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EIGHT NEW RR LYRAE STARS IN THE NORTH GALACTIC CAP

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In the course of photometric studies of field blue horizontal branch stars (Kinman, Suntzeff and Kraft, 1994 and later unpublished studies), it has been found that several of the candidates are RR Lyrae variables. This paper gives Johnson BV photometry for eight of these stars. Two of them have been identified as RR Lyrae variables in the ROTSE1 catalogue (Akerlof, 2000) and this classification is confirmed. Identifications are given in Table 1 where the coordinates are taken from the USNO A2.0 Star List (http://ftp.nofs.navy.mil/data/fchpix).

Table 1. Identifications and positions for the variables

Identification	R.A.	Dec.	Other ID
	J 2000		
NSV 5476[a]	$12^h09^m17^s.0$	$+33°39'36''$	Case A-F 020[b]
Case A-F 791[c]	$12^h47^m16^s.3$	$+35°12'06''$	ROTSE1 J124716.30+351206.2[d]
Case A-F 155[b]	$12^h53^m51^s.2$	$+32°09'56''$	
Case A-F 163[b]	$12^h54^m47^s.4$	$+31°16'45''$	KSK94 SA57 013[e]
KSK94 SA57 019[e]	$12^h56^m51^s.2$	$+28°10'35''$	GSC 1995 01702[f]
KSK94 SA57 047[e]	$13^h05^m14^s.5$	$+28°37'14''$	GSC 1995 00782[f]
KSK94 SA57 060[e]	$13^h09^m29^s.7$	$+27°01'00''$	GSC 1996 01661[f]
Case A-F 882[c]	$13^h17^m03^s.5$	$+36°06'58''$	ROTSE1 J131703.38+360656.3[d]

[a] New Catalogue of Suspected Variables, Kholopov (1982).
Suspected variable 1 (Table 8) in Kinman et al., (1966)
[b] Case A-F star (Sanduleak, 1988).
[c] Case A-F star (MacConnell et al., 1993).
[d] ROTSE1 Catalogue (Akerlof, 2000).
[e] Kinman et al., 1994.
[f] Space Telescope Guide Sar Catalogue (Lasker et al. 1990).

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The V and $B-V$ for these variables are given in Table 2 (file 5311-t2.txt at the IBVS web site). The sources for these data (listed in the first column of Table 2) are:

(a) photoelectric observations made with the Mk III photometer operated on the Kitt Peak 1.3-m telescope (with chopping secondary) between 1989 and 1995. Observational details may be found in Sec. 3.1 of Kinman, Suntzeff and Kraft (1994).

(b) CCD observations made with CCDPHOT on the Kitt Peak 0.9-m telescope between 1995 and 1999. Observational details may be found in Sec 2 of Kinman (1998).

(c) photoelectric observations made with the 42-inch John S. Hall telescope of the Lowell Observatory, Arizona during May 2002. The Kron aperture photometer was used with a $24''$ diameter aperture and the detector was a thermo-electrically cooled EMI 6256 photomultiplier. Standard stars (Landolt, 1992) were observed each night so that the magnitudes are on the Johnson system.

Periods were determined both with a phase dispersion minimization program (Lafler & Kinman 1965) and a periodogram program (Horne & Baliunas 1986). The periods found for Case A-F 791 and Case A-F 882 agree with those given in the ROTSE1 Catalogue (Akerlof, 2000). Several of these variables have quite low amplitudes and would not have been easily detected by blinking photographic plates. Table 3 gives the ephemerides and a summary of the photometric data and the V light curves are given in Fig. 1. The scatter in the light curves of NSV 5476 and Case A-F 155 suggests that secondary periods may be present.

Table 3. Ephemerides and Photometric Data for Variables

ID	Period (days)	HJD Max +2400000.	V_{max} B_{max}	V_{min} B_{min}	M-m† n_{obs}‡	RR type
NSV 5476	0.3266873	49043.590	14.82	15.20	0.47	RR*c*
			14.96	15.47	41	
Case A-F 791	0.6184320	50528.277	14.18	15.15	0.13	RR*ab*
			14.32	15.57	42	
Case A-F 155	0.2979233	48722.690	14.75	15.30	0.35	RR*c*
			14.83	15.55	58	
Case A-F 163	0.2953118	47654.582	14.46	15.02	0.40	RR*c*
			14.59	15.29	52	
KSK94 SA57 019	0.2581435	47654.668	14.37	14.79	0.45	RR*c*
			14.49	15.02	41	
KSK94 SA57 047	0.6485456	47295.604	14.25	14.58	0.28	RR*ab*
			14.58	15.01	40	
KSK94 SA57 060	0.6224220	47295.705	14.01	14.36	0.20	RR*ab*
			14.34	14.81	35	
Case A-F 882	0.6773250	50532.856	14.00	15.03	0.17	RR*ab*
			14.10	15.46	19	

† Light curve asymmetry. ‡ No. of observations in B and V (the same in both colors)

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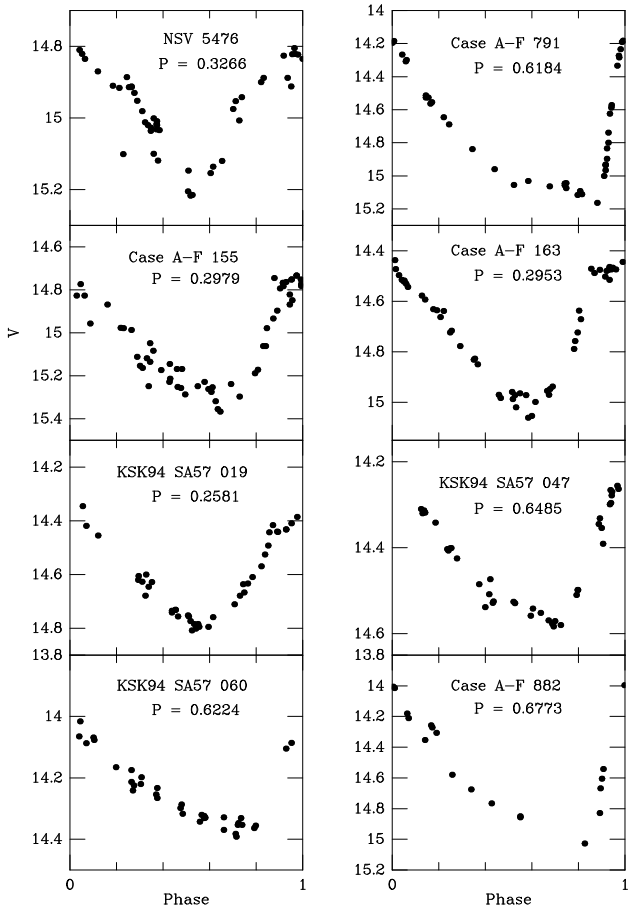

Figure 1. Light curves of variables (ordinate V magnitude)