

MICROMETER MEASUREMENTS OF DOUBLE STARS (Series 52)

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SUMMARY: A set of 71 measurements of double and multiple stars, carried out with the Large Zeiss Refractor 65/1055 cm of the Belgrade Observatory, is communicated. The bulk of these measurements, 41 in all, unpublished yet, is due to late D. Zulević

Zulević's last published measurements of double stars appeared in Belgrade Series № 46 (Zulević 1991) and № 47 – POP pairs – (Popović, Zulević 1003). The former Series contains his measurements on March 20, 1990. Since that date till his retirement and untimely death in 1998, he made but 41 additional measurements (exclusive some POP pairs) which were left unreduced. We think that these measurements should be published especially in view of the fact that D. Zulević withheld their publication on account solely of their small number.

With their measurements appearing in the present Series Popović and Pavlović continue those published in the Series № 51 (Popović, Pavlović 1998).

It is to be noted that from the summer 1995 on, the observations with our Large Refractor have become largely irregular in consequence of various electric, reconstruction and repair works in the dome of this instrument. Even at present the instrument has not yet reached its earlier performance. In 1999 there were additional misfortunes – damage inflicted by the NATO aggression.

Only sporadic measurements could be performed over short intervals throughout this period when the instrument could be tolerably used.

This modest Series, in addition to Zulević's measurements, contains just these sporadic measurements. The arrangement of data in it is the same as has been in the previous Series. Therefore the explanation to Table 1 is not repeated here. In the calculation of (O – C)s for orbital pairs, listed in Table 2, use has been made of Couteau's Ephemeris Catalogue (Couteau *et al.* 1986).

REFERENCES

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Table 1 Micrometer Measurements of Double Stars

WDS	Disc.	Mult.	ADS BD	Epoch	P [°]	ρ ["]	Est.Mag.	Weight	Obs	Notes	
00014 + 3937	HLD	60	17178	90.859	177.6	1.11	9.0-9.4	3+3	Zul		
				90.859	177.6	1.11	9.0-9.4	1n	Zul	O	
00195 + 3544	POP	35	+34°33	98.794	293.2	0.72	1.5	1+1	Pop		
				98.810	297.2	0.63	0.5	1+1	Pop		
				98.802	295.2	0.68	1.0	2n	Pop	N	
				98.793	294.3	1.54	-	1+1	Pal		
				98.810	320.2	1.31	-	-	Pal		
				98.802	307.2	1.42	-	2n	Pal		
00197 + 3501	POP	36	+34°34	98.810	109.9	0.60	-	1+1	Pop		
				98.810	109.9	0.60	-	1n	Pop	N	
				98.810	121.5	0.97	-	2+2	Pal		
				98.810	121.5	0.97	-	1n	Pal		
00211 + 3539	HU	1202	291	98.794	193.9	1.14	9.5-10.0	1+1	Pop		
				98.794	193.9	1.14	9.5-10.0	1n	Pop	N	
				98.794	199.1	1.41	1.0	1+1	Pal		
				98.794	199.1	1.41	1.0	1n	Pal		
00424 + 0410	STT	18	AB	588	90.859	204.3	1.56	7.7-9.5	2+2	Zul	
					90.859	204.3	1.56	7.7-9.5	1n	Zul	O
01559 + 0151	STF	186	1538	90.859	57.8	1.12	7.0-7.0	2+2	Zul		
					90.859	57.8	1.12	7.0-7.0	1n	Zul	O
02020 + 0246	STF	202	1615	98.813	273.6	1.82	0.7	2+2	Pop		
				98.813	273.6	1.82	0.7	1n	Pop	O	
				98.813	276.9	1.77	-	1+1	Pal		
				98.813	276.9	1.77	-	1n	Pal		
02123 + 2357	STF	226	1696	98.797	235.0	1.71	1.5	1+1	Pop		
				98.797	235.0	1.71	1.5	1n	Pop	N	
				98.797	237.1	1.92	-	1+1	Pal		
				98.797	237.1	1.92	-	1n	Pal		
12244 + 2535	STF	1639	AB	8539	92.368	326.5	1.48	2+2	Zul		
					92.368	326.5	1.48	-	1n	Zul	O
12306 + 0943	STF	1647	8575	92.365	243.5	1.37	-	1+1	Zul		
					92.365	243.5	1.37	-	1n	Zul	N
13491 + 2659	STF	1785	9031	92.368	165.7	3.21	0.2	2+2	Zul		
					92.368	165.7	3.21	0.2	1n	Zul	O
14139 + 2906	STF	1816	9174	91.486	101.5	0.90	8.0-8.1	1+1	Zul		
					91.486	101.5	0.90	8.0-8.1	1n	Zul	N
14153 + 0308	STF	1819	9182	92.368	216.1	0.96	0.1	1+1	Zul		
					92.368	216.1	0.96	0.1	1n	Zul	O

Table 1 (Continue)

WDS	Disc.	Mult.	ADS BD	Epoch	P [$^{\circ}$]	ρ ["]	Est.Mag.	Weight	Obs	Notes	
14463 + 0939	STF	1879	9380	92.368 92.368	89.2 89.2	1.46 1.46	1.0 1.0	2+2 1n	Zul Zul	O	
19062 + 3026	STF	2454	12040	90.684 90.684	283.8 283.8	1.10 1.10	8.5-9.8 8.5-9.8	1+1 1n	Zul Zul	O	
19143 + 1864	STF	2484	12201	90.684 96.655 93.669	235.8 238.1 236.9	2.06 2.35 2.20	8.0-9.5 8.5-9.5 8.2-9.5	1+1 1+1 2n	Zul Zul Zul		
19412 + 3528	POP	59	-	90.684 90.684	260.0 260.0	5.36 5.36	9.5-11.5 9.5-11.5	1+1 1n	Zul Zul		
19487 + 1148	STF	2583	12962	90.780 90.780	109.4 109.4	1.37 1.37	6.5-6.8 6.5-6.8	3+3 1n	Zul Zul	N	
19456 + 3337	STF	2576	AB	12889	90.815 90.815	167.2 167.2	1.92 1.92	9.3-9.3 9.3-9.3	1+1 1n	Zul Zul	O
19511 + 3643	ES	242	13022	90.780 90.780	31.6 31.6	1.90 1.90	9.5-10.0 9.5-10.0	1+1 1n	Zul Zul		
20255 + 4006	D	22	AB	13847	90.774 90.780 90.777	159.9 158.8 159.7	2.57 2.81 2.69	7.5-9.0 8.5-9.0 8.0-9.0	2+2 2+2 2n	Zul Zul Zul	
20257 + 3709	ES	2192	13848	90.774 90.774	82.6 82.6	1.84 1.84	9.5-11.5 9.5-11.5	1+1 1n	Zul Zul		
20262 + 3712	HO	130	13856	90.774 90.774	287.4 287.4	1.91 1.91	- -	1+1 1n	Zul Zul		
21066 + 3436	POP	22	+34 $^{\circ}$ 4283	98.847 98.847	105.0 105.0	5.48 5.48	9.5-10.5 9.5-10.5	1+2 1n	Pop Pop	N	
21208 + 3227	STT	437	AB	14889	90.744 90.815 90.779	25.0 24.9 25.0	2.19 2.18 2.18	7.0-7.5 6.5-7.0 6.8-7.2	1+1 1+1 2n	Zul Zul Zul	N
21289 + 1105	STF	2799	AB	15007	90.744 90.758 90.777 90.815 90.775	264.1 268.7 266.3 269.6 266.9	1.69 1.47 1.75 1.55 1.66	0.0 7.0-7.0 7.5-7.5 7.0-7.0 0.0	1+1 1+1 3+3 1+1 4n	Zul Zul Zul Zul Zul	O
21441 + 2845	STF	2822	15270	90.815 90.859 90.837	301.6 303.1 302.4	1.71 1.53 1.62	4.7-6.1 4.7-6.1 4.7-6.1	1+1 1+1 2n	Zul Zul Zul	O	

Table 1 (Continue)

WDS	Disc.	Mult.	ADS BD	Epoch	P [°]	ρ ["]	Est.Mag.	Weight	Obs	Notes	
21506 + 2216	HO	467	AB	15373	90.777 90.777	221.4 221.4	2.26 2.26	8.5-10.5 8.5-10.5	2+2 1n	Zul Zul	N
22146 + 2934	STF	2881		15769	90.815 90.815	80.1 80.1	1.22 1.22	7.7-8.2 7.7-8.2	2+2 1n	Zul Zul	N
22245 + 0349	STF	2901		15905	98.804 98.804	155.6 155.6	2.62 2.62	1.0 1.0	1+1 1n	Pop Pop	
22272 + 3517	POP	93		-	98.805 98.805	285.7 285.7	5.64 5.64	0.5 0.5	1+1 1n	Pop Pop	N
22284 + 3533	HJ	1770		-	98.804 98.804	285.8 285.8	6.52 6.52	10.0-10.0 10.0-10.0	1+2 1n	Pop Pop	N
22280 + 3514	POP	99		-	98.804 98.807 98.806	296.3 295.7 295.9	1.75 1.59 1.64	0.5 - 0.5	1+1 2+2 2n	Pop Pop Pop	N
22325 + 3500	POP	39		+34°4710	98.807 98.807	96.4 96.4	0.55 0.55	9.7-9.5 9.7-9.5	3+3 1n	Pop Pop	N
22328 + 2625	HO	475	AB	16037	90.780 90.780	301.0 301.0	0.88 0.88	9.0-9.3 9.0-9.3	2+2 1n	Zul Zul	
			AC		90.780 90.780	226.9 226.9	8.16 8.16	9.0-11.5 9.0-11.5	1+1 1n	Zul Zul	
22419 + 2126	STF	2934		16185	90.815 90.859 90.848	67.3 64.6 65.3	0.96 1.06 1.04	8.2-9.2 8.5-9.5 8.4-9.4	1+1 3+3 2n	Zul Zul Zul	O
22455 + 1112	BU	711		16242	90.750 90.750	355.1 355.1	2.41 2.41	9.5-11.0 9.5-11.0	1+1 1n	Zul Zul	O
23133 + 2205	STF	2990	AB	16602	98.794 98.794	58.5 58.5	2.64 2.64	8.0-8.0 8.0-8.0	2+2 1n	Pal Pal	
					98.794	56.4	2.32	8.0-8.0	2+2	Pop	
					98.804	56.0	2.33	-0.1	1+2	Pop	
					98.798	56.3	2.32	0.0	2n	Pop	
			AC		98.794	301.6	37.45	8.0-10.0	1+2	Pal	
					98.794	301.6	37.45	8.0-10.0	1n	Pal	
					98.794	301.1	37.39	8.0-13.0	2+2	Pop	
					98.794	301.1	37.39	8.0-13.0	1n	Pop	N
23272 + 3026	POP	21		+29°4929	98.807 98.807	210.8 210.8	0.94 0.94	0.1 0.1	2+2 1n	Pop Pop	
23273 + 3014	POP	3		-	98.807 98.807	117.7 117.7	4.03 4.03	0.0 0.0	2+2 1n	Pop Pop	

Table 1 (Continue)

WDS	Disc.	Mult.	ADS BD	Epoch	P [$^{\circ}$]	ρ [$''$]	Est.Mag.	Weight	Obs	Notes	
23391 + 3013	POP	4	-	98.810	76.5	5.58	-	1+2	Pop		
				98.810	76.5	5.58	-	1n	Pop		
23431 + 1150	A	1242	16951	90.859	331.2	0.77	9.2-9.2	3+3	Zul		
				90.859	331.2	0.77	9.2-9.2	1n	Zul	O	
23527 + 2259	BU	859	17076	90.777	199.5	0.79	9.0-9.0	1+1	Zul		
				90.777	199.5	0.79	9.0-9.0	1n	Zul		
23564 - 0930	STF	3046	AB	17107	90.777	267.1	3.65	8.0-8.2	3+3	Zul	
					90.780	265.4	3.83	8.5-8.7	2+2	Zul	
					90.846	268.2	3.37	9.0-9.5	1+1	Zul	
					90.790	266.7	3.66	8.3-8.6	3n	Zul	
23595 + 3343	STF	3050	AB	17149	90.816	318.4	1.90	6.5-6.5	1+1	Zul	
					90.859	323.2	1.60	6.9-6.9	3+3	Zul	
					90.848	322.0	1.68	6.8-6.8	2n	Zul	
					98.810	330.0	1.87	0.0	2+2	Pal	
					98.810	330.0	1.87	0.0	1n	Pal	
					98.810	327.1	1.96	0.0	2+2	Pop	
98.810	327.1	1.96	0.0	1n	Pop	O					

Table 2 Notes

WDS	ADS	Disc.	Mult.	Notes
00014+3937	17178	HLD	60	Heintz W.D.1963: $0^{\circ} 0, -0'' 02$
00195+3544		POP	35	$dP/dt = +8^{\circ}/28y$. The significant difference between the measures of two observers demand new observations.
00197+3501		POP	36	$dP/dt = +13^{\circ}/28y$. Measures uncertain.
00211+3539	291	HU	1202	Slow angular decrease.
00424+0410	588	STT	18	Baize,1958: $-3^{\circ} 2, +0'' 03$ Sokolova,1960: $-4^{\circ} 6, +0'' 12$
01559+0151	1538	STF	186	Mourao R.R.F.,1976: $+0^{\circ} 4, -0'' 13$
02020+0246	1615	STF	202	Scardia M.,1981: $+1^{\circ} 1, -0'' 02$ Scardia M.,1981: $+4^{\circ} 4, -0'' 07$
02123+2357	1696	STF	226	Slow angular decrease.
12244+2535	8539	STF	1639	Aller R.M.,1951: $+2^{\circ} 0, -0'' 12$
12306+0943	8575	STF	1647	$dP/dt = +42^{\circ}/162y$
13491+2659	9031	STF	1785	Strand, 1955: $+2^{\circ} 3, -0'' 19$ Kisselev A.A., Kiyaveva O.V.,1988: $-1^{\circ} 2, -0'' 26$
14139+2906	9174	STF	1816	$dP/dt = +21^{\circ}/160y$
14153+0308	9182	STF	1819	Baize P.,1986: $+8^{\circ} 1, +0'' 13$
14463+0939	9380	STF	1879	Mason & Hartkopf,1998: $+1^{\circ} 6, -0'' 20$
19062+3036	12040	STF	2454	Docobo-Costa,1987:
19143+1864	12201	STF	2484	Hopmann,J.,1973: $-1^{\circ} 0, +0'' 39$: $+0^{\circ} 6, +0'' 69$
19456+3337	12889	STF	2576	AB Rabe, W.,1948: $-0^{\circ} 4, -0'' 47$ Baize,P.,1955: $-4^{\circ} 6, -0'' 57$
19487+1148	12962	STF	2583	$dP/dt = -12^{\circ}/161y$
20255+4006	13847	D	22	AB $dP/dt = +20^{\circ}/115y$
21066+3436		POP	22	$dP/dt = +13^{\circ}/30y$ The nature of the motion doubtful: optical or physical ?
21208+3227	14889	STT	437	AB $dP/dt = -43^{\circ}/145y$
21289+1105	15007	STF	2799	AB Popović G.,1986: $+2^{\circ} 3, -0'' 04$
21441+2845	15270	STF	2822	AB Docobo-Costa,1987: $+1^{\circ} 0, -0'' 38$ Heintz,W.D.1966: $-5^{\circ} 3, +0'' 12$
21506+2216	15373	HO	467	AB $dP/dt = +39^{\circ}/97y, d\rho/dt = +1'' 3/97y$
22146+2934	15769	STF	2881	$dP/dt = -31^{\circ}/160y$, decrease in ρ .
22272+3517		POP	93	Unchanged.
22284+3533		HJ	1770	Unchanged.
22287+3514		POP	99	Slow angular increase.
22325+3500		POP	39	Slow angular increase.
22327+2584	16037	HO	475	AB $dP/dt = -25^{\circ}/97y$
22419+2126	16185	STF	2934	Heintz, W.D.,1981: $-1^{\circ} 9, -0'' 07$
22455+1112	16242	BU	711	Popović-Ćatović, 1990: $-1^{\circ} 6, +0'' 10$
23134+2205	16602	STF	2990	AB Slow angular decrease. AC The first measurements of pair AC.
23431+1150	16951	A	1242	Zulević,D.,1977: $-0^{\circ} 1, +0'' 02$
23527+2258	17076	BU	859	$dP/dt = -18^{\circ}/109y$
23564-0930	17107	STF	3046	AB $dP/dt = -35^{\circ}/160y$
23595+3343	17149	STF	3050	AB Heintz, W.D.,1996: $+0^{\circ} 4, -0'' 08$ (Zul), $-0^{\circ} 1, +0'' 01$ (Pal), $-3^{\circ} 0, +0'' 10$ (Pop)

МИКРОМЕТАРСКА МЕРЕЊА ДВОЈНИХ ЗВЕЗДА
(Серија 52)

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Претходно саопштење

Саопштава се 71 микрометарско мерење двојних или вишеструких система обављених на Zeiss рефрактору 65/1055 cm Астрономске опсерваторије у Београду. 41 мерење је преузето из заоставштине Д. Ј. Зулевића.