ASTRONOMY & ASTROPHYSICS
SUPPLEMENT SERIES

APRIL II **2000**, PAGE 335

Astron. Astrophys. Suppl. Ser. **143**, 335–342 (2000)

Micrometer measurements of double stars made at the Côte D'Azur and Calar Alto observatories

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Received December 3; accepted December 29, 1999

Abstract. We report 312 micrometer measurements of 155 visual double stars made with the 50 cm refractor at the Côte D'Azur observatory (Nice, France) and with the 152 cm telescope at Calar Alto observatory (Almería, Spain).

Key words: astrometry — stars: binaries: visual — method: observational

1. Introduction

This is a new paper in a series of publications on astrometric investigations of double stars. A total of 312 micrometer measurements of 155 binary stars are reported here. The observations were made during three astronomical runs. In September 1998 and September 1999 they were carried out using the 152 cm Spanish telescope at E.O.C.A., Calar Alto observatory (Almería, Spain). In July 1999 the 50 cm refractor at the Côte D'Azur observatory (Nice, France) was used.

The procedure in all cases was the same as previously described for earlier runs performed with these instruments (Ling 1987; Couteau et al. 1989; Docobo et al. 1991; Docobo & Prieto 1993; Ling & Lanchares 1993; Ling & Prieto 1997).

Stars were chosen on the basis of the timeliness of a revision of their orbit, and/or for their astrophysical properties; in particular, some binaries with variable components were included.

2. Results

Table 1 lists 96 observations of 49 double stars performed at the Côte D'Azur observatory. The majority of them were made using magnifications of 750× and 938×, the accuracy of the measurements is 2°0 for position angles and 15% for angular separations.

Table 2 includes 216 measurements of 110 binaries made at Calar Alto observatory; for most, a Plössl 12 mm eyepiece with a magnification of 1016× was used. The imprecision estimated for θ is the same as in the previous case, whereas in ρ it varies from 10% for close pairs to 5% for the very wide ones.

In both cases we also present, for a total of 58 double stars, the observed-calculated discrepancies of our measurements with respect to the last published orbit of the couple. Most of the orbits are included in the Fourth Catalog of Orbits of Visual Binary Stars (Worley & Heintz 1983) or in the Cinquième Catalogue d'Éphémérides d'Étoiles Doubles Visuelles (Couteau et al. 1986), in other cases the appropriate reference is given.

The results are presented in the same format in both tables:

- *Column 1:* star's WDS catalogue number (WDS; Worley & Douglass 1997).
- *Column 2:* star's name (with letters denoting the components forming the binary).
- *Column 3:* ADS catalogue number if any (Aitken 1932).
- *Column 4:* epoch of observation, expressed in fractional Besselian year.
- *Column 5:* position angle.
- *Column 6:* angular separation.
- *Column 7:* number of nights (n) on which the star was observed.

- *Column 8:* identification code of the observer (LIN for Ling, PRI for Prieto).
- *Columns 9 and 10:* residuals in θ and ρ with respect to the last known orbit of the pair.
- *Column 11:* the author and the year of publication orbit.

Acknowledgements. We sincerely thank Dr. P. Couteau for his generous help, and the Directorship and staff of the Fresnel Departament of the Côte D'Azur observatory, and Instituto Geográfico Nacional for the help and facilities made available at Nice and Calar Alto observatories respectively. This work was supported by the Spanish DGESIC under project PB97-0501.

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Table 1. Micrometer measurements made at Côte D'Azur observatory

WDS	*Name*	*ADS*	1990.+	$\theta(^\circ)$	$\rho('')$	n	*Obs.*	$\theta_{o-c}(^\circ)$	$\rho_{o-c}('')$	*Author*
$13237-0043$	*A* 2489	8884	9.507	191.2	0.58	1	*LIN*	−0.2	0.07	*Alzner*
			9.507	191.2	0.55	1	*PRI*	−0.2	0.04	(1996)
$15116+1007$	*A* 1116	9530	9.517	44.7	0.75	1	*LIN*			
			9.517	45.5	0.71	1	*PRI*			
$15183+2650$	*STF* 1932 *Aa* − *B*	9578	9.517	258.3	1.69	1	*LIN*	−1.0	0.47	*Heintz* (1965)
$15232+3017$	*STF* 1937 *AB*	9617	9.504	62.0	0.81	1	*LIN*	0.9	0.06	*Mason et al.*
			9.504	60.5	0.80	1	*PRI*	−0.6	0.05	(1999)
$15440+2220$	*COU* 106		9.504	276.3	0.49	1	*LIN*			
			9.504	276.6	0.47	1	*PRI*			
$15465+1957$	*COU* 66		9.504	121.9	0.88	1	*LIN*			
			9.504	121.4	0.87	1	*PRI*			
$16009+1316$	*STT* 303 *AB*	9880	9.517	175.7	1.48	1	*LIN*			
			9.517	174.8	1.49	1	*PRI*			
$16160+0721$	*STF* 2026	9982	9.509	23.0	3.27	1	*LIN*	3.3	0.04	*Heintz*
			9.509	19.2	3.25	1	*PRI*	−0.5	0.02	(1963)
$16169+0113$	*A* 2181	9989	9.507	63.2	0.44	1	*LIN*	−7.5	0.02	*Heintz*
			9.507	62.2	0.45	1	*PRI*	−8.5	0.03	(1996*b*)
$16279+2559$	*STF* 2049	10070	9.517	194.1	1.13	1	*PRI*			
$16289+1825$	*STF* 2052 *AB*	10075	9.504	125.3	2.04	1	*LIN*	−5.5	0.04	*Scardia*
			9.504	126.6	1.87	1	*PRI*	−4.2	−0.13	(1984)
$16514+0113$	*STT* 315	10230	9.509	325.1	0.44	1	*LIN*	5.8	−0.07	*Docobo − Ling*
			9.509	323.2	0.46	1	*PRI*	3.9	−0.05	(1991)
$17304-0104$	*STF* 2173	10598	9.504	318.3	0.71	1	*LIN*	−1.1	0.15	*Heintz*
			9.504	318.6	0.73	1	*PRI*	−0.8	0.17	(1994)
$17520+1520$	*STT* 338 *AB*	10850	9.517	346.1	0.82	1	*LIN*			
			9.517	347.5	0.84	1	*PRI*			
$17571+0004$	*STF* 2244	10912	9.504	95.6	0.56	1	*LIN*	−1.7	0.08	*Heintz*
			9.504	96.9	0.51	1	*PRI*	−0.4	0.04	(1997)
$18054+1624$	*A* 2093	11050	9.504	230.4	0.52	1	*LIN*			
			9.504	229.2	0.52	1	*PRI*			
$18101+1629$	*STF* 2289	11123	9.504	221.4	1.33	1	*LIN*	3.5	0.09	*Hopmann*
			9.504	220.7	1.22	1	*PRI*	2.8	−0.02	(1964)
$18121+2739$	*STF* 2292	11155	9.517	271.1	0.89	1	*LIN*			
			9.517	270.3	1.00	1	*PRI*			
$18250+2724$	*STF* 2315 *AB*	11334	9.504	127.6	0.54	1	*LIN*	4.0	−0.25	*Heintz*
			9.504	127.3	0.59	1	*PRI*	3.7	−0.20	(1960)
$18253+4846$	*HU* 66 *AB*	11344	9.507	25.2	0.78	1	*LIN*			
			9.507	23.2	0.72	1	*PRI*			
$18278+2442$	*STF* 2320	11373	9.512	358.4	1.20	1	*LIN*			
			9.512	359.6	1.13	1	*PRI*			
$18355+2336$	*STT* 359	11479	9.512	5.4	0.68	1	*LIN*	−0.6	−0.02	*Symms*
			9.512	5.0	0.69	1	*PRI*	−1.0	−0.01	(1964)
$18359+1659$	*STT* 358 *AB*	11483	9.512	153.0	1.70	1	*LIN*	−0.8	0.19	*Pavlovic − Zivkov*
			9.512	154.6	1.72	1	*PRI*	0.8	0.21	(1996)
$18360+1144$	*STT* 357	11484	9.504	81.5	0.44	1	*LIN*	−3.4	0.07	*Valbousquet*
			9.504	80.9	0.44	1	*PRI*	−4.0	0.07	(1981)
$18571+2606$	*STF* 2422	11869	9.517	71.1	0.74	1	*LIN*			
			9.517	70.7	0.71	1	*PRI*			
$19062+3026$	*STF* 2454 *AB*	12040	9.509	284.6	1.33	1	*LIN*	−2.1	0.03	*Starikova*
			9.509	284.0	1.31	1	*PRI*	−2.7	0.01	(1982)

Table 1. continued

WDS	*Name*	*ADS*	1990.+	$\theta(^\circ)$	$\rho('')$	n	*Obs.*	$\theta_{o-c}(^\circ)$	$\rho_{o-c}('')$	*Author*
19126 + 1651	*BU* 139 *AB*	12160	9.512	134.3	0.58	1	*LIN*			
			9.512	136.1	0.61	1	*PRI*			
19159 + 2727	*STT* 371 *AB*	12239	9.517	162.2	0.89	1	*LIN*			
			9.517	161.0	0.89	1	*PRI*			
19160 + 1610	*STT* 368 *AB*	12236	9.512	218.2	1.13	1	*LIN*			
			9.512	220.0	1.13	1	*PRI*			
19251 + 1839	*HU* 339	12416	9.512	242.5	0.77	1	*LIN*			
			9.512	241.9	0.83	1	*PRI*			
19268 + 1252	*STF* 2520 *AB*	12449	9.504	235.8	2.23	1	*LIN*			
			9.504	234.5	2.10	1	*PRI*			
19580 + 0456	*A* 606	13169	9.504	331.2	0.45	1	*LIN*	−2.9	0.08	*Baize*
			9.504	330.9	0.45	1	*PRI*	−3.2	0.08	(1983)
20020 + 2456	*STT* 395	13277	9.512	121.7	0.78	1	*LIN*			
			9.512	122.2	0.81	1	*PRI*			
20102 + 4357	*STT* 400	13461	9.507	344.5	0.47	1	*LIN*	−1.1	−0.01	*Heintz*
			9.507	345.8	0.49	1	*PRI*	0.2	0.01	(1997)
20271 + 0948	*J* 559	13866	9.504	280.9	1.81	1	*LIN*			
			9.504	279.1	2.03	1	*PRI*			
20450 + 1244	*BU* 64 *AB*	14238	9.517	170.7	0.66	1	*LIN*	1.4	0.09	*Heintz*
			9.517	170.5	0.67	1	*PRI*	1.2	0.10	(1995)
20531 + 2909	*STT* 417 *AB*	14397	9.517	29.2	0.91	1	*LIN*			
			9.517	28.9	0.91	1	*PRI*			
20591 + 0418	*STF* 2737 *AB*	14499	9.504	285.6	0.88	1	*LIN*	0.9	0.04	*Van den Bos*
			9.504	284.6	0.86	1	*PRI*	−0.1	0.02	(1933)
22044 + 1339	*STF* 2854	15596	9.512	80.6	1.94	1	*LIN*			
			9.512	82.6	1.86	1	*PRI*			
22058 + 0452	*STF* 2856	15614	9.517	198.5	1.36	1	*LIN*			
			9.517	196.9	1.29	1	*PRI*			
22145 + 0759	*STF* 2878 *AB*	15767	9.517	113.2	1.45	1	*LIN*			
			9.517	114.5	1.48	1	*PRI*			
22202 + 2931	*BU* 1216		9.517	282.3	0.85	1	*LIN*			
			9.517	281.6	0.85	1	*PRI*			
22327 + 5347	*KUI* 112 *Aa*		9.507	254.1	0.79	1	*LIN*	−14.5	0.08	*Heintz*
			9.507	254.3	0.72	1	*PRI*	−14.3	0.01	(1976)
22520 + 5743	*A* 632	16326	9.509	149.8	0.74	1	*LIN*	−5.5	0.10	*Heintz*
			9.509	153.1	0.74	1	*PRI*	−2.2	0.10	(1991)
22564 + 2257	*COU* 240		9.512	292.4	0.65	1	*LIN*			
			9.512	292.8	0.70	1	*PRI*			
23260 + 2742	*HO* 489 *AB*	16748	9.509	223.7	0.54	1	*LIN*			
			9.509	223.9	0.51	1	*PRI*			
23340 + 3120	*BU* 720	16836	9.507	92.8	0.51	1	*LIN*	−2.8	−0.02	*Starikova*
			9.507	91.7	0.51	1	*PRI*	−3.9	−0.02	(1982)
23413 + 3234	*BU* 858 *AB*	16928	9.509	225.3	0.87	1	*LIN*			
			9.509	224.9	0.85	1	*PRI*			
00047 + 3416	*STF* 3056 *AB*	32	9.509	146.3	0.76	1	*LIN*			
			9.509	142.7	0.74	1	*PRI*			

Table 2. Micrometer measurements made at Calar Alto observatory

WDS	*Name*	*ADS*	1990.+	$\theta(^\circ)$	$\rho('')$	n	*Obs.*	$\theta_{o-c}(^\circ)$	$\rho_{o-c}('')$	*Author*
17166 − 0027	*A* 2984	10429	9.742	4.8	1.01	1	*LIN*	−2.5	−0.04	*Popovic − Catovic*
			9.742	5.9	0.99	1	*PRI*	−1.4	−0.06	(1993)
17304 − 0104	*STF* 2173	10598	9.742	318.6	0.72	1	*LIN*	0.1	0.18	*Heintz*
			9.742	320.0	0.71	1	*PRI*	1.5	0.17	(1994)
17412 + 4139	*STF* 2203	10722	9.745	293.7	0.74	1	*LIN*			
			9.745	294.2	0.72	1	*PRI*			
17434 + 3357	*HO* 560	10742	9.739	83.5	1.17	1	*LIN*			
			9.739	83.9	1.20	1	*PRI*			
18015 + 0331	*BU* 1202 *AB*	10987	9.742	345.2	0.63	1	*LIN*			
			9.742	345.1	0.59	1	*PRI*			
18017 + 4011	*STF* 2267	11001	9.745	265.4	0.67	1	*LIN*			
			9.745	265.8	0.66	1	*PRI*			
18096 + 0400	*STF* 2281 *AB*	11111	9.731	300.7	0.52	1	*LIN*	4.2	−0.02	*Heintz*
			9.731	299.2	0.50	1	*PRI*	2.7	−0.04	(1984*a*)
18126 + 3836	*BU* 1091	11170	9.745	324.3	0.66	1	*LIN*			
			9.745	323.6	0.66	1	*PRI*			
18197 + 1016	*HU* 197	11260	9.742	84.9	0.46	1	*LIN*	2.0	0.04	*Heintz*
			9.742	83.1	0.42	1	*PRI*	0.2	0.00	(1995)
18253 + 4846	*STT* 351 *BC*	11344	9.745	21.1	0.75	1	*PRI*			
18437 + 3141	*A* 253	11623	9.745	122.8	0.89	1	*LIN*	−4.6	0.1	*Baize*
			9.745	124.3	0.88	1	*PRI*	−3.1	0.09	(1987)
18558 + 0327	*A* 2192	11842	9.731	60.1	0.30	1	*LIN*	−4.9	0.01	*Heintz*
			9.731	60.4	0.32	1	*PRI*	−4.6	0.03	(1998)
18559 + 0323	*A* 2193	11844	9.731	350.2	0.87	1	*LIN*			
			9.731	349.7	0.90	1	*PRI*			
19055 + 3352	*HU* 940	12033	9.745	194.4	0.56	1	*LIN*	−3.6	0.02	*Docobo − Ling*
			9.745	196.8	0.57	1	*PRI*	−1.2	0.03	(1997)
19266 + 2719	*STF* 2525	12447	8.747	291.2	1.95	1	*LIN*	0.3	−0.06	*Heintz* (1984*a*)
19313 + 4729	*A* 713	12567	9.745	279.2	0.35	1	*LIN*			
			9.745	279.1	0.33	1	*PRI*			
19329 + 6601	*HU* 1304	12624	9.742	276.4	0.81	1	*LIN*			
			9.742	277.5	0.82	1	*PRI*			
19334 + 6203	*STF* 2553	12626	9.742	126.1	0.99	1	*LIN*			
			9.742	130.4	1.01	1	*PRI*			
19389 + 5150	*BU* 656	12758	9.742	268.2	1.11	1	*LIN*			
			9.742	268.7	0.96	1	*PRI*			
19406 + 6240	*STF* 2574	12803	9.742	267.5	0.46	1	*LIN*			
			9.742	265.2	0.44	1	*PRI*			
19429 + 4043	*STT* 383 *AB*	12831	9.739	16.6	0.80	1	*LIN*			
			9.739	15.8	0.82	1	*PRI*			
19432 + 2701	*BU* 1132	12829	9.731	213.2	0.45	1	*LIN*			
			9.731	211.4	0.43	1	*PRI*			
19456 + 3337	*STF* 2576	12889	9.739	164.7	2.70	1	*LIN*	0.0	0.00	*Scardia* (1981)
19483 + 3710	*STT* 386	12965	9.739	70.2	0.79	1	*LIN*			
19487 + 1149	*STF* 2583 *AB*	12962	9.739	104.1	1.47	1	*LIN*			
			9.739	105.4	1.40	1	*PRI*			
19585 + 3317	*STF* 2606	13196	9.739	146.3	0.75	1	*LIN*			
19586 + 3806	*STF* 2609	13198	9.739	21.6	1.94	1	*LIN*			
			9.739	22.2	2.03	1	*PRI*			
20067 + 1256	*BU* 428	13384	8.742	354.9	0.73	1	*LIN*			

Table 2. continued

WDS	*Name*	*ADS*	1990.+	$\theta(^\circ)$	$\rho('')$	n	*Obs.*	$\theta_{o-c}(^\circ)$	$\rho_{o-c}('')$	*Author*
20176 + 2622	*BU* 984	13649	9.745	267.0	0.44	1	*LIN*	−4.1	0.08	*Pavlovic − Popovic*
			9.745	267.8	0.45	1	*PRI*	−3.3	0.09	(1998)
20200 + 3616	*BU* 431	13719	9.742	26.6	0.49	1	*LIN*			
			9.742	26.3	0.46	1	*PRI*			
20244 + 1301	*HU* 1198	13804	9.745	27.8	0.57	1	*LIN*			
			9.745	26.7	0.55	1	*PRI*			
20308 + 6107	*HU* 761	13966	9.742	130.5	0.42	1	*LIN*			
			9.742	130.9	0.41	1	*PRI*			
20329 + 1357	*BU* 670 *AB*	13986	9.745	4.1	0.77	1	*LIN*			
			9.745	9.9	0.73	1	*PRI*			
20494 + 1124	*J* 194 *AB*	14333	9.745	169.0	0.64	1	*LIN*	−0.8	0.04	*Docobo − Ling*
			9.745	167.3	0.62	1	*PRI*	−2.5	0.02	(1999)
21135 + 0713	*BU* 270 *AB*	14759	9.742	351.9	0.54	1	*LIN*	2.3	−0.08	*Heintz*
			9.742	350.7	0.61	1	*PRI*	1.1	−0.01	(1979)
21143 + 4109	*STT* 432	14778	8.747	115.8	1.28	1	*LIN*			
21171 + 3546	*BU* 162 *AB*	14822	9.734	251.7	1.27	1	*LIN*			
			9.734	250.9	1.26	1	*PRI*			
21208 + 3227	*STT* 437 *AB*	14889	9.734	20.7	2.28	1	*LIN*			
			9.734	21.0	2.32	1	*PRI*			
21426 + 1900	*HO* 165	15234	9.739	62.0	0.64	1	*LIN*			
			9.739	59.8	0.59	1	*PRI*			
21565 + 0715	*STT* 453 *AB*	15464	9.742	268.8	0.68	1	*LIN*			
			9.742	269.3	0.73	1	*PRI*			
22094 + 2233	*STF* 2868	15673	9.739	353.3	1.14	1	*LIN*			
			9.739	352.8	1.04	1	*PRI*			
22110 + 6324	*STF* 2879 *AB*	15712	8.747	233.0	0.64	1	*LIN*			
22146 + 2934	*STF* 2881	15769	9.739	78.1	1.27	2	*LIN*			
			9.739	79.4	1.23	2	*PRI*			
22302 + 2228	*HU* 388	15992	9.731	58.2	0.48	1	*LIN*	−1.2	0.13	*Costa − Docobo*
			9.731	58.4	0.48	1	*PRI*	−1.0	0.13	(1983)
22402 + 3732	*HO* 188	16164	9.731	216.7	0.34	1	*LIN*	−0.4	0.01	*Docobo − Costa*
			9.731	217.2	0.34	1	*PRI*	0.1	0.01	(1986)
22419 + 2126	*STF* 2934	16185	9.739	57.6	1.21	1	*LIN*	−4.5	0.05	*Heintz*
			9.739	60.0	1.19	1	*PRI*	−2.1	0.03	(1981)
22457 + 2924	*HO* 481	16250	9.731	285.2	0.42	1	*LIN*			
			9.731	287.1	0.43	1	*PRI*			
22514 + 2623	*HO* 482 *AB*	16314	9.739	20.1	0.49	1	*LIN*	−1.7	0.04	*Starikova*
			9.739	21.3	0.47	1	*PRI*	−0.5	0.02	(1982)
22557 + 1547	*HU* 987	16373	9.739	79.5	1.08	1	*LIN*	−3.1	0.14	*Heintz*
			9.739	81.2	0.97	1	*PRI*	−1.4	0.03	(1984*b*)
22592 + 1144	*STT* 483	16428	9.742	340.4	0.46	1	*PRI*	−5.8	0.00	*Heintz* (1996*a*)
23024 + 1837	*HU* 398	16463	9.745	273.4	0.40	1	*LIN*	−7.3	−0.01	*Baize*
			9.745	275.4	0.42	1	*PRI*	−5.3	0.01	(1981)
23050 + 3322	*STF* 2974	16496	9.736	165.6	2.63	1	*LIN*			
			9.736	165.2	2.69	1	*PRI*			
23103 + 3229	*BU* 385 *AB*	16561	9.742	86.2	0.62	2	*LIN*			
			9.742	86.0	0.63	2	*PRI*			
23159 + 1430	*J* 581	16634	9.745	12.0	1.14	1	*LIN*			
			9.745	15.3	1.12	1	*PRI*			
23340 + 3120	*BU* 720	16836	8.742	94.9	0.59	1	*LIN*	−0.1	0.06	*Starikova* (1982)

Table 2. continued

WDS	*Name*	*ADS*	1990.+	$\theta(^\circ)$	$\rho('')$	n	*Obs.*	$\theta_{o-c}(^\circ)$	$\rho_{o-c}('')$	*Author*
23413 + 3234	*BU* 858 *AB*	16928	9.743	226.8	0.74	2	*LIN*			
			9.739	225.7	0.85	1	*PRI*			
23420 + 2018	*STT* 503 *AB*	16937	9.743	133.2	1.14	2	*LIN*			
			9.739	133.3	1.14	1	*PRI*			
23487 + 6453	*STT* 507 *AB*	17020	8.747	312.4	0.70	1	*LIN*	1.1	−0.03	*Zulevic* (1977)
23505 + 4703	*A* 792	17036	9.745	266.5	0.70	1	*LIN*			
			9.745	265.0	0.71	1	*PRI*			
23595 + 3343	*STF* 3050 *AB*	17149	9.734	327.7	1.94	1	*LIN*	−3.4	0.07	*Heintz*
			9.734	328.6	1.88	1	*PRI*	−2.5	0.01	(1996*b*)
00048 + 4358	*A* 203	39	9.739	346.4	1.82	1	*LIN*			
			9.739	345.3	1.78	1	*PRI*			
00063 + 5826	*STF* 3062	61	9.743	327.9	1.46	2	*LIN*	1.2	−0.12	*Baize*
			9.743	326.2	1.47	2	*PRI*	−0.5	−0.12	(1957)
00116 + 5558	*STF* 7	143	9.734	211.8	1.21	1	*LIN*			
			9.734	210.6	1.18	1	*PRI*			
00118 + 2825	*BU* 255	147	9.742	71.8	0.41	1	*LIN*			
			9.742	69.8	0.44	1	*PRI*			
00167 + 3629	*STT* 4	221	9.742	133.7	0.33	1	*LIN*	−16.3	−0.09	*Scardia*
			9.742	134.4	0.38	1	*PRI*	−15.6	−0.04	(1982)
00187 + 1559	*STF* 25 *AB*	257	9.739	193.1	1.17	1	*LIN*			
			9.739	194.4	1.18	1	*PRI*			
00205 + 4531	*A* 647	277	9.742	112.0	0.58	1	*LIN*			
			9.742	113.0	0.60	1	*PRI*			
00206 + 1219	*BU* 1015	281	9.742	93.7	0.46	1	*LIN*	−3.2	0.04	*Seymour − Hartkopf*
			9.742	94.5	0.44	1	*PRI*	−2.4	0.02	(1999)
00210 + 6740	*HJ* 1018	283	9.734	88.1	1.53	1	*LIN*	1.6	−0.05	*Muller*
			9.734	87.0	1.56	1	*PRI*	0.5	−0.02	(1957)
00334 + 4739	*A* 911	461	9.734	316.6	0.57	1	*LIN*			
			9.734	314.5	0.59	1	*PRI*			
00373 + 5801	*BU* 1097	515	9.745	72.9	0.49	1	*LIN*			
			9.745	73.0	0.51	1	*PRI*			
00376 + 2240	*HU* 411	524	9.739	103.8	0.62	1	*LIN*			
			9.739	103.3	0.61	1	*PRI*			
00402 + 4715	*BU* 257	559	9.746	250.2	0.59	2	*LIN*			
00508 + 3203	*A* 922	691	9.731	340.2	0.40	1	*LIN*			
			9.731	340.1	0.42	1	*PRI*			
00521 + 1036	*STF* 67	709	9.741	350.8	2.24	2	*LIN*			
			9.741	350.7	2.20	2	*PRI*			
00542 + 5108	*HU* 1018	739	9.746	50.0	0.83	2	*LIN*			
			9.746	49.0	0.85	2	*PRI*			
00550 + 2338	*STF* 73 *AB*	755	8.742	309.8	0.79	1	*LIN*	3.6	−0.09	*Docobo − Costa* (1990)
01030 + 4723	*STT* 21	862	9.731	175.0	1.17	1	*LIN*	−0.5	0.13	*Heintz*
			9.731	172.7	1.19	1	*PRI*	−2.8	0.15	(1966)
01097 + 2348	*BU* 303	955	9.736	292.6	0.66	1	*LIN*			
			9.736	292.7	0.67	1	*PRI*			
			9.745	251.0	0.65	1	*PRI*			
01106 + 4917	*COU* 2156		9.742	163.1	0.50	1	*LIN*			
			9.742	158.4	0.55	1	*PRI*			
01106 + 5101	*BU* 235 *Aa*	963	9.739	133.2	1.05	1	*LIN*			
			9.739	131.9	0.95	1	*PRI*			
01151 + 3416	*HU* 803	1005	9.739	208.5	0.90	1	*PRI*			

Table 2. continued

WDS	*Name*	*ADS*	1990.+	$\theta(^\circ)$	$\rho('')$	n	*Obs.*	$\theta_{o-c}(^\circ)$	$\rho_{o-c}('')$	*Author*
01292 + 2004	*A* 2214	1177	9.739	209.2	0.59	1	*LIN*			
			9.739	207.5	0.62	1	*PRI*			
01356 + 7227	*A* 816	1226	9.746	307.4	0.81	2	*LIN*			
			9.745	307.4	0.82	1	*PRI*			
01372 + 4843	*A* 817	1263	9.742	25.2	0.48	1	*LIN*			
			9.742	25.4	0.50	1	*PRI*			
01389 + 7643	*HU* 1030	1264	9.745	321.5	0.76	1	*LIN*			
			9.745	322.0	0.76	1	*PRI*			
01401 + 3858	*STF* 141	1305	9.736	303.4	1.73	1	*LIN*			
			9.736	302.7	1.68	1	*PRI*			
01437 + 3705	*COU* 1063		9.731	211.6	0.49	1	*LIN*			
			9.731	211.9	0.47	1	*PRI*			
01445 + 3957	*STF* 149	1368	9.731	85.2	1.37	1	*LIN*			
01448 + 5006	*COU* 2258		9.734	116.5	0.75	1	*LIN*			
			9.734	117.2	0.87	1	*PRI*			
01493 + 4754	*STF* 162 *AaB*	1438	9.739	201.4	1.95	1	*PRI*			
01559 + 0151	*STF* 186	1538	9.734	64.5	1.06	1	*LIN*	4.9	−0.25	*Starikova* (1980)
01593 + 2450	*STF* 194	1579	9.739	274.6	1.25	1	*LIN*			
			9.739	276.3	1.24	1	*PRI*			
02021 + 4530	*COU* 1665		9.742	102.8	0.45	1	*LIN*			
			9.742	103.0	0.47	1	*PRI*			
02140 + 4729	*STF* 228	1709	8.747	280.5	1.01	1	*LIN*	−2.4	−0.01	*Heintz* (1984*a*)
02174 + 6121	*STF* 234 *AB*	1737	8.747	232.3	0.74	1	*LIN*	1.6	−0.04	*Scardia* (1981)
02206 + 6321	*HU* 1037	1777	9.745	333.2	0.43	1	*LIN*			
			9.745	334.3	0.43	1	*PRI*			
02231 + 7021	*MLR* 377		9.745	144.7	0.62	1	*LIN*	−12.5	0.06	*Muller*
			9.745	147.1	0.64	1	*PRI*	−10.1	0.08	(1991)
02257 + 6133	*STF* 257	1833	9.742	62.1	0.40	1	*LIN*	0.0	−0.01	*Zaera*
			9.742	60.2	0.39	1	*PRI*	−1.9	−0.02	(1985)
02333 + 5619	*A* 1276	1934	9.742	199.8	0.90	2	*LIN*			
			9.742	199.8	0.89	2	*PRI*			
02389 + 6918	*STF* 278	1985	9.742	28.9	0.47	1	*LIN*			
			9.742	29.8	0.45	1	*PRI*			
02407 + 2637	*STT* 43	2034	8.747	355.3	0.77	1	*LIN*	18.5	0.21	*Heintz* (1962)
02517 + 4559	*A* 1281	2173	9.742	126.4	0.52	1	*LIN*	9.8	−0.09	*Heintz*
			9.742	124.3	0.57	1	*PRI*	7.7	−0.04	(1984*a*)
02589 + 2137	*BU* 525	2253	8.747	266.5	0.56	1	*LIN*	−5.1	0.11	*Baize* (1980)
03101 + 2145	*BU* 1030	2375	9.739	106.3	0.78	1	*LIN*			
			9.739	107.3	0.81	1	*PRI*			
03177 + 3838	*STT* 53	2446	9.739	251.4	0.77	1	*LIN*	0.9	0.04	*Alzner*
			9.739	253.5	0.79	1	*PRI*	3.0	0.06	(1998)
03189 − 0101	*BU* 1177	2464	9.745	199.3	0.51	1	*LIN*	−0.3	0.00	*Baize*
			9.745	198.7	0.51	1	*PRI*	−0.9	0.00	(1988)
03413 + 4554	*BU* 1181	2680	9.742	90.8	0.36	1	*LIN*			
			9.742	91.4	0.35	1	*PRI*			
03506 + 1257	*HEI* 317		9.745	147.5	1.31	1	*LIN*			
			9.745	146.5	1.31	1	*PRI*			
03590 + 0947	*HU* 27	2911	9.745	319.4	0.38	1	*LIN*			
			9.745	316.6	0.40	1	*PRI*			