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Four New Eclipsing Variable Stars

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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-B1.0 1272-0434094	19 51 46.52, +37 16 16.1	EA	18.50	19.00	R	0.9025	2455421.475	min		Comm. 1	1.jpg	1.gif	v1.txt
2		2MASS 19515054+3719269	19 51 50.55, +37 19 27.0	EA	15.39	16.05	R	2.075	2455412.3697	min		Comm. 2	2.jpg	2.gif	v2.txt
3		USNO-B1.0 1273-0436132	19 51 52.82, +37 18 10.6	EW	18.10	18.65	R	0.30365	2455428.307	min		Comm. 3	3.jpg	3.gif	v3.txt
4		VAR 19515449+3716263	19 51 54.49, +37 16 26.3	EW	16.98	17.58	R	0.29404	2455414.325	min		Comm. 4	4.jpg	4.gif	v4.txt

Comments:

1. A secondary minimum is clearly seen in the average phased light curve (see 1.jpg in the Table). MinII = 18.60.

2. Minima:
2455411.3343 +/- 0.0003 (II);
2455412.3697 +/- 0.0003 (I);
2455414.4448 +/- 0.0004 (I);
2455415.4845 +/- 0.0008 (II).
MinII = 16.05.

3. MinII = 18.60.

4. A very close pair of a faint variable and a brighter neighbouring star (USNO-B1.0 1272-0434523). The two stars could not be measured separately on most of our frames, so the brightness of the blend was measured (top panel of 4.jpg in the Table). A few dozens of the best frames allow us to measure the stars separetely, to find that it is definitely the faint star that varies, to subtract the flux of the brighter neighbour (R = $14^{m}.077$), and to plot the clear phase light curve of the eclipsing variable (bottom panel of 4.jpg in the Table).
MinII = 17.55.

Remarks:

During observations of a poorly studied cataclysmic variable RX J1951.7+3716 (Zubareva & Antipin 2011), we discovered four new eclipsing variable stars in close vicinity of the variable. Our observations were carried out at the 60-cm reflector of the Crimean Laboratory of Sternberg Astronomical Institute equipped with an Apogee AP-47p CCD camera. We monitored the field for fifteen nights on July 30–August 23, 2010 (JD 2455408–2455432). The frames were taken with 120 s exposure times in the Johnson R filter. The CCD observations were reduced in the standard way involving dark-frame and flat-field corrections. To search for new variable stars, we used C-Munipack and VaST (Sokolovsky & Lebedev 2005) software. The aperture photometry package Winfits developed by V.P. Goranskij and MaxIm DL software were applied to measure the stars brightness. USNO-A2.0 1200-13535062 ($\alpha = 19^h51^m50^s.37$, $\delta = +37°17' 20''.3$, J2000, 2MASS; $R = 14^m.0$) was used for comparison. Stability of the comparison star was verified by brightness measurements with respect to several check stars. The coordinates of variable stars were drawn from the 2MASS catalogue (Skrutskie et al. 2006) or were measured by us relative to neighbouring stars from this catalogue.

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References:

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