

Double Star Measures Using a DSLR Camera #4

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Abstract: This article contains measures by the author made with a DSLR camera. The images used for the measures were taken in the period between 2008.150-2008.778. The result is 381 positive and 8 negative measures.

In 2008 I had the opportunity to build an observatory for my telescope, with a retractable roof (Figure 1), so the conditions for taking photographs have become more comfortable. The next results detailed here are from the period between 24 Feb – 11 Oct 2008. The equipment used for photographing and the methods of photo processing and measuring are the same as those detailed in my first article [1]. Therefore, I would only like to note that I was working with a Canon 350D digital camera with a 35.5cm Newtonian telescope with the focal length increased to 4200mm. The pictures were measured with Florent Losse's program (*Reduc* 3.85). I owe special thanks to him, because he has modified *Reduc* after my request, making it much easier to measure large images. I used approximately 1742 photos for the present publication. It contains the data of 4932 independent measures of 389 pairs.

Also, the structure of the tables, the contents of the notes section and the appendix with the images have all been created as described in reference [1].

In the case of some doubles, when the available measures show a significant deviation in the parameters, I tried to explore the reason for this difference. I downloaded the DSS images of the area (POSS 1 Blue and POSS 2 IR) to check whether the doubles under scrutiny changed in the period between the different measures. In some cases it has been proved that the proper motion of one of the components caused this change. I employed the same method when I could not identify a double in or near the position given by WDS.

I have also attached images (Figures 2—7) of some

of the doubles I measured. The complete image archive of the article and table referring to the photos can be accessed at

http://csillag.bacska.hu/dcam/JDSO/2009_3/.

I would specially like to thank Ágnes Kiricsi, who has helped a lot in this publication with the English translations and the correspondence.

References

1. Berkó, Ernő, "Double Star Measures Using a DSLR Camera", *JDSO*, 4, 144-156, 2008.



Figure 1: The author in his new observatory.

Double Star Measures Using a DSLR Camera #4

RA +/- Dec	Discoverer	Mags	PA	+/-	Sep	+/-	Epoch	N	Notes
07049-0217	BAL 111	11.06 11.3	195.67	0.20	9.85	0.03	2008.155	11	1
07050-0225	BAL 112	10.77 12.5	349.16	0.10	13.72	0.00	2008.155	2	2
07060-0137	BAL 393	11.1 11.3	126.24	0.16	15.24	0.03	2008.155	15	3
07064-0140	BAL 395	11.4 11.5	179.12	0.25	8.97	0.04	2008.155	15	4
07065-0134	BAL 399AB	10.5 12.9	168.20	0.30	8.45	0.07	2008.155	17	5
07065-0134	BAL 400BC	12.9 13.1	267.40	0.13	19.49	0.05	2008.155	15	6
07065-0134	BAL 397DC	13.1 13.1	101.10	0.35	13.00	0.03	2008.155	13	7
07067-0137	BAL 401	11.20 11.35	155.76	0.14	17.31	0.05	2008.155	17	8
07075-0112	CHE 83	8.0 11.0					2008.155		9
07081-0146	BAL 408	10.06 12.3	337.72	0.38	5.54	0.03	2008.155	16	10
07082-0151	J 2781AB	10.0 10.2	9.29	0.10	25.94	0.03	2008.155	17	11
07082-0151	BAL 409BC	10.3 10.9	267.18	0.39	5.02	0.07	2008.155	11	11
07085-0144	BAL 413	12.2 14.0	82.74	0.22	19.01	0.05	2008.155	10	12
07094-0234	BAL 136	11.4 11.5	190.35	0.21	13.76	0.03	2008.155	12	13
07095-0139	BAL 416	11.1 11.5	81.67	0.10	16.16	0.04	2008.150	27	14
07095-0140	Anon. 1	13.7 15.0	85.91	0.50	10.56	0.05	2008.150	26	15
07096-0132	BAL 418	12.6 12.7	297.34	0.38	10.36	0.04	2008.150	20	16
07096-0137	BAL 417	10.91 13.5	249.54	0.12	19.84	0.04	2008.150	24	17
07097-0236	Anon. 2	12.6 13.2	323.07	0.40	8.38	0.04	2008.155	12	18
07098-0135	BAL 420	11.3 11.4	60.66	0.18	17.00	0.06	2008.150	27	19
07098-0211	BAL 137	10.36 11.8	4.75	0.24	12.35	0.07	2008.155	10	20
07098-0231	Anon. 3	12.7 14.3	350.14	0.36	7.16	0.05	2008.155	12	21
07099-0230	BAL 139	9.81 9.9	213.80	0.18	12.81	0.05	2008.155	12	22
07100-0201	Anon. 4	12.5 13.5	3.17	0.29	9.01	0.08	2008.155	11	23
07100-0200	BAL 422	11.4 11.5	30.03	0.08	19.39	0.04	2008.155	17	24
07100-0236	Anon. 5	12.8 13.5	275.45	0.49	6.76	0.08	2008.155	12	25
07101-0220	BAL 140	11.3 11.5	348.37	0.38	11.99	0.03	2008.155	10	26
07102-0212	BAL 141	11.94 12.6	302.03	0.22	14.15	0.07	2008.155	18	27
07102-0218	BAL 142	11.32 12.6	1.42	0.26	17.37	0.06	2008.155	12	28
07105-0237	BAL 144	11.3 11.3	99.71	0.18	12.12	0.04	2008.155	27	29
07105-0306	BAL 143AB	10.9 10.9	28.31	0.19	12.02	0.06	2008.155	14	30
07105-0306	BAL 143AC	10.9 11.5					2008.155		31
07105-0306	Anon. 6Ax	10.9 13.8	99.71	0.22	14.14	0.07	2008.155	12	32
07105-0306	BAL 143BC	10.9 11.5					2008.155		31
07105-0306	Anon. 6xy	13.8 13.7	64.57	0.55	10.05	0.08	2008.155	11	33
07105-0306	Anon. 6xz	13.8 13.7	127.17	0.14	10.39	0.06	2008.155	12	33
07107-0223	BAL 145	11.1 11.1	129.41	0.18	12.64	0.07	2008.155	13	34
07108-0128	BAL 426	11.3 11.4	121.64	0.09	14.79	0.03	2008.150	11	35
07108-0130	Anon. 7	13.5 14.5	180.79		3.62		2008.150	1	36
07108-0135	BAL 427	11.24 12.4	160.24	0.11	10.61	0.09	2008.155	3	37
07108-0144	BAL 428	11.4 11.4	150.57	0.25	9.52	0.02	2008.155	3	38
07108-0226	BAL 146	9.2 11.1	324.85	0.34	14.01	0.04	2008.155	7	39
07108-0230	Anon. 8	13.2 14.6	295.69	0.42	9.68	0.06	2008.155	11	40

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RA +/- Dec	Discoverer	Mags	PA	+/-	Sep	+/-	Epoch	N	Notes
07108-0234	Anon. 9	12.3 13.0	343.96	0.30	4.77	0.08	2008.155	5	41
07109-0134	Anon.10	14.0 14.5	23.48	0.34	3.52	0.04	2008.150	5	42
07109-0247	BAL 147	11.59 13.3	300.18	0.14	12.38	0.03	2008.155	14	43
07110-0230	Anon.11	10.4 14.0	244.93	0.23	14.39	0.12	2008.155	6	44
07110-0232	BAL 148	11.1 11.4	197.07	0.15	10.46	0.04	2008.155	13	45
07110-0249	BAL 149	11.0 11.4	110.06	0.14	10.35	0.04	2008.155	13	46
07111-0139	BAL 432	11.52 11.6	55.68	0.29	4.16	0.06	2008.155	5	47
07111-0207	BAL 434	10.43 10.8	22.28	0.17	28.40	0.06	2008.150	9	48
07111-0246	BAL 150	11.38 12.7	25.21	0.26	15.49	0.03	2008.155	14	49
07112-0136	BAL 433	12.04 12.8	58.62	0.21	15.37	0.05	2008.155	12	50
07112-0206	Anon.12	14.9 15.2	64.24		8.89		2008.150	1	51
07112-0208	BAL 436	11.4 11.5	22.82	0.19	17.81	0.07	2008.150	11	52
07112-0209	BAL 435	9.96 11.15	303.68	0.10	20.75	0.03	2008.150	13	53
07112-0304	BAL 151	12.48 12.69	33.04	0.38	4.92	0.08	2008.155	11	54
07113-0205	Anon.13AB	13.0 14.0	275.24		5.17		2008.150	1	55
07113-0205	Anon.13AC	13.0 14.5	233.57		11.30		2008.150	1	55
07113-0208	Anon.14	14.1 14.4	33.76	0.27	18.14	0.05	2008.150	11	56
07113-0247	BAL 152	11.0 11.2	81.09	0.45	11.23	0.05	2008.155	14	57
07114-0007	BAL1085	11.80 11.9	68.01	0.22	9.02	0.03	2008.150	15	58
07114-0053	BAL 772	11.00 14.0	49.55	0.21	13.60	0.06	2008.150	12	59
07114-0138	Anon.15	13.6 14.3	147.77	0.40	10.35	0.07	2008.150	14	60
07115-0006	Anon.16	14.0 14.5	309.83	0.31	6.54	0.03	2008.150	8	61
07115-0025	BAL 774	10.0 11.3	252.79	0.24	9.14	0.04	2008.150	18	62
07115-0219	Anon.17	14.6 14.7	73.85	0.23	10.98	0.09	2008.150	12	63
07115-0244	Anon.18	13.6 14.3	290.46	0.35	10.65	0.05	2008.155	12	64
07116-0132	BAL 439	11.4 11.5	289.54	0.21	18.93	0.05	2008.150	19	65
07116-0211	BAL 153	11.3 11.4	254.31	0.28	17.32	0.07	2008.150	7	66
07117-0006	Anon.19	14.0 14.5	53.47	0.26	7.26	0.06	2008.150	11	67
07117-0057	BAL 775	9.5 10.9	142.08	0.15	19.84	0.03	2008.150	14	68
07117-0206	BAL 440	11.84 12.2	195.53	0.16	15.55	0.03	2008.150	16	69
07117-0217	BAL 154	9.81 9.9	12.39	0.11	18.54	0.03	2008.150	12	70
07117-0219	Anon.20	13.7 13.8	1.14	0.20	10.20	0.04	2008.150	12	71
07118-0130	Anon.21	13.9 14.0	106.80	0.33	9.44	0.04	2008.150	10	72
07119-0130	BAL 441	8.8 9.5	33.72	0.13	14.43	0.07	2008.150	20	73
07119-0132	Anon.22	14.3 14.4	167.93	0.23	5.93	0.07	2008.150	4	74
07119-0135	Anon.23	12.9 13.5	16.50	0.40	9.09	0.06	2008.150	12	75
07119-0207	BAL 443	11.60 12.8	227.46	0.21	15.93	0.03	2008.150	16	76
07120-0142	BAL 442	11.87 12.2	52.97		2.95		2008.150	1	77
07121-0218	BAL 155	12.17 12.3	345.61	0.39	7.37	0.04	2008.150	12	78
07122-0205	BAL 444	11.80 13.4	300.55	0.19	14.17	0.02	2008.150	16	79
07123-0029	BAL 776AB	10.8 11.3	236.57	0.09	17.25	0.05	2008.150	18	80
07123-0029	BKO 24AC	10.8 11.0	203.92	0.02	110.91	0.06	2008.150	18	80
07123-0029	BKO 24CD	11.0 11.5	71.20	0.43	8.55	0.06	2008.150	13	80
07123-0226	BAL 157	11.02 13.7	130.14	0.42	12.17	0.04	2008.150	13	81

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RA +/- Dec	Discoverer	Mags	PA	+/-	Sep	+/-	Epoch	N	Notes
07123-0304	BAL 156	10.23 10.5	219.30	0.11	11.45	0.02	2008.155	14	82
07124-0139	Anon.24	13.6 13.8	274.10	0.42	8.78	0.08	2008.150	9	83
07124-0307	Anon.25	12.8 13.9	283.10	0.20	11.51	0.04	2008.155	7	84
07125-0141	BAL 445	10.6 11.5	41.93	0.18	20.50	0.05	2008.150	7	85
07125-0146	Anon.26	13.7 14.5	309.34	0.40	8.61	0.05	2008.150	9	86
07125-0204	BAL 446	11.2 11.3	125.56	0.10	17.54	0.03	2008.150	16	87
07125-0228	Anon.27	13.4 14.2	213.05	0.06	5.50	0.04	2008.150	2	88
07126-0147	BAL 448	10.8 11.0	227.12	0.61	4.25	0.08	2008.150	3	89
07127-0226	BAL 159	11.4 11.5	60.07	0.20	12.76	0.03	2008.150	13	90
07127-0311	STF1045	8.01 9.08	235.87	0.27	5.63	0.05	2008.155	21	91
07128-0221	BAL 160	11.44 12.7	299.05	0.25	15.75	0.05	2008.150	13	92
07131-0255	XMI 50	10.76 11.29	166.18	0.10	23.60	0.04	2008.155	13	93
07131-0256	Anon.28	12.0 13.0	158.59	0.25	7.15	0.04	2008.155	14	94
07133-0150	BAL 452	12.84 12.83					2008.155		31
07135-0249	J 2791	12.58 12.55	42.63	0.33	6.39	0.07	2008.155	13	95
19329+3028	Anon.29	13.5 13.5	202.33	0.10	6.97	0.04	2008.762	2	96
19330+3030	SMA 86	10.0 11.5	37.93	0.37	15.35	0.05	2008.762	11	97
19459+3501	H 5 137AB	6.22 8.18	25.98	0.11	39.09	0.06	2008.762	7	98
19459+3501	BOT 3AC	6.10 8.5	75.92	0.01	445.69	0.05	2008.762	4	98
19459+3501	ACA 1AD	6.22 11.81	36.23		224.57		2008.762	1	98
19467+3504	GYL 91	10.5 11.0	190.99	0.09	36.25	0.06	2008.762	16	99
19490+3443	SEI 686	11.09 12.73	220.65	0.05	20.45	0.07	2008.762	11	100
19493+3441	Anon.30	12.0 12.0	319.50	0.30	10.43	0.03	2008.762	14	101
19494+3446	Anon.31	13.0 13.0	316.93	0.49	5.35	0.05	2008.762	8	102
19507+3429	SEI 695AB	10.0 10.7	350.60	0.26	8.57	0.05	2008.762	16	103
19507+3429	POP1227AC	10.0 11.5	290.73	0.06	49.05	0.04	2008.762	16	104
19508+3430	POP 13AB	12.0 13.2	357.29	0.57	4.00	0.07	2008.762	6	105
19508+3430	SEI 696AC	12.0 13.1	309.10	0.08	19.36	0.02	2008.762	16	106
19508+3430	Anon.32Ax	12.0 14.0	271.42	0.42	8.31	0.08	2008.762	12	107
19513+3434	J 1160	9.7 9.7	292.82	0.36	5.91	0.05	2008.762	5	108
19513+3434	SEI 699AB	11.0 11.2	239.90	0.01	3.68	0.06	2008.762	2	109
19513+3434	SEI 700AC	11.0 11.0	177.28	0.24	25.59	0.07	2008.762	15	110
19514+3434	J 1161	10.8 11.0					2008.762		31
20022+3332	SEI 801	9.8 10.3	107.09	0.34	7.65	0.04	2008.762	10	111
20023+3354	SEI 804	11.33 11.5	90.09	0.08	27.43	0.04	2008.762	17	112
20025+3427	SEI 811	12.09 12.45	79.50	0.15	20.17	0.06	2008.762	17	113
20025+3341	HO 117AB	10.41 11.7	312.63		4.57		2008.762	1	114
20025+3341	Anon.33Ax	10.41 14.0	27.62		6.66		2008.762	1	114
20026+3352	Anon.34AB	13.0 14.5	34.36	0.30	10.66	0.06	2008.762	10	115
20026+3352	Anon.34BC	14.5 14.0	56.89	0.33	4.75	0.06	2008.762	10	115
20027+3355	Anon.35AB	12.5 13.5	339.15	0.33	7.00	0.09	2008.762	2	116
20027+3355	Anon.35AD	12.5 13.5	198.53	0.27	10.79	0.02	2008.762	15	116
20027+3355	Anon.35BC	13.5 13.5	14.74		1.90		2008.762	1	116
20027+3355	Anon.35DE	13.5 14.0	155.75	0.42	4.22	0.07	2008.762	8	116

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RA +/- Dec	Discoverer	Mags	PA	+/-	Sep	+/-	Epoch	N	Notes
20027+3349	SEI 815AB	10.5 11.0	359.42	0.11	19.64	0.05	2008.762	16	117
20027+3349	SEI 816AC	10.5 11.0	112.29	0.19	20.93	0.05	2008.762	15	117
20027+3349	Anon.36Ax	10.5 13.0	348.42	0.77	4.99	0.09	2008.762	3	117
20030+3416	Anon.37	12.1 12.6	61.10	0.26	14.07	0.05	2008.762	17	118
20031+3421	Anon.84	12.4 13.2	307.81	0.16	11.45	0.03	2008.762	17	119
20031+3421	SEI 820	10.26 11.5	89.79	0.26	10.63	0.03	2008.762	17	120
20031+3350	SEI 819	10.56 11.9	148.43	0.11	21.95	0.03	2008.762	17	121
20031+3343	SEI 818	9.49 11.80	207.34	0.10	15.36	0.06	2008.762	19	122
20032+3357	SEI 821	11.61 11.98	93.26	0.13	29.09	0.04	2008.762	17	123
20034+3420	SEI 823	12.06 12.19	232.42	0.06	17.10	0.06	2008.762	17	124
20043+3431	SEI 836	11.18 11.6	5.61	0.15	16.26	0.04	2008.762	14	125
20049+3431	Anon.38	13.3 13.5	41.28	0.32	10.78	0.07	2008.762	9	126
20108+1614	Anon.39	10.12 13.0	114.48		6.64		2008.778	1	127
20111+1611	ENG 71AB	7.42 9.67	147.33	0.03	209.24	0.06	2008.778	10	128
20111+1611	HZG 15AD	7.42 11.21	260.81	0.21	37.24	0.06	2008.778	12	128
20111+1611	GIC 163AE	7.42 13.64	94.61	0.15	104.13	0.06	2008.778	11	128
20111+1611	BUP 205BC	9.67 12.62	272.62	0.11	61.75	0.06	2008.778	18	128
20122+1534	CHE 187AB	9.97 10.25	18.00	0.27	17.99	0.05	2008.778	18	129
20122+1534	Anon.40Bx	10.25 13.0	112.35	0.34	5.97	0.07	2008.778	4	129
20123+1607	CHE 189	9.94 11.5	83.81	0.14	18.15	0.04	2008.778	15	130
20123+1529	CHE 190	10.33 11.0	232.91	0.05	33.99	0.04	2008.778	18	131
20123+1524	CHE 191AB	9.13 9.65	336.61	0.26	12.22	0.05	2008.778	17	132
20123+1524	CHE 191AC	9.13 11.5	336.89	0.24	18.24	0.04	2008.778	12	132
20123+1501	CHE 192	9.90 10.18	4.70	0.22	25.34	0.05	2008.773	11	133
20124+1550	CHE 193	10.00 10.5	339.77	0.67	1.83	0.08	2008.778	5	134
20126+1616	CHE 67AB	10.04 11.0	298.41	0.27	12.21	0.05	2008.778	15	135
20126+1616	Anon.41Bx	11.0 13.0	295.23	0.46	10.19	0.04	2008.778	15	135
20126+1553	Anon.42	13.0 13.5	171.17	0.40	2.00	0.07	2008.778	3	136
20126+1506	CHE 194	10.48 12.82	222.56	0.11	21.51	0.05	2008.773	13	137
20127+1516	CHE 195	9.81 12.0	63.76	0.09	27.70	0.04	2008.778	8	138
20127+1508	CHE 196	10.15 10.30	52.02	0.19	11.58	0.04	2008.773	17	139
20127+1458	CHE 197	9.26 12.0	84.53	0.08	29.71	0.08	2008.773	13	140
20128+1548	SMA 113	10.0 12.0					2008.778		141
20128+1548	Anon.43	12.5 13.0	32.69	0.35	5.14	0.03	2008.778	13	142
20128+1520	CHE 198	8.90 10.35	225.69	0.31	16.87	0.07	2008.778	13	143
20128+1508	CHE 199	9.26 10.38	7.35	0.13	23.98	0.05	2008.773	15	144
20128+1504	CHE 200	10.13 11.0	326.98	0.12	16.42	0.02	2008.773	17	145
20129+1548	CHE 201	11.11 12.84	321.51	0.14	28.02	0.04	2008.778	16	146
20129+1548	CHE 202	10.56 13.36	343.65	0.30	10.89	0.03	2008.778	16	147
20129+1503	CHE 203	10.20 12.7	92.27	0.07	28.65	0.04	2008.773	17	148
20129+1441	CHE 204	11.70 12.78	168.98	0.05	30.86	0.02	2008.778	16	149
20130+1533	CHE 205	10.33 11.0	338.17	0.19	23.56	0.03	2008.778	18	150
20131+1455	CHE 206	10.13 10.30	209.03	0.09	28.25	0.04	2008.773	17	151
20132+1541	CHE 207AB	10.13 11.57	263.98	0.14	23.60	0.06	2008.778	10	152

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Double Star Measures Using a DSLR Camera #4

RA +/- Dec	Discoverer	Mags	PA	+/-	Sep	+/-	Epoch	N	Notes
20132+1541	Anon.44Bx	11.57 12.5	183.78	0.42	7.13	0.05	2008.778	9	152
20132+1503	CHE 208	10.38 10.5	120.40	0.15	25.66	0.06	2008.773	16	153
20133+1530	CHE 209	11.74 11.86	50.54	0.05	29.95	0.04	2008.778	10	154
20133+1529	Anon.45	13.0 13.5	210.18	0.37	6.78	0.04	2008.778	5	155
20133+1516	CHE 210	9.70 10.17	304.49	0.07	28.07	0.02	2008.778	17	156
20134+1611	CHE 211	9.93 11.0	339.80	0.15	21.86	0.05	2008.773	20	157
20134+1604	CHE 212	9.83 9.99	13.38	0.10	28.32	0.05	2008.773	13	158
20134+1536	Anon.46	13.0 13.2	253.55	0.43	6.53	0.07	2008.778	9	159
20135+1555	CHE 213	10.29 11.0	33.89	0.15	22.93	0.05	2008.778	15	160
20136+1613	CHE 214	8.29 11.8	334.15	0.18	24.36	0.06	2008.773	18	161
20136+1537	CHE 215AB	9.94 10.39	95.21	0.10	32.80	0.05	2008.778	15	162
20136+1537	Anon.47Bx	10.39 12.5	325.84	0.28	5.39	0.04	2008.778	8	162
20137+1609	CHE 216	10.23 11.0	290.08	0.09	25.89	0.04	2008.773	20	163
20137+1452	CHE 217	9.35 10.20	129.89	0.15	27.94	0.06	2008.767	14	164
20138+1609	Anon.48	12.5 13.5	255.95	0.40	8.70	0.07	2008.773	20	165
20138+1450	CHE 218AB	10.10 11.0	221.38	0.11	26.51	0.05	2008.767	11	166
20138+1450	Anon.49Bx	10.10 13.0	107.88	0.73	4.55	0.08	2008.767	7	166
20139+1549	CHE 219	10.10 11.5	59.79	0.26	10.62	0.03	2008.778	15	167
20139+1529	CHE 220	10.41 10.5	221.69	0.08	37.28	0.03	2008.778	14	168
20139+1441	CHE 221	9.98 10.41	7.58	0.12	17.61	0.02	2008.778	14	169
20140+1503	CHE 222	11.02 11.23	339.41	0.10	17.20	0.02	2008.767	17	170
20141+1612	CHE 223	10.35 11.5	82.07	0.39	8.43	0.04	2008.773	18	171
20142+1508	Anon.50	12.2 13.0	125.80	0.31	6.23	0.07	2008.767	12	172
20142+1442	CHE 224	9.97 10.13	337.70	0.07	23.63	0.04	2008.778	15	173
20143+1507	CHE 225AB	11.5 13.6	211.56	0.32	7.47	0.04	2008.767	15	174
20143+1507	Anon.51Ax	11.5 14.5	275.20	0.41	4.26	0.07	2008.767	6	174
20143+1451	CHE 226	10.33 10.55	285.72	0.17	12.88	0.06	2008.767	16	135
20144+1611	CHE 227	10.09 10.10	46.26	0.26	5.16	0.04	2008.773	17	175
20144+1608	CHE 228AB	9.63 10.21	309.82	0.08	38.68	0.06	2008.773	18	176
20144+1608	CHE 228AC	9.63 11.5	268.33	0.10	24.22	0.06	2008.773	14	176
20144+1608	Anon.52Bx	10.21 13.6	134.29	0.33	9.91	0.06	2008.773	18	176
20144+1533	CHE 229	10.13 10.40	261.56	0.07	17.48	0.06	2008.778	16	177
20144+1505	Anon.53	13.5 13.7	138.09	0.39	5.66	0.02	2008.767	4	135
20145+1555	CHE 230AB	11.46 12.09	252.55	0.10	20.54	0.03	2008.778	17	178
20145+1555	Anon.54Bx	12.09 13.0	176.66	0.33	7.91	0.04	2008.778	10	178
20145+1541	CHE 231	13.5 13.6	266.36	0.21	14.54	0.04	2008.778	11	135
20145+1503	CHE 232	13.4 14.2	332.72	0.20	9.57	0.04	2008.767	16	179
20145+1503	Anon.55	12.6 14.2	182.65	0.33	11.63	0.03	2008.767	16	180
20146+1600	CHE 233	9.51 10.20	268.87	0.15	15.64	0.03	2008.778	17	181
20146+1503	CHE 234	10.5 11.0	89.46	0.07	18.60	0.03	2008.767	16	182
20146+1452	CHE 235	10.00 11.5	28.34	0.27	13.85	0.06	2008.767	15	183
20147+1602	CHE 236	10.41 11.0	290.94	0.13	21.54	0.04	2008.778	17	184
20148+1616	CHE 237	10.30 11.5	218.60	0.32	21.88	0.04	2008.778	9	135
20148+1605	CHE 238	12.03 12.56	302.05	0.09	24.25	0.02	2008.778	17	185

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Double Star Measures Using a DSLR Camera #4

RA +/- Dec	Discoverer	Mags	PA	+/-	Sep	+/-	Epoch	N	Notes
20148+1441	CHE 239	12.55 13.07	55.28	0.06	28.72	0.05	2008.778	15	186
20150+1504	CHE 240	9.9 10.6	178.95	0.09	28.56	0.02	2008.767	16	187
20151+1555	CHE 241	10.18 11.0	48.86	0.08	21.37	0.06	2008.778	13	188
20151+1552	Anon.56	13.2 13.5	325.18	0.28	6.41	0.07	2008.778	9	135
20153+1535	CHE 242	10.08 14.3	5.76	0.23	13.89	0.05	2008.773	7	189
20154+1538	CHE 243AB	9.22 11.0	219.06	0.21	23.99	0.05	2008.773	9	190
20154+1538	CHE 243AC	9.22 11.5	202.74	0.30	26.94	0.06	2008.773	8	190
20154+1457	CHE 244	10.18 11.5	108.60	0.37	13.78	0.06	2008.773	13	191
20155+1502	SMA 114	12.0 12.2	309.87	0.29	5.01	0.02	2008.773	12	192
20155+1455	Anon.57	13.5 13.6	29.51		2.59		2008.773	1	193
20155+1452	CHE 245AB	11.0 11.5	285.91	0.12	17.94	0.05	2008.773	17	135
20155+1452	Anon.58Ax	11.0 13.0	1.31	0.40	6.70	0.05	2008.773	17	135
20156+1527	Anon.59	13.0 13.5	107.36	0.34	7.06	0.06	2008.773	12	194
20156+1526	HDS2887AB	8.85 13.18					2008.773		195
20156+1526	CHE 246AC	8.85 11.0	87.48	0.23	16.78	0.06	2008.773	17	196
20156+1526	CVP 1AD	8.85 11.0	340.88	0.10	39.46	0.06	2008.773	17	196
20157+1537	CHE 247	10.33 11.5	358.68	0.41	4.33	0.04	2008.773	19	197
20157+1534	Anon.60	13.5 14.0	89.53	0.31	4.31	0.06	2008.773	12	198
20157+1520	CHE 248	9.72 13.3	321.81	0.08	32.04	0.04	2008.773	17	199
20157+1509	Anon.61	13.0 13.5	63.47	0.97	2.64	0.04	2008.773	4	200
20157+1508	CHE 249AB	10.43 11.0	348.28	0.07	22.94	0.05	2008.773	15	201
20157+1508	Anon.62Ax	10.43 14.0	112.19	0.36	4.88	0.06	2008.773	12	201
20157+1457	Anon.63	13.5 14.0	299.11	0.36	3.93	0.03	2008.773	7	135
20157+1453	CHE 250	10.24 13.51	143.94	0.30	20.55	0.06	2008.773	9	202
20158+3759	SLE 978	10.1 12.9	199.01	0.31	11.72	0.05	2008.743	14	203
20158+1536	Anon.64	14.0 14.0	241.18	0.41	4.92	0.06	2008.773	12	204
20158+1510	Anon.65	13.0 13.4	67.68	0.47	3.43	0.08	2008.773	9	205
20158+1455	CHE 251	10.53 11.5	61.07	0.07	28.18	0.04	2008.773	17	135
20159+1535	CHE 252	9.75 11.0	303.53	0.09	37.40	0.06	2008.773	18	206
20159+1505	Anon.66	12.2 13.5	110.94	0.37	5.08	0.05	2008.773	15	207
20159+1457	Anon.67	13.5 13.5	323.38	0.35	5.77	0.06	2008.773	10	208
20160+3758	SEI1048	11.0 11.0	123.00	0.14	19.69	0.04	2008.743	14	209
20160+1521	CHE 253	11.87 12.2	324.44	0.14	14.45	0.02	2008.773	18	210
20160+1510	Anon.68	12.5 12.5	202.74	0.44	4.63	0.06	2008.773	12	211
20161+1552	CHE 254AB	10.45 10.5	133.33	0.06	26.73	0.02	2008.773	14	135
20161+1552	Anon.69Ax	10.45 13.5	313.06	0.28	10.27	0.06	2008.773	14	135
20161+1552	Anon.70	12.7 14.0	349.43	0.32	5.43	0.05	2008.773	8	212
20161+1537	CHE 255	10.45 10.51	212.27	0.11	25.46	0.04	2008.773	19	135
20162+3805	SEI1050	11.0 11.0	135.88	0.34	3.83	0.06	2008.743	5	213
20162+1534	CHE 256	12.56 13.32	47.65	0.09	27.55	0.05	2008.773	17	214
20162+1507	CHE 258	11.95 12.52	229.64	0.05	16.24	0.03	2008.773	15	215
20162+1504	CHE 259	12.17 12.17	138.37	0.10	16.63	0.02	2008.773	15	216
20163+1615	CHE 260	10.20 11.0	200.56	0.06	27.41	0.03	2008.773	14	135
20163+1538	CHE 261AB	10.01 10.16	41.57	0.16	18.58	0.05	2008.773	18	217

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Double Star Measures Using a DSLR Camera #4

RA +/- Dec	Discoverer	Mags	PA	+/-	Sep	+/-	Epoch	N	Notes
20163+1538	CHE 261AC	10.01 11.0	110.26	0.15	24.21	0.05	2008.773	18	217
20165+3739	BU 442AB	9.72 8.04	103.62	0.15	18.85	0.03	2008.743	15	218
20165+3739	SLV 8AC	9.72 8.82	78.35	0.04	31.82	0.03	2008.743	15	218
20165+3739	ABH 135AD	9.72 12.81	50.66	0.11	24.44	0.03	2008.743	15	218
20165+3739	SLE 982AG	9.72 10.61	11.46	0.01	88.53	0.05	2008.743	15	218
20165+3739	SLE 982AH	8.2 12.3	19.74	0.01	111.54	0.05	2008.743	15	218
20165+3739	SLE 982AI	8.2 12.5	44.66	0.05	63.29	0.07	2008.743	15	218
20165+3739	SLE 982AJ	8.2 11.9	35.40	0.02	96.53	0.06	2008.743	15	218
20165+3739	SLE 982AK	8.2 11.5	34.77	0.01	114.68	0.05	2008.743	15	218
20165+3739	SLE 982AL	8.2 8.5	28.40	0.01	177.56	0.06	2008.743	15	219
20165+3739	SLE 982AM	8.2 13.1	66.38	0.03	89.11	0.04	2008.743	15	218
20165+3739	SLE 982AN	8.2 11.6	77.15		156.24		2008.743	1	218
20165+3739	SLE 982AO	8.2 11.7	119.33	0.06	59.07	0.04	2008.743	15	218
20165+3739	BU 442AP	9.72 10.8	156.48	0.24	4.17	0.04	2008.743	12	218
20165+3739	BU 442AQ	9.72 13.1	158.94	0.27	8.67	0.05	2008.743	12	218
20165+3739	BU 442AR	9.72 11.07	332.31	0.10	19.20	0.05	2008.743	15	218
20165+3739	BU 442BC	8.04 8.82	49.79	0.08	16.88	0.05	2008.743	15	218
20165+3739	ABH 135BD	8.04 12.81	126.43	0.14	41.25	0.06	2008.743	15	220
20165+3739	ABH 135BE	8.04 12.89	89.14	0.09	49.88	0.06	2008.743	15	218
20165+3739	ABH 135BF	8.04 12.46	140.95	0.08	64.04	0.07	2008.743	15	218
20165+3739	BU 442BP	8.04 10.8	272.11	0.34	16.69	0.05	2008.743	15	218
20165+3739	BU 442BR	8.04 11.07	308.21	0.14	34.67	0.05	2008.743	15	218
20165+3739	BU 442BS	8.04 14.5	128.47		4.37		2008.743	1	218
20165+3739	BU 442BT	8.04 11.5	165.22	0.35	6.61	0.07	2008.743	8	218
20165+3739	BU 442BU	8.04 10.9	75.17	0.20	25.32	0.05	2008.743	15	218
20165+3739	BU 442BV	8.04 11.25	87.07	0.15	30.96	0.04	2008.743	15	218
20165+3739	BU 442BW	8.04 11.1	1.67	0.08	19.97	0.06	2008.743	13	221
20165+3739	BU 442CU	8.82 12.0	110.70	0.28	12.44	0.04	2008.743	15	218
20165+3739	BU 442CV	8.82 12.8	117.15	0.13	20.34	0.04	2008.743	15	218
20165+3739	BU 442CW	8.82 13.7	306.57	0.17	15.25	0.05	2008.743	15	222
20165+3739	BU 442UV	12.0 12.8	127.25	0.23	8.09	0.02	2008.743	15	218
20165+1602	Anon.71	14.0 14.0	136.58	0.41	6.21	0.05	2008.773	11	223
20165+1601	Anon.72	12.2 14.5	36.35	0.44	4.58	0.05	2008.773	8	135
20166+3759	ALI 663	12.9 12.9	239.61	0.17	11.96	0.06	2008.743	14	224
20166+1606	CHE 263	9.93 11.5	136.20		4.17		2008.773	1	225
20166+1603	CHE 264	10.05 11.5	35.71	0.08	28.34	0.03	2008.773	16	226
20167+1513	CHE 265	9.60 10.25	70.35	0.19	21.11	0.04	2008.778	15	227
20168+1543	CHE 266	9.57 10.41	51.30	0.11	36.28	0.06	2008.773	18	228
20168+1523	CHE 267	9.75 11.5	18.42	0.06	36.26	0.05	2008.778	20	229
20169+1506	CHE 268AB	9.91 11.0	213.33	0.19	10.10	0.04	2008.778	15	230
20169+1506	CHE 268AC	9.91 10.28	337.29	0.10	21.63	0.03	2008.778	15	231
20169+1506	ABH 136AD	12.33 13.81	281.76	0.08	39.78	0.04	2008.778	15	230
20169+1506	ABH 136AJ	12.33 15.4	56.39	0.05	93.70	0.07	2008.778	9	230
20169+1506	ABH 136AK	12.33 15.8	64.49	0.08	103.68	0.05	2008.778	7	230

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Double Star Measures Using a DSLR Camera #4

RA +/- Dec	Discoverer	Mags	PA	+/-	Sep	+/-	Epoch	N	Notes
20169+1506	ABH 136AL	12.33 15.9	63.39	0.06	126.30	0.07	2008.778	6	230
20170+1538	CHE 269	8.97 9.92	284.23	0.13	27.22	0.04	2008.773	18	232
20171+1604	CHE 270	10.28 10.5	103.01	0.17	15.87	0.03	2008.773	16	233
20171+1601	CHE 271	10.02 11.0	33.03	0.17	26.23	0.05	2008.773	15	234
20171+1536	CHE 272	10.21 10.37	105.05	0.08	17.98	0.03	2008.773	16	235
20172+1553	CHE 273AB	7.02 11.0	93.75	0.12	27.17	0.04	2008.773	12	236
20172+1553	Anon.73Bx	11.0 13.0	198.71	0.59	1.44	0.06	2008.773	4	237
20172+1515	CHE 274	10.21 10.29	148.15	0.13	27.56	0.05	2008.778	15	238
20173+1443	CHE 275	10.01 10.0	330.04	0.08	31.54	0.05	2008.778	16	239
20174+1522	CHE 276	11.0 11.5	261.27	0.19	18.11	0.05	2008.778	19	240
20175+1444	CHE 277	9.87 9.95	345.70	0.51	3.91	0.03	2008.778	9	241
20177+1539	CHE 278	11.27 12.8	89.55	0.23	10.67	0.06	2008.773	15	242
20177+1503	CHE 279	11.2 11.5	180.90	0.19	6.81	0.04	2008.778	5	243
20178+1530	CHE 280	11.69 11.76	230.50	0.05	27.54	0.03	2008.778	15	244
20178+1520	CHE 281	8.89 10.18	315.15	0.17	17.53	0.05	2008.778	16	245
20178+1440	CHE 282	8.76 10.25	134.16	0.34	15.13	0.05	2008.778	12	246
20179+1553	CHE 283	11.68 11.88	79.77	0.07	24.53	0.04	2008.773	15	247
20180+1544	CHE 284	9.45 10.13	338.74	0.07	30.14	0.06	2008.773	16	248
20180+1543	CHE 285	10.21 10.33	16.57	0.34	7.14	0.06	2008.773	17	249
20180+1526	CHE 286	11.01 11.5	91.58	0.09	25.78	0.04	2008.778	15	250
20180+1501	CHE 287	11.0 11.5	134.69	0.13	27.31	0.04	2008.778	17	251
20181+1605	Anon.74	10.8 12.0	91.30	0.39	5.78	0.05	2008.773	13	252
20181+1555	J 553	9.4 10.5	20.95		3.56		2008.773	1	253
20181+1552	CHE 289	9.76 11.0	38.96	0.06	32.73	0.04	2008.773	19	254
20181+1519	CHE 290	9.66 10.06	153.93	0.25	10.14	0.04	2008.778	16	255
20181+1519	SMA 116	10.0 11.5	159.53	0.44	9.80	0.04	2008.778	16	256
20182+1604	CHE 291	9.75 11.5	274.20	0.33	8.45	0.06	2008.773	15	257
20183+1556	CHE 292	9.44 11.0	180.78	0.11	15.94	0.05	2008.773	17	258
20183+1539	CHE 293	10.06 10.12	174.02	0.09	25.06	0.04	2008.773	18	259
20183+1509	CHE 294AB	9.97 10.5	356.99	0.16	15.66	0.04	2008.778	15	260
20183+1509	CHE 294AC	9.97 11.5	237.63	0.15	14.19	0.06	2008.778	15	260
20186+1548	CHE 295	10.18 10.30	259.89	0.14	13.69	0.04	2008.773	18	261
20186+1444	CHE 296	10.02 10.5	23.69	0.10	29.50	0.06	2008.778	16	262
20187+1551	CHE 297AB	9.86 9.98	30.10	0.08	26.73	0.03	2008.773	3	263
20187+1551	CHE 298AC	9.86 10.05	137.52	0.09	16.71	0.05	2008.773	17	264
20188+1530	TOB 319AB	9.93 11.3	65.27	0.17	15.12	0.04	2008.778	17	265
20188+1530	CHE 299AC	9.93 10.27	328.84	0.07	37.21	0.04	2008.778	17	265
20188+1442	CHE 300	9.39 9.93	318.77	0.06	40.21	0.04	2008.778	18	266
20189+3635	Anon.75	14.0 14.0	241.83		6.76		2008.743	1	267
20189+1546	CHE 301	9.70 10.13	295.71	0.08	27.91	0.04	2008.773	18	268
20189+1524	CHE 302	9.56 10.5	127.91	0.14	23.69	0.05	2008.778	17	269
20190+1530	Anon.76	10.0 11.5	148.70	0.29	9.38	0.06	2008.778	11	270
20190+1456	CHE 303	9.97 11.0	259.25	0.14	20.58	0.04	2008.778	16	271
20191+3644	SLE 997	12.0 12.4	160.96	0.20	9.93	0.03	2008.743	16	272

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Double Star Measures Using a DSLR Camera #4

RA +/- Dec	Discoverer	Mags	PA	+/-	Sep	+/-	Epoch	N	Notes
20191+3635	SEI1080	10.5 11.1	252.85	0.34	22.53	0.06	2008.743	14	273
20192+3647	SEI1081AB	10.0 10.8	232.12	0.10	18.09	0.03	2008.743	16	274
20192+3647	TOB 184BC	11.1 12.3	171.38	0.10	23.85	0.04	2008.743	16	274
20193+3641	Anon.77	13.2 13.8	137.84	0.26	11.21	0.04	2008.743	16	275
20193+3635	AG 253AB	9.38 9.85	118.99	0.23	9.49	0.04	2008.743	13	276
20193+3635	AG 253AC	9.38 11.28	268.75	0.01	173.16	0.05	2008.743	10	276
20194+3646	SLE1002	12.6 12.6	240.46	0.51	7.92	0.07	2008.743	16	277
20194+3644	Anon.78	12.6 13.9	11.53	0.16	11.29	0.04	2008.743	16	278
20200+3921	MLB 882	10.5 12.0	279.71	0.39	4.92	0.08	2008.743	5	279
20201+3921	ES 2050AB	10.0 13.5	94.04	0.14	6.40	0.05	2008.743	5	280
20201+3921	ES 2050AC	10.0 13.5	191.48	0.34	11.22	0.06	2008.743	10	280
20203+3922	SEI1091	10.1 12.3	181.08	0.10	27.41	0.04	2008.743	11	281
20203+3920	SEI1090	10.8 12.0	156.16	0.22	13.35	0.06	2008.743	15	282
20203+3919	Anon.79	12.6 13.0	160.71	0.36	5.86	0.05	2008.743	17	283
20206+3917	Anon.80AB	13.0 13.0	285.11	0.29	5.48	0.04	2008.743	18	284
20206+3917	Anon.80AC	13.0 14.0	87.21	0.44	4.77	0.09	2008.743	3	284
20207+3922	SEI1094	9.4 12.4	317.18	0.16	27.48	0.06	2008.743	14	285
20208+3922	Anon.81	13.2 13.5	249.85	0.27	8.17	0.05	2008.743	17	286
20210+3919	SEI1097AB	11.20 12.02	45.50	0.05	27.18	0.02	2008.743	17	287
20210+3919	TOB 186BC	12.02 12.09	51.75	0.12	16.44	0.04	2008.743	17	287
20345+3759	Anon.82	12.5 13.0	74.82	0.38	8.41	0.05	2008.743	16	288
20350+3757	SEI1178AB	10.0 11.0	174.22	0.10	19.02	0.05	2008.743	16	289
20350+3757	Anon.83Ax	10.0 14.0	13.14	0.33	5.88	0.07	2008.743	11	289
20352+3755	SEI1182	10.0 10.0	116.68	0.21	8.89	0.02	2008.743	14	290
20352+3754	SEI1180AB	10.5 11.0	138.66	0.11	28.46	0.05	2008.743	16	291
20352+3754	SEI1181AC	10.5 10.5	102.66	0.07	29.24	0.04	2008.743	16	291
20352+3754	SEI1180BC	10.5 11.0	33.03	0.13	17.85	0.08	2008.743	16	291
20404+3758	SEI1212	10.3 11.8	192.12	0.20	18.89	0.06	2008.743	14	292
20408+3802	ALI 672	11.59 12.30	167.57	0.18	12.44	0.06	2008.743	18	293
20412+3801	ES 2512	10.0 12.0	322.93	0.44	6.61	0.05	2008.743	11	294
22284+5825	H 4 31AB	8.54 10.52	3.59	0.13	25.27	0.04	2008.778	16	295
22284+5825	ARN 79AC	8.54 9.46	320.35	0.03	79.18	0.05	2008.778	16	295
22292+5825	BU 702AB	4.21 13.0	283.25		22.28		2008.778	1	296
22292+5825	STFA 58AC	4.21 6.11	191.31	0.12	40.79	0.06	2008.778	18	296
22496+5656	STI2865	11.91 12.5	23.64	0.21	8.73	0.02	2008.778	19	297
22503+5652	STI2871	11.29 11.71	10.04	0.54	4.51	0.03	2008.778	18	298
22507+5652	STI2874	11.30 11.3					2008.778		31
22509+5659	STI2875	12.6 12.6	36.51	0.16	11.57	0.04	2008.778	19	135

Table Notes

1. A=GSC 4818 1267 blended object.
2. A=GSC 4818 3460 blended object.
3. A=GSC 4814 1774 (07059-0138!).
4. A=GSC 4814 2130.
5. A=GSC 4814 44.
6. Very different parameters. The images available do not show significant proper motion of the nearby stars.
7. A=GSC 4814 44.
8. A=GSC 4814 1962 non star (07066-0137!).
9. I cannot find such double in the vicinity. It cannot be identified in the DSS images, either.
10. A=GSC 4815 2707 (07080-0146!).

Double Star Measures Using a DSLR Camera #4

11. A=GSC 4815 2431 (07082-0152!).
12. A=GSC 4815 3019 non star (07084-0145!).
13. A=GSC 4819 4242 (07094-0233!).
14. A=GSC 4815 2521.
15. A=GSC 4815 2929.
16. A=GSC 4815 2911 non star.
17. A=GSC 4815 2885.
18. A=GSC 4819 318 non star.
19. A=GSC 4815 3025 (07097-0134!).
20. A=GSC 4819 2478.
21. A=GSC 4819 778 blended object.
22. A=GSC 4819 2706 (07100-0230!).
23. AB=GSC 4819 3414 blended object.
24. A=GSC 4819 3450 (07099-0159!).
25. A=GSC 4819 2544 blended object.
26. A=GSC 4819 3751 non star.
27. A=GSC 4819 3304.
28. A=GSC 4819 1796.
29. A=GSC 4819 2892 non star (07106-0236!).
30. A=GSC 4819 1859 blended object. The 1893 measures of the system are most probably not of this pair.
31. It cannot be identified in the DSS images, either. The images available do not show significant proper motion of the nearby stars.
32. This system can be found near BAL 143 AB.
33. This system can be found near BAL 143 AB.
34. A=GSC 4819 1844 (07106-0223!).
35. A=GSC 4815 583 non star (07107-0128!).
36. AB=GSC 4815 697.
37. A=GSC 4815 1208 non star (07108-0134!).
38. A=GSC 4815 1740 non star.
39. A=GSC 4819 2900. Very different parameters. The images available do not show significant proper motion of the nearby stars.
40. A=GSC 4819 3571.
41. A=GSC 4819 1144.
42. AB=GSC 4815 1934 non star.
43. A=GSC 4819 2152 blended object (07109- 0246!).
44. A=GSC 4819 2318 non star. Could this be BAL 146, far from its indicated position?
45. A=GSC 4819 3096 blended object.
46. A=GSC 4819 1294 blended object.
47. A=GSC 4815 982 non star.
48. A=GSC 4819 3258 (07111-0205!). The images available do not show significant proper motion of the nearby stars.
49. A=GSC 4819 2630.
50. A=GSC 4815 889 (07111-0136!).
51. A=GSC 4819 3298.
52. A=GSC 4819 2738 (07112-0207!).
53. A=GSC 4819 2836.
54. AB=GSC 4819 2265 non star.
55. ABC=GSC 4819 3018 non star.
56. A=GSC 4819 3250. BAL 434?
57. A=GSC 4819 506 (07115-0248!). Very different parameters. The images available do not show significant proper motion of the nearby stars.
58. A=GSC 4815 69 blended object.
59. A=GSC 4815 2072.
60. A=GSC 4815 1186.
61. AB=GSC 4815 315 non star.
62. A=GSC 4815 182 blended object.
63. A=GSC 4819 960 blended object.
64. A=GSC 4819 108.
65. A=GSC 4815 2345 non star.
66. A=GSC 4819 3472.
67. AB=GSC 4815 165 non star.
68. A=GSC 4815 650 (07116-0056!).
69. A=GSC 4819 2876.
70. A=GSC 4819 1902.
71. A=GSC 4819 2648.
72. A=GSC 4815 1464 non star.
73. A=GSC 4815 988 non star (07119-0129!).
74. AB=GSC 4815 1536 non star.
75. A=GSC 4815 1784 non star.
76. A=GSC 4819 3526.
77. AB=GSC 4815 1272 (07119-0142!). Very difficult to measure.
78. AB=GSC 4819 3527.
79. A=GSC 4819 2776 non star (07123-0205!).
80. A=GSC 4815 419 (07124-0030!).
81. A=GSC 4819 1702.
82. A=GSC 4819 2633 blended object.
83. A=GSC 4815 970 non star.
84. A=GSC 4819 2569.
85. A=GSC 4815 568 (07124-0141!).
86. A=GSC 4815 1384 non star.
87. A=GSC 4819 3172 non star.
88. A=GSC 4819 3118 blended object.

Double Star Measures Using a DSLR Camera #4

89. AB=GSC 4815 1612 non star.
90. A=GSC 4819 1534 (07128-0226!).
91. A=GSC 4819 2689 1.
92. A=GSC 4819 2928.
93. A=GSC 4819 976.
94. AB=GSC 4819 526 non star.
95. AB=GSC 4819 1200 non star (07137-0250!).
96. AB=GSC 2655 3505 non star.
97. A=GSC 2655 2087 (19331+3031!).
98. A=GSC 2664 1473.
99. A=GSC 2664 659 (19464+3502!). The images available do not show significant proper motion of the nearby stars.
100. A=GSC 2677 81.
101. A=GSC 2677 519. Is it possibly SEI 690?
102. AB=GSC 2677 183 non star.
103. A=GSC 2677 661 (19507+3430!).
104. A=GSC 2677 661 (19507+3430!). Very different parameters. The images available do not show significant proper motion of the nearby stars.
105. ABx=GSC 2677 481 (19509+3429!).
106. A=GSC 2677 23. In reality SEI 696 AB, not common with POP 13.
107. ABx=GSC 2677 481 (19509+3429!).
108. A=GSC 2677 324 (19509+3437!). Probably this is J1160, but the other components cannot be identified.
109. AB=GSC 2677 184 non star (19512+3435!). Common system with SEI 700.
110. AB=GSC 2677 184 non star (19512+3435!). Common system with SEI 699.
111. A=GSC 2674 2284 non star (20021+3332!).
112. A=GSC 2678 228 (20023+3353!).
113. A=GSC 2678 2097.
114. A=GSC 2674 5689.
115. A=GSC 2678 1382.
116. A=GSC 2678 1020 blended object.
117. Ax=GSC 2678 1576 non star (20027+3348!).
118. A=GSC 2678 2022.
119. A=GSC 2678 2142.
120. A=GSC 2678 1936 (20032+3420!).
121. A=GSC 2678 1708 (20031+3349!).
122. A=GSC 2674 5784.
123. A=GSC 2678 720 non star (20033+3357!).
124. A=GSC 2678 2252 (20034+3419!).
125. A=GSC 2678 2080.
126. A=GSC 2678 1567.
127. A=GSC 1618 627.
128. A=GSC 1618 827. A and C cpm in PA 310 direction.
129. A=GSC 1618 749.
130. A=GSC 1618 373.
131. A=GSC 1618 2072.
132. A=GSC 1618 1164.
133. A=GSC 1618 2223 (20124+1501!).
134. AB=GSC 1618 1416.
135. Does not appear in GSC.
136. AB=GSC 1618 1237.
137. A=GSC 1618 1978.
138. A=GSC 1618 1255.
139. A=GSC 1618 2077.
140. A=GSC 1085 647.
141. In my opinion, it is the same as CHE 202. I cannot find any other double.
142. AB=GSC 1618 498.
143. A=GSC 1618 1594.
144. A=GSC 1618 2083.
145. A=GSC 1618 1878.
146. A=GSC 1618 829. The 1998 measures are not of the real B component, but of GSC 1618 498.
147. A=GSC 1618 1432.
148. A=GSC 1618 2226.
149. A=GSC 1085 917.
150. A=GSC 1618 1923.
151. A=GSC 1085 341.
152. A=GSC 1618 481.
153. A=GSC 1618 1734 non star.
154. A=GSC 1618 1632.
155. AB=GSC 1618 1875 non star.
156. A=GSC 1618 1430.
157. A=GSC 1618 126.
158. A=GSC 1618 898.
159. A=GSC 1618 832 blended object.
160. B=GSC 1618 705 (20136+1556!).
161. A=GSC 1618 575.
162. A=GSC 1618 1383.
163. A=GSC 1618 147.
164. A=GSC 1085 397.
165. A=GSC 1618 142 non star.
166. A=GSC 1085 583.

Double Star Measures Using a DSLR Camera #4

167. A=GSC 1618 530 non star.
 168. A=GSC 1618 2035.
 169. A=GSC 1085 739.
 170. A=GSC 1618 1847.
 171. A=GSC 1618 310 non star.
 172. AB=GSC 1618 1921 non star.
 173. A=GSC 1085 603 (20413+1442!).
 174. ABx=GSC 1618 1896 non star.
 175. A=GSC 1618 539 non star.
 176. A=GSC 1618 1497.
 177. A=GSC 1618 1453.
 178. A=GSC 1618 1048.
 179. AB=GSC 1618 2144 non star.
 180. A=GSC 1618 2258.
 181. A=GSC 1618 651 (20145+1600!).
 182. B=GSC 1618 1764 non star (20146+1501!).
 183. A=GSC 1085 477 (20146+1453!).
 184. A=GSC 1618 285 non star.
 185. A=GSC 1618 273.
 186. A=GSC 1085 501.
 187. A=GSC 1618 2029 non star (20150+1515!).
 188. A=GSC 1618 400 (20151+1556!).
 189. A=GSC 1618 218.
 190. A=GSC 1618 1401.
 191. A=GSC 1085 743 (20154+1458!).
 192. AB=GSC 1618 2102 non star (20156+1503!).
 193. AB=GSC 1085 1133.
 194. A=GSC 1618 1996 non star.
 195. A=GSC 1618 1698 1. Cannot be measured.
 196. A=GSC 1618 1698 1.
 197. AB=GSC 1618 761 non star.
 198. AB=GSC 1618 637 non star.
 199. A=GSC 1618 1622.
 200. AB=GSC 1618 1779 non star.
 201. Ax=GSC 1618 1779 non star.
 202. A=GSC 1085 639.
 203. A=GSC 3151 2917.
 204. AB=GSC 1618 1981 non star.
 205. A=GSC 1618 1922 non star.
 206. A=GSC 1618 202 (20159+1536!).
 207. AB=GSC 1618 2242 non star.
 208. AB=GSC 1085 499 non star.
 209. A=GSC 3151 3019.
 210. A=GSC 1631 599 (20160+1522!).
 211. AB=GSC 1618 1459 non star.
 212. A=GSC 1631 435 non star.
 213. A=GSC 3151 2555 (20162+3806!).
 214. A=GSC 1631 269 (20162+1535!).
 215. A=GSC 1631 2409 (20163+1508!).
 216. A=GSC 1631 2405 (20160+1504!).
 217. A=GSC 1631 623 (20162+1538!).
 218. A=GSC 3151 3461.
 219. L=GSC 3151 1234. Very different parameters. The images available do not show significant proper motion of the nearby stars.
 220. Incorrect component naming. Correctly ABH 135 BO.
 221. Incorrect component naming. Correctly BU 442 BD.
 222. Incorrect component naming. Correctly BU 442 CD.
 223. AB=GSC 1631 407 non star.
 224. A=GSC 3151 3123 (20166+3758!).
 225. A=GSC 1631 23.
 226. A=GSC 1631 315.
 227. A=GSC 1631 261 (20168+1514!).
 228. A=GSC 1631 493.
 229. A=GSC 1631 676 (20169+1522!).
 230. A=GSC 1631 2441 non star.
 231. A=GSC 1631 2441 non star. The 1998 measures are possibly of BC components.
 232. A=GSC 1631 209.
 233. A=GSC 1631 465 (20171+1603!).
 234. A=GSC 1631 193.
 235. A=GSC 1631 1264 (20171+1535!).
 236. A=GSC 1631 5 (LZ Del).
 237. Bx=GSC 1631 495. B=12.5m.
 238. A=GSC 1631 445 non star.
 239. A=GSC 1085 17 (20173+1442!).
 240. A=GSC 1631 1304 (20175+1522!).
 241. A=GSC 1085 29.
 242. A=GSC 1631 345.
 243. A=GSC 1631 1377 non star (20177+1502!).
 244. A=GSC 1631 753 (20178+1529!).
 245. A=GSC 1631 541.
 246. A=GSC 1085 31.
 247. A=GSC 1631 2086.
 248. A=GSC 1631 281.
 249. A=GSC 1631 167 (20180+1542!).

Double Star Measures Using a DSLR Camera #4

250. A=GSC 1631 107 (20180+1525!).
251. A=GSC 1631 1355.
252. A=GSC 1631 349.
253. AB=GSC 1631 441.
254. A=GSC 1631 91.
255. A=GSC 1631 555 non star (20181+1518!).
256. A=GSC 1631 651 non star (20179+1520!).
257. A=GSC 1631 596.
258. A=GSC 1631 53.
259. A=GSC 1631 669.
260. A=GSC 1631 1116.
261. A=GSC 1631 1439. In my opinion, the 1984 measures are of GSC stars.
262. A=GSC 1086 553 (20186+1445!).
263. A=GSC 1631 497 (20187+1550!). The proper motion in PA 100 direction of component B accounts for the changes of the measured parameters. The 2002 measures are possibly of CB components.
264. A=GSC 1631 497 (20187+1550!).
265. A=GSC 1631 689.
266. A=GSC 1086 297 (20186+1443!):
267. A=GSC 2684 1673 non star.
268. A=GSC 1631 628.
269. A=GSC 1631 197.
270. A=GSC 1631 641 non star.
271. A=GSC 1086 39.
272. A=GSC 2684 1835.
273. B=GSC 2684 1792 (20191+3634!).
274. A=GSC 2684 1773 (20192+3646!).
275. A=GSC 2684 1875.
276. A=GSC 2684 1643 1.
277. Does not appear in GSC (20194+3645!).
278. A=GSC 2684 1819.
279. AB=GSC 3152 1552 non star.
280. A=GSC 3152 1557.
281. A=GSC 3152 1545.
282. A=GSC 3152 1516.
283. AB=GSC 3152 1573 non star.
284. ABC=GSC 3152 1579 non star.
285. A=GSC 3152 1528.
286. A=GSC 3152 17 blended object.
287. A=GSC 3152 403 (20210+3918!).
288. AB=GSC 3153 94 blended object.
289. A=GSC 3153 286 non star.
290. A=GSC 3153 594 non star (20352+3754!).
291. Does not appear in GSC (20350+3756!). The images available do not show significant proper motion of the nearby stars.
292. A=GSC 3166 1587.
293. A=GSC 3166 1192.
294. A=GSC 3166 1442 (20411+3802!).
295. A=GSC 3995 1335.
296. A=GSC 3995 1479.
297. A=GSC 3992 1443.
298. AB=GSC 3992 2341.

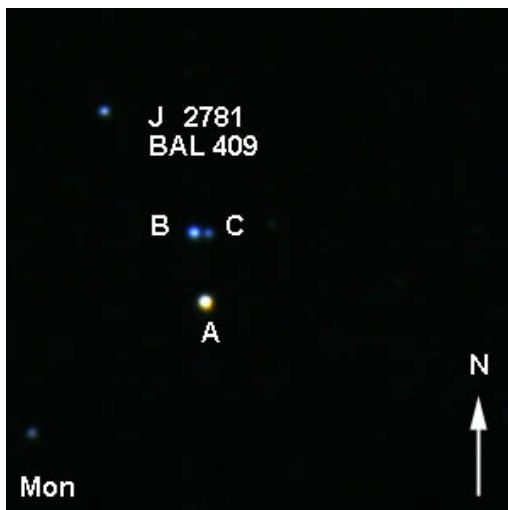


Figure 2: Image of J 2781 and BAL 409 at 07082-0151.

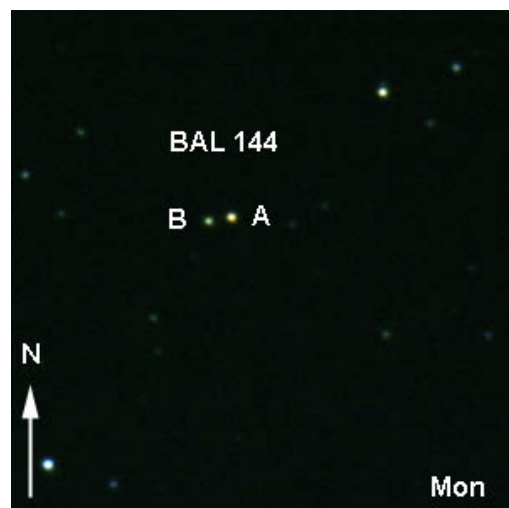


Figure 3: Image of BAL 144 at 07105-0237.

Double Star Measures Using a DSLR Camera #4

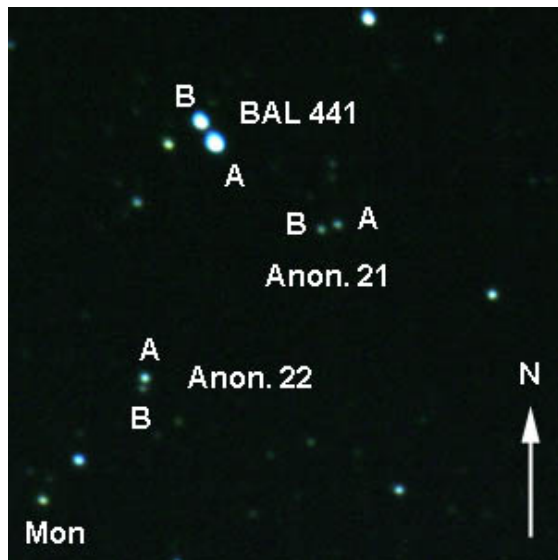


Figure 4: BAL441 (07119-0130, Anon21 (07118-0130), and Anon. 22 (07119-0132)



Figure 5: CHE 229 at 20144+1533.



Figure 6: CHE 266 at 20168+1543.

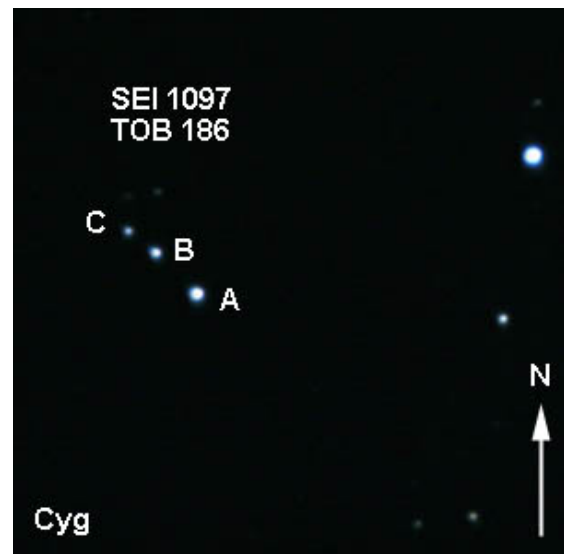


Figure 7: SEI 1097 (20210+3919) and TOB 186