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ELEMENTS FOR 5 RR LYRAE STARS IN OPHIUCHUS

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The variability of these stars was announced by Hoffmeister (1967); no further observations or ephemeris were published until today. Recent estimations, made on photographic plates taken with the Sonneberg Observatory 40cm Astrograph during the years 1964-1994, have allowed to determine the type of variability as well as first elements (see Table 1). The given elements 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.

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

Table 1. Summary of this paper

Star	Type	Epoch 2400000+	Period (day)	Max.	Min.	M–m	No. of Plates
V1053 Oph	RRab	44024.427 ±6	0.5783325 ±7	14 ^m 7	15 ^m 5	0 ^p 15	206
V1056 Oph	RRab	44024.444 ±12	0.5927557 ±15	15 ^m 2	16 ^m 4	0 ^p 13	182
V1059 Oph	RRab	44372.334 ±9	0.6872508 ±10	14 ^m 2	15 ^m 5	0 ^p 16	222
V1060 Oph	RRab	44370.391 ±4	0.4403777 ±3	15 ^m 1	16 ^m 1	0 ^p 13	194
V1061 Oph	RRab	44376.398 ±13	0.5893621 ±13	15 ^m 0	16 ^m 4	0 ^p 13	215

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

Star	HJD (max.)	Epoch	$O - C$	Star	HJD (max.)	Epoch	$O - C$	
V1053 Oph	38502.523	-9548	0.014	V1059 Oph	44376.427	6	-0.031	
	38528.508	-9503	-0.026		44732.466	524	0.012	
	38531.424	-9498	-0.001		45822.442	2110	0.009	
	38557.467	-9453	0.017		46644.382	3306	-0.003	
	38579.425	-9415	-0.002		49098.546	6877	-0.012	
	38583.446	-9408	-0.029		49193.416	7015	0.018	
	38937.420	-8796	0.005		V1060 Oph	38530.538	-13261	-0.004
	39299.462	-8170	0.011			38531.424	-13259	0.001
	44024.435	0	0.008			38549.468	-13218	-0.011
	45055.617	1783	0.023			38579.425	-13150	0.001
	46641.392	4525	0.010			39299.462	-11515	0.020
	47262.496	5599	-0.015			39918.613	-10109	0.000
	49488.498	9448	-0.014			44370.400	0	0.009
	V1056 Oph	38557.467	-9223		0.008	44373.467	7	-0.007
38883.487		-8673	0.013	45055.617	1556	-0.002		
38937.420		-8582	0.005	45056.500	1558	0.000		
39618.468		-7433	-0.023	45082.472	1617	-0.010		
44024.414		0	-0.030	45854.459	3370	-0.005		
44749.419		1223	0.035	49193.416	10952	0.008		
45082.497		1785	-0.016	V1061 Oph	37112.470	-12325	-0.040	
46612.425		4366	0.009		38530.538	-9919	0.023	
V1059 Oph	38533.459	-8496	0.007		38533.459	-9914	-0.003	
	38555.466	-8464	0.022	38579.425	-9836	-0.007		
	38882.544	-7988	-0.031	39288.461	-8633	0.026		
	38902.485	-7959	-0.020	44373.482	-5	0.031		
	39238.572	-7470	0.001	44376.400	0	0.002		
	39917.607	-6482	0.032	44749.455	633	-0.009		
	44343.463	-42	-0.007	45053.591	1149	0.016		
	44365.436	-10	-0.026	45056.537	1154	0.015		
	44372.369	0	0.035	45854.475	2508	-0.043		
	44374.390	3	-0.006	46612.425	3794	-0.013		

Table 3. Comparison stars and cross references

		V1053 Oph		V1056 Oph	
		S 9622		S 9623	
		GSC 397.2567		USNO 0900-09177312	
Comp. No.	GSC	m*	GSC	m*	
1	397.2315	14 ^m 3	397.0078	14 ^m 5	
2	397.2376	15 ^m 1	397.2414	16 ^m 0	
3	397.2340	15 ^m 5	397.0116	16 ^m 3	
4	397.2565	15 ^m 7			

		V1059 Oph		V1060 Oph	
		S 9628		S 9629	
		USNO 0975-08854021		USNO 0975-08929161	
Comp. No.	GSC/USNO	m*	GSC/USNO	m*	
1	977.1260	13 ^m 7	977.1000	14 ^m 5	
2	977.1420	14 ^m 4	0975-08924076	15 ^m 4	
3	0975-08854635	15 ^m 1	0975-08926346	16 ^m 3	
4	0975-08854985	15 ^m 9			

		V1061 Oph	
		S 9630	
		USNO 0975-08968969	
Comp. No.	GSC/USNO	m*	
1	982.1367	14 ^m 8	
2	982.1923	14 ^m 9	
3	0975-08970180	16 ^m 1	

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

Reference:

Hoffmeister, C., 1967, *Astron. Nachr.*, **289**, 205

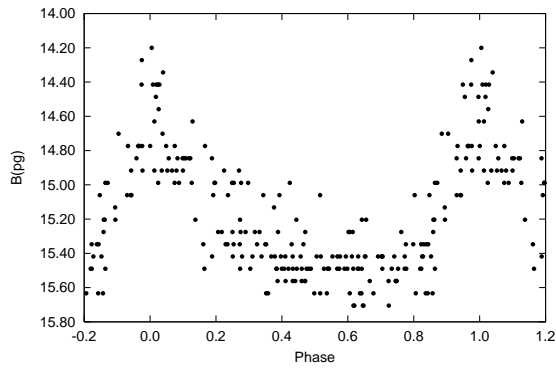


Figure 1. Light curve of V1053 Oph

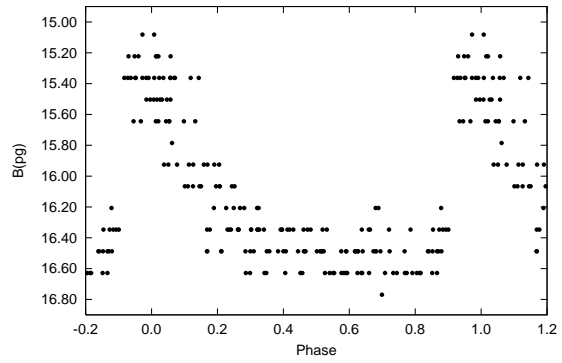


Figure 2. Light curve of V1056 Oph

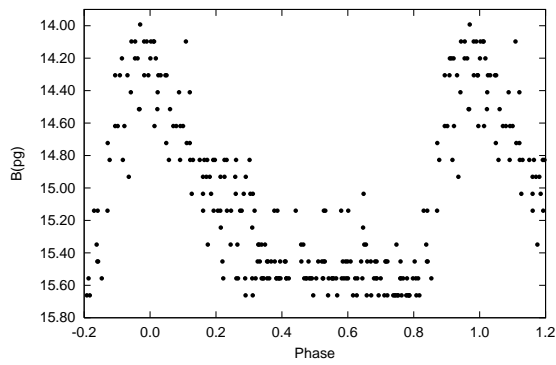


Figure 3. Light curve of V1059 Oph

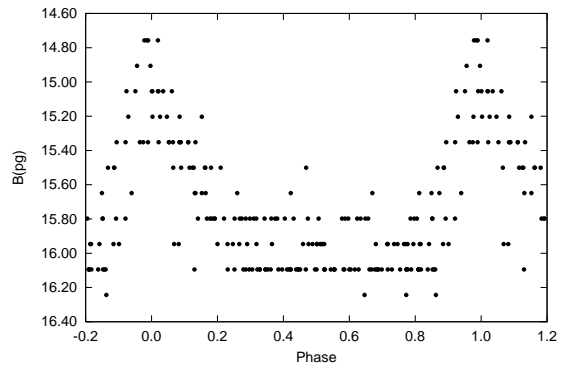


Figure 4. Light curve of V1060 Oph

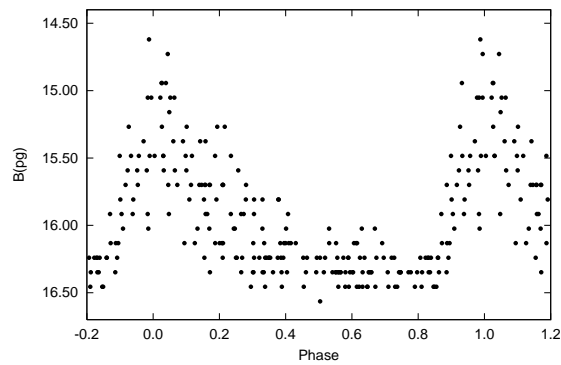


Figure 5. Light curve of V1061 Oph