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ELEMENTS FOR 10 RR LYRAE STARS

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These stars were discovered and reported to be of RR Lyrae type by Boyce & Huruhata (1942), and Morgenroth (1934). Except for V864 Oph and V2312 Oph (see details noted in the remarks below), neither further observations nor ephemeris have been published until today. Photographic plates of a field centered at alpha Oph, taken with the Sonneberg Observatory 40-cm Astrographs during three intervals spread over the years from 1964 to 1994, were used to investigate the behaviour of these objects (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 2. An extensive list holding the times of maxima derived can be retrieved as `5811-t3.txt`, using the link in the HTML version of this paper. Individual data are available upon request.

Remarks:

V864 Oph

First elements were derived from Northern Sky Variability Survey data (NSVS 13682138, Max (hel) = J.D. 2451373.78 + 0^d50969) by Wils et al. (2006). The initial epoch given in this paper was used for our period analysis.

V2312 Oph

First elements derived by Garrigos Sanchez (1996) could be established and refined. In addition to our observations, the CCD recorded maximum timing (J.D. hel. 2450241.467) published in his paper was included in this period analysis.

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

References:

Boyce, E.H., Huruhata, M., 1942, *Harvard Annals*, **109**, 19

Garrigos Sanchez, A., 1996, *IAU Inform. Bull. Var. Stars*, **4356**

Morgenroth, O., 1934, *Astron. Nachr.*, **252**, 389

Wils, P., Lloyd, C., Bernhard, K., 2006, *Mon. Not. R. Astron. Soc.*, **368**, 1757

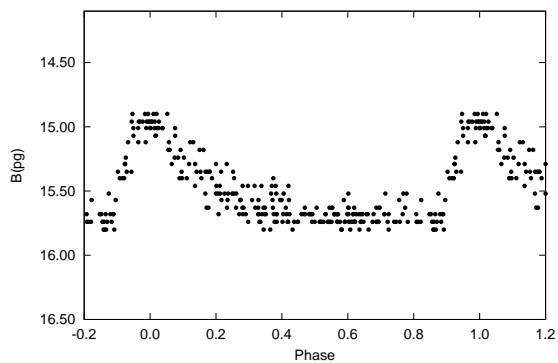


Figure 1. Light curve of V781 Oph

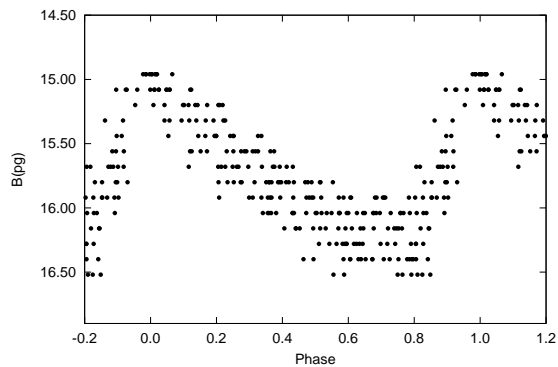


Figure 2. Light curve of V787 Oph

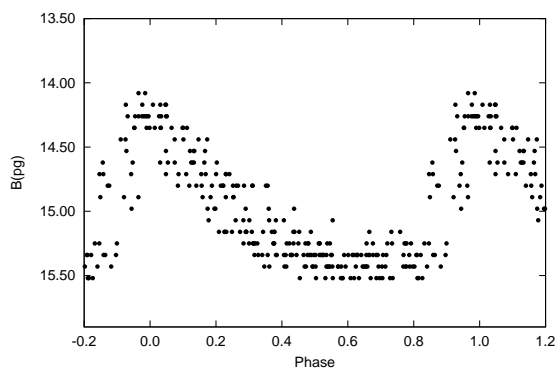


Figure 3. Light curve of V793 Oph

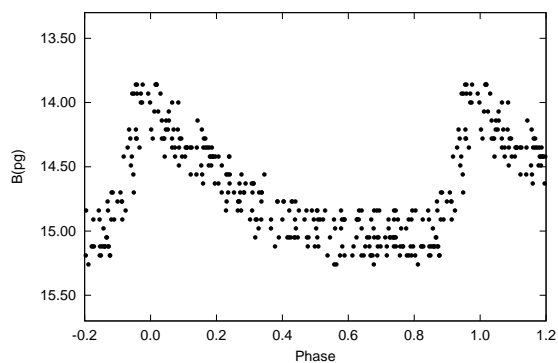


Figure 4. Light curve of V801 Oph

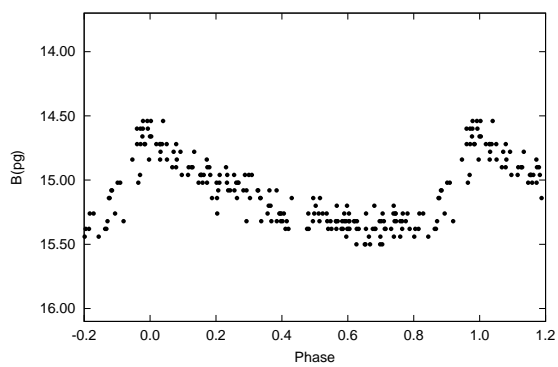


Figure 5. Light curve of V808 Oph

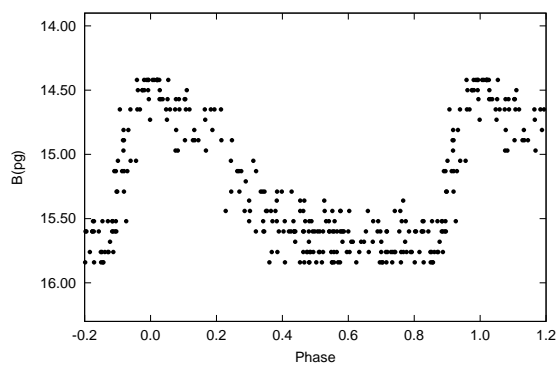


Figure 6. Light curve of V813 Oph

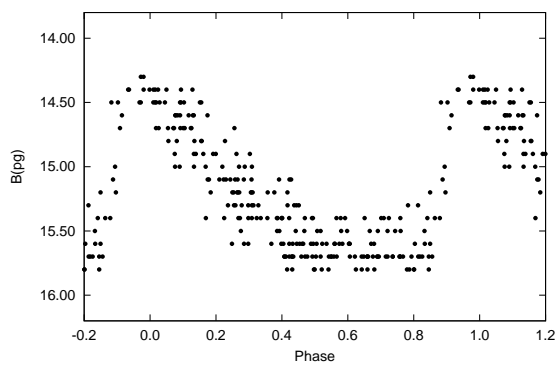


Figure 7. Light curve of V826 Oph

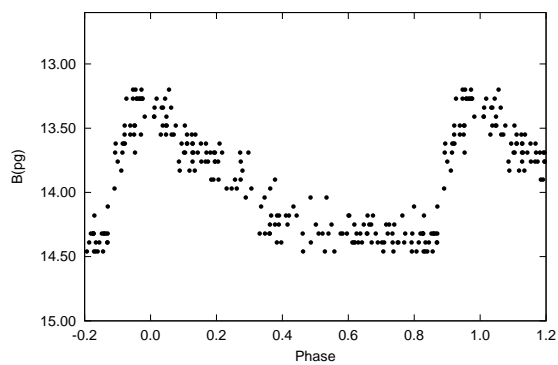


Figure 8. Light curve of V864 Oph

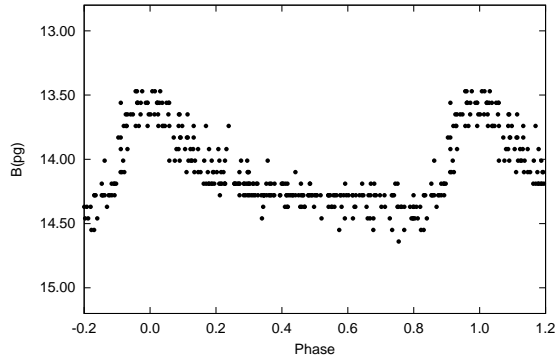


Figure 9. Light curve of V2312 Oph

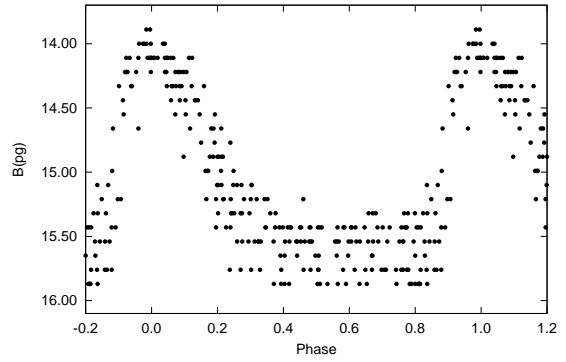


Figure 10. Light curve of NSV 9004

Table 1. Summary of this paper

Star	Type	Epoch 2400000+	Period (day)	Max.	Min.	$M - m$	No. of Plates
V781 Oph	RRab	49488.525 ± 7	0.6051615 ± 7	15 ^m 0	15 ^m 7	0 ^p 15	261
V787 Oph	RRab	49098.518 ± 13	0.5703201 ± 10	15 ^m 1	16 ^m 3	0 ^p 25	258
V793 Oph	RRab	49154.488 ± 8	0.5508803 ± 6	14 ^m 2	15 ^m 3	0 ^p 21	266
V801 Oph	RRab	49154.470 ± 7	0.4396193 ± 6	14 ^m 0	15 ^m 0	0 ^p 18	279
V808 Oph	RRab	49098.524 ± 14	0.5674352 ± 25	14 ^m 6	15 ^m 3	0 ^p 20	190
V813 Oph	RRab	49214.384 ± 6	0.4825801 ± 5	14 ^m 5	15 ^m 8	0 ^p 23	255
V826 Oph	RRab	49154.470 ± 11	0.4987588 ± 8	14 ^m 4	15 ^m 6	0 ^p 22	243
V864 Oph	RRab	51373.785 ± 11	0.5096870 ± 9	13 ^m 3	14 ^m 4	0 ^p 20	192
V2312 Oph	RRab	50241.467 ± 10	0.6965889 ± 9	13 ^m 6	14 ^m 4	0 ^p 22	290
NSV 9004	RRab	49482.488 ± 8	0.4752510 ± 6	14 ^m 1	15 ^m 7	0 ^p 20	256

Table 2. Comparison stars and cross references

		V781 Oph HV 10981 USNO 0975-09383928		V787 Oph HV 10988 USNO 0975-09419570	
Comp. No.	USNO	m^*	USNO	m^*	
1	0975-09384928	15 ^m 1	0975-09421686	14 ^m 5	
2	0975-09382102	15 ^m 5	0975-09415442	15 ^m 5	
3	0975-09385167	15 ^m 9	0975-09418617	15 ^m 8	
4			0975-09419077	16 ^m 7	
		V793 Oph HV 10995 USNO 0975-09461015		V801 Oph HV 11004 USNO 0975-09485291	
Comp. No.	USNO	m^*	USNO	m^*	
1	0975-09461268	14 ^m 0	0975-09489563	14 ^m 1	
2	0975-09461784	14 ^m 2	0975-09484358	14 ^m 5	
3	0975-09463250	15 ^m 0	0975-09486724	14 ^m 8	
4	0975-09461116	15 ^m 6	0975-09484926	15 ^m 4	
		V808 Oph HV 11010 USNO 0975-09525734		V813 Oph HV 11022 USNO 0975-09563863	
Comp. No.	USNO	m^*	USNO	m^*	
1	0975-09527020	14 ^m 3	0975-09565058	14 ^m 1	
2	0975-09519973	14 ^m 8	0975-09555186	14 ^m 8	
3	0975-09520205	14 ^m 9	0975-09561877	15 ^m 5	
4	0975-09524016	15 ^m 7	0975-09564432	16 ^m 2	
		V826 Oph HV 11049 USNO 0975-09763780		V864 Oph AN 72.1934 USNO 0975-09046689	
Comp. No.	USNO	m^*	USNO	m^*	
1	0975-09767534	14 ^m 1	0975-09042642	13 ^m 3	
2	0975-09766323	14 ^m 7	0975-09043053	13 ^m 9	
3	0975-09761494	15 ^m 4	0975-09039898	14 ^m 5	
4	0975-09763558	16 ^m 0			
		V2312 Oph HV 10972 USNO 0975-09350557		NSV 9004 HV 10958 USNO 0975-09298413	
Comp. No.	USNO	m^*	USNO	m^*	
1	0975-09351873	13 ^m 2	0975-09297760	14 ^m 5	
2	0975-09352592	14 ^m 0	0975-09301834	14 ^m 8	
3	0975-09351879	14 ^m 4	0975-09296368	15 ^m 5	
4			0975-09299654	16 ^m 4	

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