

# CPM pairs from LSPM so far not WDS listed – Part V

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**Abstract:** The LSPM catalog (Lepine and Shara 2005) is a rich source for CPM pairs. We thought that after our four recent “CPM pairs from LSPM” reports – now largely exhausted – to make sure we had once again a closer look and found against our expectations that indeed nearly 200 additional potential CPM pairs so far (per March 2018) not listed in the WDS catalog. This report covers about 90 of these objects

## 1. Introduction

The LSPM catalog contains 61,977 high proper motion stars detected mainly by comparing POSS I (average epoch 1950) to POSS II (average epoch 1990) images using software developed specifically for locating such objects (Lépine and Shara 2005) but also by using other sources as for example Tycho II and 2MASS. The authors of this catalog also identified 1,159 common proper motion pairs to be included in this data set but only about 170 such pairs were considered new discoveries and listed in the WDS catalog with the discoverer code LEP. Yet our own research showed that the LSPM catalog contains about 3,500 pairs of objects closer than 25 arc seconds with a high probability that such pairs are very fast common proper motion pairs. About 95% of these pairs are per March 2018 already listed in the WDS catalog usually with note code “V”, which means considered physical by means of common proper motion, along with a multitude of different discoverer codes, but there is still a residue of nearly 200 so far not WDS listed CPM candidates.

A bit less than half of these objects have not only GAIA DR1 data available for both components, but also from 2MASS, allowing the use of our current work-horse CPM rating procedure according to Knapp and

Nanson 2017 (see description Appendix A) by comparing 2MASS to GAIA DR1 positions but also for calculating Vmag estimations from the then available G/J/H/K magnitude data procedure according to Knapp/Nanson 2018. We decided to limit this report to this subset of objects and checked also several other catalogs like UCAC4, UCAC5, URAT1, and SDSS9 by cross-matching with our list to get a solid observation history for these objects. As a reference, the LSPM catalog data is also listed even if for unknown reasons no observation date per object is provided although this data had to be available for calculating proper motion values. Finally we did a cross-match with the first data release of the most recent very large Pan-STARRS star catalog (PS1) – this resulted in the first step in a surprising large number of matched objects for some primaries as well as for some secondaries due to obvious problems of this catalog with fast moving stars leading to multiple objects for the same star along its proper motion path (as example three objects for the primary with 120180155409691210, 120180155413511309 and 120180155412340851 and two objects for the secondary with 120180155400451483 and 120180155403301508). Another side effect with the same cause seems to be in some cases a single object for fast moving stars with an imprecise star position due

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to averaged different measurement results over time – at least the calculated separation and position angle from the PS1 positions seem in some cases a bit off.

### 2. Results of Our Research

In Table 1 we present for the selected objects as much data as we could find in the catalogs available to us. Given below is a description of the table content per column:

- Obj gives the discoverer code with a running number in the header line
- RA and Dec give the recent precise RA/DE coordinates of the A component from GAIA DR1 in the header line in decimal degrees and in the data lines for the sources referred to in the Notes column
- Sep gives separation in arcseconds in the data lines calculated from the indicated catalog positions
- PA gives position angle in degrees in the data lines calculated from the indicated catalog positions
- M1 and M2 give estimated Vmags in the header line for A and B and in the data lines values as indicated in the Notes column
- pmRA1 and pmDE1 with e\_pm1 give the proper motion data for A and pmRA2, pmDE2 and e\_pm2 for B in the header line calculated by comparison of 2MASS to GAIA DR1 positions as well as in the data lines directly from the catalogs specified in the Notes column if available
- CPM Score gives the estimated probability for being physical based on the CPM assessment result comparing positions between 2MASS and GAIA DR1 in the header line
- Ap indicates in the data lines the aperture used for the observation listed and Me indicates the WDS code for the used observation method (for GAIA calculated equivalent circular surface diameter)
- Date is the Julian epoch of the (averaged) observation date given in the data lines
- N gives in the header line the suggested WDS note code “V”
- Source/Notes finally indicate in the header line and in the data lines the sources used and additional explanations if considered necessary.

### 3. Summary

From 91 objects checked for CPM about 2/3 are most probably physical pairs indicated by very fast common proper motion and less than 10% are to be considered optical.

NSN n+15 and n+21 are objects with contradicting evidence – the comparison 2MASS to GAIA DR1 positions indicates strongly common proper motion with the caveat of a rather large 2MASS position error. But this

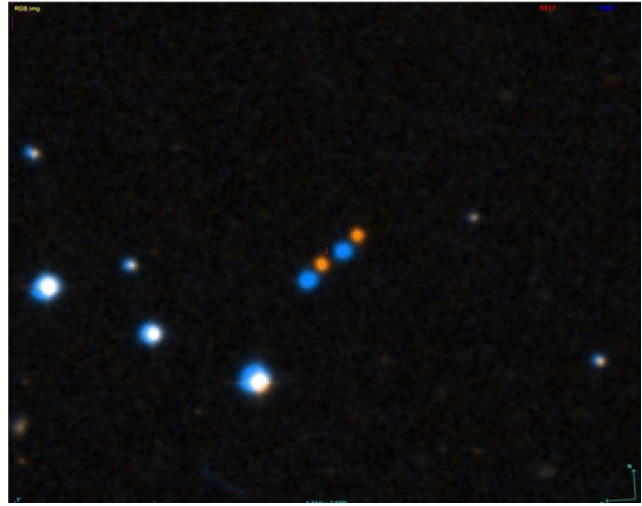


Figure 1. NSN n+21 RGB POSS.I to POSS.II composite

impression is heavily supported by the visual comparison of POSS.I to POSS.II images represented also by comparison of USNO A2 to USNO B1 catalog positions – Figure 1 is an RGB-composite of these images for NSN n+21.

On the other side we have a “rather optical” CPM assessment based on quite precise UCAC5 proper motion data – this high precision is the reason for the “rather optical” rating because the difference in proper motion direction and proper motion speed is outside the range allowed by the small UCAC5 proper motion data error. We assume in both cases a potential orbit as reason for this contradicting evidence – we can only hope that future GAIA data releases provide Plx data for these stars allowing for an assessment of potential gravitational relationship.

One other object (KPP n+18) seems of special interest, as LSPM indicates here a physical triple with a third component seemingly confirmed by 2MASS and SDSS9 – but this component might rather be bogus than real.

### 4. Follow Up

There is a remainder of about 100 further potential CPM pairs with separation up to 25 arc seconds with currently not enough data available for a reliable CPM assessment. For these we wait for the next GAIA data release hoping for proper motion data for all these objects for both components.

None of our own images and thus our own measurements are currently available for the listed objects, but this might be a future step.

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Table 1. Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+1	2.9260953	3.38804405	6.755	188.593	16.146	16.186	275.827	-40.624	8.819	279.426	-42.242	8.819	1.00	0.96	Hg	2015.000	V	GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Most certainly physical
	2.92495100	3.38821200	6.738	189.114	16.100		286.000	-45.000		286.000	-45.000							LSPM J0011+0323. M1 and M2 are LSPM Vmag estimates
	2.92486200	3.38822600	6.738	189.114	14.553	14.896								1.30	E2	1998.876		2MASS. M1 and M2 estimated from J- and K-band
	2.92499830	3.38820250	6.747	189.176	15.771	15.771	286.000	-45.000	11.314	286.000	-45.000	11.314		0.20	Eu	2000.000		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	2.92559500	3.38809100	6.747	188.638	17.199	17.185	330.000	273.000	9.899				2.50	Es	2008.756		SDSS9. M1 and M2 are SDSS9 gmags	
	2.92583469	3.38807615	6.751	188.472	16.972	16.966							1.80	C	2011.612			Pan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are PS1 gmags
	2.92609953	3.38804405	6.755	188.593	15.130	15.216								0.96	Hg	2015.000		GAIA DRI. M1 and M2 are Gmags
NSN n+1	9.61673847	38.41643496	6.970	332.288	18.279	18.945	143.020	86.892	6.138	144.786	85.369	6.137	1.00	0.96	Hg	2015.000	V	GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Most certainly physical
	9.61597800	38.41607300	7.001	332.189	19.120	19.080	144.000	80.000		144.000	80.000			1.30	E2	2000.791		2MASS. M1 and M2 estimated from J- and K-band
	9.61601800	38.41609200	7.001	332.189	16.992									2.50	Es	2002.764		SDSS9. M1 and M2 are SDSS9 gmags
	9.61613900	38.41614400	6.993	332.311	19.487	20.108	135.000	79.000	4.243	100.000	87.000	4.243		0.20	Eu	2013.180		URAT1
	9.61597800	38.41607330	7.002	332.177			142.400	84.900	6.600	145.400	83.700	6.600		1.80	C	2012.597		Pan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are PS1 gmags
	9.61672066	38.41642576	6.971	332.333	19.239	19.818								0.96	Hg	2015.000		GAIA DRI. M1 and M2 are Gmags
	9.61673847	38.41643496	6.970	332.288	17.168	17.613								0.96	Hg	2015.000		GAIA DRI. M1 and M2 are Gmags
	9.61597000	38.41620900	6.618	326.500	15.560	16.110	134.000	86.000	5.657	74.000	82.000	56.886				1975.700		USNO B1. M1 and M2 are Imags
KPP n+2	12.55201620	62.58251328	20.273	112.555	16.056	16.074	-103.938	-117.697	5.608	-105.685	-118.886	5.608	97	0.96	Hg	2015.000	V	GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Almost certainly physical
	12.55295800	62.58300400	20.288	112.482	16.760	17.410	-102.000	-117.000		-102.000	-117.000			1.30	E2	1999.868		2MASS. M1 and M2 estimated from J- and K-band
	12.55296500	62.58300800	20.290	112.480	14.487	14.264								0.20	Eu	1986.548		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	12.55293390	62.58296170	20.493	111.823			-108.000	-111.200	6.522	-102.600	-106.800	5.445		0.20	Eu	1952.708		URAT1
	12.55295620	62.58300360	20.291	112.479			-104.700	-116.100	5.900	-107.000	-118.300	6.000		0.20	Eu	2013.444		Pan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are PS1 gmags
	12.55224279	62.58262650	20.269	112.561	17.076	17.246								1.80	C	2011.560		GAIA DRI. M1 and M2 are Gmags
	12.55201620	62.58251328	20.273	112.555	14.865	14.808								0.96	Hg	2015.000		USNO A2. M1 and M2 are Rmags
	12.55601700	62.58458100	20.365	112.338	15.700	15.500								1.20	Pp	1976.400		USNO B1. M1 and M2 are Imags
	12.55286200	62.58299500	20.254	112.775	14.140	13.190	-106.000	-124.000	6.708	-110.000	-126.000	8.944						GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Almost certainly physical
NSN n+2	15.54120051	10.15061258	3.369	284.029	13.098	13.408	155.263	15.553	10.430	155.178	13.245	10.430	95	0.96	Hg	2015.000	V	LSPM J0102+1009. M1 and M2 are LSPM Vmag estimates
	15.54054300	10.15054700	3.380	284.620	13.700	15.210	160.000	18.000		160.000	18.000			1.30	E2	2000.746		2MASS. M1 and M2 estimated from J- and K-band
	15.54057600	10.15055100	3.376	284.576	12.208	12.487								0.20	Eu	1998.613		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	15.54057240	10.15055370	3.366	283.679	12.648	12.648	160.000	18.000	11.314	23.400	42.100	6.037		2.50	Es	2008.825		SDSS9. M1 and M2 are SDSS9 gmags
	15.54086100	10.15056600	3.312	284.477	25.114	14.024								1.80	C	2014.209		Pan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are PS1 gmags
	15.54120047	10.15061257	3.293	284.970	13.757	14.122								0.96	Hg	2015.000		GAIA DRI. M1 and M2 are Gmags
	15.54120051	10.15061258	3.369	284.029	12.154	12.432												

Table 1 continues on the next page.

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Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+3	16.32030711	16.33819899	7.797	8.584	14.991	17.151	180.912	13.715	4.899	183.879	17.603	4.899	1.00	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	16.31953200	16.33814200	7.723	8.256	15.520	14.700	196.000	14.000		196.000	14.000							LSPM J0105+1620. M1 and M2 are LSPM Vmag estimates
	16.31940000	16.33813300	7.723	8.281	14.208	15.623								1.30	E2	1997.678		2MASS. M1 and M2 estimated from J- and K-band
	16.31996900	16.33817500	7.763	9.141	15.911	18.375								2.50	Es	2008.840		SDSS9. M1 and M2 are SDSS9 gmag
	16.31952190	16.33814040	7.733	8.330	15.050		181.500	11.600	5.200	185.300	15.700	5.300		0.20	Eu	2013.423		URAT1
	16.32029065	16.33819706	7.797	8.572	15.722	18.065								1.80	C	2012.251		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are F51 gmag
	16.32030711	16.33819899	7.797	8.584	14.104	16.078								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	16.31702000	16.33810800	6.222	8.783	13.700	15.800								1.20	Pp	1953.997		USNO A2. M1 and M2 are Rmag
NSN n+3	27.80357893	81.35093457	20.716	33.170	14.016	20.114	208.076	7.193	5.934	219.125	13.454	26.325	76	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most probably physical
	27.79781200	81.35089900	20.589	32.953	13.670	18.340	209.000	26.000		178.000	14.000			1.30	E2	2000.731		LSPM J0151+8121. M1 and M2 are LSPM Vmag estimates
	27.79808300	81.35090600	20.561	32.964	13.812									1.30	E2	2000.731		2MASS. M1 and M2 estimated from J- and K-band
	27.79812930	81.35086690	20.568	32.321			-35.700	199.500	13.100	217.600	12.400	8.300		0.20	Eu	2013.467		URAT1
	27.80346620	81.35093634	20.481	31.985	14.193	20.396								1.80	C	2012.370		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are F51 gmag
	27.80357893	81.35093457	20.716	33.170	13.661	19.097								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	27.79718900	81.35104800	20.522	32.442	13.050	18.220	-94.000	-56.000	5.000	210.000	340.000	18.601				1977.200		USNO B1. M1 and M2 are Imags
KPP n+4	34.80486862	50.64913464	9.223	50.499	14.756	16.445	119.287	100.882	5.573	118.826	102.000	5.573	1.00	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	34.80408500	50.64871600	9.216	50.599	15.250	15.130	117.000	103.000		117.000	103.000							LSPM J0219+5038. M1 and M2 are LSPM Vmag estimates
	34.80407300	50.64870800	9.218	50.608	13.143	14.228								1.30	E2	1999.775		2MASS. M1 and M2 estimated from J- and K-band
	34.80408410	50.64871390	9.219	50.609			117.500	102.700	5.900	116.800	103.800	5.900		0.20	Eu	2013.487		URAT1
	34.80486194	50.64912750	9.192	50.458	15.563	17.558								1.80	C	2012.600		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are F51 gmag
	34.80486862	50.64913464	9.223	50.499	13.648	15.107								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	34.80177000	50.64742000	8.387	51.067	14.000	15.000								1.20	Pp	1953.912		USNO A2. M1 and M2 are Rmag
	34.80468700	50.64922800	9.436	51.073	11.700		246.000	278.000	41.012	306.000	268.000	6.708				1978.450		USNO B1. M1 and M2 are Imags
NSN n+4	37.55648134	42.02318127	5.279	71.836	11.545	14.428	166.117	-17.101	5.708	172.177	-7.933	5.708	80	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most probably physical
	37.55545000	42.02325800	5.377	74.146	11.320		162.000	-21.000		159.000	-19.000							LSPM J0230+4201. M1 and M2 are LSPM Vmag estimates
	37.55547800	42.02325800	5.141	73.064	11.202	12.157								1.30	E2	1998.847		2MASS. M1 and M2 estimated from J- and K-band
	37.55554810	42.02325160	5.148	72.963	11.404		163.700	-19.300	5.500	166.700	-10.100	5.700		0.20	Eu	2013.514		URAT1
	37.55648134	42.02318127	5.279	71.836	10.779	13.043								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag

Table 1 continues on the next page.

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Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KFP n+5	44.85520482	63.65448425	8.149	85.724	15.189	19.292	-23.156	-105.463	5.936	-24.771	-101.487	6.690	95	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/3/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	44.85542300	63.65493400	8.166	86.133	15.210	18.500	-30.000	-161.000		-30.000	-161.000							LSPM J0259+6339. M1 and M2 are LSPM vmag estimates
	44.85541200	63.65490300	8.168	86.133	14.524	17.569								1.30	E2	2000.706		2MASS. M1 and M2 estimated from J- and K-band
	44.85542250	63.65492340	8.171	86.165	15.212		-24.100	-104.800	6.300	-29.100	-99.500	6.500		0.20	Eu	2013.462		GAIA DR1. M1 and M2 are Gmag
	44.85520482	63.65448425	8.149	85.724	14.363	17.965								0.96	Hg	2015.000		USNO A2. M1 and M2 are Rmags
	44.85610900	63.65622000	9.030	81.009	14.400	18.100								1.20	Pp	1954.414		USNO B1. M1 and M2 are Imags
	44.85549500	63.65496700	8.824	87.309	13.740	16.330	-20.000	-100.000	5.000	-68.000	-120.000	14.213				1976.650		GAIA DR1/2MASS. M1 and M2 estimated from G/3/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
NSN n+5	45.82886429	50.26639401	6.974	140.136	15.834	17.112	148.475	-79.716	5.278	148.829	-78.799	5.278	100	0.96	Hg	2015.000	V	LSPM J0309+5016. M1 and M2 are LSPM vmag estimates
	45.82789200	50.26672700	6.979	140.278	15.700	15.554								1.30	E2	1998.923		2MASS. M1 and M2 estimated from J- and K-band
	45.82782700	50.26675000	6.981	140.249	14.815	15.554								0.20	Eu	2013.474		URAT1
	45.82789200	50.26672670	6.981	140.238			150.500	-78.300	5.600	150.300	-77.100	5.600						Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are FSI gmag
	45.82882565	50.26640666	6.972	140.139	16.624	18.016								1.80	C	2012.200		GAIA DR1. M1 and M2 are Gmag
	45.82886429	50.26639401	6.974	140.136	14.863	16.033								0.96	Hg	2015.000		GAIA DR1/2MASS. M1 and M2 estimated from G/3/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
KFP n+6	59.82485870	58.39459239	7.143	40.826	16.120	18.060	114.928	-184.113	5.314	115.072	-179.276	5.314	100	0.96	Hg	2015.000	V	LSPM J0359+5823. M1 and M2 are LSPM vmag estimates
	59.82394000	58.395336300	7.081	41.196	14.320	15.876								1.30	E2	1999.033		2MASS. M1 and M2 estimated from J- and K-band
	59.82388600	58.39540900	7.083	41.219	14.427	15.876								0.20	Eu	2013.546		URAT1
	59.82394460	58.39535950	7.089	41.202			115.600	-183.900	5.600	115.600	-179.000	5.700						Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are FSI gmag
	59.82483502	58.39461153	7.142	40.908	17.065	19.288								1.80	C	2012.871		GAIA DR1. M1 and M2 are Gmag
	59.82485870	58.39459239	7.143	40.826	15.011	16.758								0.96	Hg	2015.000		GAIA DR1/2MASS. M1 and M2 estimated from G/3/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
NSN n+6	69.81833910	39.11018064	9.422	235.662	16.859	18.812	199.946	16.343	6.553	202.358	17.842	6.554	100	0.96	Hg	2015.000	V	LSPM J0439+3906. M1 and M2 are LSPM vmag estimates
	69.81726100	39.11010400	9.476	235.867	17.070	19.140	192.000	-16.000		182.000	13.000			1.30	E2	1998.779		2MASS. M1 and M2 estimated from J- and K-band
	69.81717800	39.11010700	9.468	235.674	15.414	16.859								0.20	Eu	2013.523		URAT1
	69.81726500	39.11011240	9.464	235.660			200.000	15.700	5.500	202.900	16.500	5.600						Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are FSI gmag
	69.81830282	39.11017959	9.407	235.614	17.705	19.681								1.80	C	2012.726		GAIA DR1. M1 and M2 are Gmag
	69.81833910	39.11018064	9.422	235.662	15.819	17.416								0.96	Hg	2015.000		USNO B1. M1 and M2 are Imags
	69.81723900	39.11004500	9.080	238.683	14.810	16.180	232.000	-50.000	15.000	214.000	12.000	48.703				1988.700		GAIA DR1/2MASS. M1 and M2 estimated from G/3/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
KFP n+7	96.67677258	17.84302981	3.467	82.224	17.654	18.614	2.109	-160.479	7.019	-2.792	-161.465	7.059	100	0.96	Hg	2015.000	V	LSPM J0626+1750. M1 and M2 are LSPM vmag estimates
	96.67677300	17.84369900	3.536	82.100	16.720		13.000	-159.000		13.000	-159.000							2MASS. M1 and M2 estimated from J- and K-band
	96.67676200	17.84379600	3.553	82.138			6.300	-158.600	5.200	-15.800	-160.800	6.600		1.30	E2	1997.812		URAT1
	96.67676590	17.84369970	3.504	82.117										0.20	Eu	2013.487		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are FSI gmag
	96.67677183	17.84306060	3.464	82.666	18.345	19.319								1.80	C	2011.896		GAIA DR1. M1 and M2 are Gmag
	96.67677258	17.84302981	3.467	82.224	16.802	17.643								0.96	Hg	2015.000		

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
NSN n+7	99.90983957	23.99157254	7.504	83.797	14.115	20.545	-14.198	-166.376	6.083	-12.864	-134.732	18.289	5	0.96	Hg	2015.000		GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly optical
	99.90990400	23.99226600	7.460	87.483	14.400	19.560	-18.000	-169.000		-18.000	-169.000							LSPM J0639+2359. M1 and M2 are LSPM Vmag estimates
	99.90990500	23.99227300	7.447	87.451	14.180									1.30	E2	1999.844		2MASS. M1 and M2 estimated from J- and K-band
	99.90984168	23.99159533	7.492	84.186	14.342									1.80	C	2011.897		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	99.90983957	23.99157254	7.504	83.797	13.792	19.317	-14.000	-160.000	2.236	12.000	-148.000	5.099		0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	99.90993100	23.99226700	6.737	83.002	12.990	17.580	-14.000	-160.000								1980.400		USNO BL. M1 and M2 are Imags
KFP n+8	101.91494250	5.94940287	22.915	211.411	15.962	19.080	101.413	-133.283	7.027	96.589	-118.624	7.027	78	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most probably physical
	101.91452000	5.94995900	23.059	210.939	16.600	18.850	117.000	-126.000		117.000	-126.000							LSPM J0647+0556. M1 and M2 are LSPM Vmag estimates
	101.91451400	5.94996300	23.067	210.969	14.510	16.192								1.30	E2	1999.871		2MASS. M1 and M2 estimated from J- and K-band
	101.91451750	5.94995810	23.067	210.971	16.294		101.400	-136.800	6.000	102.500	-138.600	6.700		0.20	Bu	2013.526		URAT1
	101.91492940	5.94941847	22.933	211.339	16.920	19.414								1.80	C	2012.316		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	101.91494250	5.94940287	22.915	211.411	14.846	17.282								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	101.91307500	5.95155600	23.164	210.783	15.600	17.800								1.20	Fo	1953.992		USNO A2. M1 and M2 are Rmags
	101.91409500	5.95035600	23.078	210.911	13.680	15.470										1950.000		USNO BL. M1 and M2 are Imags
NSN n+8	102.00645360	30.61126220	5.306	145.181	15.114	20.325	2.039	-150.825	5.287	3.563	-155.542	7.097	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	102.00644700	30.61188500	5.238	144.738	15.370		13.000	-166.000		13.000	-166.000							LSPM J0648+3036. M1 and M2 are LSPM Vmag estimates
	102.00644300	30.61193700	5.230	144.927	13.841									1.30	E2	1998.893		2MASS. M1 and M2 estimated from J- and K-band
	102.00645290	30.61128438	5.326	145.426	15.965									1.80	C	2011.911		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	102.00645360	30.61126220	5.306	145.181	14.029	18.378								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
KFP n+9	103.37468250	60.75767343	4.624	130.501	11.526	15.654	-46.140	-167.369	6.269	-40.166	-172.364	7.148	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	103.37496900	60.75832700	4.552	127.517	11.480		-56.000	-168.000		-48.000	-173.000							LSPM J0653+6045. M1 and M2 are LSPM Vmag estimates
	103.37510100	60.75841500	4.499	130.518	11.399	14.097								1.30	E2	1999.049		2MASS. M1 and M2 estimated from J- and K-band
	103.37478880	60.75780539	4.798	134.972	11.935									1.80	C	2012.090		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	103.37468250	60.75767343	4.624	130.501	10.950	14.523	-48.820	-168.094	1.044					0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
NSN n+9	106.17738670	4.18083978	17.905	94.918	18.111	19.479	172.607	-225.730	5.654	173.666	-230.127	23.772	95	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	106.17665900	4.18178000	17.890	94.709	17.960	19.420	183.000	-231.000		183.000	-231.000							LSPM J0704+0410. M1 and M2 are LSPM Vmag estimates
	106.17666200	4.18178500	17.883	94.711	17.726	17.960								1.30	E2	1999.925		2MASS. M1 and M2 estimated from J- and K-band
	106.17710800	4.18122200	17.761	94.557	19.156	20.635	176.000	-242.000	4.243	179.000	-232.000	5.657		2.50	Es	2009.082		SDSS9. M1 and M2 are SDSS9 gmag
	106.17666540	4.18178030	17.881	94.709			179.200	-221.800	7.100	147.200	-212.900	10.500		0.20	Bu	2012.936		URAT1
	106.17738270	4.18084633	17.915	95.013	18.927	20.370								1.80	C	2013.873		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	106.17738670	4.18083978	17.905	94.918	17.363	18.525								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	106.17651700	4.18187300	18.285	94.777	14.730	17.310	164.000	-240.000	19.849	182.000	-232.000	8.544				1981.250		USNO BL. M1 and M2 are Imags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes	
KPP n+10	112.14125810	89.68378631	17.589	306.903	16.223	17.429	199.128	-140.429	9.005	197.105	-134.327	9.005	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical	
	111.99185200	89.68442500	17.505	306.716	16.860	18.440	231.000	89.000		231.000	89.000							LSPM J0727+8941. M1 and M2 are LSPM Vmag estimates	
	111.98275800	89.68440200	17.507	306.711	14.705	15.569								1.30	B2	1999.216		2MASS. M1 and M2 estimated from J- and K-band	
	111.99047370	89.68436910	17.511	306.718			202.300	-146.700	6.700	199.000	-142.500	6.800		0.20	Ed	2013.101		URAT1	
	112.11818190	89.68393330	17.532	306.770	17.062	18.390								1.80	C	2012.204		Fan-STARS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag	
	112.14125810	89.68378631	17.589	306.903	15.161	16.290								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag	
	111.52575600	89.68610900	17.622	305.882	15.600	16.800								1.20	Fp	1952.642		USNO A2. M1 and M2 are Rmag	
	112.01254500	89.68435300	18.455	306.399	12.580	13.660	192.000	-132.000	2.236	-378.000	208.000	11.402				1981.650		USNO B1. M1 and M2 are Imags	
	NSN n+10	115.50143181	3.80957497	19.308	93.950	13.985	14.083	-221.775	36.552	6.120	-218.797	33.822	6.119	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
		115.50235700	3.80942300	19.257	93.837	14.680	14.210	-219.000	38.000		-219.000	38.000			1.30	B2	1999.934		LSPM J0742+0348. M1 and M2 are LSPM Vmag estimates
115.50236200		3.80942200	19.261	93.837	13.120	13.148								0.20	Bu	1997.878		2MASS. M1 and M2 estimated from J- and K-band	
115.50235830		3.80942670	19.307	93.854	14.100	14.161	-221.700	31.600	9.398	-232.100	36.200	7.948		0.20	Bu	1997.878		UCAC4. Given magnitudes are Vmags. Central epochs averaged	
115.50143535		3.80957682	19.321	93.964	14.746	14.841								1.80	C	2013.267		Fan-STARS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag	
115.50143181		3.80957497	19.308	93.950	13.077	13.165								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag	
115.50509500		3.80897800	19.301	93.861	13.400	13.700								1.20	Fp	1955.955		USNO A2. M1 and M2 are Rmag	
115.50235300		3.80937500	20.020	93.350	12.720	12.740				246.000	12.000	3.606				1989.100		USNO B1. M1 and M2 are Imags	
KPP n+11		117.57001110	48.47250498	9.633	21.941	12.106	20.201	-52.397	-278.163	6.737	-53.353	-278.414	7.287	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
		117.57034300	48.47366300	9.648	22.055	12.060		-59.000	-274.000		-59.000	-274.000							LSPM J0750+4828. M1 and M2 are LSPM Vmag estimates
	117.57033700	48.47365200	9.642	22.011	11.609	17.043								1.30	B2	2000.155		2MASS. M1 and M2 estimated from J- and K-band	
	117.57029800	48.47335500	9.642	21.781	15.299	25.112								2.50	Es	2003.886		SDSS9. M1 and M2 are SDSS9 gmag	
	117.57003390	48.47259670	9.411	21.817	12.016									0.20	Ed	2013.902		URAT1	
	117.57013750	48.47270459	9.688	21.016	13.545	20.988								1.80	C	2011.717		Fan-STARS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag	
	117.57001110	48.47250498	9.633	21.941	11.320	18.187								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag	
	NSN n+11	120.37131110	57.98965980	3.905	277.744	13.108	15.601	-47.073	-214.138	5.759	-47.615	-214.779	5.760	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
		120.37168100	57.99055100	3.896	277.915	13.130		-50.000	-220.000		-50.000	-220.000							LSPM J0801+5759. M1 and M2 are LSPM Vmag estimates
		120.37170600	57.99061200	3.897	277.911	12.451	13.888								1.30	B2	1998.992		2MASS. M1 and M2 estimated from J- and K-band
120.37138320		57.98982589	3.994	269.690	13.695	16.483								1.80	C	2012.471		Fan-STARS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag	
120.37131110	57.98965980	3.905	277.744	12.265	14.464								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag		

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+12	136.24782794	2.43621322	10.048	68.278	13.010	13.448	-209.282	6.087	5.695	-202.926	12.616	5.730	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	136.24870300	2.43618800	9.904	68.552	13.060	12.440	-197.000	3.000		-197.000	3.000							LSPM J0905+0226. M1 and M2 are LSPM Vmag estimates
	136.24869600	2.43618800	9.924	68.597	11.907	11.802								1.30	E2	2000.081		2MASS. M1 and M2 estimated from J- and K-band
	136.24869080	2.43619030	9.920	68.722	12.904		-197.000	3.000	11.314	-197.000	3.000	11.314		0.20	Eu	2000.000		UCAC4. Given magnitudes are Vmags. Central epochs averaged
NSN n+12	136.24858200	2.43614400	10.151	67.962	15.472	15.417								2.50	Es	2001.140		SDSS9. M1 and M2 are SDSS9 vmags
	136.24870070	2.43618770	9.923	68.596			-208.000	1.300	5.900	-202.200	8.300	5.900		0.20	Eu	2013.893		URAT1
	136.24782761	2.43621273	10.069	68.427		14.435								1.80	C	2013.117		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 vmags
	136.24782794	2.43621322	10.048	68.278	11.967	12.244								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
KPP n+13	139.41627290	28.55545973	8.869	110.923	13.434	14.166	-204.467	-85.408	6.275	-199.308	-83.752	6.308	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	139.41725200	28.55581900	8.802	111.271	12.750	14.330	-196.000	-70.000		-196.000	-70.000							LSPM J0917+2833. M1 and M2 are LSPM Vmag estimates
	139.41729300	28.55583400	8.802	111.271	12.243	12.704								1.30	E2	1999.224		2MASS. M1 and M2 estimated from J- and K-band
	139.41722620	28.55579620	8.682	111.624	13.342		-200.400	-79.700	8.450	-196.000	-70.000	11.314		0.20	Eu	2000.195		UCAC4. Given magnitudes are Vmags. Central epochs averaged
NSN n+13	139.41693400	28.55569200	8.532	113.208	14.826	15.515								2.50	Es	2004.212		SDSS9. M1 and M2 are SDSS9 vmags
	139.41646910	28.5558028	8.632	114.520	14.209	15.035								1.80	C	2011.994		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 vmags
	139.41627290	28.55545973	8.869	110.923	12.354	13.016								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	146.93021270	38.33563030	5.377	291.512	16.386	17.116	103.829	-298.992	5.068	104.243	-297.765	5.068	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
NSN n+13	146.92965700	38.33687200	5.365	291.325	15.650		110.000	-309.000		110.000	-309.000							LSPM J0947+3820. M1 and M2 are LSPM Vmag estimates
	146.92959700	38.33702100	5.376	291.282	14.943	15.363								1.30	E2	1998.255		2MASS. M1 and M2 estimated from J- and K-band
	146.92977800	38.33682200	5.373	291.540	17.503	18.263								2.50	Es	2002.999		SDSS9. M1 and M2 are SDSS9 vmags
	146.93016610	38.33571690	5.337	291.238										0.20	Eu	2013.889		URAT1
NSN n+13	146.93011570	38.3358597	5.366	291.385	17.281	18.051								1.80	C	2012.300		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 vmags
	146.93021270	38.33563030	5.377	291.512	15.325	15.997								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	148.75393853	48.57182783	9.878	303.230	12.666	13.305	158.929	-1.742	5.687	153.026	0.345	7.167	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	148.75293000	48.57183500	9.792	303.344		12.220	150.000	-7.000		150.000	-7.000							LSPM J0954+4834. M1 and M2 are LSPM Vmag estimates
NSN n+13	148.75294900	48.57183500	9.788	303.359	12.206	12.355								1.30	E2	2000.169		2MASS. M1 and M2 estimated from J- and K-band
	148.75311530	48.57183420	9.774	303.286	12.442		150.000	-7.000	11.314	150.000	-7.000	11.314		0.20	Eu	2000.000		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	148.75314220	48.57182000	9.846	303.261	12.308	13.094	157.300	2.300	1.697	154.900	3.400	1.697	100	0.20	Eu	2002.943		UCAC5. M1 and M2 are mag values. Most certainly physical
	148.75312700	48.57180200	9.839	303.337	15.145	14.670								2.50	Es	2001.890		SDSS9. M1 and M2 are SDSS9 vmags
NSN n+13	148.75293760	48.57183490	9.787	303.362			156.500	-2.100	5.900	150.200	0.100	5.900		0.20	Eu	2013.739		URAT1
	148.75399204	48.57183862	9.963	302.639	13.312									1.80	C	2013.732		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 vmags
	148.75393853	48.57182783	9.878	303.230	11.827	12.363								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags

Table 1 continues on the next page.



CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+14	156.05630641	39.04302930	5.750	243.107	13.468	13.883	-94.458	94.247	5.069	-94.143	107.909	5.068	64	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Probably physical
	156.05680800	39.04264500	5.850	241.071	12.650	12.076	-93.000	112.000		-93.000	112.000							LSPM J1024+3902. M1 and M2 are LSPM Vmag estimates
	156.05687200	39.04259100	5.862	241.137	11.705	12.076	-93.000	112.000		-93.000	112.000			1.30	E2	1998.258		2MASS. M1 and M2 estimated from J- and K-band
	156.05673860	39.04270670	5.837	241.243	13.329	13.329	-93.000	112.000	11.314	-93.000	112.000	11.314	0.20	Eu	2000.000			UCAC4. Given magnitudes are Vmags. Central epochs averaged
	156.05667800	39.04271600	5.805	241.475	14.889	15.382	-95.800	96.700	5.200	-94.500	110.800	5.200	2.50	Es	2003.087			SDSS9. M1 and M2 are SDSS9 gmags
	156.05681240	39.04263770	5.848	241.346	13.329	13.329	-95.800	96.700	5.200	-94.500	110.800	5.200	0.20	Eu	2013.896			URAT1
	156.05629129	39.04302762	5.652	242.593	14.468	14.912							1.80	C	2012.208			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	156.05630641	39.04302930	5.750	243.107	12.212	12.580							0.96	Hg	2015.000			GAIA DR1. M1 and M2 are Gmags
	158.70419300	1.97855700	8.980	124.980	14.440	14.080	126.000	-159.000			126.000	-159.000						LSPM J1034+0158. M1 and M2 are LSPM Vmag estimates
	158.70419300	1.97855200	8.989	124.940	13.576	13.786							1.30	E2	2000.106			2MASS. M1 and M2 estimated from J- and K-band
NSN n+14	158.70416210	1.97856090	9.112	124.632	14.178	14.126	13.400	-57.300	3.124	126.000	-159.000	11.314	0.20	Eu	1998.508			UCAC4. Given magnitudes are Vmags. Central epochs averaged
	158.70414300	1.97853400	8.984	124.935	15.580	15.640	-18.000	-52.000	5.657	442.000	-354.000	25.456	2.50	Es	2000.343			SDSS9. M1 and M2 are SDSS9 gmags
	158.70418920	1.97855640	8.989	124.937	14.178	14.178	125.700	-151.900	5.900	124.600	-152.400	5.800	0.20	Eu	2014.110			URAT1
	158.70471087	1.97792773	8.963	125.033	15.374	15.431							1.80	C	2014.429			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	158.70471058	1.97792776	8.972	125.028	13.700	13.753							0.96	Hg	2015.000			GAIA DR1. M1 and M2 are Gmags
	158.70413900	1.97855600	8.465	124.713	11.950	11.950	-12.000	-52.000	15.652	420.000	-328.000	136.517				1988.150		USNO B1. M1 and M2 are Imags
	164.64075540	46.21622202	2.932	90.028	19.356	20.185	-85.542	-187.813	16.342	-82.282	-194.850	14.087	95	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	164.64128100	46.21699900	2.854	87.759	18.160	18.160	-55.000	-212.000		-55.000	-212.000							LSPM J1058+4613. M1 and M2 are LSPM Vmag estimates
	164.64130700	46.21706000	2.882	87.781									1.30	E2	1998.938			2MASS. M1 and M2 estimated from J- and K-band
	164.64104100	46.21688600	2.934	90.000	20.221	20.963							2.50	Es	2003.177			SDSS9. M1 and M2 are SDSS9 gmags
KPP n+15	164.64076570	46.21623877	2.910	90.452	19.956	20.672							1.80	C	2013.300			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	164.64075540	46.21622202	2.932	90.028	18.392	19.022							0.96	Hg	2015.000			GAIA DR1. M1 and M2 are Gmags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
NSN n+15	174.66795584	23.72994713	18.423	195.800	12.728	13.005	-224.664	-4.758	24.828	-229.721	-0.989	24.828	80	0.96	Hg	2015.000	?	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most probably physical
	174.66897600	23.72996700	18.455	195.496	13.040	12.980	-219.000	6.000	-219.000	6.000								LSPM J1138+2343. M1 and M2 are LSPM Vmag estimates
	174.66898100	23.72996700	18.457	195.525	11.912	12.154								1.30	E2	1999.962		2MASS. M1 and M2 estimated from J- and K-band
	174.66890140	23.72997200	18.523	194.445	12.807	13.094	-219.000	6.000	11.314	-234.700	6.200	4.892		0.20	Eu	1998.493		UCAC4. Given magnitudes are Vmags. Central epochs averaged
174.66890220	23.72993690	18.466	195.519	12.492	12.819	-225.700	2.700	1.910	-231.200	7.400	1.980	32	0.20	Eu	2001.184		UCAC5. M1 and M2 are Vmag values. Probably optical. Might be effect of orbit	
174.66865400	23.72993100	18.432	195.579	15.835	16.018	-228.000	27.000	18.385	-236.000	7.000	2.828		2.50	Es	2005.096		SDSS9. M1 and M2 are SDSS9 gmags	
174.66805280	23.72995560	18.420	195.761	12.816	13.094									0.20	Eu	2013.806		URAT1
174.66795070	23.72994725	18.423	195.793	13.613	13.717									1.80	C	2012.360		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
174.66795584	23.72994713	18.423	195.800	11.794	12.064									0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
174.67242500	23.72981400	18.385	194.651	11.800	11.600	-210.000	12.000	81.468	-226.000	18.000	4.472			1.20	Fp	1950.353		USNO A2. M1 and M2 are Rmags
174.66909000	23.72993400	17.978	195.295	10.300	10.700											1987.800		USNO B1. M1 and M2 are Imags
KPP n+16	177.58507247	51.55428980	5.914	60.480	12.625	13.342	-133.505	-80.790	6.154	-131.989	-81.643	6.154	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	177.58596800	51.55462600	5.901	60.263		9.970	-144.000	-66.000		-144.000	-66.000							LSPM J1150+5133. M1 and M2 are LSPM Vmag estimates
	177.58596600	51.55462600	5.901	60.263	12.526	13.075								1.30	E2	2000.019		2MASS. M1 and M2 estimated from J- and K-band
	177.58577220	51.55457370	5.775	60.260	12.117	12.456	-144.000	-66.000	11.314	-144.000	-66.000	11.314		0.20	Eu	2000.000		UCAC4. Given magnitudes are Vmags. Central epochs averaged
177.58586700	51.55454400	5.937	60.426	15.350	14.673								2.50	Es	2001.970		SDSS9. M1 and M2 are SDSS9 gmags	
177.58596690	51.55462620	5.901	60.265	12.116		-131.500	-78.100	5.900	-131.700	-78.500	5.900			0.20	Eu	2013.757		URAT1
177.58507247	51.55428980	6.013	61.014		13.703									1.80	C	2012.792		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
177.58507247	51.55428980	5.914	60.480	12.166	12.771									0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
NSN n+16	177.80018110	37.13041755	4.772	10.133	11.980	16.036	-175.647	-63.850	6.821	-175.213	-62.153	6.821	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	177.80108600	37.13063800	4.928	10.266	11.600		-176.000	-64.000		-184.000	-57.000							LSPM J1151+3707. M1 and M2 are LSPM Vmag estimates
	177.80120400	37.13071400	4.743	10.107	11.852	14.607								1.30	E2	1998.285		2MASS. M1 and M2 estimated from J- and K-band
	177.80083300	37.13059700	4.835	9.946	12.384	17.072								2.50	Es	2004.207		SDSS9. M1 and M2 are SDSS9 gmags
177.80109930	37.13068330	4.736	10.058	11.837		-175.400	-64.300	5.200	-178.100	-67.700	7.700			0.20	Eu	2014.078		URAT1
177.80022240	37.13041224	4.792	9.545	13.196	16.581									1.80	C	2011.963		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
177.80018110	37.13041755	4.772	10.133	11.539	15.019	-178.458	-59.330	1.300						0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
KPP n+17	180.54182790	23.64545145	4.333	205.485	17.136	17.752	-158.351	-94.509	13.391	-163.703	-102.688	13.338	95	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	180.54254200	23.64584500	4.175	205.000	16.260		-165.000	-91.000		-165.000	-91.000							LSPM J1202+2338. M1 and M2 are LSPM Vmag estimates
	180.54257700	23.64586100	4.182	205.204	16.248	16.966								1.30	E2	1999.400		2MASS. M1 and M2 estimated from J- and K-band
	180.54229800	23.64570700	4.332	205.283	17.952	18.687								2.50	Es	2005.189		SDSS9. M1 and M2 are SDSS9 gmags
180.54196310	23.64551554	4.657	208.408	17.777	18.493									1.80	C	2012.078		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
180.54182790	23.64545145	4.333	205.485	16.442	17.034									0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
NSN n+17	185.79160820	4.70430425	4.753	233.109	14.166	17.099	-164.487	44.909	7.620	-165.338	46.225	7.620	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	185.79228200	4.70411700	4.746	232.751	14.100		-182.000	54.000		-182.000	54.000							LSPM J1223+0442. M1 and M2 are LSPM Vmag estimates
	185.79228900	4.70411900	4.755	232.829	13.119	15.463								1.30	E2	2000.150		2MASS. M1 and M2 estimated from J- and K-band
	185.79226300	4.70414600	4.785	232.994	15.953	18.335	-152.000	64.000	4.243					2.50	Es	2001.290		SDSS9. M1 and M2 are SDSS9 gmags
KPP n+18	185.79229580	4.70411690	4.754	232.828	14.358		-166.500	47.600	6.100	-173.000	42.100	6.500		0.20	Eu	2013.701		URAT1
	185.79175250	4.70425276	5.003	237.394	14.972	18.041								1.80	C	2011.894		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	185.79160820	4.70430425	4.753	233.109	13.167	15.877								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	188.08654296	13.58382735	12.516	351.208	9.985	16.220	-281.900	-10.140	5.840	-284.326	-2.106	5.837	100	0.96	Hg	2015.000		GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
NSN n+18	188.08654800	13.58382900	12.470	351.600	9.860	17.110	-275.000	-6.000		-263.000	6.000							LSPM J1232+1335W and LSPM J1232+1335N. M1 and M2 are LSPM Vmag estimates. Note: There is with LSPM J1232+1335E a third component with unclear status - might be bogus
	188.08671800	13.58385700	12.735	351.299	9.800	14.900								1.30	E2	1998.039		2MASS. M1 and M2 estimated from J- and K-band
	188.08655420	13.58382920	12.539	350.251	9.920		-273.200	-3.600		-263.000	6.000			0.20	Eu	1995.500		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	188.08546690	13.58381220	12.486	351.426	9.920		-274.350	-10.110	6.200	-276.530	-2.990	6.270	100	0.20	Eu	2013.915		URAT1. PM from position comparison with 2MASS
NSN n+18	188.08535167	13.58380921	12.470	352.100	9.714	17.055								1.80	C	2012.398		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	188.08654296	13.58382735	12.516	351.208	9.633	15.181								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	189.36291460	29.87837546	9.545	263.390	13.441	17.890	-162.558	-93.597	13.550	-166.753	-98.134	13.550	95	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	189.36369300	29.87876100	9.439	263.782	13.850		-149.000	-101.000		-149.000	-101.000							LSPM J1237+2952. M1 and M2 are LSPM Vmag estimates
NSN n+18	189.36379100	29.87881300	9.467	263.800	12.423	15.393								1.30	E2	1998.171		2MASS. M1 and M2 estimated from J- and K-band
	189.36341400	29.87861800	9.523	263.662	15.358	19.441								2.50	Es	2004.957		SDSS9. M1 and M2 are SDSS9 gmags
	189.36369430	29.87876560	9.476	263.771	13.660		-165.100	-92.700	5.200	-170.200	-96.700	5.300		0.20	Eu	2013.678		URAT1
	189.36293300	29.87837203	9.510	263.883	14.198	19.086								1.80	C	2011.436		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
189.36291460	29.87837546	9.545	263.390	12.412	16.410								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags	

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+19	190.50561513	75.14582872	6.139	125.983	14.903	15.669	-205.945	-24.230	9.414	-195.387	-29.899	6.732	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	190.50897200	75.14592700	5.950	126.192	16.510	15.750	-197.000	-46.000		-197.000	-46.000							LSPM J1242+7508. M1 and M2 are LSPM Vmag estimates
	190.50913900	75.14593500	5.951	126.231		14.245								1.30	E2	1999.209		2MASS. M1 and M2 estimated from J- and K-band
	190.50804650	75.14591060	6.070	126.892	14.845					-197.000	-46.000	11.314		0.20	Eu	2002.025		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	190.50570568	75.14583202	6.113	126.078	15.148	16.596								1.80	C	2012.659		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	190.50561513	75.14582872	6.139	125.983	15.295	14.514								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
NSN n+19	191.46016829	63.33268625	15.045	143.997	16.897	17.143	-159.088	79.249	10.271	-158.921	80.667	10.271	95	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	191.46163900	63.33235500	15.068	144.021	16.930	16.790	-158.000	83.000		-158.000	84.000							LSPM J1245+6319. M1 and M2 are LSPM Vmag estimates
	191.46171700	63.33234000	15.061	144.056	15.695	15.908								1.30	E2	1999.271		2MASS. M1 and M2 estimated from J- and K-band
	191.46146100	63.33240700	15.071	143.978	17.917	18.205	-148.000	82.000	4.243	-151.000	83.000	4.243		2.50	Es	2001.391		SDSS9. M1 and M2 are SDSS9 gmags
	191.46164440	63.33235650	15.061	144.055			-160.100	81.600	5.600	-160.200	82.500	5.600		0.20	Eu	2013.651		URAT1
	191.46022942	63.33267161	15.038	144.012	17.694	17.982								1.80	C	2012.136		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	191.46016829	63.33268625	15.045	143.997	15.962	16.196								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	191.46597000	63.33135000	15.176	143.483	16.200	16.600								1.20	Pp	1993.280		USNO A2. M1 and M2 are Rmags
	191.46153900	63.33246400	15.103	144.914	14.410	14.550	-146.000	86.000	2.236	-154.000	82.000	6.708				1977.400		USNO B1. M1 and M2 are Imags
KPP n+20	197.59418774	31.92089465	7.143	96.297	15.034	15.209	-204.759	-92.392	5.950	-198.112	-92.312	5.953	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	197.59518400	31.92127800	7.038	96.373		12.100	-197.000	-94.000		-197.000	-94.000							LSPM J1310+3155. M1 and M2 are LSPM Vmag estimates
	197.59531400	31.92132600	7.032	96.408	13.571	13.682								1.30	E2	1998.193		2MASS. M1 and M2 estimated from J- and K-band
	197.59503210	31.92121920	7.190	95.689	14.755					-197.000	-94.000	11.314		0.20	Eu	2000.750		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	197.59487100	31.92114400	7.076	96.485	16.192	16.365								2.50	Es	2004.362		SDSS9. M1 and M2 are SDSS9 gmags
	197.59426780	31.92091690	7.120	96.351										0.20	Eu	2013.745		URAT1
	197.59438598	31.92097635	6.942	97.736	15.918	16.130								1.80	C	2012.365		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	197.59418774	31.92089465	7.143	96.297	13.889	14.062								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
NSN n+20	202.09689580	35.75677614	3.109	102.699	15.249	15.563	-183.541	-29.139	7.871	-195.966	-35.665	7.871	80	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most probably physical
	202.09783900	35.75689300	3.262	100.171	14.900	14.900	-191.000	-44.000		-191.000	-44.000							LSPM J1328+3545. M1 and M2 are LSPM Vmag estimates
	202.09789600	35.75690500	3.283	100.170	13.345	13.491								1.30	E2	1999.080		2MASS. M1 and M2 estimated from J- and K-band
	202.09767740	35.75695870	3.404	105.644			67.300	-104.900	8.773	-191.000	-44.000	11.314		0.20	Eu	2000.343		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	202.09758500	35.75696000	3.209	101.323	16.628	17.085								2.50	Es	2004.209		SDSS9. M1 and M2 are SDSS9 gmags
	202.09690579	35.75678370	3.124	102.163	16.348	16.618								1.80	C	2013.380		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	202.09689580	35.75677614	3.109	102.699	13.938	14.155								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
KPP n+21	204.37606700	16.21978766	4.475	43.822	14.753	19.283	-197.703	-40.061	7.115	-199.032	-38.367	7.115	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	204.37662300	16.21995200	4.497	44.694	14.950		-186.000	-46.000		-186.000	-46.000							LSPM J1337+1613. M1 and M2 are LSPM Vmag estimates
	204.37703500	16.21997600	4.471	44.284	13.390									1.30	E2	1998.075		2MASS. M1 and M2 estimated from J- and K-band
	204.37659000	16.21991200	4.551	43.899	15.799	25.114	-192.000	-48.000	2.828					2.50	Es	2005.364		SDSS9. M1 and M2 are SDSS9 gmags
	204.37608130	16.21979153	4.479	44.136	15.569									1.80	C	2012.429		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	204.37606700	16.21978766	4.475	43.822	13.640	17.677								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
NSN n+21	217.07528389	63.81773459	19.587	306.030	13.854	14.237	-136.935	187.102	21.956	-139.876	180.072	9.386	95	0.96	Hg	2015.000	?	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	217.07656900	63.81695600	19.621	306.356	14.590	12.980	-154.000	181.000		-154.000	181.000							LSPM J1428+6349. M1 and M2 are LSPM Vmag estimates
	217.07664000	63.81691700	19.615	306.370	12.378	12.713								1.30	E2	1999.269		2MASS. M1 and M2 estimated from J- and K-band
	217.07663740	63.81697670	20.429	306.533	14.232		-151.500	184.200	4.118	-154.000	181.000	11.314		0.20	Eu	1999.920		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	217.07635080	63.81714250	19.611	305.787	14.074	14.297	-144.600	181.900	1.838	-138.800	186.400	1.980	20	0.20	Eu	2003.279		UCAC5. M1 and M2 are fmag values. Most probably optical. Might be effect of orbit
	217.07656400	63.81699200	19.561	305.793	15.157	15.286	-146.000	182.000	4.243	-145.000	190.000	4.243		2.50	Es	2000.321		SDSS9. M1 and M2 are SDSS9 gmags
	217.07657720	63.81695570	19.617	306.345	14.232		-137.400	190.100	5.700	-145.600	183.600	5.700		0.20	Eu	2013.587		URAT1
	217.07528085	63.81773446	19.609	306.004	14.744	14.993								1.80	C	2013.290		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	217.07528389	63.81773459	19.587	306.030	12.725	13.087								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	217.08052800	63.81472800	19.393	304.846	12.100	12.600								1.20	Fp	1956.201		USNO A2. M1 and M2 are Rmags
	217.07668100	63.81697000	19.654	305.883	11.060	11.230	-142.000	182.000	2.828	-142.000	192.000	4.243				1978.600		USNO B1. M1 and M2 are Imags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+22	225.16476630	14.35798784	4.251	281.652	14.768	17.795	-167.983	-17.316	5.532	-166.464	-13.755	5.532	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	225.16549700	14.35806000	4.281	280.711	15.130		-168.000	-19.000		-168.000	-19.000							LSPM J1500+1421. M1 and M2 are LSPM Vmag estimates
	225.16556900	14.35806800	4.264	280.803	13.853	16.016								1.30	E2	1998.335		2MASS. M1 and M2 estimated from J- and K-band
	225.16520200	14.35804600	4.278	281.060	15.977	19.053	-156.000	-10.000	2.828					2.50	Es	2005.362		SDSS9. M1 and M2 are SDSS9 gmag
	225.16478430	14.35798793	4.224	281.642	15.445	18.726								1.80	C	2012.637		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
NSN n+22	225.16476630	14.35798784	4.251	281.652	13.846	16.640								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	229.61100380	51.81334176	4.607	273.956	14.999	16.814	59.171	-184.600	5.130	60.084	-186.060	5.130	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	229.61059600	51.81411000	4.631	274.235	13.720	15.694	53.000	-190.000		53.000	-190.000			1.30	E2	1998.458		LSPM J1518+5148. M1 and M2 are LSPM Vmag estimates
	229.61056400	51.81419000	4.624	274.242	14.604	15.694								1.30	E2	1998.458		2MASS. M1 and M2 estimated from J- and K-band
	229.61067560	51.81394280	4.466	275.204	14.843		53.000	-190.000	11.314					0.20	Eu	2001.595		UCAC4. Given magnitudes are Vmag. Central epochs averaged
KPP n+23	229.61065600	51.81399100	4.600	273.994	15.943	17.839								2.50	Es	2002.437		SDSS9. M1 and M2 are SDSS9 gmag
	229.61060290	51.81411180	4.620	274.187	14.843		55.900	-182.700	5.300	58.100	-186.100	5.500		0.20	Eu	2013.579		URAT1
	229.61099210	51.81336254	4.604	274.102	15.560	17.562								1.80	C	2012.560		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	229.61100380	51.81334176	4.607	273.956	14.287	15.909								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	230.69858660	59.71482087	14.462	114.218	19.116	20.192	0.531	-181.598	6.361	1.445	-175.629	7.252	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
NSN n+23	230.69857800	59.71558000	14.499	114.575	19.840	20.800	-8.000	-171.000		-8.000	-171.000							LSPM J1522+5942. M1 and M2 are LSPM Vmag estimates
	230.69858200	59.71561400	14.488	114.580	16.817	17.792								1.30	E2	1999.277		2MASS. M1 and M2 estimated from J- and K-band
	230.69856700	59.71523900	14.457	114.119	20.178	21.650	6.000	-176.000	4.243					2.50	Es	2006.394		SDSS9. M1 and M2 are SDSS9 gmag
	230.69858260	59.71557850	14.487	114.554			1.800	-175.800	5.800	4.100	-168.100	6.400		0.20	Eu	2013.442		URAT1
	230.69858450	59.71483708	14.468	114.281	19.987	21.264								1.80	C	2012.648		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
NSN n+23	230.69858660	59.71482087	14.462	114.218	17.600	18.662								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	230.69852500	59.71560900	15.204	119.568	15.810	17.300	12.000	-176.000	3.162	26.000	-568.000	17.263				1980.100		USNO B1. M1 and M2 are Imags
	230.79185370	16.22578118	17.209	44.018	15.597	19.805	-192.405	39.518	6.742	-193.472	40.864	6.743	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	230.79267900	16.22561800	17.241	44.225	16.210	20.360	-179.000	30.000		-179.000	30.000							LSPM J1523+1613. M1 and M2 are LSPM Vmag estimates
	230.79267100	16.22562000	17.205	44.102	14.175	16.895								1.30	E2	2000.317		2MASS. M1 and M2 estimated from J- and K-band
NSN n+23	230.79238100	16.22567300	17.201	44.068	16.725	21.493	-183.000	47.000	2.828					2.50	Es	2005.195		SDSS9. M1 and M2 are SDSS9 gmag
	230.79268840	16.22561680	17.206	44.107	15.841		-190.700	38.100	6.100	-192.200	37.600	6.500		0.20	Eu	2013.573		URAT1
	230.79187610	16.22577654	17.202	43.968	16.486	21.134								1.80	C	2012.731		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
230.79185370	16.22578118	17.209	44.018	14.478	17.932								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag	

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+24	231.14426330	31.78079100	5.878	253.718	14.294	18.045	-203.961	43.617	5.503	-214.159	39.578	5.503	80	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most probably physical
	231.14527900	31.78060300	5.733	254.035	14.190		-197.000	30.000		-197.000	30.000							LSPM J1524+3146. M1 and M2 are LSPM Vmag estimates
	231.14538000	31.78058800	5.695	253.890	14.262	17.194								1.30	B2	1998.245		2MASS. M1 and M2 estimated from J- and K-band
	231.14501600	31.78066300	5.856	253.941	14.605	19.025	-193.000	45.000	4.243					2.50	Es	2003.330		SDSS9. M1 and M2 are SDSS9 gmags
NSN n+24	231.14427290	31.78078954	5.818	253.396	14.521	18.760								1.80	C	2012.629		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	231.14426330	31.78079100	5.878	253.718	13.936	17.240								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	234.78889459	54.04620925	4.844	7.570	17.562	19.564	6.280	-130.473	10.404	-20.384	-122.409	28.441	1	0.96	Hg	2015.000		GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	234.78884900	54.04675700	4.796	12.420	17.840	17.820		-159.000			-159.000							LSPM J1539+5402. M1 and M2 are LSPM Vmag estimates
KPP n+25	234.78885100	54.04674100	4.795	12.395	16.934									1.30	B2	2000.328		2MASS. M1 and M2 estimated from J- and K-band
	234.78885000	54.04679200	4.846	7.695	18.451	20.581	5.000	-406.000	33.941	101.000	371.000	79.196		2.50	Es	2000.261		SDSS9. M1 and M2 are SDSS9 gmags
	234.78884990	54.04675270	4.795	12.520			7.100	-128.200	6.200	-23.800	-121.300	6.200		0.20	Eu	2013.708		URAT1
	234.78889316	54.04622471	5.054	7.409	18.255	20.364								1.80	C	2013.010		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
NSN n+25	234.78889459	54.04620925	4.844	7.570	16.883	18.711								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	244.12879590	74.94402011	4.341	254.849	11.742	17.595	-146.654	65.968	7.685	-149.117	65.478	7.685	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	244.13119500	74.94375600	4.337	254.596	11.230		-146.000	70.000		-133.000	78.000							LSPM J1616+7456. M1 and M2 are LSPM Vmag estimates
	244.13125300	74.94373300	4.301	254.814	11.442									1.30	B2	1999.332		2MASS. M1 and M2 estimated from J- and K-band
NSN n+25	244.12879510	74.94401932	4.290	254.375	12.342									1.80	C	2012.156		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	244.12879590	74.94402011	4.341	254.849	11.106	15.132	-144.136	67.951	1.364					0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	249.43491930	37.19972645	23.442	238.716	12.962	17.262	-170.213	50.406	5.530	-169.411	52.487	5.530	97	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	249.43582200	37.19951600	23.466	238.653	13.020	17.470	-158.000	48.000		-158.000	48.000							LSPM J1637+3711. M1 and M2 are LSPM Vmag estimates
NSN n+25	249.43590900	37.19949300	23.471	238.661	12.578	15.378								1.30	B2	1998.327		2MASS. M1 and M2 estimated from J- and K-band
	249.43566100	37.19955300	23.459	238.765	15.815	18.472	-163.000	53.000	4.243	-179.000	55.000	4.243		2.50	Es	2002.438		SDSS9. M1 and M2 are SDSS9 gmags
	249.43580990	37.19951570	23.468	238.673	12.834		-169.200	49.100	5.300	-168.800	52.200	5.300		0.20	Eu	2013.649		URAT1
	249.43491880	37.19972577	23.354	238.507		18.185								1.80	C	2011.853		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
NSN n+25	249.43491930	37.19972645	23.442	238.716	12.245	16.138								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	249.43851200	37.19889800	23.618	239.436	12.200	16.600								1.20	Fp	1954.400		USNO A2. M1 and M2 are Rmags
249.43597300	37.19948100	24.090	240.727	11.110	14.540	-150.000	46.000	6.403	-200.000	50.000	40.460				1977.450		USNO B1. M1 and M2 are Imags	

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+26	250.33374260	35.07841991	21.957	218.531	15.967	20.961	-171.430	3.654	5.942	-255.028	32.559	5.942	0	0.96	Hg	2015.000		GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Almost certainly optical
	250.33462500	35.07840700	21.530	214.899	15.980	19.300	-155.000	5.000		-155.000	5.000							LSPM J1641+3504. M1 and M2 are LSPM Vmag estimates
	250.33471200	35.07840300	21.511	214.828	14.637	17.834								1.30	B2	1998.340		2MASS. M1 and M2 estimated from J- and K-band
	250.33446400	35.07839600	21.715	214.653	17.030	21.593	-161.000	3.000	4.243					2.50	Bs	2002.438		SDSS9. M1 and M2 are SDSS9 gmags
	250.33391860	35.07842653	21.599	215.207	16.776									1.80	C	2012.171		Pan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are PS1 gmags
	250.33374260	35.07841991	21.957	218.531	14.974	18.969								0.96	Hg	2015.000		GAIA DRI. M1 and M2 are Gmags
	250.33706700	35.07838400	21.813	217.127	14.500	18.400								1.20	Fp	1954.400		USNO A2. M1 and M2 are Rmags
	250.33478100	35.07847300	21.984	218.517	13.590	17.370	-146.000	6.000	5.000	-156.000	8.000	12.369				1976.300		USNO B1. M1 and M2 are Imags
NSN n+26	252.74260720	27.79043888	20.997	44.154	15.227	20.497	-125.345	117.659	5.921	-126.038	117.576	5.921	97	0.96	Hg	2015.000	V	GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Almost certainly physical
	252.74321000	27.78994900	20.999	44.154	15.670	21.100	-122.000	124.000		-122.000	124.000							LSPM J1650+2747. M1 and M2 are LSPM Vmag estimates
	252.74322000	27.78993000	21.006	44.173	14.015	17.279								1.30	B2	1999.430		2MASS. M1 and M2 estimated from J- and K-band
	252.74299400	27.79010500	21.005	44.284	16.275	22.307	-123.000	126.000	2.828	-208.629	-212.217	5.073	80	0.96	Hg	2015.000	V	GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Most probably physical
	252.74319780	27.78994830	21.005	44.171	15.531		-124.900	116.600	5.700	-125.000	115.800	6.300		0.20	Bu	2013.414		SDSS9. M1 and M2 are SDSS9 gmags
	252.74262460	27.79042411	20.996	44.101	16.030	21.950								1.80	C	2011.523		URAT1
	252.74260720	27.79043888	20.997	44.154	14.136	18.503								0.96	Hg	2015.000		Pan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are PS1 gmags
	252.74339500	27.78979500	21.064	44.978		17.290										1993.400		GAIA DRI. M1 and M2 are Gmags
KPP n+27	258.86564357	30.87188009	14.944	346.889	13.059	13.856	-216.752	-210.026	5.073	-208.629	-212.217	5.073	80	0.96	Hg	2015.000	V	USNO B1. M1 and M2 are Imags
	258.86673000	30.87277400	15.025	346.199	13.600	11.330	-182.000	-171.000		-182.000	-171.000							GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Most probably physical
	258.86681700	30.87285600	15.011	346.417	11.735	12.507								1.30	B2	1998.272		LSPM J1715+3052. M1 and M2 are LSPM Vmag estimates
	258.86659420	30.87266030	15.050	346.223	13.097	13.097	-182.000	-171.000	11.314	-182.000	-171.000	11.314		0.20	Bu	2000.000		2MASS. M1 and M2 estimated from J- and K-band
	258.86661600	30.87288600	14.896	346.408	16.352	15.194								2.50	Bs	2001.291		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	258.86574970	30.87196890	14.951	346.710										0.20	Bu	2013.688		SDSS9. M1 and M2 are SDSS9 gmags
	258.86564346	30.87187978	14.942	346.895	18.444									1.80	C	2013.713		URAT1
	258.86564357	30.87188009	14.944	346.889	11.957	12.762								0.96	Hg	2015.000		Pan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are PS1 gmags
	258.86740000	30.87355300	16.871	347.820		10.500										1985.450		GAIA DRI. M1 and M2 are Gmags
NSN n+27	262.14934770	13.55514513	8.175	116.113	11.056	14.322	-106.795	-104.346	6.290	-110.279	-109.618	6.362	100	0.96	Hg	2015.000	V	USNO B1. M1 and M2 are Imags
	262.14984100	13.55538200	7.787	111.082	10.850		-101.000	-223.000		-121.000	-119.000							GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Most certainly physical
	262.14979500	13.55557000	8.187	115.470	10.556	13.177								1.30	B2	2000.342		LSPM J1728+1333. M1 and M2 are LSPM Vmag estimates
	262.14979800	13.55529000	7.722	110.124	10.929		-101.000	-223.000	11.314	-121.000	-119.000	11.314		0.20	Bu	2000.000		2MASS. M1 and M2 estimated from J- and K-band
	262.14980520	13.55557990	8.187	115.451	10.930		-103.900	-103.000	6.000	-109.200	-110.600	6.100		0.20	Bu	2013.826		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	262.14934780	13.55514513	8.172	115.828	12.006	15.167								1.80	C	2013.402		URAT1
	262.14934770	13.55514513	8.175	116.113	10.355	13.241								0.96	Hg	2015.000		Pan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are PS1 gmags
																		GAIA DRI. M1 and M2 are Gmags

Table 1 continues on the next page.



CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+28	268.04904600	76.41071523	15.458	347.158	18.308	19.985	-69.823	126.853	6.760	-65.053	129.892	6.760	97	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	268.05029300	76.41018700	15.427	346.847	19.130	20.400	-66.000	134.000		-66.000	134.000							LSPM J1752+7624. M1 and M2 are LSPM Vmag estimates
	268.05026700	76.41019400	15.430	346.866	16.618	17.457								1.30	E2	2000.208		2MASS. M1 and M2 estimated from J- and K-band
	268.05028430	76.41018680	15.428	346.861			-68.700	123.800	6.200	-65.700	130.000	6.400		0.20	E1	2013.387		URAT1
	268.04908570	76.41069823	15.469	347.133	19.340	20.985								1.80	C	2012.553		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PSl gmags
	268.04904600	76.41071523	15.458	347.158	17.162	18.437								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	268.05039800	76.41026400	14.848	348.118	15.990	16.890	-66.000	134.000	5.000							1996.250		USNO B1. M1 and M2 are Imags
NSN n+28	273.51044090	38.88264272	6.487	124.992	10.599	16.096	-45.270	147.658	5.113	-55.833	154.296	5.113	64	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Probably physical
	273.51068100	38.88198100	6.581	123.728	10.580		-43.000	162.000		-37.000	154.000							LSPM J1814+3852. M1 and M2 are LSPM Vmag estimates
	273.51070900	38.88196200	6.694	124.904	10.308	14.108								1.30	E2	1998.404		2MASS. M1 and M2 estimated from J- and K-band
	273.51068430	38.88202760	6.658	124.882	10.421		-43.600	148.300	5.300	-60.500	163.300	5.300		0.20	E1	2014.084		URAT1
	273.51044090	38.88264272	6.517	125.236	10.197	17.031								1.80	C	2011.827		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PSl gmags
	273.51044090	38.88264272	6.487	124.992	9.966	14.769	-44.168	161.651	1.037					0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
KPP n+29	279.51681920	63.68012903	3.453	134.098	18.174	18.921	13.201	196.521	6.755	9.903	193.691	6.755	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	279.51669300	63.67931000	3.463	132.992	17.900		12.000	182.000		12.000	182.000							LSPM J1838+6340. M1 and M2 are LSPM Vmag estimates
	279.51669800	63.67932900	3.460	133.046	16.547	17.488								1.30	E2	2000.345		2MASS. M1 and M2 estimated from J- and K-band
	279.51679300	63.67966400	3.451	134.088	19.249	20.025								2.50	E1	2006.331		SDSS9. M1 and M2 are SDSS9 gmags
	279.51669440	63.67931000	3.462	133.056			15.700	196.800	6.400	11.100	200.600	6.400		0.20	E1	2013.398		URAT1
	279.51681420	63.68010779	3.437	133.815	19.013	19.708								1.80	C	2013.053		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PSl gmags
	279.51681920	63.68012903	3.453	134.098	17.119	17.712								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
NSN n+29	285.11483570	5.85966178	17.253	26.138	14.803	15.436	72.972	-185.252	6.905	73.070	-182.336	6.905	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	285.11453200	5.86043300	17.187	26.028	14.930	15.530	76.000	-197.000		76.000	-197.000							LSPM J1900+0551. M1 and M2 are LSPM Vmag estimates
	285.11452200	5.86045400	17.212	26.200	13.390	13.886								1.30	E2	1999.605		2MASS. M1 and M2 estimated from J- and K-band
	285.11454500	5.86039120	17.193	26.071			76.000	-197.000	11.314	76.000	-197.000	11.314		0.20	E1	2000.000		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	285.11453060	5.86044670	17.216	26.116	15.179	15.710	76.500	-197.700	3.183	78.100	-195.600	4.950	100	0.20	E1	2000.711		UCAC5. M1 and M2 are fmag values. Most certainly physical
	285.11452980	5.86043370	17.214	26.197	15.129		70.400	-183.900	6.200	69.900	-181.000	6.100		0.20	E1	2013.482		URAT1
	285.11477540	5.85982840	16.889	27.428	15.693	16.396								1.80	C	2011.838		Fan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PSl gmags
	285.11483570	5.85966178	17.253	26.138	13.653	14.215								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	285.11355900	5.86310300	17.345	26.064	13.800	14.700								1.20	F1	1951.506		USNO A2. M1 and M2 are Rmags
	285.11459800	5.86058900	16.727	25.380	12.170	12.850	80.000	-182.000	5.657	70.000	-192.000	3.162				1975.100		USNO B1. M1 and M2 are Imags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+30	290.59280280	4.90815445	10.125	189.500	14.196	17.558	-201.489	84.388	5.979	-182.855	83.241	15.140	76	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most probably physical
	290.59362800	4.90780000	10.150	191.186	15.240	17.520	-230.000	56.000		-196.000	81.000							LSPM J1922+0454. M1 and M2 are LSPM Vmag estimates
	290.59366900	4.90779300	10.159	191.115	12.977													2MASS. M1 and M2 estimated from J- and K-band
	290.59364580	4.90780260	10.157	191.057	14.391		-198.500	86.200	5.800	-173.600	82.500	6.500		0.20	Eu	2013.989		URAT1
	290.59297120	4.90807078	9.964	192.559	15.010	17.861								1.80	C	2011.944		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
NSN n+30	290.59280280	4.90815445	10.125	189.500	13.147	17.430								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	290.59652000	4.90680300	10.793	192.416	12.500	17.300								1.20	Pp	1950.611		USNO A2. M1 and M2 are Rmag
	290.76105470	39.41093217	7.153	9.110	15.972	16.314	-97.555	-251.069	5.554	-100.535	-251.725	5.553	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	290.76156600	39.41197200	7.173	9.530	16.190	16.530	-111.000	-264.000		-111.000	-264.000							LSPM J1923+3924. M1 and M2 are LSPM Vmag estimates
	290.76163700	39.41209000	7.172	9.487	15.242	15.777								1.30	E2	1998.398		2MASS. M1 and M2 estimated from J- and K-band
KPP n+31	290.76146360	39.41177450	7.188	9.354			-111.000	-264.000	11.314	-111.000	-264.000	11.314		0.20	Eu	2000.000		UCAC4. Given magnitudes are Vmag. Central epochs averaged
	290.76149080	39.41179220	7.184	8.684	15.898	16.352	-98.400	-251.000	3.677	-94.500	-254.200	4.455	100	0.20	Eu	2002.667		UCAC5. M1 and M2 are fmag values. Most certainly physical
	290.76109190	39.41103720	7.156	9.222										0.20	Eu	2013.587		URAT1
	290.76115480	39.41114366	7.170	9.236	16.674	17.032								1.80	C	2011.951		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	290.76105470	39.41093217	7.153	9.110	15.189	15.575								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
NSN n+31	290.76168900	39.41228900	6.723	7.870	13.360	13.630	-92.000	-246.000	12.083	-70.000	-84.000	43.566				1979.150		USNO B1. M1 and M2 are Imags
	291.51384910	44.35973726	6.063	30.647	10.371	15.166	69.467	209.761	5.122	69.109	212.124	5.122	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	291.51339700	44.35884500	6.185	32.245	10.390		73.000	207.000		79.000	198.000							LSPM J1926+4421. M1 and M2 are LSPM Vmag estimates
	291.51340200	44.35877200	6.032	30.885	10.403	14.320								1.30	E2	1998.434		2MASS. M1 and M2 estimated from J- and K-band
	291.51342800	44.35885980	6.821	30.794	10.324		73.000	207.400	5.341	79.000	198.000	11.314		0.20	Eu	2000.580		UCAC4. Given magnitudes are Vmag. Central epochs averaged
NSN n+31	291.51384910	44.35973726	6.063	30.647	10.113	14.351	73.716	208.123	1.502					0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	296.43090740	31.67938570	19.845	122.901	15.276	17.899	-6.726	158.446	5.090	-8.042	156.850	5.090	97	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	296.43093900	31.67872000	19.889	122.717	14.980	17.710	-13.000	147.000		-13.000	147.000							LSPM J1945+3140. M1 and M2 are LSPM Vmag estimates
	296.43094400	31.67865200	19.850	122.802	14.619	16.437								1.30	E2	1998.330		2MASS. M1 and M2 estimated from J- and K-band
	296.43093820	31.67872540	19.849	122.804			-9.600	158.800	5.400	-11.700	158.000	5.500		0.20	Eu	2013.361		URAT1
296.43090870	31.67935750	19.851	122.924	15.921	18.861								1.80	C	2011.793		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag	
296.43090740	31.67938570	19.845	122.901	14.452	16.894								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag	
296.43094800	31.67865900	19.768	122.186	13.580	15.690	20.000	46.000	2.828	18.000	180.000	7.810				1981.950		USNO B1. M1 and M2 are Imags	

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+32	297.40514930	10.17525806	24.690	246.218	17.831	17.918	124.462	91.185	5.502	124.195	94.060	5.497	97	0.96	Hg	2015.000	V	GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Almost certainly physical
	297.40463300	10.17487900	24.717	246.133	18.030	18.230	139.000	103.000		139.000	103.000							LSPM J1949+1010. M1 and M2 are LSPM Vmag estimates
	297.40460700	10.17486700	24.704	246.120	16.363	16.513								1.30	E2	1999.561		2MASS. M1 and M2 estimated from J- and K-band
	297.40478000	10.17498900	24.657	246.181	25.116	19.247	117.000	88.000	12.728	129.000	98.000	4.243		2.50	Bs	2004.710		SDSS9. M1 and M2 are SDSS9 gmags
	297.40462200	10.17487840	24.704	246.120			123.200	92.700	5.700	122.600	96.500	5.900		0.20	Bu	2013.901		URAT1
	297.40504270	10.17521325	24.715	246.179	18.900	18.940								1.80	C	2012.143		Fan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are P81 gmags
	297.40514930	10.17525806	24.690	246.218	16.618	16.698								0.96	Hg	2015.000		GAIA DRI. M1 and M2 are Gmags
	297.40469800	10.17487300	24.875	246.521	15.100	15.430	144.000	60.000	6.083	130.000	94.000	6.403				1984.700		USNO B1. M1 and M2 are Imags
NSN n+32	302.97655052	10.51794417	22.714	222.956	16.563	18.081	-138.016	-122.188	8.599	-139.966	-116.705	8.596	97	0.96	Hg	2015.000	V	GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Almost certainly physical
	302.97714200	10.51845600	22.751	222.760	17.830	17.830	-151.000	-145.000		-151.000	-145.000							LSPM J2011+1031. M1 and M2 are LSPM Vmag estimates
	302.97711900	10.51843900	22.754	222.767	14.943	16.579								1.30	E2	2000.421		2MASS. M1 and M2 estimated from J- and K-band
	302.97713490	10.51845250	22.755	222.763			-134.900	-116.800	6.000	-136.000	-113.000	6.300		0.20	Bu	2013.977		URAT1
	302.97657306	10.51796497	22.741	222.961	17.360	19.053								1.80	C	2012.392		Fan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are P81 gmags
	302.97655052	10.51794417	22.714	222.956	15.553	16.984								0.96	Hg	2015.000		GAIA DRI. M1 and M2 are Gmags
	302.97920000	10.52026200	22.843	222.982	15.600	17.400								1.20	Fp	1951.645		USNO A2. M1 and M2 are Rmags
KPP n+33	306.56056131	31.94439794	17.146	60.398	16.611	16.862	109.768	101.667	5.422	111.013	97.929	5.422	97	0.96	Hg	2015.000	V	GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Almost certainly physical
	306.56002800	31.94397400	17.181	60.252	16.790	16.460	119.000	97.000		119.000	97.000							LSPM J2026+3156. M1 and M2 are LSPM Vmag estimates
	306.55999900	31.94395600	17.158	60.196	14.881	14.897								1.30	E2	1999.351		2MASS. M1 and M2 estimated from J- and K-band
	306.56002210	31.94397450	17.162	60.191			110.100	103.600	5.700	113.000	108.700	5.800		0.20	Bu	2013.468		URAT1
	306.56054264	31.94438394	17.154	60.347	17.722	17.953								1.80	C	2012.107		Fan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are P81 gmags
	306.56056131	31.94439794	17.146	60.398	15.374	15.562								0.96	Hg	2015.000		GAIA DRI. M1 and M2 are Gmags
	306.55828700	31.94278400	17.190	60.366	16.000	16.300								1.20	Fp	1951.665		USNO A2. M1 and M2 are Rmags
NSN n+33	308.43534240	23.49770633	9.438	94.079	16.527	19.439	-44.457	-126.999	6.289	-41.451	-135.952	19.584	76	0.96	Hg	2015.000	V	GAIA DRI/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DRI comparison. Most probably physical
	308.43554700	23.49823800	9.385	93.320	16.810	19.220	-70.000	-146.000		-70.000	-146.000							LSPM J2033+2329. M1 and M2 are LSPM Vmag estimates
	308.43554000	23.49822400	9.385	93.299	16.401									1.30	E2	2000.326		2MASS. M1 and M2 estimated from J- and K-band
	308.43554430	23.49823590	9.382	93.271			-42.600	-125.200	6.100	-33.900	-139.300	6.200		0.20	Bu	2013.572		URAT1
	308.43535050	23.49772766	9.439	94.316	17.030	20.166								1.80	C	2012.211		Fan-STARRS release 1 (PS1) Survey - DRI. M1 and M2 are P81 gmags
	308.43534240	23.49770633	9.438	94.079	15.969	18.531								0.96	Hg	2015.000		GAIA DRI. M1 and M2 are Gmags
	308.43547500	23.49831700	9.668	92.775	15.410	17.240	-82.000	-138.000	6.708	-48.000	-126.000	11.705				1980.050		USNO B1. M1 and M2 are Imags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
KPP n+34	309.71614560	1.46939744	6.338	241.354	15.278	20.014	-53.123	-182.563	6.886	-56.743	-182.568	6.894	100	0.96	Hg	2015.000	V	GAIA DR1/ZMSS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical.
	309.71637000	1.47015800	6.276	241.046	16.010	19.890	-34.000	-179.000		-34.000	-179.000							LSPM J2038+0128. M1 and M2 are LSPM Vmag estimates
	309.71636000	1.47013400	6.292	241.125	13.931	17.089								1.30	E2	2000.476		2MASS. M1 and M2 estimated from J- and K-band
	309.71636700	1.47015760	6.295	241.157	15.521		-51.700	-179.700	6.300	-44.200	-179.500	6.700		0.20	Eu	2013.622		URAT1
	309.71615150	1.46942181	6.354	241.151	16.102	21.198								1.80	C	2012.603		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	309.71614560	1.46939744	6.338	241.354	14.204	18.115								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
NSN n+34	312.50910160	24.01329620	4.879	225.173	15.028	19.659	-136.557	-120.567	6.098	-97.732	-93.317	21.097	4	0.96	Hg	2015.000		GAIA DR1/ZMSS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical.
	312.50973500	24.01380000	5.636	226.882	15.090		-122.000	-111.000		-122.000	-111.000							LSPM J2050+2400. M1 and M2 are LSPM Vmag estimates
	312.50973000	24.01380300	5.588	226.421	14.572	18.023								1.30	E2	1999.868		2MASS. M1 and M2 estimated from J- and K-band
	312.50972500	24.01379870	5.582	226.408			-129.100	-114.100	6.000	-83.900	-87.500	11.900		0.20	Eu	2013.473		URAT1
	312.50912500	24.01331578	4.928	225.220	15.180	19.976								1.80	C	2011.932		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	312.50910160	24.01329620	4.879	225.173	14.491	18.449								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
KPP n+35	314.14653172	30.79811637	10.008	200.186	13.970	14.425	197.925	84.927	5.920	194.412	85.122	5.920	100	0.96	Hg	2015.000	V	GAIA DR1/ZMSS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical.
	314.14556900	30.79776200	9.988	199.892	14.330	14.200	194.000	88.000		194.000	88.000							LSPM J2056+3047. M1 and M2 are LSPM Vmag estimates
	314.14553500	30.79774900	9.992	199.885	12.724	13.090								1.30	E2	1999.428		2MASS. M1 and M2 estimated from J- and K-band
	314.14556940	30.79774750	9.981	200.053			201.600	92.900	4.968	194.100	87.300	5.061		0.20	Eu	2001.675		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	314.14557180	30.79776260	9.992	199.897			199.500	86.000	5.800	196.200	86.400	5.800		0.20	Eu	2013.660		URAT1
	314.14631966	30.79803741	10.010	200.140	14.820	15.321								1.80	C	2011.841		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	314.14653172	30.79811637	10.008	200.186	12.930	13.352								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
NSN n+35	317.00939820	31.27068296	7.618	221.610	14.496	17.562	258.960	134.099	5.565	261.568	135.697	5.565	100	0.96	Hg	2015.000	V	GAIA DR1/ZMSS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical.
	317.00814800	31.27012400	7.642	221.574	14.930	17.510	254.000	135.000		254.000	135.000							LSPM J2108+3116. M1 and M2 are LSPM Vmag estimates
	317.00811500	31.27011500	7.663	221.711	13.060	15.579								1.30	E2	1999.753		2MASS. M1 and M2 estimated from J- and K-band
	317.00926490	31.27062690	7.657	221.804	14.345									0.20	Eu	2013.464		URAT1
	317.00938080	31.27067456	7.701	221.869	15.308	18.837								1.80	C	2011.914		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	317.00939820	31.27068296	7.618	221.610	13.434	16.233								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
KPP n+36	317.25486558	36.86919785	5.223	266.947	18.368	18.543	-152.143	-158.546	6.430	-135.417	-151.420	7.698	80	0.96	Hg	2015.000	V	GAIA DR1/ZMSS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most probably physical.
	317.25567600	36.86986200	5.464	265.806			-112.000	-157.000		-112.000	-157.000							LSPM J2109+3652. M1 and M2 are LSPM Vmag estimates
	317.25573900	36.86992600	5.506	265.876	17.178									1.30	E2	1998.466		2MASS. M1 and M2 estimated from J- and K-band
	317.25583390	36.86992060	6.002	264.223			179.100	-12.400	5.500	-134.100	-147.900	5.600		0.20	Eu	2013.297		URAT1
	317.25488711	36.86921846	5.223	266.942	19.064	19.368								1.80	C	2012.176		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	317.25486558	36.86919785	5.223	266.947	17.569	17.823								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	317.25754500	36.87191200	3.858	268.503	16.800	16.700								1.20	Fp	1951.517		USNO A2. M1 and M2 are Rmags
	317.25595300	36.86992800	5.547	266.279	15.130	15.950	-14.000	-144.000	15.133	-88.000	-180.000	38.079						USNO B1. M1 and M2 are Imags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
NSN n+36	317.86511102	27.30857949	6.996	210.132	15.532	16.010	-43.166	-213.272	5.623	-38.704	-199.651	5.623	80	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most probably physical
	317.86532600	27.30946900	7.221	210.008			-28.000	-209.000		-28.000	-209.000							LSPM J2111+2718. M1 and M2 are LSPM Vmag estimates
	317.86531500	27.30947500	7.208	209.773	14.119	14.055								1.30	E2	1999.884		2MASS. M1 and M2 estimated from J- and K-band
KPP n+37	317.86531090	27.30934370	7.245	209.948	15.137	15.137	-28.000	-209.000	11.314	-28.000	-209.000	11.314		0.20	Eu	2000.000		UCAC4. Given magnitudes are Vmags. Central epochs averaged
	317.86531350	27.30946830	7.208	209.770	15.137		-41.800	-211.800	6.000	-44.600	-211.400	6.000		0.20	Eu	2013.515		URAT1
	317.86542116	27.30861910	7.058	210.151	16.376	16.696								1.80	C	2011.987		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
KPP n+37	317.86511102	27.30857949	6.996	210.132	14.506	14.805								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	320.93176250	44.32522823	17.249	230.760	14.773	17.434	120.442	188.496	5.232	118.665	186.304	5.232	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	320.93106100	44.32443600	17.143	230.795	15.500	18.240	129.000	169.000		140.000	202.000							LSPM J2123+4419. M1 and M2 are LSPM Vmag estimates
KPP n+37	320.93100400	44.32437900	17.204	230.791	13.766	15.793								1.30	E2	1998.781		2MASS. M1 and M2 estimated from J- and K-band
	320.93105900	44.32444380	17.209	230.788	14.908		119.000	191.500	5.600	116.200	189.500	5.700		0.20	Eu	2013.499		URAT1
	320.93175340	44.32521686	17.316	230.693	15.503	18.373								1.80	C	2012.005		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
NSN n+37	320.92902300	44.32197500	17.847	231.752	13.800	16.800								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	320.93107500	44.32428900	16.228	233.773	12.280	14.290	118.000	178.000	8.602	138.000	210.000	3.606		1.20	Pp	1953.677		USNO A2. M1 and M2 are Rmags
	323.54636730	28.06259448	4.132	275.085	16.116	16.894	-115.692	-112.742	5.732	-118.390	-115.034	5.731	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
KPP n+38	323.54693600	28.06306500	4.093	275.654	15.720	15.720	-116.000	-113.000		-116.000	-113.000							LSPM J2134+2803. M1 and M2 are LSPM Vmag estimates
	323.54695400	28.06309900	4.093	275.654	14.775	15.392								1.30	E2	1998.890		2MASS. M1 and M2 estimated from J- and K-band
	323.54656200	28.06274800	4.132	275.300	17.317	18.163								2.50	Es	2009.879		SDSS9. M1 and M2 are SDSS9 gmags
KPP n+38	323.54691250	28.06306470	4.091	275.656			-117.400	-111.300	5.600	-116.300	-111.300	6.600		0.20	Eu	2013.393		URAT1
	323.54639520	28.06261628	4.124	275.172	17.047	17.927								1.80	C	2011.904		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags
	323.54636730	28.06259448	4.132	275.085	15.073	15.766								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
KPP n+38	324.45889060	33.61480370	9.883	17.554	14.853	19.594	-5.835	-208.787	5.815	14.961	-304.682	27.659	4	0.96	Hg	2015.000		GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly optical
	324.45892300	33.61567300	11.142	13.776	14.980	16.690	10.000	-207.000		10.000	-207.000							LSPM J2137+3336. M1 and M2 are LSPM Vmag estimates
	324.45891900	33.61565000	11.148	13.896	13.383	18.095								1.30	E2	2000.408		2MASS. M1 and M2 estimated from J- and K-band
KPP n+38	324.45891960	33.61567390	11.060	13.984	15.146		-7.400	-208.800	6.300	5.600	6.500	6.300		0.20	Eu	2013.335		URAT1
	324.45889060	33.61480370	9.883	17.554	13.667	18.563								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmags
	324.45887000	33.61579800	10.786	15.361	12.000	16.420	-16.000	-208.000	13.038	36.000	14.142							USNO B1. M1 and M2 are Imags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes	
NSN n+38	326.07432507	16.17806126	15.702	337.562	16.037	16.985	-203.373	-45.086	5.220	-206.019	-44.751	5.221	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical	
	326.07522600	16.17824900	15.709	337.483	16.590	16.590	-185.000	-45.000		-185.000	-45.000							LSPM J2144+1610. M1 and M2 are LSPM Vmag estimates	
	326.07528200	16.17826500	15.681	337.700	14.313	15.340								1.30	E2	1998.732		2MASS. M1 and M2 estimated from J- and K-band	
	326.07514980	16.17823120	15.706	337.476			-185.000	-45.000	11.314	-185.000	-45.000	11.314	0.20	Eu	2000.000			UCAC4. Given magnitudes are Vmags. Central epochs averaged	
	326.07463700	16.17812700	15.673	337.662	17.023	18.134	-203.200	-48.100	5.600	-202.500	-47.100	5.700	2.50	Es	2009.789			SDSS9. M1 and M2 are SDSS9 gmags	
	326.07520750	16.17824820	15.682	337.700										0.20	Eu	2013.300			URAT1
	326.07432507	16.17806126	15.702	337.562	14.960	15.908							1.80	C	2012.037			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags	
	326.07432507	16.17806126	15.702	337.562	14.960	15.908							0.96	Hg	2015.000			GAIA DR1. M1 and M2 are Gmags	
	327.90269177	18.09345136	5.750	139.626	14.806	14.980	51.361	-214.182	6.442	54.773	-215.319	6.433	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical	
	327.90246600	18.09434300	5.689	140.027	16.230	15.540	60.000	-213.000		60.000	-213.000							LSPM J2151+1805. M1 and M2 are LSPM Vmag estimates	
KPP n+39	327.90245800	18.09437800	5.703	139.918	13.176	13.498							1.30	E2	1999.425			2MASS. M1 and M2 estimated from J- and K-band	
	327.90253730	18.09423140	5.534	140.889	14.487	14.487	-126.100	27.900	10.526	60.000	-213.000	11.314	0.20	Eu	1999.403			UCAC4. Given magnitudes are Vmags. Central epochs averaged	
	327.90259400	18.09375700	5.735	140.097	15.911	16.054							2.50	Es	2009.791			SDSS9. M1 and M2 are SDSS9 gmags	
	327.90269500	18.09347862	5.737	139.790	15.681	15.791							1.80	C	2011.903			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags	
	327.90269177	18.09345136	5.750	139.626	13.701	13.933							0.96	Hg	2015.000			GAIA DR1. M1 and M2 are Gmags	
	328.08916840	28.37821202	5.101	285.417	14.171	14.265	194.320	59.450	5.822	195.913	62.585	5.821	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical	
	328.08825700	28.37806300	5.196	284.650	13.090		182.000	62.000		182.000	62.000							LSPM J2152+2822. M1 and M2 are LSPM Vmag estimates	
	328.08827300	28.37807100	5.112	284.853	12.876	12.943							1.30	E2	2000.405			2MASS. M1 and M2 estimated from J- and K-band	
	328.08836830	28.37809250	5.152	285.041	13.674		182.000	62.000	11.314				0.20	Eu	2000.940			UCAC4. Given magnitudes are Vmags. Central epochs averaged	
	328.08850000	28.37825500	5.104	285.211	15.833	15.475							2.50	Es	2009.878			SDSS9. M1 and M2 are SDSS9 gmags	
KPP n+40	328.08826710	28.37805990	5.174	284.827	13.674		44.300	98.300	8.000	194.400	64.700	6.500	0.20	Eu	2013.354			URAT1	
	328.08910200	28.37826480	4.988	287.665	14.948	15.049							1.80	C	2012.060			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags	
	328.08916840	28.37831202	5.101	285.417	13.139	13.234							0.96	Hg	2015.000			GAIA DR1. M1 and M2 are Gmags	
	330.39145070	45.46347885	7.878	292.972	11.331	15.893	149.958	102.082	5.828	149.296	100.127	5.829	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical	
	330.39056400	45.46305100	7.881	293.189	11.380		145.000	107.000		148.000	111.000							LSPM J2201+4527. M1 and M2 are LSPM Vmag estimates	
	330.39058600	45.46306600	7.881	293.189	11.191	14.462							1.30	E2	2000.441			2MASS. M1 and M2 estimated from J- and K-band	
	330.39059310	45.46304950	7.710	296.233	11.111		143.600	105.500	1.281	148.000	111.000	11.314	0.20	Eu	1998.570			UCAC4. Given magnitudes are Vmags. Central epochs averaged	
	330.39097500	45.46323100	7.518	294.619	14.638	17.144							2.50	Es	2006.394			SDSS9. M1 and M2 are SDSS9 gmags	
	330.39055980	45.46305290	7.881	293.193	11.111		149.800	105.500	6.200	150.000	102.700	6.200	0.20	Eu	2013.501			URAT1	
	330.39117420	45.46335087	7.699	294.874									1.80	C	2012.032			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags	
330.39145070	45.46347885	7.878	292.972	10.885	14.820	142.538	103.856	1.623				0.96	Hg	2015.000			GAIA DR1. M1 and M2 are Gmags		

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
NSN n+40	334.83818280	66.66483484	20.655	13.779	16.922	17.397	154.805	85.167	5.563	150.470	83.828	5.588	97	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	334.83654800	66.66448200	20.691	13.995	17.040	17.620	150.000	97.000		150.000	97.000							LSPM J2219+6639. M1 and M2 are LSPM Vmag estimates
	334.83652700	66.66474000	20.690	13.943	15.871	16.211								1.30	E2	1999.747		2MASS. M1 and M2 estimated from J- and K-band
	334.83655460	66.66479980	20.690	13.942			156.200	83.900	6.000	152.400	83.100	6.000		0.20	Eu	2013.300		URATI
	334.83810900	66.66481866	20.662	13.802	17.801	18.295								1.80	C	2012.235		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	334.83818280	66.66483484	20.655	13.779	15.917	16.347								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	334.83157000	66.66334200	20.713	13.989	16.400	17.100								1.20	Fp	1952.631		USNO A2. M1 and M2 are Rmag
	334.83659000	66.66488400	20.434	15.183	14.720	15.300	152.000	92.000	4.123	206.000	60.000	16.643						USNO B1. M1 and M2 are Imags
KPP n+41	337.85463780	38.17525829	6.232	22.423	16.270	16.836	-165.980	-123.666	6.159	-166.500	-124.049	6.159	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	337.85553000	38.17577400	6.253	22.737	15.990	16.660	-173.000	-118.000		-173.000	-118.000							LSPM J2231+3810. M1 and M2 are LSPM Vmag estimates
	337.85559000	38.17581600	6.241	22.473	14.715	15.125								1.30	E2	1998.765		2MASS. M1 and M2 estimated from J- and K-band
	337.85515200	38.17552300	6.241	22.558	17.407	18.029								2.50	Es	2006.708		SDSS9. M1 and M2 are SDSS9 gmag
	337.85517500	38.17573400	6.241	22.464			-166.100	-123.600	5.700	-166.500	-123.700	5.700		0.20	Eu	2013.263		URATI
	337.85467510	38.17527764	6.239	22.471	17.155	17.777								1.80	C	2012.355		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	337.85463780	38.17525829	6.232	22.423	15.143	15.670								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	337.85843100	38.17742500	4.923	23.619	15.300	15.300								1.20	Fp	1953.608		USNO A2. M1 and M2 are Rmag
NSN n+41	340.27575290	39.14694958	19.873	315.897	14.937	17.395	228.120	146.325	5.681	231.554	143.910	14.815	95	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	340.27450600	39.14634300	19.914	315.774	15.530	17.630				214.000	128.000							LSPM J2241+3908. M1 and M2 are LSPM Vmag estimates
	340.27442700	39.14629000	19.941	315.859	13.691	17.977								1.30	E2	1998.772		2MASS. M1 and M2 estimated from J- and K-band
	340.27560470	39.14688330	19.859	315.847	15.200									0.20	Eu	2013.303		URATI
	340.27546360	39.14680772	19.859	315.842	15.810	17.612								1.80	C	2011.417		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	340.27575290	39.14694958	19.873	315.897	13.866	17.397								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	340.27458700	39.14636200	19.940	315.936	12.620	17.220	230.000	154.000	5.000	232.000	148.000	51.546						USNO B1. M1 and M2 are Imags
KPP n+42	342.54227670	88.11576919	15.291	332.507	17.902	18.076	238.467	63.504	6.992	237.193	66.766	6.992	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
	342.51217700	88.11550100	15.242	332.455	18.830	19.180	298.000	53.000		298.000	53.000							LSPM J2250+8806. M1 and M2 are LSPM Vmag estimates
	342.51165200	88.11550100	15.242	332.459	15.851	15.801								1.30	E2	1999.797		2MASS. M1 and M2 estimated from J- and K-band
	342.54024220	88.11575000	15.284	332.526										0.20	Eu	2013.774		URATI
	342.54136840	88.11576419	15.286	332.534	19.050	19.275								1.80	C	2012.222		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	342.54227670	88.11576919	15.291	332.507	16.561	16.624								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	342.42018100	88.11477300	14.779	331.832	17.200	17.700								1.20	Fp	1952.642		USNO A2. M1 and M2 are Rmag
	342.50337300	88.11545600	15.115	335.914	15.270	15.180	-242.000	-84.000	7.280	228.000	64.000	6.325						USNO B1. M1 and M2 are Imags

Table 1 continues on the next page.

CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (continued). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes	
NSN n+42	343.18392920	34.98832024	5.590	127.457	15.843	16.006	144.223	117.236	5.134	144.134	116.077	5.134	100	0.96	Hg	2015.000	V	GAIADR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIADR1 comparison. Most certainly physical.	
	343.18319700	34.98783100	5.554	127.446	15.080		136.000	118.000		136.000	118.000							LSPM J2252+3459. M1 and M2 are LSPM Vmag estimates	
	343.18312100	34.98778200	5.579	127.291	14.581	14.454							1.30	E2	1998.472			2MASS. M1 and M2 estimated from J- and K-band	
	343.18330500	34.98790480	5.551	127.411	15.616		136.000	118.000	11.314	136.000	118.000	11.314	0.20	Eu	2000.000			UCAC4. Given magnitudes are Vmags. Central epochs averaged	
KPP n+43	343.18319540	34.98783270	5.581	127.323			144.300	119.300	5.600	143.200	117.700	5.500	0.20	Eu	2013.457			URAT1	
	343.18389620	34.98829842	5.588	127.452	16.701	16.973							1.80	C	2012.367			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags	
	343.18392920	34.98832024	5.590	127.457	14.800	14.883							0.96	Hg	2015.000			GAIADR1. M1 and M2 are Gmags	
	345.68282570	65.32317386	20.616	88.449	15.578	19.028	221.261	110.528	7.936	217.250	105.538	9.367	100	0.96	Hg	2015.000	V	GAIADR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIADR1 comparison. Most certainly physical.	
NSN n+43	345.68063400	65.32271600	20.649	88.252	15.250	19.890	220.000	96.000		220.000	96.000							LSPM J2302+6519. M1 and M2 are LSPM Vmag estimates	
	345.68059200	65.32270800	20.679	88.244	14.789	18.107							1.30	E2	1999.826			2MASS. M1 and M2 estimated from J- and K-band	
	345.68275650	65.32315962	20.660	88.385	16.255	19.912							1.80	C	2012.023			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags	
	345.68282570	65.32317386	20.616	88.449	14.821	18.030							0.96	Hg	2015.000			GAIADR1. M1 and M2 are Gmags	
NSN n+44	345.68022500	65.32332670	21.115	93.118	12.790	17.610	216.000	148.000	5.000	226.000	114.000	7.280				1976.800		USNO B1. M1 and M2 are Imags	
	346.25622120	31.27200337	17.320	141.911	15.638	18.996	138.516	4.175	7.098	89.080	-16.158	8.041	0	0.96	Hg	2015.000		GAIADR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIADR1 comparison. Almost certainly optical.	
	346.25554000	31.27198600	17.514	139.548	15.260	19.070	152.000	5.000		152.000	5.000							LSPM J2305+3116. M1 and M2 are LSPM Vmag estimates	
	346.25554700	31.27198600	17.554	139.395	14.401	17.890							1.30	E2	2000.023			2MASS. M1 and M2 estimated from J- and K-band	
KPP n+44	346.25598400	31.27201200	17.414	140.995	16.631	19.892				95.000	-16.000	4.243	2.50	Es	2009.796			SDSS9. M1 and M2 are SDSS9 gmags	
	346.25554570	31.27198570	17.554	139.391	15.730		137.800	6.400	6.100	88.300	-11.900	6.300	0.20	Eu	2013.269			URAT1	
	346.25608070	31.27200878	17.571	140.916	16.389	19.668							1.80	C	2012.100			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags	
	346.25622120	31.27200337	17.320	141.911	14.572	17.963							0.96	Hg	2015.000			GAIADR1. M1 and M2 are Gmags	
KPP n+44	346.25547300	31.27192800	17.294	138.038	12.120	16.150	142.000	2.000	7.211	96.000	-14.000	6.083				1976.200		USNO B1. M1 and M2 are Imags	
	352.21036390	7.05686160	14.909	325.553	14.447	15.222	144.810	-37.514	6.814	148.650	-36.498	6.814	100	0.96	Hg	2015.000	V	GAIADR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIADR1 comparison. Most certainly physical.	
	352.20974700	7.05701800	14.936	325.299	14.740	15.700	151.000	-35.000		151.000	-35.000							LSPM J2328+0703. M1 and M2 are LSPM Vmag estimates	
	352.20977500	7.05701300	14.928	325.344	13.781	14.373							1.30	E2	2000.471			2MASS. M1 and M2 estimated from J- and K-band	
KPP n+44	352.20974860	7.05702200	14.841	325.585			146.800	-31.700	15.164	151.000	-35.000	11.314	0.20	Eu	1999.630			UCAC4. Given magnitudes are Vmags. Central epochs averaged	
	352.20978580	7.05701190	14.962	325.465	14.371	15.334	144.800	-37.900	2.052	148.200	-40.100	3.124	80	0.20	Eu	2000.733			UCAC5. M1 and M2 are fmag values. Most probably physical
	352.20999900	7.05697800	14.886	325.433	15.856	16.203	149.000	-35.000	2.828	147.000	-35.000	2.828	2.50	Es	2005.698			SDSS9. M1 and M2 are SDSS9 gmags	
	352.20975610	7.05701760	14.929	325.334			142.200	-36.000	6.600	146.700	-35.700	6.600	0.20	Eu	2013.096			URAT1	
KPP n+44	352.21036840	7.05687107	14.943	325.282	15.129	15.986							1.80	C	2012.178			Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmags	
	352.21036390	7.05686160	14.909	325.553	13.579	14.293							0.96	Hg	2015.000			GAIADR1. M1 and M2 are Gmags	
	352.20773700	7.05755000	14.778	325.798	13.500	14.500							1.20	Pp	1951.604			USNO A2. M1 and M2 are Rmags	
	352.20974500	7.05710600	14.771	325.413	12.320	12.910	146.000	-30.000	3.606	146.000	-32.000	4.472				1976.200		USNO B1. M1 and M2 are Imags	

Table 1 concludes on the next page.



CPM Pairs from LSPM so far not WDS Listed – Part V

Table 1 (conclusion). Research Results for Potential Common Proper Motion Pairs Found in the LSPM Catalog

Obj	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	CPM score	Ap	Me	Date	N	Source/Notes
NSN n+44	352.08999150	47.69552823	11.306	236.241	14.906	18.361	169.512	-21.501	5.237	168.725	-20.226	5.237	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical.
	352.08895900	47.69561800	11.311	236.131	15.540	18.770	170.000	-24.000		170.000	-24.000							LSPM J2328+4741. M1 and M2 are LSPM Vmag estimates
	352.08885800	47.69562500	11.307	236.117	13.523	16.192								1.30	E2	1998.797		2MASS. M1 and M2 estimated from J- and K-band
	352.08918700	47.69561000	11.289	236.188	16.014	20.037	168.000	-20.000	4.243	168.000	-23.000	4.243		2.50	Es	2003.738		SDSS9. M1 and M2 are SDSS9 gmag
KPP n+45	352.08894060	47.69561890	11.306	236.123	15.164		167.000	-18.600	5.500	166.500	-16.900	5.500		0.20	Eu	2013.485		URAT1
	352.08980520	47.69554707	11.020	234.929	15.780	19.692								1.80	C	2012.493		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	352.08999150	47.69552823	11.306	236.241	13.751	16.869								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	352.08578100	47.69588400	11.369	236.219	14.500	17.700								1.20	Fp	1954.583		USNO A2. M1 and M2 are Rmag
KPP n+45	352.08892300	47.69570000	10.946	236.639	12.690	15.620	170.000	-18.000	2.828	178.000	-14.000	11.705				1977.000		USNO B1. M1 and M2 are Imag
	352.82567080	46.12333687	3.853	342.549	18.340	21.380	-18.695	-205.448	5.246	-14.997	-207.474	10.938	95	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
	352.82580600	46.12419100	3.904	341.786	19.100		-25.000	-216.000										LSPM J2331+4607. M1 and M2 are LSPM Vmag estimates
	352.82579200	46.12426000	3.902	341.856	16.256	18.007								1.30	E2	1998.824		2MASS. M1 and M2 estimated from J- and K-band
NSN n+45	352.82576000	46.12397800	3.790	342.294	19.553	22.877	-17.000	-211.000	4.243					2.50	Es	2003.738		SDSS9. M1 and M2 are SDSS9 gmag
	352.82567910	46.12336324	3.795	342.016	19.298									1.80	C	2012.503		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	352.82567080	46.12333687	3.853	342.549	17.220	19.585								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	357.10645337	22.89507867	4.945	18.428	14.801	15.221	-97.317	-128.538	8.263	-98.378	-128.509	8.263	95	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Almost certainly physical
KPP n+46	357.10687300	22.89561700	4.959	19.049	14.900	13.890	-99.000	-143.000										LSPM J2348+2253. M1 and M2 are LSPM Vmag estimates
	357.10688100	22.89559900	4.949	18.599	13.754	14.303								1.30	E2	2000.427		2MASS. M1 and M2 estimated from J- and K-band
	357.10682450	22.89555920	4.955	19.144		14.384	-99.000	-143.000	11.314	-99.000	-143.000	11.314		0.20	Eu	2000.000		UCAC4. Given magnitudes are Vmag. Central epochs averaged
	357.10659600	22.89530300	4.964	18.461	16.076	16.368								2.50	Es	2009.794		SDSS9. M1 and M2 are SDSS9 gmag
NSN n+46	357.10689340	22.89561380	4.950	18.611	14.384	14.384	-99.200	-124.900	6.500	-101.100	-126.000	6.200		0.20	Eu	2013.517		URAT1
	357.10646396	22.89509024	4.953	18.395	15.540	15.948								1.80	C	2012.346		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	357.10645337	22.89507867	4.945	18.428	13.803	14.260								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag
	358.15647930	27.33472770	6.037	133.989	14.635	17.777	-156.741	-96.813	8.886	-152.362	-100.517	8.886	100	0.96	Hg	2015.000	V	GAIA DR1/2MASS. M1 and M2 estimated from G/J/H/K-mag. PM data from 2MASS to GAIA DR1 comparison. Most certainly physical
NSN n+46	358.15719600	27.33512900	5.960	133.898	14.190		-156.000	-104.000										LSPM J2352+2720. M1 and M2 are LSPM Vmag estimates
	358.15726900	27.33516100	5.944	134.048	13.902	15.866								1.30	E2	1998.888		2MASS. M1 and M2 estimated from J- and K-band
	358.15673300	27.33487700	6.032	134.293	15.534	19.230								2.50	Es	2009.792		SDSS9. M1 and M2 are SDSS9 gmag
	358.15721550	27.33513090	5.949	134.065	14.725		-153.300	-96.700	5.700	-152.900	-100.700	5.900		0.20	Eu	2013.354		URAT1
KPP n+46	358.15649570	27.33473693	6.038	133.696	15.355	18.837								1.80	C	2011.995		Pan-STARRS release 1 (PS1) Survey - DR1. M1 and M2 are PS1 gmag
	358.15647930	27.33472770	6.037	133.989	13.715	16.466								0.96	Hg	2015.000		GAIA DR1. M1 and M2 are Gmag

**CPM Pairs from LSPM so far not WDS Listed – Part V**

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**5. Acknowledgements**

The following tools and resources have been used for this research:

- Washington Double Star catalog
- 2MASS All Sky catalog
- GAIA DR1 catalog
- UCAC4 catalog
- UCAC5 catalog
- URAT1 catalog
- SDSS9 catalog
- LSPM catalog
- Aladin Sky Atlas v9 and 10
- SIMBAD, VizieR, TAP Vizier, X-Match
- AstroPlanner V2.2

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