# Identification and Spectral Classification of Close Red Dwarf Binary Stars

James Chivers

Montgomery, Powys, Wales
chiversjames@ymail.com

**Abstract**:The position angle, angular and linear separation, distance, and spectral class of 713 red dwarf binary star systems are reported based on data-mining the Sloan Digital Sky Survey Data Release 10. 707 of these systems are new discoveries.

## Introduction

The aim of this experiment was to combine results from two of the 100+ tables that form the Sloan Digital Sky Survey (SDSS) Data Release 10 (Ahn et al. 2012) with the earlier works on M dwarf stars authored by Bochanski, J. J. et al. (2010) and by West, A. A. et al. (2011). The 2010 paper described how the de-reddened SDSS (r-z) magnitude could be used to predict the absolute magnitude of a red dwarf star and hence its distance from the observer. The 2011 paper demonstrated how the de-reddened SDSS (r-i) and SDSS (i-z) magnitudes could be used as predictive tools to allocate stars to the sub-types between M0 and M9 inclusive.

Previous papers by Chivers have relied heavily on proper motion data. In the past, obtaining reliable proper motion data has required accurate astrometric information obtained over a period of years – the more years the better. With close double stars (3 to 5 arc seconds separation) many of the early surveys lacked the resolution to report the two components of such objects separately. A close double star would be reported as a single object situated somewhere on the straight line joining the two components - with the exact position depending on their relative brightness.

For this reason, this study has used a combination of the colours of the two stars plus their angular and linear separations as the primary diagnostic tools. As with previous papers (Chivers, 2014), the emphasis has been on identifying a relatively small number of very strong candidates, rather than a much larger number of possible red dwarf pairs.

## Method

STEP 1 – A Structured Query Language (SQL) program was created using the CASJOBS facility that can be accessed at http://skyserver.sdss3.org/casjobs/login.

Two tables from Data Release 10 were used:

Neighbors – this identifies all SDSS objects that lie within 30 arc-seconds of each other.

PhotoObjAll – this contains astrometric and photometric information on every SDSS detection.

The first section of the program was designed to identify pairs of objects separated by between 3 and 5 arc seconds (Distance between 0.05 and 0.0833), where the two components were both stars (Type = 6) and primary objects (Mode = 1) and where both stars had clean photometry (Clean = 1).

The second section checked that the i-band magnitude was less than 18.0, that the galactic extinction in the r-band was less than 0.1 magnitudes, and that the difference between the i-band magnitudes for the two components was less than 0.5 magnitudes.

The third section calculated the SDSS (r-i) and SDSS (i-z) magnitudes and only those pairs of stars where both components had colours characteristic of red dwarf stars were processed further.

STEP 2 – The de-reddened magnitudes in the SDSS r, i, and z bands were determined by eliminating the galactic extinction from the downloaded PSF magnitudes. Then the de-reddened SDSS (r-i), (i-z), and (r-z) magnitudes were calculated.

STEP 3 – The designation of the primary star was

based on the SDSS r-band magnitude. Once the primary star was known, the separation and the position angle between the two components could be calculated.

STEP 4 – The allocation to a spectral sub class (M0 to M9) was based on the average value obtained from analysis of the de-reddened SDSS (r-i) and SDSS (i-z) colours.

STEP 5 – The absolute magnitude (Mr) for both components of each candidate pair was calculated using the de-reddened SDSS (r-z) colour and the distance to each star calculated using the standard formula –

*Distance Modulus* = 5(log *d*) – 5

where *Distance Modulus* = (Apparent magnitude – Absolute magnitude) and *d* = distance in parsecs

Only pairs where the percentage difference in the two calculated distances was less than 5% were subject to additional processing.

## Results and Discussion

A total of 713 pairs of stars were identified where both components had the SDSS (r-i) and SDSS (i-z) colours associated with red dwarf stars and where the angular separation between the components was between 3 and 5 arc seconds and where the difference in the linear distance to the two stars was within five percent.

All 713 pairs were checked visually using the "Image List" facility available via the SDSS SkyServer page: http://skyserver.sdss3.org/public/en/home.aspx.

This is an important precaution to take because it is not unknown for image artifacts to be included in astronomical catalogs. See Table 2 in the tabulated results section at the end of the paper.

Six pairs were already listed in the Washington Double Star Catalog and in five of the six cases the position angle and separation calculated using the SDSS data were very similar to the most recent results available from the Vizier site: http://vizier.ustrasbg.fr/viz-bin/VizieR.

The allocation of each star to a spectral sub-class (M0 to M9) was done using the results obtained by West and all values should be taken as being ±1. As would be expected, the primary star is either of an earlier sub-type than the secondary star or is of the same spectral type. Both components are at virtually the same distance from the observer and, because early M dwarfs are more luminous than later M dwarfs, they will appear brighter.

The binary star systems presented in this paper vary in linear distance from the observer from between 36 and 1443 parsecs and the separation between the components varies between 111 and 6671 AU.

The results for all 713 binary star systems are given in Table 2 and contains astrometric data, magnitudes, angular separation, position angle, the colors, spectral classifications, linear distance, and linear separation of the two components.

## Conclusions

Combining data from a number of different SDSS Data Release 10 tables greatly accelerates the process of identifying candidate red dwarf binary star systems. The temptation to be too lenient when deciding what selection criteria to use should always be resisted because even a small relaxation in the rigour with which these constraints are selected and applied can result in large numbers of "false positive" discovery claims. The quality of any discovery claim is always more important than the quantity

*(Continued on page 58)*

*Table 1 – Pairs already listed the Washington Double Star Catalog*

| Number | Discoverer Code | This study PA | This study Sep | WDS PA | WDS Sep | WDS Name |
|---|---|---|---|---|---|---|
| 40 | SKF 1001 | 113.02 | 3.02 | 34 | 3.8 | 01094+0057 |
| 277 | LDS 3015 | 23.73 | 3.11 | 23 | 3.0 | 10353+5323 |
| 339 | LDS 5204 | 272.43 | 4.03 | 272 | 4.0 | 11216+5111 |
| 634 | LDS 1430 | 57.12 | 3.62 | 59 | 3.6 | 15575+4933 |
| 678 | LDS 2732 | 244.14 | 3.23 | 244 | 3.2 | 17179+6718 |
| 694 | LDS 5253 | 194.75 | 4.20 | 195 | 4.1 | 23099+0034 |

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 1 | 00 02 58.415 | -11 06 10.94 | 16.80 | 16.90 | 235.72 | 4.52 | 2000.737 | 1.16 | 0.60 | 1.18 | 0.60 | 3 | 3 | 192 | 866 |
| 2 | 00 03 37.260 | +26 32 23.09 | 16.73 | 17.18 | 32.00 | 3.89 | 2003.743 | 0.65 | 0.46 | 0.72 | 0.51 | 1 | 1 | 481 | 1868 |
| 3 | 00 07 28.414 | +05 32 00.09 | 15.32 | 15.62 | 203.60 | 3.84 | 2008.770 | 0.73 | 0.32 | 0.82 | 0.36 | 0 | 1 | 265 | 1016 |
| 4 | 00 13 14.723 | +06 08 29.65 | 18.01 | 18.46 | 137.80 | 3.38 | 2008.757 | 1.19 | 0.67 | 1.33 | 0.71 | 3 | 4 | 275 | 930 |
| 5 | 00 15 03.302 | -03 38 29.64 | 16.80 | 17.14 | 348.18 | 3.49 | 2008.683 | 0.65 | 0.31 | 0.75 | 0.35 | 0 | 1 | 590 | 2057 |
| 6 | 00 15 27.226 | +05 19 26.77 | 16.24 | 16.28 | 72.60 | 3.11 | 2008.757 | 0.99 | 0.56 | 0.99 | 0.57 | 2 | 2 | 199 | 618 |
| 7 | 00 17 24.553 | -05 08 11.55 | 18.20 | 18.75 | 156.63 | 3.64 | 2008.888 | 1.54 | 0.83 | 1.63 | 0.92 | 5 | 5 | 149 | 543 |
| 8 | 00 18 10.532 | -03 56 53.73 | 16.07 | 16.29 | 214.29 | 3.95 | 2008.888 | 1.08 | 0.56 | 1.13 | 0.59 | 3 | 3 | 159 | 629 |
| 9 | 00 18 13.050 | -02 58 49.11 | 18.82 | 19.41 | 30.63 | 3.26 | 2008.830 | 1.26 | 0.70 | 1.40 | 0.77 | 4 | 4 | 353 | 1152 |
| 10 | 00 19 15.261 | -02 04 23.67 | 16.43 | 16.51 | 286.45 | 3.12 | 2008.683 | 0.57 | 0.30 | 0.59 | 0.33 | 0 | 0 | 575 | 1794 |
| 11 | 00 21 39.501 | -08 24 36.76 | 17.66 | 17.78 | 24.02 | 4.17 | 2009.791 | 0.77 | 0.44 | 0.79 | 0.44 | 1 | 1 | 639 | 2663 |
| 12 | 00 22 08.218 | -20 13 47.13 | 18.94 | 19.16 | 86.96 | 4.58 | 2004.953 | 1.18 | 0.60 | 1.21 | 0.62 | 3 | 3 | 496 | 2272 |
| 13 | 00 25 09.410 | -15 08 45.06 | 18.11 | 18.29 | 94.64 | 4.31 | 2006.711 | 1.03 | 0.58 | 1.06 | 0.59 | 3 | 3 | 435 | 1876 |
| 14 | 00 25 49.644 | +00 34 41.13 | 18.97 | 19.09 | 103.72 | 3.85 | 2003.875 | 1.39 | 0.72 | 1.41 | 0.71 | 4 | 4 | 312 | 1200 |
| 15 | 00 25 52.656 | +26 37 56.11 | 17.94 | 18.09 | 233.02 | 4.38 | 2008.817 | 1.06 | 0.57 | 1.10 | 0.57 | 3 | 3 | 388 | 1700 |
| 16 | 00 26 42.633 | +01 21 47.10 | 18.36 | 18.83 | 192.26 | 3.85 | 2008.756 | 0.81 | 0.44 | 0.86 | 0.55 | 1 | 2 | 819 | 3150 |
| 17 | 00 27 04.947 | +04 39 37.57 | 17.98 | 18.04 | 264.82 | 4.01 | 2008.770 | 1.05 | 0.50 | 1.06 | 0.52 | 2 | 2 | 439 | 1760 |
| 18 | 00 27 13.405 | +03 20 18.80 | 18.59 | 18.67 | 231.85 | 4.57 | 2008.756 | 1.20 | 0.66 | 1.24 | 0.67 | 3 | 3 | 362 | 1654 |
| 19 | 00 27 20.800 | -15 56 47.35 | 16.07 | 16.55 | 77.51 | 4.45 | 2006.744 | 0.87 | 0.49 | 0.98 | 0.54 | 2 | 2 | 240 | 1069 |
| 20 | 00 33 25.719 | -18 55 40.12 | 16.90 | 17.37 | 293.72 | 4.89 | 2006.711 | 1.15 | 0.55 | 1.25 | 0.62 | 3 | 3 | 212 | 1035 |
| 21 | 00 34 00.963 | +23 53 35.29 | 18.16 | 18.49 | 355.26 | 3.20 | 2008.751 | 1.18 | 0.60 | 1.24 | 0.63 | 3 | 3 | 347 | 1107 |
| 22 | 00 34 47.047 | -10 03 00.51 | 17.79 | 18.05 | 39.94 | 4.26 | 2000.740 | 1.03 | 0.55 | 1.10 | 0.55 | 2 | 3 | 394 | 1675 |
| 23 | 00 41 31.072 | -08 26 31.58 | 18.36 | 18.84 | 149.46 | 3.94 | 2009.742 | 1.14 | 0.64 | 1.26 | 0.67 | 3 | 3 | 378 | 1489 |
| 24 | 00 41 53.771 | -00 16 05.46 | 17.39 | 17.54 | 159.10 | 3.09 | 2003.886 | 1.25 | 0.64 | 1.29 | 0.65 | 3 | 3 | 204 | 631 |
| 25 | 00 43 26.095 | +20 59 12.07 | 18.20 | 18.55 | 20.17 | 3.21 | 2009.046 | 1.17 | 0.62 | 1.23 | 0.67 | 3 | 3 | 343 | 1103 |
| 26 | 00 44 38.431 | +24 01 35.05 | 17.99 | 18.48 | 337.12 | 3.86 | 2009.737 | 0.59 | 0.32 | 0.70 | 0.35 | 0 | 1 | 1137 | 4390 |
| 27 | 00 44 43.374 | +23 46 23.88 | 17.63 | 18.08 | 318.31 | 4.84 | 2004.723 | 0.92 | 0.50 | 1.05 | 0.53 | 2 | 2 | 453 | 2193 |
| 28 | 00 48 23.961 | +21 35 17.31 | 18.92 | 19.44 | 183.29 | 4.50 | 2009.071 | 1.03 | 0.62 | 1.17 | 0.63 | 3 | 3 | 596 | 2683 |
| 29 | 00 48 35.495 | +23 52 38.37 | 15.45 | 15.84 | 70.65 | 3.60 | 2009.737 | 0.64 | 0.32 | 0.71 | 0.40 | 0 | 1 | 323 | 1161 |
| 30 | 00 48 47.979 | +03 32 19.15 | 18.81 | 19.06 | 10.63 | 3.80 | 2008.754 | 1.28 | 0.64 | 1.30 | 0.69 | 3 | 4 | 377 | 1432 |
| 31 | 00 51 53.676 | +23 19 42.35 | 18.26 | 18.41 | 37.58 | 4.09 | 2009.071 | 0.78 | 0.42 | 0.82 | 0.43 | 1 | 1 | 842 | 3443 |
| 32 | 00 54 09.885 | +05 04 19.20 | 16.81 | 16.88 | 55.16 | 4.64 | 2008.770 | 1.26 | 0.67 | 1.27 | 0.68 | 3 | 4 | 148 | 686 |
| 33 | 00 54 47.814 | -09 57 22.38 | 18.79 | 19.34 | 333.74 | 4.96 | 2000.740 | 1.04 | 0.53 | 1.17 | 0.58 | 2 | 3 | 619 | 3071 |
| 34 | 00 55 12.070 | +05 25 42.48 | 18.59 | 18.61 | 69.12 | 3.93 | 2008.770 | 0.75 | 0.41 | 0.71 | 0.44 | 1 | 1 | 1045 | 4107 |
| 35 | 00 55 19.934 | +22 13 20.12 | 16.04 | 16.46 | 233.44 | 3.77 | 2009.049 | 0.59 | 0.34 | 0.67 | 0.38 | 0 | 1 | 448 | 1690 |
| 36 | 00 56 21.179 | +20 40 54.43 | 17.79 | 17.87 | 212.23 | 4.75 | 2009.057 | 0.95 | 0.44 | 0.95 | 0.46 | 2 | 2 | 515 | 2446 |
| 37 | 00 59 56.693 | +20 40 53.95 | 17.98 | 18.32 | 108.21 | 4.94 | 2009.057 | 0.69 | 0.31 | 0.76 | 0.35 | 0 | 1 | 984 | 4857 |
| 38 | 01 04 28.146 | +20 39 26.94 | 15.98 | 16.48 | 329.97 | 3.38 | 2009.057 | 0.71 | 0.33 | 0.83 | 0.39 | 0 | 1 | 365 | 1236 |
| 39 | 01 09 25.244 | +00 57 11.30 | 16.45 | 16.58 | 34.13 | 3.79 | 2003.886 | 1.46 | 0.78 | 1.49 | 0.81 | 4 | 5 | 78 | 297 |
| 40 | 01 09 26.787 | +06 07 11.47 | 17.17 | 17.45 | 113.02 | 3.02 | 2005.742 | 0.99 | 0.51 | 1.05 | 0.56 | 2 | 2 | 323 | 975 |
| 41 | 01 13 10.436 | +23 00 11.08 | 18.79 | 18.88 | 85.79 | 4.04 | 2004.707 | 1.32 | 0.66 | 1.35 | 0.68 | 4 | 4 | 337 | 1363 |
| 42 | 01 16 27.264 | -10 21 44.14 | 17.08 | 17.13 | 162.91 | 4.39 | 2000.737 | 1.19 | 0.61 | 1.21 | 0.62 | 3 | 3 | 200 | 878 |
| 43 | 01 17 56.102 | +00 01 09.29 | 17.47 | 18.01 | 350.19 | 4.93 | 2003.886 | 1.04 | 0.59 | 1.15 | 0.66 | 3 | 3 | 308 | 1515 |
| 44 | 01 18 05.854 | +12 34 05.69 | 18.48 | 18.54 | 140.99 | 3.04 | 2008.839 | 0.74 | 0.40 | 0.74 | 0.44 | 1 | 1 | 1005 | 3055 |
| 45 | 01 18 18.429 | -21 42 43.06 | 14.60 | 14.83 | 321.22 | 3.58 | 2006.892 | 0.63 | 0.36 | 0.69 | 0.35 | 0 | 1 | 214 | 768 |
| 46 | 01 18 22.694 | -09 37 27.00 | 16.96 | 17.22 | 109.18 | 3.88 | 2000.737 | 1.05 | 0.55 | 1.11 | 0.60 | 2 | 3 | 254 | 986 |
| 47 | 01 18 58.311 | +14 23 55.01 | 16.17 | 16.78 | 14.99 | 4.22 | 2000.915 | 0.65 | 0.32 | 0.78 | 0.40 | 0 | 1 | 443 | 1872 |
| 48 | 01 26 40.691 | +06 44 22.96 | 17.91 | 18.24 | 180.84 | 4.90 | 2005.781 | 1.00 | 0.58 | 1.09 | 0.61 | 2 | 3 | 406 | 1989 |
| 49 | 01 27 06.699 | +00 12 43.96 | 18.54 | 18.62 | 45.91 | 4.23 | 2001.863 | 1.00 | 0.48 | 0.98 | 0.50 | 2 | 2 | 647 | 2738 |
| 50 | 01 29 42.011 | +15 03 46.09 | 17.05 | 17.46 | 19.20 | 3.00 | 2000.915 | 0.92 | 0.51 | 1.02 | 0.57 | 2 | 2 | 337 | 1012 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 51 | 01 37 39.892 | -18 21 33.14 | 17.25 | 17.39 | 203.90 | 4.63 | 2004.956 | 0.66 | 0.37 | 0.69 | 0.39 | 1 | 1 | 666 | 3081 |
| 52 | 01 37 59.049 | -02 00 03.41 | 18.42 | 18.65 | 345.60 | 4.03 | 2008.830 | 0.99 | 0.55 | 1.06 | 0.54 | 2 | 2 | 555 | 2237 |
| 53 | 01 39 04.698 | -06 28 28.11 | 18.33 | 18.69 | 141.37 | 4.78 | 2009.044 | 0.85 | 0.41 | 0.91 | 0.44 | 1 | 2 | 812 | 3884 |
| 54 | 01 41 38.679 | +02 47 01.48 | 18.47 | 18.78 | 26.97 | 4.70 | 2008.756 | 1.07 | 0.53 | 1.13 | 0.55 | 2 | 3 | 522 | 2457 |
| 55 | 01 42 38.813 | -00 52 10.44 | 18.37 | 18.44 | 72.87 | 3.01 | 2001.863 | 1.13 | 0.59 | 1.17 | 0.60 | 3 | 3 | 404 | 1218 |
| 56 | 01 43 17.694 | -01 51 28.48 | 15.47 | 15.54 | 21.87 | 4.85 | 2008.833 | 1.49 | 0.82 | 1.51 | 0.84 | 5 | 5 | 45 | 221 |
| 57 | 01 43 28.387 | -05 30 10.36 | 17.39 | 17.50 | 9.44 | 3.58 | 2008.997 | 0.60 | 0.33 | 0.50 | 0.46 | 0 | 1 | 836 | 2993 |
| 58 | 01 45 33.942 | +00 04 13.00 | 16.88 | 17.11 | 146.20 | 3.39 | 2003.886 | 0.93 | 0.44 | 0.98 | 0.48 | 2 | 2 | 339 | 1149 |
| 59 | 01 45 54.824 | +02 09 43.54 | 17.79 | 17.96 | 284.67 | 4.90 | 2009.740 | 0.75 | 0.45 | 0.74 | 0.53 | 1 | 2 | 672 | 3292 |
| 60 | 01 49 16.579 | -17 51 30.26 | 16.82 | 16.89 | 12.58 | 3.79 | 2006.892 | 1.40 | 0.75 | 1.40 | 0.75 | 4 | 4 | 109 | 414 |
| 61 | 01 51 45.363 | -00 46 25.27 | 18.00 | 18.26 | 190.19 | 3.09 | 2003.886 | 1.20 | 0.59 | 1.25 | 0.63 | 3 | 3 | 313 | 968 |
| 62 | 01 53 04.996 | -01 14 41.95 | 15.76 | 15.97 | 287.14 | 3.90 | 2003.886 | 0.81 | 0.45 | 0.86 | 0.48 | 1 | 2 | 242 | 945 |
| 63 | 01 53 13.169 | -06 04 53.77 | 18.81 | 19.11 | 137.23 | 4.17 | 2009.003 | 1.32 | 0.73 | 1.38 | 0.73 | 4 | 4 | 317 | 1324 |
| 64 | 01 54 26.613 | +01 36 26.79 | 18.36 | 18.74 | 338.26 | 3.15 | 2008.757 | 1.11 | 0.56 | 1.17 | 0.59 | 3 | 3 | 451 | 1419 |
| 65 | 01 54 45.084 | +02 07 49.43 | 16.09 | 16.38 | 264.45 | 3.51 | 2009.740 | 0.66 | 0.33 | 0.75 | 0.36 | 0 | 1 | 410 | 1438 |
| 66 | 01 55 15.073 | +00 31 37.01 | 18.14 | 18.58 | 148.16 | 4.22 | 2003.886 | 0.54 | 0.32 | 0.63 | 0.38 | 0 | 1 | 1291 | 5445 |
| 67 | 01 59 52.049 | -03 48 57.91 | 17.42 | 17.90 | 111.29 | 3.45 | 2008.975 | 1.27 | 0.65 | 1.34 | 0.72 | 3 | 4 | 201 | 695 |
| 68 | 02 00 16.582 | -00 46 14.77 | 17.75 | 18.10 | 347.50 | 4.19 | 2003.886 | 0.96 | 0.55 | 1.03 | 0.60 | 2 | 3 | 420 | 1761 |
| 69 | 02 02 11.637 | -15 13 47.83 | 15.49 | 15.61 | 65.98 | 3.28 | 2008.000 | 0.86 | 0.45 | 0.89 | 0.47 | 2 | 2 | 198 | 649 |
| 70 | 02 07 19.342 | -11 53 21.54 | 18.24 | 18.78 | 109.75 | 3.59 | 2008.000 | 1.28 | 0.66 | 1.38 | 0.71 | 3 | 4 | 283 | 1015 |
| 71 | 02 12 26.024 | -05 51 47.53 | 18.27 | 18.60 | 61.90 | 3.61 | 2009.003 | 1.21 | 0.62 | 1.28 | 0.65 | 3 | 3 | 338 | 1218 |
| 72 | 02 16 41.391 | -05 47 56.97 | 15.79 | 15.84 | 312.46 | 3.02 | 2009.003 | 0.64 | 0.29 | 0.65 | 0.29 | 0 | 0 | 395 | 1192 |
| 73 | 02 18 23.298 | -00 14 54.94 | 19.20 | 19.32 | 299.62 | 3.19 | 2003.886 | 1.37 | 0.66 | 1.38 | 0.67 | 4 | 4 | 391 | 1244 |
| 74 | 02 18 55.730 | -01 01 36.32 | 17.73 | 18.09 | 312.28 | 4.77 | 2004.776 | 0.57 | 0.36 | 0.68 | 0.38 | 0 | 1 | 955 | 4557 |
| 75 | 02 21 38.413 | -05 09 42.61 | 17.97 | 18.32 | 182.81 | 3.27 | 2008.975 | 0.82 | 0.42 | 0.90 | 0.42 | 1 | 1 | 711 | 2324 |
| 76 | 02 22 52.616 | +00 38 54.63 | 19.29 | 19.59 | 276.78 | 3.47 | 2001.964 | 1.49 | 0.79 | 1.54 | 0.82 | 4 | 5 | 283 | 980 |
| 77 | 02 23 31.007 | +02 55 27.69 | 15.92 | 16.38 | 122.91 | 4.63 | 2008.683 | 1.02 | 0.54 | 1.13 | 0.60 | 2 | 3 | 165 | 763 |
| 78 | 02 23 44.525 | -05 42 54.16 | 17.56 | 17.87 | 80.68 | 3.31 | 2009.003 | 1.22 | 0.62 | 1.26 | 0.64 | 3 | 3 | 244 | 809 |
| 79 | 02 29 49.404 | -08 05 08.67 | 16.95 | 17.17 | 84.74 | 3.19 | 2000.888 | 0.60 | 0.33 | 0.65 | 0.37 | 0 | 1 | 666 | 2122 |
| 80 | 02 30 03.772 | +00 59 10.61 | 15.72 | 16.22 | 337.38 | 4.42 | 2008.757 | 0.63 | 0.34 | 0.75 | 0.40 | 0 | 1 | 356 | 1571 |
| 81 | 02 30 06.210 | -05 31 44.48 | 18.96 | 19.31 | 282.95 | 4.28 | 2009.003 | 1.08 | 0.59 | 1.18 | 0.60 | 3 | 3 | 582 | 2494 |
| 82 | 02 34 16.250 | +01 55 47.63 | 17.36 | 17.71 | 203.54 | 4.97 | 2008.683 | 1.34 | 0.66 | 1.39 | 0.70 | 4 | 4 | 173 | 862 |
| 83 | 02 35 58.268 | -06 35 20.93 | 16.15 | 16.32 | 110.68 | 4.35 | 2009.044 | 0.68 | 0.37 | 0.73 | 0.38 | 1 | 1 | 393 | 1708 |
| 84 | 02 37 25.274 | -06 37 38.10 | 16.22 | 16.71 | 269.96 | 4.08 | 2006.881 | 0.96 | 0.45 | 1.06 | 0.50 | 2 | 2 | 242 | 987 |
| 85 | 02 38 49.709 | -06 53 10.24 | 16.50 | 16.88 | 17.87 | 4.89 | 2009.044 | 0.67 | 0.36 | 0.76 | 0.40 | 1 | 1 | 472 | 2308 |
| 86 | 02 39 02.158 | -08 25 10.85 | 17.87 | 17.87 | 352.88 | 3.45 | 2000.888 | 1.01 | 0.52 | 1.01 | 0.54 | 2 | 2 | 427 | 1470 |
| 87 | 02 40 46.082 | -01 13 40.58 | 17.20 | 17.83 | 146.34 | 4.30 | 2002.777 | 1.11 | 0.60 | 1.25 | 0.66 | 3 | 3 | 244 | 1048 |
| 88 | 02 41 56.664 | -07 10 58.74 | 18.16 | 18.22 | 265.19 | 3.29 | 2009.044 | 1.25 | 0.69 | 1.27 | 0.69 | 3 | 4 | 271 | 893 |
| 89 | 02 45 43.392 | -06 29 58.64 | 18.04 | 18.39 | 300.56 | 3.89 | 2009.003 | 1.36 | 0.74 | 1.41 | 0.78 | 4 | 4 | 207 | 806 |
| 90 | 07 51 43.488 | +13 33 19.03 | 18.50 | 18.83 | 76.20 | 4.56 | 2004.946 | 0.94 | 0.54 | 1.02 | 0.55 | 2 | 2 | 633 | 2886 |
| 91 | 07 53 54.420 | +27 36 33.40 | 17.69 | 17.75 | 109.43 | 4.01 | 2001.969 | 1.18 | 0.62 | 1.16 | 0.64 | 3 | 3 | 274 | 1096 |
| 92 | 07 55 48.359 | +48 33 56.19 | 17.36 | 17.45 | 10.21 | 4.72 | 2003.812 | 1.36 | 0.65 | 1.40 | 0.67 | 4 | 4 | 165 | 780 |
| 93 | 07 55 51.976 | +05 31 25.43 | 17.45 | 17.45 | 25.28 | 4.01 | 2003.075 | 1.50 | 0.78 | 1.47 | 0.80 | 4 | 4 | 120 | 482 |
| 94 | 07 57 03.025 | +11 28 46.17 | 18.90 | 19.23 | 181.00 | 4.04 | 2005.047 | 1.09 | 0.62 | 1.21 | 0.64 | 3 | 3 | 518 | 2092 |
| 95 | 07 57 52.254 | +10 07 17.13 | 17.67 | 18.13 | 153.41 | 3.47 | 2005.096 | 1.05 | 0.57 | 1.16 | 0.62 | 2 | 3 | 344 | 1195 |
| 96 | 07 57 54.819 | -01 34 42.41 | 17.53 | 18.15 | 39.79 | 3.12 | 2001.213 | 0.71 | 0.36 | 0.85 | 0.42 | 1 | 1 | 727 | 2268 |
| 97 | 07 58 16.038 | -01 25 51.66 | 15.53 | 15.66 | 107.67 | 4.34 | 2001.216 | 0.23 | 0.97 | 0.24 | 0.98 | 2 | 2 | 244 | 1057 |
| 98 | 07 59 17.484 | +15 52 55.86 | 18.89 | 19.06 | 185.46 | 3.67 | 2004.948 | 1.12 | 0.58 | 1.13 | 0.59 | 3 | 3 | 554 | 2034 |
| 99 | 07 59 54.993 | +06 00 07.26 | 19.01 | 19.06 | 132.19 | 3.44 | 2003.075 | 1.25 | 0.69 | 1.28 | 0.70 | 4 | 4 | 398 | 1371 |
| 100 | 08 01 06.143 | +05 03 51.19 | 16.13 | 16.63 | 295.41 | 4.22 | 2002.868 | 0.68 | 0.37 | 0.81 | 0.44 | 1 | 1 | 381 | 1607 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 101 | 08 02 42.078 | -01 02 20.41 | 18.00 | 18.61 | 272.05 | 4.62 | 2000.258 | 0.73 | 0.39 | 0.86 | 0.46 | 1 | 2 | 837 | 3866 |
| 102 | 08 03 48.003 | +03 04 51.20 | 16.41 | 16.74 | 220.53 | 3.15 | 2001.139 | 0.62 | 0.33 | 0.67 | 0.35 | 0 | 1 | 524 | 1650 |
| 103 | 08 03 57.328 | +07 29 50.13 | 18.81 | 18.90 | 89.00 | 3.33 | 2006.016 | 0.93 | 0.53 | 0.94 | 0.55 | 2 | 2 | 738 | 2453 |
| 104 | 08 04 41.621 | +03 32 38.18 | 19.46 | 19.66 | 209.26 | 3.20 | 2002.868 | 1.53 | 0.87 | 1.59 | 0.87 | 5 | 5 | 256 | 819 |
| 105 | 08 04 46.994 | +11 28 00.67 | 18.84 | 19.28 | 38.48 | 4.83 | 2005.194 | 1.06 | 0.59 | 1.13 | 0.65 | 3 | 3 | 568 | 2744 |
| 106 | 08 04 57.122 | +17 00 54.19 | 17.31 | 17.43 | 127.04 | 3.33 | 2004.288 | 1.16 | 0.63 | 1.21 | 0.65 | 3 | 3 | 226 | 752 |
| 107 | 08 05 36.156 | +02 53 05.77 | 18.95 | 19.46 | 128.39 | 3.94 | 2001.140 | 1.25 | 0.70 | 1.36 | 0.75 | 4 | 4 | 383 | 1508 |
| 108 | 08 05 50.988 | +04 20 39.09 | 18.40 | 18.77 | 234.59 | 3.13 | 2002.120 | 0.67 | 0.33 | 0.73 | 0.41 | 0 | 1 | 1176 | 3677 |
| 109 | 08 05 56.367 | +04 47 16.14 | 19.05 | 19.39 | 271.86 | 3.92 | 2003.075 | 1.16 | 0.65 | 1.23 | 0.67 | 3 | 3 | 498 | 1952 |
| 110 | 08 10 50.996 | +01 45 43.95 | 18.34 | 18.67 | 15.37 | 3.62 | 2001.140 | 0.57 | 0.33 | 0.63 | 0.36 | 0 | 0 | 1369 | 4951 |
| 111 | 08 10 55.847 | +04 24 06.12 | 17.11 | 17.22 | 295.89 | 3.02 | 2002.120 | 0.96 | 0.51 | 0.97 | 0.53 | 2 | 2 | 334 | 1010 |
| 112 | 08 11 52.442 | +05 56 48.48 | 17.29 | 17.53 | 325.31 | 3.01 | 2003.076 | 0.73 | 0.41 | 0.79 | 0.41 | 1 | 1 | 594 | 1788 |
| 113 | 08 11 53.463 | +07 47 34.26 | 16.05 | 16.56 | 10.50 | 3.62 | 2006.084 | 0.65 | 0.33 | 0.74 | 0.40 | 0 | 1 | 417 | 1512 |
| 114 | 08 12 37.227 | +03 31 42.19 | 18.02 | 18.21 | 227.65 | 3.30 | 2001.140 | 0.80 | 0.44 | 0.86 | 0.44 | 1 | 1 | 709 | 2342 |
| 115 | 08 13 13.583 | +03 13 52.00 | 18.57 | 19.14 | 193.19 | 3.72 | 2002.120 | 0.99 | 0.50 | 1.10 | 0.56 | 2 | 3 | 637 | 2370 |
| 116 | 08 15 52.259 | +02 49 58.23 | 16.49 | 17.08 | 46.78 | 4.21 | 2002.120 | 0.63 | 0.30 | 0.76 | 0.36 | 0 | 1 | 546 | 2296 |
| 117 | 08 16 11.538 | +04 17 21.64 | 18.86 | 19.46 | 305.18 | 4.52 | 2002.120 | 1.42 | 0.73 | 1.55 | 0.80 | 4 | 5 | 274 | 1239 |
| 118 | 08 16 55.519 | +11 35 58.94 | 15.98 | 16.54 | 124.12 | 4.70 | 2005.194 | 0.78 | 0.44 | 0.89 | 0.51 | 1 | 2 | 284 | 1333 |
| 119 | 08 18 32.267 | +03 05 43.79 | 18.54 | 18.70 | 193.73 | 3.35 | 2002.174 | 0.75 | 0.48 | 0.76 | 0.51 | 1 | 2 | 928 | 3109 |
| 120 | 08 18 35.269 | +03 02 26.33 | 17.52 | 17.57 | 303.46 | 4.57 | 2002.120 | 0.57 | 0.34 | 0.58 | 0.34 | 0 | 0 | 910 | 4159 |
| 121 | 08 19 59.471 | +06 30 36.18 | 17.15 | 17.32 | 339.12 | 3.52 | 2003.076 | 1.28 | 0.65 | 1.32 | 0.68 | 3 | 4 | 170 | 599 |
| 122 | 08 22 14.435 | +09 45 01.00 | 18.63 | 19.03 | 192.42 | 4.99 | 2006.016 | 0.97 | 0.51 | 1.09 | 0.53 | 2 | 2 | 655 | 3266 |
| 123 | 08 22 43.644 | +15 34 35.31 | 16.41 | 16.51 | 121.52 | 4.02 | 2004.951 | 0.69 | 0.35 | 0.73 | 0.36 | 1 | 1 | 447 | 1798 |
| 124 | 08 24 11.444 | +10 55 16.92 | 18.96 | 19.09 | 152.90 | 3.23 | 2005.194 | 1.21 | 0.62 | 1.22 | 0.63 | 3 | 3 | 469 | 1518 |
| 125 | 08 30 23.411 | +45 12 08.69 | 18.76 | 19.19 | 33.26 | 3.02 | 2001.072 | 1.22 | 0.65 | 1.32 | 0.71 | 3 | 4 | 391 | 1181 |
| 126 | 08 31 23.929 | -03 23 20.00 | 18.53 | 18.60 | 301.03 | 3.58 | 2006.881 | 1.25 | 0.64 | 1.25 | 0.65 | 3 | 3 | 350 | 1254 |
| 127 | 08 31 54.658 | +18 54 04.46 | 18.13 | 18.35 | 258.92 | 3.44 | 2004.948 | 0.64 | 0.37 | 0.70 | 0.37 | 1 | 1 | 1037 | 3570 |
| 128 | 08 31 59.090 | +35 03 32.89 | 17.71 | 17.88 | 10.88 | 4.66 | 2001.969 | 0.67 | 0.33 | 0.69 | 0.35 | 0 | 1 | 881 | 4100 |
| 129 | 08 35 28.782 | +10 26 57.32 | 17.94 | 18.07 | 122.48 | 3.89 | 2006.016 | 0.61 | 0.28 | 0.63 | 0.33 | 0 | 0 | 1112 | 4324 |
| 130 | 08 36 13.929 | +18 03 19.62 | 19.22 | 19.58 | 126.91 | 3.37 | 2004.951 | 1.32 | 0.72 | 1.41 | 0.74 | 4 | 4 | 383 | 1289 |
| 131 | 08 36 50.400 | +46 19 19.27 | 18.29 | 18.42 | 7.46 | 3.07 | 2001.072 | 1.18 | 0.64 | 1.24 | 0.65 | 3 | 3 | 336 | 1028 |
| 132 | 08 38 26.458 | +03 36 00.00 | 18.49 | 18.95 | 142.76 | 3.19 | 2002.120 | 1.38 | 0.74 | 1.46 | 0.78 | 4 | 4 | 247 | 789 |
| 133 | 08 39 28.223 | +03 56 28.01 | 17.80 | 18.06 | 336.34 | 3.47 | 2002.120 | 0.64 | 0.38 | 0.73 | 0.37 | 1 | 1 | 884 | 3065 |
| 134 | 08 39 32.158 | -01 08 43.79 | 18.11 | 18.38 | 250.77 | 3.58 | 2000.173 | 1.15 | 0.58 | 1.21 | 0.59 | 3 | 3 | 368 | 1316 |
| 135 | 08 41 00.928 | +53 39 47.51 | 16.24 | 16.77 | 24.82 | 3.48 | 2000.337 | 1.10 | 0.58 | 1.20 | 0.64 | 3 | 3 | 165 | 573 |
| 136 | 08 41 02.620 | +50 44 50.60 | 17.89 | 18.22 | 204.75 | 3.69 | 2000.258 | 1.32 | 0.71 | 1.39 | 0.72 | 4 | 4 | 213 | 787 |
| 137 | 08 41 07.356 | -02 26 38.56 | 18.06 | 18.34 | 181.32 | 3.10 | 2006.881 | 0.76 | 0.42 | 0.83 | 0.44 | 1 | 1 | 789 | 2449 |
| 138 | 08 42 31.479 | -03 17 17.76 | 17.70 | 17.73 | 166.52 | 3.99 | 2007.198 | 0.69 | 0.40 | 0.71 | 0.40 | 1 | 1 | 762 | 3039 |
| 139 | 08 45 44.792 | +11 34 04.42 | 17.72 | 17.74 | 202.34 | 3.43 | 2006.016 | 0.59 | 0.33 | 0.61 | 0.34 | 0 | 0 | 964 | 3309 |
| 140 | 08 47 12.880 | +02 51 03.35 | 17.07 | 17.21 | 306.83 | 4.15 | 2001.140 | 0.90 | 0.47 | 0.93 | 0.48 | 2 | 2 | 380 | 1580 |
| 141 | 08 47 15.822 | +02 15 33.74 | 18.02 | 18.44 | 318.88 | 3.67 | 2000.916 | 0.90 | 0.47 | 1.00 | 0.52 | 2 | 2 | 583 | 2143 |
| 142 | 08 47 37.848 | +10 28 45.83 | 16.76 | 17.07 | 57.79 | 4.43 | 2006.016 | 0.90 | 0.45 | 0.97 | 0.48 | 2 | 2 | 338 | 1496 |
| 143 | 08 47 41.176 | +43 15 34.11 | 18.57 | 18.94 | 288.23 | 3.39 | 2002.024 | 0.63 | 0.39 | 0.75 | 0.39 | 1 | 1 | 1264 | 4283 |
| 144 | 08 48 10.439 | +36 00 27.77 | 19.06 | 19.54 | 12.46 | 3.99 | 2002.106 | 1.18 | 0.61 | 1.29 | 0.66 | 3 | 3 | 514 | 2050 |
| 145 | 08 49 30.047 | +53 34 51.56 | 18.12 | 18.55 | 350.60 | 3.42 | 2000.261 | 1.01 | 0.53 | 1.12 | 0.55 | 2 | 3 | 479 | 1639 |
| 146 | 08 49 36.956 | +11 33 49.27 | 16.83 | 17.07 | 107.00 | 3.10 | 2006.084 | 1.58 | 0.65 | 1.62 | 0.67 | 4 | 4 | 97 | 301 |
| 147 | 08 49 45.784 | +52 50 26.16 | 17.86 | 18.29 | 289.10 | 4.23 | 2000.261 | 0.72 | 0.35 | 0.83 | 0.40 | 1 | 1 | 837 | 3538 |
| 148 | 08 49 48.752 | -02 39 02.30 | 16.46 | 16.54 | 276.26 | 4.18 | 2007.198 | 0.86 | 0.41 | 0.88 | 0.43 | 1 | 1 | 329 | 1376 |
| 149 | 08 49 59.378 | -02 04 34.83 | 17.95 | 18.45 | 356.47 | 4.79 | 2006.881 | 0.59 | 0.30 | 0.70 | 0.35 | 0 | 1 | 1137 | 5442 |
| 150 | 08 50 18.167 | +42 08 06.86 | 18.74 | 19.34 | 228.80 | 3.23 | 2001.967 | 0.91 | 0.54 | 1.04 | 0.61 | 2 | 3 | 722 | 2329 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 151 | 08 50 34.235 | +46 13 54.98 | 17.50 | 17.92 | 77.40 | 4.81 | 2001.287 | 0.64 | 0.31 | 0.73 | 0.38 | 0 | 1 | 835 | 4014 |
| 152 | 08 51 49.047 | -01 27 21.50 | 18.56 | 18.76 | 158.89 | 4.21 | 2007.198 | 0.82 | 0.41 | 0.89 | 0.43 | 1 | 1 | 904 | 3804 |
| 153 | 08 53 09.221 | +16 51 56.64 | 18.58 | 18.73 | 247.04 | 4.51 | 2005.047 | 0.95 | 0.46 | 0.96 | 0.53 | 2 | 2 | 693 | 3125 |
| 154 | 08 54 02.759 | +38 34 34.92 | 17.13 | 17.58 | 101.01 | 3.64 | 2001.969 | 1.05 | 0.57 | 1.13 | 0.63 | 3 | 3 | 267 | 974 |
| 155 | 08 54 02.878 | +39 21 35.59 | 17.15 | 17.61 | 33.83 | 4.67 | 2002.024 | 0.83 | 0.48 | 0.93 | 0.55 | 2 | 2 | 425 | 1986 |
| 156 | 08 55 43.968 | +51 53 27.12 | 15.87 | 15.88 | 193.48 | 4.21 | 2000.907 | 1.28 | 0.65 | 1.29 | 0.65 | 3 | 3 | 95 | 401 |
| 157 | 08 56 29.961 | -00 33 30.28 | 18.85 | 19.05 | 340.99 | 3.37 | 1999.220 | 1.44 | 0.81 | 1.50 | 0.81 | 4 | 5 | 239 | 807 |
| 158 | 08 57 07.425 | +29 15 12.19 | 16.93 | 17.40 | 261.54 | 3.31 | 2003.179 | 0.86 | 0.49 | 0.97 | 0.55 | 2 | 2 | 362 | 1199 |
| 159 | 08 57 11.701 | +31 58 47.94 | 18.09 | 18.27 | 243.02 | 3.69 | 2002.999 | 0.57 | 0.33 | 0.61 | 0.32 | 0 | 0 | 1220 | 4502 |
| 160 | 08 57 57.716 | +28 45 17.19 | 17.15 | 17.52 | 204.68 | 3.70 | 2003.971 | 0.97 | 0.53 | 1.03 | 0.56 | 2 | 2 | 332 | 1229 |
| 161 | 09 00 46.475 | +47 18 15.34 | 17.69 | 17.91 | 241.20 | 4.66 | 2001.287 | 1.23 | 0.70 | 1.27 | 0.70 | 3 | 4 | 228 | 1062 |
| 162 | 09 01 00.420 | +19 22 21.15 | 16.79 | 16.84 | 93.74 | 3.87 | 2004.957 | 1.16 | 0.58 | 1.17 | 0.58 | 3 | 3 | 194 | 751 |
| 163 | 09 01 24.013 | +00 31 28.86 | 18.90 | 19.32 | 142.66 | 4.79 | 2007.198 | 1.02 | 0.49 | 1.11 | 0.55 | 2 | 3 | 708 | 3392 |
| 164 | 09 01 27.204 | +36 21 59.80 | 16.85 | 17.05 | 187.31 | 4.79 | 2002.851 | 0.58 | 0.34 | 0.64 | 0.37 | 0 | 0 | 647 | 3101 |
| 165 | 09 01 42.266 | -02 37 41.03 | 16.37 | 16.56 | 198.49 | 3.41 | 2001.213 | 0.63 | 0.32 | 0.63 | 0.35 | 0 | 0 | 517 | 1762 |
| 166 | 09 01 57.971 | +34 01 51.03 | 15.09 | 15.23 | 178.60 | 3.27 | 2002.999 | 0.83 | 0.43 | 0.87 | 0.45 | 1 | 1 | 178 | 583 |
| 167 | 09 02 48.596 | +83 24 49.69 | 18.65 | 18.98 | 169.40 | 3.15 | 2006.303 | 0.94 | 0.54 | 1.03 | 0.58 | 2 | 3 | 655 | 2060 |
| 168 | 09 03 41.622 | +55 09 20.56 | 15.77 | 16.13 | 250.08 | 3.29 | 2000.258 | 0.71 | 0.35 | 0.81 | 0.39 | 1 | 1 | 322 | 1061 |
| 169 | 09 03 44.817 | +04 52 43.29 | 15.92 | 16.55 | 90.52 | 3.44 | 2002.174 | 0.87 | 0.44 | 1.02 | 0.52 | 1 | 2 | 238 | 819 |
| 170 | 09 03 49.168 | +36 30 20.21 | 17.37 | 17.63 | 172.32 | 3.31 | 2002.950 | 0.56 | 0.35 | 0.60 | 0.37 | 0 | 0 | 859 | 2844 |
| 171 | 09 05 26.493 | +53 52 39.50 | 18.31 | 18.62 | 133.19 | 4.74 | 2000.258 | 0.58 | 0.35 | 0.65 | 0.39 | 0 | 1 | 1265 | 5999 |
| 172 | 09 05 58.776 | +55 29 59.95 | 18.50 | 18.70 | 69.95 | 3.21 | 2000.258 | 0.81 | 0.47 | 0.86 | 0.48 | 1 | 2 | 845 | 2714 |
| 173 | 09 07 53.093 | +01 34 48.86 | 17.88 | 18.30 | 2.33 | 3.69 | 2007.198 | 1.18 | 0.63 | 1.27 | 0.66 | 3 | 3 | 292 | 1077 |
| 174 | 09 08 41.716 | +57 02 01.98 | 18.38 | 18.66 | 219.94 | 4.10 | 2003.062 | 0.64 | 0.33 | 0.72 | 0.36 | 0 | 1 | 1227 | 5032 |
| 175 | 09 10 31.942 | +25 56 44.42 | 14.99 | 15.30 | 145.27 | 4.46 | 2004.291 | 0.70 | 0.37 | 0.79 | 0.41 | 1 | 1 | 221 | 986 |
| 176 | 09 10 45.572 | +35 52 01.23 | 16.88 | 16.92 | 313.85 | 3.38 | 2002.950 | 1.08 | 0.56 | 1.04 | 0.60 | 3 | 3 | 236 | 798 |
| 177 | 09 12 43.647 | +00 49 13.04 | 18.53 | 18.89 | 166.70 | 3.97 | 2007.198 | 0.71 | 0.33 | 0.73 | 0.43 | 0 | 1 | 1193 | 4730 |
| 178 | 09 12 54.697 | +01 41 03.63 | 18.64 | 18.65 | 294.95 | 3.23 | 2007.198 | 0.80 | 0.42 | 0.82 | 0.43 | 1 | 1 | 952 | 3073 |
| 179 | 09 13 09.262 | +01 34 23.03 | 18.26 | 18.36 | 131.07 | 3.90 | 2006.881 | 1.43 | 0.71 | 1.45 | 0.74 | 4 | 4 | 211 | 823 |
| 180 | 09 13 32.317 | +12 58 36.42 | 18.10 | 18.63 | 7.13 | 3.30 | 2006.085 | 1.47 | 0.82 | 1.57 | 0.86 | 5 | 5 | 162 | 536 |
| 181 | 09 14 56.229 | +03 17 20.53 | 18.85 | 19.12 | 105.44 | 4.88 | 2001.140 | 1.48 | 0.80 | 1.52 | 0.82 | 4 | 5 | 233 | 1137 |
| 182 | 09 15 40.383 | +26 05 00.03 | 16.30 | 16.73 | 17.79 | 3.76 | 2004.291 | 0.68 | 0.39 | 0.78 | 0.44 | 1 | 1 | 409 | 1534 |
| 183 | 09 16 02.803 | +36 09 03.86 | 18.75 | 18.85 | 7.43 | 3.07 | 2003.067 | 0.87 | 0.46 | 0.90 | 0.50 | 2 | 2 | 850 | 2613 |
| 184 | 09 16 14.871 | +02 01 42.96 | 18.42 | 19.03 | 345.38 | 4.33 | 2006.881 | 0.73 | 0.37 | 0.85 | 0.47 | 1 | 2 | 1026 | 4439 |
| 185 | 09 16 37.818 | +28 53 25.59 | 19.07 | 19.48 | 90.21 | 3.29 | 2003.971 | 1.18 | 0.68 | 1.25 | 0.72 | 3 | 4 | 470 | 1548 |
| 186 | 09 17 04.576 | +59 05 06.76 | 18.57 | 19.00 | 277.99 | 4.46 | 2000.321 | 0.67 | 0.35 | 0.76 | 0.42 | 1 | 1 | 1232 | 5495 |
| 187 | 09 18 31.930 | +32 52 25.74 | 18.50 | 19.07 | 39.61 | 3.10 | 2003.179 | 0.71 | 0.38 | 0.84 | 0.41 | 1 | 1 | 1116 | 3459 |
| 188 | 09 19 20.803 | -02 36 51.58 | 17.01 | 17.01 | 340.32 | 4.11 | 2001.213 | 0.85 | 0.45 | 0.84 | 0.46 | 1 | 1 | 413 | 1700 |
| 189 | 09 19 49.578 | +17 04 33.26 | 18.67 | 18.85 | 99.85 | 3.62 | 2005.096 | 1.06 | 0.60 | 1.11 | 0.58 | 3 | 3 | 532 | 1929 |
| 190 | 09 20 29.965 | +01 36 08.85 | 18.98 | 19.04 | 216.14 | 3.07 | 2006.881 | 1.25 | 0.65 | 1.29 | 0.67 | 3 | 4 | 406 | 1247 |
| 191 | 09 21 39.448 | +55 45 42.14 | 15.94 | 16.41 | 188.88 | 4.75 | 2000.258 | 0.93 | 0.51 | 1.04 | 0.56 | 2 | 2 | 200 | 952 |
| 192 | 09 21 39.713 | -01 30 04.94 | 15.51 | 15.97 | 143.43 | 3.49 | 2001.213 | 0.81 | 0.41 | 0.89 | 0.48 | 1 | 2 | 229 | 801 |
| 193 | 09 21 47.920 | +29 28 42.30 | 17.43 | 17.87 | 217.48 | 3.25 | 2003.971 | 0.93 | 0.55 | 1.00 | 0.61 | 2 | 3 | 382 | 1242 |
| 194 | 09 22 17.819 | +35 25 46.40 | 18.11 | 18.54 | 228.96 | 3.31 | 2003.067 | 1.09 | 0.67 | 1.16 | 0.70 | 3 | 3 | 358 | 1183 |
| 195 | 09 23 37.196 | +29 31 22.98 | 16.92 | 17.40 | 101.01 | 4.66 | 2004.209 | 0.60 | 0.36 | 0.74 | 0.37 | 0 | 1 | 640 | 2983 |
| 196 | 09 23 41.333 | +41 31 12.58 | 16.89 | 16.90 | 78.67 | 3.93 | 2002.106 | 1.03 | 0.54 | 1.05 | 0.54 | 2 | 2 | 255 | 1002 |
| 197 | 09 23 59.364 | +15 09 46.88 | 15.25 | 15.58 | 208.45 | 4.89 | 2005.931 | 0.90 | 0.44 | 0.97 | 0.49 | 2 | 2 | 169 | 825 |
| 198 | 09 24 31.661 | +27 19 12.19 | 17.99 | 18.39 | 46.26 | 4.15 | 2004.291 | 0.82 | 0.46 | 0.94 | 0.48 | 1 | 2 | 653 | 2707 |
| 199 | 09 25 41.492 | +62 40 08.61 | 18.22 | 18.79 | 120.69 | 3.83 | 2003.812 | 0.71 | 0.43 | 0.82 | 0.48 | 1 | 2 | 910 | 3488 |
| 200 | 09 25 43.423 | +61 30 36.10 | 18.18 | 18.77 | 330.70 | 3.58 | 2000.263 | 0.95 | 0.56 | 1.05 | 0.60 | 2 | 3 | 533 | 1906 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 201 | 09 28 02.880 | -00 23 59.33 | 17.76 | 18.12 | 0.67 | 3.87 | 2000.173 | 0.61 | 0.30 | 0.69 | 0.34 | 0 | 0 | 1007 | 3896 |
| 202 | 09 29 06.403 | +10 24 07.14 | 17.15 | 17.43 | 78.20 | 3.11 | 2003.076 | 0.69 | 0.38 | 0.77 | 0.42 | 1 | 1 | 595 | 1849 |
| 203 | 09 31 47.742 | +16 39 00.90 | 18.50 | 19.06 | 312.50 | 4.05 | 2005.189 | 0.74 | 0.48 | 0.87 | 0.53 | 1 | 2 | 908 | 3677 |
| 204 | 09 32 14.546 | +22 46 53.50 | 18.58 | 19.17 | 307.74 | 3.54 | 2004.957 | 1.08 | 0.63 | 1.24 | 0.67 | 3 | 3 | 455 | 1612 |
| 205 | 09 33 42.618 | +10 20 51.20 | 18.86 | 18.98 | 72.10 | 4.30 | 2003.982 | 1.12 | 0.62 | 1.18 | 0.61 | 3 | 3 | 497 | 2133 |
| 206 | 09 34 30.123 | +35 02 40.80 | 16.92 | 17.36 | 254.82 | 3.44 | 2003.179 | 1.05 | 0.54 | 1.14 | 0.58 | 2 | 3 | 257 | 885 |
| 207 | 09 34 39.361 | +18 57 52.16 | 18.12 | 18.25 | 57.21 | 3.61 | 2005.096 | 1.14 | 0.51 | 1.11 | 0.58 | 2 | 3 | 408 | 1474 |
| 208 | 09 35 35.540 | +30 14 52.68 | 17.11 | 17.68 | 92.94 | 3.24 | 2004.209 | 1.10 | 0.63 | 1.22 | 0.67 | 3 | 3 | 232 | 753 |
| 209 | 09 38 54.197 | +59 08 31.17 | 17.90 | 18.29 | 273.69 | 4.78 | 2000.258 | 0.61 | 0.33 | 0.71 | 0.37 | 0 | 1 | 1027 | 4907 |
| 210 | 09 38 58.461 | +39 05 23.53 | 17.80 | 17.98 | 45.89 | 4.22 | 2002.950 | 1.00 | 0.57 | 1.03 | 0.58 | 2 | 2 | 404 | 1702 |
| 211 | 09 38 58.515 | +29 22 53.37 | 18.83 | 19.36 | 98.65 | 4.75 | 2004.212 | 1.34 | 0.69 | 1.40 | 0.76 | 4 | 4 | 333 | 1580 |
| 212 | 09 39 19.822 | +57 48 00.86 | 18.66 | 18.93 | 224.30 | 3.58 | 2000.258 | 1.44 | 0.78 | 1.49 | 0.82 | 4 | 5 | 225 | 805 |
| 213 | 09 40 16.713 | +11 59 46.62 | 18.76 | 18.84 | 350.44 | 4.36 | 2003.971 | 1.26 | 0.66 | 1.27 | 0.67 | 3 | 3 | 369 | 1609 |
| 214 | 09 44 46.424 | +30 04 37.39 | 18.44 | 18.93 | 210.25 | 4.86 | 2004.209 | 0.52 | 0.38 | 0.69 | 0.40 | 0 | 1 | 1374 | 6671 |
| 215 | 09 45 00.241 | +16 47 12.98 | 18.70 | 18.97 | 244.04 | 3.56 | 2005.194 | 0.96 | 0.53 | 1.03 | 0.58 | 2 | 2 | 660 | 2350 |
| 216 | 09 46 23.255 | +45 12 14.19 | 18.60 | 19.07 | 264.75 | 4.26 | 2001.970 | 0.97 | 0.54 | 1.08 | 0.55 | 2 | 2 | 644 | 2740 |
| 217 | 09 46 56.103 | +47 59 08.28 | 18.34 | 18.40 | 85.40 | 3.47 | 2001.890 | 1.35 | 0.67 | 1.35 | 0.68 | 4 | 4 | 264 | 918 |
| 218 | 09 47 12.200 | +19 49 57.65 | 15.34 | 15.52 | 259.87 | 3.47 | 2005.096 | 0.94 | 0.46 | 1.00 | 0.46 | 2 | 2 | 164 | 568 |
| 219 | 09 48 31.159 | +05 38 46.66 | 16.91 | 17.13 | 26.30 | 4.69 | 2002.120 | 0.65 | 0.33 | 0.71 | 0.35 | 0 | 1 | 615 | 2887 |
| 220 | 09 48 44.552 | +41 23 50.48 | 19.48 | 19.96 | 289.06 | 4.79 | 2002.851 | 2.03 | 1.06 | 2.18 | 1.11 | 6 | 7 | 101 | 483 |
| 221 | 09 48 56.865 | +25 09 18.84 | 18.46 | 19.13 | 220.55 | 4.51 | 2004.951 | 1.28 | 0.75 | 1.45 | 0.79 | 4 | 4 | 275 | 1239 |
| 222 | 09 49 08.915 | +49 17 30.80 | 18.72 | 19.38 | 95.76 | 3.87 | 2001.964 | 1.18 | 0.63 | 1.34 | 0.67 | 3 | 4 | 426 | 1647 |
| 223 | 09 50 33.219 | +19 13 45.15 | 16.06 | 16.49 | 142.36 | 3.59 | 2005.096 | 0.98 | 0.57 | 1.06 | 0.59 | 2 | 3 | 188 | 677 |
| 224 | 09 51 02.233 | +24 31 32.24 | 18.69 | 19.17 | 276.50 | 4.00 | 2004.957 | 0.75 | 0.37 | 0.84 | 0.40 | 1 | 1 | 1183 | 4732 |
| 225 | 09 52 23.229 | +11 37 53.27 | 15.73 | 16.25 | 331.50 | 3.22 | 2003.971 | 0.61 | 0.33 | 0.72 | 0.39 | 0 | 1 | 379 | 1220 |
| 226 | 09 52 31.963 | +20 16 23.71 | 17.27 | 17.86 | 222.37 | 3.03 | 2005.096 | 0.93 | 0.52 | 1.07 | 0.58 | 2 | 3 | 367 | 1109 |
| 227 | 09 54 21.456 | +06 40 06.36 | 18.70 | 19.38 | 35.34 | 4.91 | 2002.120 | 0.82 | 0.52 | 1.01 | 0.56 | 2 | 2 | 833 | 4089 |
| 228 | 09 54 36.277 | +38 51 43.72 | 18.96 | 19.08 | 49.89 | 3.24 | 2002.999 | 1.07 | 0.61 | 1.10 | 0.61 | 3 | 3 | 575 | 1864 |
| 229 | 09 54 38.972 | +46 46 26.85 | 17.66 | 17.99 | 347.96 | 4.46 | 2002.035 | 0.57 | 0.32 | 0.64 | 0.37 | 0 | 1 | 986 | 4400 |
| 230 | 09 54 48.884 | +08 12 43.54 | 17.93 | 18.07 | 20.50 | 3.20 | 2002.194 | 0.67 | 0.40 | 0.71 | 0.43 | 1 | 1 | 858 | 2750 |
| 231 | 09 54 59.547 | +53 25 12.75 | 18.01 | 18.46 | 181.47 | 3.39 | 2002.120 | 1.48 | 0.82 | 1.58 | 0.87 | 5 | 5 | 149 | 505 |
| 232 | 09 55 17.855 | +33 05 09.78 | 18.83 | 19.21 | 248.01 | 4.25 | 2004.211 | 1.33 | 0.70 | 1.41 | 0.74 | 4 | 4 | 322 | 1369 |
| 233 | 09 55 33.123 | +19 49 40.45 | 16.53 | 16.94 | 271.28 | 3.74 | 2005.096 | 0.62 | 0.32 | 0.68 | 0.36 | 0 | 1 | 565 | 2114 |
| 234 | 09 55 59.478 | +07 32 43.56 | 18.88 | 19.26 | 253.02 | 4.73 | 2002.934 | 1.11 | 0.64 | 1.16 | 0.69 | 3 | 3 | 512 | 2422 |
| 235 | 09 57 14.557 | +10 32 15.68 | 15.68 | 15.79 | 28.48 | 4.05 | 2003.075 | 0.77 | 0.38 | 0.79 | 0.40 | 1 | 1 | 274 | 1107 |
| 236 | 09 57 48.539 | +11 57 54.94 | 17.44 | 17.88 | 174.09 | 3.66 | 2003.076 | 1.16 | 0.53 | 1.23 | 0.58 | 3 | 3 | 285 | 1045 |
| 237 | 09 59 51.039 | +35 39 06.13 | 18.29 | 18.47 | 45.56 | 4.56 | 2003.179 | 1.16 | 0.65 | 1.18 | 0.67 | 3 | 3 | 353 | 1611 |
| 238 | 09 59 52.618 | +40 48 27.67 | 17.31 | 17.63 | 92.81 | 3.38 | 2002.950 | 0.60 | 0.36 | 0.66 | 0.41 | 0 | 1 | 752 | 2540 |
| 239 | 10 00 12.436 | +02 35 27.60 | 18.47 | 18.93 | 40.26 | 3.40 | 2000.343 | 0.60 | 0.30 | 0.69 | 0.36 | 0 | 1 | 1431 | 4863 |
| 240 | 10 00 49.282 | +04 19 46.93 | 18.53 | 18.68 | 111.71 | 4.00 | 2001.140 | 0.72 | 0.39 | 0.75 | 0.42 | 1 | 1 | 1083 | 4331 |
| 241 | 10 06 08.745 | +51 18 59.80 | 18.23 | 18.28 | 119.79 | 3.58 | 2001.970 | 0.79 | 0.39 | 0.79 | 0.40 | 1 | 1 | 853 | 3055 |
| 242 | 10 06 55.292 | +80 02 24.41 | 17.61 | 17.67 | 216.16 | 4.05 | 2006.303 | 0.95 | 0.52 | 0.96 | 0.54 | 2 | 2 | 416 | 1685 |
| 243 | 10 07 53.215 | +34 36 17.23 | 16.01 | 16.52 | 116.90 | 3.33 | 2004.130 | 1.02 | 0.50 | 1.13 | 0.55 | 2 | 3 | 188 | 625 |
| 244 | 10 09 03.653 | +39 58 11.82 | 17.80 | 18.05 | 57.93 | 3.50 | 2003.226 | 1.17 | 0.61 | 1.21 | 0.66 | 3 | 3 | 289 | 1014 |
| 245 | 10 09 10.175 | +22 59 04.05 | 18.35 | 18.95 | 160.15 | 3.09 | 2004.971 | 1.03 | 0.56 | 1.16 | 0.63 | 2 | 3 | 490 | 1511 |
| 246 | 10 09 56.886 | +09 29 07.96 | 16.48 | 17.11 | 16.95 | 3.74 | 2002.194 | 0.55 | 0.31 | 0.70 | 0.39 | 0 | 1 | 591 | 2209 |
| 247 | 10 10 00.060 | -02 36 08.83 | 19.03 | 19.36 | 54.77 | 3.74 | 2001.213 | 1.31 | 0.69 | 1.35 | 0.77 | 4 | 4 | 369 | 1377 |
| 248 | 10 11 32.014 | +54 17 01.08 | 17.92 | 18.41 | 261.74 | 3.43 | 2002.024 | 0.91 | 0.44 | 1.01 | 0.49 | 2 | 2 | 579 | 1982 |
| 249 | 10 11 39.003 | +21 32 16.16 | 16.39 | 16.58 | 115.17 | 3.55 | 2005.096 | 1.35 | 0.64 | 1.41 | 0.64 | 4 | 4 | 112 | 398 |
| 250 | 10 12 00.557 | +26 02 45.55 | 18.55 | 18.81 | 137.10 | 4.36 | 2004.957 | 0.89 | 0.47 | 0.94 | 0.49 | 2 | 2 | 771 | 3363 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 251 | 10 13 33.544 | +48 39 57.12 | 18.04 | 18.29 | 236.89 | 4.48 | 2001.970 | 0.73 | 0.39 | 0.80 | 0.41 | 1 | 1 | 843 | 3778 |
| 252 | 10 15 19.463 | +24 00 04.05 | 16.91 | 16.95 | 236.44 | 3.10 | 2005.047 | 1.35 | 0.67 | 1.36 | 0.70 | 4 | 4 | 133 | 411 |
| 253 | 10 16 47.088 | +19 55 05.20 | 19.04 | 19.43 | 75.33 | 3.43 | 2005.189 | 1.20 | 0.67 | 1.28 | 0.70 | 3 | 4 | 451 | 1547 |
| 254 | 10 17 04.229 | +26 21 53.70 | 15.40 | 15.43 | 275.37 | 3.93 | 2004.957 | 1.08 | 0.58 | 1.08 | 0.59 | 3 | 3 | 115 | 451 |
| 255 | 10 18 07.678 | +48 37 45.62 | 17.02 | 17.44 | 313.15 | 3.61 | 2002.035 | 1.32 | 0.70 | 1.39 | 0.73 | 4 | 4 | 147 | 531 |
| 256 | 10 18 54.702 | +51 33 15.88 | 16.52 | 17.15 | 76.61 | 4.41 | 2002.248 | 0.66 | 0.41 | 0.81 | 0.48 | 1 | 2 | 452 | 1995 |
| 257 | 10 19 13.494 | +20 08 16.72 | 18.40 | 18.65 | 274.66 | 3.35 | 2005.194 | 1.44 | 0.71 | 1.48 | 0.73 | 4 | 4 | 227 | 760 |
| 258 | 10 19 27.204 | +07 34 05.66 | 17.74 | 18.00 | 208.74 | 3.20 | 2002.174 | 1.21 | 0.68 | 1.25 | 0.70 | 3 | 4 | 243 | 777 |
| 259 | 10 19 52.227 | +18 55 44.41 | 18.82 | 19.09 | 74.71 | 3.07 | 2005.194 | 1.04 | 0.57 | 1.06 | 0.62 | 3 | 3 | 602 | 1849 |
| 260 | 10 20 32.363 | +15 45 56.77 | 15.71 | 16.09 | 347.37 | 3.90 | 2006.016 | 0.91 | 0.48 | 0.99 | 0.53 | 2 | 2 | 196 | 765 |
| 261 | 10 20 40.050 | +30 53 08.86 | 17.34 | 17.78 | 189.03 | 4.10 | 2004.291 | 0.92 | 0.49 | 0.99 | 0.53 | 2 | 2 | 412 | 1685 |
| 262 | 10 21 12.848 | +07 41 00.66 | 18.20 | 18.76 | 59.00 | 3.45 | 2002.174 | 0.56 | 0.32 | 0.70 | 0.36 | 0 | 1 | 1291 | 4458 |
| 263 | 10 22 52.186 | +38 23 05.95 | 15.42 | 15.51 | 216.32 | 4.73 | 2003.180 | 1.10 | 0.62 | 1.14 | 0.62 | 3 | 3 | 105 | 496 |
| 264 | 10 23 33.463 | +22 54 17.08 | 16.33 | 16.35 | 298.60 | 3.04 | 2005.096 | 0.57 | 0.30 | 0.57 | 0.30 | 0 | 0 | 554 | 1682 |
| 265 | 10 24 01.634 | +42 03 30.82 | 17.53 | 17.98 | 353.38 | 4.33 | 2003.226 | 0.68 | 0.35 | 0.76 | 0.40 | 1 | 1 | 774 | 3349 |
| 266 | 10 25 43.438 | +11 58 20.20 | 18.60 | 18.71 | 88.02 | 3.98 | 2003.076 | 1.12 | 0.64 | 1.16 | 0.66 | 3 | 3 | 426 | 1694 |
| 267 | 10 26 25.220 | +26 28 04.71 | 17.76 | 17.98 | 263.96 | 4.11 | 2004.957 | 0.71 | 0.33 | 0.76 | 0.36 | 0 | 1 | 829 | 3407 |
| 268 | 10 26 51.053 | +21 06 04.63 | 18.48 | 19.02 | 106.13 | 3.55 | 2005.096 | 1.21 | 0.62 | 1.33 | 0.66 | 3 | 4 | 374 | 1328 |
| 269 | 10 27 56.052 | +44 13 32.47 | 18.23 | 18.44 | 317.31 | 3.45 | 2002.950 | 1.19 | 0.62 | 1.22 | 0.64 | 3 | 3 | 343 | 1184 |
| 270 | 10 28 06.167 | +43 26 13.48 | 15.92 | 16.87 | 206.50 | 4.00 | 2002.950 | 0.58 | 1.08 | 1.26 | 0.68 | 3 | 3 | 147 | 588 |
| 271 | 10 29 06.366 | +28 42 20.52 | 19.27 | 19.44 | 348.23 | 4.28 | 2004.970 | 1.70 | 0.97 | 1.71 | 1.01 | 6 | 6 | 161 | 690 |
| 272 | 10 30 37.049 | +43 58 43.40 | 18.06 | 18.66 | 49.20 | 3.68 | 2002.950 | 0.79 | 0.40 | 0.90 | 0.49 | 1 | 2 | 771 | 2839 |
| 273 | 10 30 56.841 | +58 16 40.70 | 16.56 | 16.81 | 343.69 | 4.03 | 2001.071 | 0.71 | 0.32 | 0.78 | 0.35 | 0 | 1 | 483 | 1944 |
| 274 | 10 31 41.622 | +17 25 57.53 | 18.45 | 18.58 | 177.63 | 4.19 | 2005.356 | 0.81 | 0.43 | 0.84 | 0.43 | 1 | 1 | 881 | 3688 |
| 275 | 10 33 31.657 | +33 12 19.07 | 17.95 | 18.15 | 320.79 | 3.72 | 2004.083 | 1.25 | 0.68 | 1.29 | 0.69 | 3 | 4 | 251 | 936 |
| 276 | 10 34 31.143 | +12 37 22.05 | 16.43 | 16.50 | 63.91 | 3.70 | 2003.982 | 0.91 | 0.51 | 0.93 | 0.51 | 2 | 2 | 266 | 982 |
| 277 | 10 35 10.816 | +53 23 33.04 | 15.07 | 15.38 | 23.73 | 3.11 | 2001.888 | 0.98 | 0.53 | 1.04 | 0.54 | 2 | 2 | 126 | 391 |
| 278 | 10 38 54.234 | +22 05 58.75 | 16.49 | 17.11 | 82.28 | 3.99 | 2005.096 | 1.31 | 0.73 | 1.44 | 0.79 | 4 | 4 | 110 | 437 |
| 279 | 10 39 34.036 | +07 41 26.05 | 17.97 | 18.50 | 150.81 | 3.58 | 2002.120 | 0.66 | 0.34 | 0.78 | 0.41 | 0 | 1 | 962 | 3441 |
| 280 | 10 40 31.974 | +51 03 57.59 | 18.99 | 19.23 | 201.90 | 3.01 | 2002.035 | 1.07 | 0.55 | 1.11 | 0.57 | 2 | 3 | 646 | 1946 |
| 281 | 10 40 39.242 | +57 18 55.79 | 14.42 | 16.40 | 69.03 | 4.38 | 2002.120 | -0.93 | 2.20 | 1.30 | 0.61 | 0 | 3 | 129 | 564 |
| 282 | 10 41 27.746 | +06 24 49.20 | 18.39 | 18.72 | 321.65 | 3.96 | 2002.120 | 0.62 | 0.35 | 0.68 | 0.40 | 0 | 1 | 1237 | 4894 |
| 283 | 10 42 01.832 | +10 22 49.33 | 18.19 | 18.73 | 300.41 | 4.10 | 2003.245 | 1.29 | 0.79 | 1.40 | 0.85 | 4 | 4 | 225 | 922 |
| 284 | 10 42 27.071 | +39 43 18.96 | 17.48 | 17.52 | 139.08 | 4.23 | 2003.087 | 0.88 | 0.48 | 0.89 | 0.51 | 2 | 2 | 458 | 1939 |
| 285 | 10 42 54.261 | +12 49 59.90 | 18.44 | 19.12 | 304.03 | 4.31 | 2003.982 | 0.75 | 0.40 | 0.94 | 0.45 | 1 | 2 | 960 | 4138 |
| 286 | 10 43 02.945 | +15 51 34.65 | 18.70 | 18.71 | 236.89 | 3.61 | 2005.427 | 1.02 | 0.52 | 1.01 | 0.53 | 2 | 2 | 629 | 2269 |
| 287 | 10 43 04.435 | +20 58 54.79 | 17.88 | 18.30 | 25.60 | 3.22 | 2005.189 | 0.56 | 0.33 | 0.65 | 0.38 | 0 | 1 | 1104 | 3550 |
| 288 | 10 43 05.083 | +35 23 32.90 | 17.44 | 17.72 | 139.44 | 3.62 | 2004.206 | 0.77 | 0.39 | 0.84 | 0.44 | 1 | 1 | 598 | 2167 |
| 289 | 10 43 23.181 | +43 10 19.29 | 18.82 | 19.38 | 211.46 | 3.87 | 2003.226 | 0.88 | 0.45 | 1.01 | 0.52 | 2 | 2 | 892 | 3451 |
| 290 | 10 45 50.138 | +41 21 23.00 | 17.91 | 18.28 | 128.33 | 4.71 | 2003.231 | 1.01 | 0.55 | 1.09 | 0.60 | 2 | 3 | 421 | 1985 |
| 291 | 10 46 19.531 | +36 13 13.91 | 17.49 | 18.02 | 243.27 | 3.59 | 2004.083 | 1.15 | 0.57 | 1.25 | 0.62 | 3 | 3 | 279 | 1001 |
| 292 | 10 47 39.449 | +14 12 17.69 | 18.27 | 18.54 | 138.90 | 3.15 | 2003.982 | 1.07 | 0.61 | 1.13 | 0.65 | 3 | 3 | 411 | 1297 |
| 293 | 10 48 29.560 | +14 33 39.35 | 17.82 | 17.85 | 307.49 | 3.86 | 2003.982 | 1.20 | 0.58 | 1.19 | 0.59 | 3 | 3 | 294 | 1135 |
| 294 | 10 49 58.741 | +18 36 24.16 | 18.54 | 18.93 | 233.81 | 3.83 | 2005.356 | 1.22 | 0.68 | 1.30 | 0.73 | 3 | 4 | 340 | 1303 |
| 295 | 10 50 06.993 | +52 32 54.71 | 18.70 | 18.85 | 188.66 | 4.02 | 2002.248 | 1.08 | 0.54 | 1.11 | 0.53 | 2 | 3 | 564 | 2268 |
| 296 | 10 50 59.589 | +36 19 14.43 | 18.34 | 18.39 | 80.91 | 4.51 | 2004.083 | 0.86 | 0.49 | 0.89 | 0.51 | 2 | 2 | 683 | 3082 |
| 297 | 10 51 16.195 | +37 47 45.11 | 18.01 | 18.42 | 74.49 | 3.84 | 2004.130 | 0.83 | 0.45 | 0.92 | 0.50 | 1 | 2 | 661 | 2539 |
| 298 | 10 53 27.660 | +59 16 38.07 | 17.96 | 18.15 | 119.95 | 4.67 | 2002.120 | 0.58 | 0.33 | 0.59 | 0.35 | 0 | 0 | 1128 | 5266 |
| 299 | 10 53 40.017 | +07 24 03.94 | 14.56 | 14.73 | 242.66 | 3.47 | 2002.120 | 0.76 | 0.42 | 0.81 | 0.45 | 1 | 1 | 155 | 539 |
| 300 | 10 53 43.814 | +45 14 01.02 | 17.70 | 17.94 | 17.92 | 4.89 | 2002.950 | 1.09 | 0.56 | 1.14 | 0.59 | 3 | 3 | 337 | 1646 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 301 | 10 54 17.494 | +13 58 13.07 | 18.34 | 18.66 | 265.85 | 4.49 | 2003.982 | 0.84 | 0.40 | 0.91 | 0.43 | 1 | 2 | 819 | 3682 |
| 302 | 10 55 03.003 | +33 49 55.77 | 17.68 | 17.98 | 294.32 | 3.58 | 2004.283 | 1.00 | 0.52 | 1.05 | 0.55 | 2 | 2 | 407 | 1458 |
| 303 | 10 56 07.147 | +59 49 38.68 | 16.24 | 16.28 | 262.10 | 3.99 | 2001.378 | 0.77 | 0.43 | 0.79 | 0.43 | 1 | 1 | 330 | 1316 |
| 304 | 10 56 27.518 | +09 08 36.64 | 16.00 | 16.28 | 102.87 | 3.60 | 2002.194 | 0.71 | 0.34 | 0.79 | 0.37 | 1 | 1 | 364 | 1310 |
| 305 | 10 57 43.257 | +23 04 05.38 | 19.03 | 19.45 | 236.37 | 4.46 | 2005.096 | 1.13 | 0.61 | 1.21 | 0.69 | 3 | 3 | 533 | 2380 |
| 306 | 10 58 28.585 | +41 02 22.17 | 18.23 | 18.74 | 81.08 | 3.05 | 2003.313 | 1.09 | 0.56 | 1.20 | 0.62 | 3 | 3 | 428 | 1304 |
| 307 | 10 58 40.417 | +06 47 50.04 | 18.50 | 18.77 | 35.44 | 4.21 | 2002.120 | 0.57 | 0.40 | 0.62 | 0.43 | 0 | 1 | 1318 | 5550 |
| 308 | 10 59 26.400 | +06 56 57.57 | 17.36 | 17.59 | 228.89 | 3.58 | 2002.175 | 1.11 | 0.56 | 1.16 | 0.61 | 3 | 3 | 275 | 986 |
| 309 | 11 00 22.354 | +20 40 03.33 | 17.90 | 18.08 | 284.36 | 4.50 | 2005.189 | 1.23 | 0.67 | 1.28 | 0.69 | 3 | 4 | 251 | 1132 |
| 310 | 11 00 23.732 | +62 22 10.77 | 17.75 | 17.94 | 182.07 | 3.94 | 2001.072 | 1.00 | 0.51 | 1.05 | 0.53 | 2 | 2 | 420 | 1654 |
| 311 | 11 00 28.984 | +29 57 44.61 | 18.61 | 19.07 | 68.34 | 4.47 | 2004.367 | 0.90 | 0.43 | 1.00 | 0.48 | 1 | 2 | 817 | 3649 |
| 312 | 11 00 50.227 | +37 56 45.88 | 18.95 | 19.17 | 227.99 | 4.54 | 2003.316 | 1.02 | 0.61 | 1.08 | 0.61 | 3 | 3 | 618 | 2806 |
| 313 | 11 00 57.873 | +12 47 42.76 | 18.69 | 19.05 | 119.56 | 4.27 | 2003.223 | 0.80 | 0.42 | 0.89 | 0.45 | 1 | 2 | 999 | 4269 |
| 314 | 11 01 26.452 | +11 13 45.47 | 17.71 | 17.90 | 352.05 | 4.82 | 2003.245 | 1.24 | 0.70 | 1.26 | 0.72 | 4 | 4 | 224 | 1079 |
| 315 | 11 03 25.665 | +49 35 02.92 | 16.93 | 17.11 | 289.17 | 3.05 | 2002.106 | 1.17 | 0.62 | 1.19 | 0.63 | 3 | 3 | 195 | 594 |
| 316 | 11 03 35.809 | +19 48 17.74 | 17.99 | 18.20 | 157.44 | 4.55 | 2005.356 | 1.41 | 0.70 | 1.45 | 0.71 | 4 | 4 | 197 | 897 |
| 317 | 11 04 00.648 | +39 11 17.35 | 16.66 | 17.00 | 49.59 | 3.25 | 2004.130 | 1.18 | 0.62 | 1.26 | 0.68 | 3 | 3 | 164 | 532 |
| 318 | 11 04 02.545 | +09 23 19.09 | 18.28 | 18.61 | 153.74 | 3.46 | 2002.944 | 1.04 | 0.50 | 1.10 | 0.53 | 2 | 2 | 524 | 1811 |
| 319 | 11 04 25.479 | +66 03 44.71 | 18.28 | 18.83 | 254.56 | 3.57 | 2000.264 | 0.89 | 0.48 | 1.00 | 0.54 | 2 | 2 | 665 | 2375 |
| 320 | 11 06 12.606 | +11 32 45.81 | 18.11 | 18.29 | 148.52 | 3.58 | 2003.223 | 1.06 | 0.57 | 1.09 | 0.58 | 3 | 3 | 421 | 1507 |
| 321 | 11 07 00.147 | +47 12 59.91 | 15.52 | 15.58 | 95.55 | 3.43 | 2002.950 | 1.29 | 0.69 | 1.30 | 0.69 | 4 | 4 | 76 | 262 |
| 322 | 11 08 13.873 | +18 52 40.83 | 18.69 | 18.88 | 6.02 | 4.04 | 2005.356 | 0.79 | 0.45 | 0.80 | 0.48 | 1 | 1 | 979 | 3956 |
| 323 | 11 08 57.291 | +25 03 03.27 | 17.62 | 17.96 | 159.71 | 4.08 | 2005.096 | 0.93 | 0.49 | 1.00 | 0.53 | 2 | 2 | 451 | 1840 |
| 324 | 11 09 51.573 | +30 00 30.18 | 15.93 | 16.44 | 228.88 | 3.16 | 2004.957 | 0.82 | 0.43 | 0.94 | 0.49 | 1 | 2 | 264 | 833 |
| 325 | 11 09 53.861 | +53 46 57.03 | 16.75 | 16.79 | 324.59 | 3.25 | 2002.248 | 1.07 | 0.62 | 1.11 | 0.62 | 3 | 3 | 201 | 655 |
| 326 | 11 12 09.273 | +12 17 12.75 | 18.61 | 18.76 | 281.35 | 4.92 | 2003.245 | 0.83 | 0.43 | 0.87 | 0.43 | 1 | 1 | 904 | 4447 |
| 327 | 11 12 30.951 | +21 59 41.79 | 17.09 | 17.25 | 211.46 | 4.70 | 2005.189 | 0.95 | 0.44 | 1.00 | 0.46 | 2 | 2 | 369 | 1734 |
| 328 | 11 12 34.427 | +36 28 28.69 | 15.86 | 16.02 | 120.88 | 4.30 | 2004.083 | 0.69 | 0.39 | 0.72 | 0.41 | 1 | 1 | 332 | 1427 |
| 329 | 11 13 01.948 | +18 16 45.48 | 17.42 | 17.85 | 293.20 | 3.05 | 2005.252 | 0.68 | 0.35 | 0.75 | 0.39 | 0 | 1 | 748 | 2280 |
| 330 | 11 13 29.653 | +22 59 14.52 | 17.63 | 17.84 | 232.23 | 3.12 | 2005.252 | 0.67 | 0.37 | 0.72 | 0.39 | 1 | 1 | 785 | 2449 |
| 331 | 11 14 57.950 | +28 29 23.06 | 16.33 | 16.56 | 146.78 | 3.96 | 2004.957 | 0.81 | 0.42 | 0.87 | 0.45 | 1 | 1 | 330 | 1305 |
| 332 | 11 15 09.940 | +40 22 50.16 | 17.39 | 17.69 | 162.38 | 4.48 | 2003.313 | 0.77 | 0.41 | 0.82 | 0.45 | 1 | 1 | 585 | 2620 |
| 333 | 11 16 39.502 | +28 41 19.85 | 16.94 | 17.19 | 337.75 | 3.76 | 2004.951 | 1.09 | 0.54 | 1.15 | 0.57 | 2 | 3 | 243 | 912 |
| 334 | 11 17 58.325 | +54 18 48.11 | 16.97 | 17.22 | 137.72 | 4.63 | 2001.964 | 0.87 | 0.51 | 0.93 | 0.54 | 2 | 2 | 355 | 1641 |
| 335 | 11 18 22.042 | +49 06 01.64 | 16.68 | 16.87 | 42.41 | 3.95 | 2002.219 | 0.59 | 0.30 | 0.63 | 0.35 | 0 | 0 | 621 | 2455 |
| 336 | 11 18 27.061 | +33 35 07.42 | 17.66 | 18.12 | 337.47 | 3.45 | 2004.283 | 0.61 | 0.33 | 0.71 | 0.39 | 0 | 1 | 919 | 3174 |
| 337 | 11 18 44.116 | +59 49 31.66 | 18.44 | 19.01 | 77.14 | 4.77 | 2002.120 | 1.18 | 0.60 | 1.32 | 0.66 | 3 | 4 | 385 | 1837 |
| 338 | 11 21 00.185 | +14 13 09.43 | 17.46 | 17.51 | 13.86 | 3.96 | 2003.076 | 0.68 | 0.36 | 0.66 | 0.41 | 1 | 1 | 724 | 2868 |
| 339 | 11 21 33.597 | +51 12 00.07 | 16.23 | 16.24 | 272.43 | 4.03 | 2001.970 | 1.29 | 0.71 | 1.29 | 0.72 | 4 | 4 | 102 | 409 |
| 340 | 11 21 54.127 | +21 39 52.22 | 18.46 | 18.67 | 13.49 | 3.87 | 2005.189 | 1.13 | 0.64 | 1.18 | 0.66 | 3 | 3 | 397 | 1536 |
| 341 | 11 22 12.583 | +67 35 51.87 | 15.93 | 16.05 | 92.55 | 3.57 | 2000.321 | 0.77 | 0.42 | 0.80 | 0.42 | 1 | 1 | 293 | 1045 |
| 342 | 11 22 39.612 | +33 05 14.09 | 18.57 | 19.05 | 72.95 | 3.06 | 2004.291 | 1.04 | 0.51 | 1.13 | 0.59 | 2 | 3 | 576 | 1760 |
| 343 | 11 22 40.312 | +33 13 26.21 | 19.03 | 19.40 | 180.16 | 3.86 | 2004.283 | 1.29 | 0.65 | 1.38 | 0.66 | 3 | 4 | 411 | 1590 |
| 344 | 11 23 48.749 | +25 35 46.42 | 18.18 | 18.54 | 83.88 | 3.92 | 2005.096 | 0.64 | 0.36 | 0.72 | 0.37 | 0 | 1 | 1101 | 4316 |
| 345 | 11 24 29.915 | +47 38 29.77 | 17.88 | 18.09 | 325.30 | 3.02 | 2003.177 | 0.73 | 0.38 | 0.77 | 0.41 | 1 | 1 | 802 | 2424 |
| 346 | 11 28 24.007 | -06 39 53.15 | 17.67 | 17.92 | 174.95 | 3.66 | 2006.016 | 0.57 | 0.34 | 0.63 | 0.35 | 0 | 0 | 971 | 3558 |
| 347 | 11 29 55.865 | +42 32 06.64 | 18.63 | 19.02 | 39.40 | 3.95 | 2003.313 | 1.35 | 0.77 | 1.44 | 0.77 | 4 | 4 | 267 | 1055 |
| 348 | 11 31 04.789 | +53 21 33.80 | 16.71 | 16.85 | 163.79 | 4.99 | 2001.964 | 0.56 | 0.33 | 0.58 | 0.35 | 0 | 0 | 646 | 3223 |
| 349 | 11 32 53.467 | +30 57 52.32 | 17.64 | 17.96 | 253.27 | 3.39 | 2004.367 | 1.09 | 0.61 | 1.16 | 0.64 | 3 | 3 | 304 | 1031 |
| 350 | 11 33 25.490 | +61 21 45.99 | 15.88 | 16.15 | 159.46 | 4.54 | 2000.908 | 1.10 | 0.60 | 1.13 | 0.63 | 3 | 3 | 137 | 624 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 351 | 11 34 02.355 | +70 58 49.02 | 18.00 | 18.58 | 111.47 | 3.50 | 2006.303 | 0.97 | 0.52 | 1.09 | 0.57 | 2 | 3 | 490 | 1713 |
| 352 | 11 38 11.241 | +17 47 51.03 | 18.36 | 18.47 | 39.73 | 3.81 | 2005.416 | 0.97 | 0.49 | 0.97 | 0.55 | 2 | 2 | 593 | 2263 |
| 353 | 11 38 19.761 | +08 30 36.63 | 18.60 | 18.79 | 110.79 | 3.61 | 2002.175 | 1.11 | 0.56 | 1.18 | 0.59 | 3 | 3 | 478 | 1726 |
| 354 | 11 40 38.040 | +72 32 27.76 | 15.23 | 15.64 | 246.38 | 3.79 | 2006.328 | 0.71 | 0.35 | 0.80 | 0.39 | 1 | 1 | 254 | 964 |
| 355 | 11 40 53.259 | +28 02 13.05 | 16.48 | 16.55 | 78.04 | 3.11 | 2004.973 | 1.23 | 0.60 | 1.24 | 0.61 | 3 | 3 | 147 | 459 |
| 356 | 11 41 31.254 | +72 55 09.10 | 16.96 | 16.97 | 49.90 | 3.19 | 2006.303 | 1.20 | 0.62 | 1.21 | 0.62 | 3 | 3 | 185 | 592 |
| 357 | 11 43 08.574 | +71 05 35.04 | 18.47 | 18.90 | 298.45 | 4.67 | 2006.328 | 1.17 | 0.68 | 1.26 | 0.75 | 3 | 4 | 351 | 1639 |
| 358 | 11 43 14.696 | +20 31 17.80 | 18.10 | 18.40 | 165.21 | 4.85 | 2005.252 | 1.30 | 0.71 | 1.35 | 0.76 | 4 | 4 | 236 | 1146 |
| 359 | 11 43 49.640 | +03 08 43.53 | 17.86 | 17.97 | 71.22 | 4.72 | 2000.979 | 1.17 | 0.60 | 1.19 | 0.61 | 3 | 3 | 305 | 1440 |
| 360 | 11 46 36.301 | +54 32 46.17 | 18.45 | 18.64 | 51.26 | 3.62 | 2001.964 | 1.28 | 0.69 | 1.32 | 0.71 | 4 | 4 | 299 | 1083 |
| 361 | 11 47 53.084 | +35 44 11.49 | 17.82 | 17.98 | 146.07 | 3.32 | 2004.291 | 0.75 | 0.40 | 0.81 | 0.42 | 1 | 1 | 727 | 2413 |
| 362 | 11 48 07.214 | -01 36 31.54 | 18.68 | 18.73 | 215.69 | 4.33 | 2000.171 | 1.08 | 0.56 | 1.09 | 0.59 | 3 | 3 | 530 | 2296 |
| 363 | 11 48 58.342 | +07 37 27.90 | 18.12 | 18.72 | 276.85 | 3.69 | 2003.248 | 0.87 | 0.50 | 0.99 | 0.59 | 2 | 2 | 606 | 2238 |
| 364 | 11 49 42.820 | +34 03 31.56 | 17.97 | 18.24 | 101.28 | 4.42 | 2004.291 | 0.92 | 0.54 | 0.95 | 0.56 | 2 | 2 | 514 | 2272 |
| 365 | 11 50 37.434 | +39 03 17.93 | 18.88 | 19.41 | 117.18 | 4.89 | 2003.316 | 1.06 | 0.59 | 1.17 | 0.64 | 3 | 3 | 582 | 2847 |
| 366 | 11 50 41.114 | +29 02 27.68 | 17.04 | 17.13 | 225.81 | 4.90 | 2004.951 | 0.76 | 0.41 | 0.76 | 0.45 | 1 | 1 | 493 | 2418 |
| 367 | 11 52 13.420 | +55 29 57.92 | 19.04 | 19.28 | 25.63 | 4.27 | 2001.964 | 1.48 | 0.75 | 1.56 | 0.78 | 4 | 5 | 260 | 1110 |
| 368 | 11 53 38.848 | +33 43 22.89 | 17.39 | 17.43 | 145.89 | 4.44 | 2004.291 | 1.12 | 0.61 | 1.13 | 0.62 | 3 | 3 | 257 | 1141 |
| 369 | 11 53 52.646 | +41 59 19.29 | 18.18 | 18.23 | 82.20 | 3.92 | 2003.313 | 1.51 | 0.89 | 1.51 | 0.89 | 5 | 5 | 143 | 561 |
| 370 | 11 54 27.242 | +08 23 54.26 | 16.68 | 17.11 | 300.27 | 3.91 | 2003.248 | 0.91 | 0.48 | 1.02 | 0.49 | 2 | 2 | 310 | 1212 |
| 371 | 11 55 14.344 | +06 45 14.79 | 17.83 | 18.33 | 308.75 | 4.33 | 2006.019 | 0.83 | 0.47 | 0.92 | 0.53 | 2 | 2 | 600 | 2601 |
| 372 | 11 57 54.360 | +54 52 59.74 | 18.41 | 18.72 | 258.26 | 3.49 | 2002.248 | 0.81 | 0.42 | 0.90 | 0.46 | 1 | 2 | 848 | 2960 |
| 373 | 11 59 36.105 | -03 29 21.16 | 16.03 | 16.41 | 199.86 | 4.24 | 2000.116 | 0.68 | 0.35 | 0.77 | 0.40 | 0 | 1 | 382 | 1621 |
| 374 | 12 00 07.690 | +07 27 06.55 | 18.79 | 18.94 | 78.22 | 3.25 | 2006.017 | 0.85 | 0.41 | 0.86 | 0.47 | 1 | 2 | 968 | 3147 |
| 375 | 12 00 55.529 | +45 53 53.43 | 17.76 | 18.11 | 240.84 | 3.11 | 2003.231 | 0.83 | 0.47 | 0.90 | 0.51 | 2 | 2 | 576 | 1787 |
| 376 | 12 01 16.032 | +61 32 57.84 | 18.00 | 18.05 | 68.80 | 4.11 | 2001.378 | 1.17 | 0.60 | 1.17 | 0.61 | 3 | 3 | 324 | 1330 |
| 377 | 12 01 20.849 | -02 23 50.25 | 18.36 | 18.49 | 20.42 | 3.41 | 2000.171 | 0.97 | 0.50 | 0.97 | 0.52 | 2 | 2 | 606 | 2067 |
| 378 | 12 01 46.027 | +01 18 19.81 | 17.13 | 17.73 | 69.39 | 3.06 | 2000.343 | 0.70 | 0.42 | 0.84 | 0.46 | 1 | 1 | 567 | 1733 |
| 379 | 12 02 21.629 | +16 11 25.74 | 18.81 | 18.93 | 219.61 | 3.92 | 2004.075 | 1.38 | 0.75 | 1.40 | 0.77 | 4 | 4 | 275 | 1079 |
| 380 | 12 02 27.570 | +69 25 14.78 | 18.69 | 18.87 | 314.92 | 4.45 | 2006.303 | 1.04 | 0.57 | 1.08 | 0.58 | 3 | 3 | 562 | 2498 |
| 381 | 12 02 40.130 | +66 27 37.36 | 17.38 | 17.41 | 237.61 | 3.08 | 2000.321 | 1.13 | 0.59 | 1.14 | 0.59 | 3 | 3 | 262 | 807 |
| 382 | 12 02 40.500 | +39 27 55.12 | 17.51 | 17.95 | 225.80 | 3.11 | 2004.130 | 0.90 | 0.49 | 1.03 | 0.54 | 2 | 2 | 437 | 1362 |
| 383 | 12 04 50.952 | +54 01 29.25 | 17.44 | 17.87 | 356.31 | 3.07 | 2001.964 | 0.68 | 0.38 | 0.77 | 0.43 | 1 | 1 | 705 | 2162 |
| 384 | 12 05 21.077 | +41 53 30.99 | 18.08 | 18.32 | 87.64 | 3.65 | 2003.248 | 0.63 | 0.33 | 0.68 | 0.38 | 0 | 1 | 1076 | 3927 |
| 385 | 12 06 58.248 | +27 39 22.54 | 17.62 | 18.07 | 309.93 | 4.97 | 2004.973 | 0.84 | 0.46 | 0.93 | 0.51 | 1 | 2 | 540 | 2683 |
| 386 | 12 07 21.080 | -02 32 21.76 | 17.98 | 18.20 | 204.43 | 3.29 | 2000.116 | 1.28 | 0.69 | 1.33 | 0.71 | 4 | 4 | 238 | 781 |
| 387 | 12 07 53.814 | +57 19 09.66 | 16.80 | 17.10 | 266.99 | 3.87 | 2001.967 | 1.00 | 0.51 | 1.09 | 0.55 | 2 | 2 | 268 | 1038 |
| 388 | 12 08 28.297 | +13 38 09.65 | 17.40 | 17.96 | 241.95 | 4.77 | 2003.245 | 0.58 | 0.28 | 0.68 | 0.34 | 0 | 0 | 931 | 4440 |
| 389 | 12 08 48.603 | -00 40 06.48 | 17.01 | 17.06 | 344.72 | 3.59 | 2007.300 | 1.24 | 0.65 | 1.23 | 0.67 | 3 | 3 | 172 | 618 |
| 390 | 12 11 10.112 | +36 21 13.53 | 17.79 | 18.12 | 9.72 | 3.02 | 2004.083 | 1.47 | 0.77 | 1.52 | 0.84 | 4 | 5 | 145 | 439 |
| 391 | 12 13 16.879 | -01 16 40.18 | 18.16 | 18.39 | 8.18 | 3.62 | 2000.116 | 1.20 | 0.64 | 1.22 | 0.67 | 3 | 3 | 321 | 1162 |
| 392 | 12 14 48.581 | -03 16 18.09 | 19.16 | 19.33 | 176.13 | 4.81 | 2000.171 | 1.43 | 0.80 | 1.46 | 0.82 | 4 | 4 | 282 | 1356 |
| 393 | 12 15 09.707 | +01 24 27.55 | 19.14 | 19.48 | 124.79 | 3.69 | 2000.343 | 1.53 | 0.79 | 1.57 | 0.84 | 5 | 5 | 250 | 925 |
| 394 | 12 15 33.124 | +50 10 43.15 | 18.85 | 18.90 | 285.81 | 4.26 | 2002.219 | 1.18 | 0.60 | 1.18 | 0.63 | 3 | 3 | 469 | 1996 |
| 395 | 12 15 50.132 | +12 35 14.51 | 16.86 | 16.92 | 122.72 | 3.49 | 2003.223 | 0.68 | 0.35 | 0.68 | 0.37 | 0 | 1 | 565 | 1974 |
| 396 | 12 15 57.501 | +05 55 01.64 | 18.93 | 19.02 | 285.18 | 4.38 | 2001.290 | 1.55 | 0.84 | 1.58 | 0.86 | 5 | 5 | 199 | 870 |
| 397 | 12 16 01.043 | +32 32 35.75 | 17.53 | 17.70 | 132.99 | 3.13 | 2004.362 | 0.62 | 0.35 | 0.67 | 0.37 | 0 | 1 | 828 | 2589 |
| 398 | 12 16 14.926 | -00 02 42.76 | 17.94 | 18.56 | 45.88 | 3.26 | 1999.221 | 0.90 | 0.50 | 1.04 | 0.57 | 2 | 2 | 538 | 1752 |
| 399 | 12 16 21.702 | +03 03 05.73 | 16.50 | 16.91 | 58.04 | 4.28 | 2000.343 | 0.64 | 0.36 | 0.72 | 0.41 | 0 | 1 | 496 | 2123 |
| 400 | 12 16 27.929 | +19 52 43.47 | 17.75 | 18.13 | 155.62 | 3.79 | 2005.252 | 1.45 | 0.74 | 1.51 | 0.80 | 4 | 5 | 157 | 595 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 401 | 12 17 17.004 | +44 01 59.22 | 19.04 | 19.56 | 233.28 | 3.96 | 2003.226 | 1.18 | 0.65 | 1.27 | 0.69 | 3 | 4 | 490 | 1938 |
| 402 | 12 17 35.957 | +24 24 35.71 | 18.84 | 19.19 | 4.55 | 3.96 | 2005.050 | 1.15 | 0.64 | 1.25 | 0.67 | 3 | 3 | 456 | 1807 |
| 403 | 12 20 32.739 | -02 04 11.07 | 15.68 | 15.97 | 283.74 | 3.58 | 2000.171 | 1.52 | 0.82 | 1.56 | 0.84 | 5 | 5 | 50 | 179 |
| 404 | 12 23 11.206 | +22 44 08.14 | 17.93 | 18.28 | 133.96 | 3.89 | 2005.189 | 1.38 | 0.70 | 1.44 | 0.74 | 4 | 4 | 201 | 781 |
| 405 | 12 23 26.640 | +35 07 44.41 | 18.56 | 18.79 | 355.24 | 4.75 | 2004.291 | 0.70 | 0.39 | 0.74 | 0.40 | 1 | 1 | 1160 | 5513 |
| 406 | 12 23 41.667 | +49 04 17.30 | 15.10 | 15.53 | 118.76 | 3.08 | 2002.106 | 0.83 | 1.54 | 1.68 | 0.83 | 5 | 5 | 36 | 111 |
| 407 | 12 23 45.107 | +07 16 46.67 | 18.02 | 18.23 | 357.77 | 3.37 | 2003.248 | 0.59 | 0.32 | 0.65 | 0.36 | 0 | 0 | 1116 | 3764 |
| 408 | 12 24 21.045 | +35 06 51.31 | 18.80 | 18.97 | 180.60 | 3.09 | 2004.291 | 0.94 | 0.50 | 0.98 | 0.50 | 2 | 2 | 765 | 2368 |
| 409 | 12 25 37.234 | +05 34 49.07 | 18.35 | 18.71 | 55.96 | 4.62 | 2001.290 | 0.79 | 0.44 | 0.89 | 0.48 | 1 | 2 | 820 | 3791 |
| 410 | 12 26 21.675 | +26 30 03.97 | 17.66 | 18.11 | 150.77 | 3.04 | 2005.050 | 1.38 | 0.75 | 1.46 | 0.79 | 4 | 4 | 167 | 506 |
| 411 | 12 26 23.509 | +08 51 24.93 | 16.46 | 16.66 | 140.12 | 3.54 | 2002.194 | 1.09 | 0.54 | 1.12 | 0.57 | 2 | 3 | 197 | 695 |
| 412 | 12 26 40.393 | +00 08 08.65 | 17.86 | 18.43 | 212.53 | 4.45 | 1999.218 | 0.83 | 0.47 | 0.93 | 0.51 | 1 | 2 | 625 | 2781 |
| 413 | 12 27 03.932 | +26 02 52.46 | 17.77 | 17.88 | 336.38 | 4.97 | 2005.050 | 0.81 | 0.43 | 0.84 | 0.45 | 1 | 1 | 627 | 3119 |
| 414 | 12 27 52.986 | +16 37 23.55 | 18.03 | 18.30 | 162.27 | 4.83 | 2005.430 | 1.39 | 0.73 | 1.46 | 0.73 | 4 | 4 | 199 | 961 |
| 415 | 12 28 08.930 | +61 50 17.86 | 15.08 | 15.13 | 195.78 | 3.55 | 2001.391 | 1.09 | 0.63 | 1.10 | 0.64 | 3 | 3 | 91 | 322 |
| 416 | 12 28 11.539 | +27 11 45.87 | 17.26 | 17.53 | 312.76 | 3.38 | 2004.973 | 0.63 | 0.28 | 0.68 | 0.32 | 0 | 0 | 802 | 2706 |
| 417 | 12 28 47.935 | +03 00 01.86 | 17.39 | 17.85 | 217.57 | 3.64 | 2000.343 | 1.16 | 0.62 | 1.26 | 0.64 | 3 | 3 | 247 | 899 |
| 418 | 12 29 00.612 | +30 06 12.96 | 18.61 | 18.63 | 130.41 | 3.66 | 2004.392 | 1.04 | 0.54 | 1.06 | 0.55 | 2 | 2 | 558 | 2038 |
| 419 | 12 29 16.987 | +05 56 17.97 | 16.44 | 16.52 | 276.89 | 3.40 | 2001.290 | 1.40 | 0.76 | 1.43 | 0.76 | 4 | 4 | 89 | 304 |
| 420 | 12 29 47.868 | -00 29 43.25 | 18.21 | 18.40 | 65.93 | 3.41 | 1999.221 | 1.18 | 0.62 | 1.23 | 0.64 | 3 | 3 | 338 | 1152 |
| 421 | 12 30 20.353 | +09 49 04.48 | 18.78 | 18.89 | 355.41 | 4.13 | 2003.319 | 1.33 | 0.70 | 1.34 | 0.72 | 4 | 4 | 316 | 1304 |
| 422 | 12 31 19.290 | +53 32 20.82 | 19.36 | 19.71 | 140.49 | 3.18 | 2002.036 | 1.51 | 0.81 | 1.58 | 0.85 | 5 | 5 | 272 | 865 |
| 423 | 12 32 10.907 | +02 06 14.95 | 17.38 | 17.46 | 112.67 | 3.27 | 2000.343 | 1.56 | 0.79 | 1.58 | 0.81 | 5 | 5 | 103 | 338 |
| 424 | 12 32 59.960 | +40 25 58.98 | 17.33 | 17.47 | 331.48 | 4.60 | 2003.316 | 0.89 | 0.48 | 0.92 | 0.50 | 2 | 2 | 425 | 1954 |
| 425 | 12 33 06.654 | +26 00 27.72 | 15.83 | 16.01 | 350.86 | 3.48 | 2005.252 | 0.64 | 0.31 | 0.68 | 0.34 | 0 | 0 | 389 | 1354 |
| 426 | 12 34 53.605 | +34 47 04.29 | 15.66 | 16.17 | 95.63 | 4.37 | 2004.283 | 1.03 | 0.52 | 1.14 | 0.59 | 2 | 3 | 150 | 657 |
| 427 | 12 35 07.240 | +13 49 08.93 | 18.01 | 18.59 | 194.84 | 3.32 | 2003.076 | 1.59 | 0.93 | 1.71 | 1.04 | 5 | 6 | 108 | 358 |
| 428 | 12 35 08.841 | +33 20 12.16 | 18.28 | 18.90 | 348.96 | 4.56 | 2004.362 | 0.79 | 0.42 | 0.93 | 0.47 | 1 | 2 | 842 | 3836 |
| 429 | 12 35 11.322 | -02 53 50.04 | 17.90 | 17.99 | 87.11 | 4.04 | 2000.171 | 0.98 | 0.52 | 0.99 | 0.56 | 2 | 2 | 451 | 1821 |
| 430 | 12 35 15.318 | +67 40 17.64 | 18.78 | 18.99 | 133.01 | 3.17 | 2000.321 | 0.92 | 0.48 | 0.96 | 0.49 | 2 | 2 | 813 | 2576 |
| 431 | 12 35 41.749 | +13 26 00.73 | 17.90 | 18.18 | 145.74 | 4.63 | 2003.223 | 1.29 | 0.68 | 1.35 | 0.69 | 4 | 4 | 232 | 1075 |
| 432 | 12 35 48.341 | +17 16 13.92 | 18.57 | 18.78 | 190.00 | 3.34 | 2005.430 | 0.77 | 0.44 | 0.84 | 0.47 | 1 | 2 | 938 | 3130 |
| 433 | 12 37 31.074 | +24 52 43.51 | 18.91 | 19.17 | 340.60 | 3.28 | 2005.050 | 0.97 | 0.53 | 1.12 | 0.49 | 2 | 2 | 720 | 2365 |
| 434 | 12 38 05.211 | +22 57 06.21 | 18.99 | 19.36 | 344.43 | 3.24 | 2005.195 | 1.04 | 0.44 | 1.11 | 0.48 | 2 | 2 | 781 | 2529 |
| 435 | 12 38 27.968 | +37 19 14.98 | 18.45 | 18.61 | 129.46 | 4.10 | 2004.207 | 0.94 | 0.47 | 0.95 | 0.50 | 2 | 2 | 680 | 2787 |
| 436 | 12 39 18.253 | +18 35 48.82 | 18.94 | 19.23 | 325.39 | 4.98 | 2005.430 | 1.32 | 0.66 | 1.38 | 0.66 | 4 | 4 | 376 | 1871 |
| 437 | 12 39 50.848 | +36 05 07.62 | 18.06 | 18.57 | 96.38 | 4.57 | 2004.283 | 0.84 | 0.48 | 0.94 | 0.52 | 2 | 2 | 658 | 3004 |
| 438 | 12 40 06.546 | +26 21 23.46 | 18.65 | 18.98 | 155.07 | 3.43 | 2004.973 | 1.23 | 0.59 | 1.28 | 0.62 | 3 | 3 | 414 | 1421 |
| 439 | 12 40 27.846 | +10 43 52.73 | 16.91 | 17.40 | 309.27 | 4.52 | 2003.319 | 0.83 | 0.49 | 0.95 | 0.55 | 2 | 2 | 372 | 1682 |
| 440 | 12 43 09.012 | +32 12 54.42 | 17.47 | 17.76 | 277.64 | 3.16 | 2004.316 | 0.78 | 0.43 | 0.84 | 0.47 | 1 | 2 | 576 | 1822 |
| 441 | 12 43 58.872 | -02 30 15.17 | 16.71 | 16.82 | 106.36 | 3.36 | 2006.331 | 1.09 | 0.58 | 1.09 | 0.58 | 3 | 3 | 212 | 713 |
| 442 | 12 44 42.209 | +00 25 37.82 | 18.43 | 18.49 | 64.17 | 3.82 | 2006.331 | 1.31 | 0.68 | 1.33 | 0.70 | 4 | 4 | 283 | 1083 |
| 443 | 12 44 51.021 | -06 28 54.37 | 18.65 | 19.22 | 240.78 | 4.05 | 2006.085 | 0.84 | 0.43 | 0.97 | 0.50 | 1 | 2 | 901 | 3644 |
| 444 | 12 45 12.585 | +07 35 12.08 | 17.96 | 17.99 | 210.24 | 4.93 | 2003.248 | 1.07 | 0.58 | 1.07 | 0.58 | 3 | 3 | 384 | 1893 |
| 445 | 12 46 06.459 | +60 16 01.62 | 18.20 | 18.66 | 152.20 | 3.05 | 2001.287 | 0.70 | 0.25 | 0.72 | 0.37 | 0 | 1 | 1177 | 3588 |
| 446 | 12 46 10.955 | +05 31 00.68 | 19.31 | 19.40 | 67.41 | 3.70 | 2006.331 | 1.44 | 0.74 | 1.49 | 0.74 | 4 | 4 | 321 | 1184 |
| 447 | 12 46 42.217 | +05 00 47.56 | 15.45 | 16.92 | 21.95 | 3.39 | 2006.085 | -0.25 | 1.37 | 1.04 | 0.53 | 2 | 2 | 262 | 889 |
| 448 | 12 47 47.666 | +05 18 23.48 | 16.57 | 16.86 | 336.41 | 3.06 | 2006.331 | 0.78 | 0.39 | 0.81 | 0.41 | 1 | 1 | 415 | 1270 |
| 449 | 12 49 38.377 | +25 51 11.58 | 18.31 | 18.87 | 208.16 | 3.79 | 2005.252 | 0.95 | 0.52 | 1.05 | 0.59 | 2 | 3 | 582 | 2206 |
| 450 | 12 50 37.877 | +31 17 22.59 | 18.86 | 19.26 | 80.04 | 4.45 | 2004.316 | 1.33 | 0.69 | 1.41 | 0.71 | 4 | 4 | 337 | 1500 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 451 | 12 50 46.344 | +23 26 46.66 | 17.42 | 17.76 | 47.34 | 4.80 | 2005.189 | 0.79 | 0.40 | 0.87 | 0.43 | 1 | 1 | 578 | 2776 |
| 452 | 12 51 02.814 | -02 20 13.83 | 19.20 | 19.60 | 1.28 | 4.32 | 2000.171 | 1.35 | 0.69 | 1.41 | 0.72 | 4 | 4 | 389 | 1680 |
| 453 | 12 51 54.228 | +53 54 03.68 | 18.16 | 18.61 | 294.64 | 3.96 | 2002.248 | 1.06 | 0.57 | 1.15 | 0.62 | 3 | 3 | 429 | 1699 |
| 454 | 12 53 40.872 | +25 36 06.19 | 17.76 | 17.87 | 34.00 | 4.44 | 2005.050 | 0.77 | 0.46 | 0.80 | 0.48 | 1 | 1 | 628 | 2784 |
| 455 | 12 54 40.080 | -01 59 42.52 | 18.43 | 18.51 | 8.51 | 3.48 | 2000.171 | 0.53 | 0.35 | 0.54 | 0.36 | 0 | 0 | 1443 | 5013 |
| 456 | 12 55 12.308 | +30 19 30.12 | 18.57 | 18.66 | 122.93 | 3.14 | 2004.392 | 1.24 | 0.66 | 1.29 | 0.66 | 3 | 3 | 341 | 1069 |
| 457 | 12 56 37.821 | +60 45 37.12 | 17.62 | 18.07 | 54.08 | 3.57 | 2002.120 | 0.83 | 0.42 | 0.93 | 0.46 | 1 | 2 | 586 | 2089 |
| 458 | 12 56 50.041 | +39 56 06.69 | 18.60 | 18.99 | 213.15 | 3.16 | 2004.075 | 1.26 | 0.72 | 1.37 | 0.76 | 4 | 4 | 309 | 977 |
| 459 | 12 58 26.401 | +09 39 28.83 | 16.25 | 16.81 | 278.75 | 4.89 | 2003.319 | 1.10 | 0.58 | 1.23 | 0.66 | 3 | 3 | 161 | 790 |
| 460 | 12 59 12.011 | +31 23 40.08 | 17.93 | 18.51 | 46.41 | 3.43 | 2004.362 | 1.35 | 0.72 | 1.44 | 0.78 | 4 | 4 | 206 | 707 |
| 461 | 13 00 53.892 | -02 11 17.59 | 18.52 | 18.73 | 177.61 | 3.68 | 2000.116 | 1.04 | 0.56 | 1.05 | 0.58 | 2 | 3 | 545 | 2004 |
| 462 | 13 03 19.194 | +67 58 53.41 | 18.21 | 18.78 | 23.45 | 4.93 | 2000.321 | 0.69 | 0.36 | 0.83 | 0.44 | 1 | 1 | 982 | 4838 |
| 463 | 13 09 36.180 | +29 34 10.63 | 18.54 | 19.16 | 13.22 | 4.38 | 2004.392 | 0.72 | 0.43 | 0.85 | 0.50 | 1 | 2 | 1033 | 4520 |
| 464 | 13 09 39.710 | +46 40 37.12 | 17.98 | 18.19 | 97.45 | 4.66 | 2003.191 | 1.25 | 0.63 | 1.28 | 0.64 | 3 | 3 | 278 | 1294 |
| 465 | 13 10 00.829 | +08 20 17.10 | 17.65 | 18.15 | 103.53 | 4.44 | 2003.248 | 1.21 | 0.60 | 1.31 | 0.65 | 3 | 3 | 262 | 1164 |
| 466 | 13 10 09.520 | +18 30 33.41 | 15.28 | 15.37 | 321.87 | 3.01 | 2005.353 | 1.14 | 0.57 | 1.17 | 0.60 | 3 | 3 | 99 | 298 |
| 467 | 13 10 23.868 | +17 10 06.73 | 16.93 | 17.25 | 107.55 | 4.00 | 2005.427 | 1.18 | 0.61 | 1.23 | 0.64 | 3 | 3 | 196 | 783 |
| 468 | 13 10 44.301 | +14 34 32.89 | 19.16 | 19.74 | 284.16 | 4.82 | 2004.075 | 2.14 | 1.18 | 2.31 | 1.27 | 7 | 8 | 67 | 321 |
| 469 | 13 10 46.680 | +07 39 54.58 | 18.91 | 19.12 | 131.49 | 3.76 | 2003.248 | 1.43 | 0.75 | 1.47 | 0.79 | 4 | 4 | 269 | 1014 |
| 470 | 13 11 48.303 | +62 49 29.95 | 18.25 | 18.87 | 350.14 | 3.06 | 2001.391 | 0.64 | 0.39 | 0.82 | 0.43 | 1 | 1 | 1055 | 3230 |
| 471 | 13 12 14.131 | +40 09 11.52 | 18.26 | 18.92 | 90.98 | 3.59 | 2003.316 | 1.07 | 0.53 | 1.23 | 0.60 | 2 | 3 | 459 | 1648 |
| 472 | 13 12 14.647 | -00 49 27.25 | 15.73 | 16.23 | 64.30 | 3.90 | 1999.218 | 1.24 | 0.66 | 1.33 | 0.71 | 3 | 4 | 95 | 372 |
| 473 | 13 13 35.220 | +19 03 05.97 | 18.81 | 18.87 | 352.73 | 4.22 | 2005.353 | 1.02 | 0.56 | 1.06 | 0.58 | 2 | 3 | 599 | 2524 |
| 474 | 13 13 42.574 | +25 42 58.49 | 18.54 | 18.73 | 334.77 | 3.81 | 2004.973 | 0.99 | 0.41 | 0.97 | 0.49 | 2 | 2 | 712 | 2714 |
| 475 | 13 13 47.380 | +55 50 14.20 | 18.99 | 19.10 | 309.03 | 3.84 | 2003.180 | 1.11 | 0.59 | 1.13 | 0.61 | 3 | 3 | 565 | 2171 |
| 476 | 13 14 40.107 | +04 40 00.46 | 15.59 | 15.60 | 210.18 | 3.85 | 2001.214 | 0.85 | 0.44 | 0.86 | 0.44 | 1 | 1 | 217 | 834 |
| 477 | 13 16 54.684 | +45 56 02.54 | 18.86 | 19.12 | 317.30 | 3.83 | 2003.177 | 0.93 | 0.44 | 0.98 | 0.46 | 2 | 2 | 870 | 3336 |
| 478 | 13 16 59.445 | +47 39 51.83 | 17.62 | 18.17 | 298.73 | 3.44 | 2003.177 | 1.11 | 0.53 | 1.24 | 0.61 | 2 | 3 | 321 | 1102 |
| 479 | 13 17 14.454 | +50 19 09.82 | 18.86 | 19.39 | 268.48 | 3.51 | 2002.107 | 0.94 | 0.49 | 1.05 | 0.54 | 2 | 2 | 795 | 2795 |
| 480 | 13 18 18.548 | +46 15 40.54 | 18.81 | 19.09 | 214.73 | 4.06 | 2003.177 | 1.44 | 0.84 | 1.50 | 0.87 | 5 | 5 | 223 | 908 |
| 481 | 13 20 04.116 | +24 26 01.63 | 17.78 | 18.27 | 178.54 | 3.09 | 2005.252 | 0.55 | 0.34 | 0.66 | 0.41 | 0 | 1 | 1032 | 3193 |
| 482 | 13 20 26.880 | +57 10 22.43 | 16.50 | 16.75 | 19.87 | 3.69 | 2003.188 | 0.73 | 0.41 | 0.78 | 0.44 | 1 | 1 | 412 | 1521 |
| 483 | 13 21 43.232 | +29 13 45.17 | 17.72 | 17.89 | 253.93 | 3.75 | 2004.392 | 0.78 | 0.41 | 0.81 | 0.41 | 1 | 1 | 678 | 2545 |
| 484 | 13 22 10.383 | +06 04 07.54 | 18.36 | 18.70 | 60.51 | 3.76 | 2003.248 | 1.25 | 0.65 | 1.30 | 0.69 | 3 | 4 | 320 | 1203 |
| 485 | 13 22 41.789 | +67 49 13.20 | 15.61 | 15.76 | 19.04 | 3.37 | 2000.321 | 1.01 | 0.54 | 1.04 | 0.57 | 2 | 2 | 149 | 501 |
| 486 | 13 22 42.722 | +02 22 02.13 | 19.11 | 19.48 | 203.59 | 4.16 | 2000.340 | 1.60 | 0.85 | 1.66 | 0.89 | 5 | 5 | 205 | 852 |
| 487 | 13 22 47.452 | +64 23 49.35 | 18.91 | 19.42 | 223.87 | 3.17 | 2000.261 | 1.30 | 0.73 | 1.44 | 0.76 | 4 | 4 | 335 | 1061 |
| 488 | 13 23 38.487 | +38 19 32.04 | 17.70 | 18.31 | 39.68 | 4.68 | 2004.075 | 1.34 | 0.73 | 1.45 | 0.79 | 4 | 4 | 186 | 869 |
| 489 | 13 24 47.659 | +03 55 27.32 | 19.18 | 19.27 | 112.81 | 3.25 | 2001.214 | 1.24 | 0.66 | 1.25 | 0.67 | 3 | 3 | 460 | 1497 |
| 490 | 13 24 56.412 | +00 21 14.57 | 17.76 | 18.17 | 150.25 | 4.02 | 2000.316 | 0.82 | 0.48 | 0.91 | 0.50 | 2 | 2 | 582 | 2340 |
| 491 | 13 25 46.688 | +59 59 10.43 | 16.28 | 16.89 | 12.14 | 4.14 | 2001.288 | 0.75 | 0.41 | 0.88 | 0.48 | 1 | 2 | 356 | 1473 |
| 492 | 13 27 15.331 | +29 21 30.85 | 17.63 | 17.90 | 160.92 | 3.19 | 2004.392 | 1.04 | 0.53 | 1.09 | 0.56 | 2 | 3 | 367 | 1170 |
| 493 | 13 27 22.781 | +50 36 05.38 | 18.23 | 18.52 | 263.56 | 3.41 | 2003.246 | 0.90 | 0.48 | 0.97 | 0.53 | 2 | 2 | 633 | 2154 |
| 494 | 13 27 36.001 | +12 58 47.56 | 16.40 | 16.83 | 102.12 | 4.55 | 2003.223 | 1.26 | 0.70 | 1.34 | 0.73 | 4 | 4 | 119 | 543 |
| 495 | 13 29 30.012 | +50 12 56.81 | 18.96 | 19.01 | 12.66 | 4.41 | 2003.324 | 1.32 | 0.72 | 1.32 | 0.72 | 4 | 4 | 341 | 1502 |
| 496 | 13 30 26.998 | +06 20 11.12 | 17.80 | 18.40 | 299.64 | 3.11 | 2006.399 | 0.57 | 0.32 | 0.69 | 0.39 | 0 | 1 | 1060 | 3292 |
| 497 | 13 31 20.998 | +03 28 12.34 | 18.64 | 19.19 | 110.99 | 3.17 | 2000.340 | 0.97 | 0.54 | 1.09 | 0.57 | 2 | 3 | 652 | 2068 |
| 498 | 13 32 39.071 | +14 37 43.39 | 18.29 | 18.56 | 113.44 | 4.29 | 2004.075 | 1.09 | 0.59 | 1.15 | 0.59 | 3 | 3 | 429 | 1842 |
| 499 | 13 33 46.932 | +00 59 59.47 | 15.86 | 16.20 | 115.61 | 4.04 | 1999.218 | 0.87 | 0.46 | 0.94 | 0.50 | 2 | 2 | 230 | 928 |
| 500 | 13 33 49.683 | +67 11 19.76 | 17.32 | 17.95 | 277.28 | 3.70 | 2000.321 | 0.74 | 0.42 | 0.90 | 0.48 | 1 | 2 | 567 | 2097 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 501 | 13 35 48.580 | +58 21 49.95 | 17.22 | 17.71 | 236.77 | 3.07 | 2001.288 | 0.73 | 0.39 | 0.85 | 0.44 | 1 | 1 | 580 | 1782 |
| 502 | 13 35 55.552 | +29 07 22.91 | 18.96 | 19.12 | 57.07 | 4.13 | 2004.392 | 1.49 | 0.72 | 1.51 | 0.77 | 4 | 4 | 263 | 1084 |
| 503 | 13 36 16.134 | +32 40 14.61 | 17.66 | 17.98 | 43.27 | 4.59 | 2004.291 | 0.70 | 0.42 | 0.77 | 0.45 | 1 | 1 | 720 | 3303 |
| 504 | 13 36 18.843 | +05 42 07.59 | 16.45 | 17.04 | 137.97 | 4.81 | 2006.396 | 0.64 | 0.35 | 0.80 | 0.42 | 0 | 1 | 484 | 2329 |
| 505 | 13 37 05.564 | +41 49 02.09 | 17.57 | 18.00 | 163.46 | 3.20 | 2003.325 | 1.31 | 0.70 | 1.39 | 0.75 | 4 | 4 | 188 | 600 |
| 506 | 13 37 35.703 | +42 42 32.08 | 16.45 | 16.48 | 355.98 | 3.92 | 2003.226 | 0.84 | 0.41 | 0.87 | 0.43 | 1 | 1 | 329 | 1290 |
| 507 | 13 38 18.114 | +32 29 53.53 | 18.44 | 18.74 | 21.49 | 3.25 | 2004.283 | 0.72 | 0.40 | 0.79 | 0.44 | 1 | 1 | 1014 | 3293 |
| 508 | 13 38 33.672 | +05 13 59.94 | 16.67 | 17.00 | 161.41 | 3.48 | 2006.396 | 0.84 | 0.47 | 0.92 | 0.52 | 2 | 2 | 341 | 1187 |
| 509 | 13 38 34.320 | +61 09 01.38 | 18.12 | 18.36 | 353.50 | 3.28 | 2001.391 | 0.65 | 0.34 | 0.72 | 0.34 | 0 | 1 | 1073 | 3519 |
| 510 | 13 39 50.187 | +13 44 47.04 | 18.58 | 19.14 | 165.13 | 4.25 | 2003.409 | 0.72 | 0.48 | 0.85 | 0.53 | 1 | 2 | 976 | 4144 |
| 511 | 13 40 10.425 | +38 04 48.58 | 18.81 | 19.31 | 310.04 | 4.20 | 2004.075 | 1.32 | 0.64 | 1.34 | 0.74 | 3 | 4 | 364 | 1529 |
| 512 | 13 40 18.235 | +23 55 56.25 | 18.00 | 18.06 | 299.87 | 4.46 | 2005.050 | 0.97 | 0.52 | 0.99 | 0.53 | 2 | 2 | 485 | 2162 |
| 513 | 13 42 59.055 | +38 10 26.30 | 19.00 | 19.32 | 108.78 | 3.35 | 2003.316 | 1.10 | 0.59 | 1.15 | 0.62 | 3 | 3 | 585 | 1959 |
| 514 | 13 43 26.217 | +05 50 27.37 | 18.01 | 18.41 | 61.70 | 3.02 | 2003.248 | 0.75 | 0.42 | 0.85 | 0.46 | 1 | 2 | 774 | 2336 |
| 515 | 13 44 02.364 | +23 30 39.43 | 18.63 | 18.81 | 9.34 | 4.03 | 2005.050 | 1.19 | 0.59 | 1.23 | 0.61 | 3 | 3 | 424 | 1708 |
| 516 | 13 44 27.326 | +43 54 00.78 | 16.73 | 16.93 | 128.55 | 3.42 | 2003.232 | 1.60 | 0.86 | 1.65 | 0.89 | 5 | 5 | 66 | 224 |
| 517 | 13 44 32.610 | +06 25 43.10 | 18.80 | 18.94 | 241.33 | 3.20 | 2003.319 | 0.88 | 0.46 | 0.90 | 0.47 | 2 | 2 | 893 | 2860 |
| 518 | 13 45 04.024 | +03 08 55.02 | 18.09 | 18.29 | 49.74 | 4.36 | 2000.340 | 1.14 | 0.60 | 1.17 | 0.63 | 3 | 3 | 353 | 1540 |
| 519 | 13 45 40.241 | +30 17 07.03 | 18.99 | 19.34 | 251.84 | 3.79 | 2004.362 | 1.33 | 0.71 | 1.42 | 0.72 | 4 | 4 | 345 | 1306 |
| 520 | 13 45 57.288 | +00 41 43.41 | 16.10 | 16.46 | 17.73 | 3.02 | 2006.399 | 0.64 | 0.39 | 0.74 | 0.43 | 1 | 1 | 391 | 1180 |
| 521 | 13 46 59.452 | +46 18 16.56 | 18.81 | 18.96 | 10.18 | 3.20 | 2003.177 | 1.26 | 0.66 | 1.28 | 0.69 | 3 | 4 | 375 | 1199 |
| 522 | 13 47 09.971 | +06 39 11.42 | 18.15 | 18.53 | 164.98 | 3.28 | 2003.248 | 1.10 | 0.56 | 1.19 | 0.57 | 3 | 3 | 412 | 1350 |
| 523 | 13 48 38.747 | +55 59 01.01 | 17.96 | 17.99 | 39.54 | 4.55 | 2003.188 | 1.12 | 0.54 | 1.12 | 0.58 | 3 | 3 | 363 | 1651 |
| 524 | 13 49 05.795 | +45 40 32.10 | 18.53 | 19.10 | 291.44 | 3.80 | 2003.191 | 1.26 | 0.71 | 1.36 | 0.77 | 4 | 4 | 313 | 1188 |
| 525 | 13 49 06.794 | +05 12 43.12 | 17.61 | 17.64 | 81.40 | 3.46 | 2001.290 | 0.70 | 0.38 | 0.73 | 0.38 | 1 | 1 | 726 | 2514 |
| 526 | 13 49 53.174 | +30 10 53.03 | 18.63 | 19.05 | 83.43 | 3.79 | 2004.362 | 0.97 | 0.54 | 1.06 | 0.55 | 2 | 2 | 649 | 2460 |
| 527 | 13 50 01.087 | -05 40 56.82 | 17.09 | 17.26 | 196.59 | 3.55 | 2006.399 | 1.05 | 0.57 | 1.10 | 0.60 | 3 | 3 | 260 | 924 |
| 528 | 13 51 05.345 | +26 22 32.51 | 18.57 | 19.10 | 358.56 | 4.96 | 2004.447 | 0.62 | 0.36 | 0.77 | 0.41 | 0 | 1 | 1310 | 6495 |
| 529 | 13 52 23.520 | +31 15 03.44 | 17.56 | 18.09 | 242.83 | 4.34 | 2004.362 | 0.57 | 0.30 | 0.70 | 0.38 | 0 | 1 | 948 | 4117 |
| 530 | 13 56 18.948 | +04 50 27.82 | 18.77 | 19.09 | 207.62 | 4.86 | 2001.214 | 0.87 | 0.46 | 0.97 | 0.47 | 2 | 2 | 874 | 4250 |
| 531 | 13 57 42.248 | +44 47 06.22 | 18.26 | 18.53 | 329.15 | 3.20 | 2003.191 | 0.60 | 0.33 | 0.68 | 0.35 | 0 | 1 | 1233 | 3947 |
| 532 | 13 58 09.983 | +17 44 24.08 | 17.30 | 17.68 | 311.41 | 3.31 | 2005.353 | 0.83 | 0.47 | 0.94 | 0.50 | 2 | 2 | 460 | 1523 |
| 533 | 13 58 31.662 | +54 07 33.56 | 17.32 | 17.77 | 141.97 | 3.20 | 2003.188 | 1.06 | 0.55 | 1.15 | 0.62 | 2 | 3 | 296 | 946 |
| 534 | 13 59 09.145 | +57 23 45.83 | 16.21 | 16.76 | 42.18 | 4.99 | 2002.437 | 0.91 | 0.41 | 1.04 | 0.47 | 1 | 2 | 271 | 1349 |
| 535 | 13 59 58.071 | +30 19 53.52 | 17.28 | 17.43 | 16.58 | 4.62 | 2004.308 | 0.88 | 0.47 | 0.90 | 0.50 | 2 | 2 | 430 | 1984 |
| 536 | 14 01 48.921 | +08 41 49.87 | 17.84 | 18.00 | 196.73 | 4.46 | 2003.322 | 1.16 | 0.57 | 1.20 | 0.61 | 3 | 3 | 314 | 1401 |
| 537 | 14 03 35.384 | +03 40 42.68 | 17.65 | 18.21 | 327.75 | 4.50 | 2000.357 | 1.03 | 0.59 | 1.15 | 0.62 | 3 | 3 | 350 | 1575 |
| 538 | 14 04 38.805 | +34 26 53.49 | 17.89 | 18.16 | 116.59 | 4.28 | 2004.209 | 1.30 | 0.62 | 1.34 | 0.65 | 3 | 4 | 251 | 1074 |
| 539 | 14 05 38.845 | +16 36 22.00 | 18.36 | 18.60 | 40.19 | 3.59 | 2005.359 | 1.48 | 0.83 | 1.53 | 0.85 | 5 | 5 | 176 | 630 |
| 540 | 14 05 55.948 | +48 58 05.44 | 17.66 | 17.92 | 79.13 | 3.05 | 2003.246 | 1.22 | 0.63 | 1.26 | 0.65 | 3 | 3 | 248 | 757 |
| 541 | 14 06 02.073 | +36 36 15.68 | 18.69 | 18.83 | 63.04 | 3.00 | 2003.316 | 0.82 | 0.49 | 0.85 | 0.53 | 2 | 2 | 855 | 2565 |
| 542 | 14 06 38.258 | +05 41 02.51 | 17.95 | 18.36 | 156.80 | 4.34 | 2003.319 | 0.81 | 0.44 | 0.92 | 0.48 | 1 | 2 | 671 | 2911 |
| 543 | 14 07 08.227 | +12 03 09.60 | 16.86 | 17.49 | 155.91 | 4.21 | 2003.314 | 1.04 | 0.56 | 1.19 | 0.63 | 2 | 3 | 240 | 1009 |
| 544 | 14 08 47.605 | +06 04 39.49 | 18.45 | 18.50 | 126.99 | 4.65 | 2003.322 | 0.74 | 0.44 | 0.75 | 0.46 | 1 | 1 | 931 | 4330 |
| 545 | 14 09 19.605 | +42 06 06.00 | 18.04 | 18.46 | 85.45 | 3.67 | 2003.232 | 1.09 | 0.58 | 1.17 | 0.63 | 3 | 3 | 384 | 1409 |
| 546 | 14 09 54.828 | +07 00 11.98 | 18.69 | 19.23 | 260.05 | 4.03 | 2003.322 | 0.85 | 0.47 | 0.93 | 0.52 | 2 | 2 | 883 | 3556 |
| 547 | 14 10 41.785 | +14 36 33.83 | 18.21 | 18.34 | 50.38 | 3.05 | 2003.472 | 1.87 | 0.99 | 1.90 | 1.03 | 6 | 6 | 75 | 229 |
| 548 | 14 10 56.898 | +15 25 02.71 | 18.99 | 19.01 | 22.21 | 3.52 | 2005.362 | 1.24 | 0.60 | 1.28 | 0.59 | 3 | 3 | 452 | 1589 |
| 549 | 14 12 23.255 | +50 03 49.73 | 18.57 | 19.11 | 255.00 | 3.42 | 2003.246 | 0.63 | 0.35 | 0.74 | 0.43 | 0 | 1 | 1317 | 4505 |
| 550 | 14 16 11.275 | +63 25 06.63 | 16.43 | 16.47 | 142.51 | 4.78 | 2007.199 | 0.99 | 0.53 | 1.00 | 0.54 | 2 | 2 | 225 | 1076 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 551 | 14 18 01.095 | +48 57 15.47 | 18.81 | 18.83 | 302.71 | 3.26 | 2003.324 | 1.07 | 0.58 | 1.05 | 0.62 | 3 | 3 | 551 | 1794 |
| 552 | 14 19 24.809 | +08 02 17.52 | 16.74 | 16.85 | 65.57 | 3.95 | 2003.322 | 0.70 | 0.39 | 0.72 | 0.41 | 1 | 1 | 486 | 1922 |
| 553 | 14 20 58.750 | +37 07 42.02 | 15.59 | 16.03 | 249.47 | 3.72 | 2003.325 | 1.04 | 0.55 | 1.13 | 0.59 | 2 | 3 | 140 | 521 |
| 554 | 14 21 46.663 | -00 07 54.20 | 18.78 | 19.03 | 120.31 | 3.30 | 1999.221 | 0.96 | 0.48 | 1.00 | 0.55 | 2 | 2 | 734 | 2420 |
| 555 | 14 22 14.683 | +12 38 57.03 | 18.27 | 18.50 | 256.67 | 3.65 | 2003.409 | 1.02 | 0.50 | 1.06 | 0.54 | 2 | 2 | 530 | 1932 |
| 556 | 14 22 24.858 | +05 24 54.82 | 15.92 | 16.00 | 224.57 | 3.36 | 2003.322 | 0.60 | 0.33 | 0.62 | 0.34 | 0 | 0 | 421 | 1414 |
| 557 | 14 22 50.634 | +44 34 02.74 | 18.34 | 18.84 | 153.25 | 3.61 | 2002.107 | 1.02 | 0.53 | 1.09 | 0.60 | 2 | 3 | 531 | 1918 |
| 558 | 14 24 56.310 | +46 59 54.32 | 17.49 | 17.65 | 343.87 | 4.18 | 2003.324 | 1.22 | 0.68 | 1.25 | 0.69 | 3 | 4 | 214 | 892 |
| 559 | 14 25 15.094 | +27 03 11.51 | 18.31 | 18.83 | 146.75 | 3.33 | 2004.390 | 1.23 | 0.63 | 1.32 | 0.68 | 3 | 4 | 332 | 1104 |
| 560 | 14 25 43.264 | +37 18 59.75 | 17.52 | 17.52 | 186.82 | 4.28 | 2003.325 | 0.82 | 0.45 | 0.82 | 0.47 | 1 | 1 | 532 | 2277 |
| 561 | 14 26 42.472 | +52 24 18.05 | 18.60 | 18.95 | 46.36 | 3.76 | 2003.188 | 1.43 | 0.77 | 1.49 | 0.80 | 4 | 4 | 232 | 873 |
| 562 | 14 28 18.037 | +55 59 51.21 | 18.85 | 19.30 | 343.20 | 3.07 | 2002.437 | 1.02 | 0.57 | 1.11 | 0.62 | 2 | 3 | 624 | 1918 |
| 563 | 14 28 48.932 | +09 00 07.53 | 17.65 | 17.84 | 122.67 | 3.31 | 2003.322 | 1.11 | 0.57 | 1.14 | 0.60 | 3 | 3 | 314 | 1041 |
| 564 | 14 28 55.768 | +45 11 36.36 | 18.57 | 19.18 | 54.88 | 4.37 | 2002.107 | 0.74 | 0.50 | 0.97 | 0.48 | 1 | 2 | 906 | 3959 |
| 565 | 14 29 13.492 | +40 18 08.33 | 18.17 | 18.37 | 311.14 | 3.03 | 2003.232 | 0.93 | 0.50 | 0.99 | 0.53 | 2 | 2 | 565 | 1715 |
| 566 | 14 29 39.253 | +45 02 22.26 | 18.00 | 18.16 | 115.91 | 4.15 | 2002.107 | 0.72 | 0.37 | 0.74 | 0.41 | 1 | 1 | 867 | 3596 |
| 567 | 14 30 53.529 | +38 21 52.96 | 17.82 | 18.42 | 182.76 | 3.23 | 2003.314 | 1.05 | 0.57 | 1.19 | 0.63 | 3 | 3 | 368 | 1189 |
| 568 | 14 31 44.104 | +34 30 22.05 | 17.21 | 17.33 | 191.10 | 3.48 | 2003.475 | 0.95 | 0.56 | 0.97 | 0.56 | 2 | 2 | 333 | 1159 |
| 569 | 14 32 20.600 | +39 15 26.63 | 15.81 | 16.07 | 150.95 | 3.03 | 2003.232 | 0.75 | 0.42 | 0.80 | 0.42 | 1 | 1 | 292 | 885 |
| 570 | 14 32 24.235 | +56 46 17.53 | 19.17 | 19.64 | 339.76 | 4.63 | 2002.437 | 1.25 | 0.63 | 1.30 | 0.72 | 3 | 4 | 474 | 2193 |
| 571 | 14 34 05.964 | +35 04 50.29 | 17.72 | 17.78 | 17.80 | 3.17 | 2003.316 | 0.73 | 0.40 | 0.75 | 0.42 | 1 | 1 | 715 | 2265 |
| 572 | 14 34 48.929 | +16 36 37.96 | 17.09 | 17.51 | 246.24 | 3.92 | 2005.356 | 1.30 | 0.62 | 1.37 | 0.65 | 3 | 4 | 176 | 689 |
| 573 | 14 37 16.457 | +29 59 43.67 | 16.60 | 17.15 | 242.86 | 4.86 | 2004.288 | 0.93 | 0.50 | 1.03 | 0.56 | 2 | 2 | 282 | 1370 |
| 574 | 14 40 40.811 | +40 02 49.47 | 18.92 | 19.31 | 203.69 | 3.78 | 2003.226 | 0.99 | 0.53 | 1.08 | 0.58 | 2 | 3 | 702 | 2656 |
| 575 | 14 43 06.324 | +48 33 12.07 | 18.29 | 18.44 | 55.01 | 3.41 | 2002.350 | 1.14 | 0.60 | 1.17 | 0.61 | 3 | 3 | 389 | 1324 |
| 576 | 14 45 58.429 | +29 33 34.65 | 18.47 | 18.53 | 270.88 | 4.04 | 2004.291 | 0.85 | 0.48 | 0.74 | 0.60 | 2 | 2 | 776 | 3134 |
| 577 | 14 46 12.078 | +13 53 39.77 | 18.83 | 19.20 | 295.14 | 4.40 | 2005.364 | 1.30 | 0.65 | 1.42 | 0.67 | 3 | 4 | 359 | 1577 |
| 578 | 14 46 14.031 | +17 28 24.45 | 17.97 | 18.39 | 292.07 | 4.45 | 2005.190 | 0.58 | 0.36 | 0.70 | 0.39 | 0 | 1 | 1056 | 4701 |
| 579 | 14 46 29.107 | +58 01 02.27 | 17.71 | 17.89 | 279.30 | 3.47 | 2001.378 | 0.86 | 0.46 | 0.91 | 0.46 | 2 | 2 | 553 | 1917 |
| 580 | 14 47 54.065 | +51 32 51.97 | 17.00 | 17.37 | 349.64 | 4.07 | 2003.188 | 1.32 | 0.69 | 1.39 | 0.73 | 4 | 4 | 144 | 588 |
| 581 | 14 49 46.117 | +54 41 16.55 | 19.15 | 19.32 | 310.82 | 4.38 | 2002.352 | 1.19 | 0.65 | 1.20 | 0.69 | 3 | 3 | 499 | 2185 |
| 582 | 14 50 22.512 | +34 53 45.70 | 16.67 | 16.81 | 253.03 | 4.93 | 2003.475 | 0.75 | 0.39 | 0.80 | 0.41 | 1 | 1 | 433 | 2133 |
| 583 | 14 51 25.781 | +10 46 06.84 | 15.70 | 15.93 | 215.29 | 3.59 | 2003.245 | 1.03 | 0.55 | 1.10 | 0.58 | 2 | 3 | 145 | 522 |
| 584 | 14 52 04.466 | +11 57 46.89 | 17.38 | 17.40 | 58.57 | 3.14 | 2003.409 | 1.45 | 0.79 | 1.43 | 0.81 | 4 | 4 | 123 | 385 |
| 585 | 14 52 11.992 | +05 45 37.79 | 18.31 | 18.69 | 159.77 | 3.39 | 2003.322 | 0.92 | 0.50 | 0.99 | 0.55 | 2 | 2 | 622 | 2106 |
| 586 | 14 52 24.006 | +11 01 56.49 | 17.73 | 17.93 | 279.83 | 4.96 | 2003.472 | 1.21 | 0.61 | 1.24 | 0.64 | 3 | 3 | 266 | 1319 |
| 587 | 14 52 51.536 | +52 21 02.20 | 15.27 | 15.41 | 112.95 | 4.27 | 2003.180 | 0.66 | 0.34 | 0.67 | 0.35 | 0 | 0 | 289 | 1232 |
| 588 | 14 53 42.393 | +18 19 18.57 | 16.43 | 16.49 | 268.08 | 3.55 | 2005.190 | 1.06 | 0.52 | 1.06 | 0.55 | 2 | 2 | 207 | 734 |
| 589 | 14 56 00.465 | +11 05 18.27 | 18.42 | 18.78 | 354.30 | 3.76 | 2003.409 | 0.75 | 0.43 | 0.82 | 0.47 | 1 | 1 | 936 | 3522 |
| 590 | 14 56 12.408 | +39 00 02.74 | 18.29 | 18.46 | 294.78 | 4.85 | 2003.232 | 0.57 | 0.35 | 0.61 | 0.39 | 0 | 1 | 1245 | 6031 |
| 591 | 14 59 46.200 | +34 06 43.11 | 16.65 | 17.20 | 71.16 | 3.55 | 2003.475 | 1.16 | 0.57 | 1.27 | 0.63 | 3 | 3 | 185 | 657 |
| 592 | 14 59 48.355 | +59 05 18.27 | 17.87 | 18.31 | 46.26 | 3.26 | 2000.261 | 1.07 | 0.58 | 1.16 | 0.64 | 3 | 3 | 360 | 1173 |
| 593 | 15 01 32.631 | +33 16 46.82 | 17.85 | 18.31 | 196.13 | 4.40 | 2003.475 | 0.71 | 0.36 | 0.80 | 0.41 | 1 | 1 | 846 | 3722 |
| 594 | 15 05 21.404 | +35 54 58.23 | 19.06 | 19.55 | 317.43 | 4.97 | 2003.314 | 1.13 | 0.57 | 1.24 | 0.65 | 3 | 3 | 572 | 2842 |
| 595 | 15 05 26.380 | +33 43 00.28 | 18.81 | 19.05 | 140.36 | 4.07 | 2003.325 | 0.91 | 0.59 | 0.98 | 0.59 | 2 | 2 | 705 | 2866 |
| 596 | 15 07 30.765 | +40 45 12.32 | 18.67 | 19.19 | 66.57 | 4.75 | 2003.114 | 1.03 | 0.56 | 1.14 | 0.59 | 2 | 3 | 582 | 2761 |
| 597 | 15 09 49.186 | +14 51 03.82 | 15.96 | 16.21 | 165.96 | 3.59 | 2005.354 | 0.94 | 0.46 | 0.99 | 0.49 | 2 | 2 | 218 | 782 |
| 598 | 15 10 55.064 | +41 04 22.40 | 15.71 | 16.08 | 331.45 | 3.00 | 2002.107 | 0.76 | 0.38 | 0.84 | 0.43 | 1 | 1 | 282 | 848 |
| 599 | 15 11 40.132 | +17 35 21.66 | 18.68 | 18.89 | 341.88 | 3.43 | 2005.190 | 0.75 | 0.40 | 0.79 | 0.43 | 1 | 1 | 1096 | 3758 |
| 600 | 15 13 11.399 | +52 27 55.47 | 18.53 | 18.86 | 279.75 | 4.82 | 2002.437 | 0.90 | 0.45 | 0.99 | 0.48 | 2 | 2 | 754 | 3633 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 601 | 15 13 35.255 | +30 26 00.90 | 18.77 | 18.89 | 232.50 | 4.86 | 2003.475 | 1.35 | 0.69 | 1.32 | 0.74 | 4 | 4 | 314 | 1526 |
| 602 | 15 14 57.727 | +51 24 53.92 | 18.71 | 19.12 | 279.83 | 4.66 | 2002.352 | 1.03 | 0.56 | 1.11 | 0.59 | 2 | 3 | 594 | 2769 |
| 603 | 15 15 28.467 | +19 25 56.05 | 17.52 | 17.58 | 227.72 | 3.06 | 2004.452 | 1.23 | 0.65 | 1.25 | 0.66 | 3 | 3 | 217 | 666 |
| 604 | 15 17 20.053 | +57 00 47.73 | 17.93 | 18.04 | 327.69 | 4.20 | 2006.331 | 0.66 | 0.37 | 0.68 | 0.40 | 1 | 1 | 913 | 3837 |
| 605 | 15 23 55.837 | +08 40 57.78 | 18.31 | 18.34 | 297.87 | 4.64 | 2003.245 | 0.71 | 0.36 | 0.74 | 0.37 | 1 | 1 | 1018 | 4720 |
| 606 | 15 24 12.586 | +29 19 37.88 | 18.34 | 18.41 | 52.98 | 3.51 | 2004.209 | 0.96 | 0.53 | 0.99 | 0.53 | 2 | 2 | 565 | 1981 |
| 607 | 15 25 03.438 | +08 47 27.10 | 17.22 | 17.65 | 5.92 | 3.77 | 2003.314 | 0.58 | 0.31 | 0.66 | 0.34 | 0 | 0 | 829 | 3129 |
| 608 | 15 25 05.592 | +60 33 49.08 | 18.00 | 18.34 | 303.79 | 4.63 | 2000.321 | 0.73 | 0.42 | 0.81 | 0.43 | 1 | 1 | 814 | 3771 |
| 609 | 15 26 17.800 | +17 15 32.55 | 18.53 | 18.95 | 183.52 | 4.94 | 2004.452 | 1.10 | 0.58 | 1.18 | 0.64 | 3 | 3 | 467 | 2307 |
| 610 | 15 27 32.334 | +30 12 14.47 | 17.14 | 17.72 | 189.89 | 3.85 | 2003.475 | 0.91 | 0.46 | 1.02 | 0.54 | 2 | 2 | 388 | 1493 |
| 611 | 15 28 01.142 | +38 44 23.91 | 17.87 | 17.96 | 16.18 | 3.45 | 2003.404 | 0.85 | 0.42 | 0.88 | 0.43 | 1 | 1 | 633 | 2183 |
| 612 | 15 32 20.691 | +43 55 32.62 | 18.71 | 18.92 | 23.60 | 4.95 | 2002.350 | 1.18 | 0.61 | 1.23 | 0.63 | 3 | 3 | 438 | 2169 |
| 613 | 15 33 41.609 | +54 59 44.11 | 15.39 | 16.36 | 350.05 | 3.22 | 2005.428 | -0.20 | 1.44 | 1.03 | 0.49 | 2 | 2 | 215 | 693 |
| 614 | 15 35 39.243 | +42 12 56.20 | 16.99 | 17.10 | 171.09 | 4.90 | 2002.350 | 0.91 | 0.50 | 0.94 | 0.53 | 2 | 2 | 343 | 1680 |
| 615 | 15 37 24.900 | +64 09 39.64 | 16.32 | 16.74 | 157.24 | 3.98 | 2005.416 | 0.65 | 0.32 | 0.74 | 0.36 | 0 | 1 | 481 | 1914 |
| 616 | 15 38 23.491 | +57 17 03.49 | 17.83 | 17.87 | 5.05 | 3.19 | 2000.321 | 1.09 | 0.60 | 1.09 | 0.60 | 3 | 3 | 340 | 1083 |
| 617 | 15 38 28.185 | +39 29 08.58 | 18.93 | 19.50 | 163.37 | 3.09 | 2003.324 | 1.07 | 0.57 | 1.15 | 0.65 | 3 | 3 | 612 | 1893 |
| 618 | 15 38 54.773 | +54 19 56.10 | 18.63 | 19.13 | 80.48 | 4.98 | 2001.072 | 1.41 | 0.76 | 1.51 | 0.82 | 4 | 5 | 241 | 1200 |
| 619 | 15 39 09.832 | +46 35 57.83 | 15.80 | 16.24 | 272.68 | 3.81 | 2002.353 | 1.14 | 0.59 | 1.23 | 0.63 | 3 | 3 | 126 | 478 |
| 620 | 15 39 16.602 | +40 29 36.99 | 18.63 | 18.81 | 129.12 | 3.77 | 2003.324 | 0.77 | 0.39 | 0.81 | 0.42 | 1 | 1 | 1049 | 3958 |
| 621 | 15 39 57.075 | +38 50 47.67 | 16.97 | 17.26 | 218.14 | 3.46 | 2003.324 | 0.89 | 0.46 | 0.95 | 0.49 | 2 | 2 | 374 | 1295 |
| 622 | 15 42 31.998 | +15 05 30.32 | 18.66 | 18.87 | 252.38 | 3.88 | 2005.367 | 1.23 | 0.61 | 1.29 | 0.59 | 3 | 3 | 406 | 1578 |
| 623 | 15 43 22.078 | +46 19 04.97 | 16.30 | 16.66 | 206.53 | 3.58 | 2002.437 | 1.06 | 0.56 | 1.13 | 0.59 | 2 | 3 | 187 | 672 |
| 624 | 15 44 56.192 | +27 08 11.90 | 17.49 | 18.04 | 332.34 | 3.50 | 2003.475 | 1.20 | 0.64 | 1.34 | 0.70 | 3 | 4 | 226 | 791 |
| 625 | 15 49 43.607 | +48 44 30.35 | 18.66 | 18.74 | 70.13 | 4.75 | 2001.375 | 1.23 | 0.61 | 1.24 | 0.61 | 3 | 3 | 400 | 1897 |
| 626 | 15 50 29.810 | +36 44 16.85 | 18.04 | 18.58 | 326.36 | 4.27 | 2003.406 | 0.82 | 0.32 | 0.92 | 0.38 | 1 | 1 | 830 | 3539 |
| 627 | 15 50 36.733 | +56 16 50.72 | 18.39 | 18.79 | 359.45 | 3.14 | 2000.321 | 0.79 | 0.45 | 0.88 | 0.47 | 1 | 2 | 849 | 2665 |
| 628 | 15 51 03.022 | +55 14 22.06 | 18.39 | 18.72 | 188.27 | 4.99 | 2001.225 | 1.05 | 0.57 | 1.11 | 0.60 | 3 | 3 | 488 | 2432 |
| 629 | 15 51 16.339 | +42 47 03.03 | 18.63 | 18.77 | 19.50 | 4.64 | 2003.180 | 1.09 | 0.63 | 1.13 | 0.60 | 3 | 3 | 479 | 2220 |
| 630 | 15 51 29.949 | +56 40 22.38 | 18.42 | 18.61 | 336.72 | 3.45 | 2000.321 | 1.12 | 0.55 | 1.15 | 0.58 | 3 | 3 | 455 | 1570 |
| 631 | 15 52 32.014 | +17 38 24.31 | 17.57 | 17.66 | 307.38 | 4.49 | 2004.447 | 1.25 | 0.68 | 1.26 | 0.69 | 3 | 4 | 212 | 951 |
| 632 | 15 55 06.921 | +49 53 57.70 | 18.30 | 18.46 | 318.42 | 4.08 | 2001.392 | 0.87 | 0.46 | 0.91 | 0.48 | 2 | 2 | 709 | 2897 |
| 633 | 15 57 18.689 | +16 15 22.14 | 17.30 | 17.66 | 313.59 | 3.19 | 2004.447 | 0.59 | 0.35 | 0.67 | 0.37 | 0 | 1 | 792 | 2528 |
| 634 | 15 57 25.654 | +49 33 08.27 | 15.52 | 15.72 | 57.12 | 3.62 | 2001.392 | 0.92 | 0.49 | 0.95 | 0.52 | 2 | 2 | 175 | 635 |
| 635 | 15 57 38.614 | +58 20 26.05 | 18.70 | 19.10 | 293.22 | 4.81 | 2004.453 | 1.20 | 0.67 | 1.30 | 0.69 | 3 | 4 | 390 | 1872 |
| 636 | 15 59 12.630 | +52 50 32.38 | 17.56 | 18.06 | 350.82 | 3.90 | 2000.261 | 0.63 | 0.36 | 0.76 | 0.42 | 0 | 1 | 808 | 3150 |
| 637 | 15 59 50.353 | +43 34 48.38 | 18.00 | 18.58 | 83.31 | 3.28 | 2002.437 | 0.89 | 0.49 | 0.98 | 0.56 | 2 | 2 | 588 | 1929 |
| 638 | 15 59 52.508 | +55 57 17.95 | 18.62 | 19.04 | 231.29 | 3.02 | 2000.321 | 1.22 | 0.69 | 1.31 | 0.72 | 3 | 4 | 356 | 1073 |
| 639 | 16 08 49.816 | +46 19 26.59 | 18.18 | 18.40 | 353.11 | 3.63 | 2001.392 | 1.07 | 0.56 | 1.13 | 0.56 | 3 | 3 | 436 | 1582 |
| 640 | 16 12 43.835 | +48 37 45.71 | 19.17 | 19.23 | 39.39 | 3.63 | 2001.290 | 1.43 | 0.77 | 1.42 | 0.79 | 4 | 4 | 298 | 1079 |
| 641 | 16 12 49.090 | +31 15 59.03 | 18.73 | 18.93 | 332.92 | 3.41 | 2003.194 | 1.25 | 0.67 | 1.29 | 0.69 | 3 | 4 | 363 | 1237 |
| 642 | 16 18 41.937 | +54 11 42.16 | 18.42 | 18.44 | 351.33 | 4.04 | 2004.453 | 0.72 | 0.36 | 0.73 | 0.39 | 1 | 1 | 1056 | 4266 |
| 643 | 16 18 54.388 | +45 06 26.43 | 17.61 | 17.75 | 4.39 | 4.63 | 2001.375 | 1.25 | 0.65 | 1.29 | 0.66 | 3 | 3 | 220 | 1020 |
| 644 | 16 23 20.015 | +46 47 02.33 | 17.59 | 17.74 | 29.81 | 4.37 | 2000.261 | 1.32 | 0.66 | 1.34 | 0.68 | 4 | 4 | 198 | 865 |
| 645 | 16 24 09.420 | +36 15 53.50 | 18.89 | 19.24 | 106.79 | 4.25 | 2002.353 | 1.22 | 0.61 | 1.27 | 0.68 | 3 | 4 | 442 | 1878 |
| 646 | 16 29 00.245 | +35 43 20.35 | 16.84 | 17.13 | 65.65 | 3.65 | 2002.353 | 0.63 | 0.32 | 0.68 | 0.37 | 0 | 1 | 622 | 2266 |
| 647 | 16 29 51.710 | +43 47 22.32 | 17.49 | 17.94 | 347.78 | 3.09 | 2000.261 | 1.25 | 0.71 | 1.33 | 0.75 | 4 | 4 | 196 | 605 |
| 648 | 16 32 03.518 | +45 35 47.51 | 16.97 | 17.16 | 182.61 | 4.29 | 2000.261 | 1.38 | 0.74 | 1.42 | 0.77 | 4 | 4 | 120 | 514 |
| 649 | 16 39 01.195 | +50 39 49.64 | 17.16 | 17.81 | 23.06 | 4.84 | 2003.481 | 1.07 | 0.50 | 1.22 | 0.58 | 2 | 3 | 291 | 1407 |
| 650 | 16 39 03.510 | +33 52 45.70 | 18.51 | 18.73 | 234.84 | 3.53 | 2002.353 | 1.32 | 0.68 | 1.36 | 0.72 | 4 | 4 | 290 | 1025 |

*Table continues on next page.*

## Identification and Spectral Classification of Close Red Dwarf Binary Stars

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 651 | 16 43 38.737 | +45 32 41.72 | 19.53 | 19.90 | 156.45 | 3.64 | 2001.225 | 1.62 | 0.86 | 1.68 | 0.91 | 5 | 5 | 237 | 860 |
| 652 | 16 45 49.526 | +49 01 27.05 | 17.61 | 18.03 | 89.55 | 3.13 | 2004.453 | 1.30 | 0.64 | 1.37 | 0.70 | 3 | 4 | 212 | 662 |
| 653 | 16 46 20.640 | +50 34 08.23 | 17.77 | 18.30 | 320.98 | 3.24 | 2005.416 | 0.65 | 0.40 | 0.79 | 0.45 | 1 | 1 | 823 | 2669 |
| 654 | 16 47 12.563 | +33 00 16.73 | 16.43 | 16.46 | 122.35 | 3.91 | 2003.180 | 0.73 | 0.40 | 0.74 | 0.40 | 1 | 1 | 403 | 1575 |
| 655 | 16 49 27.641 | +51 23 48.92 | 17.78 | 17.92 | 204.10 | 3.64 | 2005.416 | 0.71 | 0.39 | 0.74 | 0.42 | 1 | 1 | 775 | 2823 |
| 656 | 16 49 28.508 | +40 05 10.18 | 17.86 | 17.89 | 308.88 | 3.47 | 2001.395 | 1.19 | 0.62 | 1.21 | 0.64 | 3 | 3 | 280 | 971 |
| 657 | 16 51 41.786 | +43 43 58.90 | 17.27 | 17.41 | 124.58 | 3.13 | 2000.338 | 0.66 | 0.37 | 0.67 | 0.40 | 1 | 1 | 682 | 2133 |
| 658 | 16 52 43.732 | +45 47 21.91 | 17.60 | 17.76 | 65.97 | 4.59 | 2003.481 | 0.98 | 0.54 | 1.03 | 0.57 | 2 | 2 | 381 | 1749 |
| 659 | 16 54 52.296 | +41 38 22.09 | 18.30 | 18.37 | 198.07 | 4.51 | 2001.225 | 0.62 | 0.31 | 0.65 | 0.29 | 0 | 0 | 1275 | 5754 |
| 660 | 16 55 38.908 | +61 10 20.81 | 15.63 | 15.83 | 180.33 | 3.55 | 2000.258 | 0.61 | 0.34 | 0.65 | 0.36 | 0 | 0 | 359 | 1275 |
| 661 | 16 56 52.832 | +38 23 29.08 | 18.40 | 18.80 | 214.64 | 4.75 | 2001.225 | 1.05 | 0.55 | 1.11 | 0.58 | 2 | 3 | 515 | 2442 |
| 662 | 16 57 13.144 | +46 05 28.74 | 17.36 | 17.60 | 90.18 | 4.26 | 2005.417 | 0.87 | 0.47 | 0.94 | 0.49 | 2 | 2 | 446 | 1901 |
| 663 | 16 57 55.274 | +39 18 09.36 | 18.65 | 19.22 | 354.85 | 3.83 | 2001.395 | 0.75 | 0.36 | 0.90 | 0.41 | 1 | 1 | 1131 | 4325 |
| 664 | 16 58 00.816 | +49 31 13.85 | 17.15 | 17.31 | 169.30 | 4.04 | 2005.417 | 0.66 | 0.32 | 0.70 | 0.35 | 0 | 1 | 688 | 2777 |
| 665 | 16 58 44.204 | +44 28 33.50 | 18.58 | 19.02 | 36.04 | 4.40 | 2004.453 | 0.91 | 0.47 | 1.05 | 0.50 | 2 | 2 | 733 | 3221 |
| 666 | 16 59 16.887 | +46 13 04.93 | 18.56 | 18.85 | 90.13 | 4.65 | 2005.417 | 0.97 | 0.51 | 1.04 | 0.53 | 2 | 2 | 645 | 3002 |
| 667 | 16 59 35.783 | +41 06 22.70 | 15.73 | 16.11 | 271.45 | 3.55 | 2000.338 | 1.03 | 0.54 | 1.09 | 0.57 | 2 | 3 | 156 | 554 |
| 668 | 17 02 17.720 | +45 23 10.56 | 17.31 | 17.70 | 201.67 | 3.01 | 2005.444 | 1.10 | 0.56 | 1.17 | 0.62 | 3 | 3 | 278 | 838 |
| 669 | 17 03 03.370 | +63 33 59.78 | 15.98 | 16.07 | 85.11 | 3.10 | 2006.331 | 0.81 | 0.47 | 0.83 | 0.47 | 1 | 2 | 264 | 818 |
| 670 | 17 04 10.214 | +31 59 14.55 | 17.91 | 17.98 | 237.96 | 3.52 | 2001.392 | 1.12 | 0.58 | 1.15 | 0.59 | 3 | 3 | 339 | 1195 |
| 671 | 17 05 22.740 | +64 39 59.92 | 16.18 | 16.52 | 217.10 | 4.21 | 2006.394 | 0.95 | 0.48 | 1.01 | 0.52 | 2 | 2 | 233 | 980 |
| 672 | 17 08 26.633 | +57 57 59.07 | 16.39 | 16.47 | 98.61 | 3.90 | 2000.259 | 0.71 | 0.41 | 0.73 | 0.40 | 1 | 1 | 405 | 1578 |
| 673 | 17 08 41.021 | +34 30 03.63 | 16.97 | 17.38 | 68.76 | 4.68 | 2001.291 | 1.08 | 0.53 | 1.17 | 0.56 | 2 | 3 | 256 | 1200 |
| 674 | 17 09 07.104 | +34 22 46.54 | 16.93 | 17.07 | 303.78 | 3.41 | 2001.291 | 0.72 | 0.37 | 0.75 | 0.39 | 1 | 1 | 534 | 1817 |
| 675 | 17 09 32.703 | +43 24 18.35 | 17.68 | 17.81 | 89.60 | 3.76 | 2005.435 | 0.70 | 0.37 | 0.72 | 0.41 | 1 | 1 | 768 | 2886 |
| 676 | 17 10 16.584 | +58 00 36.93 | 19.40 | 19.66 | 321.34 | 4.50 | 2000.259 | 1.51 | 0.80 | 1.53 | 0.84 | 5 | 5 | 289 | 1301 |
| 677 | 17 15 06.523 | +36 04 20.80 | 18.03 | 18.35 | 222.45 | 3.27 | 2004.453 | 0.99 | 0.55 | 1.09 | 0.56 | 2 | 3 | 460 | 1506 |
| 678 | 17 17 56.272 | +67 17 13.47 | 18.27 | 18.50 | 244.14 | 3.23 | 2000.264 | 1.27 | 0.67 | 1.34 | 0.70 | 3 | 4 | 281 | 905 |
| 679 | 17 19 21.236 | +40 44 20.98 | 18.65 | 18.69 | 140.80 | 3.82 | 2005.365 | 1.51 | 0.74 | 1.53 | 0.76 | 4 | 4 | 212 | 809 |
| 680 | 17 22 54.086 | +44 40 22.17 | 17.28 | 17.50 | 79.31 | 4.81 | 2005.444 | 1.21 | 0.64 | 1.27 | 0.66 | 3 | 3 | 205 | 984 |
| 681 | 17 26 51.332 | +52 32 00.83 | 17.24 | 17.34 | 262.16 | 4.70 | 2000.259 | 1.09 | 0.64 | 1.09 | 0.66 | 3 | 3 | 244 | 1146 |
| 682 | 17 29 27.129 | +35 32 04.52 | 18.35 | 18.64 | 244.18 | 4.97 | 2005.365 | 0.65 | 0.33 | 0.70 | 0.37 | 0 | 1 | 1203 | 5981 |
| 683 | 17 31 33.155 | +36 43 43.48 | 17.51 | 17.89 | 346.93 | 3.56 | 2005.365 | 0.68 | 0.31 | 0.78 | 0.31 | 0 | 1 | 822 | 2929 |
| 684 | 17 33 21.812 | +43 06 26.44 | 18.11 | 18.28 | 238.45 | 3.77 | 2005.444 | 1.27 | 0.63 | 1.30 | 0.66 | 3 | 4 | 279 | 1053 |
| 685 | 17 35 18.763 | +50 57 16.71 | 17.30 | 17.44 | 180.95 | 3.50 | 2001.717 | 1.04 | 0.54 | 1.07 | 0.54 | 2 | 2 | 316 | 1105 |
| 686 | 17 38 20.012 | +26 56 31.55 | 17.77 | 18.29 | 43.01 | 4.98 | 2004.710 | 0.96 | 0.46 | 1.07 | 0.50 | 2 | 2 | 492 | 2448 |
| 687 | 20 35 46.849 | -20 18 49.81 | 19.21 | 19.23 | 300.26 | 4.21 | 2004.699 | 1.41 | 0.75 | 1.43 | 0.75 | 4 | 4 | 319 | 1340 |
| 688 | 21 35 43.302 | -08 49 45.58 | 17.78 | 18.00 | 260.63 | 4.97 | 2001.717 | 1.02 | 0.55 | 1.07 | 0.58 | 2 | 3 | 388 | 1926 |
| 689 | 21 36 04.565 | +08 05 55.09 | 17.96 | 18.06 | 250.66 | 4.20 | 2008.827 | 1.16 | 0.58 | 1.19 | 0.60 | 3 | 3 | 328 | 1379 |
| 690 | 21 45 29.916 | -05 34 49.80 | 18.39 | 18.59 | 287.17 | 3.01 | 2004.707 | 0.91 | 0.49 | 0.96 | 0.49 | 2 | 2 | 671 | 2019 |
| 691 | 21 47 31.006 | -05 40 25.78 | 17.83 | 18.17 | 32.70 | 3.19 | 2004.707 | 0.98 | 0.48 | 1.03 | 0.53 | 2 | 2 | 475 | 1516 |
| 692 | 22 53 31.306 | -19 26 19.38 | 17.03 | 17.54 | 7.68 | 4.35 | 2004.953 | 0.87 | 0.50 | 0.98 | 0.56 | 2 | 2 | 369 | 1605 |
| 693 | 23 09 04.928 | -10 18 29.11 | 18.02 | 18.12 | 359.40 | 3.33 | 2001.718 | 1.18 | 0.64 | 1.18 | 0.67 | 3 | 3 | 305 | 1014 |
| 694 | 23 09 46.721 | -00 33 56.34 | 15.38 | 15.41 | 194.75 | 4.20 | 2004.775 | 1.22 | 0.67 | 1.23 | 0.67 | 3 | 3 | 81 | 339 |
| 695 | 23 15 42.553 | -07 04 21.92 | 18.56 | 19.09 | 126.42 | 3.07 | 2009.788 | 1.20 | 0.61 | 1.26 | 0.70 | 3 | 4 | 398 | 1222 |
| 696 | 23 16 15.779 | -20 31 16.31 | 17.82 | 18.35 | 124.82 | 4.03 | 2004.953 | 0.72 | 0.41 | 0.85 | 0.45 | 1 | 1 | 762 | 3068 |
| 697 | 23 18 04.543 | -20 33 33.02 | 18.35 | 18.97 | 142.26 | 3.52 | 2004.953 | 0.54 | 0.33 | 0.69 | 0.41 | 0 | 1 | 1372 | 4825 |
| 698 | 23 20 52.280 | -09 34 46.21 | 18.47 | 18.92 | 90.20 | 4.65 | 2000.737 | 1.17 | 0.64 | 1.23 | 0.69 | 3 | 3 | 391 | 1814 |
| 699 | 23 25 16.693 | +16 20 29.71 | 15.96 | 16.57 | 267.23 | 4.06 | 2006.717 | 1.32 | 0.74 | 1.43 | 0.80 | 4 | 4 | 85 | 343 |
| 700 | 23 28 23.793 | -20 17 22.41 | 16.85 | 16.93 | 131.23 | 3.19 | 2004.953 | 0.53 | 0.33 | 0.54 | 0.34 | 0 | 0 | 716 | 2284 |

*Table continues on next page.*

| # | PRIMARY | | MAGNITUDE | | PA | SEP | DATE | PRIMARY | | SECONDARY | | TYPE | TYPE | DIST. | SEP. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | DECL | A | B | | | | R-I | I-Z | R-I | I-Z | M+ | M+ | PARSEC | AU |
| 701 | 23 32 41.903 | -20 45 41.54 | 19.28 | 19.58 | 296.57 | 4.92 | 2004.953 | 1.52 | 0.75 | 1.62 | 0.79 | 4 | 5 | 273 | 1344 |
| 702 | 23 38 49.727 | +00 33 50.02 | 16.78 | 17.01 | 68.11 | 3.10 | 2003.741 | 0.59 | 0.32 | 0.63 | 0.33 | 0 | 0 | 655 | 2033 |
| 703 | 23 39 14.251 | -03 24 00.64 | 17.15 | 17.48 | 30.59 | 4.12 | 2008.830 | 0.83 | 0.42 | 0.87 | 0.47 | 1 | 2 | 470 | 1938 |
| 704 | 23 42 40.729 | -06 22 24.08 | 16.50 | 16.59 | 209.07 | 3.77 | 2009.788 | 1.14 | 0.65 | 1.15 | 0.66 | 3 | 3 | 159 | 598 |
| 705 | 23 43 22.280 | -01 14 08.72 | 18.10 | 18.68 | 315.08 | 3.80 | 2003.741 | 0.75 | 0.38 | 0.88 | 0.44 | 1 | 2 | 857 | 3255 |
| 706 | 23 44 04.566 | +15 34 33.78 | 17.55 | 17.87 | 174.27 | 4.47 | 2000.740 | 1.21 | 0.64 | 1.28 | 0.67 | 3 | 4 | 233 | 1040 |
| 707 | 23 44 55.423 | -10 46 15.55 | 16.84 | 16.98 | 27.23 | 3.28 | 2000.879 | 0.95 | 0.44 | 0.98 | 0.47 | 2 | 2 | 325 | 1065 |
| 708 | 23 45 16.291 | -02 56 27.94 | 18.17 | 18.41 | 130.66 | 3.04 | 2008.830 | 1.19 | 0.69 | 1.27 | 0.72 | 3 | 4 | 292 | 890 |
| 709 | 23 45 27.744 | +00 54 46.16 | 17.81 | 17.87 | 182.57 | 3.76 | 2003.741 | 0.90 | 0.45 | 0.91 | 0.48 | 2 | 2 | 541 | 2030 |
| 710 | 23 46 12.724 | -19 40 26.55 | 17.17 | 17.35 | 296.15 | 3.46 | 2004.953 | 1.01 | 0.57 | 1.04 | 0.57 | 2 | 3 | 296 | 1026 |
| 711 | 23 49 37.863 | +00 39 54.90 | 16.73 | 17.09 | 275.32 | 3.81 | 2001.881 | 0.60 | 0.28 | 0.67 | 0.33 | 0 | 0 | 653 | 2486 |
| 712 | 23 52 34.681 | -06 53 40.90 | 18.72 | 19.01 | 191.98 | 3.47 | 2009.788 | 1.22 | 0.65 | 1.28 | 0.65 | 3 | 3 | 403 | 1397 |
| 713 | 23 54 52.710 | +16 54 08.16 | 18.75 | 19.05 | 354.61 | 4.87 | 2008.754 | 0.97 | 0.52 | 1.05 | 0.55 | 2 | 2 | 686 | 3342 |

*(Continued from page 43)*

## Acknowledgements

This research has made use of the Washington Double Star Catalog maintained at the U.S. Naval Observatory and the VizieR database of astronomical catalogs, maintained at the Centre de Données Astronomiques, Strasbourg, France.

Funding for SDSS-III has been provided by the Alfred P. Sloan Foundation, the Participating Institutions, the National Science Foundation, and the U.S. Department of Energy Office of Science.

The SDSS-III web site is http://www.sdss3.org/. SDSS-III is managed by the Astrophysical Research-Consortium.

## References

Bochanski, J. J., *et al*., 2010, *AJ*, **139**, 6.

Chivers, J., 2014, JDSO, **10**, 1.

Chivers, J., 2014, JDSO, **10**, 4.

Christopher P. Ahn, et al., 2012, *ApJS*, **203,** 21.

West, A. A., et al., 2011, *AJ*, **141**, 97.