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ELEMENTS FOR 5 VARIABLE STARS

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The discovery of the variability of these stars has been reported by Hoffmeister (1968), Morgenroth (1934, 1935) and Ross (1927) a long while ago; nevertheless there were no ephemerides published until today. Photographic plates of a field around κ Oph, taken with the Sonneberg Observatory 40cm Astrograph during the years 1964-1994, were used to determine the type of variability as well as first elements (see Table 1). The elements listed below were obtained by means of least-squares solutions. Photographic amplitudes were derived with respect to magnitudes of the comparison stars given in Table 3. Individual data are available upon request.

Remarks:

NSV 8001

This star is known to be an infrared source (IRAS 16490 +0823). The variability was also confirmed by the ROTSE experiment (ROTSE1 J 165124.98 + 081853.8; Akerlof et al., 2000) but no period could be derived. The shape of the light curve varies.

NSV 8184

Obviously the period varies. Elements given below are at least valid for an interval of JD 2442900-2449500. Unfortunately there were not enough older plates available to determine date of the period change as well as the value of the period acting in the time before the interval mentioned above.

This research made use of the SIMBAD data base, operated by the CDS at Strasbourg, France.

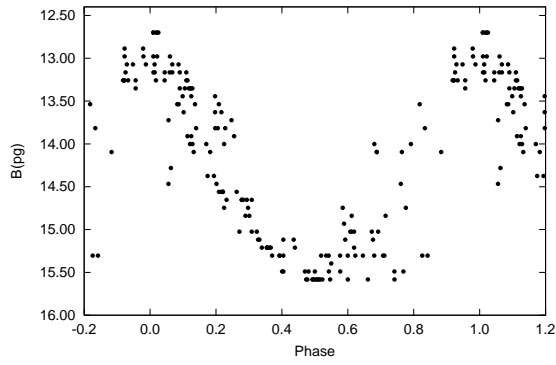


Figure 1. Light curve of NSV 8001

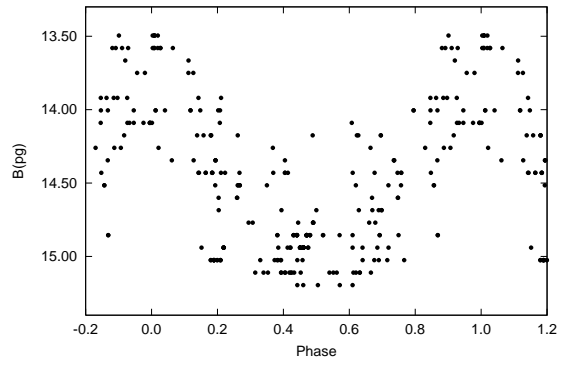


Figure 2. Light curve of NSV 8095

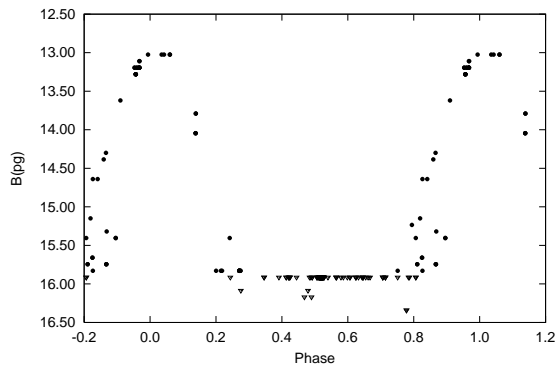


Figure 3. Light curve of NSV 8097. Triangles denote observations fainter than 15^m9

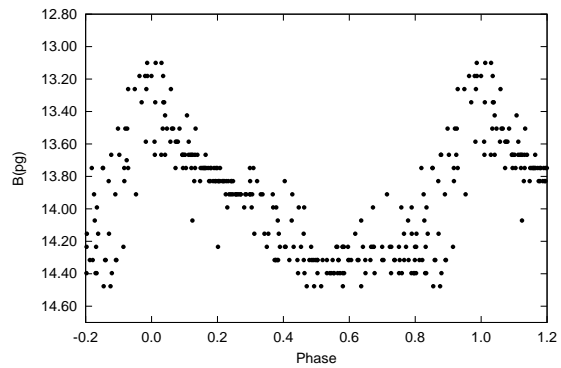


Figure 4. Light curve of NSV 8132

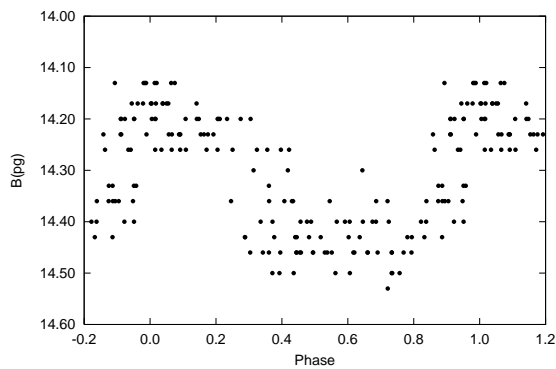


Figure 5. Light curve of NSV 8184 (JD 2442924-2449488)

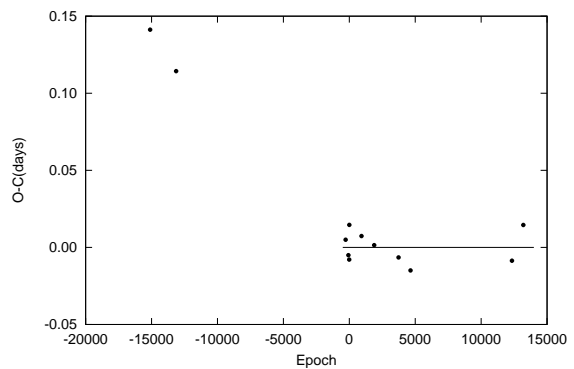


Figure 6. ($O - C$) diagram for NSV 8184

Table 1. Summary of this paper

Star	Type	Epoch 2400000+	Period (day)	Max.	Min.	M–m	No. of Plates
NSV 8001	M	42935.0 ±4.2	260.98 ±.36	12 ^m 9	15 ^m 6	0 ^p 30	164
NSV 8095	SRa	44024.5 ±2.2	101.21 ±.07	13 ^m 6	15 ^m 1		249
NSV 8097	M	45065.7 ±9.8	279.22 ±.72	13 ^m 0	>15 ^m 9		152
NSV 8132	RRab	44704.498 ±7	0.50480515 ±.72	13 ^m 2	14 ^m 4	0 ^p 17	249
NSV 8184	RRc	44374.383 ±4	0.38749054 ±.71	14 ^m 1	14 ^m 5		146 (217 total)

Table 2. Individual maxima and $O - C$ values according to the elements derived in this paper

Star	JD (max.)*	Epoch	$O - C$	Star	JD (max.)*	Epoch	$O - C$
NSV 8001	38495	-17	-3.3	NSV 8132	39284.422	-10737	0.017
	39286	-14	4.7		39287.453	-10731	0.019
	39537	-13	-5.2		39288.461	-10729	0.018
	42953	0	18.0		39293.497	-10719	0.006
	44757	7	-4.9		39615.549	-10081	-0.008
	45003	8	-19.8		44704.491	0	-0.007
	45810	11	4.2		44749.419	89	-0.006
NSV 8095	46595	14	6.3	45441.498	1460	-0.015	
	39266	-47	-1.6	45854.459	2278	0.015	
	44024	0	-0.5	46173.487	2910	0.006	
	45441	14	-0.4	NSV 8184	38521.480	-15105	0.141
	45854	18	7.7		39284.422	-13136	0.114
	47770	37	0.7		44266.666	-278	0.005
	48067	40	-5.9		44346.479	-72	-0.005
NSV 8097	38642	-23	-1.7	44372.438	-5	-0.008	
	45077	0	11.3	44374.398	0	0.015	
	46173	4	-9.6	44732.432	924	0.007	
NSV 8132	38553.465	-12185	0.018	45104.417	1884	0.001	
	38555.466	-12181	0.000	45822.429	3737	-0.007	
	38556.466	-12179	-0.010	46173.487	4643	-0.015	
	38557.467	-12177	-0.018	49154.458	12336	-0.009	
	38882.544	-11533	-0.036	49488.498	13198	0.015	

* Heliocentric times for the RR Lyr variables

References:

- Akerlof, C. et al., 2000, *Astron. Journal*, **119**, 1901
Hoffmeister, C., 1968, *Astron. Nachr.*, **290**, 277
Morgenroth, O., 1934, *Astron. Nachr.*, **252**, 389
Morgenroth, O., 1935, *Astron. Nachr.*, **254**, 369
Ross, F. E., 1927, *Astron. Journal*, **37**, 155

Table 3. Comparison stars and cross references

	NSV 8001		NSV 8095	
	ROSS 208		ROSS 210	
	GSC 975.1093		GSC 976.1649	
Comp. No.	GSC	m*	GSC	m*
1	975.0578	12 ^m 7	976.0814	12 ^m 9
2	975.0289	13 ^m 3	976.1546	13 ^m 9
3	975.0695	13 ^m 3	976.1023	14 ^m 0
4	975.0209	14 ^m 8	976.1645	14 ^m 8
5	975.0700	15 ^m 3	976.1234	15 ^m 2
	NSV 8097		NSV 8132	
	67.1934		487.1934	
	GSC 393.1531		GSC 976.1682	
Comp. No.	GSC/USNO	m*	GSC	m*
1	406.3241	12 ^m 7	976.0868	13 ^m 2
2	393.1517	13 ^m 5	976.1285	14 ^m 3
3	393.1891	13 ^m 6	976.0436	14 ^m 4
4	393.1293	14 ^m 6		
5	393.1281	14 ^m 9		
6	0900-09185651	16 ^m 3		
	NSV 8184			
	S 10327			
	GSC 410.1238			
Comp. No.	GSC	m*		
1	410.1498	14 ^m 0		
2	410.0316	14 ^m 5		

* Magnitudes refer to the B values of the USNO–A2.0 catalogue