

Moscow Digital Variables. I

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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 1050-06875858	13 14 34.49, +20 30 25.2	RRAB	15.0	17.1	pg	0.501149	2437052.282	max			1.png	map1.png	1.dat
2		USNO-A2.0 1050-06877767	13 15 04.47, +19 42 53.2	RRC	15.9	16.8	pg	0.315251	2445761.490	max			2.png	map2.png	2.dat
3		GSC 1454-00902, USNO-A2.0 1050-06878780	13 15 19.72, +19 30 24.3	RRAB	14.1	15.3	pg	0.600913	2445758.514	max			3.png	map2.png	3.dat
4		USNO-A2.0 1050-06881173	13 15 55.17, +21 25 21.6	GAL	15.8	17.1	pg			other		Comm. 4	4.png	map4.png	4.dat
5		USNO-A2.0 1050-06890945	13 18 12.50, +17 22 02.5	RRAB	15.5	17.2	pg	0.484674	2441393.548	max		Comm. 5	5.png	map5.png	5.dat
6		GSC 1454-00854, USNO-A2.0 1050-06892904	13 18 41.92, +17 45 24.5	RRAB	14.0	15.6	pg	0.557481	2445408.493	max			6.png	map6.png	6.dat
7	BG Com	USNO-A2.0 1050-06897266	13 19 44.65, +18 18 26.2	RRC	15.5	16.4	pg	0.291706	2439971.416	max		Comm. 7	7.png	map7.png	7.dat
8		ASAS 131954+1954, GSC 1454-00093	13 19 54.55, +19 53 57.0	RRAB	13.3	14.2	pg	0.601167	2440358.366	max		Comm. 8	8.png	map8.png	8.dat
9		USNO-A2.0 1050-06900500	13 20 32.74, +19 09 22.7	RRC	15.6	16.4	pg	0.336356	2440294.495	max			9.png	map9.png	9.dat
10		USNO-A2.0 1050-06903768	13 21 18.43, +18 08 22.3	SXPHE	15.5	16.8	pg	0.0656853	2437050.3068	max			10.png	map10.png	10.dat
11		USNO-A2.0 1050-06906739	13 22 00.08, +18 27 09.1	RRAB	15.5	17.2	pg	0.491717	2440742.325	max			11.png	map11.png	11.dat
12		GSC 1458-00933, USNO-A2.0 1050-06916184	13 24 12.75, +17 02 18.1	EW	15.4	16.4	pg	0.258127	2437074.525	min			12.png	map12.png	12.dat
13		GSC 1461-00453, USNO-A2.0 1050-06918694	13 24 48.58, +17 41 10.4	EW	15.2	16.2	pg	0.400234	2439971.516	min			13.png	map13.png	13.dat
14		USNO-A2.0 1050-06926703	13 26 46.20, +21 00 57.8	GAL:	16.2	17.6	pg			other		Comm. 14	14.png	map14.png	14.dat
15	BK Com	GSC 1464-00992, USNO-A2.0 1050-06932290	13 28 09.83, +20 13 33.7	RRAB	13.8	15.1	pg	0.825465	2441392.513	max		Comm. 15	15.png	map15.png	15.dat
16		GSC 1461-00818, USNO-A2.0 1050-06932328	13 28 10.41, +19 38 16.6	LB	14.6	15.4	pg			other			16.png	map16.png	16.dat
17		USNO-A2.0 1050-06936452	13 29 09.34, +18 00 17.5	RRAB	16.0	17.6	pg	0.720507	2444040.335	max			17.png	map17.png	17.dat
18		USNO-A2.0 1050-06949115	13 32 04.62, +18 31 03.3	RRAB	15.5	16.5	pg	0.590303	2440360.371	max			18.png	map18.png	18.dat

Comments:

4. USNO A2.0 1050-06881173 = RXS J13159+2125 was first identified as an AGN by Bade et al. (1998). According to Veron-Cetty & Veron (2006), it is a 17.0(V) mag. Seyfert 1 galaxy at z=0.088. It is

listed as a faint radio source (1.25 mJy at 20 cm) in the FIRST catalog (White et al., 1998). SDSS photometry obtained on 2005 March 10, 09:40 UT is available: $u=17.25$, $g=16.92$, $r=16.43$, $i=15.81$, $z=15.68$. The object is clearly identified as a galaxy on SDSS images.

5. The light curve of USNO A2.0 1050-06890945 (183 estimates, JD2437047 - 2447647) permits us to consider the new variable as an RR Lyrae type star with some peculiarities. The scatter on the phased light curve is fairly large in maximum (close to phase 0.0), suggesting modulation, like multimodality or Blazhko effect. CCD observations are needed.

7. The variability of BG Com was discovered by Hoffmeister (1964). Meinunger and Wenzel (1968) report the period of 0.305352d for the star, which is inconsistent with our data (175 estimates, JD2437047 - 2447655). Our analysis leads to a period of 0.291706d.

8. ASAS 131954+1954 was first identified as an RR Lyrae variable by the All Sky Automated Survey (Pojmanski et al., 2005). Automatic analysis of the ASAS data gave the period of 0.374985d, but our data suggest $P = 0.601167$ d instead.

14. USNO-A2.0 1050-06926703 = IRXS J132645.8+210102. Its light curve is similar to those of the Seyfert galaxies RXS J13159+2125 (this paper) and FBQS J161047.7+330337 (Sokolovsky, 2006) obtained from plates of the same telescope, except that here the light variations take place on a longer time scale - of decades rather than of years. No sign of an underlying galaxy is visible on SDSS images, the object is classified as "STAR". The SDSS photometry obtained on 2005 March 10, 09:50 UT is: $u=16.85$, $g=16.54$, $r=16.53$, $i=16.65$, $z=16.59$. Spectroscopic observations are required to reveal the true nature of this object, which can also be an X-ray variable star of unrevealed nature.

15. The variability of BK Com was discovered by Hoffmeister (1964). Meinunger and Wenzel (1968) report the period of 0.45219d, which, as in the case of BG Com, is inconsistent with our data (164 estimates, JD2437072 - 2447655). Our analysis suggest a period of 0.825465d.

Remarks:

We present the results of one of our pilot projects of variable-star search using scanned photographic plates. A four-by-four-degree region in Coma Berenices was studied. 247 photographic plates of the field were taken with the 40-cm astrograph in Crimea, they cover 29 years between 1960 and 1989. The plates were scanned by one of the authors (A. Manannikov) at 2400 dpi resolution with the Sternberg Institute's CREO EverSmart Supreme II flatbed scanner. 16 bit-per-channel TIFF images produced by the scanner were converted to FITS format commonly used in astronomical applications by means of custom software developed by A. Lebedev & K. Sokolovsky (available online at [ftp://scan.sai.msu.ru/pub/software/tiff2fits/](http://scan.sai.msu.ru/pub/software/tiff2fits/)). Further analysis was done in VAST software (Sokolovsky, Lebedev, 2005) which is based on the well-known SExtractor by (Bertin, 2006). A total of 35 variable objects were detected by VAST. Among them, there are 12 known RR Lyrae variables in the globular clusters NGC 5053 and M53, which are not considered here, 8 known variables in the field, and 15 previously unreported variable stars. For 5 stars (BL Com, BN Com, RS Com, RT Com and RV Com), our results are fully consistent with those previously published, and we do not discuss these stars in the present note. Our conclusions about periods of ASAS 131954+1954, BG Com and BK Com significantly differ from those in their earlier studies (see Remarks). Among the newly discovered variables, there are 9 RR Lyrae stars, 2 eclipsing binaries of the W Ursae Majoris type, one high-amplitude SX Phoenicis star, one non-periodic red variable, an optically variable Seyfert 1 galaxy, and a variable X-ray object of unclear nature (probably a Seyfert galaxy or a QSO). All magnitudes in this work were calibrated using photographic blue magnitudes of neighboring USNO-A2.0 stars (Monet et al., 1998). Time series analysis was done with WinEffect software, developed by V. Goranskij.

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