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MULTICOLOUR CCD PHOTOMETRY OF THREE RRab STARS

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The fifth set of CCD light curves of monophasic fundamental mode RR Lyrae stars based on the observations of the 60 cm automatic telescope of Konkoly Observatory, Svábhegy, Budapest is published. The equipment and data reduction procedure were the same as described in Jurcsik et al. (2008).

Observations of CN Lyr, CG Peg and FH Vul are presented here. Photometric data on these three variables were published previously by Oosterhoff (1960), Sturch (1966), Stepien (1972), Penston (1973), Schmidt & Reiswig (1993), and Castellani et al. (1998). The light curve of FH Vul was considered as a stable one and was used as a calibrator object for deriving the $[Fe/H]$ –Fourier parameter relation by Jurcsik & Kovács (1996). Though no indication of light curve variation of any of these variables was evident, small amplitude Blazhko-modulation (e.g. found in Jurcsik et al. 2005, 2006) could not be excluded from the earlier observations.

Based on the accuracy and time coverage of our data we conclude that the light curves of these 3 stars are stable, indeed. There is no apparent light curve modulation with amplitude larger than 0.01 – 0.02 mag in the maximum brightness of any of the stars.

Table 1. Log of observations

Star	Comparison			V [mag] *	Observation period		No. of	
	GSC 2.3.2	RA(2000)	DEC(2000)		JD 2400000 +	nights	$B/V/I_C$	data
CN Lyr	N24S000237	18 41 42.87	+28 44 57.1	11.90	54642 – 54701	8	267 / 271 / 242	
CG Peg	N2MC000574	24 41 01.91	+24 44 16.6	13.16	54656 – 54751	11	333 / 292 / 295	
FH Vul	N2P8000417	20 40 29.43	+22 12 24.3	12.82	54633 – 54741	8	218 / 234 / 227	

* V magnitudes of the comparison stars are from GSC 2.3.2

The photometric data are available electronically from the IBVS website (5859-t5.txt – 5859-t16.txt). The tables list the relative BVI_C magnitude and relative $B - V$, $V - I_C$ colour time series with respect to the comparison stars listed in Table 1. The brightnesses of the comparison stars remained constant during the observations. The *r.m.s.* scatter of their relative magnitudes measured to several check stars are between 0.005 and 0.015 mag.

For comparison, the *r.m.s.* scatter of the Fourier fits to the B , V , I_C light curves of CN Lyr, CG Peg, and FH Vul are 0.007/0.006/0.005, 0.010/0.007/0.006, and 0.016/0.009/0.009 mag, respectively.

The V light curves and the colour curves of the three stars are plotted in Figs. 1 – 3.

Normal maximum timings and Fourier parameters of the V light curves of CN Lyr, CG Peg, and FH Vul are listed in Table 2, and Table 3, respectively. Table 4 compares the photometric metallicities calculated from the V light curves of the variables according to Eq. 3 of Jurcsik & Kovács (1996) to the results of spectroscopic metallicity measurements.

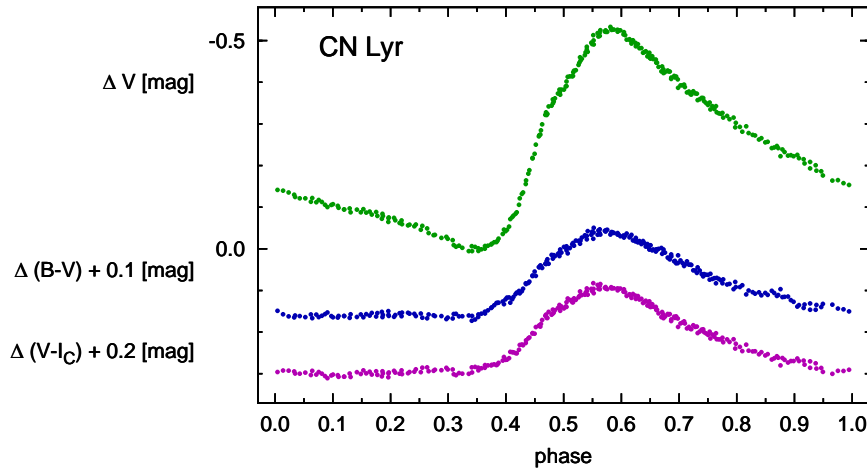


Figure 1. Differential V , $B - V$ and $V - I_C$ light and colour curves of CN Lyr.

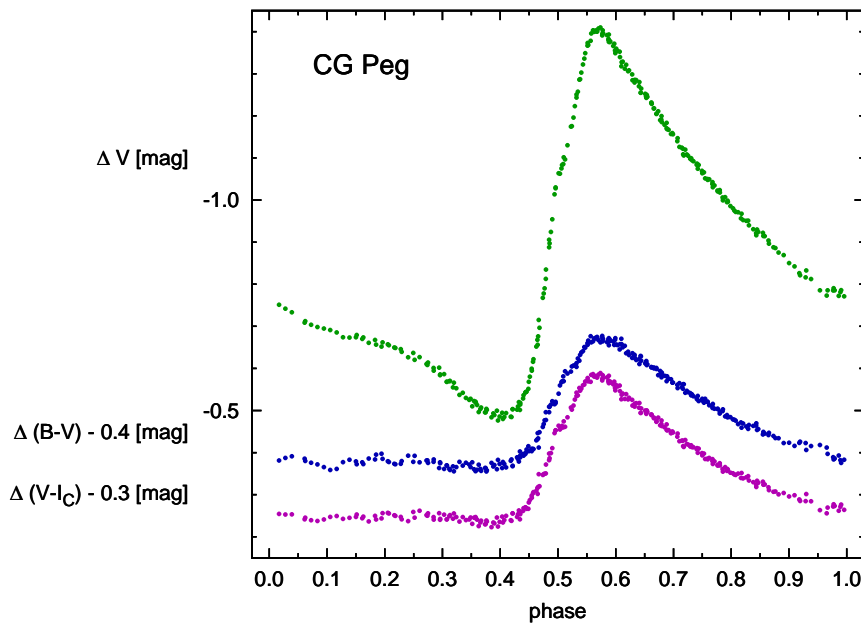


Figure 2. Differential V , $B - V$ and $V - I_C$ light and colour curves of CG Peg.

Table 2. Normal maximum timings of the V light curves.

Star	$T_{\max} - 2400000$ [HJD]	Star	$T_{\max} - 2400000$ [HJD]
CN Lyr	54671.3549	FH Vul	54640.5113
CG Peg	54703.8288	FH Vul	54717.5400

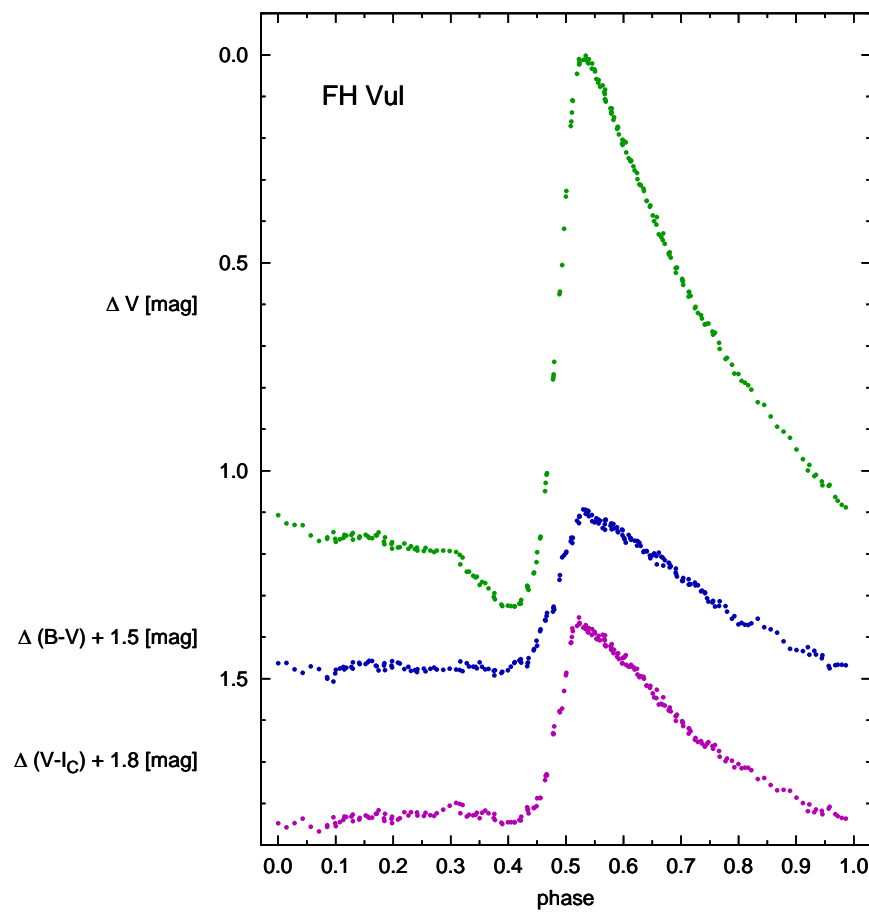
**Figure 3.** Differential V , $B - V$ and $V - I_C$ light and colour curves of FH Vul.

Table 3. Fourier parameters of the V light curves.

Star	P [d]	A_1 [mag]	R_{21}	R_{31}	R_{41}	R_{51}	ϕ_{21}^* [rad]	ϕ_{31}^* [rad]	ϕ_{41}^* [rad]	ϕ_{51}^* [rad]
CN Lyr	0.41138232**	0.205	0.439	0.224	0.073	0.024	2.616	5.523	2.274	5.679
CG Peg	0.46713820**	0.312	0.542	0.327	0.186	0.099	2.574	5.435	2.035	4.742
FH Vul	0.405413(4)	0.440	0.516	0.373	0.239	0.170	2.256	4.930	1.227	3.927

* Phase differences are given according to sine term decomposition.

** GCVS period.

Table 4. Spectroscopic and photometric $[\text{Fe}/\text{H}]$ values.

Star	$[\text{Fe}/\text{H}]_{\text{phot}}$	$[\text{Fe}/\text{H}]_{\text{spect}}^a$	ref.
CN Lyr	+0.17	-0.05	Layden (1994)
CG Peg	-0.25	-0.26	Layden (1994)
FH Vul	-0.59	-0.61	Layden (1994)

a: Spectroscopic metallicities are transformed to the $[\text{Fe}/\text{H}]$ scale

used for the photometric metallicities according to Eq. 3 and Eq. 2 of Jurcsik (1995) and Jurcsik & Kovács (1996), respectively.

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ERRATUM FOR IBVS 5793

In IBVS 5793 Table 3 the 2nd line on the maximum timings of BK Cas gives erroneous T_{max} value. This line should correctly be: “BK Cas **54321.1434** normal”.