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TIMES OF MINIMA OF SOME SOUTHERN ECLIPSING BINARIES

Z. KVÍZ^{†1}, M. ZEJDA², L. KOHOUTEK³, J. GRYGAR⁴

¹ Observatoire de Genève, 1920 Sauverny, Switzerland

² N. Copernicus Observatory and Planetarium, Kraví hora 2, 616 00 Brno, Czech Republic

³ Hamburg Observatory, Gojenbergsweg 112, 21029 Hamburg, Germany

⁴ Institute of Physics, Na Slovance 2, 180 40 Praha 8 – Libeň, Czech Republic

Moments of minima were derived for eight southern eclipsing binaries from photoelectric observations made with the seven channel photometer in the Geneva photometric system by one of the authors (Z. Kvíz) in the years 1977–1988. The photometer was attached to the 0.7-m Swiss reflector operating at the European Southern Observatory, La Silla (Chile). The reason for these observations was to study the interesting systems, especially to investigate the possible period changes of these short period binaries (see e.g. Kvíz, Rufener, 1981). Unfortunately, Zdeněk Kvíz was not able to continue this programme.

The programme stars are listed in Table 1, where the columns are as follows: name of the star, brightness of the binary outside the eclipse and in the centre of the primary minimum, system of magnitudes used (the letter P means photographic magnitudes and the letter V denotes visual or photovisual magnitudes), equatorial co-ordinates (1950.0) and orbital elements $M(0)$ and P of the systems given in GCVS (Kholopov et al., Samus' et al., 1998), used in Table 2.

The results are given in Table 2, where HJD are the heliocentric JD of the respective minima together with their mean errors, and n is the number of individual observations used. We also give the respective phases and the epochs (see Table 1 for the orbital elements).

The times of the 21 minima were determined using the programme TINT4 (Gaspani, 1995) based on the artificial neural network. The presented error is similar to the standard deviation of the time of minimum. The programme uses measurements made in all colours and the V-magnitudes were weighted separately from the magnitudes of six colour indices. The calculated phases of the minima differ significantly from 0.0 and 0.5, respectively, so that small changes of periods can be expected with most of the mentioned stars.

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Table 1: List of programme stars.

Star	Brightness Max	[mag] Min I	Branch	RA (1950.0)	DEC	$M(0)$ (JD - 2400000)	P [days]
U Col	10.40	11.00	P	06 13 02	-33 03 36	28521.774	1.24617466
V Lep	9.60	10.10	V	06 08 50	-20 12 00	18873.723	1.0701048
RS Lep	9.91	10.38	V	05 57 09	-20 13 36	36191.148	1.2885439
RU Lep	11.23	12.12	V	06 01 50	-24 54 00	43516.670	4.459601
UX Men	8.80	9.57	P	05 31 59	-76 17 00	41984.64388	4.181100
ζ Phe	3.91	4.42	V	01 06 17.3	-55 30 46	41643.6890	1.6697671
BQ Sgr	9.40	11.87	V	19 10 54.4	-36 19 51	22224.378	8.019537
CW Vel	10.10	11.12	V	09 00 49.2	-52 38 36	44248.7584	2.360927

Table 2: Times of minima.

Star	Type of minima	HJD (-2400000)	Error*	n	Epoch	Phase	Note
U Col	prim	44993.676	0.001	28	13218.0	0.973	normal min. (3 nights)
	sec	43482.691	0.007	46	12005.5	0.474	normal min. (2 nights)
	sec	44945.696	0.006	23	13179.5	0.471	
V Lep	prim	43478.727	0.003	36	22993.0	0.079	normal min. (2 nights)
	sec	43471.774	0.001	13	22986.5	0.582	
RS Lep	prim	45678.702	0.004	32	7363.0	0.004	
	sec	45680.633	0.010	9	7364.5	0.502	
RU Lep	prim	43516.670	<0.001	11	0.0	0.000	
	prim	45670.654	<0.001	9	483.0	0.999	
	prim	45719.727	0.002	30	494.0	0.003	
	prim	45728.648	0.002	24	496.0	0.003	
	prim	46058.654	0.003	49	570.0	0.003	normal min. (3 nights)
	sec	45699.662	0.021	45	489.5	0.504	normal min. (7 nights)
UX Men	prim	43485.659	0.003	23	359.0	0.000	
ζ Phe	prim	43473.755	0.010	43	1096.0	0.001	normal min. (5 nights)
	sec	43469.593	0.001	18	1093.5	0.508	
	sec	43474.605	0.002	31	1096.5	0.510	normal min. (2 nights)
BQ Sgr	prim	47253.07	0.10	10	3121.0	0.96	normal min. (10 nights)
	sec	47305.54	0.08	7	3127.5	0.51	normal min. (7 nights)
CW Vel	prim	46491.639	0.002	31	950.0	0.000	normal min. (6 nights)
	sec	46485.745	0.002	35	947.5	0.504	normal min. (6 nights)

* The error given in TINT4 (a version of TINAGEL) is very similar to a standard deviation and it describes the true uncertainty of $t(0)$ better, than only the statistical properties of the data set would do.

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