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ORBITS FOR SIXTEEN BINARIES

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SUMMARY: In this paper orbits for 13 binaries are recalculated and presented. The reason is that recent observations show higher residuals than the corresponding ephemerides calculated by using the orbital elements given in the Sixth Catalog of Orbits of Visual Binary Stars. The binaries studied were: WDS 00182+7257 = A 803, WDS 00335+4006 = HO 3, WDS 00583+2124 = BU 302, WDS 01011+6022 = A 926, WDS 01014+1155 = BU 867, WDS 01112+4113 = A 655, WDS 01361−2954 + HJ 3447, WDS 02333+5219 = STT 42 AB, WDS 04362+0814 = A 1840 AB, WDS 08017−0836 = A 1580, WDS 08277−0425 = A 550, WDS 17471+1742 = STF 2215 and WDS 18025+4414 = BU 1127 Aa-B. In addition, for three binaries - WDS 01532+1526 = BU 260, WDS 02563+7253 =STF 312 AB and WDS 05003+3924 = STT 92 AB - the orbital elements are calculated for the first time. In this paper the authors present not only the orbital elements, but the masses, dynamical parallaxes, absolute magnitudes and ephemerides for the next five years, as well.

Key words. binaries: visual – stars: fundamental parameters

1. INTRODUCTION

The Sixth Catalog of Orbits of Visual Binary Stars (Hartkopf and Mason 2003) contains 2024 orbits for 1888 systems. All of them have been graded on a 1 - 5 scale (1 = definitive, 2 = good, 3 = reliable, 4 = preliminary and 5 = indeterminate). For only a small fraction of them (about 3%) the grade is 1. Many orbits were determined either from old measurements of low precision or from the measurements covering a short orbital arc. Because of this they have low grades and need improvements on the basis of new measurements. Every new measurement should be first compared with the corresponding ephemerides. Recent measurements are largely interferometric, thus of a higher precision and enabling a more accurate orbit determination for binaries.

There are 13 binaries for which we find significant disorepancies between the recent interferometric measurements published in the Fourth Catalog of Interferometric Measurements of Binary Stars (Hartkopf et al. 2003) and the corresponding ephemerides. For this reason their orbits are recalculated. These are the following binaries WDS 00182+7257 = A 803, WDS 01361−2954 + HJ 3447, WDS 02333+5219 = STT 42 AB (orbital elements calculated by B. Novaković), WDS 00335+4006 = HO 3, WDS 00583+2124 = BU 302, WDS 01011+6022 = A 926, WDS 01014+1155 = BU 867, WDS 01112+4113 = A 655, WDS 04362+0814 = A 1840 AB, WDS 08017−0836 = A 1580, WDS 08277−0425 = A 550, WDS 17471+1742 = STF 2215 and WDS 18025+4414 = BU 1127 Aa-B (orbital elements calculated by Z. Cvetković).

There are three additional binaries the orbits of which are calculated for the first time (B. Novaković): WDS 01532+1526 = BU 260, WDS 02563+7253 =STF 312 AB and WDS 05003+3924 = STT 92 AB. Their orbital elements have not been calculated before due to the insufficient number of observations and the short arc.

Our orbital elements for all the 16 binaries have been accepted and published in IAUDS Information Circular No. 158 (Cvetković 2006a) and IAUDS Information Circular No. 159 (Cvetković 2006b, Novaković 2006) and they are already included in the Sixth Catalog of Orbits of Visual Binary Stars.

2. METHOD, RESULTS AND DISCUSSION

2.1 Method

Problems in the calculation of orbital elements for visual binaries arise generally when the observations cover a small orbital arc, or for very close pairs where the observed positions are clustered at one or on both ends of the orbit, and in between the separation ρ is immeasurable because of the geometry. The orbit calculation is then impossible or very difficult and gives unreliable results.

In our calculations, the Kovalski-Olević method (Olević and Cvetković 2004) is applied. It yields solutions also in the cases of clustering of observations along the arc of the apparent orbit. Using the Hipparcos (ESA 1997) trigonometric parallax and two orbital elements obtained here - period P and semimajor axis a - we calculate the total mass by means of the Kepler's third law. In addition, the masses of the components, their absolute magnitudes and the resulting dynamical parallax are also calculated where, provided that a given component belongs to the Main Sequence and its spectral type is known, we apply the mass-luminosity relation according to Angelov (1993). The obtained dynamical parallaxes are compared to the trigonometric ones taken from Hipparcos Catalogue, whereas the total masses obtained dynamically (Kepler's law) are compared to the ones resulting from the mass-luminosity relation. The good agreement indicates the reliability of both the orbital elements obtained here and the trigonometric parallaxes and spectral types.

2.2 Results

The orbital elements (equinox J2000) are listed in Table 1.

In Table 2 the astrophysical and dynamical data are given, namely, apparent magnitudes of components m_A and m_B, and spectral type Sp taken from the WDS Catalog (Mason et al. 2003), absolute magnitudes M_A and M_B, and astrophysical masses of components $\mathcal{M}_A$ and $\mathcal{M}_B$ obtained by applying the mass-luminosity relation, total mass $\mathcal{M}_{\rm dyn}$ calculated from the Kepler's third law, resulting dynamical parallax $\pi_{\rm dyn}$ and trigonometric parallax $\pi_{\rm HIP}$ taken from the Hipparcos Catalogue.

Table 3 contains the observational data used and their residuals. The asterisk (*) indicates observations for which the quadrant is changed (rotation by 180°) in the orbit calculation. The double asterisks (**) indicate the measurements not used in the orbit calculation. In the parentheses we give the ephemerides of the coordinates based on the calculated orbital elements.

Since this table is very large, only a part of it is given herewith; the whole table can be found at the journal's site, given in the footnote.[1]

Finally, Table 4 gives the ephemerides for the interval 2007-2011.

Figs. 1 to 16 give the apparent orbits where the solid curves refer to our orbits and the dashed ones to those published earlier. The solid straight lines are the nodal lines. The old measurements are indicated by crosses, the interferometric ones by filled circles and they are connected with the corresponding ephemerides. The arrows indicate the sense (direct or retrograde) of the companion's revolution around the primary.

2.3 Discussion

WDS 00182+7257 = A 803: From its discovery by Aitken in 1904 at Lick Observatory, 31 measurements of this binary star have been made. The preceding orbit was calculated by Zulević (1996), but it exhibits significant residuals when compared to more recent observations (see Fig. 1). According to our orbital elements and the Hipparcos parallax, the dynamical mass of the system is $3.6\mathcal{M}_\odot$, which is lower than expected for this spectral type, but in view of the errors in the Hipparcos parallax, orbital period and semimajor axis, this value could increase up to $6.9\mathcal{M}_\odot$.

WDS 00335+4006 = HO 3: This binary was discovered by Hough in 1887. The preceding orbital elements were determined by Baize (1991), but the interferometric measurements indicate significant residuals for this orbit. Our orbit achieves a better fit (Fig. 2). The total dynamical mass exceeds the corresponding astrophysical one, obtained assuming that both components belong to the Main Sequence. According to the WDS and Hipparcos Catalogues, the spectral type is F8, whereas the magnitude difference is Δm=1.63. The obtained dynamical parallax is somewhat higher than the trigonometric one.

WDS 00583+2124 = BU 302: This pair was discovered in 1876. From the moment of discovery, the position angle has changed for about 90°, the separation by $0\farcs4$. The orbital elements were determined by Zulević (1997). The ours are significantly different from his elements, yielding a better fit to the observations. The largest difference pertains to the eccentricity: Zulević's value is 0.015, ours 0.665. The spectral type of the pair is A2V, and the mass values obtained for the components are somewhat lower than those expected for Main-Sequence stars of this spectral type, especially in the case of the secondary. The dynamical total mass is as expected.

WDS 01011+6022 = A 926: Its duplicity was discovered by Aitken about 100 years ago. The

[1] http://saj.matf.bg.ac.yu/173/pdf/Table3.pdf

observations cover an arc of about 90°. The preceding orbit was determined by Popović et al. (1997). They found a period of 750 years, whereas we find a value about three times smaller, i.e. 254 years. The star does not belong to the Main Sequence (its spectral type is F5IV). The total dynamical mass is $2.75\mathcal{M}_\odot$.

WDS 01014+1155 = BU 867: The preceding orbit (Baize 1993) and ours do not differ much. The ours yields a better fit to the interferometric measurements. The agreement between the values of dynamical ($\pi_{\rm dyn}$=14.70 mas) and trigonometric ($\pi_{\rm HIP}$=13.85 mas) parallaxes is good. The dynamical mass $2.71\mathcal{M}_\odot$ agrees with that expected for a Main-Sequence F5 star.

WDS 01112+4113 = A 655: The author of the previous orbit is Heintz (1986). The observations cover half of the orbit. Our individual masses and the dynamical total one exceed the values expected for a Main-Sequence G5 star. The dynamical parallax ($\pi_{\rm dyn}$=8.48 mas) and the trigonometric one ($\pi_{\rm HIP}$=7.57 mas) agree well.

WDS 01361−2954 = HJ 3447: This binary star was discovered by J. Herschel in 1835 and up to the present 95 measurements of this binary have been made. The preceding orbit was calculated by Arend and Mouraso (1968), but it exhibits very large residuals for the new measurements. Our orbit solution provides a somewhat better fit. According to our calculation, the dynamical parallax is $\pi_{\rm dyn}$=16.40 mas being in good agreement with the Hipparcos value of $\pi_{\rm HIP}$=16.13±0.97.

WDS 01532+1526 = BU 260: It was discovered by Burnham, and up to now 54 measurements of this binary have been made. Its orbital elements were calculated for the first time by us, in view of a short arc covered by the measurements (30°) this solution should be classified as preliminary.

WDS 02333+5219 = STT 42 AB: This multiple star was discovered by O. Struve, and up to the present 84 measurements of the pair AB have been made. The preceding orbit was calculated by Baize (1986), but the predicted positions show large residuals compared to the interferometric measurements (see Fig. 9). Our solution was calculated from the interferometric measurements only, as, in our opinion, they were more accurate than the old measurements and, therefore, yield a more reliable orbit solution.

WDS 02563+7253 = STF 312 AB: Since 1830, when this multiple star was discovered by F. Struve, 84 measurements of the pair AB have been made. Almost 180 years of observations cover a short arc of 35° that indicates a very long orbital period. Due to the fact that measurements cover a short arc, the orbit of this binary is preliminary.

WDS 04362+0814 = A 1840 AB: For this double star, the preceding orbit was determined by Olević et al. (1993). Both WDS and Hipparcos give for this pair A0 as its spectral type. We find a good agreement between the dynamical and astrophysical total masses, as well as between our dynamical parallax and the trigonometric one. However, for Main-Sequence A0 stars this mass is low, just as the absolute magnitudes calculated herewith do not correspond to the given spectral type.

WDS 05003+3924 = STT 92 AB: This triple star was discovered by O. Struve and, up to the present day, 75 measurements of the pair AB have been made. This is a wide pair with semimajor axis of 5.4 mas. According to our orbital elements and the Hipparcos parallax, the dynamical mass of this triple system (Aa-B) is $9.1\mathcal{M}_\odot$.

WDS 08017−0836 = A 1580: The authors of the preceding orbit are Olević and Jovanović (1997). They found a period of 152.39 years, differing from our value of 255.28. A significant difference arises also in the eccentricity: they obtained 0.786, we 0.232. The dynamical total mass, equal to $17.14\mathcal{M}_\odot$, exceeds the value expected for the spectral type F2-A2. The reason may be the small value of the trigonometric parallax determined with an error of 30% ($\pi_{\rm HIP}$ =3.06±1.04 mas).

WDS 08277−0425 = A 550: In the Sixth Catalog of Orbits of Visual Binary Stars there are two orbits for this pair. One orbit was calculated by Heintz (1986) and the other one by Hartkopf (2000). The difference is in the measured data for the position angle θ where both authors changed quadrants for some values. Our orbit was calculated from the interferometric measurements only, and the obtained orbital elements are closer to those given by Heintz. The spectral type of this pair is F2IV according to WDS, i.e. F0 according to Hipparcos. We find a value of $3.83\mathcal{M}_\odot$ for its dynamical total mass which can be expected for a Main-Sequence star of this spectral type. Besides, this mass value is close to the astrophysical one. For the dynamical parallax we obtain $\pi_{\rm dyn}$=8.69 mas, a value in good agreement with the Hipparcos parallax - $\pi_{\rm HIP}$=8.22±0.87 mas. According to our results, the pair belongs to luminosity class V, rather than to class IV.

WDS 17471+1742 = STF 2215: Since its discovery in 1831, the companion has passed only a short arc of 60° around the primary. The preceding orbit was calculated by Popović and Pavlović (1995) who found a period of 853.14 years. Our result is 1062.47 years and this orbit yields a better fit to the interferometric measurements (Fig. 15). The dynamical total mass is small for an A1V star. Most likely, the reason may lie in the trigonometric parallax being twice the dynamical one.

WDS 18025+4414 = BU 1127 Aa-B: The spectral type of this pair is F5V according to WDS, i.e. F2 according to Hipparcos. We find good agreement between our dynamical parallax, $\pi_{\rm dyn}$=12.65 mas, and the trigonometric one, $\pi_{\rm HIP}$=12.75±0.79 mas, as well as between the dynamical ($2.58\mathcal{M}_\odot$) and astrophysical ($2.63\mathcal{M}_\odot$) total masses indicating a good quality of orbital elements, especially when borne in mind that an arc of only 85° is covered by observations.

Table 1. Orbital elements.

Name WDS	ADS HIP	P[yr]	T	a[″]	e	i[°]	Ω[°]	ω[°]
A 803	243	247.63	2053.72	0.367	0.392	68.6	151.2	243.0
00182+7257	1461	±5.08	±3.70	±0.026	±0.035	±1.3	±1.1	±5.3
HO 3	463	64.53	1984.84	0.388	0.290	111.6	116.5	143.1
00335+4006	2643	±0.54	±0.59	±0.017	±0.030	±0.9	±1.1	±3.4
BU 302	805	331.97	2017.54	0.651	0.665	48.1	17.2	252.2
00583+2124	4558	±3.33	±2.99	±0.046	±0.028	±1.2	±2.2	±3.7
A 926	832	253.99	2131.63	0.318	0.388	32.3	74.2	85.7
01011+6022	4755	±7.07	±3.02	±0.016	±0.027	±3.4	±6.0	±8.6
BU 867	828	239.84	2000.55	0.745	0.222	102.6	173.4	160.8
01014+1155	4775	±8.14	±7.72	±0.040	±0.033	±0.8	±1.0	±10.8
A 655	974	153.09	2040.76	0.338	0.185	53.1	157.5	290.5
01112+4113	5553	±4.78	±2.97	±0.007	±0.012	±0.8	±1.1	±5.3
HJ 3447	-	1503.58	2039.79	3.155	0.604	55.6	69.6	140.2
01361−2954	7463	±35.32	±33.80	±0.132	±0.019	±0.8	±0.8	±2.8
BU 260	1503	931.05	2804.38	1.303	0.262	71.8	73.0	119.9
01532+1526	8810	±31.30	±2.36	±0.100	±0.007	±0.3	±0.2	±2.5
STT 42 AB	1938	297.72	1985.66	0.295	0.353	80.3	96.1	222.4
02333+5219	11889	±11.35	±11.38	±0.004	±0.009	±0.1	±0.1	±1.2
STF 312 AB	-	2037.66	2137.36	3.880	0.506	59.8	14.5	115.6
02563+7253	13677	±58.53	±52.99	±0.042	±0.006	±0.2	±0.2	±0.6
A 1840 AB	3326	128.58	2003.60	0.222	0.551	133.0	62.4	62.8
04362+0814	21434	±3.26	±2.69	±0.014	±0.036	±1.6	±2.8	±4.4
STT 92 AB	3589	1598.04	3242.73	5.379	0.536	56.1	155.4	333.4
05003+3924	23261	±50.35	±8.96	±0.388	±0.031	±0.8	±0.7	±4.5
A 1580	6526	255.28	2013.03	0.318	0.232	56.5	104.6	202.9
08017−0836	39264	±5.66	±5.12	±0.007	±0.024	±1.2	±2.5	±5.1
A 550	6825	21.23	1981.30	0.099	0.866	149.6	71.6	82.1
08277−0425	41489	±0.23	±0.29	±0.003	±0.191	±12.4	±24.7	±29.4
STF 2215	10795	1062.47	2066.49	0.838	0.397	132.2	105.5	270.6
17471+1742	87044	±12.70	±11.67	±0.006	±0.004	±0.5	±1.5	±2.3
BU 1127 Aa-B	11010	270.82	2102.72	0.732	0.365	150.9	142.5	239.1
18025+4414	88350	±4.14	±2.12	±0.047	±0.027	±2.9	±4.7	±5.7

Table 2. Astrophysical and dynamical data.

Name WDS	m_A - m_B	Sp.	M_A	M_B	$\mathcal{M}_A[\mathcal{M}_\odot]$	$\mathcal{M}_B[\mathcal{M}_\odot]$	$\mathcal{M}_{\rm dyn}[\mathcal{M}_\odot]$	$\pi_{\rm dyn}$[mas]	$\pi_{\rm HIP}$[mas]
A 803 00182+7257	8.10 - 8.40	A6III	-	-	-	-	3.62	-	6.06±0.75
HO 3 00335+4006	8.09 - 9.72	F8	4.57	6.20	1.04	0.77	3.03	19.80	16.68±1.62
BU 302 00583+2124	6.60 - 8.77	A2V	1.38	3.55	2.08	1.34	5.67	9.02	7.62±1.03
A 926 01011+6022	9.23 - 8.65	F5IV	-	-	-	-	2.75	-	5.65±1.70
BU 867 01014+1155	8.23 - 9.34	F5	4.07	5.18	1.23	1.04	2.71	14.70	13.85±1.51
A 655 01112+4113	8.35 - 9.36	G5	2.99	4.00	1.48	1.24	3.80	8.48	7.57±1.51
HJ 3447 01361−2954	5.97 - 7.35	F2V	2.04	3.42	1.79	1.37	3.31	16.40	16.13±0.97
BU 260 01532+1526	8.75 - 8.97	F5	3.76	3.98	1.29	1.25	2.05	10.03	10.76±2.31
STT 42 AB 02333+5219	7.11 - 8.03	A2IV	-	-	-	-	3.03	-	4.57±0.70
STF 312 AB 02563+7253	8.16 - 8.93	G0	4.51	5.28	1.15	1.02	3.29	18.65	16.23±1.34
A 1840 AB 04362+0814	8.37 - 8.91	A0	2.24	2.78	1.68	1.48	2.54	5.94	6.38±1.32
STT 92 AB 05003+3924	6.02 - 9.50	-	3.43	6.91	1.36	0.82	9.08	30.36	18.86±1.26
A 1580 08017−0836	7.81 - 8.70	F5-A2	1.32	2.21	2.11	1.72	17.14	5.05	3.06±1.04
A 550 08277−0425	7.47 - 7.91	(F0) F2IV	2.16	2.60	1.70	1.54	3.83	8.69	8.22±0.87
STF 2215 17471+1742	6.02 - 6.89	A1V	−0.87	0.00	4.15	3.07	0.75	4.18	8.86±0.82
BU 1127 Aa-B 18025+4414	7.31 - 9.20	F5V	2.82	4.71	1.52	1.11	2.58	12.65	12.75±0.79

Table 3. Observations and residuals.

WDS 00335+4006 = ADS 463 = HO 3 = HIP 2643

t	θ	ρ	n	Obs.	$\Delta\theta$	$\Delta\rho$
1887.37**	121.3	0.40	2	Ho, 2 Sp	-11.7	-0.006
1894.88	-	-	1	Ho	(122.0	0.473)
1896.10**	113.3	0.30	2	Sp	-6.9	-0.174
1906.03	-	-	1	A, 3 Dool	(104.3	0.353)
1948.79	137.8	0.340	2	VBs	-1.7	-0.014
1954.98	130.1	0.490	3	Cou	2.0	0.045
1962.40	118.0	0.470	3	Cou, 4 Bz	0.0	0.000
1970.38	103.8	0.350	3	Cou, 4 Wor	-0.9	-0.008
1985.8401	305.7	0.267	1	McA1987b	-1.1	0.015
1986.79	302.7	0.260	2	McA	0.0	-0.010
1987.7543	299.8	0.262	1	McA1989	0.9	-0.021
1988.6552	295.8	0.277	1	McA1990	0.1	-0.013
1991.2500	286.0	0.287	1	HIP1997a	-0.6	-0.001
1991.9016	284.4	0.274	1	Hrt1994	0.2	-0.008
1993.9194	275.8	0.245	1	Hrt1997	-0.2	-0.012
1994.7084	273.4	0.251	1	Hrt2000a	1.1	0.007
1995.7679	265.7	0.239	1	Hrt1997	-0.9	0.013
1996.6909	261.4	0.218	1	Hrt2000a	0.5	0.008

Table 4. Ephemerides.

WDS	2007		2008		2009		2010		2011	
	$\theta[^\circ]$	$\rho['']$	$\theta[^\circ]$	$\rho['']$	$\theta[^\circ]$	$\rho['']$	$\theta[^\circ]$	$\rho['']$	$\theta[^\circ]$	$\rho['']$
00182+7257	307.4	0.256	308.4	0.259	309.3	0.261	310.3	0.264	311.2	0.266
00335+4006	163.1	0.225	157.7	0.245	153.1	0.266	149.2	0.287	145.9	0.308
00583+2124	203.0	0.279	206.0	0.267	209.4	0.255	213.1	0.242	217.3	0.229
01011+6022	341.0	0.373	341.8	0.372	342.6	0.372	343.4	0.372	344.2	0.372
01014+1155	354.2	0.582	353.6	0.585	353.1	0.586	352.6	0.587	352.1	0.587
01112+4113	343.4	0.335	344.9	0.331	346.4	0.326	347.9	0.321	349.4	0.316
01361−2954	181.0	0.803	182.6	0.806	184.3	0.809	185.9	0.812	187.6	0.816
01532+1526	259.4	1.098	259.6	1.098	259.8	1.097	260.0	1.096	260.1	1.095
02333+5219	37.2	0.042	45.7	0.047	52.5	0.052	58.0	0.058	62.4	0.065
02563+7253	42.8	1.889	43.2	1.876	43.5	1.863	44.0	1.850	44.3	1.837
04362+0814	317.5	0.075	304.5	0.082	293.9	0.090	285.2	0.100	278.1	0.111
05003+3924	280.8	4.060	280.9	4.071	281.1	4.082	281.4	4.093	281.6	4.105
08017−0836	289.5	0.243	290.8	0.242	292.1	0.240	293.4	0.238	294.8	0.236
08277−0425	190.8	0.125	186.7	0.137	183.1	0.145	179.8	0.152	176.8	0.156
17471+1742	253.5	0.480	252.9	0.477	252.2	0.473	251.5	0.470	250.9	0.466
18025+4414	56.4	0.819	55.6	0.817	54.7	0.814	53.8	0.811	52.9	0.808

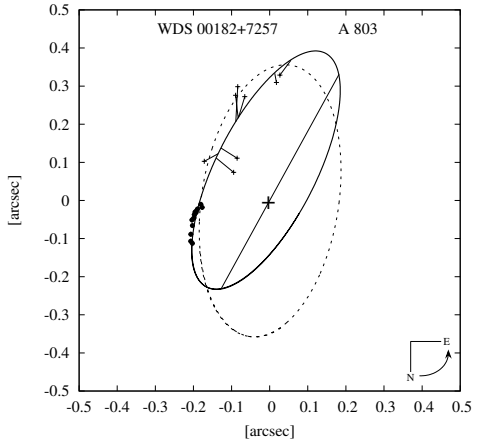

Fig. 1. *Orbit of WDS 00182+7257.*

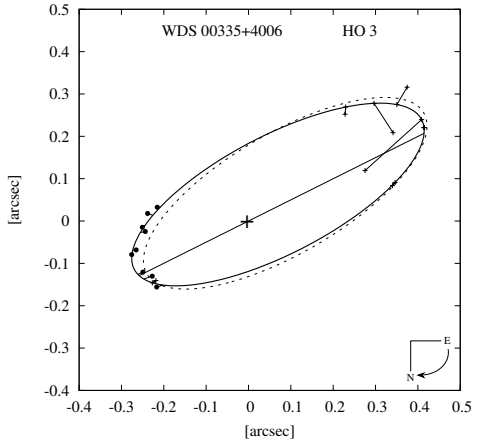

Fig. 2. *Orbit of WDS 00335+4006.*

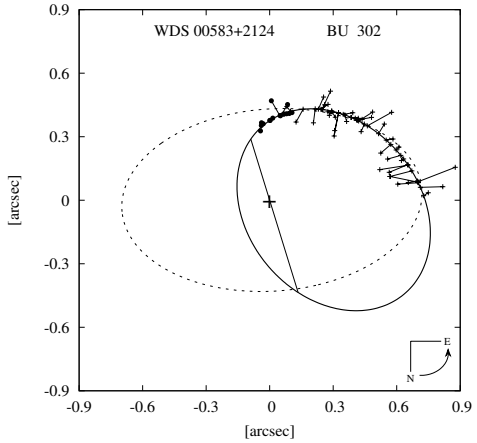

Fig. 3. *Orbit of WDS 00583+2124.*

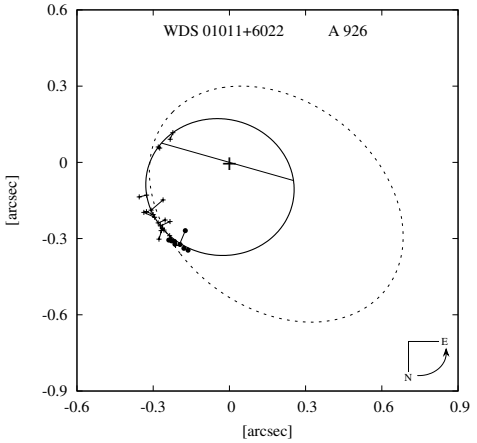

Fig. 4. *Orbit of WDS 01011+6022.*

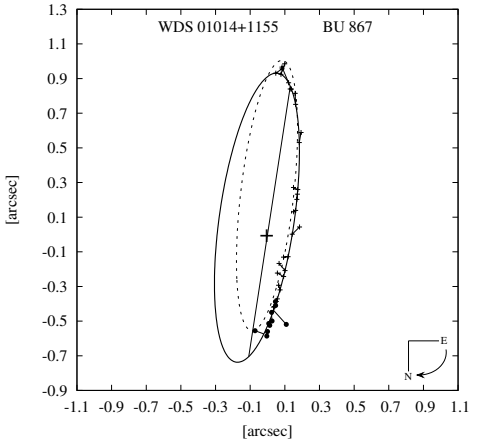

Fig. 5. *Orbit of WDS 01014+1155.*

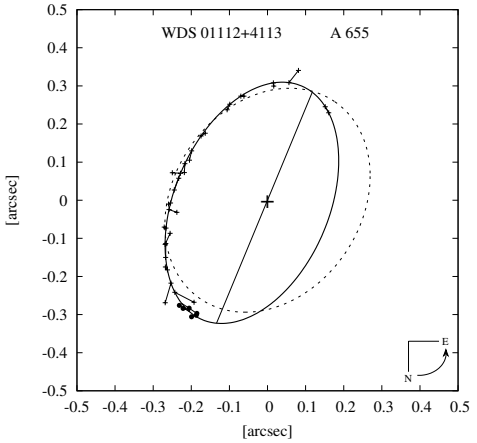

Fig. 6. *Orbit of WDS 01112+4113.*

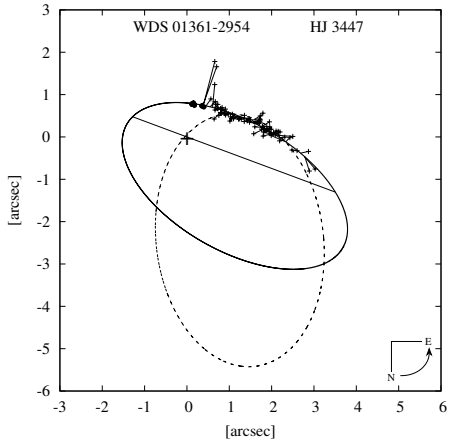

Fig. 7. *Orbit of WDS 01361−2954.*

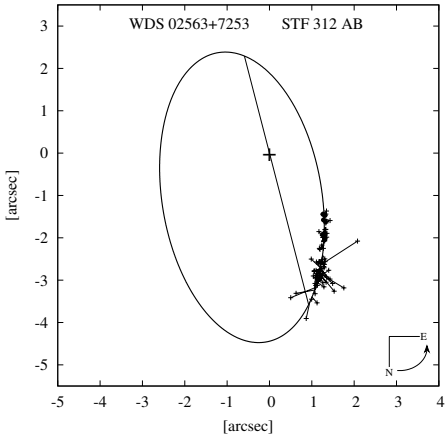

Fig. 10. *Orbit of WDS 02563+7253.*

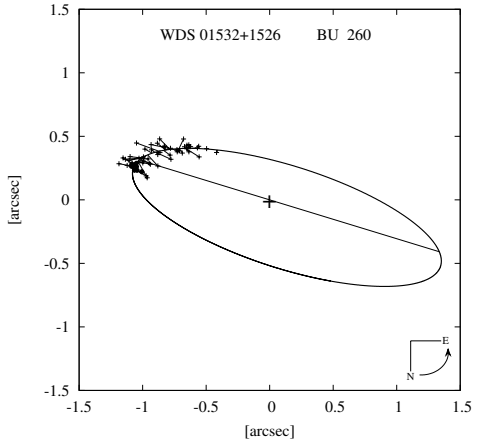

Fig. 8. *Orbit of WDS 01532+1526.*

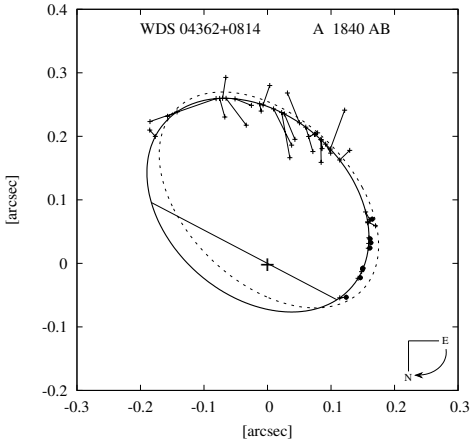

Fig. 11. *Orbit of WDS 04362+0814.*

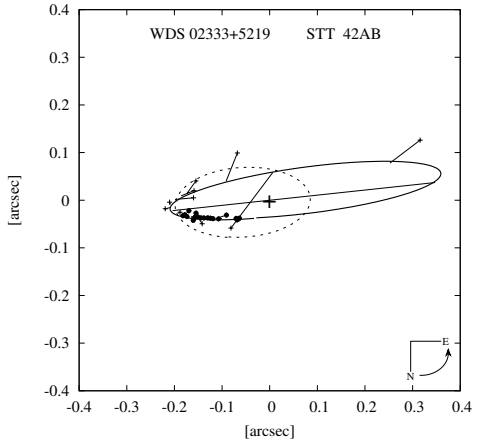

Fig. 9. *Orbit of WDS 02333+5219.*

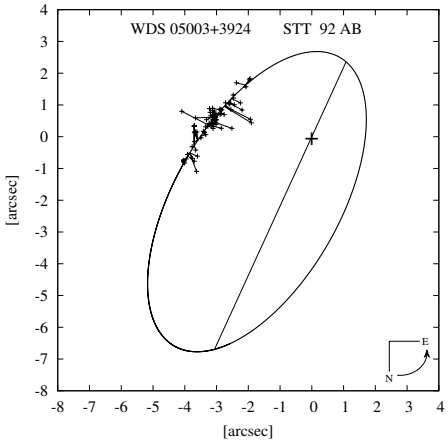

Fig. 12. *Orbit of WDS 05003+3924.*

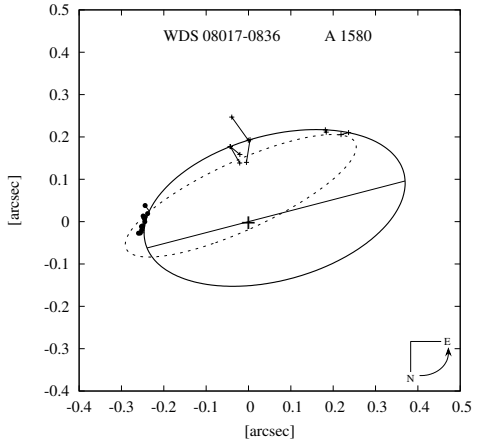

Fig. 13. *Orbit of WDS 08017−0836.*

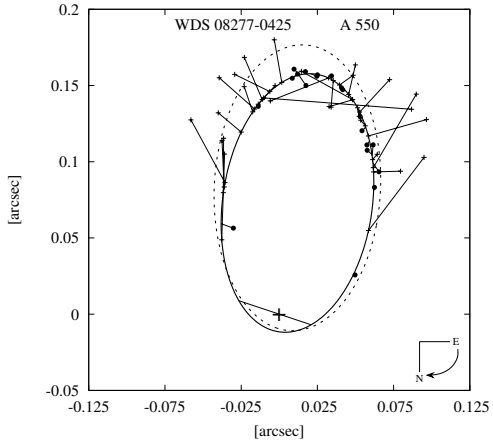

Fig. 14. *Orbit of WDS 08277−0425.*

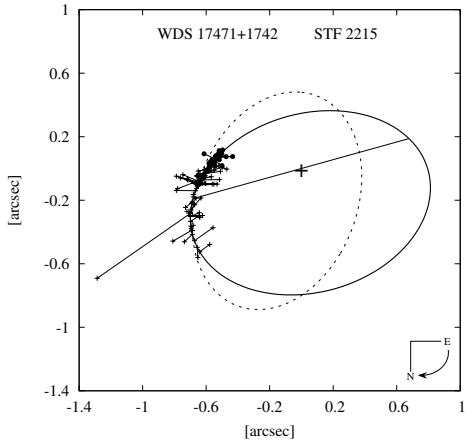

Fig. 15. *Orbit of WDS 17471+1742.*

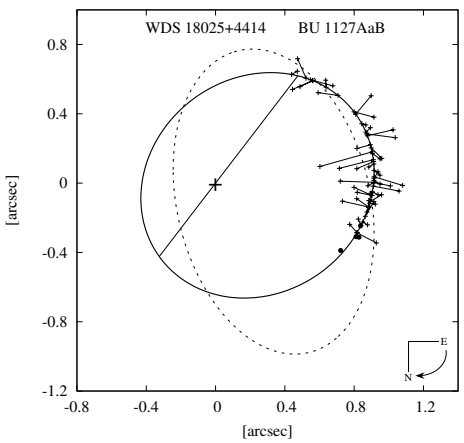

Fig. 16. *Orbit of WDS 18025+4414.*

3. CONCLUSION

For the recalculated orbits our solutions yield, in every case, improvements in comparison to those published earlier, i.e. they yield better fits to more recent measurements. For two binaries we find a significant disagreement between the total masses determined dynamically and the ones determined astrophysically, the influence of errors in the orbital elements being much smaller than that due to the uncertainty of trigonometric parallax. The mass-luminosity relation used here is valid for Main-Sequence stars only, hence, another source of discrepancy may lie the fact that the spectral type is not known for both components. The three new orbits are preliminary.

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ОРБИТЕ ШЕСНАЕСТ ДВОЈНИХ ЗВЕЗДА

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Оригинални научни рад

У овом раду дате су поново израчунате орбите за 13 двојних звезда зато што новија посматрања имају већа одступања од одговарајућих ефемеридских вредности рачунатих на основу њихових орбиталних елемената садржаних у Sixth Catalog of Orbits of Visual Binary Stars. То су двојне звезде: WDS 00182+7257 = A 803, WDS 00335+4006 = HO 3, WDS 00583+2124 = BU 302, WDS 01011+6022 = A 926, WDS 01014+1155 = BU 867, WDS 01112+4113 = A 655, WDS 01361−2954 = HJ 3447, WDS 02333+5219 = STT 42 AB, WDS 04362+0814 = A 1840 AB, WDS 08017−0836 = A 1580, WDS 08277−0425 = A 550, WDS 17471+1742 = STF 2215 и WDS 18025+4414 = BU 1127 Aa-B. Такође су, први пут, израчунати орбитални елементи за 3 двојне звезде, WDS 01532+1526 = BU 260, WDS 02563+7253 = STF 312 AB и WDS 05003+3924 = STT 92 AB. У раду су, осим орбиталних елемента, дате њихове масе, динамичке паралаксе, апсолутне величине и ефемериде за наредних пет година.