Bull. Astron. Belgrade № 150 (1994), 109 – 116

UDC 521.328
Preliminary report

MICROMETER MEASUREMENTS OF DOUBLE STARS
(Series 48)

G. M. Popović, R. Pavlović

Astronomical Observatory, Volgina 7, 11050 Belgrade, Yugoslavia

(Recieved: September 19, 1994)

SUMMARY: 124 micrometric measurements of 53 double or multiple systems carried out with the Zeiss 65/1055 cm Refractor of Belgrade Observatory are communicated.

The present measurements follow the ones published in Series 45-46 (Popović, 1991), (Zulević, 1991). Series 47 (Popović, 1993) also contains micrometric measurements of double stars, but there are measurements of Popović's pairs only.

This series contains the first micrometric measurements of R. Pavlović who in this year joined the team of double-star observers.

The series contains 124 measurements of 53 double or multiple systems. The comparison of the measurements with the ephemeris in the case of orbital pairs was performed with respect to the Ephemeris Catalogue by Couteau et al. (1986).

The team of double stars observers at the Belgrade Observatory is planning observations with the aid of CCD camera attached to the Large Refractor. Currently we are engaged in preliminary experimental observations with the novel technique. It is most likely, however, that the close pairs (separation less than 1") will remain within the domain of the micrometer measurements, i.e. the new technique is not going to discontinue them.

The observations of this series are reduced by applying the standard procedure, just as in the case of the earlier ones.

The results are presented in Table 1.

Acknowledgement – This work has been supported by Ministry for Science and Technology of Serbia through the project "Physics and Motions of Celestial Bodies".

REFERENCES

Couteau, P., Morel, P. J., Fulconis, M.: 1986, *Cinquiéme Catalogue d'Ephemeride d'Etoiles Doubles Visuelles.*
Muller, M. P.: 1949, *J. Obs.* **32**, 114.
Popović, G. M.: 1991, *Bull. Obs. Astron. Belgrade*, **144**, 39.
Popović, G. M., Zulević, D. J.: 1993, *Bull. Obs. Astron. Belgrade*, **147**, 45.
Zulević, D. J.: 1991, *Bull. Obs. Astron. Belgrade*, **144**, 47.

Table 1 Micrometar Measurements of Double Stars

ADS	Disc. IDS Mag	Mult.	Epoch 1900+	P	ρ	Est.Mag.	Weight	Obs.	Notes
60	STF 3060	AB	90.848	129.°6	2.″92	8.5 – 9.0	1+1		
	00008N1732		**90.848**	**129.6**	**2.92**	**8.5 – 9.0**	**1n**	POP	
	9.5 – 9.7								
		AC	90.848	268.9	70.18	8.5 – 11.5	1+1		
			90.848	**268.9**	**70.18**	**8.5 – 11.5**	**1n**	POP	
3353	STF 572		91.094	192.0	3.86	6.5 – 6.5	1+2		
	04323N2644		91.097	193.1	5.68	−0.1	2+2		
	3.2 – 4.2		**91.096**	**192.6**	**4.90**	**0.0**	**2n**	POP	$\Delta\theta/161y = -17°$
–	POP 212		91.095	103.9	6.04	12.0–12.2	1+1		The position of the pair related to
	05181N3712		91.097	102.9	5.92	0.0	1+1		ADS 3994: $\Delta\alpha = -8^s$, $\Delta\delta = +2'$
			91.096	**103.4**	**5.98**	**0.1**	**2n**	POP	
–	POP 215		91.097	232.7	3.38	14.0–14.0	1+1		The position of the pair related to
	05148N3506		**91.097**	**232.7**	**3.38**	**14.0–14.0**	**1n**	POP	POP 69: $\Delta\alpha = 0^s$, $\Delta\delta = -3'$
	–								
3897	WEI 8	AB	91.097	329.7	2.60	8.5–8.8	2+2		
	05130N3608		**91.097**	**329.7**	**2.60**	**8.5–8.8**	**1n**	POP	
	9.7–9.8								
3994	HU 1104		91.097	231.8	0.80	9.0–10.5	2+1		$\Delta\theta/87y = +10°$
	05182N3710		**91.097**	**231.8**	**0.80**	**9.0–10.5**	**1n**	POP	
	9.0–9.6								
5958	STT 170		92.119	74.6	0.79	7.5–8.0	1+2		
	07122N0929		**92.119**	**74.6**	**0.79**	**7.5–8.0**	**1n**	POP	Popović, 1982: +0.°4, +0.″14
	7.6–7.9								
6133	AG –		92.119	175.3	1.92	0.1	1+1		
	07244N2559		**92.119**	**175.3**	**1.92**	**0.1**	**1n**	POP	
	9.5–9.6								
6180	STF 1116		92.119	96.4	1.65	8.0–8.7	1+1		
	07290N1231		**92.119**	**96.4**	**1.65**	**8.0–8.7**	**1n**	POP	
	7.9–8.6								
7864	STF 1457		91.254	330.9	1.66	8.0–9.0	1+2		
	10335N0575		**91.254**	**330.9**	**1.66**	**8.0–9.0**	**1n**	POP	$\Delta\theta/162y = +43°$
	8.0–9.0								
8355	STT 241	AB	91.306	140.1	1.54	7.0–8.5	1+2		
	11511N3560		91.322	138.0	1.64	7.5–9.0	1+2		
	6.8–8.7		**91.314**	**139.0**	**1.59**	**7.2–8.7**	**2n**	POP	$\Delta\theta/142y = +20°$
8386	STF 1589		91.306	157.4	1.92	10.0–10.5	2+2		
	11555N4371		91.322	158.7	1.92	10.0–10.0	1+2		
	9.4 – 9.9		**91.313**	**158.0**	**1.92**	**10.0–10.5**	**2n**	POP	

Table 1 (continues)

ADS	Disc. IDS Mag	Mult.	Epoch 1900+	P	ρ	Est.Mag.	Weight	Obs.	Notes
8406	STF 1596		94.413	236°.7	3″.50	6.5—8.0	1+1		
	11592N2161		94.473	237.5	3.62	–	1+1		
	6.0 — 7.5		**94.443**	**237.1**	**3.56**	**6.5—8.0**	**2n**	POP	
			94.413	237.7	3.87	–	1+1		
			94.473	237.5	3.92	–	1+1		
			94.443	**237.6**	**3.90**	–	**2n**	PAV	
8575	STF 1647	AB	92.365	244.0	1.53	–	1+1		
	12255N0976		92.373	240.3	1.57	0.5	1+2		
	8.5 — 8.5		**92.370**	**241.8**	**1.55**	**0.5**	**2n**	POP	$\Delta\theta/162y = +40°$
8949	STF 1757	AB	94.415	121.1	1.90	8.0—9.0	2+2		
	13292N0012		94.421	123.4	1.90	8.0—9.0	2+2		
	7.7 — 8.8		**94.418**	**122.2**	**1.90**	**8.0—9.0**	**2n**	POP	Heintz, 1956: $-3°.0, +0″.10$
			94.415	121.8	2.37	–	2+2		
			94.421	123.4	2.11	–	3+2		
			94.418	**122.7**	**2.22**	–	**2n**	PAV	Heintz, 1956: $-2°.8, +0″.42$
9174	STF 1816		91.322	87.3	0.79	7.5—7.5	1+2		
	14095N2934		91.486	92.6	0.88	8.0—8.2	1+1		
	7.5 — 7.6		**91.388**	**89.4**	**0.83**	**7.8—7.8**	**2n**	POP	$\Delta\theta/160y = +9°$, $\Delta\rho''/160y = -1″.1$
9338	STF 1864	AB	94.487	110.7	5.66	–	2+2		
	14360N1651		94.490	110.5	5.66	–	2+2		
	4.9 — 5.8		**94.488**	**110.6**	**5.66**	–	**2n**	POP	Muller, 1949: $\Delta\rho = +0″.32$
			94.487	110.3	5.81	–	3+2		
			94.490	109.9	5.76	–	2+2		
			94.488	**110.1**	**5.79**	–	**2n**	PAV	Muller, 1949: $\Delta\rho = +0″.45$
9340	STF 1867		94.487	359.0	0.64	9.0—9.7	2+1		
	14365N3143		94.490	358.5	0.72	9.0—9.5	2+2		
	8.4 — 8.9		**94.489**	**358.7**	**0.68**	**9.0—9.6**	**2n**	POP	$\Delta\theta/163y = -22°$, ρ decreased
			94.487	1.0	0.94	–	2+2		
			94.490	4.2	0.90	–	2+2		
			94.488	**2.6**	**0.92**	–	**2n**	PAV	
9423	BU 31	AB	94.479	218.0	1.72	9.0—10.5	2+2		
	14479N1869		94.481	223.5	1.76	9.5—11.0	2+1		
	8.2 — 9.9		**94.480**	**220.4**	**1.74**	**9.2—10.8**	**2n**	POP	$\Delta\theta/120y = +38°$
			94.479	216.4	2.01	–	1+1		
			94.481	219.7	1.41	8.0—9.7	2+1		
			94.480	**218.0**	**1.71**	**8.0—9.7**	**2n**	PAV	

Table 1 (continues)

ADS	Disc. IDS Mag	Mult.	Epoch 1900+	P	ρ	Est.Mag.	Weight	Obs.	Notes
9497	BU 119	AB	94.421	279°.2	2″.08	–	1+1		
	15002S0638		94.476	280.2	1.99	–	1+1		
	8.0 – 8.5		**94.448**	**279.7**	**2.04**	–	**2n**	POP	$\Delta\theta/119y = -33°$
			94.421	277.2	2.22	–	1+1		
			94.476	277.4	2.35	–	1+1		
			94.448	**277.3**	**2.28**	–	**2n**	PAV	
–	POP 118		94.465	344.7	2.47	10.0–10.1	1+1		
	15122N4215		94.473	344.4	2.56	–	1+1		
	–		94.476	345.5	2.60	–0.2	1+1		
			94.471	**344.9**	**2.54**	**0.05**	**3n**	POP	
			94.473	340.1	3.23	–	1+1		
			94.476	345.0	2.89	–	1+1		
			94.474	**342.6**	**3.06**	–	**2n**	PAV	
9530	A 1116		94.479	49.4	0.71	8.5–8.6	3+2		
	15068N1030		94.481	47.2	0.82	9.5–9.7	1+1		
	8.5 – 8.5		**94.480**	**48.8**	**0.74**	**8.8–8.8**	**2n**	POP	$\Delta\theta/99y = +27°$
			94.479	49.9	0.92	–	1+1		
			94.481	48.5	0.98	–	1+1		
			94.480	**49.2**	**0.95**	–	**2n**	PAV	
9578	STF 1932		94.492	256.2	1.50	8.5–8.5	1+1		
	15140N2627		94.495	258.5	1.41	8.0–8.2	1+1		
	7.1 – 7.6		**94.494**	**257.4**	**1.46**	**8.2–8.4**	**2n**	POP	Heintz, 1965: +0°.2, –0″.10
			94.492	259.5	1.68	–	2+2		
			94.495	258.2	1.63	–	1+1		
			94.493	**259.1**	**1.66**	–	**2n**	PAV	Heintz, 1965: +1°.9, +0″.10
9600	HU 146		94.479	127.1	0.62	9.7–9.7	1+2		
	15165N2126		94.482	131.2	0.58	9.7–9.7	1+1		
	9.3 – 9.6		**94.480**	**128.7**	**0.60**	**9.7–9.7**	**2n**	POP	$\Delta\theta/94y = -43°$
			94.479	126.6	0.73	–	2+2		
			94.482	136.1	0.94	–	1+1		
			94.480	**129.8**	**0.80**	–	**2n**	PAV	
9737	STF 1965		94.487	306.5	6.22	–	2+2		
	15356N3658		94.490	306.4	6.33	–	2+2		
	5.1 – 6.0		**94.488**	**306.4**	**6.28**	–	**2n**	POP	Muller, 1949: $\Delta\rho = +0″.21$
			94.487	305.8	6.57	–	2+2		
			94.490	305.1	6.50	–	2+2		
			94.488	**305.4**	**6.54**	–	**2n**	PAV	Muller, 1949: $\Delta\rho = +0″.47$

Table 1 (continues)

ADS	Disc. IDS Mag	Mult.	Epoch 1900+	P	ρ	Est.Mag.	Weight	Obs.	Notes
–	POP 16		94.487	311°.1	8″.23	10.0—13.0	1+1		
	18343N3500		**94.487**	**311.1**	**8.23**	**10.0—13.0**	**1n**	POP	
	–								
			94.487	306.1	8.15	–	1+1		
			94.487	**306.1**	**8.15**	–	**1n**	PAV	
10075	STF 2052	AB	94.495	125.0	1.80	0.5	1+1		
	16245N1837		**94.495**	**125.0**	**1.80**	**0.5**	**1n**	POP	Scardia, 1984: −8°.0, −0″.07
	7.8 – 7.8								
			94.495	128.5	2.07	–	1+1		
			94.495	**128.5**	**2.07**	–	**1n**	PAV	Scardia, 1984: −4°.5, +0″.20
10699	STF 2199		94.476	59.0	1.79	8.5—9.0	2+2		
	17368N5549		94.482	59.1	1.93	7.8—8.5	2+2		
	7.8 – 8.4		**94.479**	**59.0**	**1.86**	**8.2—8.8**	**2n**	POP	$\Delta\theta/164y = -57°$
			94.476	59.8	1.73	–	2+2		
			94.482	61.3	2.04	–	2+2		
			94.479	**60.6**	**1.88**	–	**2n**	PAV	
11432	STT 354		94.487	199.0	0.72	8.5—8.7	1+1		
	18272N0643		94.490	194.8	0.71	0.5	1+1		
	7.7 – 8.5		**94.488**	**196.9**	**0.72**	**0.4**	**2n**	POP	
			94.487	204.2	0.99	–	1+1		
			94.490	197.4	0.92	–	1+1		
			94.488	**200.8**	**0.96**	–	**2n**	PAV	
11483	STT 358	AB	91.650	160.4	1.59	0.0	2+2		
	18314N1654		91.653	161.5	1.63	7.5—8.0	1+2		
	6.8 – 7.8		91.670	161.2	1.61	7.0—7.3	2+2		
			91.658	**161.0**	**1.61**	**0.2**	**3n**	POP	Heintz, 1954: +7°.6, +0″.18
11669	STF 2390		90.681	153.9	4.01	8.0—9.0	1+2		
	18422N3425		**90.681**	**153.9**	**4.01**	**8.0—9.0**	**1n**	POP	
	7.2 – 8.6								
12040	STF 2454		91.650	279.7	1.15	8.5—10.0	3+2		
	19023N3017		91.653	281.4	1.35	8.5—10.5	1+1		
	8.5 – 9.7		**91.651**	**280.2**	**1.21**	**8.5—10.1**	**2n**	POP	Baize, 1976: −2°.4, −0″.04
12169	STF 2486	AB	91.653	208.0	7.74	6.0—6.5	1+2		
	19095N4940		91.793	208.9	7.62	6.0—6.5	2+2		
	6.6 – 6.8		**91.733**	**208.5**	**7.67**	**6.0—6.5**	**2n**	POP	
	6.6 – 13.3	AC	91.653	82.2	22.52	6.0—13.0	1+1		
			91.793	81.8	–	–	1+1		
			91.723	**82.0**	**22.52**	**6.0—13.0**	**1n**	POP	

Table 1 (continues)

ADS	Disc. IDS Mag	Mult.	Epoch 1900+	P	ρ	Est.Mag.	Weight	Obs.	Notes
12201	STF 2484		90.684	237°.6	2″.33	8.0−10.0	1+1		
	19099N1854		90.758	236.7	2.00	8.0−10.0	1+1		
	7.9 − 9.4		**90.721**	**237.2**	**2.16**	**8.0−10.0**	**2n**	POP	$\Delta\theta/130y = +19°$
13050	STT 388	AB	91.634	137.5	3.61	8.0−8.2	1+2		
	19482N2536		**91.634**	**137.5**	**3.61**	**8.0−8.2**	**1n**	POP	
	8.2 − 8.2								
	7.7 − 8.9	AC	91.634	130.9	31.73	8.0−8.5	1+2		
			91.634	**130.9**	**31.73**	**8.0−8.5**	**1n**	POP	
-	POP 214		91.645	93.0	3.80	13.0−13.5	1+1		The position of the pair related to
	20042N3803		**91.645**	**93.0**	**3.80**	**13.0−13.5**	**1n**	POP	BD +38°.3915($8^m.2$):
	-								$\Delta\alpha = +6^s$, $\Delta\delta = -9'$.
13294	STF 2615		92.685	304.7	8.44	8.0−10.0	1+1		
	19581N0807		**92.685**	**304.7**	**8.44**	**8.0−10.0**	**1n**	POP	
	7.9 − 10.8								
13506	STF 2644		91.648	208.1	2.38	0.3	1+1		
	20075N0034		**91.648**	**208.1**	**2.38**	**0.3**	**1n**	POP	
	6.8 − 7.1								
13842	MLB 22		90.774	227.5	5.50	10.0−11.5	1+1		
	20217N3943		**90.774**	**227.5**	**5.50**	**10.0−11.5**	**1n**	POP	
	10.3 − 11.6								
13847	D 22	AB	90.774	157.0	2.60	7.5−9.0	2+2		
	20219N3946		90.780	157.7	2.72	8.0−9.5	1+1		
	8.0 − 9.1		**90.776**	**157.2**	**2.64**	**7.3−9.2**	**2n**	POP	$\Delta\theta/116y = +17°$
	7.7 − 13.8	AC	90.774	98.0	72.91	7.5−9.5	1+1		
			90.780	98.7	73.45	8.0−10.0	1+1		
			90.777	**98.4**	**73.18**	**7.8−9.8**	**2n**	POP	
13848	ES 2192		90.774	79.2	2.38	10.0−12.0	1+1		
	20219N3649		90.780	81.1	2.40	10.0−12.0	1+1		
	9.7 − 12.0		**90.777**	**80.2**	**2.39**	**10.0−12.0**	**2n**	POP	
-	BRT 1157		90.747	224.6	6.64	9.5−10.5	1+2		Star BD +45°.3781($9^m.5$) is mea-
	22006N4555		**90.747**	**224.6**	**6.64**	**9.5−10.5**	**1n**	POP	sured, but the designation of the
	9.3 − 10.0								pair registered as BRT 1157 is
									BD +45°.3780.
14364	A 612		91.645	14.2	1.94	10.0−10.3	1+1		
	20467N0713		**91.645**	**14.2**	**1.94**	**10.0−10.3**	**1n**	POP	
	10.6 − 10.8								

Table 1 (continues)

ADS	Disc. IDS Mag	Mult.	Epoch 1900+	P	ρ	Est.Mag.	Weight	Obs.	Notes
14889	STT 437	AB	90.746	25°.3	2″.22	0.5	1+1		
	21166N3202		90.750	23.0	2.32	7.0—7.7	2+3		
	6.9 — 7.6		**90.749**	**23.7**	**2.29**	**0.6**	**2n**	POP	$\Delta\theta/146y = +44°$
	6.4 — 11.2	AC	90.750	142.0	80.72	7.0—10.0	2+2		
			90.750	**142.0**	**80.72**	**7.0—10.0**	**1n**	POP	
	—	CD	90.750	21.1	15.01	10.0—10.0	2+2		The position related to AB:
			90.750	**21.1**	**15.01**	**10.0—10.0**	**1n**	POP	$\Delta\alpha = +6^s$, $\Delta\delta = +3'$. The first measurements.
15007	STF 2799	AB	90.746	263.7	1.73	0.0	1+1		
	21240N1039		90.758	264.7	1.81	7.0—7.0	1+1		
	7.5 — 7.5		90.777	264.5	1.61	7.5—7.5	2+2		
			90.764	**264.4**	**1.69**	**0.0**	**3n**	POP	Popović, 1987: −0°.8, −0″.01
15270	STF 2822	AB	94.698	307.3	1.71	6.0—8.0	1+1		
	21397N2817		**94.698**	**307.3**	**1.71**	**6.0—8.0**	**1n**	POP	Heintz, 1965: −4°.8, +0″.33
	4.7 — 6.1								
			94.698	303.7	2.09	–	1+1		
			94.698	**303.7**	**2.09**	–	**1n**	PAV	Heintz, 1965: −8°.4, +0″.71
15373	HO 467	AB	90.777	221.2	2.13	9.0—12.0	1+1		
	21460N2147		**90.777**	**221.2**	**2.13**	**9.0—12.0**	**1n**	POP	$\Delta\theta/103y = +40°$
	8.1 — 10.3								
	8.1 — 12.0	AC	90.777	335.2	–	–	1+1		
			90.777	**335.2**	–	–	**1n**	POP	
15639	STF 2862		91.653	95.0	2.26	0.5	1+2		
	22020N0005		91.730	96.1	2.23	7.5—8.0	1+1		
	8.2 — 8.6		**91.684**	**95.4**	**2.25**	**0.5**	**2n**	POP	$\Delta\theta/163y = -9°$
15894	HO 182		91.730	134.9	1.41	9.5—9.5	1+1		
	22186N1703		**91.730**	**134.9**	**1.41**	**9.5—9.5**	**1n**	POP	
	10.8 — 10.8								
16037	HO 475	AB	90.780	311.7	0.97	9.0—9.7	2+1		
	22280N2554		**90.780**	**311.7**	**0.97**	**9.0—9.7**	**1n**	POP	$\Delta\theta/98y = -13°$
	9.3 — 9.5								
	8.7 — 10.9	AC	90.780	227.2	7.83	9.0—10.5	1+1		
			90.780	**227.2**	**7.83**	**9.0—10.5**	**1n**	POP	
16242	BU 711		90.750	357.5	2.30	1.5	1+1		
	22405N1040		**90.750**	**357.5**	**2.30**	**1.5**	**1n**	POP	$\Delta\theta/112y = -82°$
	9.7 — 11.7								

Table 1 (continues)

ADS	Disc. IDS Mag	Mult.	Epoch 1900+	P	ρ	Est.Mag.	Weight	Obs.	Notes
17076	BU 859		90.777	199°.4	0″.86	9.7−9.5	2+2		
	23476N2225		**90.777**	**199.4**	**0.86**	**9.7−9.5**	**1n**	POP	$\Delta\theta/110y = -18°$
	11.0 − 11.5								
17107	STF 3046	AB	90.777	264.3	3.65	8.5−8.7	2+2		
	23513S0963		90.780	266.1	3.67	9.5−10.0	2+2		
	9.0 − 9.5		90.846	266.5	3.57	9.0−9.3	1+1		
			90.792	**265.5**	**3.64**	**9.0−9.3**	**3n**	POP	$\Delta\theta/161y = +34°$

МИКРОМЕТАРСКА МЕРЕЊА ДВОЈНИХ ЗВЕЗДА

(Серија 48)

Г. М. Поповић и Р. Павловић

Астрономска Опсерваторија, Волгина 7, 11050 Београд, Југославија

УДК 521.328

Претходно саопштење

Саопштавају се 124 микрометарских мерења 53 двојних и вишеструких система реализованих на Zeiss рефрактору 65/1055 cm Опсерваторије у Београду.