

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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Double Star Measures Using a DSLR Camera #4

| 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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Double Star Measures Using a DSLR Camera #4

| 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 |

Table continues on next page

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 |

Table continues on next page

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 |

Table continues on next page

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 |

Table continues on next page

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 |

Table continues on next page

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.

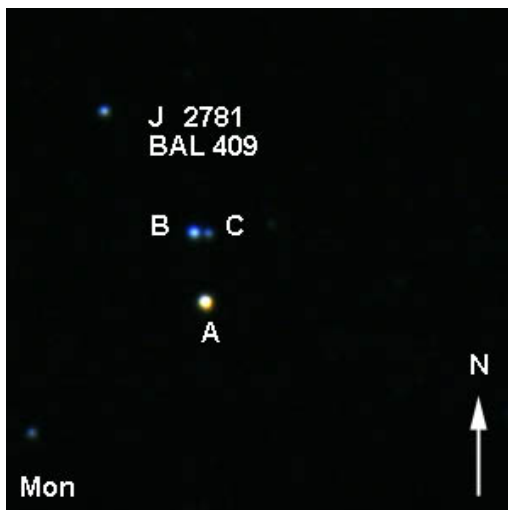


Figure 2: Image of J 2781 and BAL 409 at 07082-0151.

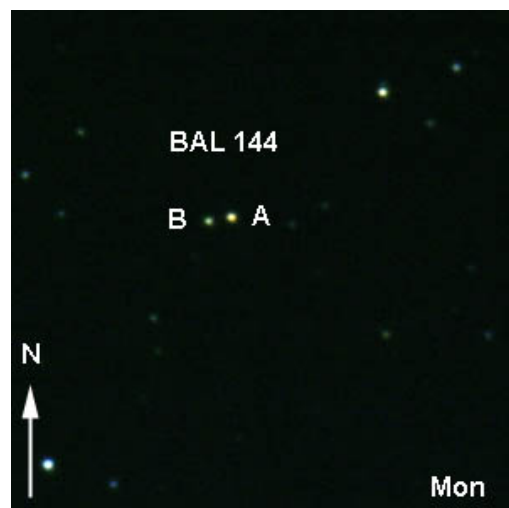


Figure 3: Image of BAL 144 at 07105-0237.

Double Star Measures Using a DSLR Camera #4

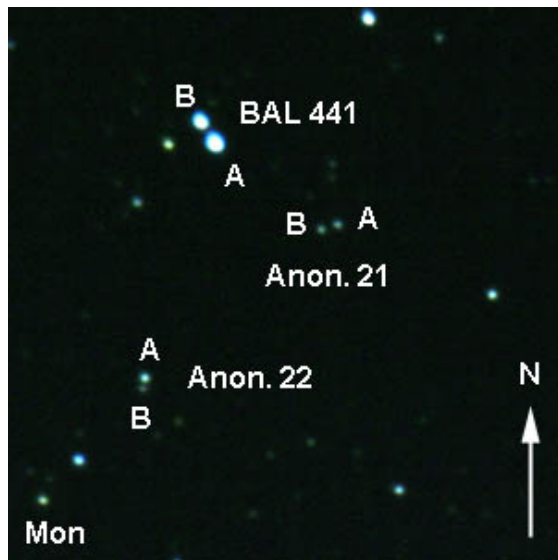


Figure 4: BAL441 (07119-0130, Anon21 (07118-0130), and Anon. 22 (07119-0132)



Figure 5: CHE 229 at 20144+1533.

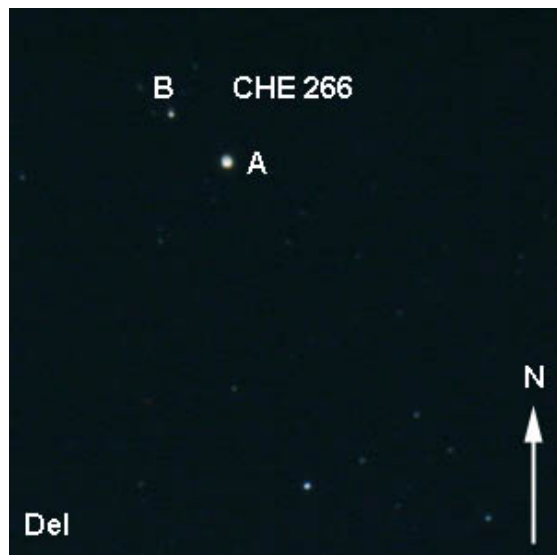


Figure 6: CHE 266 at 20168+1543.

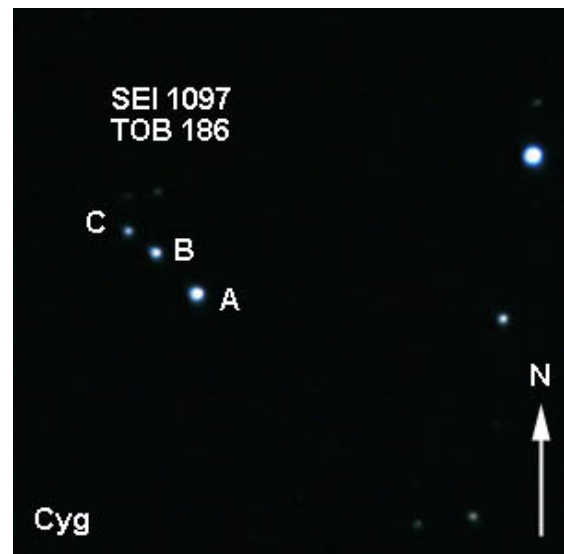


Figure 7: SEI 1097 (20210+3919) and TOB 186