

351 New Common Proper-Motion Pairs from the Sloan Digital Sky Survey

Rafael Caballero

Agrupación Astronómica Hubble
Martos, Jaén, Spain

Email: rafa@sip.ucm.es

Abstract: This paper presents 351 previously uncataloged pairs with separation under 100 arcseconds and proper motion over 70 milliseconds of arc/year. These pairs are the result of an extensive study that started with 96,205 candidate pairs from the Sloan Digital Survey (SDSS). Different criteria explained in the paper are applied to increase the probability of a physical bound between the components.

Introduction

This paper presents 351 new common proper motion pairs (CPMP's) obtained from the seventh data release of the Sloan Digital Sky Survey (SDSS-DR7, Abazajian et al. 2009). The characteristics of the pairs are:

- Separation between 6 and 100 arcseconds
- Proper motion over 70 milliseconds of arc/year

The idea of using the SDSS for obtaining new pairs is not new. A first list of wide double stars in this catalog was proposed by Sesar, Ivezić, and Jurić (2008). By using the DR6 version of the catalog the authors considered stars with proper motion over 15 milliseconds of arc/year, matched components to within 5 milliseconds of arc/year, and identified 22,000 total candidates with excellent completeness, but with a one third of them expected to be false positives. Also, Longhitano and Binggeli (2010), presented a statistical research based on this catalog. However, due to the large number of false positives, the results of these papers could not be included in

the the WDS (Washington Double Star Catalog, Mason et al., 2003). Dhital et al. (2010) takes a different approach, trying to minimize the number of false positives. The more than 1000 pairs obtained have been included in the WDS.

The purpose of this paper is similar: starting with a set of candidates from the SDSS, we use several filters, either based on statistical or on physical properties, with the goal of eliminating chance alignments of stars. We also have checked the results, verifying that all the pairs presented appear with noticeable movement in the Aladin plates (Bonnarel et al., 2000). The CPMP's data and images obtained can be downloaded from <http://gpd.sip.ucm.es/rafa/astro/sdss>

Initial set of candidate pairs

In previous projects we had obtained the initial set of stars using VizieR (available from <http://vizier.u-strasbg.fr/viz-bin/VizieR>). However, this project involves a much larger number of stars, and a timeout error was obtained in VizieR when trying to obtain the initial set of stars. Fortunately, the SDSS project includes a Catalog Archive Server query tool (available from <http://casjobs.sdss.org/CasJobs/>). In particular this tool allows the user to define directly

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their SQL queries and save the result in the server. We started downloading those stars with r magnitude < 19 , and with proper motion over 50 milliseconds of arc/year. This yielded a set of 572,649 stars. Then the first set of candidates was obtained by finding all the pairs with separation under 100 seconds. This produced an initial set of candidates with 96,205 pairs.

Filters

Next we explain the different filters that we have used to reduce the possibility of chance alignments, that is, to increase the possibility of obtaining physically attached pairs.

1. Elimination of cataloged pairs

The WDS catalog was compared with our set of candidates, looking for already discovered pairs. This allowed eliminating about 200 pairs, most of them with identifier SLW (from the Sloan Digital Sky Survey SLoWPoKES Catalog, see Dhital et al. 2010).

2. Modified Halbwachs' criteria

Halbwachs (1986) defined the following three criteria for detecting physically attached pairs:

- (1) $(\mu_1 - \mu_2)^2 < -2(e_1^2 + e_2^2) \ln(0.05)$
- (2) $|\mu_1|, |\mu_2| \geq 0.05$
- (3) $\rho / |\mu_1|, \rho / |\mu_2| < 1000 \text{ yr}$

where μ_1, μ_2 are the two proper motion vectors in arcseconds/year, e_i is the mean error of the projections on the coordinate axes of μ_i , and ρ is the angular separation of the two stars. The first condition checks if the hypothesis $\mu_1 = \mu_2$ is admissible with a 95% confidence considering the given errors e_1 and e_2 . The second condition fixes a value of 50 milliseconds of arc/year as the minimum required for proper motion pairs. The third condition relates the separation and the proper motion.

In order to improve these criteria, the author proposes some improvements. The first one is to apply criterion (1) to both axes (RA and DEC) separately in order to reject different proper motion vectors. Also, it has been found that the original criteria allow some pairs with large proper motion differences. Therefore, an additional criterion is introduced: delete all the pairs verifying that the proper motion difference in any axis is:

- Greater than 10 milliseconds of arc/year, and,
- Greater than the 10% of the minimum of the two values

Finally, in the second criterion the 0.05 value is replaced by 0.07, which implies requiring that all the pairs must have proper motion over 70 milliseconds of arc/year.

After applying these more restrictive criteria, only 5690 pairs were left

3. Relating colors

According to Sesar et al. (2008) the inequality:

$$(r_1 - r_2) [(g - i)_1 - (g - i)_2] > 0;$$

where the subscript 1 is assigned to the brighter component, must be satisfied. This condition requires that the component with bluer $g - i$ color be brighter in the r band. This filter reduced the number of candidates to about 4723 pairs.

4. Reduced Proper Motion criterion

The Reduced Proper Motion (RPM) discriminator proposed by Salim & Gould (2003) requires both the V and J magnitudes for each component. In particular, the V magnitude was difficult to obtain for the fainter stars. In the cases where it was possible (about 60% of the sample), the criterion was applied. This eliminated about 20 pairs of the candidate set.

5. Checking the photographic plates

This step is necessary because all the catalogs include many errors, usually introduced during the catalog generation. Therefore, every pair was checked for two stars with noticeable motion and roughly the same astrometry data in the expected position. This was done applying the *assoc* and the *RGB* utilities included in Aladin. The surveys employed were the POSS I and POSS II plates corresponding to the Palomar Observatory Sky Surveys (Reid et al., 1991), and the SERC for the parts of the sky not covered by POSS II. The result of this last step was that only 351 of the 4700 candidates can be seen in the plates as CPMPs. Table 1 includes the data of the new pairs. The complete set of RGB compositions can be seen at: <http://gpd.sip.ucm.es/rafa/astro/sdss/images/photo.html>

Conclusions

The great numbers of surveys that can be accessed online provide an important resource for amateurs. In particular, they allow us to find new possible binaries. However, in order to increase the quality of the results, different criteria must be employed in order to eliminate as many line-of-sight pairs as possible. Although we cannot ensure that the 351 CPMP's proposed in this paper are true binaries, the

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number of criteria applied indicate that they are at least good candidates that deserve a deeper study.

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RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
00 16 26.98 -11 55 51.2	15.21 18.96	59.89	10.80	1994.952	+102.0 +2.0	+107.0 +5.0
00 17 05.88 -12 04 44.6	16.58 17.01	117.47	80.26	1994.952	+88.0 -14.0	+88.0 -9.0
00 21 16.56 -09 55 03.9	15.68 18.95	4.75	21.03	2000.737	+83.0 +3.0	+84.0 +3.0
00 46 36.93 -22 41 52.2	13.09 14.39	290.99	36.08	1994.985	+55.0 -56.0	+55.0 -56.0
01 02 18.55 +00 25 39.1	15.08 18.09	0.37	63.90	2002.679	+85.0 -28.0	+85.0 -32.0
01 11 50.94 +26 46 16.8	14.17 17.67	234.99	20.77	2004.653	+38.0 -68.0	+34.0 -69.0
01 12 50.16 +20 06 50.2	14.50 14.85	334.12	20.91	2004.707	+76.0 -45.0	+78.0 -46.0
01 19 29.98 -00 02 29.5	14.46 16.05	119.94	18.58	2001.890	-10.0 -149.0	-8.0 -149.0
01 19 33.88 +24 49 56.1	16.52 16.79	266.24	64.53	2004.707	-12.0 -72.0	-9.0 -71.0
02 17 23.13 +70 45 37.4	16.70 18.34	148.42	31.64	2005.841	-59.0 +73.0	-61.0 +71.0
02 20 13.79 +05 34 36.2	16.78 17.35	97.92	28.51	2005.781	+15.0 -71.0	+14.0 -69.0
02 32 43.91 +74 08 54.7	18.31 18.51	160.89	14.76	2005.841	+211.0 -57.0	+207.0 -56.0
02 33 01.17 +01 05 38.8	15.63 16.09	344.56	29.13	2001.890	+134.0 -47.0	+147.0 -44.0
02 46 54.25 -02 18 59.1	13.48 19.53	307.29	23.72	1996.242	+73.0 -11.0	+73.0 -14.0
03 04 29.29 +00 03 20.4	15.43 16.27	186.09	84.41	2002.679	+80.0 -28.0	+82.0 -27.0
03 04 50.47 +37 56 10.2	18.49 18.95	129.20	8.01	1994.172	+130.0 -60.0	+122.0 -56.0
03 05 46.37 +01 45 40.7	16.39 17.54	333.30	28.47	2004.954	-17.0 -131.0	-12.0 -130.0
03 06 35.88 +00 25 47.5	15.48 16.43	335.84	30.03	2002.679	-38.0 -69.0	-40.0 -66.0
03 15 26.76 +02 27 31	13.95 19.04	58.54	21.48	1995.051	+36.0 -67.0	+36.0 -68.0
03 17 45.82 +00 59 36.2	18.00 19.16	97.04	11.91	2002.679	-51.0 -53.0	-56.0 -55.0
03 26 36.25 +05 10 11.7	15.95 16.36	84.78	41.13	2004.953	+73.0 -4.0	+79.0 +1.0
03 48 20.76 +11 03 14.4	17.98 18.07	308.30	54.01	1995.051	-11.0 -74.0	-8.0 -71.0
03 52 48.82 +00 19 28.6	15.96 18.19	102.53	16.58	2001.890	-42.0 -106.0	-42.0 -100.0
04 23 16.87 +17 00 41.6	16.18 17.64	335.36	28.31	1995.051	+85.0 -11.0	+86.0 -6.0
04 30 06.37 +09 02 27.8	15.57 16.23	251.98	16.11	1995.076	-33.0 -69.0	-31.0 -71.0
04 48 04.93 +59 40 35.2	16.40 16.40	358.24	22.09	2004.790	+86.0 -71.0	+83.0 -69.0
05 06 12.74 +61 31 46	14.76 18.97	78.60	43.05	2004.951	+55.0 -59.0	+58.0 -65.0
05 30 46.74 -00 34 04.3	15.84 18.01	283.66	15.11	1996.124	-84.0 -128.0	-83.0 -131.0
05 31 09.56 +63 20 40.6	15.53 17.99	71.93	27.13	2004.951	+44.0 -112.0	+48.0 -115.0
05 39 45.69 +19 04 19.6	15.01 19.03	248.03	19.61	1995.076	+20.0 -72.0	+25.0 -77.0
06 07 52.65 +35 20 30.5	14.40 18.00	23.02	11.93	1995.065	+44.0 -80.0	+46.0 -80.0
06 13 55.36 +05 14 22.6	13.99 17.72	46.35	67.24	1996.125	+7.0 -78.0	+13.0 -76.0
06 40 27.16 +64 15 14.3	14.91 16.91	25.07	14.38	2004.951	+11.0 -140.0	+11.0 -137.0
07 27 50.79 +42 28 19	15.99 17.83	172.80	32.09	2003.886	+53.0 -146.0	+52.0 -145.0
07 28 20.78 +31 00 11.7	15.06 17.83	296.12	9.40	1995.128	+25.0 -143.0	+20.0 -141.0
07 35 40.38 +27 49 25.3	15.53 16.77	102.42	17.56	2001.966	-83.0 -52.0	-81.0 -52.0

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RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
07 47 23.50 +24 38 23.7	18.10 18.82	312.08	35.78	2000.740	+136.0 -68.0	+137.0 -70.0
07 58 50.08 +46 26 41.6	15.57 17.53	326.97	12.99	2000.315	-88.0 +7.0	-88.0 +6.0
08 00 30.27 +51 31 54.6	13.86 17.67	164.76	17.57	2003.886	-9.0 -75.0	-12.0 -70.0
08 01 29.38 +19 40 39.5	13.83 18.96	131.35	57.41	2004.129	+29.0 -81.0	+28.0 -80.0
08 04 49.03 +19 20 00.9	12.40 16.12	301.03	39.20	2004.209	-31.0 -72.0	-31.0 -69.0
08 05 19.03 +11 06 44.6	14.74 17.75	296.37	14.96	2005.830	+36.0 -83.0	+39.0 -82.0
08 05 32.28 +31 24 51.6	12.94 18.66	120.92	25.07	2001.890	-38.0 -98.0	-37.0 -102.0
08 09 32.51 +54 06 26.6	16.23 18.97	180.52	64.75	2003.913	+20.0 -69.0	+16.0 -69.0
08 14 12.84 +14 08 49.6	15.69 18.33	36.07	21.97	2004.970	-66.0 -69.0	-62.0 -72.0
08 14 43.65 +46 50 36.5	15.84 18.62	8.70	15.97	2000.740	-48.0 -73.0	-46.0 -71.0
08 19 47.96 +42 27 24.9	14.74 18.68	9.23	29.90	2000.979	-8.0 -94.0	-1.0 -94.0
08 20 02.34 +48 23 19.8	15.21 16.25	291.54	45.19	2000.258	-108.0 -78.0	-106.0 -77.0
08 20 59.44 +17 02 48.7	18.27 19.54	283.35	30.62	2004.946	+55.0 -76.0	+57.0 -82.0
08 22 00.54 +82 16 30.5	15.21 16.61	26.13	28.62	1994.235	-58.0 -47.0	-59.0 -53.0
08 22 31.76 +37 27 47.6	13.41 19.18	50.77	32.97	2001.967	-48.0 -130.0	-41.0 -129.0
08 25 06.62 +12 13 47.5	17.85 18.15	124.45	51.19	2005.194	-51.0 -55.0	-54.0 -62.0
08 25 52.69 +29 25 16.8	18.87 19.35	288.26	16.30	2002.950	-39.0 -86.0	-31.0 -83.0
08 29 25.73 +30 33 45.5	13.49 16.60	312.89	16.91	2002.950	-59.0 -58.0	-54.0 -60.0
08 30 00.61 +28 14 21.5	15.06 18.29	307.04	37.21	2002.999	-104.0 -49.0	-110.0 -57.0
08 30 55.74 +32 59 21.1	17.15 18.84	157.46	65.15	2002.106	-32.0 -66.0	-41.0 -63.0
08 31 04.59 +15 08 59.6	15.57 17.06	284.76	47.17	2005.047	+52.0 -54.0	+53.0 -54.0
08 32 49.93 +11 56 13.5	14.60 19.27	250.65	18.58	2005.860	+4.0 -73.0	+11.0 -72.0
08 33 12.08 +26 45 51.7	14.80 18.84	207.83	43.02	2003.078	-84.0 -30.0	-90.0 -37.0
08 33 51.86 +24 26 12.8	17.64 19.29	69.67	42.67	2003.971	-61.0 +121.0	-63.0 +117.0
08 33 54.63 +12 19 48.3	13.64 14.62	295.73	38.68	2001.145	+59.0 -46.0	+58.0 -46.0
08 34 48.64 +22 57 52	15.32 18.31	300.68	27.69	2004.211	-54.0 -89.0	-63.0 -93.0
08 37 33.67 +24 41 31.6	14.51 18.36	132.78	99.64	2004.130	-158.0 -121.0	-154.0 -128.0
08 39 42.71 +18 01 25.4	15.31 16.30	206.05	28.22	2001.146	-86.0 +9.0	-83.0 +10.0
08 43 34.72 +63 08 26.8	15.03 17.78	199.41	19.56	2003.914	-46.0 -60.0	-45.0 -61.0
08 43 54.05 +58 28 47.1	16.08 16.96	347.24	23.29	2003.810	-26.0 -72.0	-28.0 -75.0
08 46 24.02 +24 02 12.4	16.80 17.32	110.30	22.20	2004.212	-79.0 -71.0	-78.0 -73.0
08 50 53.57 +57 57 32.2	13.95 16.29	282.79	45.72	2003.812	-57.0 -73.0	-62.0 -69.0
08 51 35.02 +35 31 45.7	14.62 17.81	191.08	18.74	2002.106	-42.0 -91.0	-39.0 -90.0
08 52 31.52 +54 44 01.9	14.11 19.14	152.45	29.75	2001.213	+6.0 -118.0	+14.0 -117.0
08 56 16.24 +13 32 26.7	14.03 15.39	255.86	99.30	1994.172	-35.0 +113.0	-38.0 +113.0
09 08 52.09 +25 28 09.1	13.06 18.40	66.65	44.39	2004.288	-58.0 -57.0	-54.0 -63.0

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RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
09 10 03.05 +21 32 59.8	15.90 17.92	189.14	24.42	2004.956	-76.0 -19.0	-76.0 -13.0
09 12 13.45 +28 38 06.5	18.52 19.41	295.66	36.81	2004.209	-18.0 -74.0	-18.0 -78.0
09 13 23.70 +47 09 08.4	12.89 19.07	138.47	14.88	2001.290	+44.0 -67.0	+50.0 -73.0
09 17 59.87 +51 38 16	15.18 15.45	184.76	24.41	2001.287	-83.0 -72.0	-77.0 -67.0
09 25 07.78 +63 58 18.1	14.27 16.07	296.17	14.20	2001.457	-61.0 -108.0	-63.0 -105.0
09 26 34.96 +45 47 22.9	13.90 16.99	259.14	13.37	2001.890	+6.0 -70.0	+6.0 -70.0
09 27 54.14 +28 38 21.7	14.66 16.82	115.43	45.78	2004.212	-102.0 -50.0	-105.0 -52.0
09 29 44.91 +24 32 01.8	15.16 15.92	84.89	27.31	2004.367	-26.0 -93.0	-22.0 -95.0
09 29 58.48 +35 51 40.5	14.53 17.91	68.23	11.45	2003.067	-52.0 -47.0	-48.0 -52.0
09 30 07.88 +05 43 01.4	15.35 16.70	203.78	11.13	2002.12	+83.0 -94.0	+85.0 -98.0
09 30 10.14 +39 19 44	14.51 15.46	289.88	15.35	2002.851	-57.0 -52.0	-59.0 -53.0
09 35 18.99 +52 31 37.4	14.95 15.80	194.75	14.30	2001.287	-6.0 -91.0	-9.0 -92.0
09 35 31.66 +15 14 10.6	17.47 17.70	85.45	15.99	2005.356	-120.0 +5.0	-122.0 +1.0
09 35 58.70 +52 41 36.4	12.78 16.81	253.18	16.03	2001.287	-56.0 -68.0	-57.0 -73.0
09 36 35.32 +60 39 24.6	14.08 15.62	173.11	65.63	2000.321	-55.0 -46.0	-55.0 -46.0
09 42 22.52 +64 22 23	13.05 18.39	277.53	14.80	2003.81	-174.0 -61.0	-172.0 -60.0
09 42 41.04 +33 33 38.9	14.75 16.39	242.62	45.59	2003.316	-75.0 -12.0	-73.0 -11.0
09 49 53.28 +50 17 15.2	16.35 16.39	310.57	21.22	2001.888	-86.0 -28.0	-92.0 -24.0
09 51 24.13 +24 55 51.5	16.87 18.57	84.16	21.48	2004.951	+51.0 -56.0	+53.0 -57.0
09 54 23.33 +42 19 45.4	16.27 16.56	229.54	27.21	2002.851	-71.0 +19.0	-73.0 +15.0
09 54 35.54 +26 58 00.1	16.84 17.43	336.50	28.97	2004.367	-26.0 -79.0	-27.0 -77.0
09 55 25.45 +13 42 37.5	16.13 17.68	206.93	57.95	1994.326	+51.0 -56.0	+49.0 -53.0
09 57 03.39 +26 39 04.2	13.69 15.98	101.29	50.57	2004.946	-71.0 -32.0	-68.0 -35.0
10 00 17.81 +68 29 03.4	17.79 18.70	13.34	15.51	2003.914	-47.0 -62.0	-42.0 -66.0
10 02 43.44 +40 09 48.2	15.68 17.57	33.03	29.96	2002.999	-127.0 -24.0	-125.0 -19.0
10 02 50.04 +10 05 39.4	12.46 17.33	314.47	69.96	2002.953	-47.0 -73.0	-46.0 -72.0
10 04 17.82 +47 31 51.7	16.23 18.28	334.91	26.42	2002.035	-79.0 +10.0	-77.0 +5.0
10 06 23.07 +07 12 12.6	16.03 18.91	175.40	18.46	2001.788	+35.0 -67.0	+34.0 -65.0
10 09 38.24 +40 41 14.3	16.76 17.02	203.84	35.29	2002.999	-60.0 -73.0	-64.0 -72.0
10 10 15.24 +47 25 07.6	14.16 15.19	134.42	19.58	2001.970	-19.0 -70.0	-20.0 -71.0
10 10 18.68 +01 07 19.8	16.88 18.21	113.92	8.64	2000.979	-106.0 +35.0	-99.0 +36.0
10 14 01.60 +03 05 50.3	18.26 18.32	277.62	26.50	2000.343	+106.0 -104.0	+104.0 -102.0
10 14 12.19 +31 18 13.3	14.41 18.22	262.37	43.05	2004.291	-81.0 -35.0	-88.0 -34.0
10 14 31.93 +01 53 09.7	15.48 17.21	225.95	21.24	2000.343	-131.0 -50.0	-127.0 -54.0
10 22 08.98 +34 27 02	17.62 17.97	70.55	28.14	2004.212	-65.0 -30.0	-63.0 -31.0
10 23 50.47 +31 52 45.5	15.67 15.96	38.64	39.33	2004.288	-70.0 +7.0	-72.0 +7.0

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RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
10 25 20.17 +30 57 42.1	18.23 18.91	112.64	35.09	2004.288	-78.0 -65.0	-83.0 -62.0
10 28 54.79 +33 48 01.7	14.41 16.93	285.76	20.29	2004.083	-42.0 -67.0	-42.0 -65.0
10 29 58.12 +00 43 16.8	11.69 17.81	274.82	30.44	1999.220	+29.0 -88.0	+38.0 -85.0
10 31 03.06 +05 59 39.5	18.74 18.80	32.11	28.27	2002.120	-39.0 -85.0	-32.0 -85.0
10 32 18.86 +27 59 25.9	13.22 15.98	265.67	30.38	2004.957	-71.0 +19.0	-68.0 +19.0
10 37 28.27 +29 31 32.8	13.02 16.45	324.77	43.96	2004.970	-80.0 -59.0	-76.0 -59.0
10 38 41.16 +02 06 38.4	12.80 17.98	303.01	24.75	2000.979	-89.0 +6.0	-90.0 +7.0
10 40 15.25 +36 05 31.6	14.01 17.04	177.18	19.96	2003.316	-24.0 -78.0	-22.0 -72.0
10 40 25.69 +61 53 25.8	13.3 0 17.99	127.72	40.92	2002.120	-82.0 -102.0	-81.0 -110.0
10 45 01.14 +25 37 15.4	15.34 18.46	298.65	9.85	2004.973	-91.0 -33.0	-96.0 -38.0
10 50 04.73 +59 51 50.1	14.23 16.00	113.02	13.52	2000.908	-54.0 -60.0	-51.0 -63.0
10 50 12.05 +32 41 10.2	16.01 18.57	287.82	8.95	2004.291	-75.0 +20.0	-67.0 +23.0
10 50 47.21 +62 04 48.5	18.18 18.31	48.92	19.26	2000.258	-70.0 -13.0	-78.0 -16.0
10 53 06.72 +03 40 17.7	13.49 18.79	129.47	24.33	2001.140	-88.0 +2.0	-85.0 +3.0
10 54 16.19 +00 02 58.8	15.40 16.90	117.27	42.13	1995.541	+104.0 -102.0	+109.0 -103.0
10 59 46.73 +22 42 46.7	18.09 18.36	352.33	25.12	2005.096	+35.0 -98.0	+36.0 -94.0
11 00 05.29 +42 43 18.2	16.53 18.76	322.85	12.03	2003.226	-46.0 -80.0	-47.0 -80.0
11 02 01.89 +23 53 07.9	15.52 16.60	118.95	97.80	2002.350	-146.0 -96.0	-146.0 -92.0
11 02 24.47 +24 35 44.5	14.62 18.62	226.84	63.78	2005.096	-123.0 -5.0	-120.0 -8.0
11 02 47.68 +30 18 45	14.37 17.75	310.00	17.47	2004.362	-95.0 -11.0	-99.0 -7.0
11 07 53.89 +41 54 58.1	12.30 18.60	90.21	60.26	2003.313	-97.0 +3.0	-99.0 +1.0
11 09 51.06 +47 37 08.6	14.12 18.35	301.79	10.49	2002.106	-112.0 -9.0	-114.0 -6.0
11 11 42.91 +06 32 45.8	14.25 18.80	166.13	13.20	2002.120	+34.0 -73.0	+40.0 -80.0
11 11 57.06 +04 58 22.4	15.18 17.77	289.02	24.58	2001.290	-87.0 -55.0	-88.0 -51.0
11 15 22.27 +02 51 32.3	17.04 18.33	186.90	47.77	2000.343	+75.0 -32.0	+67.0 -40.0
11 15 48.96 +32 02 14.4	14.02 18.88	156.89	38.88	2004.362	+5.0 -84.0	+8.0 -87.0
11 16 44.03 +07 14 06.5	14.41 17.64	246.97	22.98	2003.248	+44.0 -66.0	+49.0 -66.0
11 18 21.04 +29 13 08	17.74 18.53	237.84	16.48	2004.951	-106.0 -28.0	-100.0 -25.0
11 20 12.17 +25 28 21.5	15.92 16.57	116.30	21.60	2005.096	-19.0 -113.0	-19.0 -110.0
11 21 45.09 +02 16 58	14.41 18.88	98.67	10.60	2000.979	+9.0 -131.0	+12.0 -141.0
11 21 58.65 +54 44 48.7	15.68 15.95	163.5	30.97	2002.999	-77.0 -44.0	-74.0 -46.0
11 26 44.77 +25 03 16.3	16.32 17.68	355.39	12.35	2003.076	-80.0 -38.0	-78.0 -39.0
11 27 24.67 +04 35 06.4	12.67 15.84	259.48	64.66	2001.290	-74.0 +3.0	-74.0 +2.0
11 29 59.10 +24 47 06.6	15.67 16.89	75.64	19.82	2005.096	-76.0 -4.0	-75.0 -3.0
11 31 42.15 -08 44 51.5	16.51 18.55	183.90	25.57	1994.266	-90.0 +7.0	-96.0 +7.0
11 33 30.32 +33 08 29.5	13.62 16.79	211.24	56.84	2004.367	-110.0 -9.0	-107.0 -13.0

Table continued on next page.

351 New Common Proper-Motion Pairs from the Sloan Digital Sky Survey

RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
11 33 59.84 +16 56 46.8	17.11 17.50	328.79	64.55	2005.427	-130.0 -46.0	-124.0 -47.0
11 35 40.32 +04 57 29.7	15.42 19.60	30.53	10.16	2001.290	-239.0 +43.0	-230.0 +34.0
11 37 15.80 +31 56 52.3	15.78 17.41	261.54	26.29	2004.368	-147.0 -17.0	-146.0 -21.0
11 39 30.94 -02 08 16.4	15.25 17.91	128.75	13.26	2000.116	-102.0 +62.0	-99.0 +67.0
11 40 07.53 +37 57 43.2	12.37 16.17	196.41	18.55	2003.087	-91.0 -3.0	-93.0 -8.0
11 43 42.12 +54 57 44.4	15.80 17.58	175.93	29.45	2001.964	-91.0 +24.0	-91.0 +22.0
11 44 08.82 +19 14 20.5	14.87 16.47	212.75	15.15	2005.252	-106.0 -18.0	-105.0 -15.0
11 44 54.22 +14 26 20.9	14.22 18.88	203.08	31.78	2003.076	-93.0 -45.0	-93.0 -41.0
11 45 10.15 +31 50 01.2	14.11 17.54	138.83	29.10	2004.362	-75.0 +49.0	-77.0 +50.0
11 45 17.40 +03 19 25.7	13.76 16.27	316.95	87.84	2000.343	-76.0 -118.0	-75.0 -120.0
11 45 46.44 +17 50 40.2	14.90 16.68	351.08	87.43	2003.180	-122.0 +19.0	-123.0 +15.0
11 46 46.23 -03 33 54.7	13.72 17.48	175.82	61.84	2000.171	-82.0 +24.0	-82.0 +16.0
11 46 57.13 +20 56 18.6	15.20 15.23	261.60	25.31	2005.252	-83.0 -13.0	-80.0 -8.0
11 47 02.29 +35 04 32.2	14.55 17.84	303.54	12.15	2004.283	-71.0 +20.0	-73.0 +19.0
11 48 01.80 +23 56 56.7	14.77 16.71	172.97	52.07	2005.050	-87.0 +9.0	-85.0 +8.0
11 51 47.12 +27 02 36.3	12.85 15.54	212.79	20.67	2004.973	-76.0 -32.0	-82.0 -33.0
11 51 47.28 +17 00 11.6	14.83 17.84	157.01	12.19	2005.416	-79.0 +6.0	-72.0 +7.0
11 53 01.76 +45 12 51.4	15.70 16.98	94.56	30.41	2003.226	-76.0 -43.0	-74.0 -40.0
11 54 13.29 +20 23 20.2	14.90 16.37	74.72	14.75	2003.322	-73.0 +7.0	-70.0 +7.0
11 58 09.14 +05 42 54.2	12.41 15.44	81.81	69.59	2003.407	-73.0 +25.0	-70.0 +25.0
11 59 48.15 -03 15 16.9	14.68 17.41	353.62	24.73	2000.171	-70.0 +5.0	-72.0 +6.0
12 00 21.27 +09 09 32.1	14.98 18.76	157.50	9.94	2002.194	-102.0 0.0	-103.0 -6.0
12 00 47.62 +26 11 44	14.18 14.37	250.78	21.88	2003.472	-67.0 -22.0	-72.0 -24.0
12 01 27.52 +21 27 28.3	12.15 18.85	294.85	21.92	2005.189	+15.0 -131.0	+17.0 -134.0
12 03 01.61 +11 05 11.5	12.52 15.64	144.79	17.52	2002.944	-57.0 -90.0	-56.0 -98.0
12 03 10.93 +49 48 50.9	17.40 18.91	164.54	19.30	2003.809	-98.0 -39.0	-98.0 -37.0
12 04 21.77 +63 00 48.1	15.85 18.36	186.40	91.47	2000.908	-103.0 -43.0	-102.0 -42.0
12 04 41.04 +09 16 56.3	15.18 17.91	251.99	81.39	2002.194	-80.0 -35.0	-71.0 -40.0
12 06 02.12 +12 18 18.1	13.66 16.49	269.49	38.12	2003.245	-11.0 -184.0	-5.0 -182.0
12 06 41.64 +66 20 57.7	12.64 17.68	56.39	48.39	2000.264	-74.0 -14.0	-73.0 -16.0
12 09 21.21 +06 39 15.9	15.25 17.99	74.43	8.55	2003.248	-89.0 +23.0	-80.0 +24.0
12 10 32.69 +33 16 13.3	15.75 16.74	303.81	13.75	2004.316	-89.0 -12.0	-94.0 -14.0
12 12 36.34 +23 47 20.6	14.78 15.47	173.10	27.82	2005.252	-83.0 -68.0	-83.0 -67.0
12 17 58.15 +27 51 27.8	12.73 17.61	330.59	37.02	2005.050	-82.0 +20.0	-82.0 +17.0
12 21 48.21 +04 32 26.8	15.99 17.46	243.50	74.40	2005.435	+39.0 -85.0	+36.0 -80.0
12 22 44.44 +03 24 40.1	14.44 17.96	338.86	39.74	2000.343	-125.0 +62.0	-120.0 +54.0

Table continued on next page.

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RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
12 23 16.53 +66 45 38.8	15.61 17.99	313.05	33.43	2000.264	-83.0 -51.0	-83.0 -49.0
12 26 33.24 -02 10 05.8	13.92 14.18	336.25	12.74	2000.116	+53.0 -114.0	+49.0 -105.0
12 30 50.45 +54 08 00.4	16.69 17.73	139.74	8.83	2002.248	-85.0 +1.0	-89.0 -6.0
12 31 43.49 +63 54 30.9	12.75 16.77	122.94	17.86	2001.072	-110.0 -6.0	-108.0 -7.0
12 34 59.74 +20 26 26.5	16.53 18.85	191.54	32.19	2005.356	-75.0 +26.0	-77.0 +28.0
12 35 14.00 +53 36 03.5	14.07 16.98	76.15	79.90	2002.036	-77.0 -65.0	-83.0 -57.0
12 35 32.66 +17 52 16.6	16.13 18.12	325.87	22.91	2005.430	+77.0 -57.0	+75.0 -59.0
12 36 13.33 +14 57 16.5	15.80 17.74	14.23	80.54	2003.076	-158.0 -107.0	-157.0 -107.0
12 39 34.60 +18 17 17.4	16.57 18.39	282.08	44.59	2005.416	-56.0 -75.0	-58.0 -81.0
12 40 08.25 +37 21 46.1	14.33 17.19	76.61	33.03	2004.206	+114.0 -191.0	+118.0 -191.0
12 40 43.12 +46 26 55.4	17.00 18.93	257.23	11.51	2003.191	-26.0 -77.0	-31.0 -79.0
12 41 12.37 +50 38 18.7	15.54 17.41	138.10	13.05	2002.106	-72.0 +30.0	-74.0 +29.0
12 42 38.32 +61 21 24.4	18.31 19.00	147.56	6.35	2004.288	-73.0 -24.0	-65.0 -27.0
12 43 04.91 +10 10 02.5	12.41 16.11	27.18	35.12	2003.319	-119.0 -58.0	-129.0 -54.0
12 44 58.89 +42 48 13.2	15.59 18.00	70.37	22.60	2004.291	-103.0 -46.0	-102.0 -45.0
12 47 19.20 +02 29 39.4	14.81 16.99	83.76	18.93	2000.343	-104.0 -29.0	-104.0 -22.0
12 48 33.42 +04 08 36.7	13.17 17.03	319.90	40.62	2001.290	-86.0 -1.0	-86.0 -3.0
12 53 28.40 +36 12 30.4	14.38 14.99	278.19	14.98	2004.291	-79.0 +2.0	-77.0 +5.0
12 55 33.51 +26 27 25.8	14.65 17.52	177.98	21.99	2004.973	-76.0 -40.0	-74.0 -39.0
12 55 46.88 +05 00 23	16.01 18.94	26.92	9.98	2001.290	-74.0 -20.0	-81.0 -19.0
12 56 39.38 +31 02 40.8	16.68 18.36	192.87	35.39	2004.362	+51.0 -85.0	+50.0 -83.0
12 59 54.49 +36 20 06.2	14.93 17.67	168.60	13.21	2004.130	-16.0 -105.0	-14.0 -104.0
13 00 54.03 +09 39 39.9	15.39 16.22	171.01	24.38	2003.319	+36.0 -124.0	+34.0 -121.0
13 02 51.78 +32 37 55.4	11.86 18.25	96.21	56.30	2004.362	-69.0 +14.0	-70.0 +12.0
13 03 27.85 +42 50 09.9	16.10 18.94	170.00	43.17	2003.313	-59.0 +95.0	-54.0 +91.0
13 05 11.27 +06 54 54.6	15.76 17.58	153.05	7.51	2003.248	-77.0 -12.0	-71.0 -21.0
13 07 34.85 -02 45 07.6	15.71 18.91	278.63	44.45	2000.171	+8.0 -76.0	+10.0 -85.0
13 08 15.79 +08 12 46.8	17.36 18.16	329.73	11.82	2003.248	-17.0 -85.0	-18.0 -88.0
13 09 03.20 +35 54 40	12.75 16.49	196.01	93.60	2004.207	-79.0 -89.0	-75.0 -89.0
13 10 21.34 +32 52 58.6	14.37 17.19	359.92	66.43	2004.362	-175.0 +1.0	-178.0 0.0
13 10 39.43 +07 14 20.9	15.63 15.99	301.59	23.34	2003.248	-77.0 -58.0	-81.0 -62.0
13 10 53.48 +54 39 25.6	14.47 17.90	344.27	8.50	2002.287	-70.0 -9.0	-73.0 -3.0
13 11 21.11 +58 56 13.4	14.23 16.54	234.86	34.08	2002.120	-73.0 -9.0	-70.0 -5.0
13 13 39.49 +59 14 25.4	13.80 18.85	289.88	16.15	2002.120	-70.0 -27.0	-68.0 -29.0
13 14 26.82 +17 32 09.2	16.29 18.50	341.15	19.96	2004.393	-40.0 -58.0	-41.0 -58.0
13 14 46.90 +25 44 26.3	16.52 18.03	110.07	8.56	2004.973	-97.0 0.0	-89.0 -2.0

Table continued on next page.

351 New Common Proper-Motion Pairs from the Sloan Digital Sky Survey

RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
13 16 14.32 +15 56 28.3	13.21 15.77	273.37	19.37	2005.416	-73.0 -17.0	-72.0 -13.0
13 16 37.70 +12 43 37.8	15.23 18.19	141.02	62.17	2003.223	-87.0 -4.0	-86.0 +3.0
13 17 45.23 +00 32 52.1	14.36 15.92	24.60	35.81	2004.447	-105.0 -34.0	-103.0 -35.0
13 19 46.52 +53 57 51.9	14.52 16.06	170.95	16.04	2002.287	-34.0 -74.0	-32.0 -74.0
13 21 56.02 +23 04 43.7	14.18 16.04	304.59	30.88	2005.252	-75.0 -2.0	-73.0 -1.0
13 22 15.77 +05 31 17.7	15.05 17.70	236.54	46.92	2001.214	+26.0 -137.0	+25.0 -137.0
13 23 58.43 +10 29 23	16.00 16.56	169.77	21.35	2003.322	-86.0 -101.0	-80.0 -92.0
13 25 18.32 +15 14 17.4	15.88 16.88	142.31	21.91	2004.075	+56.0 -44.0	+54.0 -47.0
13 25 36.98 +43 44 37.6	16.46 16.83	165.70	9.69	2003.226	-5.0 -77.0	-4.0 -81.0
13 26 59.36 +02 29 41.5	15.89 18.55	176.52	15.89	2000.343	-151.0 -40.0	-159.0 -40.0
13 33 04.16 +38 13 07.6	15.70 18.34	233.12	9.11	2003.316	-45.0 -67.0	-49.0 -64.0
13 36 02.47 +18 45 51.6	14.74 17.53	54.78	32.60	2004.710	-133.0 +28.0	-132.0 +26.0
13 40 10.74 +14 30 41.6	14.36 18.77	88.03	63.59	2004.075	-31.0 -64.0	-31.0 -63.0
13 46 30.50 +15 22 22	15.67 18.75	234.78	11.99	2005.359	-67.0 -26.0	-69.0 -30.0
13 49 53.35 +28 54 57.2	14.57 15.44	358.16	53.99	2004.713	+4.0 -94.0	+6.0 -99.0
13 53 00.71 +04 32 56	15.13 18.57	277.18	23.77	2004.729	-61.0 -75.0	-65.0 -78.0
13 54 03.88 +16 31 10.9	15.80 17.17	8.77	36.23	2005.359	-72.0 -29.0	-71.0 -27.0
13 54 51.71 +51 28 15.6	15.09 18.09	333.53	10.32	2002.248	-67.0 -44.0	-68.0 -41.0
13 57 48.38 +24 47 36.3	16.89 17.34	147.51	36.46	2004.447	-76.0 +24.0	-77.0 +24.0
13 58 34.98 -08 09 59.5	14.75 15.10	143.70	13.46	1994.637	-81.0 +63.0	-72.0 +60.0
13 59 15.99 +13 34 03.1	15.28 15.69	206.47	22.44	2004.075	-77.0 -15.0	-75.0 -10.0
14 03 41.15 +14 40 55.7	15.40 18.38	358.61	54.76	2005.364	-64.0 +46.0	-60.0 +48.0
14 05 54.78 +19 29 40.2	17.68 18.89	17.15	7.47	2005.195	-60.0 +38.0	-65.0 +41.0
14 08 23.52 +11 40 03	18.24 18.95	248.65	36.79	2003.314	+58.0 -91.0	+58.0 -97.0
14 09 37.83 +13 49 15.4	15.17 17.75	235.33	19.16	2003.409	-81.0 +4.0	-82.0 -4.0
14 10 48.81 -03 05 21.1	14.16 15.47	315.00	18.08	2001.394	-93.0 -65.0	-90.0 -59.0
14 12 32.44 +07 17 46.1	14.49 17.28	355.59	11.82	2003.319	+65.0 -104.0	+69.0 -100.0
14 13 28.70 +23 31 12.7	14.11 17.27	299.23	11.37	2004.450	-72.0 -52.0	-70.0 -52.0
14 15 34.71 +48 06 42.1	14.49 16.66	163.61	40.35	2003.324	-77.0 -12.0	-79.0 -9.0
14 16 41.14 +32 32 28.1	14.13 17.35	291.05	10.42	2004.288	-27.0 +99.0	-31.0 +105.0
14 17 57.35 +07 25 35.1	16.07 18.11	148.32	18.20	2001.457	-76.0 +41.0	-81.0 +39.0
14 18 34.18 +17 20 00.2	14.46 18.44	295.97	56.58	2005.356	+113.0 -17.0	+120.0 -20.0
14 19 46.72 -02 30 22	18.64 18.76	109.57	35.15	2001.454	-81.0 -40.0	-76.0 -39.0
14 19 56.10 +16 33 37.2	15.13 16.10	267.34	63.24	2005.353	-83.0 +23.0	-87.0 +21.0
14 21 53.99 +00 18 08.3	14.81 15.67	266.75	32.57	1999.221	-77.0 -8.0	-73.0 -7.0
14 23 39.16 +04 07 29.7	13.92 16.06	300.98	16.20	2001.214	+36.0 -111.0	+30.0 -117.0

Table continued on next page.

351 New Common Proper-Motion Pairs from the Sloan Digital Sky Survey

RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
14 24 35.95 +18 04 13.5	16.44 18.70	224.83	33.32	2005.354	-157.0 -72.0	-155.0 -73.0
14 26 56.81 +55 39 27.8	17.55 17.57	159.60	14.53	2002.437	-83.0 +22.0	-84.0 +25.0
14 28 13.25 +10 13 20.9	16.63 17.93	205.43	19.54	2003.245	-80.0 -27.0	-79.0 -23.0
14 30 56.06 +13 01 12.3	17.88 18.95	294.19	11.80	2003.472	+34.0 -80.0	+37.0 -75.0
14 32 27.35 +48 05 28.2	15.04 18.81	239.14	85.27	2003.246	-91.0 +81.0	-93.0 +74.0
14 33 58.89 +17 18 54.7	15.53 15.59	41.87	18.48	2005.356	-54.0 +58.0	-54.0 +61.0
14 34 48.15 -01 16 35.6	15.41 16.97	111.73	38.97	2001.394	-184.0 -134.0	-178.0 -132.0
14 35 01.29 +05 12 04	13.19 15.16	83.51	70.05	2003.319	+25.0 -98.0	+26.0 -101.0
14 35 45.91 +04 58 11.3	17.41 17.52	335.38	51.82	2001.214	+31.0 -164.0	+33.0 -168.0
14 35 50.15 +00 42 34.4	16.26 18.02	138.09	49.80	1999.221	+80.0 -88.0	+82.0 -89.0
14 41 23.90 +11 41 10.2	15.58 18.30	257.43	36.51	2003.409	+12.0 -106.0	+17.0 -101.0
14 41 50.04 +15 02 35.1	15.45 18.11	36.10	60.84	2005.362	-9.0 -74.0	-9.0 -74.0
14 42 04.11 +16 53 35.5	16.64 17.44	266.12	32.22	2005.354	-73.0 +11.0	-70.0 +13.0
14 42 47.19 +28 07 20.7	15.14 15.93	184.73	95.82	2004.308	+56.0 -85.0	+57.0 -87.0
14 43 53.39 +48 00 19.1	17.56 18.87	259.16	34.71	2002.350	-62.0 -35.0	-58.0 -41.0
14 46 08.46 +10 59 01.5	12.50 17.10	86.33	20.68	2003.314	+78.0 -143.0	+79.0 -146.0
14 51 12.98 +05 47 55.7	15.03 15.20	12.44	25.55	2003.322	+12.0 -72.0	+12.0 -71.0
14 51 22.03 +08 46 27.2	16.46 16.85	144.84	14.06	2003.322	-118.0 -65.0	-118.0 -64.0
14 52 43.33 +09 20 01.7	13.82 16.35	138.96	15.85	2003.245	-2.0 -105.0	-5.0 -110.0
14 52 45.33 +03 53 42.5	13.19 18.15	174.00	21.50	2001.214	-76.0 -32.0	-75.0 -32.0
14 53 04.87 +53 56 51.3	16.54 18.35	182.49	73.95	2002.437	-26.0 +77.0	-24.0 +78.0
14 54 19.48 +15 54 09.1	14.52 16.68	94.94	10.00	2005.356	-64.0 -61.0	-71.0 -63.0
14 54 31.18 +46 19 55.6	14.70 16.67	35.25	22.81	2005.096	-11.0 -74.0	-9.0 -75.0
14 56 22.86 +33 51 26.1	15.74 18.21	267.44	78.10	2003.475	-144.0 +14.0	-147.0 +19.0
15 00 51.88 +13 14 46.3	15.65 15.88	234.55	19.23	2005.364	+33.0 -156.0	+37.0 -156.0
15 04 15.74 +18 03 26.7	12.48 16.26	183.29	16.21	2005.190	-88.0 -90.0	-88.0 -88.0
15 12 07.12 +29 52 05.8	15.78 15.91	326.88	28.38	2003.480	-82.0 +47.0	-82.0 +40.0
15 12 32.54 +56 29 14.8	14.49 18.01	97.14	15.07	2001.143	-60.0 +40.0	-62.0 +45.0
15 13 21.66 +08 38 20.1	14.96 17.62	152.85	24.78	2003.245	-123.0 -20.0	-124.0 -24.0
15 15 00.25 +20 38 42.8	17.15 18.38	179.06	71.16	2004.450	-10.0 -95.0	-8.0 -89.0
15 15 35.95 +24 30 10.5	18.75 18.94	1.77	41.34	2004.308	+39.0 -83.0	+30.0 -91.0
15 16 01.73 +56 52 22.4	16.23 18.90	339.83	12.05	2000.261	-61.0 +52.0	-59.0 +54.0
15 17 22.82 +09 04 01.3	16.67 18.18	337.80	18.13	2003.314	-90.0 -131.0	-96.0 -134.0
15 20 36.77 +55 08 13.5	14.35 17.75	101.36	17.11	2005.428	-78.0 +82.0	-76.0 +83.0
15 21 34.95 +39 21 58.7	13.72 16.20	40.61	24.93	2002.107	-71.0 +42.0	-71.0 +42.0
15 25 52.08 +12 32 04.8	15.78 17.87	31.91	46.66	2005.362	+3.0 -75.0	+5.0 -76.0

Table continued on next page.

351 New Common Proper-Motion Pairs from the Sloan Digital Sky Survey

RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
15 29 14.80 +50 26 31	12.86 15.55	204.79	69.70	2002.437	-61.0 +37.0	-63.0 +36.0
15 29 24.12 +17 34 27.8	15.06 18.96	72.40	48.78	2005.356	-95.0 -61.0	-100.0 -55.0
15 34 58.77 +20 35 28.6	17.61 18.88	110.15	7.44	2004.392	-75.0 -34.0	-73.0 -32.0
15 35 20.98 -00 17 51.2	12.09 16.67	219.97	30.08	1999.218	+44.0 -83.0	+46.0 -86.0
15 41 49.74 +26 47 06	15.57 18.25	33.32	13.27	2004.209	-94.0 -4.0	-89.0 -7.0
15 43 19.30 +40 24 09.6	16.17 18.07	315.77	36.80	2005.359	+16.0 -135.0	+17.0 -136.0
15 45 00.78 +19 32 54.8	17.76 18.67	163.53	15.15	2004.392	-77.0 -14.0	-77.0 -21.0
15 45 05.80 +09 23 16.1	17.13 18.81	137.85	53.78	2003.472	-85.0 +4.0	-86.0 +10.0
15 47 05.72 +01 45 47.9	15.00 18.71	286.04	68.35	2000.341	-81.0 -4.0	-75.0 -7.0
15 48 17.61 +37 05 52.3	16.06 17.73	109.26	37.83	2003.407	+19.0 -69.0	+23.0 -73.0
15 50 42.54 +03 01 43.8	15.67 17.58	349.56	24.65	2001.214	-54.0 -92.0	-53.0 -89.0
15 56 09.50 +03 21 48.7	17.80 18.90	142.31	27.76	2001.214	-70.0 -38.0	-73.0 -39.0
16 04 33.30 +09 54 06.2	16.23 18.80	54.04	20.69	2005.362	+25.0 -69.0	+30.0 -70.0
16 07 15.16 +34 57 53.9	14.89 17.22	168.82	67.06	2003.406	-32.0 +83.0	-29.0 +76.0
16 11 42.15 +10 22 26.2	13.12 17.61	91.07	15.16	2005.354	+46.0 -144.0	+51.0 -144.0
16 13 40.56 +39 34 55.1	14.84 18.48	155.01	28.62	2002.353	-69.0 +37.0	-64.0 +30.0
16 14 16.06 +42 15 29.5	15.81 17.99	69.76	24.68	2002.438	-113.0 +70.0	-107.0 +69.0
16 17 09.40 +44 06 47	13.77 16.69	16.17	56.82	2001.375	-35.0 +94.0	-38.0 +93.0
16 27 23.60 +43 36 19.6	15.55 17.98	77.31	16.17	2001.392	-94.0 +51.0	-98.0 +58.0
16 31 49.00 +38 04 52.3	17.07 18.74	249.62	26.00	2002.438	+2.0 +84.0	-1.0 +77.0
16 34 42.40 +22 31 41.4	12.55 18.48	251.85	39.85	2003.330	+5.0 -76.0	+1.0 -71.0
16 42 25.62 +19 08 06	18.82 19.46	333.79	6.38	2003.317	-83.0 +4.0	-84.0 -2.0
16 58 09.95 +26 52 27.1	12.76 17.44	272.40	18.42	2002.353	-83.0 -132.0	-88.0 -134.0
16 58 54.11 +49 42 51	12.92 17.80	53.74	23.18	2004.455	-34.0 +74.0	-33.0 +82.0
17 00 30.24 +33 13 37.1	16.23 17.06	289.30	27.11	2001.392	-46.0 -65.0	-47.0 -66.0
17 16 05.66 +63 06 21.4	13.63 15.86	10.63	31.30	1994.952	-11.0 -81.0	-8.0 -81.0
17 19 45.36 +67 22 58.6	13.19 15.83	219.07	22.95	2001.457	+27.0 -69.0	+28.0 -68.0
17 22 42.87 +71 47 18.1	15.44 18.75	160.08	10.34	2001.720	-13.0 +89.0	-6.0 +87.0
17 27 00.41 +33 06 03.4	14.91 18.58	312.00	39.90	2004.453	+7.0 -71.0	+12.0 -75.0
17 48 35.08 +46 05 51.2	16.23 18.73	34.33	19.83	2001.717	-2.0 +83.0	+1.0 +80.0
17 50 51.17 +49 42 51.9	14.80 15.68	189.73	14.05	1995.122	-35.0 +69.0	-30.0 +66.0
17 57 07.61 +43 03 26.3	15.18 15.34	111.28	35.84	2005.435	-9.0 -79.0	-7.0 -76.0
17 58 34.35 +23 48 21.7	15.60 17.29	265.19	19.81	2004.707	-1.0 -70.0	-8.0 -72.0
19 14 39.93 +37 17 21.5	13.41 16.82	64.86	47.81	2005.444	+28.0 -96.0	+25.0 -103.0
19 16 53.01 +37 14 12.7	14.42 17.42	177.54	28.52	1995.541	-34.0 +93.0	-31.0 +92.0
19 58 24.50 +60 31 54.1	13.69 18.96	246.17	51.55	1994.651	0.0 +96.0	-1.0 +95.0

Table concludes on next page.

351 New Common Proper-Motion Pairs from the Sloan Digital Sky Survey

RA DEC (2000)	Mags	Angle	Separation	DATE	PM-A	PM-B
20 08 28.93 +60 23 54.3	16.19 16.59	355.44	74.14	1994.651	-78.0 -30.0	-81.0 -27.0
20 09 31.23 +31 47 45.6	15.41 17.65	278.99	28.35	2003.317	-29.0 -81.0	-28.0 -83.0
20 33 58.01 +15 42 56.4	14.54 15.53	190.26	50.33	2004.783	+80.0 +41.0	+81.0 +45.0
20 36 44.74 +04 47 07.4	16.44 17.40	234.41	20.45	2005.742	-44.0 -63.0	-51.0 -68.0
20 47 11.39 +00 21 27.6	17.17 18.20	43.31	49.82	2003.324	-6.0 -101.0	-8.0 -95.0
21 00 11.29 +74 32 23.8	13.57 15.76	285.05	48.56	2003.740	-76.0 +24.0	-77.0 +19.0
21 20 56.07 +20 50 15.2	12.37 17.99	327.06	25.51	1994.643	+75.0 +18.0	+75.0 +17.0
21 38 58.41 -00 01 37	14.10 18.89	263.41	80.42	2001.788	+16.0 -91.0	+20.0 -88.0
21 41 56.72 +19 49 09	14.13 14.92	123.47	64.81	2004.712	-64.0 -32.0	-64.0 -34.0
21 43 10.20 +13 49 53.1	17.66 18.47	304.46	13.51	1994.643	-44.0 -66.0	-47.0 -62.0
21 48 59.56 +13 03 32.6	15.47 16.13	236.64	20.77	2000.740	-85.0 -22.0	-86.0 -24.0
21 55 17.40 -00 46 23.4	15.56 15.71	0.52	35.43	2002.777	+61.0 -53.0	+62.0 -52.0
22 03 36.37 +43 58 59.5	14.58 18.79	86.35	13.30	1994.652	+146.0 +49.0	+151.0 +48.0
22 04 48.64 +22 26 28.4	17.41 17.70	40.96	35.49	2004.784	-107.0 -55.0	-109.0 -53.0
22 19 38.34 +22 58 38.1	13.72 17.37	2.57	48.55	2004.712	-69.0 -43.0	-66.0 -49.0
22 20 25.33 +05 19 56.9	16.92 18.56	271.33	31.54	2005.742	-111.0 -118.0	-114.0 -123.0
22 31 44.75 +13 19 23.9	17.02 18.69	298.25	10.54	2000.740	-13.0 -74.0	-14.0 -75.0
22 36 16.06 +21 51 12.4	15.54 17.44	293.61	46.73	2003.738	+106.0 -79.0	+101.0 -77.0
22 36 59.49 +01 07 44.4	16.38 16.72	144.25	23.84	2001.788	+52.0 -47.0	+55.0 -50.0
22 38 58.94 +68 27 39.6	14.54 14.99	37.63	72.57	2003.738	+75.0 -8.0	+76.0 -13.0
22 42 31.14 +12 50 04.9	16.36 16.62	257.73	12.13	2003.738	-33.0 -76.0	-34.0 -73.0
22 52 15.78 +29 03 23.4	16.97 17.84	107.50	19.86	1994.949	-52.0 -52.0	-52.0 -51.0
23 19 26.03 +15 38 17	16.89 18.72	82.08	13.21	2000.740	-29.0 -81.0	-29.0 -79.0
23 19 53.22 -01 05 25.4	16.18 18.75	323.95	23.39	2002.678	-48.0 -78.0	-48.0 -75.0
23 28 43.52 +07 03 10.6	12.79 15.36	74.08	97.65	2004.707	+152.0 -28.0	+147.0 -36.0
23 54 35.23 +24 27 45.6	15.63 16.70	124.05	14.40	2004.712	+87.0 -29.0	+88.0 -27.0
23 59 54.91 -04 12 12.9	16.48 17.09	150.94	77.06	1994.952	-53.0 -96.0	-52.0 -97.0

Table Notes:

- Data taken from the SDSS-DR7 survey.
- The position angle is in degrees, the separation in arcseconds, and the proper motion in milliseconds of arc/year.