (UBAI) of the Academy of Sciences of the Republic of Uzbekistan (Ehgamberdiev 2018) using the 0.5-m AMT-1 telescope with Mathis Instruments MI-750/1000 equatorial fork mount equipped with an Apogee Alta U16M (4K×4K) CCD camera. The physical size of a CCD pixel is 9 microns. We used 2×2 binning, which corresponds to 0.907"/pixel, and the field of view of 30.9'×30.9'. The exposure times were 120 seconds in the Bessel R filter. The temperature of the camera was set to -20°C. Calibration images: bias, dark and flat field were also obtained for each observational date. Observations were obtained during the period from August 15 to 26, 2021 (JD 2459442.3 – 2459452.2).

The [VaST](#) (Variability Search Toolkit) software package (Sokolovsky & Lebedev 2018) was used to reveal the brightness variability. The periods of brightness changes were determined by the Lafler-Kinman method in the LK program written by E. G. Lapukhin & A.V. Konovalchikov (private communication).

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