

Double Star Measurements with a 12-inch Newtonian Telescope, Annual Report of 2017

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Abstract: This report shows the results on 259 double star measurements from 2017; minimum separation is 0.48 as (BU 525), maximum separation is 171.7 as (STFA 37AD). The mean value of all measurements is about 20 as.

In 2017 a total of 259 double stars were measured. Observations were done with a 12-inch Newtonian telescope in combination with a CMOS QHY5L II Color camera. Reproduction scale was about 0.52 a.s. per pixel. In some cases the focal length was increased with different Barlow lenses. Observations in M44 Praesepe were done with a 5-inch refractor.

As in the previous year, double stars with large magnitude differences were of special interest (Schlimmer, 2018).

Figure 1 shows the 259 measurements sorted by separation. In 188 cases (72%) the separation is smaller than or equal to 7.5 arc seconds.

Figure 2 shows the differences in magnitudes of the measured double star components. In 199 cases (77%) the difference is greater than or equal to 2 magnitudes.

Table 1 shows the measurements of separation and position angle of 259 components from 2017. Brightness and coordinates are from Washington Double Star catalog (Mason, 2016). Date is given in Besselian years.

References

- Mason, B.D., Wycoff, G.L. and Hartkopf, W.I, 2016, *The Washington Double Star Catalog*, Astrometry Department, U.S. Naval Observatory, <http://ad.usno.navy.mil/proj/WDS/>.
- Schlimmer, S. Joerg, 2018, "Double Star Measurements Using a Webcam and CCD Camera, Annual Report of 2016", *Journal of Double Star Observations*, 14-1, 23-29.

Acknowledgements

This research made use of the Washington Double Star Catalog maintained at the U.S. Naval Observatory.

This research made use of the SIMBAD database, operated at CDS, Strasbourg, France

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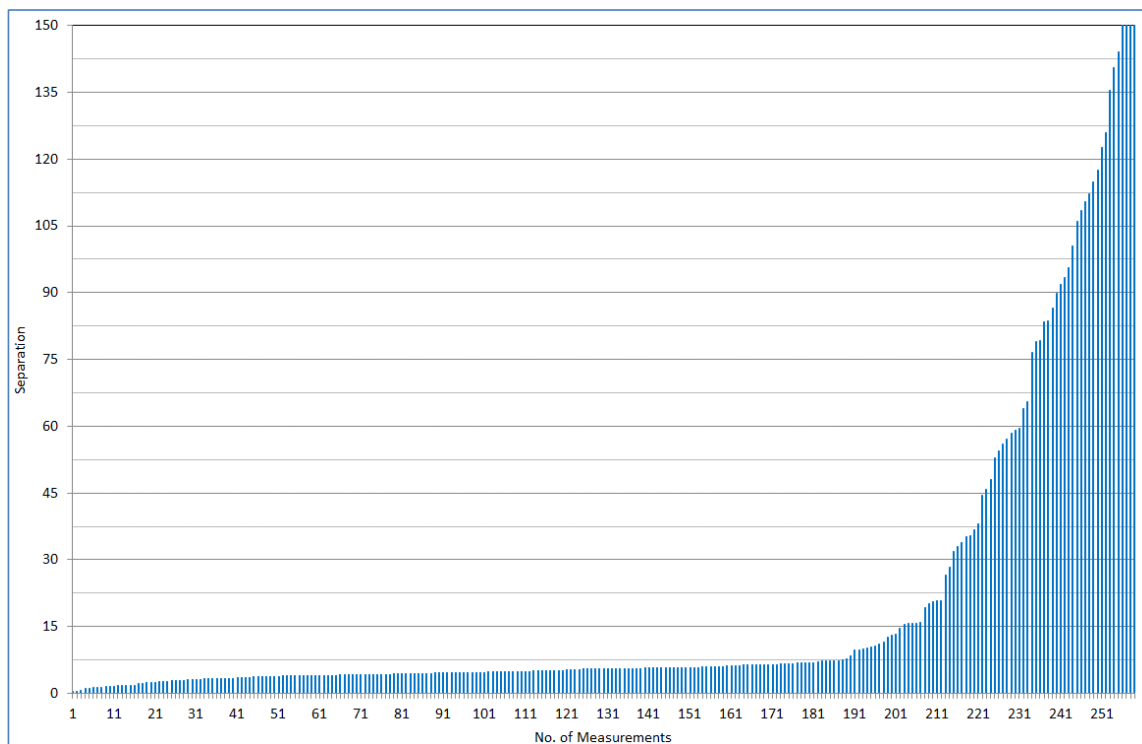


Figure 1: Separation of the 259 measurements

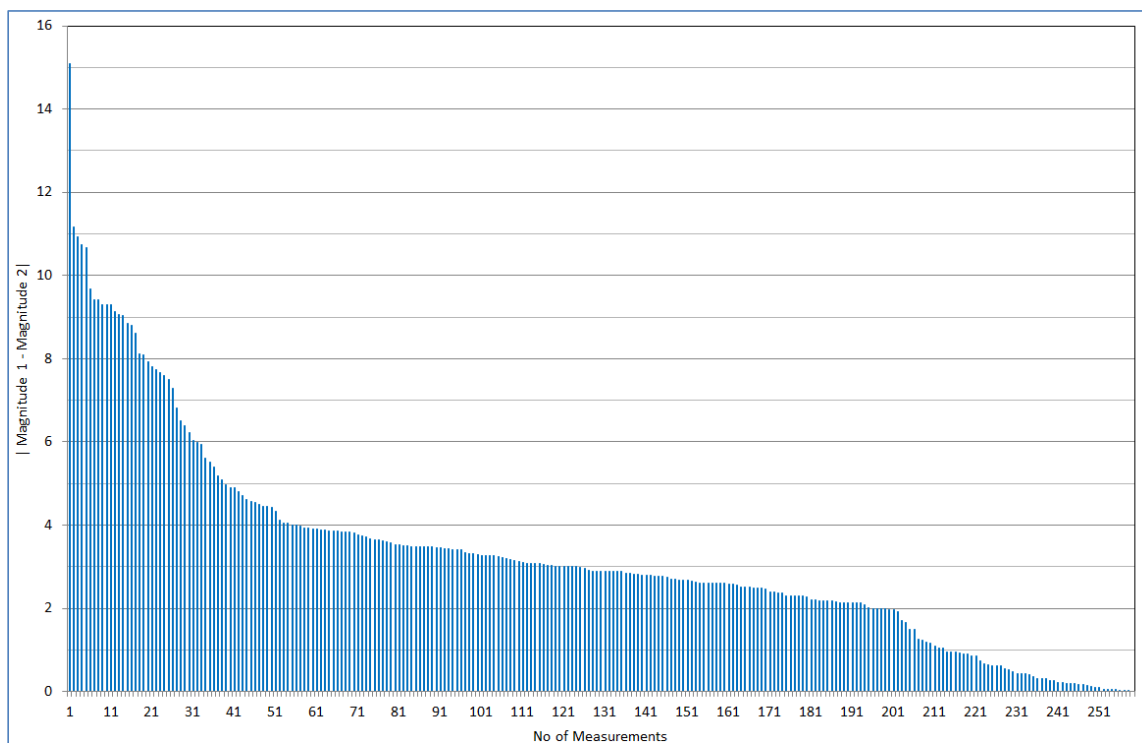


Figure 2: Differences in magnitudes of 259 measurements

Double Star Measurements with a 12-inch Newtonian Telescope, Annual Report of 2017

Table 1. Measurements

RA + Dec	Name	Mag 1	Mag 2	PA	Sep	Date	N	Note
00313+6321	BU 107AB	11.14	11.73	356.0	5.73	2017.894	1	
00337+6247	STI 97	8.41	10.55	7.7	13.17	2017.887	2	
00346+6254	BU 108AB	7.81	10.60	7.9	3.85	2017.894	1	
01226+1245	BU 1360	9.62	11.76	23.9	5.68	2017.015	1	
01535+1918	STF 180AB	4.52	4.58	1.8	7.35	2017.015	1	
02091+5104	STF 213AB	9.06	9.50	327.3	1.67	2017.017	1	2xBarlow
02172+5555	STF 235	9.60	9.81	48.4	1.78	2017.017	1	2xBarlow
02217+3923	STF 251	9.02	9.63	267.1	2.15	2017.017	1	2xBarlow
02331+5828	STF 272	8.33	8.36	217.6	1.81	2017.017	1	2xBarlow
02357+4411	A 1528	9.44	9.62	194.2	1.40	2017.017	1	2xBarlow
02388+3325	STF 285	7.48	8.14	167.5	1.51	2017.017	1	2xBarlow
02389+1526	AG 43	9.9	9.9	63.4	2.90	2017.017	1	2xBarlow
02589+2137	BU 525	7.47	7.45	273.8	0.48	2017.015	1	5xBarlow
02592+2120	STF 333AB	5.17	5.57	210.7	1.32	2017.015	1	5xBarlow
03396+1823	TOK 14AB	6.2	11.0	245.8	10.01	2017.015	1	
03446+2754	STTA 38AB	6.78	6.91	53.0	135.40	2017.015	1	Wolf 1268
03446+2754	BU 1041BC	6.91	12.42	320.8	35.09	2017.015	1	
03356+3141	BU 533AB	7.55	7.74	220.1	1.01	2017.015	1	2xBarlow
04231+3613	ES 239	10.13	13.1	240.6	4.57	2017.121	1	
04246+3358	STT 81AB	5.84	9.25	12.5	4.17	2017.121	1	
04337+4128	ES 570	10.21	14.1	186.6	4.07	2017.121	1	
04384+5455	ES 884	9.56	13.2	252.2	3.13	2017.121	1	
04522+4244	ES 1525	10.1	12.7	87.0	5.63	2017.121	1	
04537+2333	BU 1237	7.5	10.1	55.7	4.54	2017.121	1	
04581+3116	ES 330	10.68	13.5	159.3	4.46	2017.121	1	
04594+2012	A 2427	8.49	11.98	263.5	4.04	2017.121	1	
05003+3924	STT 92AB	6.02	9.50	285.0	4.08	2017.121	1	
05044+4032	ES 1719	10.37	12.9	23.1	3.90	2017.121	1	
05098+4240	BU 751AB	8.22	10.2	243.4	4.57	2017.121	1	
05098+4240	BU 751AC	8.22	11.5	104.2	12.98	2017.121	1	
05103+4040	ES 1721	8.95	11.8	168.1	6.20	2017.121	1	
05120+4154	ES 1722AB	8.63	11.91	302.9	5.61	2017.121	1	
05145+3142	A 211	9.1	13.1	134.3	4.61	2017.121	1	
05145-0812	STF 668A, BC	0.3	6.8	204.0	9.73	2017.121	1	
05145-0812	BU 555AD	0.3	15.4	0.7	44.54	2017.121	1	
05320-0018	STFA 14AC	2.41	6.83	1.0	52.91	2017.121	1	
05354-0555	STF 752AB	2.77	7.73	142.4	11.42	2017.121	1	
05355-0422	STF 750	6.43	8.39	61.0	3.84	2017.121	1	
05357-0451	HLD 173AB	5.26	14.3	170.5	20.59	2017.121	1	
05407-0157	STF 774AC	1.88	9.55	10.4	58.46	2017.121	1	

Table 1 continues on the next page.

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Table 1 (continued). Measurements

RA + Dec	Name	Mag 1	Mag 2	PA	Sep	Date	N	Note
05474+2939	BU 560	7.77	8.24	125.1	1.67	2017.190	1	
05546+1530	BU 563	8.1	11.1	185.8	6.73	2017.190	1	
05556+3315	ES 337	10.64	13.5	304.3	5.64	2017.190	1	
06121+2930	STF 862	7.55	10.84	337.9	6.88	2017.228	1	
06150+4858	ES 581	9.64	12.3	63.7	4.06	2017.228	1	
06194+3718	ES 287	9.81	13.3	258.7	6.23	2017.228	1	
06298+3636	STF 912	8.76	10.90	27.8	3.44	2017.228	1	
06425+3902	ES 2097AB	8.2	10.7	28.4	15.48	2017.228	1	
06502+3957	STF 966	8.21	10.96	112.0	5.17	2017.228	1	
06563+3227	STF 984	8.67	10.8	155.4	3.31	2017.228	1	
07094+3634	STF1022	6.78	10.05	128.2	5.48	2017.228	1	
07135+3209	STT 167AB	7.44	10.86	162.7	5.11	2017.228	1	
07307+3343	A 2125	9.31	12.0	105.3	4.09	2017.228	1	
07332+3252	BU 22AB	8.36	10.50	150.7	6.15	2017.228	1	
07346+3153	STF1110AB	1.93	2.97	54.3	5.13	2017.302	1	
07487+5339	A 1331	8.99	12.9	253.7	5.33	2017.228	1	
08014+5657	STF1160	8.71	11.54	31.8	6.08	2017.228	1	
08027+3211	ES 291	8.64	11.8	347.6	6.38	2017.228	1	
08081+5627	A 1334AB	9.23	13.0	246.9	4.83	2017.228	1	
08122+1739	STF1196AB	5.30	6.25	8.8	1.01	2017.302	1	Z Cnc, 2X Barlow
08122+1739	STF1196AB,C	4.92	5.85		5.84	2017.228	1	
08122+1739	STF1196AC	5.30	5.85	61.6	6.32	2017.302	1	Z Cnc, 2X Barlow
08148+4302	STT 189	6.87	10.73	293.3	4.38	2017.228	1	
08310+5920	A 1337	9.3	11.6	234.7	3.26	2017.228	1	
08358+0637	STF1245AB	5.98	7.16	24.9	10.08	2017.231	1	M44, ES 127
08358+0637	STF1245AC	5.98	10.70	109.3	100.38	2017.231	1	M44, ES 127
08358+0637	STF1245AD	5.98	11.91	291.5	110.34	2017.231	1	M44, ES 127
08358+0637	STF1245AE	5.98	9.60	206.6	114.80	2017.231	1	M44, ES 127
08399+1933	S 571AC	7.31	7.47	156.5	45.74	2017.231	1	M44, ES 127
08399+1933	S 571AD	7.31	6.67	240.9	91.78	2017.231	1	M44, ES 127
08399+1933	BKO 34DE	6.67	11.75	3.2	35.39	2017.231	1	M44, ES 127
08404+1940	STF1254AB	6.44	10.37	54.7	20.81	2017.302	1	
08404+1940	STF1254AC	6.52	7.61	343.3	64.03	2017.302	1	
08404+1940	STF1254AD	6.52	9.20	44.3	83.50	2017.302	1	
08404+1940	SMR 30AE	6.52	12.5	155.7	15.64	2017.302	1	
09013+1516	STF1300AB	9.47	9.73	176.8	4.98	2017.302	1	
09014+3215	STF1298AB	5.95	8.56	136.7	4.42	2017.228	1	
09169+3702	HO 362AB	8.60	12.45	149.2	4.63	2017.343	1	
09188+3648	STF1334AB	3.92	6.09	229.3	2.51	2017.343	1	
09207+5116	STT 199AB	6.19	10.0	141.8	5.63	2017.343	1	

Table 1 continues on the next page.

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Table 1 (continued). Measurements

RA + Dec	Name	Mag 1	Mag 2	PA	Sep	Date	N	Note
09412+2706	A 2052	9.29	12.27	317.8	5.15	2017.302	1	
09422+4921	ES 600	9.52	13.0	62.7	4.56	2017.302	1	
09533+5037	STT 209	7.41	10.31	309.8	4.90	2017.302	1	
10085+1206	BRT1267	10.6	12.9	1.6	4.16	2017.343	1	
10200+1950	STF1424AB	2.37	3.64	126.7	4.66	2017.302	1	
10251+5328	ES 721AB	9.97	13.5	134.3	4.07	2017.343	1	
10251+5328	ES 721AC	9.97	12.24	288.3	32.88	2017.343	1	
10293+4233	ES 1395	9.46	12.14	79.3	4.36	2017.343	1	
10339+4158	ES 1396AB	9.91	13.0	192.0	5.43	2017.343	1	
11088+4815	ES 922AB	9.64	12.87	62.3	4.87	2017.343	1	
11218+1811	STF1534	8.08	11.14	314.7	5.11	2017.343	1	
11398+2811	A 560	9.16	12.5	358.6	4.94	2017.343	1	
11436+1042	BU 917	8.70	11.59	175.9	4.08	2017.343	1	
11527+5647	ES 1826	8.95	12.8	217.5	5.62	2017.371	1	
11567+4102	STF1585	8.79	11.08	105.5	5.48	2017.371	1	
11578+4518	A 1778	9.6	11.8	218.9	3.02	2017.371	1	
12052+3851	ES 307	9.11	13.6	353.6	4.47	2017.371	1	
12077+5841	ES 1787	10.89	13.4	140.6	5.73	2017.371	1	
12089+2147	LDS 930AB	9.45	14.63	39.1	15.59	2017.343	1	Wolf 1432
12269+2816	SMR 58	4.4	12.	207.2	16.0	2017.343	1	
12272+2701	STF1643AB	9.03	9.45	2.0	2.62	2017.343	1	
12282+3641	STF1646	10.3	12.9	260.1	5.56	2017.371	1	
12392+1420	STF1666	8.15	10.30	192.3	7.38	2017.371	1	
12417-0127	STF1670AB	3.48	3.53	4.1	2.47	2017.373	1	g Vir 2xBarlow
12429+2555	ES 438	8.89	12.33	80.4	5.74	2017.371	1	
12542+2930	LDS1341	10.89	14.3	179.1	7.32	2017.371	1	
12560+3819	STF1692AB	2.85	5.52	229.2	19.33	2017.371	1	
12587+2728	STF1699	8.74	8.77	12.3	1.66	2017.417	1	2xBarlow
13003+3047	BU 1081AB	4.90	13.0	350.2	5.26	2017.343	1	
13076+2927	A 683	9.32	13.2	327.7	3.72	2017.343	1	
13125+2255	HU 573	9.83	12.30	184.5	4.12	2017.417	1	
13175+3649	HU 1146	8.75	11.84	28.3	5.55	2017.343	1	
13211+2228	HDS1873	9.24	12.70	183.5	4.36	2017.343	1	
13239+5456	STF1744AB	2.23	3.88	152.8	14.57	2017.464	1	Mizar
13287+2335	AG 188	9.60	13.1	247.0	4.65	2017.343	1	
13291+2211	STF1748AB	8.26	10.85	184.1	6.07	2017.417	1	
13407+2804	BUP 151	6.36	12.40	224.0	89.80	2017.436	1	
13407+1957	STF1772AB	5.76	9.60	133.9	4.40	2017.441	2	
13425+2812	ES 442	8.45	12.9	255.8	4.19	2017.417	1	
13447+1255	HDS1934	9.46	13.59	168.6	4.89	2017.435	2	

Table 1 continues on the next page.

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Table 1 (continued). Measurements

RA + Dec	Name	Mag 1	Mag 2	PA	Sep	Date	N	Note
13563+3438	BU 936	9.77	12.8	96.5	4.35	2017.453	1	
14089+4608	STF1809	9.42	11.98	195.7	4.12	2017.453	1	
14138+4111	HO 58	8.16	11.35	229.5	4.03	2017.453	1	
14161+5643	STF1831AB	7.16	9.56	137.7	5.79	2017.464	1	
14161+5643	STF1831AC	7.16	6.73	219.1	112.20	2017.464	1	
14161+5643	STF1830EF	9.33	10.28	312.4	10.56	2017.464	1	
14203+4830	STF1834	8.09	8.29	101.5	1.42	2017.507	1	2xBarlow
14224+5225	ES 738	9.94	12.9	311.0	5.51	2017.464	1	
14318+3022	HJ 2728	3.58	11.5	343.4	33.84	2017.436	1	
14325+4911	STT 283A,BC	8.08	12.62	130.2	5.87	2017.64	1	
14336+3535	STF1858AB	8.13	8.98	39.4	2.96	2017.507	1	2xBarlow
14397+4152	ES 1250	9.56	13.0	174.5	5.49	2017.464	1	
14401+5841	A 1108	8.61	12.10	116.0	4.69	2017.464	1	
14403+4843	STT 284	7.91	11.56	102.5	7.22	2017.466	1	
14416+5124	STF1871	8.02	8.07	314.1	1.64	2017.507	1	
14484+2422	STF1884	6.58	7.48	55.9	2.27	2017.510	1	2xBarlow
14497+4843	STF1890	6.31	6.67	46.3	2.59	2017.498	4	2xBarlow
14514+1906	STF1888AB	4.76	6.95	300.0	5.48	2017.466	1	
14527+0746	HLD 120AB	8.05	10.84	225.2	15.72	2017.464	1	
14560+3218	STT 289	6.2	11.1	109.2	4.78	2017.466	1	
14575+4010	STF1895	8.27	8.88	42.3	12.65	2017.466	1	
14577+4011	ES 1251	9.45	13.9	58.1	6.67	2017.466	1	
14583+4106	A 1628	8.56	11.63	97.2	5.14	2017.507	1	
15038+4739	STF1909	5.20	6.10	76.4	0.56	2017.475	3	5xBarlow, 44 Boo
15054+4809	BU 1086	5.57	13.3	253.3	6.82	2017.507	1	
15096+4142	A 572	9.4	11.4	3.5	4.14	2017.507	1	
15151+3318	SMR 32AB	12.76	11.21	334.9	26.64	2017.453	1	
15151+3318	SMR 32AC	12.76	12.90	72.4	36.75	2017.453	1	
15151+3318	SMR 32BC	11.21	12.90	105.7	48.09	2017.453	1	
15155+3319	STFA 27AB	3.56	7.89	78.3	105.95	2017.453	1	
15155+3319	SMR 31AC	3.56	14.30	4.5	93.46	2017.453	1	
15162+3418	A 1366	9.3	12.2	78.6	3.88	2017.507	1	
15166+3339	STF1929	9.79	11.8	7.5	6.51	2017.507	1	
15183+2650	STF1932AB	7.32	7.41	268.2	1.43	2017.510	1	
15232+3017	STF1937AB	5.64	5.95	230.0	0.53	2017.468	1	n CrB
15300+2530	STF1950	8.07	9.23	92.5	3.39	2017.510	1	2xBarlow
15364+3723	HU 1166AB	8.50	13.4	144.6	4.16	2017.518	1	
15379+3006	STF1963AB	8.54	8.85	298.2	5.34	2017.518	1	
15394+3638	STF1965	4.96	5.91	306.8	6.38	2017.518	1	
15462+4228	STT 301	7.50	10.38	27.4	3.97	2017.510	1	

Table 1 continues on the next page.

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Table 1 (continued). Measurements

RA + Dec	Name	Mag 1	Mag 2	PA	Sep	Date	N	Note
15469+4736	ES 1087	10.5	12.5	173.8	6.83	2017.518	1	
16051+5426	ES 743	9.71	12.8	13.4	5.73	2017.510	1	
16052+2211	BU 811AB	8.71	11.84	216.5	3.41	2017.510	1	
16117+3321	STT 305AB	6.44	10.17	263.0	5.67	2017.510	1	
16126+5748	ES 1793	8.74	11.52	57.1	5.66	2017.576	1	
16197+5135	HU 662	9.75	13.8	223.4	4.03	2017.576	1	
16199+5146	ES 628	13.9	13.8	265.8	3.97	2017.576	1	
16206+5150	ES 629	8.52	13.1	100.5	10.95	2017.576	1	
16240+2024	A 25	8.28	10.8	112.6	5.47	2017.576	1	
16362+5255	STF2078AB	5.38	6.42	105.1	3.07	2017.576	1	
16389+2028	STT 314	8.2	11.2	236.1	3.46	2017.576	1	
16462+4649	A 1865	9.81	12.69	296.6	4.38	2017.598	1	
16473+5218	ES 970	10.02	12.2	300.9	3.39	2017.598	1	
17046+3900	HJ 2804AB	11.00	13.3	235.8	6.41	2017.598	1	
17117+4945	STF2142AB	6.18	9.35	110.3	4.77	2017.598	1	
17146+1423	STF2140AB	3.48	5.40	102.8	4.70	2017.598	1	
17165+3448	POP 77AB	10.91	13.6	322.8	5.50	2017.598	1	
17165+3448	POP 77CD	11.43	13.7	81.0	10.42	2017.598	1	
17173+3306	STT 328	4.7	10.3	56.1	4.47	2017.598	1	
17246+1536	STF2160	6.40	9.28	66.2	3.90	2017.598	1	
17275+4716	ES 1256	10.41	13.4	329.6	4.20	2017.598	1	
17284+4822	ES 1091	10.63	13.2	308.9	6.51	2017.598	1	
17316+3601	ES 2229	10.67	13.4	31.1	3.73	2017.601	1	
17317+3604	ES 2230	10.54	11.03	92.0	9.62	2017.601	1	
17322+5236	ES 777	8.15	12.2	349.4	6.03	2017.601	1	
17353+5210	ES 635	9.50	12.6	241.5	5.84	2017.601	1	
17479+3417	BU 632AB	6.58	12.8	344.1	5.75	2017.598	1	
17503+2517	STF2232	6.71	8.85	138.7	6.34	2017.598	1	
17512+4454	STF2242	8.14	8.28	327.2	3.37	2017.598	1	
17561+2130	STT 339	8.37	10.76	171.1	3.78	2017.598	1	
17566+5129	BU 633AB	2.23	13.4	151.2	20.81	2017.598	2	
17566+5129	BU 633AD	2.23	12.9	11.1	59.50	2017.598	1	
17566+5129	BU 633AE	2.23	11.9	234.6	95.58	2017.598	2	
17566+5129	BU 633AF	2.38	11.67	113.8	126.01	2017.598	2	
17566+5129	BU 633AG	2.38	11.23	27.2	143.99	2017.598	1	
18049+4808	STT 343	7.63	10.51	82.7	3.14	2017.598	1	
18065+4022	STF2282AB	7.93	9.43	82.6	2.67	2017.598	1	
18094+4319	ES 1418	9.81	13.7	304.0	3.99	2017.598	1	
18193+4724	ES 1158	8.74	12.2	201.9	4.83	2017.598	1	
18239+5848	STF2323AB	5.06	8.07	346.3	3.77	2017.598	1	

Table 1 continues on the next page.

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Table 1 (continued). Measurements

RA + Dec	Name	Mag 1	Mag 2	PA	Sep	Date	N	Note
18267+3610	ES 2173	8.48	11.9	304.4	6.45	2017.598	1	
18324+4510	ES 1261	9.66	12.3	208.7	7.64	2017.598	1	
18369+3846	H 5 39AB	0.09	9.5	184.4	83.65	2017.661	2	
18369+3846	STFB 9AE	0.09	9.5	39.2	86.63	2017.661	2	
18399+5815	A 251AB	8.10	11.62	52.7	4.03	2017.598	1	
18438+5654	BU 465	9.2	11.2	297.9	2.97	2017.658	1	
18443+3940	STFA 37AD	5.15	5.38	171.7	210.48	2017.598	1	
18466+1659	STF2385AB	8.42	10.8	29.5	5.5	2017.598	1	
18471+5356	A 1382	9.58	12.9	226.1	4.62	2017.658	1	
18484+2544	A 255	9.23	12.9	69.3	4.89	2017.658	1	
18484+3612	ES 2023	8.73	12.0	245.9	6.36	2017.674	1	
18490+2110	STF2401AB	7.27	9.27	38.0	4.11	2017.658	1	
18517+5116	ES 788	9.41	11.99	319.4	3.36	2017.661	2	
18521+5120	STF2416AB	8.67	11.17	158.5	20.18	2017.658	1	
18521+5120	STF2416AC	8.67	9.41	40.7	122.66	2017.658	1	
18534+3728	HO 89	8.89	12.9	170.0	5.96	2017.674	1	
18545+3719	HO 90	8.72	12.7	227.5	3.98	2017.674	1	
18569+3112	ES 2422	8.96	12.0	178.5	5.55	2017.674	1	
18569+5645	STF2433AB	7.17	10.09	121.6	7.43	2017.674	1	
18581+3813	STF2427AB	9.61	9.93	59.4	55.91	2017.674	1	
18581+3813	CTT 11AD	9.61	11.8	290.5	57.19	2017.674	1	
18581+3813	SP 2AE	9.61	5.87	350.3	162.29	2017.674	1	
18581+3813	STF2427BC	9.93	10.20	78.9	7.19	2017.674	1	
18591+2730	A 261	9.07	12.9	192.6	3.70	2017.674	1	
18599+1454	STF2428AB	8.22	10.31	285.8	6.87	2017.674	1	
19010+5311	A 1388	9.51	12.83	262.2	5.23	2017.658	1	
19021+5216	STF2450A,BC	6.50	9.51	298.4	5.12	2017.674	1	
19037+3545	STF2448	8.75	8.80	192.7	2.39	2017.658	1	2x Barlow 0,254
19050+2114	HDS2708	8.22	11.79	3.3	5.95	2017.699	2	
19074+3230	STF2461AB	5.26	9.1	281.1	3.20	2017.731	2	17 Lyr
19083+5520	STF2479AB,C	7.49	9.68	28.6	6.54	2017.674	1	
19088+2825	ES 348	8.78	11.3	252.9	5.41	2017.724	1	
19100+5124	ES 790	9.32	12.1	116.1	4.64	2017.724	1	
19147+5946	ES 192	9.82	12.2	100.3	4.73	2017.737	1	
19151+5946	ES 193	9.12	11.9	134.7	8.44	2017.737	1	
19169+4711	ES 128	8.38	11.98	283.6	4.79	2017.737	1	
19170+3332	ES 351	9.4	11.9	264.1	5.98	2017.737	1	
19189+4952	ES 1095AB	8.88	12.82	134.6	6.71	2017.737	1	
19208+3427	ES 352	9.16	12.4	139.8	4.80	2017.737	1	
19213+5549	STF2516	8.27	9.50	233.6	4.13	2017.740	1	

Table 1 concludes on the next page.

Double Star Measurements with a 12-inch Newtonian Telescope, Annual Report of 2017

Table 1 (conclusion). Measurements

RA + Dec	Name	Mag 1	Mag 2	PA	Sep	Date	N	Note
19216+3018	A 268	9.11	12.6	103.1	3.60	2017.737	1	
19257+3658	ES 2179	8.98	11.5	132.6	6.94	2017.737	1	
19307+2758	WAL 114AC	3.19	10.99	340.8	65.60	2017.740	1	
19307+2758	CTT 17AD	3.19	12.24	32.9	108.44	2017.740	1	
19307+2758	CTT 18AE	3.19	11.81	206.5	76.66	2017.740	1	
19307+2758	SMR 34AF	3.19	12.	46.0	59.19	2017.740	1	
19307+2758	SMR 34AH	3.19	12.5	119.2	54.54	2017.740	1	
19307+2758	SMR 34AI	3.19	12.5	132.4	37.95	2017.740	1	
19307+2758	SMR 34AJ	3.19	10.	140.6	140.57	2017.740	1	
19310+3359	ES 2295	3.0	9.40	204.8	3.55	2017.739	2	
19351+3412	STT 376	7.56	10.41	236.7	2.94	2017.740	1	
19563+3505	BU 980AB	3.89	12.0	206.3	7.15	2017.740	1	
20462+3358	STT 594AB	2.46	11.6	261.3	79.20	2017.724	1	
20462+3358	BU 676AC	2.46	13.40	269.0	78.97	2017.724	1	
21069+3845	STF2758AB	5.20	6.05	153.2	31.93	2017.724	1	61 Cyg
21069+3845	STF2758AH	5.35	9.97	268.4	117.51	2017.724	1	
21069+3845	SMR 1AI	5.35	10.74	238.9	28.26	2017.724	1	
21069+3845	SMR 40AO	5.35	12.65	280.6	163.42	2017.724	1	
21069+3845	SMR 40AP	5.35	12.84	285.2	159.58	2017.724	1	