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TIMES OF EXTREMA OF SELECTED ECLIPSING BINARIES AND TWO SX Phe STARS

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We present heliocentric times of minima for six eclipsing binaries (Table 1) and times of extrema for two high amplitude SX Phoenicis stars (Table 2). Both times of maxima and minima can be used to study slow period changes in SX Phe stars, as is for example the case with the prototype SX Phe itself (Rodríguez et al., 1995). Times of minima may also be used to check the constancy of the shape and the skewness of the light curve. The observations were obtained with a 0.4-m telescope equipped with a Hisis24 CCD-camera. The chip is a Kodak KAF400 in a 2×2 binning mode. No filter was used. All frames were dark-framed and flat-fielded using routines of the MIPS-software. Differential photometry was performed using the method of profile fitting, also available in MIPS (Buil et al., 1993). The overall photometric accuracy is better than 0.01 mag, as verified from the differences comparison − check star in the case of BL Cam.

The times of minima of the eclipsing binaries were calculated by fitting a second degree polynomial through the observations. For the SX Phe stars, a third degree polynomial was fitted. The quality of this fit can be verified in Figure 1, where the data and the fit of one extremum of BL Cam are shown.

The $O - C$ values listed in the tables have been calculated relative to the elements mentioned in the General Catalogue of Variable Stars (GCVS, Kholopov et al., 1985). The theoretical times of minima used to compute the $O - C$ values of both SX Phe stars were calculated from the difference between the times of maximum and minimum as listed in the GCVS (Table 2).

In the case of IP Peg we used the ephemeris of Wolf et al. (1993) which is valid for the moment of white dwarf egress. We subsequently corrected the $O - C$ value with $0^{\mathrm{d}}.043$ in order to obtain the value for mid-eclipse. For BL Cam we also computed the $O - C$ values relative to two additional sets of elements derived by Hintz et al. (1997). From a comparison between the different sets of values for BL Cam we can confirm the presence of the quadratic term included in their set nr. 3.

Table 1: $O-C$ values for six eclipsing binaries

Star	N	JD Hel.	Error	$O-C$	Remark
UW Boo	151	2451299.4174	0.0002	0.000	
Z Dra	48	2451253.4047	0.0001	−0.120	
VX Lac	37	2451431.4651	0.0011	0.030	
UU Lyn	54	2451270.4313	0.0004	−0.0043	
IP Peg	27	2449972.4129	0.0001	−0.0022	cataclysmic variable
XZ UMa	67	2451270.3409	0.0003	−0.049	

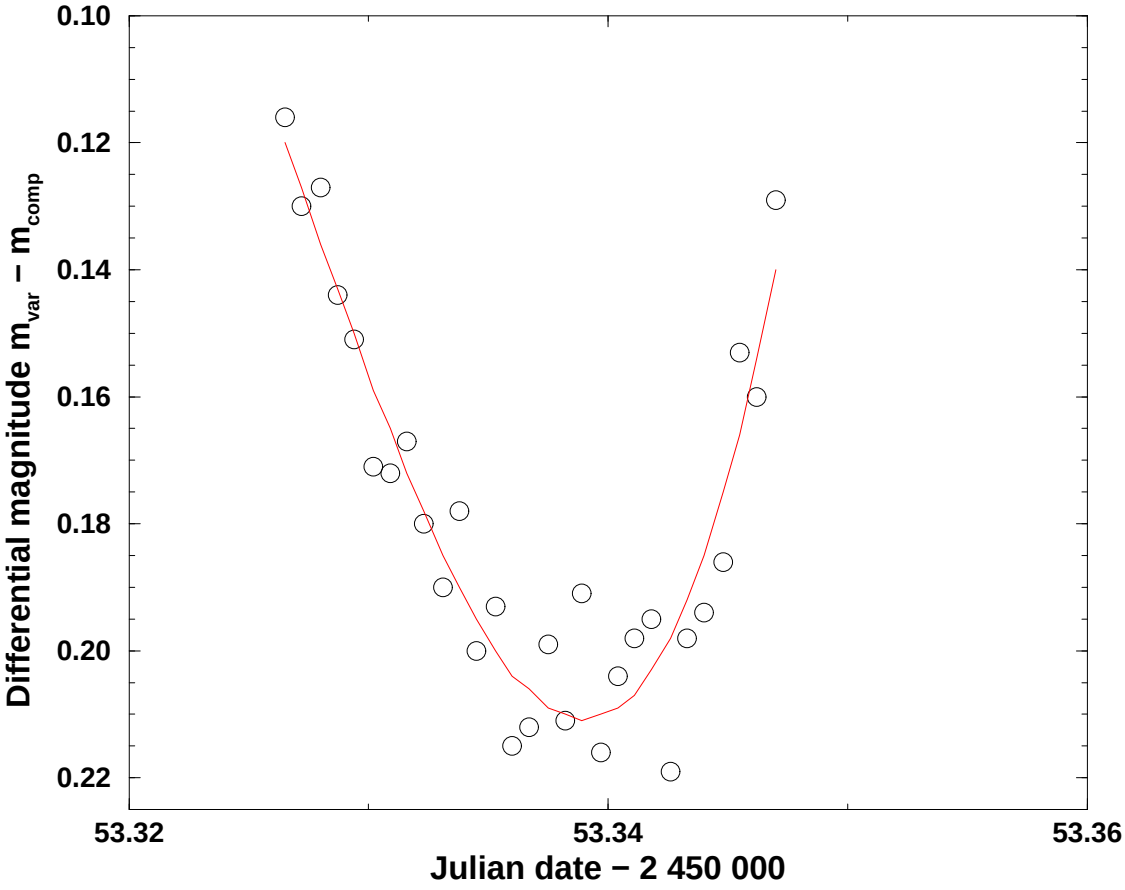

Figure 1. Data and polynomial fit are shown for one observed minimum of BL Cam

Table 2: $O-C$ values for two SX Phoenicis stars

Star	N	JD Hel.	Error	Max/ Min	$O-C$ GCVS	$O-C$ Hintz (2)	$O-C$ Hintz (3)
BL Cam	17	2450014.4750	0.0008	−	0.0019	0.0027	−0.0004
BL Cam	11	2450014.4916	0.0002	+	0.0025	0.0032	0.0002
BL Cam	17	2450014.5138	0.0005	−	0.0016	0.0024	−0.0007
BL Cam	13	2450014.5314	0.0003	+	0.0032	0.0039	0.0009
BL Cam	17	2450053.3168	0.0002	+	0.0037	0.0043	0.0011
BL Cam	29	2450053.3390	0.0004	−	0.0029	0.0034	0.0002
BL Cam	19	2450053.3552	0.0002	+	0.0030	0.0036	0.0004
BL Cam	26	2450053.3771	0.0005	−	0.0019	0.0024	−0.0008
BL Cam	19	2450053.3930	0.0003	+	0.0017	0.0023	−0.0009
BL Cam	26	2450053.4165	0.0005	−	0.0022	0.0027	−0.0005
BL Cam	19	2450053.4330	0.0003	+	0.0027	0.0032	0.0000
BL Cam	16	2451135.5071	0.0002	+	0.0116	0.0058	−0.0012
BL Cam	36	2451135.5295	0.0004	−	0.0109	0.0051	−0.0019
BL Cam	23	2451135.5457	0.0001	+	0.0111	0.0053	−0.0017
BL Cam	32	2451135.5685	0.0004	−	0.0108	0.0050	−0.0020
BL Cam	22	2451135.5851	0.0003	+	0.0114	0.0056	−0.0014
BL Cam	33	2451135.6082	0.0003	−	0.0114	0.0056	−0.0013
BL Cam	22	2451135.6254	0.0004	+	0.0126	0.0068	−0.0002
BL Cam	25	2451135.6470	0.0006	−	0.0111	0.0053	−0.0016
BL Cam	19	2451138.4785	0.0002	+	0.0116	0.0057	−0.0012
BL Cam	36	2451138.5025	0.0003	−	0.0125	0.0066	−0.0003
BL Cam	17	2451138.5184	0.0002	+	0.0124	0.0065	−0.0004
BL Cam	28	2451138.5402	0.0003	−	0.0111	0.0053	−0.0017
BL Cam	19	2451138.5569	0.0001	+	0.0118	0.0059	−0.0010
BL Cam	29	2451138.5782	0.0003	−	0.0100	0.0042	−0.0028
BL Cam	16	2451138.5963	0.0003	+	0.0121	0.0062	−0.0007
BL Cam	17	2451138.6153	0.0006	−	0.0080	0.0022	−0.0048
BL Cam	27	2451139.2955	0.0002	+	0.0075	0.0017	−0.0053
BL Cam	20	2451139.3236	0.0004	−	0.0125	0.0067	−0.0003
BL Cam	21	2451139.3402	0.0003	+	0.0131	0.0073	0.0003
BL Cam	23	2451139.3621	0.0007	−	0.0119	0.0061	−0.0009
BL Cam	15	2451139.3795	0.0002	+	0.0133	0.0075	0.0005
BL Cam	27	2451139.4001	0.0004	−	0.0108	0.0050	−0.0020
BL Cam	15	2451139.4168	0.0002	+	0.0115	0.0057	−0.0013
BL Cam	21	2451139.4393	0.0009	−	0.0109	0.0051	−0.0019
BL Cam	28	2451140.3394	0.0004	−	0.0118	0.0060	−0.0010
BL Cam	17	2451140.3568	0.0002	+	0.0132	0.0073	0.0004
BL Cam	26	2451140.3787	0.0003	−	0.0120	0.0062	−0.0008
BL Cam	15	2451140.3957	0.0007	+	0.0130	0.0071	0.0002
BL Cam	20	2451140.4166	0.0004	−	0.0108	0.0050	−0.0020

Table 2: $O-C$ values for two SX Phoenicis stars (cont.)

Star	N	JD Hel.	Error	Max/ Min	$O-C$ GCVS
DY Peg	25	2449964.4421	0.0007	−	−0.0034
DY Peg	17	2449964.4681	0.0003	+	−0.0008
DY Peg	23	2449996.3368	0.0003	+	−0.0009
DY Peg	21	2449996.3853	0.0012	−	0.0019
DY Peg	11	2449996.4094	0.0006	+	−0.0012
DY Peg	15	2450003.3375	0.0002	+	−0.0011
DY Peg	17	2450004.4312	0.0003	+	−0.0013

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