SPECKLE INTERFEROMETRY AT THE OBSERVATORIO ASTRONÓMICO NACIONAL. VI.

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RESUMEN

Presentamos mediciones de estrellas dobles mediante interferometría de motas, obtenidas en agosto de 2010 con el telescopio de 1.5 m y en mayo de 2010 con el telescopio de 2.1 m del Observatorio Astronómico Nacional en SPM (México). Reportamos los resultados de 331 mediciones de 321 sistemas, con una magnitud límite para las primarias de $V = 12.9$. Las separaciones angulares medidas están comprendidas entre 0.13 y 7.39 segundos de arco. 269 pares resultaron tener separaciones de menos de 1 segundo de arco. El error medio en las separaciones es de 0.032 segundos de arco, y en los ángulos de posición, 2 grados. La ambigüedad usual de 180 grados en los ángulos de posición fue corregida para la mayoría de ellos usando observaciones de otros autores.

ABSTRACT

We present speckle interferometric measurements of double stars performed during August of 2010 with the 1.5 m telescope and during May of 2010 with the 2.1 m telescope of the Observatorio Astronómico Nacional at SPM (México). We report here the results of 331 measurements of 321 systems with a primary limiting magnitude of $V = 12.9$. The measured angular separations range from $0''.13$ to $7''.39$. Two hundred and sixty-nine pairs have separations less than $1''$. The mean error in separation is $0''.032$ and $2°$ in position angle. The usual $180°$ ambiguity was corrected for the majority of position angles by comparison with observations performed by other observers.

Key Words: binaries: visual — stars: fundamental parameters — techniques: high angular resolution — techniques: interferometric

1. INTRODUCTION

This is the sixth paper in the series of publications presenting the results of speckle interferometric observations of double stars performed with telescopes of the Observatorio Astronómico Nacional (OAN) of the Instituto de Astronomía Universidad Nacional Autónoma de México. Regular speckle interferometric measurements of double stars have been made with OAN telescopes since 2008 (Orlov et al. 2009). This paper presents the results of double star observations carried out with the 1.5 m and the 2.1 m telescopes of Sierra San Pedro Mártir National Astronomical Observatory (OAN-SPM) in May and August of 2010. During the observations we used only one broadband filter $R(630/120 \text{ nm})$.

2. OBSERVATIONS AND RESULTS

The observations were performed at the 1.5 m telescope and 2.1 m telescope of the OAN which are located at the OAN-SPM (Mexico).

For these observations we used the DRAGON equipment (Voitsekhovich et al. 2005), which was slightly modified to be able to record speckle inter-

TABLE 1

DISTRIBUTION OF PAIRS BY THEIR SEPARATIONS

$>1''.5$	$1''.5-1''$	$1''-0''.5$	$0''.5-0''.25$	$<0.''25$
29	33	144	102	23

TABLE 2

SPECKLE MEASUREMENTS ON THE 2.1M TELESCOPE

WDS (2000)	Discoverer designation	Epoch +2010	θ (deg)	σ_θ (deg)	ρ (arcsec)	σ_ρ (arcsec)	$\theta_O - \theta_C$ (deg)	$\rho_O - \rho_C$ (arcsec)	Ref.
10192 + 2034	STF1423	0.3524	325.5	1.0	0.71	0.03	0.93	0.04	(Mason et al. 2004)
10261 + 1821	COU 291	0.3470	66.4	1.1	0.81	0.03			
10262 + 0356	BU 1280 BC	0.3524	44.7	0.8	0.71	0.03			
10320 + 0831	YSC 39	0.3524	44.9	0.8	0.81	0.04			
10343 + 1802	YSC 40	0.3442	237.6	0.9	0.40	0.02			
10401 + 1914	PER 2 AB	0.3470	218.6	1.6	0.46	0.04			
10417 + 1044	STT 227	0.3443	2.9	0.1	0.89	0.01			
10432 + 0440	A 2769	0.3524	207.4	0.6	0.47	0.02			
10454 + 0759	HDS1537	0.3443	277.4	1.2	1.07	0.05			
10474 + 0236	HDS1542	0.3470	67.2	0.3	0.56	0.01			
10488 + 0124	A 2572	0.3525	120.5	0.7	0.82	0.02			
10510 + 0502	HDS1549	0.3525	354.0	1.8	0.51	0.03			
10515 + 0756	HDS1550	0.3443	4.9	1.2	0.70	0.04			
10539 + 1706	HDS1559	0.3470	335.1	0.5	0.48	0.02			
10543 + 0737	HDS1560	0.3443	237.3	2.2	0.57	0.03			
10544 + 2044	HU 568	0.3416	353.2	0.6	0.68	0.03			
10548 + 2345	BU 597	0.3416	44.4	0.5	1.02	0.03			
10574 + 0147	HEI 763	0.3470	250.6	0.3	0.80	0.02			
10585 + 1711	A 2375	0.3416	175.6	0.7	0.50	0.03	0.88	0.03	(Docobo & Ling 2009)
10596 + 1800	HDS1568	0.3416	55.5	12.9	0.16	0.03			
11003 + 1926	A 2376	0.3525	14.1	1.5	0.17	0.05			
11003 + 2241	TDS7602	0.3416	116.6	0.9	0.62	0.03			
11008 + 2913	COU 960	0.3416	111.5	2.8	0.27	0.15			
11014 + 1235	HEI 155	0.3417	65.9	0.5	0.77	0.01			
11018 + 1903	HDS1575	0.3525	108.3	1.0	0.28	0.02			
11053 + 1635	A 2378	0.3443	143.0	1.5	0.41	0.02			
11065 + 2653	A 1775	0.3525	85.3	4.4	0.20	0.01			
11104 + 1110	HDS1591	0.3525	40.5	2.9	0.63	0.19			
11104 + 1502	HEI 61	0.3525	82.1	3.7	0.28	0.02			
11126 + 2839	COU 389	0.3443	167.2	0.4	0.93	0.02			
11131 + 1646	COU 295	0.3525	167.0	3.5	0.27	0.04			
11144 + 1531	BU 1283	0.3470	173.9	1.6	0.29	0.03			
11163 + 0915	HDS1606	0.3471	259.0	2.0	0.53	0.03			
11172 + 0745	HDS1609	0.3443	196.8	0.7	0.94	0.04			
11182 + 1638	A 2379 BC	0.3417	286.0	0.9	0.41	0.03			
11208 + 2402	TDS7805	0.3417	317.8	5.9	0.84	0.05			
11243 + 1354	HDS1622	0.3417	36.0	1.2	0.82	0.04			
11254 + 0607	HDS1624	0.3417	11.5	1.8	0.52	0.05			
11265 + 0806	A 2575	0.3417	46.1	0.6	0.42	0.03	−15.68	0.17	(Seymour et al. 2002)
11290 + 0105	RST5354	0.3443	292.0	0.5	0.87	0.03			
11290 + 1555	HDS1629	0.3417	318.9	14.0	0.49	0.25			
11292 + 0606	HEI 851	0.3471	143.9	0.7	0.94	0.03			
11301 + 2237	A 2484	0.3471	161.3	0.8	0.55	0.02			
11341 + 1453	HDS1641	0.3525	262.1	1.4	0.49	0.03			
11361 + 1251	STF1554	0.3525	208.7	1.1	0.26	0.06	−4.90	−0.01	(Zirm & Rica 2010)
11392 + 2640	HDS1651	0.3526	216.9	0.4	0.84	0.02			
11402 + 2609	HDS1652	0.3526	273.1	7.6	0.55	0.12			
11428 + 2105	HU 888	0.3418	176.2	0.3	0.56	0.02			
11460 + 0746	A 2778	0.3444	192.0	0.6	0.44	0.04			
11468 + 1500	BU 602	0.3526	124.9	0.9	0.53	0.03			
11476 + 1514	TDS 646	0.3418	170.6	0.4	0.73	0.02			
11500 + 1030	HEI 505	0.3471	347.3	0.2	1.41	0.01			
11524 + 1428	HDS1675	0.3471	47.4	40.3	0.13	0.08			
11591 + 0601	HDS1687	0.3444	122.1	1.0	0.42	0.03			
12006 + 0119	TDS8161	0.3444	187.2	1.1	0.45	0.03			
12046 + 2232	COU 92	0.3418	106.8	0.1	1.06	0.00			
12064 + 1812	HDS1708	0.3526	304.7	2.7	0.39	0.03			
12093 + 1525	A 2056	0.3526	305.0	1.2	0.61	0.04			
12111 + 1228	HDS1719	0.3472	92.5	2.1	0.56	0.03			
12154 + 4008	A 1999	0.3418	64.0	15.1	0.22	0.02	−7.45	−0.04	(Rica Romero 2013)
12194 + 1744	A 2059	0.3526	33.9	3.2	0.45	0.11			
12231 + 0651	TDS8361	0.3526	68.8	1.3	0.49	0.03			

TABLE 2 (CONTINUED)

WDS (2000)	Discoverer designation	Epoch +2010	θ (deg)	σ_θ (deg)	ρ (arcsec)	σ_ρ (arcsec)	$\theta_O - \theta_C$ (deg)	$\rho_O - \rho_C$ (arcsec)	Ref.
12345 + 0558	BU 797 AB	0.3418	146.3	0.8	0.61	0.02			
12400 + 1239	HDS1774	0.3527	65.4	4.1	0.42	0.03			
12422 + 1431	HU 892	0.3472	183.4	0.3	0.62	0.02			
12429 + 0516	A 1602	0.3445	27.2	0.4	0.56	0.03	−7.57	0.07	(Ling 2004)
12444 + 2713	COU 597	0.3527	101.6	1.2	0.30	0.03			
12507 + 2032	HU 640	0.3527	227.1	0.8	0.43	0.03	−14.02	0.05	(Baize 1984)
12516 + 0911	HEI 771	0.3445	246.6	0.1	1.24	0.00			
12526 + 2342	COU 396	0.3527	313.9	0.9	0.90	0.04			
12542 + 1119	HDS1810	0.3445	329.9	12.4	0.32	0.04			
12575 + 2457	COU 397	0.3527	60.0	0.4	0.69	0.03			
12586 + 4951	HEI 163	0.3472	234.8	0.4	0.95	0.01			
12592 + 1454	HDS1822	0.3527	67.0	1.3	0.40	0.02			
13026 + 2318	COU 95	0.3527	286.6	0.7	0.70	0.03			
13029 + 1328	STF1711	0.3418	333.4	1.2	0.37	0.02	−0.28	−0.01	(Zirm 2014)
13069 + 5200	A 1605	0.3473	348.6	0.2	1.06	0.01			
13091 + 2127	HU 572	0.3418	342.3	9.0	0.44	0.08	−0.35	−0.03	(Rica Romero & Zirm 2012)
13134 + 5252	A 1607	0.3473	11.8	0.7	0.47	0.03			
13183 + 4736	VBS 21	0.3473	320.7	0.1	0.86	0.01			
13189 + 0030	A 2585 AB	0.3445	216.8	0.3	0.83	0.02			
13222 + 2710	A 565	0.3528	16.7	0.9	0.78	0.04			
13225 + 4242	COU1581	0.3418	157.3	4.7	0.34	0.05			
13232 + 4822	COU1912	0.3419	155.7	0.4	0.43	0.03			
13258 + 4430	A 1609 AB	0.3473	35.9	0.4	0.44	0.02	−0.17	−0.01	(Heintz 1991)
13258 + 4430	A 1609 AB,C	0.3473	218.8	1.0	2.42	0.05			
13262 + 0345	HEI 773	0.3446	73.0	0.4	0.89	0.01			
13293 + 4847	COU1914	0.3473	183.4	0.6	0.50	0.03			
13336 + 6047	HDS1903	0.3473	158.3	42.9	0.18	0.21			
13359 + 1858	COU 300	0.3528	15.8	0.7	0.95	0.05			
13368 + 0650	A 1611	0.3446	121.7	0.2	0.86	0.01			
13387 + 3823	COU1429 AB	0.3419	64.6	1.4	0.65	0.05			
13387 + 4126	COU1584	0.3419	110.0	1.3	0.60	0.04			
13398 + 3625	COU1264	0.3419	258.0	1.0	0.40	0.02			
13400 + 3759	HU 897 AB	0.3473	50.6	1.6	0.36	0.02			
13478 + 0120	A 2492	0.3446	199.6	0.4	0.93	0.04			
13514 + 2620	YSC 50 Aa,Ab	0.3419	216.6	3.0	0.28	0.03			
13524 + 3851	TDS9012	0.3473	280.1	0.5	0.63	0.02			
13539 + 1008	BU 614 AB	0.3420	104.9	0.7	0.44	0.03	10.96	0.26	(Zirm 2002)
13554 + 5002	COU2689	0.3474	325.8	0.5	0.65	0.03			
13563 + 0517	STT 273 AB	0.3528	112.0	0.1	1.00	0.01			
13570 + 0118	TDS9042	0.3446	283.5	0.3	0.97	0.02			
13578 + 0610	YSC 51	0.3528	149.2	5.6	0.24	0.04			
13583 + 0213	A 2167	0.3446	97.2	3.7	0.21	0.01	−2.46	0.01	(Hartkopf & Mason 2010)
13584 + 1120	HDS1959	0.3420	180.4	2.7	0.24	0.03			
14001 + 0416	HDS1965	0.3446	332.7	3.3	0.16	0.05			
14012 + 2522	A 569	0.3420	145.9	0.6	0.59	0.02			
14020 + 5713	A 1097 AB	0.3474	253.7	0.6	0.42	0.02	3.27	−0.02	(Scardia 2000)
14029 + 2434	COU 301	0.3528	125.5	1.6	0.90	0.13			
14059 + 4059	COU1585	0.3474	214.4	0.5	0.90	0.03			
14087 + 3341	HU 742	0.3420	347.4	3.1	0.25	0.03	−3.36	0.00	(Rica Romero 2012)
14109 + 1513	HDS1989 Aa,Ab	0.3420	356.1	2.7	0.41	0.03			
14124 + 0352	A 1797	0.3528	136.8	2.5	0.26	0.04			
14128 + 1104	A 1099	0.3529	66.4	15.5	0.21	0.14			
14142 + 2642	STF1817	0.3420	335.8	1.4	0.17	0.02	−3.18	−0.10	(Zirm 2014)
14148 + 0015	RST5383	0.3447	43.3	1.1	0.57	0.03			
14185 + 0917	HDS2015	0.3529	332.5	3.7	0.40	0.03			
14216 + 1315	HEI 531	0.3529	258.8	0.1	1.32	0.00			
14222 + 0513	HDS2023	0.3447	130.0	2.2	0.39	0.03			
14234 + 4736	A 149 AB	0.3474	123.9	0.3	0.78	0.02			
14289 + 4226	COU1758	0.3474	146.5	0.4	0.57	0.02			
14293 + 0018	HDS2043 Aa,Ab	0.3447	50.7	0.7	0.61	0.03			
14340 + 4500	COU1587	0.3474	26.6	0.2	0.75	0.02			
14372 + 5214	MLR 682	0.3474	291.7	0.4	0.81	0.02			
14417 + 0932	STF1866	0.3529	203.6	0.2	0.73	0.02			
14443 + 5420	A 1624	0.3474	182.7	0.6	1.08	0.06			

TABLE 2 (CONTINUED)

WDS (2000)	Discoverer designation	Epoch +2010	θ (deg)	σ_θ (deg)	ρ (arcsec)	σ_ρ (arcsec)	$\theta_O - \theta_C$ (deg)	$\rho_O - \rho_C$ (arcsec)	Ref.
14456 + 1229	HDS2078	0.3529	42.0	1.2	0.55	0.04			
14487 + 4513	TDS9314	0.3474	273.6	0.2	0.74	0.01			
14491 + 0756	HDS2089	0.3447	352.6	1.6	0.43	0.04			
14565 + 0255	A 2172	0.3529	137.4	5.6	0.17	0.02	7.42	0.01	(Hartkopf & Mason 2010)
14571 + 5136	TDS9350	0.3475	122.6	0.1	0.90	0.01			
14590 + 0059	A 2173	0.3447	310.4	6.0	0.27	0.03			
14590 + 1732	A 2072	0.3529	237.0	0.4	0.68	0.02			
14595 + 1753	COU 188	0.3529	227.2	1.9	0.25	0.06			
15038 + 2006	HU 744	0.3420	353.2	2.3	0.95	0.04			
15056 + 1138	STF1907	0.3420	349.6	0.2	0.89	0.01			
15100 + 2751	COU 410	0.3530	152.5	1.4	0.28	0.02			
15110 + 0151	TDS9433	0.3448	177.0	7.4	0.15	0.07			
15118 + 0214	HDS2136	0.3448	27.4	0.7	0.58	0.04			
15143 + 1959	COU 27 AB	0.3530	94.4	0.1	1.17	0.00			
15151 + 3650	STT 295	0.3421	150.9	3.7	0.29	0.05	−1.22	0.00	(Zirm 2014)
15163 + 3831	COU1137	0.3421	45.0	1.5	0.59	0.04			
15175 + 4804	COU1762	0.3475	70.1	0.2	1.11	0.00			
15186 + 2356	COU 307	0.3530	3.4	2.2	0.35	0.03	−10.87	0.04	(Couteau 1999)
15192 + 4329	A 1630	0.3421	244.2	1.2	0.78	0.02			
15212 + 0523	HDS2159	0.3448	274.0	51.4	0.42	0.14			
15226 + 0720	TDS9498	0.3448	33.1	0.9	0.62	0.03			
15243 + 0248	HDS2165	0.3448	0.7	6.1	0.59	0.07			
15273 + 0306	HDS2172	0.3448	51.6	1.7	0.49	0.04			
15276 + 4140	TDS9522	0.3421	153.9	0.1	1.24	0.00			
15294 + 4651	A 1633	0.3475	82.4	4.2	0.20	0.03			
15323 + 1355	HEI 237	0.3530	166.9	1.2	0.39	0.02			
15372 + 0526	HDS2201	0.3530	176.5	0.6	0.54	0.02			
15390 + 2545	COU 612	0.3530	174.2	2.4	0.29	0.02	−1.09	0.00	(Docobo & Ling 2011b)
15420 + 0027	A 2176	0.3448	189.2	3.2	0.22	0.03	−0.23	0.00	(Brendley & Mason 2006)
15424 + 6113	MLR 48	0.3476	104.5	2.3	0.29	0.03			
15530 + 6007	HU 913 AB	0.3476	307.0	1.9	0.43	0.03			
15538 + 0029	RST5401	0.3449	5.8	0.7	0.48	0.03			
16007 + 0051	RST5403	0.3449	54.6	1.2	0.85	0.02			
16022 + 6004	MLR 45	0.3476	74.3	1.2	0.42	0.03			
16025 + 2633	COU 618	0.3531	176.7	2.8	0.52	0.05			
16029 + 4644	COU1766	0.3422	32.2	3.5	0.63	0.05			
16049 + 0213	HEI 793	0.3449	195.0	0.1	1.48	0.01			
16074 + 4842	HDS2275	0.3476	253.1	0.3	0.86	0.01			
16076 + 0002	HDS2276	0.3449	191.5	3.9	0.37	0.05			
16128 + 3922	STF2028	0.3422	143.9	2.3	0.41	0.03	2.67	0.06	(Alzner 2001)
16139 + 0123	RST5407	0.3449	221.6	0.3	0.94	0.03			
16186 + 1247	HEI 241	0.3531	58.5	0.7	0.74	0.03			
16192 + 4140	STT 309	0.3422	310.3	3.4	0.28	0.02	2.74	0.00	(Seymour et al. 2002)
16248 + 3925	HU 1276	0.3422	270.2	8.4	0.43	0.05			
16272 + 3953	BU 814	0.3476	4.0	1.3	0.29	0.02			
16273 + 2653	A 226	0.3531	93.5	0.5	1.02	0.03			
16311 + 5756	A 1138	0.3477	172.1	0.9	0.54	0.03			
16373 + 0558	HDS2350	0.3449	248.7	0.7	0.50	0.02			
16380 + 4831	COU1768	0.3477	299.9	0.9	0.61	0.03			
16384 + 3514	COU 985	0.3423	250.3	2.0	0.31	0.02	−1.80	−0.01	(Docobo & Ling 2012a)
16390 + 0204	TDS 828	0.3450	273.2	0.6	1.11	0.02			
16412 + 1714	HDS2366	0.3531	93.6	1.8	0.56	0.03			
16422 + 4112	STF2091	0.3450	325.8	0.7	0.40	0.02	−0.83	0.00	(Zirm 2014)
16438 + 5133	HU 664	0.3477	302.3	0.6	0.50	0.01			
16446 + 1009	HEI 545	0.3532	236.9	0.5	0.84	0.01			
16476 + 4255	COU1452 AB	0.3423	103.8	1.5	0.29	0.03			
16476 + 4255	GII 3 AC	0.3423	58.1	0.5	1.88	0.03			
16525 + 5250	TDS 840	0.3477	303.9	0.3	0.97	0.02			
16564 + 3755	COU1287	0.3477	162.5	1.3	0.70	0.07			
17043 + 4445	COU1593	0.3450	197.6	0.8	0.51	0.04			
17053 + 5927	MLR 353	0.3477	352.8	0.3	0.72	0.03			
17075 + 3810	COU1291	0.3423	302.1	1.9	0.27	0.02	−30.59	0.06	(Docobo & Ling 2011a)
17086 + 0951	HU 167	0.3532	89.7	0.3	0.79	0.01			
17107 + 1651	HEI 167	0.3532	91.6	2.1	0.43	0.02			

TABLE 2 (CONTINUED)

WDS (2000)	Discoverer designation	Epoch +2010	θ (deg)	σ_θ (deg)	ρ (arcsec)	σ_ρ (arcsec)	$\theta_O - \theta_C$ (deg)	$\rho_O - \rho_C$ (arcsec)	Ref.
17164 + 4643	HDS2442	0.3477	53.0	2.8	0.62	0.06			
17184 + 3240	BU 628	0.3423	265.3	1.2	0.54	0.02	−1.21	0.00	(Rica et al. 2012)
17220 + 5351	BU 1249 AB	0.3477	81.7	0.7	0.58	0.02			
17221 + 2310	COU 415	0.3423	247.6	19.3	0.22	0.03	−2.35	−0.03	(Mason & Hartkopf 2011)
17229 + 4723	COU1777	0.3450	45.9	0.4	0.45	0.02			
17251 + 0716	A 1149	0.3532	124.1	0.2	1.03	0.01			
17251 + 3444	HU 922 Aa,Ab	0.3423	47.0	1.4	0.21	0.03	41.47	−0.10	(Heintz 1982)
17251 + 5312	MLR 604	0.3478	94.5	0.4	0.83	0.02			
17293 + 0811	HU 176	0.3532	326.7	0.8	0.28	0.02			
17312 + 4903	COU1778	0.3450	191.4	1.1	0.40	0.03			
17365 + 4543	COU1595	0.3478	264.9	1.2	0.47	0.03			
17388 + 5406	HDS2493	0.3450	252.2	2.1	0.53	0.03			
17400 + 5747	MLR 572	0.3451	37.9	0.9	0.70	0.03			
17403 + 5047	COU2114	0.3478	3.3	0.8	0.38	0.03			
17454 + 4540	COU1597	0.3424	300.1	0.2	0.99	0.02			
17457 + 1650	A 2092	0.3533	336.6	5.9	0.83	0.04			
17482 + 4944	COU1923	0.3478	280.4	0.5	0.53	0.02			
17504 + 3526	ORL 1 Aa,Ab	0.3424	23.2	10.9	0.29	0.53			
17504 + 3526	STF2236 AB	0.3424	96.9	0.4	3.38	0.02			
17522 + 5913	TDT 547	0.3478	84.1	2.1	0.37	0.03			
17524 + 4845	TDT 549	0.3424	299.8	1.2	1.04	0.04			
17533 + 4329	TDT 556	0.3451	255.0	0.1	0.74	0.01			
17563 + 4705	COU1781	0.3451	182.4	0.9	0.47	0.03			
17586 + 1353	HU 1289	0.3533	73.3	0.8	0.62	0.02			
17591 + 3228	HU 1185	0.3424	138.0	2.0	0.35	0.02	−1.66	−0.02	(Docobo & Campo 2012b)
17593 + 4902	YSC 64	0.3451	41.3	0.3	0.49	0.02			
17599 + 5304	HO 563 AB	0.3478	190.4	0.2	0.71	0.02			
18000 + 6027	HDS2537	0.3451	271.0	3.1	0.34	0.07			
18033 + 1152	TDT 655	0.3533	282.4	1.6	0.40	0.03			
18110 + 5038	HDS2564	0.3451	306.0	3.5	0.35	0.03			
18133 + 5242	A 1376	0.3478	22.9	3.0	0.35	0.04			
18154 + 5720	HDS2577	0.3533	291.4	2.9	0.28	0.02			
18178 + 4351	A 578 Aa,Ab	0.3424	245.5	1.8	0.31	0.03	12.04	0.09	(Olevic & Jovanovic 2001)
18178 + 4351	A 578 AB	0.3424	166.9	0.8	1.79	0.04			
18232 + 6139	HU 1292	0.3534	134.3	2.4	0.33	0.02			
18241 + 4054	COU1603	0.3479	81.0	1.8	0.30	0.02			
18252 + 5659	MLR 537	0.3534	56.5	1.7	0.57	0.02			
18253 + 4846	HU 66 AB	0.3534	219.3	4.2	0.18	0.07	2.84	0.01	(Seymour et al. 2002)
18253 + 4846	HU 66 BC	0.3534	24.1	0.3	0.74	0.03	−3.16	−0.16	(Novakovic 2008)
18268 + 4822	COU2277	0.3451	321.8	2.7	0.25	0.03			
18297 + 3929	TDT 910	0.3424	196.5	0.3	0.82	0.01			
18298 + 5314	TDT 911	0.3534	195.5	0.5	0.71	0.03			
18301 + 5805	MLR 357	0.3479	22.3	1.0	0.57	0.03			
18306 + 4429	COU1928	0.3452	93.2	2.7	0.56	0.03			
18311 + 4527	HDS2626	0.3425	174.4	5.8	0.41	0.16			
18337 + 6019	FOX 83	0.3452	26.8	1.2	0.71	0.04			
18383 + 5353	A 1378 AB	0.3452	117.0	1.9	0.40	0.03			
18390 + 5559	A 1380 AB	0.3534	19.6	0.3	0.99	0.04			
18407 + 4336	TDT 990	0.3479	316.3	0.5	0.31	0.03			
18410 + 4848	COU2395	0.3452	135.8	0.4	0.61	0.02			
18461 + 6121	MLR 7	0.3452	303.4	1.5	1.10	0.06			
18466 + 5142	HU 756	0.3452	260.1	0.8	1.02	0.03			
18476 + 3248	COU1154	0.3425	54.6	0.5	0.57	0.03			
18557 + 5714	TDT1129	0.3479	11.1	0.6	0.54	0.03			
19021 + 5216	HU 757 BC	0.3479	167.9	2.0	0.18	0.04	56.34	0.03	(Scardia et al. 2000)
19072 + 4451	A 703	0.3452	188.6	5.7	0.57	0.06			
19134 + 4443	COU2519 Aa,Ab	0.3480	70.6	1.8	0.22	0.02			

TABLE 3

SPECKLE MEASUREMENTS ON THE 1.5M TELESCOPE

WDS (2000)	Discoverer designation	Epoch +2010	θ (deg)	σ_θ (deg)	ρ (arcsec)	σ_ρ (arcsec)	$\theta_O - \theta_C$ (deg)	$\rho_O - \rho_C$ (arcsec)	Ref.
00033 + 5332	A 1500 AB	0.6299	245.9	0.9	0.35	0.03			
00179 + 3435	HDS 41	0.6326	284.1	1.8	0.51	0.03			
00298 + 3650	COU1049	0.6299	37.8	0.4	0.73	0.03			
00308 + 4732	BU 394 AB	0.6299	276.2	0.1	0.61	0.01	0.3	−0.04	(Zulevic 1997)
00334 + 4739	A 911	0.6299	314.4	0.4	0.65	0.02			
00405 + 3627	COU1051	0.6326	89.4	0.8	0.47	0.02			
00407 + 3707	COU 852	0.6326	250.0	0.1	0.90	0.01			
00477 + 4017	COU1206	0.6326	258.7	1.5	0.35	0.03			
01026 + 4900	COU1855	0.6327	104.0	0.2	0.92	0.02			
01031 + 3252	ES 2275	0.6324	145.3	0.1	3.14	0.00			
01049 + 3234	COU 660	0.6324	191.8	0.4	3.25	0.02			
01053 + 3117	COU 549	0.6324	255.2	0.2	1.29	0.01			
01054 + 3204	new	0.6324	184.8	1.1	0.54	0.03			
01054 + 3204	SEI 12	0.6324	115.3	0.0	3.50	0.00			
01063 + 3306	TDS1767	0.6324	179.6	0.2	0.93	0.01			
01070 + 3014	A 929 AB	0.6324	127.0	0.3	0.66	0.01			
01088 + 3024	HDS 149	0.6324	181.0	2.6	0.38	0.07			
01104 + 2952	BU 2	0.6325	152.7	0.1	2.07	0.00			
01151 + 3112	A 1261	0.6325	320.2	0.3	0.59	0.01			
01187 + 3345	COU 663	0.6325	356.7	0.9	0.34	0.03			
01189 + 3347	COU 664	0.6325	323.5	0.1	2.08	0.01			
01191 + 3139	TDS 47	0.6325	182.8	0.1	1.28	0.00			
01217 + 3238	COU 665	0.6325	172.3	0.4	1.06	0.04			
01224 + 3229	BRT 232	0.6325	305.5	0.0	3.60	0.00			
01266 + 3126	ES 318	0.6325	66.9	0.0	3.16	0.00			
01286 + 3334	ES 319	0.6326	291.8	0.0	2.20	0.00			
18126 + 3836	BU 1091	0.6318	320.1	0.2	0.73	0.01	−0.1	0.00	(Zirm & Rica 2012)
18144 + 3602	HU 1188	0.6319	118.9	0.2	1.85	0.02			
18163 + 3625	HU 1291	0.6319	60.6	1.5	0.25	0.05	7.1	0.03	(Seymour et al. 2002)
18167 + 3623	COU1304	0.6319	81.7	0.2	1.37	0.01			
18172 + 3703	COU1305	0.6319	185.6	0.1	1.84	0.01			
18208 + 3639	COU1306	0.6319	39.5	2.9	0.43	0.04			
18227 + 3522	ES 2172	0.6319	44.6	0.0	2.76	0.00			
18239 + 3824	HEI 803	0.6319	284.3	0.0	3.30	0.00			
18243 + 3609	HDS2603	0.6320	355.1	5.0	0.84	0.07			
18298 + 3803	HU 1189	0.6320	210.5	1.8	1.10	0.07			
18300 + 3710	BU 420 AB	0.6320	274.1	0.1	1.78	0.01			
18316 + 3846	COU1604	0.6320	130.7	0.1	1.74	0.01			
18319 + 3538	COU1151	0.6320	277.5	0.7	1.31	0.03			
18335 + 3510	HO 86	0.6320	196.5	2.6	0.30	0.02			
18346 + 3608	HU 1293	0.6320	74.7	1.8	1.07	0.06			
18366 + 3505	COU1307	0.6321	327.1	0.0	1.14	0.00			
19514 + 4044	COU2530 AC	0.6293	55.4	0.8	4.35	0.07			
20253 + 4355	A 291 AB	0.6293	146.9	0.2	0.77	0.02			
20487 + 3124	TDT2555	0.6295	188.1	0.0	0.88	0.00			
21268 + 4228	A 619	0.6295	58.5	0.0	0.74	0.00			
21308 + 4752	A 769	0.6296	293.1	0.1	0.68	0.01			
21362 + 4253	HO 463	0.6296	178.3	0.1	0.49	0.00			
21362 + 5139	HDS3075	0.6296	13.9	0.1	0.58	0.01			
21377 + 5734	D 25 AB	0.6296	161.5	0.2	0.93	0.03			
21377 + 5734	STF2815 AB,C	0.6296	81.8	0.3	7.39	0.04			
22173 + 5049	HU 595	0.6296	221.4	0.5	0.55	0.03			
22205 + 4817	A 186 AB	0.6297	9.5	0.2	0.97	0.01			
22257 + 5631	A 1463	0.6297	333.1	0.2	0.91	0.01			
22265 + 3837	HO 185 AB	0.6322	220.9	0.1	4.07	0.01			
22271 + 4507	COU2239	0.6297	148.2	0.3	0.79	0.03			
22313 + 4113	STF2916 BC	0.6322	31.8	0.1	3.67	0.00			
22327 + 3936	COU1834 AB	0.6322	39.3	0.1	1.70	0.01			
22327 + 3936	new	0.6322	57.7	0.1	3.44	0.01			
22330 + 4121	COU1988	0.6322	350.6	1.1	1.88	0.08			
22334 + 3935	HDS3200 Aa,Ab	0.6322	174.6	2.4	0.22	0.02			
22334 + 3935	COU1835 AB	0.6322	53.4	3.4	1.75	0.08			

TABLE 3 (CONTINUED)

WDS (2000)	Discoverer designation	Epoch +2010	θ (deg)	σ_θ (deg)	ρ (arcsec)	σ_ρ (arcsec)	$\theta_O - \theta_C$ (deg)	$\rho_O - \rho_C$ (arcsec)	Ref.
22341 + 3823	*COU*1488	0.6323	52.0	0.6	0.34	0.03			
22345 + 4046	COU1838 Aa,Ab	0.6323	163.8	1.4	1.11	0.06			
22365 + 3831	COU1193	0.6323	91.4	0.1	1.00	0.01			
22375 + 3923	HDS3211 AB	0.6323	249.5	3.4	0.28	0.03	−4.6	0.00	(Balega et al. 2005)
22395 + 4123	BU 277 AB	0.6323	220.4	0.6	0.44	0.02			
22400 + 4800	COU2335	0.6297	165.4	0.1	0.97	0.00			
22424 + 4333	TDT3663	0.6297	359.7	0.1	0.93	0.01			
22425 + 3917	BU 176	0.6323	54.1	0.0	2.52	0.00			
22441 + 3928	STF2942 Aa,Ab	0.6323	64.9	7.7	0.16	0.12			
22441 + 3928	STF2942 AB	0.6323	277.2	0.9	2.76	0.05			
22465 + 4110	GCB 64	0.6323	104.4	0.0	1.72	0.00			
22470 + 4446	A 189 AB	0.6297	26.2	0.1	0.99	0.01			
22508 + 5424	TDS1189	0.6297	197.5	0.1	1.04	0.01			
22528 + 4456	TDS1193	0.6297	129.1	0.0	1.08	0.00			
23379 + 5806	A 642	0.6298	24.5	0.3	0.90	0.03			
23542 + 5438	TDS1226	0.6298	251.7	0.0	1.08	0.00			
23545 + 4408	COU1497	0.6298	28.7	0.3	0.40	0.02			
23595 + 5441	A 1498	0.6299	89.3	0.5	0.37	0.03			

ferograms (Orlov et al. 2007, 2010, 2014). During the observations we had good seeing conditions. We estimated the seeing was between 0.6 to 1.2 arcsec. Aberrations introduced by the telescope have similar values. As a result, long exposure images have a resolution of about 1.6 arc seconds. All the measurements were made through R (630/120 nm) filter.

After calibration we determined a pixel scale of $0.0246''$/px for the 1.5 m telescope and $0.0187''$/px for the 2.1 m telescope. More than half of the observed binaries have separations less than $1''$. Table 1 shows how these 331 pairs are distributed according to their separations.

Tables 2 and 3 contains 331 measurements of 321 systems of stars. The first column contains the epoch-2000 coordinates in the format used in the Washington Double Star (WDS) Catalog (Worley & Douglass 1997). The second column gives the name of the star or the discoverer designation. The third column gives the epoch of the observation in fractional Besselian years. The four following columns contain the measured position angles given in degrees, the errors of its determination, the angular distances in arcseconds and the errors of its determination. The last three columns give the difference between the observations and the ephemerides calculated for the date of observation, as well as references to publications in which orbital elements can be found (Hartkopf & Mason 2003).

3. CONCLUSION

We have presented the results of double star observations focused on objects from WDS catalogue. In particular, we have been interested in new doubles discovered by Hipparcos. We confirmed 46 new doubles detected by Hipparcos.

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