

New Variable Stars in the Field of the Open Cluster NGC 7142

[A. F. Punanova](#), [A. A. Popov](#), [V. V. Krushinsky](#), [E. A. Avvakumova](#), [I. S. Zalozhni](#), [A. Y. Burdanov](#)
Kourovka Astronomical Observatory of Ural State University, Yekaterinburg, Russia

Received: 6.06.2011; accepted: 17.11.2011
(E-mail for contact: PunanovaAnna@gmail.com)

#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	type	Sp	Comment	L.Curve	Find.Chart	Data
1		2MASS 21441320+6545013	21 44 13.21, +65 45 01.3	EB	15.72	16.18	V	0.4413	2455231.1738	min	G3	Comm. 1	1043.jpg	1043loc.jpg	1043.txt
2		2MASS 21442843+6546365	21 44 28.44, +65 46 36.6	EW	17.70	18.60	V	0.3303	2455235.5040	min		Comm. 2	1233.jpg	1233loc.jpg	1233.txt
3		2MASS 21445597+6545499	21 44 55.98, +65 45 50.0	SR:	15.51	15.71	V			other		Comm. 3	1153.jpg	1153loc.jpg	1153.txt
4		2MASS 21451515+6549242	21 45 15.16, +65 49 24.3	RR:	15.27	15.37	V	0.2900	2455236.2812	max	F0	Comm. 4	1523.jpg	1523loc.jpg	1523.txt

Comments:

1. R = 15.10 – 15.60; I = 15.05 – 15.46. Min_{II} (V) = 15.93; Min_{II} (I) = 15.30.

2. I = 16.70 – 17.40. Min_{II} (V) = 18.26.

3. R = 14.33 – 14.53; I = 13.75 – 13.86. Possible period exceeds 20 days.

4. R = 14.77 – 14.88; I = 14.83 – 14.95. The star's period, amplitude, spectral type, HR-diagram location in the instability strip suggest the RR type, but it can also be an eclipsing star of the EW type with a period of 0.58 days.

Remarks:

Our observations were performed between February 2 and March 1, 2010 at the Kourovka astronomical observatory with the Hamilton MASTER II telescope of the MASTER Robotic Net (Lipunov et al. 2010).

Astrometric cross-matching and aperture photometry were based on the IRAF package (Tody 1993). For subsequent reductions and differential photometry of 2194 stars in the 30'x30' field of NGC7142, a special C++ console program was developed. The program executes algorithms described by Everett & Howell (2001). Our photometric uncertainties for 11–15 mag stars are within 0.05 mag in all bands. We transformed our instrumental magnitudes to the Johnson–Cousins VRI system using CCD photometry of our field from Crinklaw & Talbert (1991), Magakian et al. (2004) and Hartigan & Lada (1985). Four variable stars were found using robust median statistic (Rose & Hintz 2007).

Differential photometry was performed for all suspected variable stars. For this aim, three comparison stars were used for each variable. The angular distances between variables and their comparison stars were within 30", with magnitude differences less than 0.5 mag. For comparison stars, the rms scatter was from 0.01 to 0.06 mag. The periods were determined using the WinEfk software package developed by Dr. V.P. Goranskij for Windows environment; the Lafler–Kinman method was applied.

This study was financially supported by the State Agency for Science and Innovation of the Ministry of Education and Science of the Russian Federation (state contract No. 02.740.11.0249).

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