

NEW AND RECALCULATED ORBITAL ELEMENTS OF 5 DOUBLE STARS

D. Olević and P. Jovanović

Astronomical Observatory Volgina 7, 11160 Belgrade-74, Yugoslavia

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SUMMARY: In this paper are given the orbital elements for the following five double stars: *ADS 674 A921*, *ADS 2849 A1831BC*, *ADS 4002 McA18Aab, c*, *WDS 07269+2015 = CHARA 26* and *ADS 6138 A2869*, corresponding astrophysical quantities (C, H) and also masses and dynamical parallaxes for *ADS 674*, *ADS 2849* and *ADS 6138*.

1. INTRODUCTION

The orbital elements of the pairs *ADS 674* (Erceg, 1981) and *ADS 2849* (Erceg, 1978) are not in agreement with new observations. The orbital elements of the pair *ADS 4002 McA18Aab, c* were calculated in 1976 (Mc Alister, 1976). Taking into account the new observations, this pair was observed during approximately 20 years, and that makes about two whole periods. That is why it was interesting to check the previous results. For the pairs *WDS 07269+2015 = CHARA 26* and *ADS 6138*, according to our knowledge, the orbital elements are calculated for the first time. Besides the well known catalogues, we also used catalogue of Popović *et al.* (1998).

2. RESULTS

Our results show that all previously computed orbital elements have significantly changed. For the pairs *ADS 2849* and *CHARA 26* new periods have been obtained which are twice as long as the old ones.

For some observations we considered that it was necessary to change the quadrant ($\theta_{obs} + 180^\circ$). Such observations are marked with asterisk in Table 2. All numerical results (the orbital elements, O - C residuals and ephemeris) are given in Tables 1 - 3. Graphic presentations of the apparent orbits are given in Figures 1 - 5. The results which correspond to the pairs *ADS 674*, *ADS 2849* and *ADS 6138* were also published in Information Circular of IAU Commission 26 (Double stars), (Olević and Jovanović, 1998).

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Table 1. Orbital elements, masses and parallaxes

<i>WDS</i>	00491+5720	03545+0511	05244+0224	07269+2015	07305+0743
<i>ADS</i>	674	2849	4002	-	6138
<i>Name</i>	A 921	A 1831 BC	McA18 Aab,c	CHARA 26	A 2869
<i>m</i>	9.3-9.8	10.0-10.0	3.4	5.9	8.3-8.5
<i>Sp.</i>	G5	-	B1V	F2Vn	A5
<i>P(y)</i>	146.577	234.704	19.237	14.177	112.017
<i>n(°/y)</i>	2.45605	1.53385	18.71377	25.39394	3.21379
<i>T</i>	2003.38	1978.57	1979.08	1984.40	1995.63
<i>a(″)</i>	0.213	0.209	0.059	0.061	0.266
<i>e</i>	0.582	0.258	0.047	0.237	0.827
<i>i(°)</i>	56.78	39.56	103.66	46.59	125.73
<i>Ω(°)</i>	160.58	84.00	126.53	14.36	105.30
<i>ω(°)</i>	90.60	76.39	36.52	111.43	228.33
<i>A</i>	-0.03665	-0.14973	-0.02153	-0.03116	-0.06528
<i>B</i>	-0.11065	0.06489	0.04297	0.03217	-0.20129
<i>F</i>	0.20100	-0.05859	0.02985	-0.05104	-0.15211
<i>G</i>	-0.06957	-0.19689	-0.02151	-0.02882	0.16448
<i>C</i>	0.17792	0.12860	0.03406	0.04111	-0.16137
<i>H</i>	-0.00186	0.03114	0.04600	-0.01613	-0.14363
<i>M_A</i>	2.97	2.89	-	-	2.80
<i>M_B</i>	3.47	2.89	-	-	3.00
<i>M_{A☉}</i>	1.48	1.50	-	-	1.53
<i>M_{B☉}</i>	1.36	2.89	-	-	3.00
<i>π_{dyn}″</i>	0.0054	0.0038	-	-	0.0079

Table 2. Measurements and (O - C)

WDS 00491+5720						
t	θ_t	ρ_t	n	<i>Obs.</i>	$\Delta\theta$	$\Delta\rho$
1905.6200	39°.1	0".170	3	A	2°.2	-0".021
1915.7000	47.4	0.210	2	A	-3.5	0.023
1925.8200	60.6	0.190	1	A	-4.9	0.006
1929.7100	72.0	0.170	2	A	0.8	-0.014
1947.0100	98.4	0.200	6	WBs	2.6	0.010
1958.0600	109.5	0.210	2	B	-1.1	0.015
1962.6400	115.6	0.200	6	B4,Cou2	-0.9	0.003
1964.7750	128.4	0.170	4	Wor	9.2	-0.027
1991.9043	159.8	0.147	CHARA 3	Har94	-0.2	0.004
WDS 03545+0511						
1908.7800	35.4	0.200	3	A	-0.0	0.001
1919.6600	50.0	0.200	4	A	1.1	0.000
1935.7060	67.2	0.190	4	V	-1.9	-0.004
1938.9320	71.5	0.200	2	B	-1.9	0.008
1944.7600	84.5	0.180	4	V	3.0	-0.005
1991.9047	200.9*	0.129	CHARA 3	Har94	-0.0	0.000
WDS 05244-0224 = McA18 Aab,c						
1975.9564	133.9	0.044	CHARA 3		0.7	-0.008
1976.8575	126.6	0.056	"		-2.0	0.000
1976.8602	128.5	0.057	"		-0.0	0.001
1976.9230	125.9	0.060	"		-2.4	0.004
1977.0869	127.5	0.053	"		0.0	-0.004
1977.7339	123.5	0.059	"		-0.9	0.003
1977.7421	123.0	0.058	"		-1.3	0.002
1978.7513	119.1	0.044	"		0.3	-0.005
1979.0364	118.6	0.053	"		1.7	0.007
1979.7709	118.4	0.042	"		8.0	0.005
1979.7736	111.5	0.037	"		1.1	0.000
1980.0160	105.6	0.032	"		-1.7	-0.001
1985.8542	310.9*	0.056	"		1.4	-0.003
1986.8892	307.0*	0.060	"		1.8	-0.001
1988.2546	296.1*	0.052	"		-3.0	-0.002
1995.9320	128.4	0.067	"		-1.0	0.011

Table 2. (continued)

WDS 07269+2015=CHARA 26						
t	θ_t	ρ_t	n	Obs.	$\Delta\theta$	$\Delta\rho$
1984.0607	128°.1	0".031	CHARA	3	13°.3	-0".001
1985.0000	164.0	0.051	„		2.6	0.010
1986.8867	202.7	0.050	„		- 6.8	-0.005
1988.1648	236.5	0.058	„		0.3	0.005
1988.2520	235.6	0.050	„		-2.5	-0.003
1994.0927	358.6	0.069	„		1.3	0.003
1995.1490	15.4	0.060	„		2.5	-0.003
1995.9215	24.0	0.053	„		-2.1	-0.004
WDS 07305+0743						
1914.90	84.2	0.40	2	A	0.5	0.025
1921.19	80.0	0.40	2	A	-0.5	0.010
1943.98	68.9	0.32	4	Bz	-0.6	-0.057
1947.13	69.9	0.37	3	VBs	2.1	0.002
1950.115	61.2	0.22	1	Mar	-5.0	-0.138
1953.128	54.0	0.3	1	Dom	-10.4	-0.046
1956.19	57.3	0.28	3	Mul	-5.1	-0.053
1958.069	59.1	0.27	4	Bos	-2.0	-0.054
1959.22	60.8	0.32	5	hz	0.5	0.002
1961.51	53.5	0.33	4	VBs	-5.0	0.024
1961.881	58.0	0.27	4	VBs	-0.2	-0.034
1962.13	65.4	0.22	4	Hol	7.4	-0.083
1963.256	55.6	0.25	4	Wor	-1.5	-0.046
1964.19	52.9*	0.34	4	hz	-3.4	0.049
1972.022	48.8	0.23	4	Wor	0.8	-0.010
1978.14	42.8	0.16	3	hz	4.6	-0.033
1979.07	33.0	0.17	2	hz	-3.3	-0.016
1983.0504	25.8	0.158	CHARA	3	0.0	0.006
1983.06	30.3	0.19	2	hz	4.5	0.038
1984.0525	23.1	0.137	CHARA	3	0.7	-0.007
1985.8545	16.4	0.134	„		1.3	0.006
1986.8921	11.6	0.126	„		1.6	0.007
1993.2050	330.2	0.070	„		16.4	-0.001

Table 3a. Ephemeris

	ADS 674		ADS 2849		ADS 6138	
<i>t</i>	θ	ρ	θ	ρ	θ	ρ
1998.0	182° .2	0'' .092	217° .4	0'' .172	132° .5	0'' .071
1999.0	188.9	0.081	219.8	0.145	121.9	0.099
2000.0	197.5	0.071	222.1	0.148	115.8	0.123
2001.0	209.0	0.061	224.3	0.150	111.6	0.145
2002.0	224.4	0.053	226.5	0.153	108.5	0.164
2003.0	243.7	0.049	228.5	0.155	106.0	0.182
2004.0	264.4	0.050	230.6	0.158	103.9	0.198
2005.0	282.5	0.055	232.5	0.161	102.1	0.213
2006.0	296.6	0.064	234.4	0.163	100.8	0.226
2007.0	307.1	0.074	236.2	0.166	99.2	0.239

Table 3b. Ephemeris

	McA 18		CHARA 26	
<i>t</i>	θ	ρ	θ	ρ
1998.0	128° .7	0'' .049	100° .6	0'' .032
1998.5	115.2	0.044	130.0	0.034
1999.0	110.5	0.037	154.4	0.039
1999.5	103.6	0.030	172.4	0.045
2000.0	92.0	0.022	186.1	0.050
2000.5	70.0	0.016	197.7	0.054
2001.0	32.0	0.014	208.2	0.055
2001.5	357.3	0.017	218.4	0.055
2002.0	338.6	0.024	228.8	0.054
2002.5	328.6	0.032	239.7	0.053

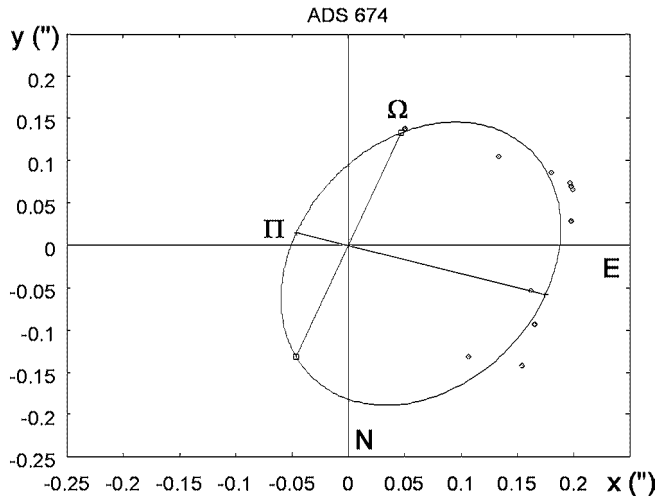


Figure 1.

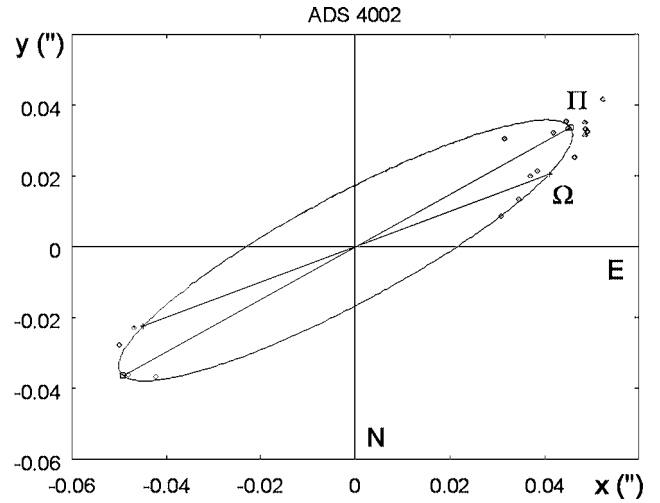


Figure 3.

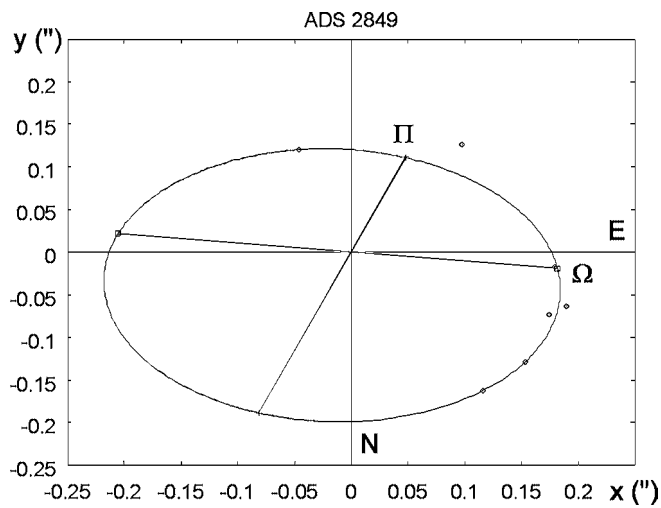


Figure 2.

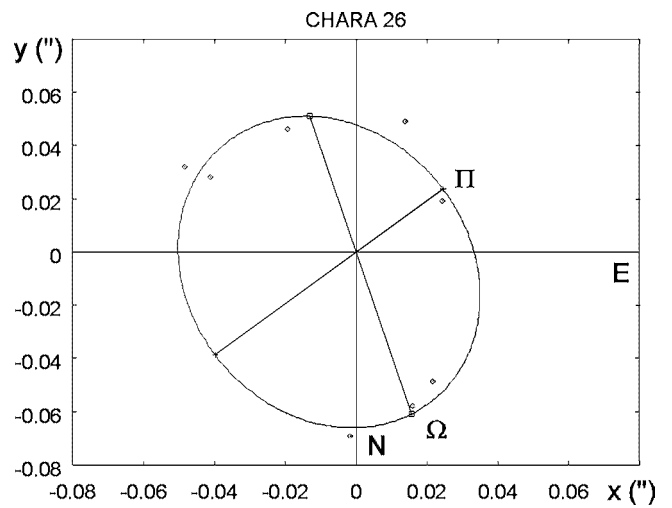


Figure 4.

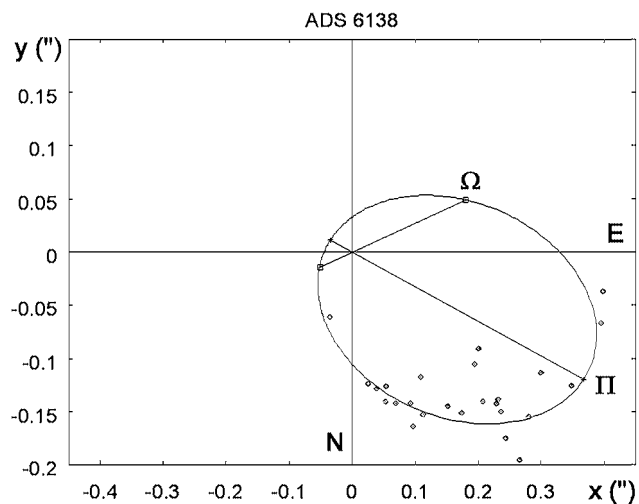


Figure 5.

НОВИ И ПОПРАВЉЕНИ ПУТАЊСКИ ЕЛЕМЕНТИ ПЕТ ДВОЈНИХ ЗВЕЗДА

Д. Олевић и П. Јовановић

Астрономска опсерваторија, Волгина 7, 11160 Београд-74, Југославија

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Претходно саопштење

У раду су дати путањски елементи за пет двојних звезда: ADS 674 A921, ADS 2849 A1831BC, ADS 4002 McA18Aab,c, WDS 07269 +2015 = CHARA 26 и ADS 6138 A2869, одго-

варајуће астрофизичке величине (С,Н) као и масе и динамичке паралаксе за ADS 674, ADS 2849 и ADS 6138.