Double Star Measures Using a DSLR Camera #5

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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 2008.847-2008.849. The result is 210 positive and 3 negative measures.

To continue the previous articles, the following results are that of the measuring period between 5 Nov – 6 Nov 2008. The equipment used for photographing, the methods of photo processing and measuring are the same as those detailed in my first article (Berkó, 2008). Therefore, the only thing I would like to note is that I am working with a Canon 350D digital camera, a 35.5cm Newton telescope, and focal length increased to 4200mm. The software used for measuring the images is Florent Losse's Reduc 3.85. For the present article, approximately 978 photos were used, and it contains the data of 1812 independent measures of 213 pairs.

The results are shown in the table, which is followed by the notes. In the first three columns of the table, the WDS coordinates and names of the doubles, and the components' brightness can be found. This latter feature was described on the basis of WDS, although it seems contradictory sometimes. When there is an Anon. component, I indicated the GSC or USNO "R" brightness; if not available, I provided the brightness that I estimated on the basis of the photo. This is followed by the position angle (PA) and the separation (S) measured and calculated by me. In both cases, the value of the standard deviation is also indicated (+/-). The column (Epoch) shows the time when the images were taken. Finally, in every row, the number of individual measures (N), the reference number to the description (Notes), and the reference number of the image belonging to the measures (Img) can be seen.

In the descriptions (notes), you can find the GSC number of the primary star of the doubles that I measured; in case it appears in the GSC. Besides this, my personal notes about the given double stars can be read here. The greatest problem I found was concerning the 10-character identification coordinates of WDS. In many cases it is different from the real position of the double. Although the coordinates that WDS contains are more accurate for most of the pairs, at times the double cannot be found at these locations. For the doubles measured by me, I "give suggestions" regarding these closest coordinates in the form of (xxxxx+xxxx!).

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

References

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

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RA +/- D	Discoverer	Mags		PA	+/-	Sep	+/-	Epoch	N	Notes	Img
20219+2606	Anon. 1	11.5	12.5	268.41	0.37	5.08	0.03	2008.847	4	1	1
20222+2606	J 3078	10.2	10.2	23.93	0.24	6.89	0.05	2008.847	9	2	1
20223+2611	Anon. 2	11.5	13.3	83.70	0.32	8.18	0.06	2008.847	13	3	1
20225+2622	Anon. 3	13.0	13.2	80.39	0.53	5.36	0.05	2008.847	6	4	2
20225+2618	HJ 1504AB	7.1	10.6	251.20	0.11	22.46	0.04	2008.847	9	5	2
20225+2618	HJ 1504AC	7.1	9.9	227.66	0.05	51.74	0.04	2008.847	8	5	2
20274+2510	POU4503	12.18	12.2	103.62	0.14	18.43	0.04	2008.847	16	6	3
20276+2502	Anon. 4	14.0	14.0	350.10		3.17		2008.847	1	1	4
20279+2421	POU4509	11.00	12.3	279.66	0.14	8.98	0.02	2008.847	17	7	5
20280+2508	POU4513	13.2	14.5	37.56		7.04		2008.847	1	8	6
20280+2503	POU4510	14.0	14.3	355.69	0.26	14.07	0.05	2008.847	15	9	4
20280+2418	Anon. 5	13.0	13.2	32.27	0.20	7.40	0.03	2008.847	8	1	5
20280+2416	POU4511	12.11	12.33	195.64	0.07	17.78	0.02	2008.847	17	10	5
20281+2510	POU4514	13.8	13.9	92.61	0.24	17.20	0.05	2008.847	14	1	6
20282+2507	Anon. 6	13.4	13.9	207.93	0.20	8.61	0.03	2008.847	10	11	6
20289+2436	Anon. 7AB	14.0	14.2	0.26	0.33	4.08	0.06	2008.847	6	12	7
20289+2436	Anon. 7BC	14.2	14.5	259.63		1.32		2008.847	1	1	7
20290+2430	Anon. 8	13.8	13.9	163.97	0.25	8.15	0.05	2008.847	17	13	8
20290+2429	Anon. 9	13.2	14.0	55.57	0.19	9.78	0.04	2008.847	12	14	8
20291+2433	POU4521AB	13.05	13.30	327.50	0.13	6.60	0.02	2008.847	17	15	9
20291+2433	Anon.10Ax	13.05	14.0	179.38	0.11	3.55	0.02	2008.847	8	15	9
20291+2429	Anon.11	13.2	14.0	143.10	0.26	7.78	0.04	2008.847	17	16	8
20293+2437	Anon.12	12.6	13.2	137.36	0.21	6.88	0.02	2008.847	15	17	10
20294+2435	Anon.13	13.5	13.5	266.88	0.27	5.34	0.07	2008.847	11	18	10
20297+2442	POU4529	12.2	13.4	264.42	0.13	10.30	0.05	2008.847	11	19	11
20298+2613	Anon.14	13.5	13.5	29.61		2.74		2008.847	1	20	12
20298+2610	HJ 1520	11.00	12.18	325.50	0.13	19.21	0.04	2008.847	12	21	12
20298+2556	J 1882	9.5	11.0	113.96	0.25	10.05	0.03	2008.847	6	22	13
20298+2507	Anon.15	12.5	13.5	285.67	0.17	4.46	0.04	2008.847	4	23	14
20298+2504	POU4531	10.98	11.8	212.13	0.23	8.43	0.05	2008.847	16	24	14
20299+2445	Anon.16	12.5	13.5	219.87	0.25	4.34	0.05	2008.847	8	25	11
20299+2444	Anon.17	14.0	14.0	213.39	0.02	1.11	0.04	2008.847	2	1	11
20300+2438	POU4534	11.39	14.5	346.06	0.16	14.79	0.05	2008.847	14	26	15
20301+2509	Anon.18	10.9	13.3	85.35	0.34	4.98	0.06	2008.847	10	27	16
20301+2443	Anon.19	13.0	13.5	223.05	0.07	9.24	0.03	2008.847	3	28	15
20302+2506	POU4536	13.2	13.3	109.32	0.35	6.38	0.04	2008.847	15	29	16
20303+2441	POU4537	11.68	14.1	318.71	0.20	16.76	0.05	2008.847	13	30	15
20363+2321	POU4721	12.9	13.4	134.55	0.26	21.60	0.05	2008.847	13	31	17
20365+2430	POU4726AB	12.3	13.5	355.99	0.24	10.92	0.03	2008.849	17	32	18
20365+2430	POU4727AC	12.3	13.6	325.06	0.18	15.74	0.05	2008.849	17	32	18

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RA +/- D	Discoverer	Mags		PA	+/-	Sep	+/-	Epoch	N	Notes	Img
20365+2428	Anon.20	13.8	14.0	21.95	0.32	2.74	0.05	2008.849	5	33	18
20365+2426	POU4728	11.06	14.5	80.46	0.36	11.80	0.03	2008.849	5	34	18
20365+2334	POU4722	10.88	13.0	57.36	0.26	18.21	0.04	2008.847	15	35	19
20365+2327	POU4724	12.1	12.8	226.45	0.18	17.37	0.06	2008.847	13	36	20
20367+2431	Anon.21	14.5	14.5	320.99	0.37	3.46	0.01	2008.849	3	1	21
20367+2328	POU4734	11.94	13.5	24.97	0.07	20.02	0.04	2008.847	16	37	22
20367+2320	Anon.22	13.5	13.8	344.85	0.33	4.83	0.06	2008.847	3	38	17
20367+2319	POU4733	12.3	13.4	241.31	0.26	4.54	0.05	2008.847	7	39	17
20367+2316	Anon.23	11.5	13.0	333.50	0.38	8.01	0.08	2008.847	8	40	17
20368+2434	Anon.24	13.0	14.5	151.06	0.04	4.20	0.01	2008.849	2	41	21
20368+2433	Anon.25	14.5	14.5	283.78	0.38	4.65	0.06	2008.849	9	42	21
20368+2324	POU4735	12.31	13.0	256.49	0.20	15.33	0.06	2008.847	11	43	20
20369+2432	POU4738	12.02	13.9	10.39	0.26	13.89	0.06	2008.849	15	44	23
20369+2330	POU4736	13.43	14.38	326.59	0.17	17.18	0.05	2008.847	11	1	22
20369+2325	POU4737	12.8	13.7	268.09	0.32	18.05	0.04	2008.847	8	45	20
20370+2429	POU4740	14.1	14.2	265.44	0.14	15.47	0.07	2008.849	18	1	23
20371+2331	Anon.26	14.0	14.5	36.11	0.34	3.18	0.03	2008.847	2	46	24
20372+2433	Anon.27	12.0	12.5	46.81	0.20	4.22	0.06	2008.849	4	47	23
20372+2319	POU4742	10.95	12.2	12.05	0.17	17.70	0.05	2008.847	16	48	25
20373+2429	POU4743	12.8	13.6	219.72	0.30	13.35	0.06	2008.849	13	1	23
20374+2338	POU4746	11.93	13.6	40.26	0.30	13.28	0.07	2008.847	4	49	26
20374+2321	POU4745AB	12.36	12.9	325.78	0.09	17.48	0.04	2008.847	16	50	25
20374+2321	Anon.28Ax	12.36	13.5	187.84	0.48	8.21	0.02	2008.847	2	51	25
20375+2339	POU4749	8.85	11.9	247.11	0.33	12.56	0.05	2008.847	11	52	26
20375+2319	POU4748	12.48	14.3	334.63	0.25	13.93	0.06	2008.847	12	53	25
20377+2334	POU4752	11.90	13.0	257.30	0.30	7.74	0.05	2008.847	7	54	27
20367+2327	Anon.29	13.5	13.6	301.93	0.37	8.11	0.07	2008.847	6	1	22
20377+2319	Anon.30	14.2	14.3	103.57	0.30	6.95	0.05	2008.847	4	55	28
20379+2442	POU4759	12.9	13.4	209.39	0.20	16.36	0.07	2008.849	11	56	29
20379+2317	POU4754	11.21	14.6	66.41	0.27	14.82	0.06	2008.847	8	57	28
20380+2334	POU4758	11.61	11.8	299.95	0.18	16.10	0.02	2008.847	15	58	27
20380+2332	POU4756	11.83	12.4	257.72	0.43	14.63	0.08	2008.847	9	59	27
20381+2403	POU4761	12.8	13.4	326.04	0.22	15.15	0.05	2008.849	8	1	30
20381+2357	POU4763	13.9	14.2	156.15	0.40	7.97	0.05	2008.849	12	60	31
20381+2353	Anon.31	14.0	14.0	335.04		1.72		2008.849	1	1	32
20381+2338	POU4762	13.7	14.0	215.44	0.16	17.63	0.04	2008.847	5	1	33
20382+2452	POU4765	13.4	13.9	139.28	0.23	16.66	0.04	2008.849	12	61	32
20382+2446	POU4770AB	11.34	13.1	111.34	0.33	13.23	0.04	2008.849	16	62	34
20382+2446	Anon.32Ax	11.34	13.5	304.26	0.29	10.32	0.04	2008.849	4	62	34
20382+2445	Anon.33	14.0	14.0	190.17	0.33	10.19	0.07	2008.849	5	1	34

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RA +/- D	Discoverer	Mags		PA	+/-	Sep	+/-	Epoch	N	Notes	Img
20382+2435	POU4769	11.73	14.1	315.32	0.26	14.62	0.04	2008.849	12	63	35
20382+2400	Anon.34	13.5	14.0	36.97		5.08		2008.849	1	64	31
20383+2429	Anon.35	13.5	13.6	234.03	0.06	2.85	0.04	2008.849	2	1	36
20383+2411	POU4768	11.38	13.6	346.88	0.38	12.65	0.04	2008.849	8	65	30
20384+2433	Anon.36	12.5	13.5	208.27	0.19	6.48	0.06	2008.849	3	66	35
20384+2427	POU4772	13.0	13.4	104.27	0.28	8.06	0.04	2008.849	13	67	36
20385+2409	POU4777	13.6	13.8	267.57	0.31	16.40	0.07	2008.849	7	1	30
20385+2342	POU4774AB	12.9	13.8	6.66	0.28	8.89	0.05	2008.847	9	68	37
20385+2342	POU4775AC	12.9	13.8	269.11	0.38	14.64	0.04	2008.847	12	68	37
20385+2341	POU4773AB	13.6	13.9	35.72	0.07	7.09	0.08	2008.847	2	69	37
20385+2341	Anon.37Ax	13.6	14.2	28.36		3.84		2008.847	1	70	37
20386+2447	POU4783AB	14.3	14.9	62.21	0.49	12.38	0.06	2008.849	5	1	38
20386+2447	Anon.38Ax	14.3	14.0	166.99	0.11	9.88	0.09	2008.849	5	1	38
20386+2445	POU4782	14.1	14.3	48.04	0.06	5.16	0.03	2008.849	2	71	38
20386+2358	POU4779AB	12.25	13.97	64.85	0.31	17.16	0.08	2008.849	7	72	39
20386+2358	POU4780AC	12.25	13.83	39.56	0.10	21.06	0.05	2008.849	15	72	39
20386+2349	POU4781	14.0	14.3	30.15	0.16	17.46	0.05	2008.849	8	1	40
20386+2333	POU4778	13.4	13.8	198.59		2.01		2008.847	1	73	41
20388+2441	POU4788AB	12.4	14.3	200.79	0.25	11.13	0.04	2008.849	8	74	42
20388+2441	POU4787AC	12.4	13.7	134.59	0.30	15.47	0.04	2008.849	13	74	42
20389+2446	POU4791	12.04	12.6	62.23	0.16	7.17	0.07	2008.849	14	75	42
20389+2445	POU4792	12.2	13.0	332.62	0.08	4.47	0.02	2008.849	2	76	42
20389+2405	Anon.39	12.5	13.5	327.38		5.45		2008.849	1	77	43
20389+2350	POU4785	13.6	13.7	334.95	0.28	8.87	0.07	2008.849	11	78	44
20390+2409	POU4789	13.0	13.9	192.53		3.14		2008.849	1	79	43
20390+2352	POU4790	11.98	13.4	337.92	0.38	3.76	0.04	2008.849	3	80	44
20391+2352	POU4795AB	13.2	14.2	320.13	0.33	9.56	0.03	2008.849	11	81	44
20391+2352	Anon.40Ax	13.2	14.5	41.87	0.23	9.81	0.01	2008.849	3	81	44
20391+2347	Anon.41	12.5	13.0	111.98	0.52	2.38	0.07	2008.849	7	82	45
20391+2339	POU4797	12.23	14.5	222.85	0.12	16.27	0.07	2008.847	8	83	46
20391+2337	POU4796	12.2	14.3	277.91	0.51	16.65	0.05	2008.847	3	84	46
20391+2336	POU4794	12.2	13.7	115.69	0.33	9.84	0.06	2008.847	8	85	46
20392+2351	POU4801	14.0	14.1	292.65	0.34	11.15	0.05	2008.849	17	1	47
20393+2354	Anon.42	14.0	14.2	135.43	0.14	3.17	0.01	2008.849	3	1	47
20393+2328	POU4802	12.7	12.8	312.81	0.25	19.21	0.05	2008.847	15	1	48
20394+2321	POU4805	13.0	13.0	220.53	0.27	18.66	0.06	2008.847	10	1	49
20395+2444	POU4813	14.3	14.4	41.15	0.23	17.27	0.05	2008.849	12	1	50
20395+2326	POU4808AB	13.7	13.5	200.67	0.13	15.88	0.04	2008.847	15	86	48
20395+2326	Anon.43Ax	13.7	14.0	193.96	0.36	8.66	0.06	2008.847	8	86	48
20395+2319	POU4807	13.8	14.3	190.96	0.35	12.59	0.06	2008.847	10	1	49

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RA +/- D	Discoverer	Mags		PA	+/-	Sep	+/-	Epoch	N	Notes	Img
20396+2515	POU4817	12.2	14.3	81.28	0.32	13.84	0.06	2008.849	8	1	51
20396+2508	POU4821	13.2	13.6	217.67	0.28	18.70	0.05	2008.849	15	1	52
20396+2503	POU4819	12.0	13.6	160.24	0.11	14.75	0.02	2008.849	15	87	53
20396+2503	POU4822	14.2	14.4	43.52	0.29	5.65	0.07	2008.849	8	88	53
20396+2417	POU4810	11.99	12.2	224.50	0.16	11.56	0.05	2008.849	14	89	54
20396+2403	POU4816	13.4	14.4	194.58	0.33	10.41	0.02	2008.849	3	90	55
20396+2352	POU4814AB	12.6	13.8	20.41	0.29	15.77	0.04	2008.847	11	91	56
20396+2352	POU4815AC	12.6	14.2	113.03	0.23	16.52	0.05	2008.847	13	91	56
20396+2345	POU4811AB	9.78	10.74	201.55	0.12	21.04	0.05	2008.847	14	92	57
20396+2345	POU4812AC	9.78	12.6	149.17	0.26	10.87	0.06	2008.847	5	92	57
20397+2516	Anon.44	11.1	14.0	196.86	0.24	10.78	0.06	2008.849	6	93	51
20397+2421	Anon.45	12.57	14.0	197.96	0.54	3.68	0.04	2008.849	3	94	54
20397+2419	POU4818	11.22	12.1	302.05	0.27	14.77	0.06	2008.849	14	95	54
20398+2512	Anon.46	14.0	14.2	285.87		4.78		2008.849	1	1	51
20398+2505	POU4825	13.5	14.0	107.61	0.26	16.61	0.04	2008.849	16	96	53
20398+2447	POU4828	13.5	13.6	342.87	0.17	18.07	0.05	2008.849	15	97	50
20398+2446	POU4826	14.3	14.5	18.61	0.33	5.49	0.03	2008.849	11	98	50
20398+2417	Anon.47	13.0	13.8	314.72	0.29	9.00	0.05	2008.849	9	1	54
20399+2352	POU4827	12.1	13.6	235.44	0.12	12.59	0.03	2008.847	17	99	58
20399+2326	POU4829	13.3	14.0	216.94	0.34	14.49	0.06	2008.847	14	1	59
20400+2503	POU4833	12.8	12.9	272.08	0.16	20.53	0.06	2008.849	14	100	60
20400+2417	POU4831	12.5	13.4	189.47	0.31	8.17	0.03	2008.849	16	101	61
20400+2350	POU4832	11.8	13.9	26.62	0.37	16.47	0.05	2008.847	5	102	56
20401+2516	POU4839	11.15	12.1	339.58	0.18	22.04	0.05	2008.849	15	103	62
20401+2513	POU4835	13.1	13.2	296.60	0.14	18.63	0.03	2008.849	17	104	62
20401+2509	POU4838	12.5	14.2	289.38	0.34	10.55	0.05	2008.849	13	105	63
20401+2458	POU4840	13.8	14.3	23.10	0.25	15.95	0.05	2008.849	7	106	60
20401+2450	POU4834	12.4	13.0	35.26	0.19	5.69	0.06	2008.849	10	107	64
20402+2418	POU4837	12.9	14.8	210.14	0.35	16.72	0.08	2008.849	8	108	61
20402+2356	POU4836AB	9.4	14.0	43.94	0.17	17.31	0.07	2008.849	2	109	65
20402+2356	Anon.48Ax	9.4	14.0	2.27	0.05	11.42	0.03	2008.849	2	109	65
20403+2510	POU4846	12.28	14.5	167.08	0.26	8.24	0.03	2008.849	10	110	63
20403+2501	POU4843	11.74	13.7	147.76	0.31	8.53	0.07	2008.849	12	111	60
20403+2451	POU4845	14.2	14.4	131.79	0.01	15.35	0.04	2008.849	2	112	64
20403+2357	POU4841AB	13.8	14.7	347.94	0.29	12.61	0.06	2008.849	17	113	65
20403+2357	Anon.49Ax	13.8	15.0	334.19	0.15	7.15	0.08	2008.849	3	113	65
20404+2422	POU4842	14.16	14.03	129.61	0.46	13.45	0.07	2008.849	5	1	66
20404+2401	POU4844	11.34	12.9	101.36	0.19	15.61	0.05	2008.849	18	114	67
20405+2448	POU4850	13.5	14.3	287.40	0.19	5.06	0.03	2008.849	2	115	64
20405+2346	POU4848AB	13.2	13.6	119.35	0.31	18.77	0.05	2008.847	13	116	68

Table continued on next page.

Double Star Measures Using a DSLR Camera #5

RA +/- D	Discoverer	Mags		PA	+/-	Sep	+/-	Epoch	N	Notes	Img
20405+2346	POU4849BC	13.6	13.9	56.24	0.23	18.23	0.06	2008.847	6	117	68
20405+2346	Anon.50Bx	13.6	14.0	28.24	0.21	8.43	0.01	2008.847	3	117	68
20407+2346	Anon.51	11.5	13.8	161.84	0.26	9.06	0.06	2008.847	12	118	68
20408+2342	Anon.52	12.5	14.0	13.34	0.11	8.79	0.03	2008.847	2	119	68
20410+2419	POU4856	12.4	12.5	144.45	0.32	12.54	0.05	2008.849	11	120	69
20411+2426	POU4863	11.99	12.6	98.45	0.10	11.89	0.02	2008.849	16	121	70
20411+2419	POU4860	13.2	13.4	206.25	0.16	18.55	0.02	2008.849	11	122	69
20411+2414	POU4861	12.7	12.9	97.77	0.18	2.99	0.09	2008.849	2	123	69
20411+2341	POU4859	12.0	14.3	23.84	0.19	18.89	0.05	2008.847	12	124	71
20412+2433	Anon.53	13.2	13.5	197.10	0.43	3.26	0.04	2008.849	6	125	72
20412+2345	POU4867	12.8	14.1	219.76	0.30	17.82	0.05	2008.847	6	126	71
20413+2430	POU4870AB	13.6	14.1	146.31	0.08	17.70	0.02	2008.849	16	127	72
20413+2430	Anon.54Bx	14.1	14.3	169.77	0.22	10.55	0.05	2008.849	7	127	72
20416+2424	POU4872	12.3	14.5	269.93	0.22	6.44	0.02	2008.849	14	128	73
21385+2429	POU5447AB	12.00	13.6	255.94	0.17	18.66	0.05	2008.847	13	129	74
21385+2429	Anon.55Bx	13.6	14.0	211.99	0.23	11.79	0.05	2008.847	9	1	74
21386+2429	Anon.56	13.0	14.0	305.67	0.38	8.42	0.06	2008.847	4	130	74
21390+2433	POU5450	13.3	13.5	286.62	0.25	11.83	0.06	2008.847	14	131	75
21393+2429	Anon.57	13.5	14.0	55.28		2.95		2008.847	1	132	75
21395+2503	POU5453	12.8	13.5	320.97	0.17	13.87	0.05	2008.847	9	133	76
21397+2457	POU5454	8.49	11.6	84.84	0.26	6.95	0.07	2008.847	7	134	77
21401+2426	POU5456	12.2	12.3					2008.847		135	
21405+2426	Anon.58	14.0	14.0	165.13		3.62		2008.847	1	136	78
21429+2345	POU5462	12.3	12.3	321.52	0.33	10.75	0.04	2008.847	10	137	79
21430+2439	POU5463	11.11	14.0	237.90	0.33	7.81	0.04	2008.847	15	138	80
21431+2343	Anon.59	14.1	14.2	215.08		10.00		2008.847	1	139	79
21434+2424	POU5464	12.21	13.4	110.41	0.17	3.96	0.01	2008.847	3	140	81
21435+2725	Anon.60	13.0	13.5	24.16	0.13	5.63	0.03	2008.849	2	141	82
21435+2721	A 299AD	9.95	10.05	63.94	0.01	378.30	0.06	2008.849	9	142	83
21435+2721	A 299DF	10.05	11.6	26.01	0.03	146.73	0.04	2008.849	9	143	83
21437+2403	POU5466	12.4	13.3	319.13	0.33	22.30	0.03	2008.847	7	144	84
21438+2424	POU5467	13.0	13.8	0.55		3.84		2008.847	1	145	85
21439+2407	POU5468	9.3	12.7	288.16		7.29		2008.847	1	146	84
21441+2418	POU5471	12.8	13.8	129.10		8.35		2008.847	1	147	86
21441+2405	POU5470	11.80	13.30	213.48	0.17	13.77	0.08	2008.847	10	148	84
21442+2631	BUP 230AB	8.45	13.1	291.80		45.25		2008.849	1	149	87
21442+2631	BUP 230AC	8.45	9.84	260.41	0.01	571.71	0.06	2008.849	6	149	87
21442+2631	BUP 230AD	8.45	10.21	288.65	0.01	439.75	0.05	2008.849	10	149	87
21442+2631	Anon.61Ax	8.45	13.5	112.89		17.31		2008.849	1	149	87
21442+2631	BUP 230CD	9.84	10.21	31.92	0.01	277.92	0.06	2008.849	9	150	87

Table continued on next page.

Double Star Measures Using a DSLR Camera #5

RA +/- D	Discoverer	Mags		PA	+/-	Sep	+/-	Epoch	N	Notes	Img
21445+2409	POU5473	12.5	13.6	298.17	0.25	16.96	0.07	2008.847	9	151	88
21447+2402	POU5474AB	12.5	13.8	300.04		7.29		2008.847	1	152	89
21447+2402	POU5475AC	12.5	14.1	76.47		7.01		2008.847	1	152	89
21449+2414	POU5477	11.06	13.7	57.58	0.19	16.03	0.02	2008.847	3	153	90
21453+2722	HO 606	8.41	12.7	92.89	0.18	18.32	0.04	2008.849	12	154	91
21456+2709	MLB1050	10.82	13.0	65.92	0.20	7.10	0.08	2008.849	10	155	92
21456+2417	POU5491AB	13.0	13.6	5.52	0.29	10.09	0.05	2008.847	6	156	93
21456+2417	POU5492AC	13.0	13.8	49.62	0.25	20.13	0.07	2008.847	15	156	93
21457+2708	Anon.62	12.3	13.5	17.28		7.27		2008.849	1	157	92
21460+2707	J 2357	9.3	13.0					2008.849		158	92
21468+2405	POU5501	12.4	14.0	294.81	0.36	13.02	0.05	2008.849	7	159	94
21472+2648	HJ 943	10.0	10.0					2008.849		135	
21474+2404	POU5505	13.8	14.0	224.80	0.28	4.74	0.03	2008.849	4	160	95

Table Notes

1. Does not appear in GSC.
2. AB=GSC 2159 252 non star (20223+2607!).
3. A=GSC 2160 510 blended object.
4. AB=GSC 2164 1020 non star.
5. A=GSC 2164 938.
6. A=GSC 2160 587.
7. A=GSC 2156 727 non star.
8. AB=GSC 2160 1068 non star (20280+2507!).
9. A=GSC 2160 1286. The 1997 measures of the system are most probably not of this pair. The images available do not show significant proper motion of the nearby stars.
10. A=GSC 2156 535 (20281+2416!).
11. A=GSC 2160 1151.
12. Does not appear in GSC. "A" has a faint pair: PA=260.
13. A=GSC 2160 1464 non star.
14. A=GSC 2160 1525.
15. AB=GSC 2160 1321 non star.
16. AB=GSC 2160 1518 non star.
17. AB=GSC 2160 1199 non star.
18. AB=GSC 2160 1256 non star.
19. A=GSC 2160 1261 non star. The proper motion in PA 0 direction of component B accounts for the changes of the measured parameters.
20. AB=GSC 2160 435 non star.
21. A=GSC 2160 631 (20297+2610!).
22. A=GSC 2160 583 non star (20294+2554!).
23. AB=GSC 2160 327 non star.
24. AB=GSC 2160 1245 non star. The proper motion in PA 30 direction of component B accounts for the changes of the measured parameters.
25. AB=GSC 2160 1174 non star.
26. A=GSC 2160 1364.
27. A=GSC 2160 403.
28. A=GSC 2160 1011.
29. AB=GSC 2160 911 non star.
30. A=GSC 2160 1007 non star.
31. B=GSC 2157 622 non star.
32. A=GSC 2161 1475 non star.
33. AB=GSC 2161 1291 non star.
34. A=GSC 2161 1165.
35. A=GSC 2157 672.
36. A=GSC 2157 1131.
37. A=GSC 2157 1371.
38. AB=GSC 2157 834 non star.
39. AB=GSC 2157 913 non star.
40. AB=GSC 2157 728 non star.
41. AB=GSC 2161 968 non star.
42. AB=GSC 2161 892 non star.
43. A=GSC 2157 589.
44. A=GSC 2161 1580.
45. A=GSC 2157 802 non star.

Double Star Measures Using a DSLR Camera #5

46. AB=GSC 2157 386 non star.
47. AB=GSC 2161 1561 non star.
48. A=GSC 2157 369.
49. A=GSC 2157 286.
50. A=GSC 2157 424 non star. The images available do not show significant proper motion of the nearby stars.
51. A=GSC 2157 424 non star.
52. A=GSC 2157 712.
53. A=GSC 2157 1565.
54. A=GSC 2157 401 non star (20376+2334!).
55. A=GSC 2157 431.
56. A=GSC 2161 1099.
57. A=GSC 2157 1200.
58. A=GSC 2157 214.
59. A=GSC 2157 526.
60. AB=GSC 2157 579 non star.
61. I cannot find any other double.
62. SC 2161 597 non star (20383+2446!).
63. A=GSC 2161 447.
64. AB=GSC 2157 536 non star.
65. A=GSC 2157 912 non star (20382+2411!)
66. AB=GSC 2161 1543 non star.
67. A=GSC 2161 1086 non star. The proper motion in PA 240 direction of component B accounts for the changes of the measured parameters.
68. A=GSC 2157 1548.
69. ABx=GSC 2157 919 non star. The images available do not show significant proper motion of the nearby stars.
70. ABx=GSC 2157 919 non star.
71. AB=GSC 2161 915 non star (20385+2449!). Very different parameters. The images available do not show significant proper motion of the nearby stars.
72. A=GSC 2157 403
73. AB=GSC 2157 504 (20385+2333!). Very difficult to measure.
74. A=GSC 2161 925.
75. AB=GSC 2161 582 non star.
76. AB=GSC 2161 481 non star.
77. AB=GSC 2157 210 non star.
78. A=GSC 2157 1065.
79. AB=GSC 2157 519 (20389+2409!). Very difficult to measure.
80. A=GSC 2157 290.
81. A=GSC 2157 69.
82. AB=GSC 2170 306 non star.
83. A=GSC 2170 326.
84. A=GSC 2170 119.
85. AB=GSC 2157 702 non star (20390+2336!).
86. Bx=GSC 2170 45 non star.
87. A=GSC 2174 511.
88. AB=GSC 2174 445 non star (20397+2503!).
89. A=GSC 2170 50 non star (20395+2417!).
90. A=GSC 2170 80 (20396+2402!).
91. A=GSC 2170 276.
92. A=GSC 2170 127 (20395+2345!).
93. A=GSC 2174 314.
94. A=GSC 2170 192.
95. A=GSC 2170 12 (20396+2419!).
96. A=GSC 2174 110.
97. B=GSC 2174 144.
98. AB=GSC 2174 126 non star.
99. A=GSC 2170 200.
100. Does not appear in GSC. Very different parameters. The images available do not show significant proper motion of the nearby stars.
101. A=GSC 2170 136 non star (20399+2417!). The images available do not show significant proper motion of the nearby stars.
102. A=GSC 2170 104 (20397+2354!). Far from the indicated position.
103. A=GSC 2174 92 (20402+2516!).
104. A=GSC 2174 374.
105. A=GSC 2174 236 (20402+2509!).
106. A=GSC 2174 1580 (20402+2458!).
107. AB=GSC 2174 300 non star.
108. A=GSC 2170 60.
109. A=GSC 2170 162.
110. AB=GSC 2174 308 non star (20404+2511!).
111. A=GSC 2174 96 non star.
112. Does not appear in GSC. The 2000 measures of the system are most probably not of this pair.
113. A=GSC 2170 248 non star.
114. A=GSC 2170 52.
115. AB=GSC 2174 512 non star.
116. A=GSC 2170 263.
117. Bx=GSC 2170 1489 non star.
118. A=GSC 2170 317 non star.
119. AB=GSC 2170 446 non star.
120. A=GSC 2170 176 (20409+2419!).
121. A=GSC 2174 457.

Double Star Measures Using a DSLR Camera #5

122.A=GSC 2170 1201 (20410+2419!).
123.AB=GSC 2170 120 non star.
124.A=GSC 2170 199.
125.AB=GSC 2174 150 non star.
126.A=GSC 2170 113 (20412+2346!).
127.A=GSC 2174 540
128.AB=GSC 2174 466 non star.
129.A=GSC 2193 50
130.A=GSC 2193 90 non star.
131.A=GSC 2193 624.
132.AB=GSC 2193 422 non star.
133.A=GSC 2193 1606 (21396+2503!).
134.A=GSC 2193 1617.
135.I cannot find such double in the vicinity. It cannot be identified in the DSS images, either.
136.AB=GSC 2193 152 non star.
137.A=GSC 2189 1270 non star.
138.A=GSC 2193 398 (21431+2440!).
139.A=GSC 2189 873 non star.
140.AB=GSC 2193 230 non star (21434+2425!).
141.A=GSC 2197 1503 non star.
142.A=GSC 2197 1015. The proper motion of component D accounts for the changes of the measured parameters.
143.D=GSC 2197 1464. The proper motion of component D accounts for the changes of the measured parameters.
144.A=GSC 2189 935.
145.AB=GSC 2193 680 (21438+2425!). A little proper motion can be observed.
146.A=GSC 2189 1741. Very difficult to measure.
147.A=GSC 2189 733 non star.
148.A=GSC 2189 29 (21440+2404!).
149.A=GSC 2197 1717. The proper motion in PA 100 direction of component A accounts for the changes of the measured parameters.
150.C=GSC 2197 1794.
151.A=GSC 2189 1311.
152.ABC=GSC 2189 1049 non star (21447+2401!).
153.A=GSC 2189 1333.
154.A=GSC 2197 1271.
155.A=GSC 2197 1270 (21458+2707!).
156.A=GSC 2189 717.
157.A=GSC 2197 1486 non star.
158.In my opinion, it is the same as MLB 1050. I cannot find any other double.
159.A=GSC 2202 1053.
160.AB=GSC 2202 441 non star (21473+2403!).