"Peremennye Zvezdy", Prilozhenie,
vol. 23, N 3 **(2023)**

Discovery of 19 new variable stars in the vicinity of the young star cluster King 12. Part I

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ISSN 2221–0474 **DOI:** 10.24412/2221-0474-2023-3-1

Received: 7.09.2023; accepted: 1.12.2023
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#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	type	Sp	Comment	L.Curve	Find.Chart	Data
1		Gaia DR3 2012891162643165696	23 48 51.614 +62 05 53.84	EA	16.27	16.46	R	2.051	2459458.2318	min		Comm. 1	07824_ph.png	07824_fchart.png	07824_lc.dat
2		Gaia DR3 2012896041725952512	23 49 28.664 +62 10 51.68	EW	15.45	15.56	R	0.26320	2459456.5001	min		Comm. 2	06521_ph.png	06521_fchart.png	06521_lc.dat
3		Gaia DR3 2012944317160593408	23 49 32.645 +62 16 04.23	EW	16.08	16.51	R	0.35012	2459462.2760	min		Comm. 3	03749_ph.png	03749_fchart.png	03749_lc.dat
4		Gaia DR3 2012896969438861440	23 49 34.180 +62 12 44.30	EA	15.50	15.92	R	1.313	2459457.2367	min		Comm. 4	05936_ph.png	05936_fchart.png	05936_lc.dat
5		Gaia DR3 2012875013566366848	23 49 55.408 +61 56 46.59	EA	15.61	15.73	R	0.6946	2459458.2993	min		Comm. 5	03081_ph.png	03081_fchart.png	03081_lc.dat
6		Gaia DR3 2012879789569893120	23 49 56.524 +62 02 33.29	EW:	16.71	16.95	R	0.3240	2459454.2549	min		Comm. 6	08768_ph.png	08768_fchart.png	08768_lc.dat
7		Gaia DR3 2012878964936200064	23 49 56.605 +62 01 05.72	BY	16.71	16.93	R	1.82		max			04978_ph.png	04978_fchart.png	04978_lc.dat
8		Gaia DR3 2012879853981875968	23 49 57.201 +62 03 19.81	EA	17.74	18.64	R	1.1072	2459457.3312	min		Comm. 8	08674_ph.png	08674_fchart.png	08674_lc.dat
9		Gaia DR3 2012879063707896960	23 50 09.305 +62 03 28.57	EA	17.85	18.55	R	0.6577	2459456.3651	min		Comm. 9	04884_ph.png	04884_fchart.png	04884_lc.dat
10		Gaia DR3 2012875799532611328	23 50 19.315 +62 00 19.22	EW	15.88	16.44	R	0.40250	2459459.1630	min		Comm. 10	05160_ph.png	05160_fchart.png	05160_lc.dat
11		Gaia DR3 2012969399772254080	23 50 34.070 +62 00 04.02	EW	16.75	17.25	R	0.3088	2459453.2336	min		Comm. 11	05257_ph.png	05257_fchart.png	05257_lc.dat
12		Gaia DR3 2012985995521172736	23 50 43.386 +62 09 57.06	EW	15.75	16.25	R	0.25938	2459453.2587	min		Comm. 12	06850_ph.png	06850_fchart.png	06850_lc.dat
13		Gaia DR3 2012969910861070592	23 50 57.367 +62 04 09.22	BY	16.92	17.13	R	1.58		max			08396_ph.png	08396_fchart.png	08396_lc.dat
14		Gaia DR3 2012987640484769280	23 51 12.986 +62 15 38.74	EA	17.20	18.80	R		2459460.3493	min		Comm. 14	48405_ph.png	48405_fchart.png	48405_lc.dat
15		Gaia DR3 2012976271715231872	23 51 40.115 +62 12 20.25	BY:	16.48	16.63	R	0.711	2459457.147	max			06189_ph.png	06189_fchart.png	06189_lc.dat
16		Gaia DR3 2012974897325849984	23 51 41.104 +62 08 21.27	DSCT	16.20	16.29	R	0.17203	2459453.2790	max			07321_ph.png	07321_fchart.png	07321_lc.dat
17		Gaia DR3 2012971014675504384	23 52 10.202 +62 07 09.35	EW	16.65	16.86	R	0.62381	2459460.3673	min		Comm. 17	07634_ph.png	07634_fchart.png	07634_lc.dat
18		Gaia DR3 2012972075524373248	23 52 02.850 +62 09 14.42	EW	16.83	17.02	R	0.7575	2459453.2835	min		Comm. 18	07071_ph.png	07071_fchart.png	07071_lc.dat
19		Gaia DR3 2012789419152099968	23 52 56.689 +62 08 18.14	EA	15.42	16.19	R	0.6394	2459460.1761	min		Comm. 19	28604_ph.png	28604_fchart.png	28604_lc.dat

Comments:

1. MinII = $16^{m}.41$.

2. MinII = $15^{m}.55$.

3. MinII = $16^{m}.46$.

4. MinII = $15^{m}.85$.

5. MinII = $15^{m}.64$.

6. MinII = $16^{m}.90$.

8. MinII = $18^{m}.4$.

9. MinII = $18^{m}.40$.

10. MinII = $16^{m}.39$.

11. MinII = $17^{m}.15$.

12. MinII = $16^{m}.15$.

14. Our dataset is not long enough to derive light elements for this Algol variable.

17. MinII = $16^{m}.77$.

18. MinII = $16^{m}.96$.

19. MinII = $15^{m}.71$.

Remarks:

We present the results of searching for variable stars in a field in Cassiopea with the center at $\alpha=23^{h}50^{m}$, $\delta=+61°56'$ (J2000.0) near the young open star cluster King12. The field of view is 30′. We inspected the available databases containing information on variable stars: GCVS (Samus et al., 2017), VSX, ZTF (Chen et al., 2020) and ASAS-SN Variable Stars Database and found no records for the objects listed in the table. The coordinates were extracted from Gaia DR3 (Gaia Collaboration et al., 2023).

Our observations were carried out at the Maidanak Astronomical Observatory of the Astronomical Institute of the Academy of Sciences of the Republic of Uzbekistan (Ehgamberdiev, 2018) using the 0.5-meter AMT-1 telescope with Mathis Instruments MI-750/1000 equatorial fork mount equipped with an Apogee Alta U16M (2K×2K) 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 180 seconds in the Bessel R filter. The temperature of the camera was set to 15°C. Calibration images as bias, dark and flat were also obtained for each observational date. The photometric dataset was obtained during the time interval from August 26 to September 4, 2021 (JD 2459453.22–2459462.50). During 10 nights 512 frames were taken. All images were processed with master bias, dark, and flat frames using standard IRAF packages. We rejected low-quality images, and the final sample contained 503 images. The VaST (Variability Search Toolkit) software package (Sokolovsky and Lebedev, 2018) was used to search for variable stars. To derive periods, we used the period search tool by Dr. K.V. Sokolovsky who incorporated it in his VaST package.

Acknowledgments: We are grateful to the staff of the Maidanak Astronomical Observatory for their efforts to support observations.

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