A&A 390, 491–499 (2002)
DOI: 10.1051/0004-6361:20020667

Astronomy
&
Astrophysics

New nearby stars selected in a high proper motion survey by DENIS photometry

C. Reylé[1], A. C. Robin[1], R.-D. Scholz[2], and M. Irwin[3]

[1] CNRS UMR 6091, Observatoire de Besançon, BP 1615, 25010 Besançon Cedex, France
[2] Astrophysikalisches Institut Potsdam, An der Sternwarte 16, Potsdam, 14482, Germany
[3] Institute of Astronomy, University of Cambridge, Madingley Road, Cambridge, CB3 0HA, UK
e-mail: `celine@obs-besancon.fr; annie.robin@obs-besancon.fr; rdscholz@aip.de; mike@ast.cam.ac.uk`

Received 22 February 2002 / Accepted 30 April 2002

Abstract. We present new nearby stars extracted from a proper motion catalogue and having a DENIS counterpart. Their distances and spectral type are estimated using the DENIS colours. 107 stars are within 50 pc. 31 stars among them have previously measured distances. In addition, 40 stars may enter within the 50 pc limit depending on which population they belong to. 6 stars among them have already measured distances. 5 objects, LHS5045, L225-57, LP831-45, LHS1767, and WT792, are probably closer than 15 pc, with L225-57 at 9.5 pc. Most of these stars are M-type while 4 stars are white dwarfs. 88 M-dwarfs are disc stars, 14 belong to the thick disc and 1 to the spheroid.

Key words. Galaxy: solar neighbourhood – stars: late-type – stars: white dwarfs

1. Introduction

The solar neighbourhood serves as a fundamental constraint for our understanding of the stellar physics and the Galaxy. The nearest stars provide accurate data on luminosities, temperatures, masses, which are fundamental parameters of stellar astronomy. Their kinematics, chemical composition, and mass function also hold important clues to the nature and history of the Milky Way.

However, among the nearest stars, many of the low luminosity stars such as white, red, and brown dwarfs remain undetected. Henry et al. (1997) estimated that more than 30% of the stars within 10 pc are currently missing from the solar neighbourhood sample. The deficit is estimated to be twice within 25 pc (Henry et al. 2002) and is largest south of declination −30°. As a confirmation, stars are continuously identified as nearby stars in proper motion catalogues or in Schmidt plates (Henry et al. 1997; Henry et al. 2002; Gizis & Reid 1997; Scholz et al. 1999; Scholz et al. 2001; Scholz et al. 2002; Jahreiss et al. 2001; Phan-Bao et al. 2001; Delfosse et al. 2001).

In addition, new nearby faint stars, mainly brown dwarfs, are detected in deep sky surveys (Ruiz et al. 1997; Delfosse et al. 1997; Delfosse et al. 1999; Martín et al. 1999; Kirkpatrick et al. 1999; Kirkpatrick et al. 2000; Reid et al. 2000; Fan et al. 2000; Gizis et al. 2000).

One way to detect nearby stars is to select the red faint objects obtained in near-infrared surveys: the *Two Micron All Sky Survey* (2MASS) (Kirkpatrick et al. 1999; Kirkpatrick et al. 2000; Reid et al. 2000; Gizis et al. 2000) and the *Deep Near-Infrared Survey of the Southern Sky* (DENIS) (Delfosse et al. 2001; Phan-Bao et al. 2001). Most of the nearest stars found in these surveys turned out to be high proper motion objects. Given this fact, Scholz et al. (2001) searched for new stars in the solar neighbourhood by combining proper motion catalogues with the 2MASS data base.

Using the same approach, we cross-identify a proper motion catalogue with DENIS data and estimate the distances using near-infrared photometry. The proper motion catalogue is described in Sect. 2. In Sect. 3, we give the result of the cross-identification with the DENIS data base. Section 4 presents the distance estimation. In Sect. 5, we discuss the effect of metallicity on the distance estimation. In Sect. 6, we list the stars found to be within 50 pc and discuss the precision on our distance determinations.

2. High proper motion sample

One of the criteria for finding nearby stars is their large proper motion. The main source for the identification of such stars are the high-proper motion catalogues of Luyten: the *Luyten Half Second proper motion catalogue* (LHS) and the *New Luyten Catalogue of Stars with Proper Motions Larger than Two Tenths of an Arcsecond* (NLTT) based on observations with the Palomar Schmidt telescope. Dawson (1986) showed that the LHS catalogue is incomplete south of declination −33°,

---

Send offprint requests to: C. Reylé,
e-mail: `celine@obs-besancon.fr`

$R > 18$ or $\mu > 2.5''$ yr^{-1}. Wroblewski & Torres (1989, 1991, 1994, 1996, 1997) improved the completness in the southern sky and found new stars with $\mu > 0.15''$ yr^{-1} and photographic magnitudes $m_{\rm pg} < 20$. Ruiz et al. (1993) found proper motion stars in the ESO Schmidt plates with $\mu > 0.1''$ yr^{-1} and $R < 20$.

In order to complete the existing proper motion catalogues at fainter magnitudes in the southern hemisphere, Scholz et al. (2000) used Automatic Plate Measuring (APM) measurements of sky survey plates taken with the UK Schmidt telescope. Plates in the passbands $B_{\rm J}$ and R were taken with typical epoch difference of 15 years. The resulting catalogue contains 693 stars (out of which 195 have already been published by Scholz et al. 2000) south of declination −15°, in the regions $0^{\rm h}$–$7^{\rm h}$, $10^{\rm h}$–$14^{\rm h}$, and $19^{\rm h}$–$23^{\rm h}$ in right ascension. The overall search area is about 3000 square degrees. The lower proper motion limit of the survey is typically 0.25 arcsec yr^{-1}. But in fields with smaller epoch difference between the $B_{\rm J}$ and R plates, only objects with even larger proper motions could be detected, respectively. The distribution of the epoch differences as a function of declination was shown in Scholz et al. (2000). The largest proper motions found are about 1.3 arcsec yr^{-1}. The practical limit for searching for high proper motion objects using two plates in different passbands is about 1 magnitude above the respective plate limits, i.e. $R = 20.0$ and $B_{\rm J} = 21.5$. For a comparison with other high proper motion catalogues and an estimate of the completeness of the survey, see Scholz et al. (2000). About half of the objects detected are known proper motion stars, whereas the remaining objects mainly at fainter magnitudes are new high proper motion stars.

With these measurements, they were able to fill the gap in the high proper motion survey of faint stars with $\delta < -33°$. In addition they obtained more accurate positions and photometry for the already known high proper motion stars. The accuracies are 0.1 to $0.2''$ in position, $0.03''$ yr^{-1} on proper motion, and ~0.2 mag on photometry.

3. Cross-identification with DENIS

The DENIS survey (Epchtein et al. 1997) provides a full coverage of the southern sky in the optical band I (0.85 μm) and the near-infrared bands J (1.25 μm) and $K_{\rm s}$ (2.17 μm). The position accuracy is $0.5''$ and the photometric accuracy is better than 0.1 mag. About 40% of the data are up to now calibrated at the *Paris Data Analysis Center* (PDAC).

We look for counterparts of the given proper motion sample in the DENIS point source catalogue extracted at the PDAC with a search radius of $3''$. We get 301 recoveries among the 693 objects. None of them have a counterpart in the USNO A2.0 catalogue, as expected for proper motion stars. The density of stars with no USNO counterpart in a field in the Galactic plane is less than 0.01 star within the search region. Thus the possibility of false cross-identification is low, smaller than 1%. Most of the unrecovered stars are in the unprocessed part of the DENIS survey. Dots in Fig. 1 shows the (I, $I-J$) colour-magnitude diagram of the recovered stars. Most stars have $I - J > 1$. They are M-dwarfs (Leggett 1992). Stars with $0.5 < I - J < 1$ are G or K-dwarfs. 1 star, with $I - J > 3$, is a possible brown dwarf (square). Stars with $I - J < 0.5$ are either white dwarfs (circles) or distant subdwarfs (triangles), as discussed in Sect. 4.

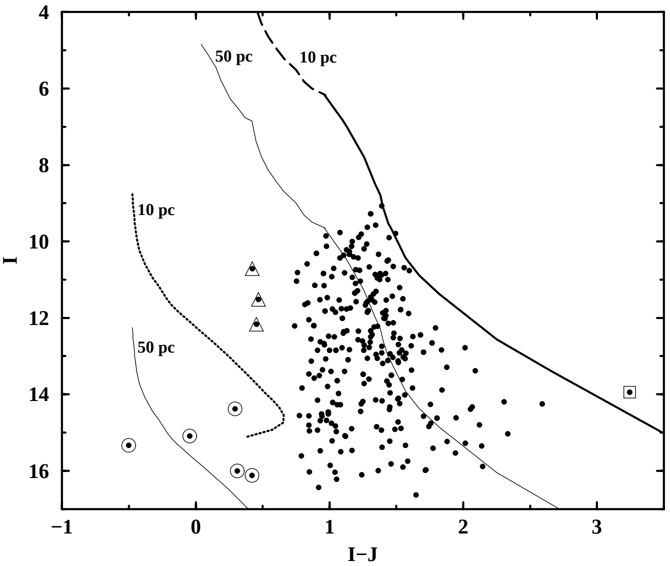

Fig. 1. (I, $I-J$) colour-magnitude diagram for the high proper motion stars cross-identified with DENIS. Dots: G, K, or M-dwarfs. Square: possible brown dwarf. Circles: white dwarfs. Triangles: G-subdwarfs. Solid line: theoretical relation for M-dwarfs with solar metallicity at 10 pc (Baraffe et al. 1998). Dashed line: theoretical relation for G and K-dwarfs with solar metallicity at 10 pc (Lejeune et al. 1997). Dotted line: theoretical relation for white dwarfs with 0.6 $M_\odot$ at 10 pc (Bergeron et al. 1995). The thin lines show the same relations for stars at 50 pc.

4. Photometric distance estimation

Photometric distances are estimated using the $I - J$ colour index. Theoretical colour-magnitude relations (M_I, $I-J$) for stars placed at 10 pc are superimposed to the observations in Fig. 1. The solid line shows the relation for M-dwarfs with solar metallicity (Baraffe et al. 1998), the dashed line shows the relation for solar metallicity G and K-dwarfs (Lejeune et al. 1997), and the dotted line shows the relation for white dwarfs with 0.6 $M_\odot$ (Bergeron et al. 1995).

We compute photometric distances from the DENIS $I - J$ colour index and the corresponding theoretical colour-magnitude relation: Baraffe et al. (1998) relation for M-dwarfs with $I-J > 1$, Lejeune et al. (1997) relation for G and K-dwarfs in the range $0.5 < I-J < 1$. Stars with $I-J < 0.5$ can be either nearby white dwarfs or distant subdwarfs. The 5 faintest blue stars (circles in Fig. 1) are white dwarfs. Indeed if they would be subdwarfs with that faint apparent magnitude, they would be at $d > 1600$ pc. Their proper motion would lead to a tangential velocity >4000 km s^{-1}, much larger than the Galactic escape speed (Leonard & Tremaine 1990; Meillon et al. 1997). For these stars, we use Bergeron et al. (1995) model atmosphere for white dwarfs of mass 0.6 $M_\odot$, before the turnover ($M_I \lesssim 14.5$), assuming they are not cool white dwarfs.

The 3 brighter blue stars (triangles in Fig. 1) are more probably late G-stars of the spheroid with large tangential velocity, rather than disc white dwarfs closer than 3 pc. The theoretical relation from Lejeune et al. (1997) for the typical spheroid metallicity $[\frac{\rm Fe}{\rm H}] = -1.8$ gives $M_I \sim 5$ mag at $I - J \sim 0.5$. The derived photometric distances of these 3 stars ranges between 160 and 260 pc, and their tangential velocities between 280 and 380 km $\rm s^{-1}$, in agreement with the spheroid kinematics.

$I - K_{\rm s}$ is also a good estimator of the luminosity or effective temperature of M-dwarfs. Photometric distances differ by 15% depending on which colour index is used. However, Delfosse et al. (1997) showed that the $K_{\rm s}$ band of DENIS can differ by ∼0.1 mag compared with the standard K band for which models are computed. We then choose to estimate the distances from the $I - J$ colour index and $(M_I, I - J)$ theoretical relations.

5. Metallicity effect

Within the sample magnitude range and proper motion range, one expects to get disc stars, but also thick disc and spheroid stars. Using a theoretical colour-magnitude relation at solar metallicity would overestimate the distance for the stars of these old populations. We use the Besançon model of population synthesis to reproduce the stellar content in the fields of the sample. The Besançon model has been described in Haywood et al. (1997). Since then, Robin et al. (2000) improved the halo density law and mass function, while Reylé & Robin (2001) constrained the thick disc population description. New constraints available on the galactic potential, the local luminosity function and the kinematics versus age, obtained with the Hipparcos mission, are also taken into account to derive the thin disk density law (Robin et al., to be submitted).

The simulation shows that the different populations are separated in the plane $(H, I - J)$, where $H = I + 5\log\mu + 5$ is the reduced proper motion. We define three regions in this plane where stars are most probably disc stars, thick disc stars, or spheroid stars, as represented in Fig. 2.

We determine the photometric distance using a theoretical colour-magnitude relations (M_I, $I - J$) at solar metallicity for stars in the disc region, at metallicity $[\frac{\rm Fe}{\rm H}] = -0.8$ in the thick disc region, and at metallicity $[\frac{\rm Fe}{\rm H}] = -1.8$ in the spheroid region. These relations are obtained by interpolation of the available relations with $[\frac{\rm Fe}{\rm H}] = -0.5, -1, -1.5, -2$ from Lejeune et al. (1997) for G and K-stars and Baraffe et al. (1998) (private communication for low metallicities) for M-stars.

For stars in between two regions, we make two determinations with both metallicity hypotheses (disc/thick disc or thick disc/spheroid). The probability that a star with a magnitude I, a colour index $I - J$ and a proper motion $\mu_{\rm tot}$, belongs to one population is estimated from the population distribution of the stars in the simulated sample. In this case, both distances and tangential velocities are computed.

Disc stars with tangential velocities as large as 250 km $\rm s^{-1}$ still are found with a large probability in the simulated sample. Indeed, the sample is not representative of the entire disc population, but as a high proper motion sample, it selects the stars having a high velocity.

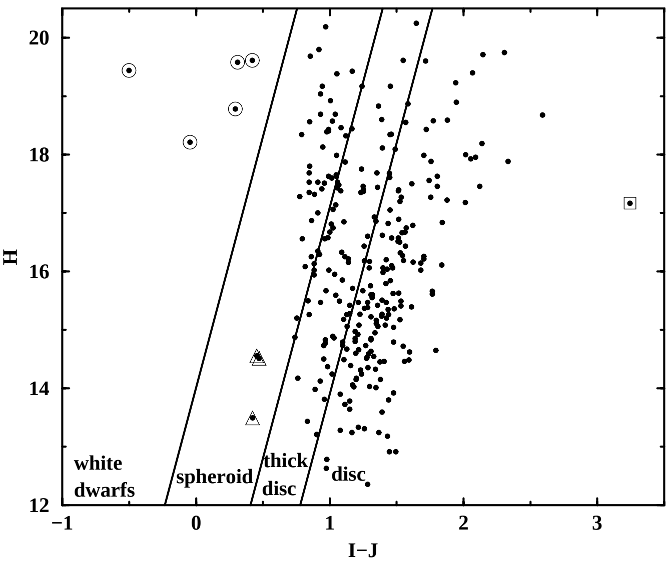

Fig. 2. (H, $I - J$) diagram for the high proper motion stars cross-identified with DENIS. Symbols have the same meaning as in Fig. 1. The solid lines define the regions where the stars are most probably, from right to left: disc stars, thick disc stars, spheroid stars, white dwarfs.

6. Stars within 50 pc

107 stars are found to have photometric distances less than 50 pc. They are mainly M-stars, but 4 stars are white dwarfs. According to the colour-reduced proper motion diagram $(H, I - J)$, 88 stars among them belong to the disc, 14 to the thick disc stars, and 1 to the spheroid. In addition, 33 stars belong either to the disc or to the thick disc. Distance estimations with both hypothesis are made for these stars and they are possibly within 50 pc. Likewise, 7 stars belong either to the spheroid or to the thick disc and may enter or not within the 50 pc limit.

Astrometric, photometric and kinematical characteristics, estimated distances and spectral types are given in Table 1. The spectral types for M-stars are derived from the $I - J$ colour index (Leggett 1992). 4 late M-type stars have been previously identified by Phan-Bao et al. (2001) and 1 by Henry et al. (2002). 6 stars already have spectroscopic distance estimates (Scholz et al. 2002). The extremely red object is the already known brown dwarf LP944-20 at 5 pc (Tinney 1996). Trigonometric distances from the Yale parallax catalogue or the Hipparcos catalogue, or photometric distances from the ARI database for nearby stars (ARICNS), available for 25 stars, are also indicated in Table 1.

Among the list of 107 nearby stars, 15 new stars are within the 25 pc limit of the *Catalogue of Nearby Stars* (CNS3, Gliese & Jahreiss 1991). New discoveries within 15 pc are LHS5045, L225-57, LP831-45, LHS1767, and WT792. L225-57 is presumably closer than 10 pc, at $d = 9.5$ pc. Its estimated spectral type is M3.5. The star LHS124 may be a M1-star of the thick disc at 7.2 pc, although the simulation of the stellar sample tends to show it is more likely a more distant star in the disc. The distance indicated in the ARICNS (21 pc) seems also to favor a disc star.

Table 1. Nearby stars candidates. The distance d is estimated from the $I-J$ colour index. When two distances are indicated, they are obtained with two metallicity hypothesis and their probable population with probability are indicated in the last two columns (see text): I = disc, int = thick disc, II = spheroid. The tangential velocity is also computed with both distance estimates. The spectral types for M-stars are derived from Leggett (1992). wd means white dwarf.

name APMPM	other name	α_{J2000}	δ_{J2000}	UKST epoch	R UKST	B_J-R UKST	I DENIS	$I-J$ DENIS	$J-K_s$ DENIS	d (pc)	μ_x	μ_y ($''$ yr^{-1})	V_t (km s^{-1})	type	population %	
J0001-3650	LP987-71	00 00 34.09	−36 50 09.3	1996.61	13.28	1.75	12.78	1.09	0.82	43.9	0.40	0.11	85.3	M0.5	int	
J0003-3414[1]	LHS1008	00 02 39.95	−34 13 37.7	1996.61	14.22	0.45	14.38	0.29	0.63	17.5	0.15	−0.74	63.0	wd		
J0009-2707[2]	LHS1026	00 09 03.88	−27 07 22.2	1990.80	10.08	1.92	9.76	1.08	0.64	40.5/11.6	0.66	0.11	128.6/36.8	M0.5	I/int	85/15
J0013-3757	WT3	00 13 29.87	−37 56 44.8	1989.66	13.24	2.29	12.85	1.00	0.78	73.8/33.7	0.07	−0.58	204.4/93.3	M0	int/II	85/15
J0015-5147	L218-29	00 15 15.02	−51 47 04.8	1993.69	11.04	2.66	11.15	0.96	0.84	100.0/42.6	0.33	0.09	161.2/68.7	M0	I/int	35/65
J0017-4149	WT4	00 16 34.85	−41 49 19.1	1989.66	14.80	2.14	13.98	1.07	0.89	80.5/44.0	0.37	−0.33	189.2/103.4	M0.5	int/II	50/50
J0017-5016[3]	L218-9	00 16 36.18	−50 16 10.9	1993.69	10.12	2.48	10.12	1.16	0.88	38.1	0.31	0.29	75.8	M1	I	
J0020-5743	L170-67	00 20 15.88	−57 42 40.9	1990.78	13.11	2.26	12.02	1.41	0.80	35.8	0.39	0.12	69.6	M3	I	
J0023-4833		00 22 34.65	−48 32 35.6	1993.69	13.72	2.19	12.83	1.15	0.97	138.8/35.2	0.31	0.10	217.1/55.1	M0.5	I/int	35/65
J0033-4733	L291-115	00 33 13.26	−47 33 17.8	1993.69	14.20	2.25	12.26	1.79	0.94	15.7	0.26	0.15	22.3	M5	I	
J0034-3759	LP937- 57	00 33 42.79	−37 59 10.5	1989.66	11.74	1.84	11.04	1.23	0.74	48.3	0.18	0.41	103.0	M1	I	
J0049-6102[4]	LHS124	00 49 27.58	−61 02 32.4	1990.78	10.52	1.51	9.89	1.22	0.76	29.5/7.2	1.09	−0.04	152.4/37.2	M1	I/int	75/25
J0058-2751[5]	LHS129	00 58 26.55	−27 51 21.7	1986.77	10.28	1.87	9.28	1.31	1.14	16.4	1.26	−0.32	101.1	M2.5	I	
J0059-3127	LHS1171	00 58 44.47	−31 27 09.0	1986.77	12.93	2.24	11.52	1.31	0.75	44.7	0.50	−0.40	135.6	M2.5	I	
J0102-6739	LHS1178	01 02 05.88	−67 39 20.2	1987.82	13.84	1.80	12.85	1.05	0.75	55.2/28.4	0.88	−0.18	235.0/120.9	M0	int/II	50/50
J0127-3219	LHS1251	01 27 02.57	−32 18 50.2	1991.91	12.28	2.09	11.85	1.04	0.81	36.0	0.20	−0.52	95.6	M0	int	
J0149-6427	L88-1	01 48 32.97	−64 26 44.0	1987.90	12.02	1.82	10.92	1.02	0.86	79.3/26.7	0.41	0.20	172.9/58.2	M0	I/int	30/70
J0150-3319	LP940-20	01 49 42.37	−33 19 21.5	1991.91	14.36	2.24	12.65	1.77	0.88	19.6	0.38	0.11	37.2	M5	I	
J0151-3058	LP884-94	01 51 04.98	−30 57 59.0	1994.89	14.02	2.60	12.52	1.47	...	35.5	0.08	0.31	53.8	M3.5	I	
J0153-4806	LHS5045	01 52 52.07	−48 05 39.2	1988.91	12.40	2.12	10.77	1.60	0.91	11.0	−0.55	−0.20	30.8	M4	I	
J0155-5307	L223-77	01 55 12.82	−53 06 34.0	1990.93	13.65	2.54	12.13	1.48	0.88	29.6	0.26	0.22	47.7	M3.5	I	
J0158-5031		01 57 54.88	−50 30 56.1	1988.91	17.29	2.23	14.61	1.95	...	37.8	0.71	−0.10	129.0	M5.5	I	
J0211-6314[6]	LHS1351	02 11 19.04	−63 13 37.6	1989.73	10.77	2.08	9.80	1.24	0.81	26.8	−0.70	−0.31	97.8	M1	I	
J0211-4714		02 11 26.70	−47 13 40.3	1988.91	13.75	1.83	13.09	1.14	0.80	41.3	0.35	0.23	82.2	M0.5	int	
J0213-3352	LHS1355	02 12 39.48	−33 52 07.6	1996.62	14.21	2.12	12.70	1.52	0.93	33.9	0.83	0.25	139.8	M3.5	I	
J0213-7346[7]	LHS1356	02 12 58.07	−73 45 51.9	1993.85	11.24	1.44	10.40	1.18	0.90	41.5	0.47	0.25	104.3	M1	I	
J0218-5508	L174-34	02 18 17.41	−55 07 34.6	1990.93	12.25	1.69	10.87	1.34	1.00	30.0	0.45	0.20	69.7	M2.5	I	
J0220-6519[8]		02 19 55.74	−65 18 44.8	1989.73	14.93	2.02	12.92	1.52	0.86	36.7	0.51	0.11	90.5	M3.5	I	
J0224-4547		02 24 17.19	−45 46 55.8	1990.73	14.05	1.63	12.57	1.21	0.87	102.9/25.3	0.33	0.19	185.3/45.6	M1	I/int	75/25
J0228-8056		02 27 54.63	−80 55 37.6	1991.63	14.78	1.81	12.94	1.45	0.94	46.2	−0.17	−0.34	83.2	M3	I	
J0232-2725	LHS5057	02 32 28.72	−27 25 13.4	1994.93	17.00	2.23	15.33	1.57	0.82	96.3/45.1	0.38	0.23	200.8/94.1	M4	I/int	60/40
J0233-2737	LHS1416	02 32 41.86	−27 37 26.0	1994.93	14.06	2.60	13.06	1.36	0.83	22.1	0.65	0.37	78.6	M3	int	
J0234-5306	L225-57	02 34 20.95	−53 05 35.4	1993.96	10.78	2.10	9.79	1.49	0.90	9.6	0.25	−0.34	19.1	M3.5	I	
J0241-6045	L127-33	02 40 36.99	−60 44 48.5	1991.78	13.85	1.50	12.34	1.13	0.91	116.7/30.4	0.19	0.29	193.6/50.4	M0.5	I/int	45/55
J0244-5835		02 43 56.21	−58 34 53.7	1991.78	16.56	2.28	13.89	1.84	1.00	31.0	0.29	0.26	57.3	M5	I	
J0244-5805	LHS1437	02 43 56.23	−58 04 51.9	1991.78	13.35	1.83	12.70	0.96	0.80	87.1/39.8	−0.51	−0.30	244.3/111.7	M0	int/II	75/25
J0246-4025	LP993-119	02 45 59.15	−40 24 55.8	1993.96	12.60	1.70	11.37	1.33	0.92	39.5	0.43	0.02	80.5	M2.5	I	
J0247-5257		02 47 20.37	−52 56 48.2	1993.96	15.32	2.08	13.37	1.61	0.98	35.5	0.41	0.53	112.7	M4	I	
J0248-3043	LHS1448	02 48 19.52	−30 43 20.4	1994.93	10.64	1.34	10.70	1.03	0.82	69.2/22.4	0.38	−0.56	223.0/72.2	M0	I/int	25/75
J0250-2444	LP830-44	02 49 36.12	−24 44 14.5	1992.68	13.90	1.49	12.40	1.10	0.88	128.8/35.1	0.36	0.03	219.8/59.9	M0.5	I/int	20/80
J0250-4941		02 50 04.24	−49 40 42.4	1992.81	15.68	2.29	14.17	1.39	0.87	108.1/34.3	0.13	0.28	158.8/50.4	M3	I/int	80/20

[1] Distance is 13 pc from the Yale parallax catalogue.
[2] Distance is 17 pc from the Yale parallax catalogue, 23 pc from the Hipparcos catalogue.
[3] Distance is 22 pc from the Hipparcos catalogue.
[4] Distance is 21 pc from the ARICNS.
[5] Distance is 13 pc from the Yale parallax catalogue and the Hipparcos catalogue.
[6] Distance is 18 pc from the ARICNS.
[7] Distance is 26 pc from the ARICNS.
[8] Already identified by Scholz et al. (2002) at 34 pc.

Table 1. continued.

name APMPM	other name	α_{J2000}	δ_{J2000}	UKST epoch	R UKST	$B_J - R$ UKST	I DENIS	$I - J$ DENIS	$J - K_s$ DENIS	d (pc)	μ_x ($''$ yr^{-1})	μ_y	V_t (km s^{-1})	type	population %	
J0252-2602	LHS1459	02 51 43.22	−26 01 33.0	1992.68	13.21	1.57	11.76	1.09	0.82	28.0	−0.01	−0.82	108.8	M0.5	int	
J0252-3412	LHS1461	02 52 17.91	−34 11 51.0	1993.80	14.38	1.73	12.77	1.30	0.77	84.2/21.9	0.47	0.09	191.6/49.8	M2.5	I/int	85/15
J0254-2837	LP886-61	02 54 08.29	−28 36 35.8	1994.93	14.77	2.14	13.61	1.54	0.88	47.1	0.29	0.17	75.9	M4	I	
J0255-2216	LP831-1	02 54 39.26	−22 15 58.0	1992.68	12.16	1.69	10.34	1.37	0.69	21.3	0.37	−0.07	38.4	M3	I	
J0314-2310	LP831-45	03 14 17.96	−23 09 31.2	1992.99	11.46	1.83	9.90	1.44	0.91	11.7	0.35	0.19	22.2	M3	I	
J0319-3749	LP943-70	03 18 44.50	−37 48 56.9	1991.78	15.15	2.12	13.02	1.55	0.80	35.2	0.37	−0.22	71.7	M4	I	
J0319-4052	LP994-96	03 18 45.25	−40 51 37.2	1991.78	10.64	2.10	9.63	1.28	0.87	21.2	0.16	0.31	35.2	M2.5	I	
J0329-2719[9]	LHS1549+1550	03 28 48.15	−27 19 05.2	1992.99	11.59	0.84	11.00	1.44	0.81	19.9	0.66	0.34	69.8	M3	I	
J0334-2619	LHS1558	03 34 12.71	−26 19 26.8	1991.93	12.80	2.16	11.87	1.40	0.83	35.9	0.60	0.35	117.4	M3	I	
J0340-3526[10]	LP944-20	03 39 34.98	−35 25 46.4	1991.70	17.24	2.93	13.95	3.25	1.25	7.7	0.31	0.31	16.1	M9	I	
J0344-4211	LP995-74	03 44 05.29	−42 10 44.7	1991.78	12.76	1.86	11.35	1.19	0.79	62.7/15.5	−0.19	−0.45	145.6/36.0	M1	I/int	80/20
J0347-2254	LHS1592	03 46 55.57	−22 54 11.8	1991.93	14.08	2.09	12.54	1.53	0.94	30.2	−0.38	−0.42	81.6	M4	I	
J0353-3823	LP944-70	03 53 29.68	−38 23 05.5	1991.91	12.49	1.73	11.46	1.31	0.90	44.6	0.12	0.41	90.9	M2.5	I	
J0402-4325[11]	WT133	04 02 13.84	−43 25 22.9	1992.99	14.07	2.18	12.92	1.57	0.89	31.4	0.06	−0.58	86.3	M4	I	
J0403-3754	LHS1622	04 03 29.94	−37 53 37.9	1991.91	13.14	2.07	11.94	1.42	0.91	33.0	0.52	0.49	111.1	M3	I	
J0405-6259	LHS5090	04 04 31.58	−62 59 10.4	1989.98	14.49	1.85	12.85	1.26	0.80	103.6/25.5	0.25	−0.46	255.4/62.9	M2.5	I/int	60/40
J0413-5352[12]	LHS1639	04 12 47.13	−53 52 08.5	1994.99	11.56	2.18	10.96	1.36	0.98	29.3	0.50	0.60	108.3	M3	I	
J0413-3729		04 13 22.71	−37 28 54.0	1992.01	13.05	2.61	12.36	1.11	0.89	34.0	0.73	−0.29	127.3	M0.5	int	
J0419-5714	LHS1656	04 18 50.80	−57 14 06.0	1994.99	11.02	1.95	10.75	1.22	0.88	42.5/10.7	0.27	0.75	160.4/40.4	M1	I/int	80/20
J0424-4551		04 23 57.71	−45 50 38.8	1992.99	16.25	0.56	16.00	0.31	...	35.9	−0.10	−0.51	88.5	wd		
J0433-3947[13]	LHS1678	04 32 42.33	−39 47 05.3	1992.08	10.06	2.31	10.26	1.15	0.83	42.5/10.3	0.27	−0.97	202.8/49.2	M0.5	I/int	50/50
J0455-4238		04 55 08.23	−42 38 03.2	1990.07	12.94	1.97	12.01	1.10	0.73	109.5/30.3	−0.20	−0.29	181.7/50.3	M0.5	I/int	45/55
J0518-5256	L233-25	05 17 30.73	−52 56 16.2	1991.12	11.33	2.27	10.67	1.30	0.86	32.3	0.41	0.22	72.0	M2.5	I	
J0523-5609	LHS5104	05 22 57.74	−56 09 01.0	1991.12	13.06	2.10	11.81	1.42	0.93	31.3	0.26	0.47	80.1	M3	I	
J0526-5501	L180-29	05 26 28.00	−55 01 01.9	1991.12	11.76	2.04	11.00	1.38	0.87	28.0	0.17	0.46	65.0	M3	I	
J0531-3012[14]	LHS1767	05 31 04.11	−30 11 41.7	1992.76	11.49	1.68	10.68	1.56	0.80	11.7	0.35	−0.45	31.6	M4.5	I	
J0532-5657		05 32 26.70	−56 57 13.4	1991.12	13.33	2.11	12.14	1.44	0.90	33.5	0.04	−0.42	66.7	M3	I	
J0533-3952		05 32 38.22	−39 52 22.6	1992.02	14.06	1.63	12.77	1.26	0.78	96.7/23.8	−0.10	0.33	155.8/38.4	M2.5	I/int	90/10
J0540-4011	L378-6	05 40 02.63	−40 11 17.3	1992.02	11.36	1.66	10.43	1.21	0.91	38.4	−0.16	0.34	69.2	M1	I	
J0541-5349		05 41 27.18	−53 49 17.9	1991.12	11.82	1.79	11.77	1.13	0.82	90.3/23.6	0.10	0.37	162.6/42.5	M0.5	I/int	65/35
J0542-3618	WT2431	05 41 52.09	−36 17 52.5	1992.00	12.15	1.66	11.77	1.02	0.74	38.7	0.28	−0.31	77.0	M0	int	
J0544-4108[15]		05 43 46.37	−41 08 04.7	1992.02	12.68	1.76	11.21	1.53	0.87	16.5	0.18	−0.59	48.5	M4	I	
J0552-5507	LHS1793	05 52 29.31	−55 06 39.6	1993.89	11.18	2.22	10.36	1.11	0.83	50.1/13.6	−0.27	−0.61	159.1/43.2	M0.5	I/int	75/25
J0604-5519[16]	LHS1815	06 04 19.81	−55 18 49.3	1993.89	10.50	2.11	10.07	1.28	0.78	26.4	0.69	0.36	97.6	M2.5	I	
J0605-3742	LP949-17	06 04 51.30	−37 41 42.0	1991.93	12.38	2.02	11.59	1.34	0.82	42.2	0.11	0.46	94.0	M2.5	I	
J0610-3740		06 09 39.83	−37 39 33.3	1991.93	18.62	2.17	15.35	2.14	0.91	41.9	0.11	0.35	73.5	M5.5	I	
J0611-4324[17]	LHS1831	06 10 52.72	−43 24 24.2	1991.87	10.67	2.00	9.58	1.34	0.90	16.3	0.14	0.76	59.5	M2.5	I	
J0619-5124		06 18 51.22	−51 24 27.1	1993.96	14.07	1.87	13.03	1.47	0.83	45.1	0.16	−0.29	70.5	M3.5	I	
J0620-4144		06 19 58.62	−41 43 35.8	1991.93	15.38	−0.42	15.09	−0.05	...	39.7	0.19	−0.38	79.0	wd		
J0629-5151		06 28 44.22	−51 50 55.5	1992.09	17.94	2.25	15.28	2.01	0.97	47.2	−0.12	0.33	78.3	M5.5	I	
J0653-5307	LHS1877	06 53 19.36	−53 07 14.2	1993.21	10.18	2.15	10.33	1.15	0.92	44.1	−0.07	0.48	102.4	M0.5	I	
J0710-5704[18]		07 09 37.29	−57 03 45.4	1992.17	11.93	2.11	10.66	1.48	0.85	15.1	0.33	0.31	32.2	M3.5	I	

[9] Distance is 17 pc from the Yale parallax catalogue, 22 pc from the ARICNS.
[10] Already known brown dwarf at 5 pc (Tinney 1996).
[11] Already identified by Henry et al. (2002) at 30.2 pc.
[12] Distance is 23 pc from the ARICNS.
[13] Distance is 30 pc from the ARICNS.
[14] Distance is 19 pc from the ARICNS.
[15] Already identified by Scholz et al. (2002) at 20 pc.
[16] Distance is 26 pc from the Yale parallax catalogue, 29 pc from the Hipparcos catalogue.
[17] Distance is 12 pc from the ARICNS.
[18] Already identified by Scholz et al. (2002) at 13 pc.

Table 1. continued.

name APMPM	other name	$\alpha_{\rm J2000}$	$\delta_{\rm J2000}$	UKST epoch	R UKST	$B_{\rm J}-R$ UKST	I DENIS	$I-J$ DENIS	$J-K_{\rm s}$ DENIS	d (pc)	μ_x ($'' \, {\rm yr}^{-1}$)	μ_y ($'' \, {\rm yr}^{-1}$)	$V_{\rm t}$ (km s^{-1})	type	population %	
J1039-2602	LHS2294	10 39 13.89	−26 01 38.8	1993.08	16.19	1.89	13.75	1.44	0.77	68.9/25.9	−0.56	0.24	199.2/74.9	M3	I/int	55/45
J1042-3112	LP904-51	10 41 43.77	−31 11 52.7	1993.15	15.10	1.70	12.84	1.84	0.88	19.3	0.37	−0.25	41.2	M5	I	
J1051-2413	LP849-16	10 50 59.70	−24 12 44.4	1993.08	14.61	1.67	12.63	1.30	0.75	77.4/20.2	−0.18	0.38	154.1/40.2	M2.5	I/int	40/60
J1106-2031	LP791-26	11 05 59.67	−20 31 22.8	1992.25	15.82	1.95	13.83	1.62	0.86	43.2	−0.37	0.11	79.9	M4	I	
J1114-2529	LHS 2376	11 13 42.33	−25 29 16.2	1990.32	14.60	2.07	13.00	1.55	0.89	34.7	−0.45	0.07	74.8	M4	I	
J1117-2757[19]	LHS2385	11 16 37.90	−27 57 12.6	1991.20	11.80	1.96	10.84	1.42	0.86	20.2	−0.52	−0.83	93.8	M3	I	
J1120-3056	LP906-15	11 20 15.99	−30 56 09.0	1991.20	16.54	1.99	14.92	1.49	0.61	103.1/41.8	−0.39	0.17	210.1/85.2	M3.5	I/int	55/45
J1120-2230	LHS2396	11 20 18.23	−22 30 05.8	1992.25	16.68	2.47	14.39	2.05	0.84	29.8	−0.43	0.28	72.0	M5.5	I	
J1120-2802	LP906-14	11 20 20.36	−28 01 56.9	1991.20	13.88	2.26	13.40	1.01	0.80	86.3/43.4	−0.48	−0.05	197.4/99.3	M0	int/II	75/25
J1218-2902	LHS323	12 17 30.67	−29 02 20.1	1993.39	15.76	2.12	13.96	1.45	0.88	28.3	−1.10	−0.05	147.6	M3	int	
J1223-3010	LP908-48	12 22 37.20	−30 09 30.3	1993.39	14.78	2.01	13.17	1.51	0.79	42.2	−0.31	−0.02	62.0	M3.5	I	
J1224-2758[20]	LHS325a	12 23 56.73	−27 57 48.5	1993.39	17.15	2.37	14.19	2.30	0.88	20.2	−1.25	0.33	123.5	M6.5	I	
J1226-3121	LP908-61	12 25 52.57	−31 20 48.3	1993.39	15.00	2.14	13.60	1.29	...	125.7/32.5	−0.31	0.03	184.7/47.8	M2.5	I/int	80/20
J1228-2746	LHS2561	12 27 35.03	−27 46 16.2	1993.39	14.22	2.20	12.84	1.54	0.71	33.4	−0.49	0.31	91.8	M4	I	
J1230-2824	LP909-6	12 30 19.65	−28 24 28.8	1993.39	13.70	2.60	12.40	1.48	0.97	33.1	−0.29	−0.26	61.2	M3.5	I	
J1316-3229	LHS2706	13 15 34.29	−32 28 34.7	1991.21	14.07	1.99	13.06	1.28	0.90	103.6/26.3	−0.45	−0.24	250.4/63.6	M2.5	I/int	70/30
J1344-2902	LP911-47	13 44 23.77	−29 01 44.7	1992.19	14.94	2.53	13.72	1.26	0.79	153.3/37.8	−0.31	−0.02	225.3/55.5	M2.5	I/int	30/70
J1357-2828	LP912-35	13 57 21.61	−28 27 48.8	1992.19	12.83	1.63	11.88	1.59	1.12	18.7	−0.33	0.03	29.3	M4	I	
J1407-3018[21]	LHS2859	14 06 49.76	−30 18 27.0	1992.20	15.65	2.43	13.38	2.09	1.04	17.9	−0.82	0.00	69.6	M5.5	I	
J1954-4748[22]	LHS480	19 54 00.15	−47 48 27.8	1990.73	11.20	1.82	10.22	1.13	0.77	44.2/11.5	−0.09	−1.02	214.5/55.8	M0.5	I	50/50
J1957-4216		19 56 57.35	−42 16 17.2	1993.62	16.99	2.27	14.34	2.07	0.61	28.6	0.11	−1.02	139.6	M5.5	I	
J1957-3251		19 56 59.43	−32 50 47.0	1991.54	14.79	1.94	12.73	1.61	0.99	26.6	−0.11	−0.32	42.9	M4	I	
J2004-3142[23]	LHS3516	20 04 06.45	−31 41 42.3	1991.54	13.40	1.30	11.44	1.47	0.89	21.8	0.34	−0.77	86.8	M3.5	I	
J2007-3842		20 07 10.64	−38 42 08.4	1993.62	15.75	1.77	14.90	1.17	0.78	84.3/42.5	−0.11	−0.50	204.6/103.1	M1	int/II	50/50
J2008-5244	LHS3525	20 08 07.28	−52 44 21.6	1990.73	12.25	1.84	10.74	1.20	0.91	46.1	0.14	−0.46	104.9	M1	I	
J2024-5102	LHS3546	20 23 53.38	−51 02 02.3	1991.59	12.04	1.93	11.53	1.07	0.63	26.9	0.42	−0.46	79.1	M0.5	int	
J2045-4218	L423-44	20 45 03.40	−42 17 41.3	1991.68	10.42	1.81	10.32	0.90	0.91	71.3/39.5	0.38	0.02	128.4/71.1	K7	I/int	40/60
J2101-4125		21 01 03.44	−41 14 31.8	1991.68	13.46	1.94	11.50	1.55	0.90	17.5	0.36	−0.25	36.5	M4	I	
J2101-4907		21 01 07.50	−49 07 23.7	1992.57	11.25	1.76	10.52	1.43	0.92	16.5	−0.31	−0.15	26.6	M3	I	
J2103-3022	LHS3616	21 03 17.02	−30 22 21.3	1989.76	12.83	1.89	11.29	1.21	0.85	57.4/14.1	0.00	−0.53	144.2/35.4	M1	I/int	80/20
J2103-5023[24]	LHS3615	21 03 21.30	−50 22 50.1	1992.57	11.22	1.38	10.48	1.44	0.86	15.5	0.30	−0.35	33.8	M3	I	
J2104-3828[25]		21 03 30.48	−38 27 47.7	1991.68	14.39	1.65	13.65	1.06	0.67	76.2/39.4	−0.40	−0.41	206.9/107.0	M0.5	int/II	75/25
J2105-5235		21 04 41.95	−52 34 40.7	1992.57	17.04	2.51	14.80	2.12	0.99	33.1	0.20	−0.27	53.3	M5.5	I	
J2106-5143	L280-56	21 06 26.95	−51 42 36.7	1992.57	10.33	1.63	10.19	1.26	0.86	30.1	−0.36	−0.21	59.9	M2.5	I	
J2109-4004[26]		21 08 30.86	−40 03 45.8	1991.76	13.21	1.78	11.30	1.35	0.83	35.8	0.44	−0.39	100.1	M2.5	I	
J2119-2817	LP929-26	21 19 11.96	−28 17 22.6	1989.76	14.21	2.08	12.61	1.25	0.80	95.1/23.4	0.01	−0.41	184.8/45.5	M1	I/int	80/20
J2134-4316[27]	WT792	21 34 22.10	−43 16 06.0	1993.61	14.83	2.50	12.78	2.01	1.07	14.9	0.14	−0.75	53.7	M5.5	I	
J2150-2731	LHS5373	21 50 23.33	−27 31 15.8	1995.63	15.13	2.35	13.12	1.51	0.93	41.8	0.47	−0.15	97.1	M3.5	I	
J2153-3121	LP930-59	21 53 02.73	−31 20 49.4	1995.63	16.82	2.16	14.26	1.76	0.89	41.6	0.37	−0.16	78.9	M5	I	
J2159-3126[28]	LHS3738	21 58 49.20	−32 26 24.8	1995.63	14.87	2.09	12.44	1.68	1.00	20.2	−0.41	−0.32	49.8	M4.5	I	
J2159-4612		21 59 22.02	−46 11 57.0	1993.61	15.61	2.10	14.40	1.45	0.73	92.1/34.7	0.42	−0.13	192.1/72.4	M3	I/int	80/20

[19] Distance is 16 pc from the ARICNS.
[20] Already identified by Phan-Bao et al. (2001) at 22.9 pc.
[21] Already identified by Phan-Bao et al. (2001) at 20 pc.
[22] Distance is 25 pc from the Yale parallax catalogue.
[23] Distance is 21 pc from the ARICNS.
[24] Distance is 17 pc from the ARICNS.
[25] Already identified by Scholz et al. (2002) as a sdK5 at 105 pc.
[26] Already identified by Scholz et al. (2002) at 20 pc.
[27] Already identified by Phan-Bao et al. (2001) at 17.5 pc.
[28] Distance is 24 pc from the ARICNS.

Table 1. continued.

name APMPM	other name	$\alpha_{\rm J2000}$	$\delta_{\rm J2000}$	UKST epoch	R UKST	$B_{\rm J}-R$ UKST	I DENIS	$I-J$ DENIS	$J-K_{\rm s}$ DENIS	d (pc)	μ_x ($''$ yr^{-1})	μ_y	$V_{\rm t}$ (km s^{-1})	type	population %	
J2202-3705[29]	LHS3746	22 02 28.65	−37 04 50.3	1990.78	10.44	2.36	9.07	1.39	0.82	10.4	0.78	−0.17	39.4	M3	I	
J2205-3127	LHS3753	22 04 37.77	−31 27 12.2	1995.63	16.73	1.38	16.12	0.42	...	31.7	0.30	−0.40	75.1	wd		
J2221-4218[30]	LHS3798	22 20 51.09	−42 18 23.0	1988.45	11.68	2.11	10.84	0.95	0.80	38.3	0.52	−0.29	108.9	M0	int	
J2222-4209	LHS5384	22 21 49.74	−42 08 59.2	1990.78	13.36	1.99	11.79	1.53	0.94	21.0	−0.19	−0.49	52.8	M4	I	
J2223-4328	LHS3800	22 23 08.90	−43 27 35.3	1990.78	13.85	1.54	12.23	1.33	0.75	15.7	0.79	−0.37	64.7	M2.5	int	
J2231-2800	LP932-34	22 31 04.83	−27 59 51.2	1995.78	15.12	2.17	13.07	1.57	0.69	34.1	−0.03	−0.47	76.0	M4	I	
J2231-2752	LP932-36	22 31 20.44	−27 51 35.8	1995.78	16.18	2.00	14.14	1.34	0.81	133.1/37.1	0.32	−0.13	220.8/61.5	M2.5	I/int	65/35
J2248-3042	LP932-77	22 48 06.01	−30 42 10.9	1995.78	12.11	1.48	11.47	0.98	0.83	110.0/41.2	0.35	−0.15	198.1/74.2	M0	I/int	20/80
J2250-2952	LP932-7	22 50 16.54	−29 52 13.5	1991.75	14.98	2.22	12.90	1.70	0.79	24.2	−0.29	−0.37	53.9	M4.5	I	
J2308-2754[31]	LHS3898	23 07 46.23	−27 54 22.8	1991.75	11.10	1.78	10.00	1.17	0.89	35.5	0.64	−0.09	109.4	M1	I	
J2308-4644		23 07 57.20	−46 44 00.1	1991.70	15.36	2.37	13.48	1.25	0.92	34.6	0.59	0.12	98.4	M1	int	
J2316-3151	LP933-4	23 16 24.06	−31 50 31.6	1996.69	14.03	2.08	12.01	1.41	0.83	36.7	0.17	−0.26	53.9	M3	I	
J2318-4608	LHS3924	23 17 32.42	−46 08 10.8	1991.70	13.16	1.66	11.54	1.42	0.74	27.2	0.51	−0.18	69.6	M3	I	
J2318-4819[32]	LHS3925	23 17 50.02	−48 18 42.4	1992.87	12.62	2.04	10.88	1.39	0.80	24.5	0.28	−0.69	85.9	M3	I	
J2318-3027	LHS3927	23 18 15.36	−30 27 10.6	1996.69	13.53	1.73	12.67	0.96	0.74	38.9	0.42	−0.83	175.5	M0	II	
J2318-2805	LP933-6	23 18 25.15	−28 05 11.5	1996.69	16.70	1.86	14.33	1.45	0.83	88.9/33.6	0.33	−0.13	147.5/55.7	M3	I/int	90/10
J2327-4651[33]	LHS3949	23 26 37.44	−46 51 03.1	1991.70	14.81	1.97	12.49	1.62	0.80	23.2	0.41	−0.35	59.4	M4	I	
J2331-2750[34]		23 31 21.61	−27 49 52.7	1996.69	18.06	2.42	14.25	2.59	1.04	15.8	0.07	0.77	57.7	M7	I	
J2338-6906[35]	LHS3988	23 38 10.33	−69 05 56.8	1987.73	11.67	1.92	10.94	1.17	0.81	54.7/13.6	0.89	−0.12	233.4/58.0	M1	I/int	90/10
J2354-3316[36]	LHS4039+4040	23 54 01.06	−33 16 25.6	1996.61	10.89	1.17	10.84	1.38	0.89	25.9	−0.32	−0.33	56.5	M3	I	
J2355-2813	LP935-40	23 54 44.54	−28 12 41.7	1990.80	17.30	1.89	14.62	1.80	0.73	45.8	0.35	−0.12	80.3	M5	I	
J2358-3407	LP987-60	23 57 54.95	−34 07 18.7	1996.61	17.61	2.45	15.03	2.33	0.96	28.9	0.13	−0.35	50.7	M6.5	I	
J2359-6246[37]		23 58 42.29	−62 45 43.6	1993.64	14.91	2.48	13.29	1.87	0.93	22.6	0.60	0.13	65.3	M5.5	I	

---

[29] Distance is 10 pc from the ARICNS.
[30] Distance is 51 pc from the Hipparcos catalogue.
[31] Distance is 45 pc from the Yale parallax catalogue, 28 pc from the ARICNS.
[32] Distance is 22 pc from the ARICNS.
[33] Distance is 24 pc from the ARICNS.
[34] Already identified by Phan-Bao et al. (2001) at 17.3 pc.
[35] Distance is 35 pc from the ARICNS.
[36] Distance is 21 pc from the ARICNS.
[37] Already identified by Scholz et al. (2002) at 11 pc.

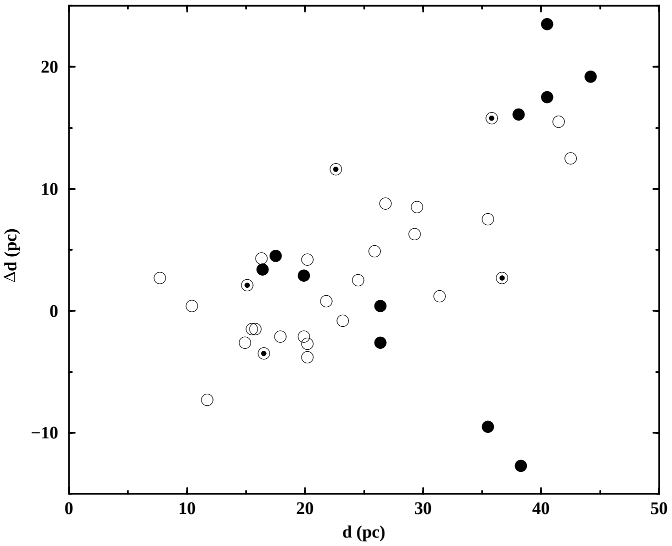

Fig. 3. Comparison between our estimated distances and determination by other authors, as indicated in Table 1. Δ*d* is the difference between both determinations. *d* is our determination. Open circles: photometric determinations. Filled circles: trigonometric determinations. Circled dots: spectroscopic determinations.

It should be noted that the distances estimated in Table 1 have large uncertainties, particularly for stars with $I - J < 1.5$, for which the colour index is less sensitive to the luminosity (see Fig. 1). Moreover, Phan-Bao et al. (2001) plotted the colour-magnitude relation of M-stars with measured distances and noted an intrinsic scatter of ±1 mag. They also superimposed the Baraffe et al. (1998) theoretical track which does not fit perfectly the mean observed relation around $I-J = 1.5$ where the M_I magnitude is lower by 1 magnitude compared to the magnitude obtained with a polynomial fit of the observed data (Phan-Bao et al. 2001). For this reason, our distance determination for the 4 stars already identified by Phan-Bao et al. (2001) is smaller by a factor up to 15%.

Figure 3 gives the difference between our estimated distance and other distances found in the litterature, as indicated in Table 1 footnotes, versus our determination. Open circles are used when the other determination is photometric, filled circles when it is trigonometric, circled dots when it is spectroscopic. Our determination is not biased compared to trigonometric parallaxes, giving confidence in our distances, while a systematic deviation appears at large distances between other photometric distances and ours, due to the different theoretical colour-magnitude relations used. The mean error is of the order of 5 pc at distances closer than 25 pc but grows to more than 10 pc at larger distances.

7. Conclusion

Thanks to the deep and large surveys at optical and near-infrared wavelengths, many low-luminosity nearby stars are identified. Most of the nearest stars turned out to have a large proper motion. In this paper, we present the identification of 107 stars closer than 50 pc among high proper motion stars cross-identified with DENIS. Their large proper motions exclude that they are giants. They are mainly M-stars, while 4 stars are white dwarfs. 31 stars among them have already measured distances. In addition, 40 stars may enter in the 50 pc limit depending on which population they belong to. 6 stars among them have previously measured distances.

15 new stars are within the 25 pc limit of the CNS3 catalogue. 5 stars, LHS5045, L225-57, LP831-45, LHS1767, and WT792, are closer than 15 pc,with 1 object, L225-57, at 9.5 pc. In order to insure the spectral types and therefore distances, we plan to obtain low-resolution spectroscopy of the closest candidates.

Acknowledgements. The authors thank Guy Simon who provided photometric values in a strip not available in the PDAC database, the whole DENIS staff and all the DENIS observers who collected the data. The DENIS project is supported by the SCIENCE and the Human Capital and Mobility plans of the European Commission under grants CT920791 and CT940627 in France, by l'Institut National des Sciences de l'Univers, the Ministère de l'Éducation Nationale and the Centre National de la Recherche Scientifique (CNRS) in France, by the State of Baden-Würtemberg in Germany, by the DGICYT in Spain, by the Sterrewacht Leiden in Holland, by the Consiglio Nazionale delle Ricerche (CNR) in Italy, by the Fonds zur Förderung der wissenschaftlichen Forschung and Bundesministerium für Wissenschaft und Forschung in Austria, and by the ESO C & EE grant A-04-046.

References

Baraffe, I., Chabrier, G., Allard, F., & Hauschildt, P. H. 1998, A&A, 337, 403
Bergeron, P., Wesemael, F., & Beauchamp, A. 1995, PASP, 107, 1047
Dawson, P. C. 1986, ApJ, 311, 984
Delfosse, X. 1997, Ph.D. Thesis, Grenoble University
Delfosse, X., Tinney, C. G., Forveille, T., et al. 1997, A&A, 327, L25
Delfosse, X., Tinney, C. G., Forveille, T., et al. 1999, A&AS, 135, 41
Delfosse, X., Forveille, T., Martín, E. L., et al. 2001, A&A, 366, L13
Epchtein, N., de Batz, B., Capoani, L., et al. 1997, The Messenger, 87, 27
Fan, X., Knapp, G. R., Strauss, M. A., et al. 2000, AJ, 119, 928
Gizis, J., & Reid, I. 1997, PASP, 109, 849
Gizis, J. E., Monet, D. G., Reid, I. N., Kirkpatrick, J. D., Liebert, J., & Williams, R. J. 2000, AJ, 120, 1085
Gliese, W., & Jahreiß, H. 1991, in The Astronomical Data Center CD-ROM: Selected Astronomical Catalogs, vol. I; ed. L. E. Brotzmann, & S. E. Gesser, NASA/Astronomical Data Center, Goddard Space Flight Center, Greenbelt, MD
Haywood, M., Robin, A. C., & Crézé, M. 1997, A&A, 320, 440
Henry, T. J., Ianna, P. A., Kirkpatrick, J. D., & Jahreiss, H. 1997, AJ, 114, 388
Henry, T. J., Walkowicz, L. M., Barto, T. C., & Golimowski, D. A. 2002, AJ, preprint [`astro-ph0112496`]
Jahreiß, H., Scholz, R., Meusinger, H., & Lehmann, I. 2001, A&A, 370, 967
Kirkpatrick, J. D., Reid, I. N., Liebert, J., et al. 1999, AJ, 519, 802
Kirkpatrick, J. D., Reid, I. N., Liebert, J., et al. 2000, AJ, 120, 447
Leggett, S. K. 1992, ApJS, 82, 351
Lejeune, T., Cuisinier, F., & Buser, R. 1997, A&AS, 125, 229
Leonard, P. J. T., & Tremaine, S. 1990, ApJ, 353, 486
Martín, E. L., Delfosse, X., Basri, G., et al. 1999, AJ, 118, 2466
Meillon, L., Crifo, F., Gomez, A. E., Udry, S., & Mayor, M. 1997, ESA SP-402: Hipparcos – Venice '97, 402, 591

Phan-Bao, N., Guibert, J., Crifo, F., et al. 2001, A&A, 380, 590
Reid, I. N., Kirkpatrick, J. D., Gizis, J. E., et al. 2000, AJ, 119, 369
Reylé, C., & Robin, A. C. 2001, A&A, 373, 886
Robin, A. C., Reylé, C., & Crézé, M. 2000, A&A, 359, 103
Ruiz, M. T., Takamiya, M. Y., Mendez, R., Maza, J., & Wishnjewsky, M. 1993, AJ, 106, 2575
Ruiz, M. T., Leggett, S. K., & Allard, F. 1997, ApJ, 491, L107
Scholz, R.-D., Irwin, M., Schweitzer, A., & Ibata, R. 1999, A&A, 345, L55
Scholz, R.-D., Irwin, M., Ibata, R., Jahreiß, H., & Malkov, O. Y. 2000, A&A, 353, 958
Scholz, R.-D., Meusinger, H., & Jahreiß, H. 2001, A&A, 374, L12
Scholz, R.-D., Ibata, R., Irwin, M., Lehmann, I., Salvato, M., & Schweitzer, A. 2002, MNRAS, 329, 109
Tinney, C. G. 1996, MNRAS, 281, 644
Wroblewski, H., & Torres, C. 1989, A&AS, 78, 231
Wroblewski, H., & Torres, C. 1991, A&AS, 91, 129
Wroblewski, H., & Torres, C. 1994, A&AS, 105, 179
Wroblewski, H., & Torres, C. 1996, A&AS, 115, 481
Wroblewski, H., & Torres, C. 1997, A&AS, 122, 447