A&A 583, A85 (2015)
DOI: 10.1051/0004-6361/201526795

Astronomy & Astrophysics

Reaching the boundary between stellar kinematic groups and very wide binaries

III. Sixteen new stars and eight new wide systems in the β Pictoris moving group

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Received 19 June 2015 / Accepted 8 August 2015

ABSTRACT

Aims. We look for common proper motion companions to stars of the nearby young β Pictoris moving group.

Methods. First, we compiled a list of 185 β Pictoris members and candidate members from 35 representative works. Next, we used the Aladin and STILTS virtual observatory tools and the PPMXL proper motion and Washington Double Star catalogues to look for companion candidates. The resulting potential companions were subjects of a dedicated astro-photometric follow-up using public data from all-sky surveys. After discarding 67 sources by proper motion and 31 by colour-magnitude diagrams, we obtained a final list of 36 common proper motion systems. The binding energy of two of them is perhaps too small to be considered physically bound.

Results. Of the 36 pairs and multiple systems, eight are new, 16 have only one stellar component previously classified as a β Pictoris member, and three have secondaries at or below the hydrogen-burning limit. Sixteen stars are reported here for the first time as moving group members. The unexpected large number of high-order multiple systems, 12 triples and two quadruples among 36 systems, may suggest a biased list of members towards close binaries or an increment of the high-order-multiple fraction for very wide systems.

Key words. binaries: general – Galaxy: kinematics and dynamics – open clusters and associations: individual: β Pictoris – binaries: visual

1. Introduction

Wide binaries provide valuable information about key questions in astrophysics; for example, halo-wide pairs contribute to constraining the properties of dark matter (Weinberg et al. 1987; Yoo et al. 2004; Quinn et al. 2009), some star formation theories depend on the frequency and separation of wide young binaries (Parker et al. 2009; Ward-Duong et al. 2015; Marks et al. 2015), and relatively bright FGK-type primaries with M-dwarf companions provide a metallicity calibration yardstick for cool stars (Bonfils et al. 2005; Rojas-Ayala et al. 2012; Newton et al. 2014; Li et al. 2014). However, the maximum projected physical separation of a wide binary is still a matter of discussion: Some authors consider a cutoff in the number of wide binaries at 2×10^4 au (∼0.1 pc), which is the typical size of protostellar cores (Tolbert 1964; Abt 1988; Wasserman & Weinberg 1991; Allen et al. 2000; Tokovinin & Lépine 2012), while others contemplate separations of 2×10^5 au (∼1 pc) or more (Jiang & Tremaine 2009; Caballero 2009; Shaya & Olling 2011). Such wide common proper-motion pair candidates, which give their name to the title of this series of papers, can be either unbound members of the same young stellar kinematic group that by chance are co-moving (Tokovinin 2014a) or bound "binaries" of very low binding energies at the limit of disruption (Caballero 2010).

The younger a weakly bound system is, the less time it has had to be disrupted (Bahcall & Soneira 1981; Retterer & King 1982; Weinberg et al. 1987; Saarinen & Gilmore 1989; Poveda & Allen 2004). As a result, a search for multiple systems within a young stellar kinematic group (moving group or stellar association) offers a unique opportunity for finding new faint benchmark objects hardly influenced by the Galactic gravitational potential, but instead by their formation process. In other words, the shape of young wide binaries is dominated by nature instead of by nurture.

In this work, we use the profitable technique of searching for common proper-motion pairs of wide separation (e.g., Luyten 1979; Chanamé & Gould 2004) in a close and very young moving group, namely β Pictoris (Zuckerman et al. 2001b; Ortega et al. 2002; Song et al. 2003). Although there is no consensus in the literature, the β Pictoris age lies in a relatively narrow interval between 11 Ma and 26 Ma (Barrado y Navascués 1998; Torres et al. 2006; Yee & Jensen 2010; Binks & Jeffries 2014; Mamajek & Bell 2014, and references therein). Known moving group members and member candidates lie at between 6 pc and 80 pc from our Sun with a median distance of 40 pc.

Because of its youth and proximity, the β Pictoris moving group has been relevant for studying resolved debris discs with high angular resolution observations (Smith & Terrile 1984; Metchev et al. 2005; Boccaletti et al. 2009; Churcher et al. 2011; Wahhaj et al. 2013; Dent et al. 2013) and exoplanets through direct imaging (Mouillet et al. 1997; Neuhäuser et al. 2003; Kasper et al. 2007; Lagrange et al. 2009, 2010; Bonnefoy et al. 2011, 2013; Biller et al. 2013; Rameau et al. 2013; Males et al. 2014; Bowler et al. 2015; Macintosh et al. 2015) or for comparing observations with evolutionary models (Crifo et al. 1997; Song et al. 2002; Cruz et al. 2009; Biller et al. 2010; Mugrauer et al. 2010; Jenkins et al. 2012; Montet et al. 2015). Therefore,

Table 1. Sources of the β Pictoris stellar sample.

Title	References
Search for associations containing young stars (I, III, V, VI)	SACY[a]
Bayesian analysis to identify new star candidates in nearby young stellar... (I–V)	BANYAN[b]
A dusty M5 binary in the β Pictoris moving group	Rodríguez et al. (2014)
On the age of the β Pictoris moving group	Mamajek & Bell (2014)
The Solar Neighborhood. XXXIII. Parallax results from the CTIOPI 0.9 m program...	Riedel et al. (2014)
A lithium depletion boundary age of 21 Myr for β Pictoris moving group	Binks & Jeffries (2014)
Unveiling new members in five nearby young moving groups	Moór et al. (2013)
Identifying the young low-mass stars within 25 pc (I, II)	Shkolnik et al. (2009, 2012)
Likely members of the β Pictoris and AB Doradus moving groups in the north	Schlieder et al. (2012b)
Cool young stars in the northern hemisphere: β Pictoris and AB Doradus moving...	Schlieder et al. (2012a)
The sizes of the nearest young stars	McCarthy & White (2012)
Potential members of stellar kinematic groups within 30 pc of the Sun	Nakajima & Morino (2012)
A search for new members of the β Pictoris, Tucana-Horologium and η Cha	Kiss et al. (2011)
β Pictoris and AB Doradus moving groups: likely new low-mass members	Schlieder et al. (2010)
The lowest-mass member of the β Pictoris moving group	Rice et al. (2010)
Potential members of stellar kinematic groups within 20 pc of the Sun	Nakajima et al. (2010)
Kinematic analysis and membership status of TWA22 AB	Teixeira et al. (2009)
Nearby young stars selected by proper motion. I. Four new members of the β Pictoris...	Lépine & Simon (2009)
Young nearby loose associations	Torres et al. (2008)
Unraveling the origins of nearby young stars	Makarov (2007)
Nearby debris disk systems with high fractional luminosity reconsidered	Moór et al. (2006)
Young stars near the Sun	Zuckerman & Song (2004)
New aspects of the formation of the β Pictoris moving group	Ortega et al. (2004)
New members of the TW Hydrae association, β Pictoris moving group and Tucana...	Song et al. (2003)
The origin of the β Pictoris moving group	Ortega et al. (2002)
The β Pictoris moving group	Zuckerman et al. (2001b)
The age of β Pictoris	Barrado y Navascués et al. (1999)

Notes. [a] SACY: Torres et al. (2006); da Silva et al. (2009); Elliott et al. (2014, 2015). [b] BANYAN: Malo et al. (2013, 2014a,b); Gagné et al. (2014, 2015). We only collected BANYAN candidates with membership probability $P > 50\%$.

increasing the number of members via common proper-motion companionship, especially at low masses, can help to inform the previously mentioned fields and to constrain the age of the group. Besides that, identiying bright M-dwarf targets of ~10–30 Ma for extremely precise radial velocity surveys is becoming critical for understanding the formation and early evolution of terrestrial planets in habitable zones (Lissauer 2007; Ramírez & Kaltenegger 2014; Luger et al. 2015; Tian 2015; Tian & Ida 2015). Preliminary results of this work, including the discovery of two new stellar members in the β Pictoris moving group, were given in Alonso-Floriano et al. (2011).

2. Analysis

2.1. Stars sample

We have compiled in Table A.1 a list of 185 β Pictoris members and member candidates around which we looked for common proper-motion companions. We gathered them from 35 previous works published in the past 16 years from the first articles of Barrado y Navascués et al. (1999) and Zuckerman et al. (2001b) to the last investigations published in the SACY (Search for Associations Containing Young stars – Torres et al. 2006; Elliott et al. 2014, 2015) and BANYAN series (Bayesian Analysis for Nearby Young AssociatioNs – Malo et al. 2014a,b; Gagné et al. 2015). Table 1 lists all works that we searched through.

We cross-matched our list with the latest Geneva-Copenhagen catalogue (Holmberg et al. 2009) and identified 17 bright stars for which metallicity was available. From these data, we determined a solar metallicity of the β Pictoris moving group of [Fe/H] = –0.2 ± 0.2. In Table A.1, we provide for each star: discovery (or recommended) name, right ascension and declination from the Two-Micron All-Sky Survey (Skrutskie et al. 2006), heliocentric distance, its uncertainty when available, and corresponding reference. We follow the nomenclature convention of Alonso-Floriano et al. (2015). In particular, we provide for the first time the ROSAT precovery names (1RXS) for several stars for which no X-ray counterpart had been identified by subsequent proper-motion surveys.

In the last column, we also list a flag indicating the quality of the star membership in β Pictoris:

1. Uncontrovertible moving group members for which at least two independent research groups have declared them to be bona fide moving group members and whose memberships have not been put in doubt afterwards. In general, these objects have coherent kinematics (with reliable distance and radial velocity determination) and youth features (coronal X-ray and chromospheric Hα emission, lithium in absorption and, in some cases, debris discs).
2. Moving-group member candidates for which there is no definitive confirmation of true membership.
3. Dubious moving group member candidates that have also been proposed as belonging to other young moving groups of similar kinematics, or even to the field. We include them in our work for completeness.

2.2. Proper motion companion candidates

For this search, we made extensive use of virtual observatory tools. We used the comprehensive PPMXL proper motion

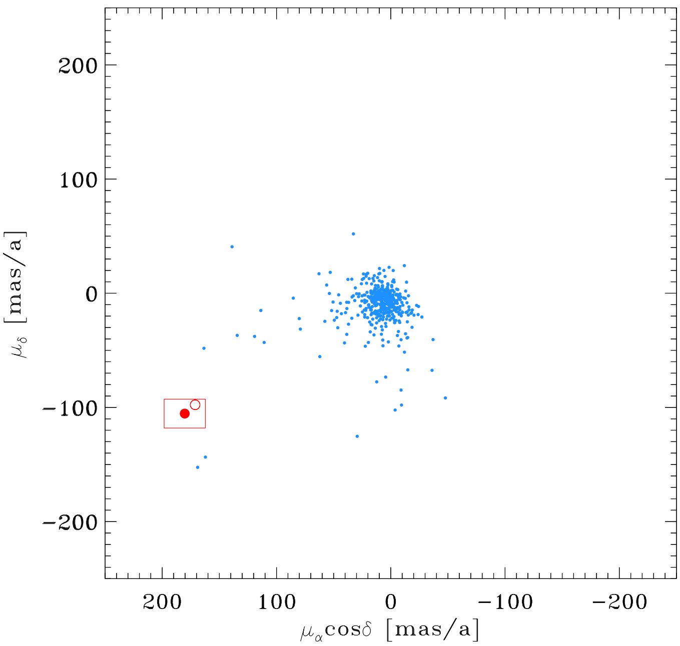

Fig. 1. Representative proper-motion diagram of all PPMXL sources brighter than $J = 15.5$ mag in a 30 arcmin-radius circular area centred on LP 648–20. The red square box in the bottom left indicates the proper-motion search area around LP 648–20, marked with a filled circle. The open circle corresponds to the bright, young G5 V star EX Cet.

catalogue (Roeser et al. 2010), the Aladin sky atlas (Bonnarel et al. 2000), and the Starlink Tables Infrastructure Library Tool Set (STILTS; Taylor 2006) to look for common proper-motion companions to the 185 β Pictoris stars in Table A.1. The PPMXL catalogue is complete down to the visual magnitude $V \approx 20$ mag and has typical individual mean errors of the proper motions between 4 and 10 mas/a, approximately. We applied the following selection criteria in our search.

– We looked for companion candidates in a circular area of angular radius $\rho = s/d$ (in arcsec) centred on each sample star, where s is the maximum projected physical separation, fixed at $s = 10^5$ au, and d (in pc) is the heliocentric distance shown in Table A.1. At the given distances, the search radii varied between over 4 deg for the closest β Pictoris stars (e.g., YZ CMi AB at 5.96 ± 0.08 pc) and 12 to 23 arcmin for the most distant ones (e.g., LP 58–170 at 140 ± 40 pc and V4046 Sgr AB and C at 73 ± 18 pc). The median search radius was 44 arcmin.
– We discarded from the survey 24 stars with total PPMXL proper motions $\mu < 50$ mas/a (19) or no proper motions at all (5). Therefore, we looked for companions of 161 β Pictoris stars. Stars slower than $\mu = 50$ mas/a were not considered at this step because of the large number of potential candidates with relative uncertainties of 10%–30% in proper motion that would fall in the surveyed area and pass the filter. As proper motion companion candidates, we classified only the PPMXL sources with a 2MASS counterpart for which the values of $\mu_\alpha \cos\delta$ and μ_δ lie within 10% of those of the primary target (see Fig. 1).
– We retained objects brighter than $J = 15.5$ mag. In general, fainter sources in the near-infrared also have very faint magnitudes in the optical, close to the limit of the USNO-B1 (Monet et al. 2003) digitisations of B_J, R_F, and I_N photographic plates, which were used by PPMXL. This faintness translates into large astrometric errors in the PPMXL proper motions. Keeping relatively bright sources assures the quality of the compiled astro-photometric measurements (see below), although prevents detecting fainter and, thus, low-mass β Pictoris members in, perhaps, the substellar domain.

Once we had a preliminary list of candidates, we inspected all of them visually with Aladin and the images and data of various all-sky surveys (Palomar Observatory Sky Survey I and II; 2MASS; SDSS-DR9, Ahn et al. 2012; WISE, Cutri et al. 2012, 2014; CMC14 and CMC15, Evans et al. 2002). In particular, we checked that the companion candidates have a unique and reliable entry in the PPMXL catalogue (e.g., at least four astrometric detections, no other PPMXL source at less than 2 arcsec, smooth variation of the magnitudes from B_J, through R_J, I_N, J, H, K_s, to WISE $W1$–4). In this step, we discarded a number of preliminary companion candidates with erroneous PPMXL proper motions (i.e., with incorrect USNO-B1 matches) owing to close visual multiplicity or source confusion in very crowded fields at low Galactic latitudes. Some of the mistaken sources were identified around α Cir, 1RXS J171502.4–333344, V4046 Sgr, 1RXS J184956.1–013402, which have $|b| < 7$ deg, and, especially, V343 Nor, which is at less than 2 deg of the Galactic plane and, besides this, towards the Galactic centre. After this visual pre-cleaning, we obtained a list of 92 proper motion companion candidates to 65 β Pictoris stars.

Next, we performed a 10 arcsec-radius cross-match on our initial 185-star sample with the Washington Double Star catalogue (WDS – Mason et al. 2001, 2015). We got 163 positive cross-matches in 55 WDS systems. Of the cross-matches, 136 corresponded to close physical binaries not resolved by 2MASS nor PPMXL ($\rho \lesssim 2.5$ arcsec) or to wider multiple systems, but with large magnitude differences measured with powerful adaptive optics systems (e.g., Lafrenière et al. 2007; Chauvin et al. 2010). The list of WDS systems unresolved or unidentified in our search are shown in Table A.2, which provides the star name, WDS discovery name (for resolved pairs) or reference (for spectroscopic binaries), multiplicity status (physical, visual – non-common proper motion –, single/double-line spectroscopic binaries), angular separation (interval of ρ when several visual companions are tabulated), position angle (θ), and WDS identifier (only for resolved pairs). For the physical and visual pairs in Table A.2, ρ and θ correspond to the latest epoch listed by WDS.

Thanks to the cross-match with WDS, we were able to add another 15 previously known secondaries detected by 2MASS to our list of 92 proper motion companion candidates. They did not pass our filters above because they have PPMXL proper motions that deviate more than 10% from those of the "primary", probably because of relative orbital motion, erroneous measurements in right ascension and/or declination, proper motions with 1σ lower limits below the 50 mas/a boundary, or no proper motions at all.

Finally, we also added to our list the companion candidates of three additional pairs of β Pictoris stars that were not in WDS and that were not detected because of the reasons explained above: [SLS2012] PYC J02017+0117N & S ($\rho \sim 10$ arcsec and equal brightness) and TYC 112–917–1 & 2E 1249 AB ($\mu \approx 41$ mas/a), which have the same predicted or measured distances and radial velocities (Schlieder et al. 2012a; Elliott et al. 2014) and are quite obvious proper motion companion candidates in Aladin, and V4046 Sgr AB and C, which was presented by Kastner et al. (2011).

In Table A.3, we list the 110 (92+15+3) proper motion companion candidates that passed on to the next analysis stage.

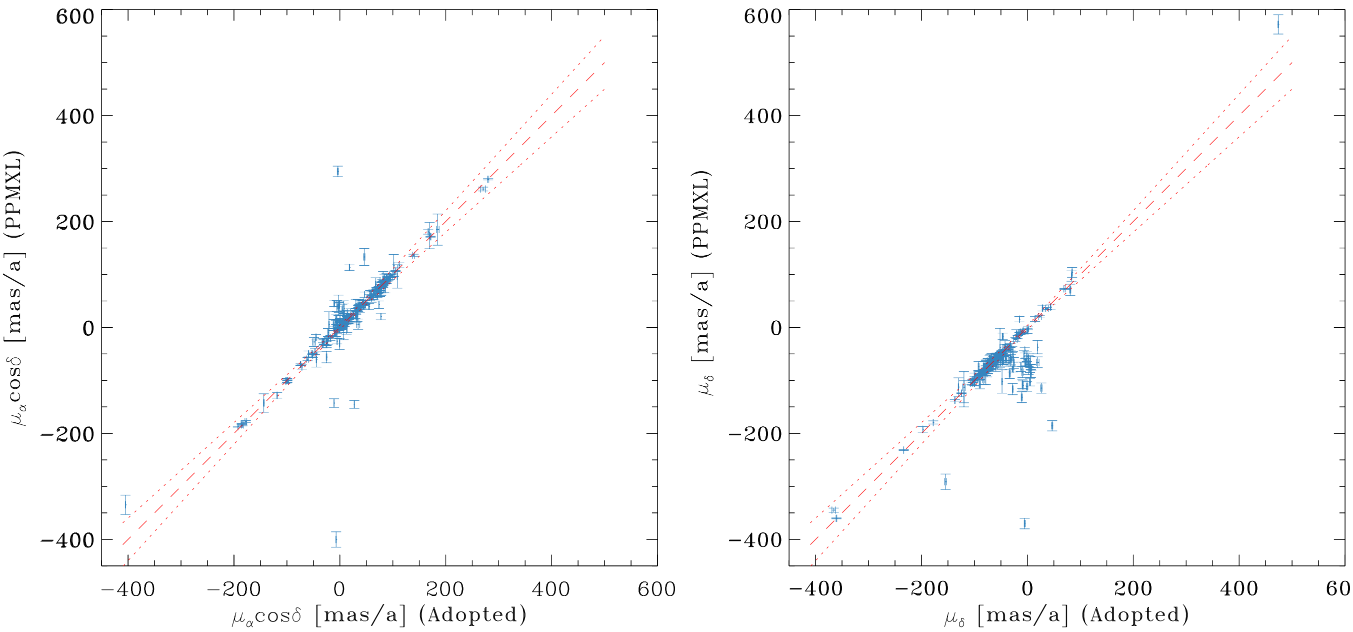

Fig. 2. PPMXL vs. adopted proper-motion diagrams in right ascension (*left panel*) and declination (*right panel*). The red dashed and dotted lines mark the one-to-one relationship and the 10% error area above and below it, respectively.

2.3. Astro-photometric follow-up

2.3.1. Astrometry

We performed a dedicated astro-photometric follow-up of the 110 companion candidates in two steps. In the first one, we confirmed true common proper motion of the pairs with a precise astrometric study. This step was necessary because PPMXL used the astro-photometric USNO-B1 catalogue as input, which is known to be affected by systematics at the fainter optical magnitudes, especially when dealing with high proper motion stars.

Of the 184 objects in Table A.3 (74 primaries and 110 companion candidates), 55 had reliable proper motions measured by Hipparcos (TYC, Høg et al. 2000; HIP2, van Leeuwen 2007). For the remaining 129 objects, we measured precise proper motions from public data in virtual observatory catalogues as in Caballero (2010, 2012). In particular, we used astrometric epochs from the following catalogues: AC2000.2 (Urban et al. 1998), USNO-A2 (Monet 1998), GSC2.3 (Lasker et al. 2008), DENIS (Epchtein et al. 1997), CMC14 and CMC15, 2MASS, SDSS, and WISE. To maximise the number of astrometric epochs, N, and time baseline, Δt, of the follow-up, which translates into reducing the uncertainty in proper motion, we also used the SuperCOSMOS digitisations of Palomar Observatory Sky Survey photographic plates, especially for the faintest objects (Hambly et al. 2001; cf., Caballero 2012). The addition of SuperCOSMOS data allowed us to get at least four accurate astrometric epochs spread over a minimum of 11.5 a for all targets except for one star (2MASS J05113065–2155189, $N = 3$). The average number of astrometric epochs and time baseline were five and 34 a, respectively. In the extreme case of TYC 4571–1414–1, we measured its proper motion with eight astrometric epochs spread over almost 115 a. Table A.3 lists the 2MASS coordinates of the 184 "primaries" and companion candidates, and their PPMXL and adopted proper motions. For the adopted proper motions that do not come from TYC or HIP2, Table A.3 also provides the time baseline and number of epochs used in our astrometric follow-up. Except for partially resolved close binaries (e.g., AT Mic AB) or faint sources ($r' \gtrsim 16$ mag), we were able to measure proper motions with typical uncertainties of 1 mas/a or less, which are comparable to or even better than TYC or HIP2.

We show a comparison of the original PPMXL proper motion values and the ones adopted by us in Fig. 2. While the values of proper motions in right ascension provided by PPMXL have in general good agreement with our adopted values, many PPMXL proper motions in declination have greater absolute values.

With the new data, we made a second, more precise, astrometric filtering and discarded 43 visual companions with adopted proper motions that deviate more than 10% from the proper motion of the system. This step of the follow-up thus left 67 physical companion candidates for the second step. In general, the astrometrically rejected objects are distant background stars with fake high proper motions in the PPMXL catalogue, which are located close to bright stars and were reported previously as companion candidates or which are located at large angular separations to our primary targets and have by chance similar, but not identical, proper motions. Of the rejected stars, four were catalogued companion candidates of c Eri, α Cir, CD–24 16238, and AF Psc, and one was a faint companion candidate to [SLS2012] PYC J10175+5542 (Schlieder et al. 2012a) that had been reported by W. J. Luyten (LDS 2851, WDS 10176+5542).

2.3.2. Photometry

In the second step of the follow-up, we studied the membership in the β Pictoris moving group of the 67 companion candidates that passed the previous astrometric filter with the help of colour-magnitude diagrams and theoretical isochrones.

First, we compiled B, V, r', J, H, K_s, and $W1$–4 magnitudes for all the sources investigated in this work. While infrared JHK_sW1–4 photometry came in all cases from 2MASS and WISE, the origin of the optical BVr' photometry was diverse. When available, we collected BVr' photometry from UCAC4 (Zacharias et al. 2013). If not available, we got it from a number

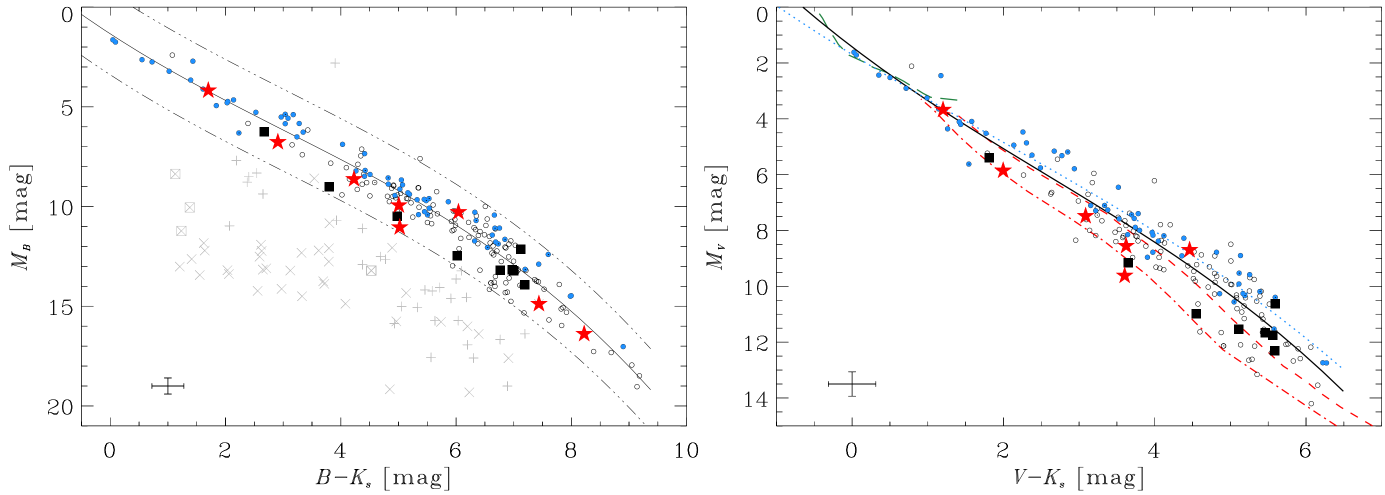

Fig. 3. Optical-to-near-infrared colour-magnitude diagrams of our β Pictoris stars and common proper-motion companion candidates. In both panels, blue filled circles mark bona fide moving group members with membership flag 1 in Table A.1 (see Sect. 2.1), and open circles indicate other member candidates with flags 2 and 3. Black filled squares denote companions previously known in the literature that had not been reported as belonging to β Pictoris. Red filled stars mark our eight new proper motion companions. Typical error bars are shown in the bottom left corner. The black solid line is the average β Pictoris sequence computed with all candidate members as in the left panel (flags 1, 2, and 3). *Left panel*: M_B vs. $B-K_s$ diagram. The dash-dotted lines are the β Pictoris sequence shifted by $\pm 3\sigma$. Grey times (×) and crosses (+) indicate discarded companion candidates from astrometry and photometry, respectively; squared symbols mark companion candidates in the WDS. *Right panel*: M_V vs. $V-K_s$ diagram. The blue dotted line is the sequence with only bona fide members (flag 1). Red dashed and dash-dotted lines are the 20 and 100 Ma isochrones from Baraffe et al. (2015). Green long dashed line is the 20 Ma isochrone from Siess et al. (2000) plotted only at highest masses. For clarity, we do not draw the discarded companion candidates. Some remarkable stars do not have V photometry.

of sources: Tycho-2 (B and V, after transformation from B_T and V_T magnitudes), USNO-B1 (B, after average of two photographic B_J magnitudes), AC2000.2 (only one star), SPM4 (Girard et al. 2011 – V, only one star), CMC 15 (r'), SDSS-DR9 (r'), or the literature (Voges et al. 1999; Bakos et al. 2002; Torres et al. 2006; Beichman et al. 2010; Smart 2013).

We were not able to compile optical BVr' photometry for all our targets. Since we were able to compile magnitudes for more stars in the B band, we applied our photometric filtering using the reddest near-infrared band, K_s, and the bluest optical one, B. Actually, we failed to find reliable B photometry for only six stars: five low-mass stars or brown-dwarf candidates with spectral types at the M/L boundary, of which four are from Gagné et al. (2014, 2015), one is the known companion of L 186–67 A (see below), and the sixth one is a star close to the bright primary V343 Nor A. The reddest and faintest object in our sample with B and K_s photometry is 2MASS J06085283-2753583 (M8.5 V, Luhman et al. 2009; $B-K_s = 9.1$ mag). The use of WISE photometry did not provide significant improvement over the use of 2MASS K_s.

We performed our photometric filtering in a recursive scheme:

- First we computed the B-band absolute magnitude M_B with the heliocentric distances in Table A.1 and built the M_B vs. $B-K_s$ diagram in left-hand panel of Fig. 3. Any new companion candidate would have to be located at the same distance as the target star.
- We defined an average β Pictoris sequence with all members and candidates in Table A.1 (flags 1, 2, and 3). All sources that did not pass the astrometric filter lie in the locus of background stars in the colour-magnitude diagram.
- We checked the reliability of our average sequence by comparing it with the latest evolutionary models by Baraffe et al. (2015). Since BT-Settl does not provide M_B magnitudes, we used M_V ones instead. We built the M_V vs. $V-K_s$ diagram in right-hand panel of Fig. 3 and plotted the corresponding BT-Settl 20 and 100 Ma isochrones. The acceptable match between our average M_V vs. $V-K_s$ sequence and the 20 Ma isochrone encouraged us to use our average M_B vs. $B-K_s$ sequence for the photometric filter.
- We discarded stars with absolute magnitudes M_B and colours $B-K_s$ inconsistent with the β Pictoris sequence. Most discarded stars lie outside the $\pm 3\sigma$ area around the sequence. The systematic error introduced by mixing different photometric systems for the blue magnitude seems to be smaller than the intrinsic scatter in the β Pictoris sequence, mostly due to uncertainties in distance.

Of the previous 67 stars, 31 did not pass the photometric filter. One known system, L 186–67 Aa, Ab, B, could not be studied photometrically because of the lack of reliable data in the optical, but the short angular separation between components and the large common proper motions ensured that it is a physical system.

3. Results and discussion

3.1. Known and new common proper motion pairs

From the initial list of 184 common proper motion companion candidates to β Pictoris stars in Sect. 2.2, only 36 targets passed the two filters of our astro-photometric follow-up in Sect. 2.3. Our final list of confirmed common-proper motion systems in the β Pictoris moving group, as shown in Table A.5, consists of

- Eighteen known systems in which the two stars had been reported previously to belong to the moving group. All of them except one are listed by WDS; the exception is the wide system formed by V4046 Sgr AB and V4046 Sgr C, which was proposed and investigated for the first time by Kastner et al. (2011). Some of the 17 WDS systems have been known for decades, such as five pairs in the W. J. Luyten's Double Star catalogue or the HD 14082 AB pair, which was resolved for the first time by F. G. W. Struve in 1821.

- Ten known systems in which only one star had been reported previously as belonging to the moving group. Of the ten stars that had not been reported as belonging to β Pictoris (i.e., not listed in Table A.1), four displayed significant X-ray emission in ROSAT observations (Voges et al. 1999; Riaz et al. 2006; Kaplan et al. 2006; Haakonsen & Rutledge 2009) and two showed intense Hα emission at the chromospheric/accretion boundary for their spectral types (pEW(Hα) ≈ –12 to –16 Å – Reid et al. 1995; Riaz et al. 2006). Since there is one star that is an Hα *and* X-ray emitter (2MASS J00193931+1951050), half of the ten new stars have known signposts of youth, which supports membership in β Pictoris. Besides this, another one has a similar radial velocity to the primary in the system (CD–44 753 A and B – Kordopatis et al. 2013). For the other four new young stars, there are only photometric data available (and, in the case of 2MASS J07293670+3554531, mass and spectral type derived from photometry – Pickles & Depagne 2010; Janson et al. 2012).
- Eight new common proper motion systems with β Pictoris stars. In reality, there are WDS entries for two β Pictoris pairs that were presented for the first time by Alonso-Floriano et al. (2011): EX Cet A, B (CAB 3) and HD 173167 A, B (CAB 8). Although the results from this preliminary publication have already been used by other authors (Shkolnik et al. 2012; Eisenbeiss et al. 2013; Bowler et al. 2015), we consider their discovery as part of this work. Moór et al. (2013) "rediscovered" the pair HD 173167 A, B, although they did not report ρ or θ. The optical spectra of these two stars and of TYC 112–917–1 and 2E 1249 AB in the new pair *WDS 05200+0613* display intense Li I λ6707.8 Å line in absorption for their spectral type (Alcalá et al. 2000; Torres et al. 2006), which supports their extremely young age. Six of these stars are reported here as new member candidates in the β Pictoris moving group.

On some occasions we use the term "pair" to refer to multiple systems that contain only two components resolvable from the ground with standard imaging (i.e., no adaptive optics or lucky imaging) and spectroscopic devices. Most of our systems are such pairs. However, Table A.5 lists 12 triple and two quadruple hierarchical systems that contain one or two close pairs unresolved by public catalogues (Table A.2). The two quadruple systems are MV Vir Aa, Ab, B, C and HD 199143 AB, CD (for which the close components were resolved first by Jayawardhana & Brandeker 2001). The latter has an "A. Tokovinin" WDS entry dated after 2011, but the wide multiplicity was previously reported by Alonso-Floriano et al. (2011) and, especially, Zuckerman et al. (2001b).

The existence of 14 triples and quadruples in a list of 36 multiples provides a high-order-multiple ratio of about 1:3, which is unexpectedly high. Law et al. (2010) found a similar ratio of about 1:2 for wide M-dwarf binaries of the field and suggest that some of the binaries with large separations are actually triple and quadruple systems. (Actually, Caballero 2007 and Burgasser et al. 2007 pointed it out before.) The increment of the high-order-multiple fraction for the widest systems is supported by the work of Reipurth & Mikkola (2012), who used N-body simulations of the dynamical evolution of triple systems to suggest that loosely bound triple systems might appear to be very wide binaries. However, recent dedicated surveys for multiplicity of F, G, K (Tokovinin et al. 2014b; Elliott et al. 2015) and M dwarfs in the field (Cortés-Contreras et al. 2014) have found lower ratios of about 1:10. Although our sample comprises a wide range of masses and separations, it is not large enough to do an appropriate comparison with the previously mentioned works. Another explanation might be an observational effect of a biased sample in which surveys for nearby young stars are naturally slanted towards detecting intrinsically bright binaries and multiple stars (Malmquist bias), and active spectroscopic binaries (very close separations enhances stellar activity). The discovery of new moving groups members only based on astrometry, as in this survey, may help to alleviate this observational bias.

In Table A.5 we list our WDS identifiers in italics if they are not included in the WDS catalogue at the time of writing these lines (i.e., V4046 Sgr AB,C and six of the eight new pairs). In total, in this survey we propose 16 new stellar members of the β Pictoris moving group: six in new pairs and ten in known systems with only one reported young star. One of the new β Pictoris stars in a new pair is HD 173167 A, which was discovered by Alonso-Floriano et al. (2011) and classified afterwards as a moving group member by Moór et al. (2013). These values represent an increase of 9% in the total number of reported β Pictoris stars and of almost 30% in the number of wide proper motion systems in the moving group. We ran the on-line BANYAN tool[1] (Malo et al. 2013) on the 16 new proposed members of β Pictoris and calculated approximate membership probabilities (Table 2). We used the distances of the systems provided in Table A.5, our proper motion measurements in Table A.3, and radial velocities from the literature (for those objects without radial velocity measurements, we assumed the values of their companions). Although only seven of the 16 pairs showed high-probability memberships to β Pictoris (see Table 2), these results should be used with caution because most of the new candidates lack accurate distances or radial velocities.

None of the new reported wide systems have parallax measurements for both components. However, the location of the 16 stars (eight primaries and eight secondaries) in the colour-magnitude diagrams suggests that both components are located at similar distances. Definitive parallactic confirmation of common distance will have to wait until early 2017 with the second *Gaia* release. In the meantime, we can infer the true physical binding of the systems with the computation of the reduced gravitational binding energy.

3.2. Projected separations and binding energies

In Table A.5 we list the angular separations, ρ, and position angles, θ, at the 2MASS epoch of observation of the 36 wide pairs in the β Pictoris moving group. Angular separations vary from 8.2 arcsec for BD–21 1074A, Ba, Bb to about 1.3 deg for the triple system AU Mic–AT Mic AB (Luyten 1941; Caballero 2009). Among our new pairs, ρ varies from 10.6 arcsec to 24.5 arcmin.

To distinguish between true very wide physical binaries and co-moving pairs of "single" stars that belong to the same kinematic group, we computed the reduced gravitational binding energies, $U_g^* = -G\mathcal{M}_1\mathcal{M}_2 s^{-1}$ (Caballero 2009), of the 36 systems. With the angular separations and distances, we obtained the projected physical separations, s, which vary from merely 100–120 au for the known pairs WDS 08228–5727 (L 186–67 Aa, Ab, B) and WDS 10596+2527 (HD 95174 AB) to about 7×10^4 au (0.34 pc) for the new pair WDS 08290+1125. Given the uncertainties in the distance (Table A.1), we provide only two significant figures for s.

[1] http://www.astro.umontreal.ca/~malo/banyan.php

Table 2. Membership probabilities for the 16 new β Pictoris candidates using the BANYAN on-line tool.

Simbad name	β Pic prob. [%]	Highest prob. [%]	V_r [km s^{-1}]	Reference of V_r
2MASS J00193931+1951050	83.9	β Pic	-1.7 ± 1.0^P	Schlieder et al. (2012a)
EX Cet	99.9	β Pic	$+41.8 \pm 0.7$	Soubiran et al. (2013)
CD–44 753 B	0.1	Tuc-Hor (99.4)	$+12.4 \pm 1.9$	Kordopatis et al. (2013)
2MASS J07293670+3554531	23.4	Field (50.8)	$+10.4 \pm 0.9^P$	Schlieder et al. (2012a)
L 186–67 B	0.0	Field (100)	$+40 \pm 9^P$	Kordopatis et al. (2013)
2MASS J08274412+1122029	16.0	Field (84.0)	$+11.2 \pm 1.7^P$	Schlieder et al. (2012a)
HD 82939 A	1.1	Field (98.9)	-0.5 ± 0.4	Gontcharov (2006)
2MASS J12120849+1248050	0.0	Field (99.9)	-4.0 ± 1.0^P	Schlieder et al. (2012a)
MV Vir C	0.0	AB Dor (86.0)	$+0.0 \pm 0.8^P$	Malo et al. (2014a)
2MASS J16170673+7734028	0.0	Field (100)	-14.4 ± 1.0^P	Schlieder et al. (2012a)
2MASS J18420483–5554126	99.9	β Pic	$+1.0 \pm 0.7^P$	Malo et al. (2013)
HD 173167 A	99.9	β Pic	$+0.8 \pm 7.0$	Moór et al. 2013
HDE 331149 B	95.3	β Pic	-19.2 ± 1.1^P	Schlieder et al. (2012a)
BPS CS 22898–0066	0.0	Field (100)	$+0.6 \pm 3.0$	Kordopatis et al. (2013)
2MASS J21551738–0046231	75.2	β Pic	...	...
2MASS J23301129–0237227	91.2	β Pic	-5.3 ± 0.2^P	Malo et al. (2014b)

Notes. $^{(P)}$ Radial velocity adopted from the primary component.

We derived masses $\mathcal{M}_1$ and $\mathcal{M}_2$ from J-band absolute magnitudes M_J and the Baraffe et al. (2015) or Siess et al. (2000) evolutionary models at 20 Ma for solar metallicity and the appropriate mass intervals. When available, we gathered masses of single early type stars and close binaries from the literature (e.g., Strassmeier & Rice 2000; Neuhäuser et al. 2002; Caballero 2009; Donati et al. 2011; Janson et al. 2012; Elliott et al. 2015; Montet et al. 2015) or suitable information that allowed us to make a precise derivation (e.g., magnitude differences from adaptive optics or lucky imaging, mass ratios from spectroscopic monitoring – Chauvin et al. 2010; Neuhäuser et al. 2011; Janson et al. 2012; Messina et al. 2014; Bowler et al. 2015; Elliott et al. 2015). Masses range approximately from 2.4 $M_\odot$ for η Tel A to well below the substellar boundary for L 186–67 B with a broad maximum of the distribution at 0.5–1.0 $M_\odot$. Derived masses reasonably match those expected from spectral types, when available. For the sake of completeness, we also list spectral types compiled from a number of sources in Table A.5 (Riaz et al. 2006; Reid et al. 2007; Pickles & Depagne 2010; Caballero 2012; Janson et al. 2012; Kraus et al. 2014; Messina et al. 2014; Rodríguez et al. 2014; Mason et al. 2015; I. Gallardo & M. Gómez Garrido, priv. comm.; SIMBAD).

The greatest absolute value of reduced binding energy among the 36 systems in Table A.5, of $-U_g^* = 9800 \times 10^{33}$ J, corresponds to the strongly bound pair HD 95174 AB, which is not only the tightest one, but also contains two stars of $\sim$0.8 $M_\odot$. On the other hand, there are two very fragile system candidates with binding energies of 0.57–2.7 10^{33} J, almost one order of magnitude lower than that of the Luyten's system AU Mic+AT Mic AB, which lies at the boundary between very wide binaries and couples of single stars that are co-moving within the same stellar kinematic group (Caballero 2010; see the title of this series of papers). As a result, it is likely that the components in the two new fragile system candidates *WDS 08290+1125* and *WDS 23317–0245*, which includes the flaring star AF Psc (Bond 1976; Kraus et al. 2014; Ramsay & Doyle 2014), originated in the same parental cloud and were ejected at the same time, in the same direction, and at the same velocity, but they are not physically bound. The six other new pairs have binding energies between 13 and 1400 $\times 10^{33}$ J and may survive the eventual disruption by the Galactic gravitational potential for some billion years (Weinberg et al. 1987; Close et al. 2007). In any case, detecting features of youth in the spectra of *WDS 08290+1125* A and B and the wide M6.0 V companion candidate to AF Psc (Reid et al. 2007) would shed light on their actual membership in the β Pictoris moving group.

3.3. Benchmark objects and probable members in other young moving groups

The 36 wide systems tabulated by us can help to constrain the actual membership of some controversial candidate members in β Pictoris:

- WDS 01367–0645. Some authors have also classified the primary of the system, EX Cet (G5 V), as a member of the Hercules-Lyra association ($\sim$100–200 Ma – Montes et al. 2001; López-Santiago et al. 2006; Shkolnik et al. 2012; Eisenbeiss et al. 2013).
- WDS 02305–4342. The primary CD–44 753 A is also a member candidate of the Columba association ($\sim$15–50 Ma – Torres et al. 2006, 2008; Elliott et al. 2014; Malo et al. 2014a).
- WDS 08228–5727. The membership of the primary L 186–67 Aa, Ab to β Pictoris is ambiguous (Malo et al. 2013, 2014a). The late-M common proper motion companion, L 186–67 B, whose physical binding in the system had been confirmed earlier (Bakos et al. 2002; Bergfors et al. 2010; Janson et al. 2012, 2014), would have a mass close to the deuterium-burning mass limit if it were 20 Ma old. If membership in β Pictoris were confirmed, the triple system would be a benchmark for very low-mass substellar astrophysics.
- WDS 09361+3733. While there are no membership studies for the primary, the homonymous secondary HD 82939 Ba,Bb was listed not only as a β Pictoris star by Schlieder et al. (2012a,b), but also as a young field star by Malo et al. (2014b).
- *WDS 16172+7734*. Schlieder et al. (2012a) listed the primary TYC 4571–1414–1 as a probable member of both β Pictoris and AB Doradus ($\sim$70 Ma) moving groups.

- WDS 21214–6655. The primary star V390 Pav A has also been classified as a member of the Tucana-Horologium association (∼30 Ma – Zuckerman et al. 2001a; Mamajek et al. 2004; Rojas et al. 2008).

If the six systems above were eventually discarded as true β Pictoris "pairs", 30 systems would still remain for further investigation in the young moving group, of which six (20%) are reported here for the first time.

Certain systems in Table A.5 are also particularly important in the low-mass domain, because they can be used to test evolutionary models. Just to cite one example, the secondary of the pairs *WDS 16172+7734* (presented here for the first time) and WDS 21105–2711 (Bergfors et al. 2010; Malo et al. 2013, 2014b) lie close to the substellar limit and, therefore, to the lithium depletion boundary. As a result, a high-resolution spectroscopic analysis of both primaries and secondaries could shed more light on the debated age of β Pictoris.

4. Conclusions

We searched through 35 previous publications and compiled an exhaustive list of 185 members and member candidates in the nearby, young (∼20 Ma) β Pictoris moving group, around which we looked for common proper-motion companions at projected physical separations of up to 10^5 au. For that, we made extensive use of the Aladin and STILTS virtual observatory tools and numerous public all-sky catalogues (e.g., WDS, PPMXL, 2MASS).

Of the 184 initial common proper-motion companion candidates, 129 were the subject of a precise astrometric follow-up, by which we measured proper motions with typical uncertainties of only 1 mas/a, and 67 of a multi-band photometric study. Eventually, we discarded five previously reported pairs and retained 36 reliable pair candidates. Of them, 18 and 10 are known systems with both components or only one component classified as β Pictoris members, respectively, and eight are new pairs in the moving group. We also report 16 new star and brown dwarf candidates in β Pictoris for the first time. These values represent an increase of 9% in the total number of reported objects in the moving group and of almost 30% in the number of wide proper motion systems.

We investigated the 36 pairs with available public information in detail. Among them, there are 12 triple and two quadruple systems, which points out to a greater incidence of high-order multiplicity in β Pictoris than in the field, possibly ascribed to a member list biased towards close binaries or an increment of the high-order, multiple fraction for very wide systems.

We measured angular separations and projected physical separations, compiled or derived masses for components in all systems, and computed reduced gravitational binding energies. Two of the new pair candidates could be unbound couples of single stars that are co-moving within β Pictoris, while at least one of the components in six (new and known) pairs have also been reported to belong to other young moving groups and associations (four in Hercules-Lyra, Columba, AB Doradus, Tucana-Horologium) or to the field (two). There are three pairs (one presented here) with masses of secondaries at or below the hydrogen-burning limit, and they can be used as benchmarks for upcoming age-dating works in β Pictoris. Our study provides a comprehensive analysis of the wide multiplicity in one of the closest and youngest moving groups known and, therefore, also serves as input to models of moving-group evolution and eventual dissipation by the Galactic gravitational field.

Acknowledgements. We thank the anonymous referee for the report. This research made use of the Washington Double Star Catalogue, maintained at the US Naval Observatory, the SIMBAD database and VizieR catalogue access tool, operated at Centre de Données astronomiques de Strasbourg, France, and the Spanish Virtual Observatory (http://svo.cab.inta-csic.es). Financial support was provided by the Universidad Complutense de Madrid, the Comunidad Autónoma de Madrid, and the Spanish Ministerios de Ciencia e Innovación and of Economía y Competitividad under grants AP2009-0187, AYA2011-24052, and AYA2011-30147-C03-02, and -03.

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Appendix A: Long tables

Table A.1. Investigated β Pictoris members and member candidates.

Simbad name	α (J2000)	δ (J2000)	d [pc]	Reference for distance	Memb. flag
HD 203	00:06:50.08	–23:06:27.2	39.39 ± 0.59	van Leeuwen (2007)	1
RBS 38	00:17:23.54	–66:45:12.5	39.0 ± 2.6	Riedel et al. (2014)	2
RX J0019.7+1951	00:19:43.04	+19:51:11.7	59.4 ± 7.9	Schlieder et al. (2012a)	2
FK Psc	00:23:34.68	+20:14:28.3	53 ± 4	Malo et al. (2014b)	2
1RXS J002700.0+663025	00:27:02.83	+66:30:39.0	56.9 ± 8.3	Schlieder et al. (2012a)	3
GJ 2006 A	00:27:50.23	–32:33:06.4	33.2 ± 2.8	Riedel et al. (2014)	1
GJ 2006 B	00:27:50.35	–32:33:23.9	31.5 ± 2.4	Riedel et al. (2014)	1
LP 525–39 AB	00:32:34.81	+07:29:27.1	41.1 ± 4.4	Schlieder et al. (2012b)	2
EROS–MP J0032–4405	00:32:55.84	–44:05:05.8	26.1 ± 2.0	Gagné et al. (2014)	2
2MASS J00464841+0715177	00:46:48.41	+07:15:17.7	$33.8^{+2.8}_{-3.2}$	Gagné et al. (2015)	2
TYC 2288–758–1	00:48:28.65	+36:32:34.5	61.4 ± 8.4	Schlieder et al. (2012a)	2
RX J0102.8+1857	01:02:50.99	+18:56:54.2	40.9 ± 4.4	Schlieder et al. (2012a)	2
TYC 5853–1318–1 AB	01:07:11.93	–19:35:36.2	54	McCarthy & White (2012)	2
LP 467–16 AB	01:11:25.42	+15:26:21.5	21.8 ± 0.8	Riedel et al. (2014)	1
2E 327 AB	01:13:28.17	–38:21:02.5	29 ± 2	Malo et al. (2014a)	2
2MASS J01294256–0823580	01:29:42.56	–08:23:58.0	32.5 ± 3.2	Gagné et al. (2015)	2
1RXS J013514.2-071254	01:35:13.93	–07:12:51.8	37.9 ± 2.4	Shkolnik et al. (2012)	2
LP 648–20 (EX Cet B)	01:36:55.17	–06:47:37.9	24.0 ± 0.4	Malo et al. (2014b)	3
BD+17 232AB	01:37:39.39	+18:35:32.7	52.6	McCarthy & White (2012)	3
1RXS J015255.9–632939	01:52:55.34	–63:29:30.1	23.7 ± 2.4	Gagné et al. (2014)	2
RBS 253 AB	01:53:50.77	–14:59:50.3	28 ± 2	Malo et al. (2014a)	2
[SLS2012] PYC J02017+0117N	02:01:46.77	+01:17:16.2	63.7 ± 9.0	Schlieder et al. (2012a)	2
[SLS2012] PYC J02017+0117S	02:01:46.93	+01:17:06.0	63.7 ± 9.0	Schlieder et al. (2012a)	2
HD 14082 B	02:17:24.73	+28:44:30.5	27.34 ± 4.26	van Leeuwen (2007)	1
HD 14082 A	02:17:25.27	+28:44:42.3	34.52 ± 3.43	van Leeuwen (2007)	1
RX J0217.9+1225	02:17:56.01	+12:25:26.6	67.9 ± 6.1	Binks & Jeffries (2013)	2
[SLS2012] PYC J02226+3055	02:22:40.83	+30:55:16.0	46.8 ± 5.1	Schlieder et al. (2012a)	2
LP 353–51	02:23:26.63	+22:44:06.9	28.7 ± 2.3	van Leeuwen (2007)	1
HD 15115	02:26:16.25	+06:17:33.1	45.23 ± 1.31	van Leeuwen (2007)	1
AG Tri B	02:27:28.05	+30:58:40.5	39.95 ± 3.59	van Leeuwen (2007)	1
AG Tri A	02:27:29.25	+30:58:24.7	39.95 ± 3.59	van Leeuwen (2007)	1
CD–44 753 Aa,Ab	02:30:32.41	–43:42:23.3	35.7	McCarthy & White (2012)	3
EXO 0235.2–5216	02:36:51.71	–52:03:03.7	28.7	Elliott et al. (2014)	3
BD+05 378 AB	02:41:25.89	+05:59:18.2	42.03 ± 2.65	van Leeuwen (2007)	1
TVLM 831–154910	02:50:11.67	–01:51:29.5	33.1 ± 4.9	Gagné et al. (2015)	2
DENIS J025344.4–795913	02:53:44.49	–79:59:13.3	$28.9^{+2.8}_{-3.2}$	Gagné et al. (2015)	2
TYC 1231–151–1	03:10:32.74	+21:31:44.3	63.6 ± 8.7	Schlieder et al. (2012a)	2
1RXS J031052.7+183855	03:10:53.57	+18:38:38.5	67.5 ± 9.9	Schlieder et al. (2012a)	2
RX J0332.6+2843 ABC	03:32:35.79	+28:43:55.5	55 ± 4	Malo et al. (2014b)	2
2MASS J03350208+2342356	03:35:02.09	+23:42:35.6	42.4 ± 2.3	Shkolnik et al. (2012)	1
1RXS J033936.7+453126	03:39:37.01	+45:31:16.0	59.6 ± 7.3	Schlieder et al. (2012a)	2
2MASS J03445673–1145126	03:44:56.73	–11:45:12.6	$31.3^{+4.0}_{-4.4}$	Gagné et al. (2015)	2
HD 232862 AB	03:57:19.99	+50:51:18.6	51.7 ± 5.7	Schlieder et al. (2012a)	2
1RXS J041137.6+250413	04:11:36.38	+25:04:41.8	64.2 ± 9.0	Schlieder et al. (2012a)	2
c Eri A	04:37:36.13	–02:28:24.8	29.43 ± 0.29	van Leeuwen (2007)	1
c Eri Ca,Cb	04:37:37.47	–02:29:28.4	29.43 ± 0.29	van Leeuwen (2007)	1
2MUCD 10320	04:43:37.61	+00:02:05.2	$25.7^{+3.2}_{-2.4}$	Gagné et al. (2014)	2
V962 Per	04:43:56.87	+37:23:03.3	59 ± 5	Malo et al. (2014b)	2
LDS 5606 A	04:48:00.86	+14:39:58.1	65 ± 6	Rodríguez et al. (2014)	2
LDS 5606 B	04:48:02.58	+14:39:51.6	65 ± 6	Rodríguez et al. (2014)	2
V1005 Ori	04:59:34.83	+01:47:00.7	25.9 ± 1.7	van Leeuwen (2007)	1
CD–57 1054	05:00:47.15	–57:15:25.6	26.78 ± 0.81	van Leeuwen (2007)	1
V1841 Ori	05:00:49.29	+15:27:00.7	53.8 ± 7.5	Schlieder et al. (2012a)	2
1RXS J050156.7+010845	05:01:56.66	+01:08:42.9	27.0 ± 3.2	Schlieder et al. (2012b)	2
LP 476–207 ABC	05:01:58.81	+09:58:58.8	24.6 ± 1.3	Riedel et al. (2014)	1
TYC 693–948–1	05:02:47.84	+12:22:56.4	66.8 ± 11.9	Schlieder et al. (2012a)	2
RX J0506.2+0439	05:06:12.93	+04:39:27.2	41.8 ± 6.0	Schlieder et al. (2012a)	2
BD–21 1074Ba,Bb	05:06:49.47	–21:35:03.8	19.2 ± 0.5	Riedel et al. (2014)	1
BD–21 1074A	05:06:49.92	–21:35:09.2	18.3 ± 0.7	Riedel et al. (2014)	1
1RXS J050712.4+143024	05:07:11.37	+14:30:01.4	51.2 ± 7.0	Schlieder et al. (2012a)	2
1RXS J050827.3-210130	05:08:27.29	–21:01:44.4	25 ± 5	Malo et al. (2014b)	2
1RXS J051954.1+315944	05:19:53.18	+31:59:33.9	48.4 ± 5.2	Schlieder et al. (2012a)	2

Table A.1. continued.

Simbad name	α (J2000)	δ (J2000)	d [pc]	Reference for distance	Memb. flag
TYC 112–917–1	05:20:00.29	+06:13:03.6	68.5	Elliott et al. (2014)	2
2E 1249 AB	05:20:31.83	+06:16:11.5	69.7	Elliott et al. (2014)	2
CD–39 1935	05:22:45.69	–39:17:06.1	33 ± 6	Malo et al. (2013)	2
1RXS J052419.1–160117 AB	05:24:19.14	–16:01:15.3	20 ± 5	Malo et al. (2014b)	2
AF Lep AB	05:27:04.77	–11:54:03.3	27.04 ± 0.35	van Leeuwen (2007)	1
2E 1287	05:29:44.68	–32:39:14.2	26.18 ± 1.10	Riedel et al. (2014)	2
V1311 Ori AB	05:32:04.50	–03:05:29.2	42 ± 6	Malo et al. (2013)	1
RBS 661	05:33:28.03	–42:57:20.5	16 ± 4	Malo et al. (2013)	2
RX J0534.0–0221	05:33:59.81	–02:21:32.5	42 ± 5	Malo et al. (2014b)	2
1RXS J054223.7–275803	05:42:23.87	–27:58:03.1	44 ± 9	Malo et al. (2013)	2
β Pic	05:47:17.08	–51:03:59.5	19.44 ± 0.04	van Leeuwen (2007)	1
2MASS J06085283–2753583	06:08:52.83	–27:53:58.3	31.269± 3.55	Faherty et al. (2012)	2
1RXS J061313.2–274205 AB	06:13:13.30	–27:42:05.4	29.4 ± 0.9	Riedel et al. (2014)	1
TYC 6513–1245–1	06:13:57.75	–27:23:55.3	51 ± 8	Malo et al. (2013)	2
1RXS J061610.6–132046 AB	06:16:10.33	–13:20:42.3	47 ± 7	Malo et al. (2013)	2
AO Men	06:18:28.24	–72:02:41.6	38.55 ± 0.13	van Leeuwen (2007)	1
1RXS J065940.5+054541	06:59:41.57	+05:45:40.0	44.3 ± 6.5	Schlieder et al. (2012a)	2
LP 58–170	07:23:29.41	+66:46:44.3	139.28 ± 42.48	van Leeuwen (2007)	2
1RXS J072643.1+185026	07:26:41.54	+18:50:34.7	57.7 ± 8.1	Schlieder et al. (2012a)	2
1RXS J072931.4+355607 AB	07:29:31.09	+35:56:00.4	42.2 ± 4.0	Schlieder et al. (2012b)	2
YZ CMi AB	07:44:40.17	+03:33:08.8	5.96 ± 0.08	van Leeuwen (2007)	2
2MASS J08025781–830076	08:02:57.81	–83:30:07.6	$20.5^{+2.4}_{-2.0}$	Gagné et al. (2015)	2
EUVE J0817–82.7 AB	08:17:39.44	–82:43:29.8	27 ± 2	Malo et al. (2014a)	2
L 186–67 Aa,Ab	08:22:47.45	–57:26:53.0	11.1 ± 3.3	Lépine & Gaidos (2011)	3
2MASS J08224748+0757171	08:22:47.49	+07:57:17.2	62.4 ± 9.8	Schlieder et al. (2012b)	2
[SLS2012] PYC J08290+1125	08:29:04.12	+11:25:05.4	58.8 ± 8.5	Schlieder et al. (2012a)	2
HD 73018 AB	08:37:39.24	+41:48:02.3	51.9 ± 5.7	Schlieder et al. (2012a)	2
[SLS2012] PYC J09226+7122S	09:22:37.64	+71:22:07.3	65.9 ± 9.6	Schlieder et al. (2012a)	2
HD 82939 Ba,Bb	09:36:15.91	+37:31:45.5	33.75 ± 2.61	van Leeuwen (2007)	3
RX J1002.0+6651	10:01:59.95	+66:51:27.7	38.7 ± 4.0	Schlieder et al. (2012b)	3
DK Leo AB	10:14:19.18	+21:04:29.5	23.08 ± 0.96	van Leeuwen (2007)	2
TWA 22 Aa,Ab	10:17:26.89	–53:54:26.5	17.5 ± 0.2	Malo et al. (2014b)	1
[SLS2012] PYCJ10175+5542	10:17:31.43	+55:42:29.4	63.0 ± 8.3	Schlieder et al. (2012a)	2
RX J1035.9+2853	10:35:57.25	+28:53:31.7	37.8 ± 3.9	Schlieder et al. (2012b)	2
HD 95174 A	10:59:38.31	+25:26:15.5	22.6 ± 2.0	Schlieder et al. (2012b)	2
HD 95174 B	10:59:38.68	+25:26:13.7	22.6 ± 2.0	Schlieder et al. (2012b)	2
[SLS2012] PYC J11167+3814	11:16:46.09	+38:14:13.6	67.6 ± 9.6	Schlieder et al. (2012a)	2
RBS 1043 Aa,Ab,B	11:51:56.81	+07:31:26.3	33.2 ± 2.7	Schlieder et al. (2012a)	2
2E 2613	12:11:53.09	+12:49:13.5	62.7 ± 8.2	Schlieder et al. (2012a)	2
1RXS J135452.3–712157	13:54:53.90	–71:21:47.7	21 ± 1	Malo et al. (2014a)	3
TYC 4634–1184–1	14:12:49.93	+84:01:31.2	57.9 ± 9.7	Schlieder et al. (2012a)	2
MV Vir Aa,Ab,B	14:14:21.36	–15:21:21.7	30.2 ± 4.5	van Leeuwen (2007)	2
SCR J1425–4113 AB	14:25:29.13	–41:13:32.4	66.9 ± 4.3	Riedel et al. (2014)	3
StKM 1–1155	14:25:55.93	+14:12:10.1	51.8 ± 7.3	Schlieder et al. (2012a)	2
α Cir AB	14:42:30.42	–64:58:30.5	16.57 ± 0.03	van Leeuwen (2007)	3
V343 Nor B	15:38:56.79	–57:42:19.0	38.54 ± 1.69	van Leeuwen (2007)	1
V343 Nor A	15:38:57.57	–57:42:27.3	38.54 ± 1.69	van Leeuwen (2007)	1
TYC 4571–1414–1	16:17:11.48	+77:33:47.8	65.0 ± 13.5	Schlieder et al. (2012a)	3
d Sco	16:18:17.90	–28:36:50.5	41.29 ± 0.38	van Leeuwen (2007)	1
1RXS J164302.3–175418	16:43:01.28	–17:54:27.4	59.2 ± 2.8	Binks & Jeffries (2013)	2
1RXS J165719.9–534328	16:57:20.30	–53:43:31.7	51 ± 3	Malo et al. (2014a)	2
1RXS J171502.4–333344	17:15:02.20	–33:33:39.8	23 ± 1	Malo et al. (2014a)	2
CD–27 11535 Aa,Ab,B	17:15:03.61	–27:49:39.7	84.1	Elliott et al. (2014)	2
V824 Ara Aa,Ab	17:17:25.51	–66:57:03.9	31.45 ± 4.94	van Leeuwen (2007)	1
V824 Ara B	17:17:31.29	–66:57:05.6	31.45 ± 4.94	van Leeuwen (2007)	1
1RXS J172919.1–501454 AB	17:29:20.67	–50:14:52.9	64 ± 5	Malo et al. (2014a)	1
CD–54 7336	17:29:55.07	–54:15:48.8	66	McCarthy & White (2012)	1
HD 160305	17:41:49.03	–50:43:27.9	72.46 ± 4.57	van Leeuwen (2007)	1
HD 161460 AB	17:48:33.74	–53:06:43.3	69.8	Elliott et al. (2014)	1
HD 164249 AB	18:03:03.41	–51:38:56.4	48.15 ± 1.30	van Leeuwen (2007)	1
HD 165189 AB	18:06:49.90	–43:25:30.8	41.84 ± 1.16	van Leeuwen (2007)	1
V4046 Sgr AB	18:14:10.48	–32:47:34.4	73 ± 18	Kastner et al. (2011)	1
V4046 Sgr C	18:14:22.07	–32:46:10.1	73 ± 18	Kastner et al. (2011)	1
1RXS J181514.7–492755	18:15:15.64	–49:27:47.2	61 ± 4	Malo et al. (2014a)	2
HD 168210	18:19:52.21	–29:16:32.8	72.57 ± 5.37	van Leeuwen (2007)	1

Table A.1. continued.

Simbad name	α (J2000)	δ (J2000)	d [pc]	Reference for distance	Memb. flag
FK Ser AB	18:20:22.75	–10:11:13.6	75.93 ± 22.00	van Leeuwen (2007)	3
1RXS J184206.5–555426	18:42:06.95	–55:54:25.5	54 ± 4	Malo et al. (2014a)	2
HD 172555 A	18:45:26.91	–64:52:16.5	28.55 ± 0.16	van Leeuwen (2007)	1
HD 172555 Ba,Bb	18:45:37.05	–64:51:46.1	29.24 ± 0.60	van Leeuwen (2007)	1
Smethells 20 (HD 173167 B)	18:46:52.56	–62:10:36.7	54 ± 3	Malo et al. (2014a)	1
HD 173167 A	18:48:06.36	–62:13:47.0	52	Holmberg et al (2009)	2
1RXS J184956.1-013402	18:49:55.44	–01:34:08.7	23 ± 6	Malo et al. (2014b)	3
CD–31 16041	18:50:44.48	–31:47:47.2	53 ± 3	Malo et al. (2014a)	1
PZ Tel Aa,Ab	18:53:05.87	–50:10:50.0	51.49 ± 2.60	van Leeuwen (2007)	1
TYC 6872–1011–1	18:58:04.15	–29:53:04.6	76 ± 5	Malo et al. (2014b)	1
2MASS J18580464–2953320	18:58:04.66	–29:53:32.2	76 ± 5	Malo et al. (2014b)	1
1RXS J191028.6-231934	19:10:28.20	–23:19:48.6	67 ± 5	Malo et al. (2014b)	2
CD–26 13904 AB	19:11:44.68	–26:04:08.5	80	McCarthy & White (2012)	1
η Tel AB	19:22:51.22	–54:25:26.3	48.22 ± 0.49	van Leeuwen (2007)	1
η Tel C	19:22:58.95	–54:32:17.1	51.81 ± 1.74	van Leeuwen (2007)	1
1RXS J192338.2–460631	19:23:38.20	–46:06:31.6	70 ± 4	Malo et al. (2014b)	2
RX J1924.5-3442	19:24:34.95	–34:42:39.3	54 ± 3	Malo et al. (2014a)	2
2MASS J19395435–5216468	19:39:54.35	–52:16:46.8	$28.9^{+2.8}_{-2.4}$	Gagné et al. (2015)	2
HDE 331149 A	19:43:37.90	+32:25:12.5	37.6 ± 8.3	Schlieder et al. (2012a)	2
2MASS J19444417–4359015	19:44:44.17	–43:59:01.5	28.1 ± 2.4	Gagné et al. (2015)	2
1RXS J195602.8–320720 AB	19:56:02.94	–32:07:18.7	55 ± 4	Malo et al. (2014a)	1
TYC 7443–1102–1	19:56:04.38	–32:07:37.6	55 ± 3	Malo et al. (2014a)	1
2MASS J20004841–7523070	20:00:48.42	–75:23:07.0	$33.3^{+3.2}_{-2.8}$	Gagné et al. (2014)	2
1RXS J200136.9–331307	20:01:37.18	–33:13:14.0	61 ± 4	Malo et al. (2014a)	2
HD 191089	20:09:05.22	–26:13:26.5	52.22 ± 1.23	van Leeuwen (2007)	1
1RXS J201001.0–280139 AB	20:10:00.02	–28:01:41.0	48.0 ± 3.1	Riedel et al. (2014)	1
SCR J2033-4903	20:33:01.86	–49:03:10.5	16.3 ± 5.0	Gagné et al. (2015)	2
1RXS J203336.9–255654	20:33:37.59	–25:56:52.1	48.3 ± 3.3	Riedel et al. (2014)	1
2MASS J20334670–3733443	20:33:46.70	–37:33:44.3	33.8 ± 2.8	Gagné et al. (2015)	2
AU Mic BC (AT Mic AB)	20:41:51.12	–32:26:07.3	10.70 ± 0.42	van Leeuwen (2007)	1
StHA 182 AB	20:43:41.14	–24:33:53.4	28.1 ± 3.9	Shkolnik et al. (2012)	2
AU Mic	20:45:09.49	–31:20:26.7	9.91 ± 0.10	van Leeuwen (2007)	1
2MASS J20513567+1924020	20:51:35.68	+19:24:02.0	51.0 ± 8.0	Schlieder et al. (2012a)	2
HD 199143 AB	20:55:47.68	–17:06:51.0	45.66 ± 1.60	van Leeuwen (2007)	1
HD 199143 CD (AZ Cap AB)	20:56:02.75	–17:10:53.9	45.66 ± 1.60	van Leeuwen (2007)	1
1RXS J210736.5–130500	21:07:36.79	–13:04:58.2	36 ± 2	Malo et al. (2013)	3
EUVE J2110–19.3	21:10:05.36	–19:19:57.4	32 ± 2	Malo et al. (2014b)	2
2MASS J21103096–2710513	21:10:30.96	–27:10:51.3	40 ± 2	Malo et al. (2013)	2
2MASS J21103147–2710578	21:10:31.48	–27:10:57.8	41 ± 3	Malo et al. (2014b)	2
2MASS J21140802–2251358	21:14:08.03	–22:51:35.8	22.1 ± 1.6	Gagné et al. (2014)	2
StKM 1–1877	21:18:33.76	+30:14:34.6	50.5 ± 8.0	Schlieder et al. (2012b)	2
V390 Pav A	21:21:24.49	–66:54:57.4	30.2 ± 1.3	van Leeuwen (2007)	3
V390 Pav B	21:21:28.72	–66:55:06.3	30.2 ± 1.3	van Leeuwen (2007)	3
2E 4498 AB	21:37:40.19	+01:37:13.7	39.2 ± 4.0	Schlieder et al. (2012b)	2
1RXS J214127.5+204302	21:41:26.62	+20:43:10.7	57.2 ± 8.5	Schlieder et al. (2012a)	2
1RXS J215518.2–004603	21:55:17.41	–00:45:47.8	47 ± 4	Malo et al. (2013)	2
RX J2155.3+5938 AB	21:55:24.36	+59:38:37.1	29.9 ± 4.1	Schlieder et al. (2012a)	2
RX J2200.7+2715	22:00:41.58	+27:15:13.5	44 ± 4	Malo et al. (2013)	1
LSPM J2240+0532	22:40:01.45	+05:32:16.3	23.6 ± 2.7	Gagné et al. (2015)	2
CPD–72 2713	22:42:48.96	–71:42:21.1	37 ± 2	Malo et al. (2014a)	1
WW PsA A	22:44:57.94	–33:15:01.6	23.34 ± 1.97	van Leeuwen (2007)	1
WW PsA B (TX PsA)	22:45:00.05	–33:15:25.8	23.34 ± 1.97	van Leeuwen (2007)	1
1RXS J225710.4+363950	22:57:11.31	+36:39:45.2	68.7 ± 11.4	Schlieder et al. (2012b)	2
LP 462–19 AB	23:17:28.07	+19:36:46.9	12 ± 1	Malo et al. (2013)	2
AF Psc	23:31:44.93	–02:44:39.6	29.15 ± 2.64	van Altena et al. (1995)	3
BD–13 6424	23:32:30.85	–12:15:51.3	28 ± 1	Malo et al. (2014a)	1
2E 4766	23:50:06.39	+26:59:51.9	24 ± 2	Malo et al. (2014a)	3
G 68–46	23:51:22.28	+23:44:20.8	16 ± 1	Malo et al. (2014a)	3

Table A.2. Unresolved or unidentified systems.

Simbad name	Discovery name or reference	Status	ρ [arcsec]	θ [deg]	WDS identifier
LP 525–39 AB	MCT 1	Physical	0.7	334	00326+0729
RBS 153 AB	BRG 3	Physical	0.4	168	01072–1936
LP 467–16 AB	BEU 2	Physical	0.3	241	01114+1526
2E 327 AB	BRG 4	Physical	1.4	28	01135–3821
LP 648–20 BC	BRG 5	Visual	5.4	184	01376–0645
LP 648–20 BD	BWL 7	Visual	6.7	23	
BD+17 232AB	COU 254	Physical	1.6	24	01377+1836
RBS 253 AB	BRG 7	Physical	2.8	292	01538–1500
HD 15115 AB	VIG 2	Visual	12.6	195	02263+0618
BD+05 378AB	Song et al. (2003)	SB1	...	...	...
CD–44 753 Aa,Ab	Elliott et al. (2015)	Physical	0.13	295	02305–4305
RX J0332.6+2843 AB	JNN 24	Physical	0.1	282	03326+2844
RX J0332.6+2843 AC	JNN 24	Physical	0.5	106	
HD 232862 AB	COU 2357	Physical	0.7	93	03573+5051
c Eri Ab	Macintosh et al. (2015)	Physical	0.4	170	04376–0228
c Eri Ca,Cb	KAS 1	Physical	0.3	18	
V1005 Ori AB	LAF 33	Visual	5.2	220	04596+0147
V1005 Ori AC	LAF 33	Visual	7.4	234	
V1005 Ori Aa,Ab	Elliott et al. (2014)	SB1?	...	...	
LP 476–207 Aa,Ab	Delfosse et al. (1999)	SB2	...	...	05020+0959
LP 476–207 Aa,Ab,B	HDS 654	Physical	1.3	151	
BD–21 1074Ba,Bb	DON 93	Physical	0.8	321	05069–2135
2E 1249 AB	Elliott et al. (2015)	Physical	0.42	235	...
1RXS J052419.1–160117 AB	BRG 21	Physical	0.6	68	05243–1601
AF Lep AB	Nordström et al. (2004)	SB2	...	...	...
V1311 Ori AB	JNN 39	Physical	0.2	56	05321–0305
1RXS J061313.2-274205 AB	TSN 2	Physical	0.1	215	06132–2742
1RXS J061610.6-132046 AB	BRG 22	Physical	0.2	167	06162–1232
1RXS J072931.4+355607 AB	JNN 57	Physical	0.2	253	07295+3556
YZ CMi AB	LAF 36	Visual	8.8	114	07447+0333
EUVE J0817–82.7 AB	CVN 22	Physical	0.6	353	08177–8243
L 186–67 Aa,Ab	BRG27	Physical	0.8	150	08228–5727
HD 73018 AB	STF 1244	Physical	3.9	0	08377+4148
HD 82939 Ba,Bb	Schlieder et al. (2012b)	SB2	...	...	...
DK Leo AB	Shkolnik et al. (2012)	SB1	...	...	...
TWA 22 Aa,Ab	CVN 16	Physical	0.1	15	10174–5354
TWA 22 Aa,Ab–Zd	CVN 16	Visual	3.5–16.8	...	
RBS 1043 Aa,Ab	Bowler et al. (2015)	SB2	...	...	...
RBS 1043 Aa,Ab,B	Bowler et al. (2015)	Physical	0.5	110	
MV Vir Aa,Ab	CVN 25	Physical	0.3	257	14144–1521
MV Vir Aa,Ab,B	RST 3869	Physical	1.1	62	
SCR J1425–4113 AB	Riedel et al. (2014)	Physical	0.6	282	...
α Cir AB	DUN 166	Physical	15.4	226	14425–6459
V343 Nor AB	SKF1501	Physical	10.2	325	15390–5742
V343 Nor A–Zd	VGT 4	Visual	2.2–7.5	...	
V343 Nor B–T	CVN 52	Visual	1.4–7.9	...	
CD–27 11535 Aa,Ab	Elliott et al. (2015)	SB1	...	...	...
CD–27 11535 Aa,Ab,B	Elliott et al. (2015)	Physical	0.08	278	
V824 Ara AC	CVN55	Visual	7.9	120	17174–6657
V824 Ara Aa,Ab	Strassmeier & Rice (2000)	SB2	...	...	...
1RXS J172919.1–501454 AB	Elliott et al. (2015)	Physical	0.73	20	...
HD 161460 AB	CVN 29	Physical	0.1	233	17486–5307
HD 164249 AB	SKF 1420	Physical	6.7	89	18031–5139
HD 164249 A–J	CVN57	Visual	7.4–14.8	...	

Table A.2. continued.

Simbad name	Discovery name or reference	Status	ρ [arcsec]	θ [deg]	WDS identifier
HD 165189 AB	HJ 5014	Physical	1.8	4	18068–4325
V4046 Sgr AB	Torres et al. (2008)	SB2	...	...	...
FK Ser AB	HER 2	Physical	1.0	17	18204–1011
HD 172555 AC	CVN 59	Visual	7.4	319	18454–6452
HD 172555 Ba,Bb	BIL 4	Physical	0.2	95	
CD–31 16041 A–J	CVN 60	Visual	1.9–6.9	...	18507–3148
PZ Tel Aa,Ab	MUG 10	Physical	0.4	60	18531–5011
PZ Tel Aa,Ab–E	CVN 61	Visual	4.0–10.7	...	
CD–26 13904 AB	RST 2094	Physical	1.1	49	19117–2604
η Tel AB	LWR 3	Physical	4.2	170	19229–5425
η Tel CD	CVN 63	Visual	4.8	251	19230–5432
η Tel CE	CVN 63	Visual	5.8	275	
1RXS J195602.8–320720 AB	Elliott et al. (2014)	SB2	...	...	...
HD 191089 A–C	MET 88	Visual	10.4–10.8	...	20091–2613
HD 191089 A–H	VIG 19	Visual	4.8–12.3	...	
1RXS J201001.0–280139 AB	BRG 30	Physical	0.7	283	20100-2802
StHA 182 AB	Shkolnik et al. (2012)	Physical	1.5	217	...
AU Mic BC (AT Mic AB)	LDS 720	Physical	2.3	153	20452-3120
HD 199143 AB	JAY 1	Physical	1.1	324	20558–1707
HD 199143 CD (AZ Cap AB)	JAY 2	Physical	2.2	140	
2E 4498 AB	JNN 291	Physical	0.4	341	21376+0137
RX J2155.3+5938 AB	JNN 292	Phsyical	0.2	102	21554+5938
LP 462–19 AB	BEU 23	Physical	0.1	220	23175+1937

Table A.3. Astrometry measurements.

Simbad name	α (J2000)	δ (J2000)	PPMXL $\mu_\alpha \cos\delta$ [mas a^{-1}]	PPMXL μ_δ [mas a^{-1}]	Adopted $\mu_\alpha \cos\delta$ [mas a^{-1}]	Adopted μ_δ [mas a^{-1}]	Δt [a]	Number of detections	Origin of adopted proper motions	Astrometric status
RX J0019.7+1951	00:19:43.04	+19:51:11.7	+69.8 ± 5.1	–49.8 ± 5.1	+72.6 ± 0.2	–43.9 ± 0.3	56.586	6	*This work*	
2MASS J00193931+1951050	00:19:39.31	+19:51:05.1	+70.3 ± 4.1	–48.9 ± 4.1	+74.7 ± 0.4	–40.9 ± 0.1	56.586	6	*This work*	Physical (in WDS)
GJ 2006 A	00:27:50.23	–32:33:06.0	+96.3 ± 22.0	–101.9 ± 22.0	+108.5 ± 0.4	–47.8 ± 0.8	27.188	5	*This work*	
GJ 2006 B	00:27:50.35	–32:33:23.8	+117.1 ± 20.7	–45.7 ± 20.7	+101.8 ± 0.3	–42.2 ± 1.0	27.188	4	*This work*	Physical (in WDS)
LP 648–20 (EX Cet B)	01:36:55.17	–06:47:37.9	+180.3 ± 4.1	–105.4 ± 4.1	+166.8 ± 0.3	–99.9 ± 0.3	11.682	5	*This work*	
EX Cet	01:37:35.47	–06:45:37.5	+171.2 ± 0.8	–97.7 ± 0.6	+171.3 ± 0.7	–98.5 ± 0.5	...	...	HIP2	Phot. follow-up
BD+17 232 AB	01:37:39.39	+18:35:32.7	+69.9 ± 1.5	–47.5 ± 1.5	+69.9 ± 1.5	–47.5 ± 1.5	...	...	TYC	
2MASS J01372935+1805559	01:37:29.35	+18:05:55.9	+73.4 ± 4.1	–45.1 ± 4.1	+73.4 ± 0.1	–46.2 ± 0.1	55.603	5	*This work*	Phot. follow-up
[SLS2012] PYC J02017+0117N	02:01:46.78	+01:17:16.2	+20.6 ± 6.3	–16.8 ± 6.3	+77.5 ± 0.3	–46.5 ± 1.0	55.969	8	*This work*	
[SLS2012] PYC J02017+0117S	02:01:46.93	+01 17 06.0	+81.2 ± 12.5	–60.7 ± 12.1	+67.8 ± 0.7	–50.6 ± 0.6	56.724	8	*This work*	Phot. follow-up
HD 14082 A	02:17:25.27	+28:44:42.3	+84.4 ± 1.5	–76.8 ± 1.4	+87.6 ± 2.2	–72.4 ± 2.5	...	...	HIP2	
HD 14082 B	02:17:24.73	+28:44:30.5	+88.5 ± 1.7	–73.0 ± 1.7	+80.2 ± 4.4	–78.4 ± 4.9	...	...	HIP2	Physical (in WDS)
2MASS J02195655+2806230	02:19:56.55	+28:06:23.0	+90.1 ± 4.2	–78.8 ± 4.2	+91.0 ± 0.6	–79.1 ± 0.2	55.738	6	*This work*	Phot. follow-up
[SLS2012] PYC J02226+3055	02:22:40.83	+30:55:16.0	+68.4 ± 5.4	–66.4 ± 5.4	+69.7 ± 0.1	–67.1 ± 0.5	55.738	6	*This work*	
2MASS J02221455+3056377	02:22:14.55	+30:56:37.7	+74.0 ± 4.2	–66.5 ± 4.2	+76.5 ± 0.5	–65.6 ± 0.4	55.738	6	*This work*	Phot. follow-up
HD 15115	02:26:16.24	+06:17:33.2	+87.1 ± 0.8	–50.7 ± 0.6	+86.3 ± 0.7	–50.0 ± 0.5	...	...	HIP2	
TYC 45–1241–1	02:27:05.45	+06:31:16.3	+85.4 ± 1.9	–51.5 ± 1.9	+88.2 ± 2.4	–51.7 ± 2.4	...	...	TYC	Phot. follow-up
AG Tri A	02:27:29.25	+30:58:24.7	+79.3 ± 1.5	–71.7 ± 1.6	+79.8 ± 2.6	–70.0 ± 1.7	...	...	HIP2	
AG Tri B	02:27:28.05	+30:58:40.5	+78.9 ± 5.4	–75.2 ± 5.4	+77.5 ± 0.3	–72.1 ± 0.1	55.738	5	*This work*	Physical (in WDS)
CD–44 753 Aa,Ab	02:30:32.41	–43:42:23.3	+78.9 ± 2.1	–11.6 ± 2.1	+80.5 ± 1.6	–14.9 ± 1.6	...	...	TYC	
CD–44 753 B	02:30:46.23	–43:43:49.3	+82.2 ± 3.1	–18.3 ± 3.1	+79.8 ± 1.5	–18.2 ± 0.8	107.623	6	*This work*	Physical (in WDS)
CD–43 759	02:29:55.59	–43:19:07.8	+73.3 ± 2.0	–11.1 ± 2.0	+69.1 ± 2.1	–12.6 ± 1.9	...	...	TYC	Phot. follow-up
2MASS J02292952–4321108	02:29:29.52	–43:21:10.8	+71.7 ± 8.5	–12.8 ± 8.5	+78.2 ± 0.1	–20.7 ± 0.3	32.601	4	*This work*	Phot. follow-up
DENIS J025344.4–795913	02:53:44.48	–79:59:13.3	+74.6 ± 9.2	+103.9 ± 9.2	+83.3 ± 0.4	+84.5 ± 0.6	20.608	4	*This work*	
2MASS J02441357–7919202	02:44:13.57	–79:19:20.2	+74.8 ± 9.7	+97.0 ± 9.7	+85.9 ± 0.2	+83.5 ± 0.5	20.608	4	*This work*	Phot. follow-up
HD 232862 AB	03:57:19.99	+50:51:18.6	+45.8 ± 1.8	–71.8 ± 1.8	+45.8 ± 1.8	–71.8 ± 1.8	...	...	TYC	
2MASS J03545988+5044350	03:54:59.88	+50:44:35.0	+44.8 ± 5.4	–75.2 ± 5.4	–10.6 ± 0.8	+7.6 ± 0.9	51.083	6	*This work*	Visual
c Eri A	04:37:36.13	–02:28:24.8	+42.2 ± 1.5	–63.3 ± 1.5	+44.2 ± 0.3	–64.4 ± 0.3	...	...	HIP2	
c Eri Ca,Cb	04:37:37.47	–02:29:28.4	+44.6 ± 2.1	–62.9 ± 2.1	+43.5 ± 0.9	–65.5 ± 3.3	113.731	7	*This work*	Physical (in WDS)
c Eri "B" (2MASS J04373798-0228164)	04:37:37.99	–02:28:16.4	+0.5 ± 2.1	+20.5 ± 2.5	+1.0 ± 3.2	+23.5 ± 2.8	105.034	4	*This work*	Visual (in WDS)
V962 Per	04:43:56.87	+37:23:03.3	+27.3 ± 5.1	–64.4 ± 5.1	+14.0 ± 0.2	–63.5 ± 0.4	54.367	5	*This work*	
2MASS J04450683+3704056	04:45:06.83	+37:04:05.6	+28.2 ± 4.2	–58.7 ± 4.2	+30.7 ± 0.5	–58.6 ± 0.2	54.637	6	*This work*	Phot. follow-up
LDS 5606 A	04:48:00.86	+14:39:58.1	+19.0 ± 4.3	–40.0 ± 4.3	+19.7 ± 0.2	–39.7 ± 0.7	54.536	5	*This work*	
LDS 5606 B	04:48:02.58	+14:39:51.6	+18.7 ± 4.3	–43.4 ± 4.3	+20.7 ± 0.2	–42.5 ± 0.4	54.536	5	*This work*	Physical (in WDS)
V1005 Ori	04:59:34.83	+01:47:00.7	+39.7 ± 1.8	–95.1 ± 1.9	34.6 ± 2.3	–94.3 ± 1.4	...	...	HIP2	
StKM 1–526	04:55:48.00	+02:02:07.5	+39.8 ± 1.9	–89.5 ± 1.9	37.0 ± 1.9	–88.8 ± 1.9	...	...	TYC	Phot. follow-up
CD–57 1054	05:00:47.15	–57:15:25.6	+35.8 ± 1.0	+72.8 ± 0.9	+36.3 ± 1.4	+70.2 ± 1.3	...	...	HIP2	
2MASS J05052576–5719046	05:05:25.76	–57:19:04.6	+39.5 ± 10.8	+70.9 ± 10.8	+37.8 ± 0.6	+81.0 ± 1.1	25.993	7	*This work*	Phot. follow-up
BD–21 1074	05:06:49.92	–21:35:09.2	+48.1 ± 3.2	–22.7 ± 3.4	+48.1 ± 3.2	–22.7 ± 3.4	...	4	TYC	
BD–21 1074Ba,Bb	05:06:49.47	–21:35:03.8	+37.0 ± 3.5	–38.1 ± 3.5	+37.0 ± 3.5	–38.1 ± 3.6	...	4	TYC	Physical (in WDS)
2MASS J05113065–2155189	05:11:30.65	–21:55:18.9	+40.4 ± 10.1	–37.3 ± 12.5	–5.7 ± 0.1	+19.3 ± 0.1	11.575	3	*This work*	Visual

Table A.3. continued.

Simbad name	α (J2000)	δ (J2000)	PPMXL $\mu_\alpha \cos\delta$ [mas a^{-1}]	PPMXL μ_δ [mas a^{-1}]	Adopted $\mu_\alpha \cos\delta$ [mas a^{-1}]	Adopted μ_δ [mas a^{-1}]	Δt [a]	Number of detections	Origin of adopted proper motions	Astrometric status
2MASS J05071096–2156441	05:07:10.96	–21:56:44.1	+40.2 ± 5.3	–41.6 ± 5.3	+44.8 ± 1.1	–28.6 ± 1.7	29.559	7	*This work*	Phot. follow-up
2MASS J05050338–2200480	05:05:03.38	–22:00:48.0	+39.6 ± 5.3	–37.9 ± 5.3	+55.1 ± 0.9	–42.4 ± 0.6	27.544	4	*This work*	Visual
1RXS J050712.4+143024	05:07:11.37	+14:30:01.3	+16.4 ± 5.0	–76.1 ± 5.0	+14.0 ± 0.3	–74.7 ± 0.4	55.655	5	*This work*	
2MASS J05080140+1403539	05:08:01.40	+14:03:53.9	+16.5 ± 4.0	–69.7 ± 4.0	+13.5 ± 0.2	–67.1 ± 0.2	55.655	4	*This work*	Phot. follow-up
TYC 112–917–1	05:20:00.29	+06:13:03.6	+6.9 ± 2.8	–35.5 ± 2.9	+5.5 ± 4.1	–37.8 ± 4.0	...	...	TYC	
2E 1249 AB	05:20:31.83	+06:16:11.5	+9.4 ± 1.9	–37.3 ± 1.9	+12.4 ± 2.6	–38.8 ± 2.5	...	...	TYC	Phot. follow-up
AF Lep AB	05:27:04.77	–11:54:03.3	+17.7 ± 0.5	–49.5 ± 0.5	+17.6 ± 0.4	–50.2 ± 0.4	...	...	HIP2	
2MASS J05244065–1233402	05:24:40.65	–12:33:40.2	+18.5 ± 4.1	–49.8 ± 4.1	+12.0 ± 0.3	–49.2 ± 0.5	54.544	4	*This work*	Phot. follow-up
1RXS J065940.5+054541	06:59:41.57	+05:45:40.0	–27.2 ± 5.5	–73.4 ± 5.5	–23.1 ± 0.3	–68.3 ± 0.2	56.504	5	*This work*	
2MASS J07010444+0533517	07:01:04.44	+05:33:51.7	–25.8 ± 5.3	–78.7 ± 5.4	–5.2 ± 0.3	–27.6 ± 1.1	55.090	5	*This work*	Visual
1RXS J072643.1+185026	07:26:41.54	+18:50:34.7	–20.0 ± 4.9	–61.3 ± 4.9	–17.9 ± 0.2	–61.4 ± 0.4	57.473	5	*This work*	
2MASS J07280694+1838117	07:28:06.94	+18:38:11.7	–18.4 ± 5.3	–60.1 ± 5.3	–45.0 ± 0.6	–64.25 ± 0.9	57.472	5	*This work*	Visual
1RXS J072931.4+355607 AB	07:29:31.09	+35:56:00.4	–31.2 ± 2.3	–101.7 ± 2.3	–31.7 ± 0.2	–102.4 ± 0.7	81.247	6	*This work*	
2MASS J07293670+3554531	07:29:36.70	+35:54:53.1	–27.2 ± 5.0	–103.9 ± 5.0	–29.7 ± 0.5	–104.4 ± 0.2	55.379	6	*This work*	Physical (in WDS)
L 186–67 Aa,Ab	08:22:47.45	–57:26:53.0	–334.7 ± 18.2	+572.0 ± 18.2	–404.9 ± 0.4	+473.9 ± 0.7	30.528	4	*This work*	
L 186–67 B	08:22:47.99	–57:26:48.1	...	...	–359.5 ± 0.7	+463.9 ± 0.8	30.528	4	*This work*	Physical (in WDS)
[SLS2012] PYC J08290+1125	08:29:04.12	+11:25:05.4	–45.6 ± 5.3	–64.2 ± 5.3	–46.9 ± 0.3	–62.6 ± 0.3	58.511	7	*This work*	
2MASS J08274412+1122029	08:27:44.12	+11:22:02.9	–49.9 ± 1.5	–60.9 ± 1.5	–52.2 ± 0.4	–58.0 ± 0.1	58.511	7	*This work*	Phot. follow-up
HD 82939 Ba,Bb	09:36:15.91	+37:31:45.5	–101.9 ± 1.9	–89.4 ± 1.3	–99.4 ± 2.5	–89.5 ± 1.4	...	...	HIP2	
HD 82939 A	09:36:04.28	+37:33:10.4	–99.9 ± 0.9	–89.4 ± 0.6	–99.1 ± 1.1	–89.4 ± 0.6	...	...	HIP2	Physical (in WDS)
2MASS J09372954+3749458	09:37:29.54	+37:49:45.8	–100.4 ± 4.6	–92.8 ± 4.6	–101.3 ± 1.2	–90.9 ± 0.5	56.556	6	*This work*	Phot. follow-up
2MASS J09365772+3758354	09:36:57.72	+37:58:35.4	–100.4 ± 4.0	–87.5 ± 4.0	–99.5 ± 1.0	–86.2 ± 0.8	56.556	5	*This work*	Phot. follow-up
[SLS2012] PYC J10175+5542	10:17:31.43	+55:42:29.4	–59.8 ± 3.0	–49.3 ± 3.0	–61.0 ± 1.8	–50.1 ± 1.4	98.221	6	*This work*	
[SLS2012] PYC J10175+5542 "B"	10:17:26.66	+55:41:45.4	–74.6 ± 4.0	–34.0 ± 4.0	–71.7 ± 0.1	–31.9 ± 0.1	55.420	4	*This work*	Visual (in WDS)
HD 95174 A	10:59:38.31	+25:26:15.5	–184.0 ± 1.7	–49.9 ± 1.6	–184.0 ± 1.7	–49.9 ± 1.6	...	...	TYC	
HD 95174 B	10:59:38.68	+25:26:13.7	–177.5 ± 1.7	–81.5 ± 1.6	–177.5 ± 1.7	–81.5 ± 1.6	...	...	TYC	Physical (in WDS)
BD+26 2148	10:56:04.06	+25:41:17.2	–182.6 ± 1.1	–79.5 ± 0.8	–185.3 ± 1.3	–79.3 ± 0.8	...	...	HIP2	Phot. follow-up
2E 2613	12:11:53.09	+12:49:13.5	–70.1 ± 1.2	–60.1 ± 1.4	–73.8 ± 0.2	–57.5 ± 0.4	55.215	6	*This work*	
2MASS J12120849+1248050	12:12:08.49	+12:48:05.0	–70.2 ± 1.3	–59.3 ± 1.3	–74.5 ± 0.2	–61.6 ± 0.7	55.215	6	*This work*	Phot. follow-up
1RXS J135452.3–712157	13:54:53.90	–71:21:47.7	–142.6 ± 17.4	–112.5 ± 17.4	–143.7 ± 0.8	–130.1 ± 0.5	34.243	8	*This work*	
2MASS J13585056–7223161	13:58:50.56	–72:23:16.1	–145.2 ± 7.4	–103.2 ± 7.3	+27.3 ± 0.3	+5.0 ± 1.2	34.243	6	*This work*	Visual
2MASS J14100900–7107256	14:10:09.00	–71:07:25.6	–142.7 ± 8.1	–107.0 ± 8.1	–11.0 ± 0.3	–9.5 ± 0.4	34.243	6	*This work*	Visual
TYC 4634–1184–1	14:12:49.93	+84:01:31.2	–49.9 ± 1.9	36.1 ± 1.9	–50.0 ± 3.0	+36.9 ± 2.9			TYC	
2MASS J14192861+8426534	14:19:28.61	+84:26:53.4	–50.0 ± 5.5	36.6 ± 5.5	–59.1 ± 0.3	+28.6 ± 0.6	55.272	4	*This work*	Phot. follow-up
2MASS J14040157+8405075	14:04:01.57	+84:05:07.5	–52.7 ± 4.0	38.6 ± 4.0	–51.2 ± 0.1	+43.8 ± 0.6	55.272	4	*This work*	Phot. follow-up
MV Vir Aa,Ab,B	14:14:21.36	–15:21:21.7	–143.0 ± 1.9	–196.3 ± 2.0	–140.5 ± 1.9	–200.4 ± 2.0	...	...	TYC	
MV Vir C	14:14:17.00	–15:21:12.7	–128.0 ± 5.3	–192.3 ± 5.3	–118.5 ± 0.5	–197.4 ± 0.2	52.130	6	*This work*	Physical (in WDS)
SCR J1425-4113 AB	14:25:29.13	–41:13:32.4	–60.5 ± 14.3	–55.2 ± 14.3	–44.3 ± 0.5	–45.6 ± 0.5	28.701	4	*This work*	
2MASS J14241480–4124200	14:24:14.80	–41:24:20.0	–55.9 ± 10.8	–54.8 ± 10.8	–25.1 ± 0.7	–6.5 ± 0.4	28.701	4	*This work*	Visual
α Cir AB	14:42:30.39	–64:58:30.5	–187.4 ± 0.8	–231.5 ± 0.8	–192.53 ± 0.1	–233.5 ± 0.1	...	...	HIP2	
α Cir "C" (2MASS J14421982-6458362)	14:42:19.82	–64:58:36.2	–3.3 ± 2.8	–1.7 ± 2.8	–1.7 ± 1.1	1.1 ± 1.5	105.774	4	*This work*	Visual (in WDS)

Table A.3. continued.

Simbad name	α (J2000)	δ (J2000)	$\mu_\alpha \cos\delta$ [mas a^{-1}] PPMXL	μ_δ [mas a^{-1}] PPMXL	$\mu_\alpha \cos\delta$ [mas a^{-1}] Adopted	μ_δ [mas a^{-1}] Adopted	Δt [a]	Number of detections	Origin of adopted proper motions	Astrometric status
TYC 4571–1414–1	16:17:11.35	+77:33:47.8	–32.7 ± 1.8	+39.7 ± 1.8	–33.3 ± 1.7	+39.9 ± 0.8	114.893	8	*This work*	
2MASS J16170673+7734028	16:17:06.73	+77:34:02.8	–35.7 ± 4.1	+42.4 ± 4.1	–38.2 ± 0.6	+39.7 ± 0.9	55.116	5	*This work*	Phot. follow-up
1RXS J164302.3–175418	16:43:01.28	–17:54:27.4	–27.4 ± 3.8	–51.3 ± 4.2	–30.7 ± 0.6	–51.9 ± 1.4	94.248	7	*This work*	
2MASS J16425150–1814492	16:42:51.50	–18:14:49.2	–30.1 ± 4.0	–47.3 ± 4.0	–25.2 ± 0.8	–48.8 ± 0.7	56.000	6	*This work*	Phot. follow-up
1RXS J165719.9–534328	16:57:20.30	–53:43:31.7	5.5 ± 24.1	–83.8 ± 24.1	–20.61 ± 0.6	–78.48 ± 0.9	31.078	5	*This work*	
2MASS J16545062–5347082	16:54:50.62	–53:47:08.2	5.2 ± 7.5	–87. ± 7.5	–7.5 ± 1.0	+6.6 ± 1.2	22.889	6	*This work*	Visual
2MASS J16574619–5400523	16:57:46.19	–54:00:52.3	5.0 ± 10.3	–84.3 ± 10.4	–4.1 ± 0.8	–9.2 ± 1.3	22.037	5	*This work*	Visual
2MASS J16552211–5348436	16:55:22.11	–53:48:43.6	5.8 ± 7.9	–77.1 ± 7.9	+3.2 ± 1.2	+5.0 ± 1.1	22.889	6	*This work*	Visual
1RXS J171502.4–333344	17:15:02.20	–33:33:39.8	5.7 ± 3.0	–179.3 ± 3.0	+6.5 ± 0.1	–177.8 ± 0.2	97.087	4	*This work*	
2MASS J17123508–3229368	17:12:35.08	–32:29:36.8	6.2 ± 9.7	–185.6 ± 9.7	+34.4 ± 3.2	+46.8 ± 1.3	13.247	4	*This work*	Visual
V824 Ara Aa,Ab	17:17:25.50	–66:57:03.7	–18.5 ± 1.5	–137.4 ± 1.6	–21.8 ± 0.4	–136.9 ± 0.4	...	...	HIP2	
V824 Ara B	17:17:31.29	–66:57:05.6	–400.2 ± 14.5	–291.2 ± 14.5	–7.1 ± 0.6	–154.4 ± 1.7	34.977	6	*This work*	Physical (in WDS)
1RXS J172919.1–501454 AB	17:29:20.67	–50:14:52.9	–8.7 ± 3.2	–59.9 ± 3.2	–5.4 ± 0.4	–54.8 ± 0.2	105.931	4	*This work*	
2MASS J17294889–4956417	17:29:48.89	–49:56:41.7	–8.5 ± 9.6	–54.5 ± 9.8	–9.8 ± 0.4	–0.9 ± 0.5	30.005	4	*This work*	Visual
2MASS J17270839–5023572	17:27:08.39	–50:23:57.2	–9.5 ± 7.4	–62.5 ± 7.4	–22.38 ± 0.5	–45.9 ± 1.1	20.102	5	*This work*	Phot. follow-up
2MASS J17265404–5010448	17:26:54.04	–50:10:44.8	–9.4 ± 7.8	–59.6 ± 7.8	–7.5 ± 0.9	–40.2 ± 1.5	30.005	4	*This work*	Visual
2MASS J17300841–5014154	17:30:08.41	–50:14:15.4	–9.6 ± 7.4	–65.0 ± 7.4	–9.4 ± 1.3	–2.1 ± 1.4	24.833	6	*This work*	Visual
HD 160305	17:41:49.03	–50:43:27.9	–2.5 ± 1.0	–67.0 ± 1.9	–3.7 ± 1.1	–65.7 ± 0.9	...	...	HIP2	
2MASS J17410520–5055268	17:41:05.20	–50:55:26.8	–2.4 ± 7.8	–66.7 ± 7.8	–1.0 ± 0.1	–4.0 ± 0.9	23.961	5	*This work*	Visual
HD 164249 AB	18:03:03.41	–51:38:56.4	+3.3 ± 0.7	–86.5 ± 0.5	+4.02 ± 0.60	–86.46 ± 0.36	...	...	HIP2	
2MASS J18043865–5118456	18:04:38.65	–51:18:45.6	+3.5 ± 8.8	–87.6 ± 8.8	–0.3 ± 0.6	–33.3 ± 1.1	29.125	4	*This work*	Visual
HD 165189 AB	18:06:49.90	–43:25:30.8	+13.8 ± 2.4	–105.3 ± 2.2	+13.8 ± 2.4	–105.3 ± 2.2	...	...	TYC	
2MASS J18041814–4316406	18:04:18.14	–43:16:40.6	+14.7 ± 9.0	–114.4 ± 9.6	–6.9 ± 1.3	+26.4 ± 1.4	24.941	7	*This work*	Visual
2MASS J18091082–4300490	18:09:10.82	–43:00:49.0	+14.7 ± 9.0	–111.4 ± 9.0	+0.28 ± 0.05	–0.6 ± 1.5	24.763	5	*This work*	Visual
V4046 Sgr AB	18:14:10.48	–32:47:34.4	+2.4 ± 2.7	–56.2 ± 2.8	+2.1 ± 2.3	–54.5 ± 2.1			TYC	
V4046 Sgr C	18:14:22.07	–32:46:10.1	+13.5 ± 36.7	–38.4 ± 36.7	+7.14 ± 0.04	–51.7 ± 0.2	11.994	4	*This work*	Physical (not in WDS)
1RXS J181514.7–492755	18:15:15.64	–49:27:47.2	+8.9 ± 3.2	–73.2 ± 3.2	+8.7 ± 0.2	–72.6 ± 1.5	105.112	5	*This work*	
2MASS J18174204–4915591	18:17:42.04	–49:15:59.1	+8.1 ± 8.9	–74.2 ± 8.9	+0.16 ± 0.8	–12.28 ± 0.4	32.061	7	*This work*	Visual
1RXS J184206.5–555426	18:42:06.95	–55:54:25.5	+1.3 ± 14.0	–72.5 ± 14.0	+12.8 ± 0.6	–74.7 ± 1.2	31.925	7	*This work*	
2MASS J18420483–5554126	18:42:04.83	–55:54:12.6	+4.2 ± 14.0	–76.7 ± 14.0	+13.8 ± 0.3	–78.2 ± 0.9	31.925	6	*This work*	Physical (in WDS)
2MASS J18445576–5547120	18:44:55.76	–55:47:12.0	+1.4 ± 10.3	–66.9 ± 10.3	+0.2 ± 0.7	–25.5 ± 0.8	31.925	6	*This work*	Visual
HD 172555 A	18:45:26.91	–64:52:16.5	+32.6 ± 0.4	–148.8 ± 0.4	+32.4 ± 0.2	–149.5 ± 0.2	...	...	HIP2	
HD 172555 Ba,Bb	18:45:37.05	–64:51:46.1	...	...	+32.5 ± 0.5	–155.4 ± 0.7	99.462	4	*This work*	Physical (in WDS)
HD 173167 B	18:46:52.56	–62:10:36.7	+15.2 ± 3.3	–80.7 ± 3.3	+18.1 ± 4.7	–76.6 ± 4.2	...	...	TYC	
HD 173167 A	18:48:06.36	–62:13:47.0	+16.1 ± 1.7	–82.4 ± 1.7	+16.1 ± 1.4	–80.3 ± 1.3	...	...	TYC	Phot. follow-up
2MASS J18452867–6236003	18:45:28.67	–62:36:00.3	+14.9 ± 8.4	–79.1 ± 8.4	+16.8 ± 0.42	–74.5 ± 1.0	34.158	6	*This work*	Phot. follow-up
PZ Tel Aa,Ab	18:53:05.87	–50:10:50.0	+16.1 ± 0.9	–83.8 ± 0.7	+17.6 ± 1.1	–83.6 ± 0.8	...	...	HIP2	
CD–50 12186	18:52:49.76	–50:14:37.0	+14.6 ± 2.1	–85.2 ± 2.2	+8.3 ± 1.6	–78.1 ± 1.6	...	...	TYC	Phot. follow-up
TYC 6872–1011–1	18:58:04.15	–29:53:04.6	+11.1 ± 3.5	–47.9 ± 3.6	+16.1 ± 4.7	–47.2 ± 4.2	...	...	TYC	
2MASS J18580464–2953320	18:58:04.66	–29:53:32.2	+7.0 ± 5.4	–56.7 ± 5.4	+9.0 ± 0.3	–50.5 ± 0.3	32.020	5	*This work*	Physical (in WDS)
η Tel AB	19:22:51.22	–54:25:26.3	+25.5 ± 0.7	–83.0 ± 0.5	+25.6 ± 0.2	–82.7 ± 0.1	...		HIP2	
η Tel C	19:22:58.95	–54:32:17.1	+23.8 ± 0.8	–82.1 ± 0.6	+24.9 ± 0.7	–81.8 ± 0.4	...		HIP2	Physical (in WDS)

Table A.3. continued.

Simbad name	α (J2000)	δ (J2000)	PPMXL $\mu_\alpha \cos\delta$ [mas a^{-1}]	PPMXL μ_δ [mas a^{-1}]	Adopted $\mu_\alpha \cos\delta$ [mas a^{-1}]	Adopted μ_δ [mas a^{-1}]	Δt [a]	Number of detections	Origin of adopted proper motions	Astrometric status
2MASS J19233074–5450090	19:23:30.74	–54:50:09.0	+25.9 ± 9.2	–90.5 ± 9.2	+29.2 ± 0.1	–92.5 ± 0.1	29.605	4	*This work*	Phot. follow-up
1RXS J192338.2–460631	19:23:38.20	–46:06:31.6	+20.5 ± 3.2	–58.3 ± 3.2	+20.5 ± 0.3	–58.4 ± 0.7	105.019	5	*This work*	
2MASS J19251419–4553480	19:25:14.19	–45:53:48.0	+21.3 ± 3.2	–54.4 ± 3.2	+21.8 ± 0.6	–55.0 ± 0.4	105.010	6	*This work*	Phot. follow-up
2MASS J19230177–4603243	19:23:01.77	–46:03:24.3	+20.1 ± 10.1	–60.6 ± 10.1	+31.2 ± 0.8	–56.3 ± 0.4	31.919	6	*This work*	Phot. follow-up
2MASS J19224371–4554186	19:22:43.71	–45:54:18.6	+21.2 ± 10.2	–55.3 ± 10.2	+6.9 ± 0.4	–27.2 ± 0.9	27.942	4	*This work*	Visual
RX J1924.5–3442	19:24:34.94	–34:42:39.2	+20.8 ± 14.3	–65.8 ± 14.3	+20.5 ± 0.2	–69.8 ± 0.2	28.525	5	*This work*	
2MASS J19245811–3445450	19:24:58.11	–34:45:45.0	+21.2 ± 9.6	–61.0 ± 9.6	+9.2 ± 0.5	–31.2 ± 1.5	28.525	5	*This work*	Visual
2MASS J19253773–3449583	19:25:37.73	–34:49:58.3	+21.6 ± 10.2	–65.7 ± 10.2	+33.1 ± 0.9	+19.5 ± 2.6	16.593	5	*This work*	Visual
HDE 331149 A	19:43:37.90	+32:25:12.5	+44.0 ± 1.8	–8.9 ± 1.8	+46.3 ± 2.4	–11.4 ± 2.3	...	...	TYC	
HDE 331149 B	19:43:36.74	+32:25:20.8	+43.5 ± 2.5	–6.7 ± 2.5	+44.9 ± 0.3	–8.0 ± 0.3	76.693	4	*This work*	Physical (in WDS)
2MASS J19541276–5711271	19:54:12.76	–57:11:27.1	+61.8 ± 9.2	–73.7 ± 9.2	+63.3 ± 0.6	–92.1 ± 1.0	33.997	6	*This work*	
2MASS J19490300–5653427	19:49:03.00	–56:53:42.7	+58.1 ± 10.5	–74.9 ± 10.5	+59.9 ± 0.7	–81.8 ± 0.9	33.997	6	*This work*	Phot. follow-up
2MASS J19572208–5632342	19:57:22.08	–56:32:34.2	+67.2 ± 8.8	–69.5 ± 8.8	+75.8 ± 1.2	–56.1 ± 1.5	15.195	4	*This work*	Visual
2MASS J19540626–5635297	19:54:06.26	–56:35:29.7	+60.7 ± 9.2	–70.9 ± 9.2	+57.1 ± 0.4	–67.3 ± 0.7	29.554	4	*This work*	Visual
TYC 7443–1102–1	19:56:04.38	–32:07:37.6	+32.8 ± 2.9	–62.7 ± 2.9	+31.2 ± 3.1	–65.0 ± 3.2	...	...	TYC	
1RXS J195602.8–320720 AB	19:56:02.94	–32:07:18.7	+41.6 ± 11.3	–71.6 ± 11.3	+34.4 ± 0.5	–59.6 ± 0.4	27.957	5	*This work*	Physical (in WDS)
2MASS J19535525–3220023	19:53:55.25	–32:20:02.3	+32.7 ± 10.1	–63.5 ± 10.1	+4.499 ± 0.5	+2.2 ± 0.6	27.957	5	*This work*	Visual
2MASS J19552077–3144521	19:55:20.77	–31:44:52.1	+36.2 ± 9.9	–65.0 ± 10.5	+7.777 ± 0.4	+5.5 ± 0.5	27.957	5	*This work*	Visual
1RXS J200136.9–331307	20:01:37.18	–33:13:14.0	+39.5 ± 13.8	–63.3 ± 13.8	+30.3 ± 0.7	–67.6 ± 0.2	27.459	5	*This work*	
2MASS J19592933–3313078	19:59:29.33	–33:13:07.8	+37.9 ± 9.4	–63.6 ± 9.4	–1.9 ± 1.5	–46.8 ± 1.1	33.929	7	*This work*	Visual
HD 191089	20:09:05.22	–26:13:26.5	+38.3 ± 0.7	–68.2 ± 0.5	+39.2 ± 0.5	–68.3 ± 0.4	...	...	HIP2	
2MASS J20100328–2637403	20:10:03.28	–26:37:40.3	+41.8 ± 19.4	–69.2 ± 19.4	–2.5 ± 1.0	+2.3 ± 1.5	32.946	8	*This work*	Visual
1RXS J201001.0–280139 AB	20:10:00.02	–28:01:41.0	+38.5 ± 5.2	–64.6 ± 5.2	+35.8 ± 0.3	–69.9 ± 0.8	26.939	5	*This work*	
2MASS J20085122–2740536	20:08:51.22	–27:40:53.6	+40.4 ± 4.0	–61.7 ± 4.0	+40.3 ± 0.4	–68.6 ± 1.0	27.957	5	*This work*	Phot. follow-up
AU Mic	20:45:09.49	–31:20:26.7	+279.7 ± 1.2	–360.3 ± 0.8	+280.0 ± 1.3	–360.6 ± 0.7	...	...	HIP2	
AU Mic BC (AT Mic AB)	20:41:51.12	–32:26:07.3	+261.3 ± 3.6	–344.8 ± 3.9	+270.5 ± 4.6	–365.6 ± 3.5	...	...	HIP2	Physical (in WDS)
2MASS J20521133–2912398	20:52:11.33	–29:12:39.8	+294.5 ± 10.0	–370.1 ± 10.0	–3.8 ± 1.1	–5.0 ± 1.0	24.116	6	*This work*	Visual
EM* StHA 182 AB	20:43:41.14	–24:33:53.4	+61.9 ± 5.0	–73.7 ± 5.0	+46.8 ± 0.2	–73.5 ± 0.6	18.073	5	*This work*	
CD–24 16238 A	20:44:23.39	–23:38:58.4	+58.5 ± 1.6	–72.3 ± 1.5	+61.4 ± 1.9	–71.9 ± 1.6	...	...	TYC	Visual
CD–24 16238 BC (CPD–24 7061 AB)	20:44:23.90	–23:38:22.0	+2.2 ± 2.2	–8.8 ± 2.2	+2.7 ± 2.0	–10.5 ± 1.7	...	...	TYC	Visual (in WDS)
2MASS J20513567+1924020	20:51:35.68	+19:24:02.0	+46.6 ± 4.8	–41.8 ± 4.8	+42.3 ± 0.3	–39.7 ± 0.1	56.748	5	*This work*	
2MASS J20511685+1858123	20:51:16.85	+18:58:12.3	+44.3 ± 5.4	–42.8 ± 5.4	-0.9 ± 0.6	–4.8 ± 0.1	56.748	5	*This work*	Visual
HD 199143 AB	20:55:47.68	–17:06:51.0	+59.9 ± 1.0	–62.3 ± 0.8	+58.81 ± 0.8	–35.0 ± 0.7	...	...	HIP2	
HD 199143 CD (AZ Cap AB)	20:56:02.75	–17:10:53.9	+59.0 ± 2.9	–64.2 ± 3.0	+59.3 ± 3.2	–63.0 ± 3.0	...	..	TYC	Physical (in WDS)
EUVE J2110–19.3	21:10:05.36	–19:19:57.4	+93.0 ± 3.9	–87.4 ± 3.9	+91.7 ± 1.3	–89.0 ± 1.4	90.696	6	*This work*	
BPS CS 22898–0066	21:10:04.60	–19:20:30.3	+83.8 ± 5.1	–91.2 ± 5.1	+82.8 ± 1.0	–99.7 ± 0.8	55.918	6	*This work*	Physical (in WDS)
2MASS J21103147–2710578	21:10:31.47	–27:10:57.8	+43.0 ± 7.0	–58.5 ± 6.2	+73.8 ± 0.1	–71.3 ± 0.4	23.344	5	*This work*	
2MASS J21103096–2710513	21:10:30.96	–27:10:51.3	+64.6 ± 4.0	–69.3 ± 4.0	+77.9 ± 0.4	–71.3 ± 0.3	23.344	5	*This work*	Physical (in WDS)
2MASS J21094649–2728291	21:09:46.49	–27:28:29.1	+60.3 ± 4.0	–63.6 ± 4.0	+70.8 ± 0.6	–74.6 ± 0.5	28.477	6	*This work*	Phot. follow-up
2MASS J21085656–2650119	21:08:56.56	–26:50:11.9	+47.1 ± 3.9	–57.7 ± 3.9	+47.8 ± 0.4	–54.2 ± 0.6	25.735	6	*This work*	Visual
2MASS J21123604-2726172	21:12:36.04	–27:26:17.2	+47.5 ± 4.0	–63.5 ± 4.0	+44.5 ± 0.6	–66.4 ± 0.2	28.477	4	*This work*	Visual
V390 Pav A	21:21:24.49	–66:54:57.4	+95.6 ± 1.4	–98.9 ± 1.6	+95.5 ± 0.7	–102.7 ± 1.0	...	...	TYC	

Table A.3. continued.

Simbad name	α (J2000)	δ (J2000)	PPMXL $\mu_\alpha \cos\delta$ [mas a^{-1}]	PPMXL μ_δ [mas a^{-1}]	Adopted $\mu_\alpha \cos\delta$ [mas a^{-1}]	Adopted μ_δ [mas a^{-1}]	Δt [a]	Number of detections	Origin of adopted proper motions	Astrometric status
V390 Pav B	21:21:28.72	–66:55:06.3	+98.4 ± 2.1	–95.8 ± 2.0	+96.9 ± 2.8	–96.6 ± 2.6	...	...	TYC	Physical (in WDS)
1RXS J215518.2–004603	21:55:17.41	–00:45:47.8	+64.5 ± 4.1	–53.7 ± 4.1	+63.6 ± 0.5	–60.2 ± 0.5	55.927	5	*This work*	
2MASS J21551738–0046231	21:55:17.38	–00:46:23.1	+64.0 ± 4.1	–52.3 ± 4.1	+64.7 ± 0.3	–58.1 ± 0.3	55.927	5	*This work*	Physical (in WDS)
RX J2155.3+5938 AB	21:55:24.36	+59:38:37.1	+117.2 ± 4.7	15.7 ± 4.7	+112.1 ± 0.1	+14.5 ± 0.1	57.788	4	*This work*	
2MASS J21543570+6008558	21:54:35.70	+60:08:55.8	+112.9 ± 5.1	15.6 ± 5.2	+18.17 ± 0.45	–15.1 ± 0.1	47.029	4	*This work*	Visual
LSPM J2240+0532	22:40:01.45	+05:32:16.3	+113.1 ± 3.9	–126.7 ± 3.9	+107.5 ± 1.0	–128.7 ± 0.6	55.918	6	*This work*	
HD 214786	22:40:27.22	+04:34:30.1	+106.4 ± 0.9	–124.1 ± 0.7	+105.2 ± 0.8	–124.4 ± 0.2	...	...	HIP2	Phot. follow-up
CPD–72 2713	22:42:48.96	–71:42:21.1	+95.2 ± 1.6	–55.1 ± 1.6	+94.1 ± 1.8	–54.4 ± 1.7	...	...	TYC	
2MASS J22353683–7149426	22:35:36.83	–71:49:42.6	+91.2 ± 9.4	–54.2 ± 9.4	+84.3 ± 0.4	–46.7 ± 0.8	28.803	4	*This work*	Phot. follow-up
2MASS J22372184–7118216	22:37:21.84	–71:18:21.6	+92.1 ± 9.4	–52.9 ± 9.4	+88.2 ± 0.6	–41.2 ± 0.4	28.803	4	*This work*	Phot. follow-up
2MASS J22401265–7123467	22:40:12.65	–71:23:46.7	+90.6 ± 14.9	–57.7 ± 14.9	+81.7 ± 1.2	–31.4 ± 0.8	28.803	4	*This work*	Visual
WW PsA A	22:44:57.94	–33:15:01.6	+184.7 ± 29.4	–112.8 ± 29.4	+184.8 ± 2.6	–119.8 ± 2.3	...	...	HIP2	
WW PsA B(TX PsA)	22:45:00.05	–33:15:25.8	+173.2 ± 24.7	–125.3 ± 24.7	+169.5 ± 0.4	–119.7 ± 0.3	26.297	5	*This work*	Physical (in WDS)
AF Psc	23:31:44.93	–02:44:39.6	+95.1 ± 4.7	–73.3 ± 4.7	+94.5 ± 0.6	–73.5 ± 0.4	55.927	7	*This work*	
AF Psc "B" (2MASS J23314589–0244273)	23:31:45.89	–02:44:27.3	+8.9 ± 5.0	–6.6 ± 5.0	–3.5 ± 2.5	+0.2 ± 1.1	55.141	6	*This work*	Visual (in WDS)
2MASS J23301129–0237227	23:30:11.30	–02:37:22.7	+101.7 ± 4.6	–77.3 ± 4.6	+102.1 ± 0.4	–72.6 ± 0.6	58.903	6	*This work*	Phot. follow-up
BD–13 6424	23:32:30.85	–12:15:51.3	+136.3 ± 2.0	–81.4 ± 2.0	+139.2 ± 1.70	–83.4 ± 1.6	...	...	TYC	
2MASS J23322017–1150414	23:32:20.17	–11:50:41.4	+133.1 ± 16.0	–77.4 ± 16.0	+46.1 ± 1.3	–76.1 ± 0.3	56.879	6	*This work*	Visual

Table A.4. Photometry measurements.

Simbad name	α (J2000)	δ (J2000)	B [mag]	V [mag]	r' [mag]	K_s [mag]	d [pc]	Photometric status
RX J0019.7+1951	00:19:43.04	+19:51:11.7	17.075 ± 0.700	...	14.694 ± 0.064	9.864 ± 0.018	59.40 ± 7.90	
2MASS J00193931+1951050	00:19:39.31	+19:51:05.1	17.079 ± 0.010	15.540 ± 0.010	14.913 ± 0.040	10.078 ± 0.018		Physical (A in β Pic)
GJ 2006 A	00:27:50.23	–32:33:06.0	14.333 ± 0.050	12.869 ± 0.100	12.312 ± 0.100	8.012 ± 0.033	33.2 ± 2.80	
GJ 2006 B	00:27:50.35	–32:33:23.8	14.659 ± 0.080	13.165 ± 0.030	12.605	8.116 ± 0.027		Physical (A and B in β Pic)
LP 648–20 (Ex Cet B)	01:36:55.17	–06:47:37.9	15.725 ± 0.050	13.996 ± 0.110	13.385 ± 0.080	8.862 ± 0.021	23.95 ± 0.42	
EX Cet	01:37:35.47	–06:45:37.5	8.661 ± 0.990	7.750 ± 0.990	7.635 ± 0.001	5.752 ± 0.018		Physical candidate (B in β Pic)
BD+17 232AB	01:37:39.39	+18:35:32.7	11.062 ± 0.060	9.890 ± 0.020	9.600 ± 0.010	6.716 ± 0.018	52.59	
2MASS J01372935+1805559	01:37:29.35	+18:05:55.9	16.826 ± 0.200	15.454 ± 0.340	14.621 ± 0.030	10.734 ± 0.022		Visual
[SLS2012] PYC J02017+0117N	02:01:46.78	+01:17:16.2	14.246 ± 0.100	12.785 ± 0.140	12.345	8.265 ± 0.016	63.70 ± 9.00	
[SLS2012] PYC J02017+0117S	02:01:46.93	+01 17 06.0	14.299 ± 0.180	12.719 ± 0.140	12.024 ± 0.120	8.258 ± 0.029		Physical candidate (A and B in β Pic)
HD 14082 A	02:17:25.27	+28:44:42.3	7.626 ± 0.990	7.048 ± 0.990	7.612 ± 0.001	5.787 ± 0.027	34.52 ± 3.43	
HD 14082 B	02:17:24.73	+28:44:30.5	8.493 ± 0.990	7.804 ± 0.990	11.984 ± 0.006	6.262 ± 0.017	27.34 ± 4.26	Physical (A and B in β Pic)
2MASS J02195655+2806230	02:19:56.55	+28:06:23.0	18.555 ± 0.700	...	17.235 ± 0.203	13.626 ± 0.037		Visual
[SLS2012] PYC J02226+3055	02:22:40.83	+30:55:16.0	15.685 ± 0.060	14.151 ± 0.050	13.517 ± 0.060	9.062 ± 0.017	46.79 ± 5.09	
2MASS J02221455+3056377	02:22:14.55	+30:56:37.7	16.986 ± 0.100	15.468 ± 0.040	14.876 ± 0.060	10.984 ± 0.019		Visual
HD 15115	02:26:16.24	+06:17:33.2	8.788 ± 0.010	8.595 ± 0.010	9.333 ± 0.001	5.822 ± 0.021	45.22 ± 1.30	
TYC45–1241–1	02:27:05.45	+06:31:16.3	12.053 ± 0.040	11.347 ± 0.010	11.142 ± 0.020	9.678 ± 0.021		Visual
AG Tri A	02:27:29.25	+30:58:24.7	11.491 ± 0.050	10.300 ± 0.100	9.793 ± 0.040	7.079 ± 0.026	39.95 ± 3.58	
AG Tri B	02:27:28.05	+30:58:40.5	13.425 ± 0.700	...	11.855	7.921 ± 0.031		Physical (A and B in β Pic)
CD–44 753 Aa, Ab	02:30:32.41	–43:42:23.3	11.380 ± 0.050	10.309 ± 0.040	9.876 ± 0.050	7.230 ± 0.027	35.70	
CD–44 753 B	02:30:46.23	–43:43:49.3	13.244 ± 0.030	11.918 ± 0.010	11.326 ± 0.010	8.267 ± 0.034		Physical (Aa,Ab in β Pic)
CD–43 759	02:29:55.59	–43:19:07.8	11.267 ± 0.020	10.576	10.371	8.862 ± 0.023		Visual
2MASS J02292952–4321108	02:29:29.52	–43:21:10.8	16.941 ± 0.110	15.543 ± 0.030	14.953 ± 0.020	11.480 ± 0.021		Visual
DENIS J025344.4–795913	02:53:44.48	–79:59:13.3	17.989 ± 0.700	...	...	10.378 ± 0.021	28.89 ± 3.20	
2MASS J02441357–7919202	02:44:13.57	–79:19:20.2	17.360 ± 0.110	15.960 ± 0.120	15.309 ± 0.060	12.031 ± 0.023		Visual
c Eri A	04:37:36.13	–02:28:24.8	5.559 ± 0.990	5.250 ± 0.990	...	4.537 ± 0.024	29.43 ± 0.29	
c Eri Ca,Cb	04:37:37.47	–02:29:28.4	11.942 ± 0.010	10.534	10.069 ± 0.040	6.413 ± 0.018		Physical (A and Ca,Cb in β Pic)
V962 Per	04:43:56.87	+37:23:03.3	14.791 ± 0.090	13.317 ± 0.090	12.678 ± 0.060	8.800 ± 0.018	59.00 ± 5.00	
2MASS J04450683+3704056	04:45:06.83	+37:04:05.6	16.767 ± 0.090	15.621 ± 0.070	15.156 ± 0.030	12.390 ± 0.023		Visual
LDS 5606 A	04:48:00.86	+14:39:58.1	17.650 ± 0.010	16.654 ± 0.010	15.725 ± 0.010	10.730 ± 0.018	65.00 ± 6.00	
LDS 5606 B	04:48:02.58	+14:39:51.6	18.210 ± 0.160	...	16.096 ± 0.114	10.683 ± 0.018		Physical (A and B in β Pic)
V1005 Ori	04:59:34.83	+01:47:00.7	11.453 ± 0.040	10.060 ± 0.040	9.507 ± 0.080	6.261 ± 0.017	25.89 ± 1.70	
StKM 1–526	04:55:48.00	+02:02:07.5	12.753 ± 0.020	11.633 ± 0.030	11.156 ± 0.030	8.829 ± 0.021		Visual
CD–57 1054	05:00:47.15	–57:15:25.6	11.267 ± 0.010	10.210 ± 0.010	9.977 ± 0.010	6.244 ± 0.024	26.78 ± 0.81	
2MASS J05052576–5719046	05:05:25.76	–57:19:04.6	19.700 ± 0.700	...	...	14.135 ± 0.067		Visual
BD–21 1074A	05:06:49.92	–21:35:09.2	11.569 ± 0.040	10.092 ± 0.030	9.609 ± 0.080	6.117 ± 0.017	18.3 ± 0.70	
BD–21 1074Ba,Bb	05:06:49.47	–21:35:03.8	13.713 ± 0.990	11.706 ± 0.990	10.387 ± 0.042	6.113 ± 0.021		Physical (A and Ba,Bb in β Pic)
2MASS J05071096–2156441	05:07:10.96	–21:56:44.1	20.314 ± 0.700	...	...	13.423 ± 0.039	18.3 ± 0.70	Visual
1RXS J050712.4+143024	05:07:11.37	+14:30:01.3	17.454 ± 0.130	15.727 ± 0.010	15.090 ± 0.020	9.663 ± 0.023	51.20 ± 7.00	
2MASS J05080140+1403539	05:08:01.40	+14:03:53.9	20.215 ± 0.700	...	18.055 ± 0.007	13.451 ± 0.030		Visual
TYC 112–917–1	05:20:00.29	+06:13:03.6	12.802 ± 0.040	11.659 ± 0.030	11.201 ± 0.060	8.573 ± 0.020	68.50	
2E 1249 AB	05:20:31.83	+06:16:11.5	13.015 ± 0.040	11.869 ± 0.020	11.413 ± 0.030	8.567 ± 0.019	69.69	Physical candidate (A and BC in β Pic)

Table A.4. continued.

Simbad name	α (J2000)	δ (J2000)	B [mag]	V [mag]	r' [mag]	K_s [mag]	d [pc]	Photometric status
AF Lep AB	05:27:04.77	–11:54:03.3	6.954 ± 0.990	6.362 ± 0.990	...	4.926 ± 0.021	27.04 ± 0.35	
2MASS J05244065–1233402	05:24:40.65	–12:33:40.2	19.755 ± 0.700	...	...	13.451 ± 0.033		Visual
1RXS J072931.4+355607 AB	07:29:31.09	+35:56:00.4	13.345 ± 0.010	11.876 ± 0.030	11.276 ± 0.020	7.796 ± 0.024	42.20 ± 4.00	
2MASS J07293670+3554531	07:29:36.70	+35:54:53.1	15.585 ± 0.020	14.112 ± 0.050	13.515 ± 0.040	9.560 ± 0.018		Physical (AB in β Pic)
[SLS2012] PYC J08290+1125	08:29:04.12	+11:25:05.4	13.600 ± 0.040	12.244 ± 0.020	11.694 ± 0.040	8.758 ± 0.025	58.79 ± 8.50	
2MASS J08274412+1122029	08:27:44.12	+11:22:02.9	14.885 ± 0.040	13.467 ± 0.020	12.906 ± 0.020	9.864 ± 0.019		Physical candidate (A in β Pic)
HD 82939 Ba,Bb	09:36:15.91	+37:31:45.5	12.453 ± 0.010	11.015 ± 0.010	10.416 ± 0.010	7.235 ± 0.018	33.75 ± 2.60	
HD 82939 A	09:36:04.28	+37:33:10.4	9.184 ± 0.990	8.324 ± 0.990	8.052 ± 0.001	6.511 ± 0.027	38.65 ± 1.45	Physical (Ba,Bb in β Pic)
2MASS J09372954+3749458	09:37:29.54	+37:49:45.8	14.029 ± 0.020	12.757 ± 0.140	12.191 ± 0.040	9.656 ± 0.017		Visual
2MASS J09365772+3758354	09:36:57.72	+37:58:35.4	19.869 ± 0.700	...	18.254 ± 0.007	13.670 ± 0.040		Visual
HD 95174 A	10:59:38.31	+25:26:15.5	9.171 ± 0.030	8.465 ± 0.100	14.295 ± 0.011	5.840 ± 0.053	22.60 ± 2.00	
HD 95174 B	10:59:38.68	+25:26:13.7	10.564	9.218	7.598 ± 0.001	5.978 ± 0.021		Physical (A and B in β Pic)
BD+26 2148	10:56:04.06	+25:41:17.2	10.090 ± 0.010	9.369 ± 0.050	9.100 ± 0.020	7.547 ± 0.018		Visual
2E 2613	12:11:53.09	+12:49:13.5	14.020 ± 0.100	12.546 ± 0.040	11.930 ± 0.030	8.663 ± 0.024	62.70 ± 8.19	
2MASS J12120849+1248050	12:12:08.49	+12:48:05.0	13.923 ± 0.100	12.538 ± 0.060	11.937 ± 0.060	8.916 ± 0.020		Physical candidate (A in β Pic)
TYC 4634–1184–1	14:12:49.93	+84:01:31.2	13.279 ± 0.090	11.994 ± 0.030	11.515 ± 0.060	8.774 ± 0.022	57.90 ± 9.69	
2MASS J14192861+8426534	14:19:28.61	+84:26:53.4	20.194 ± 0.700	...	...	13.001 ± 0.036		Visual
2MASS J14040157+8405075	14:04:01.57	+84:05:07.5	19.534 ± 0.700	...	...	13.902 ± 0.066		Visual
MV Vir Aa,Ab,B	14:14:21.36	–15:21:21.7	11.482 ± 0.040	10.222 ± 0.060	9.939 ± 0.030	6.600 ± 0.023	30.20 ± 4.50	
MV Vir C	14:14:17.00	–15:21:12.7	15.586 ± 0.060	13.937 ± 0.050	13.342 ± 0.020	8.824 ± 0.019		Physical (Aa,Ab,B in β Pic)
TYC 4571–1414–1	16:17:11.35	+77:33:47.8	13.556 ± 0.030	12.129 ± 0.010	11.816 ± 0.010	8.653 ± 0.016	65.00 ± 13.50	
2MASS J16170673+7734028	16:17:06.73	+77:34:02.8	20.450 ± 0.700	...	...	12.228 ± 0.019		Physical candidate (A in β Pic)
1RXS J164302.3–175418	16:43:01.28	–17:54:27.4	14.225 ± 0.700	...	11.948 ± 0.020	8.548 ± 0.025	59.20 ± 2.80	
2MASS J16425150–1814492	16:42:51.50	–18:14:49.2	16.504 ± 0.700	...	14.628	11.729 ± 0.026		Visual
V824 Ara Aa,Ab	17:17:25.51	–66:57:03.9	7.876 ± 0.990	6.960 ± 0.990	...	4.702 ± 0.016	31.45 ± 4.94	
V824 Ara B	17:17:31.29	–66:57:05.6	14.36* ± 0.700	12.82	...	7.629 ± 0.018		Physical (Aa,Ab and B in β Pic)
1RXS J172919.1–501454 AB	17:29:20.67	–50:14:52.9	14.319 ± 0.010	12.810 ± 0.010	12.237 ± 0.010	7.994 ± 0.027	64.00 ± 5.00	
2MASS J17270839–5023572	17:27:08.39	–50:23:57.2	15.000 ± 0.700	...	...	12.930 ± 0.044		Visual
V4046 Sgr AB	18:14:10.48	–32:47:34.4	11.662 ± 0.990	10.769 ± 0.990	9.966 ± 0.031	7.249 ± 0.020	73 ± 18	
V4046 Sgr C	18:14:22.07	–32:46:10.1	14.020 ± 0.700	...	12.193 ± 0.038	8.539 ± 0.023		Physical (AB and C in β Pic)
1RXS J184206.5–555426	18:42:06.95	–55:54:25.5	15.161 ± 0.220	13.602 ± 0.190	13.024 ± 0.150	8.583 ± 0.020	54.00 ± 5.00	
2MASS J18420483–5554126	18:42:04.83	–55:54:12.6	16.826 ± 0.190	15.411 ± 0.100	...	9.852 ± 0.021		Physical (A in β Pic)
HD 172555 A	18:45:26.91	–64:52:16.5	5.024 ± 0.990	4.798 ± 0.990	...	4.297 ± 0.031	28.54 ± 0.16	
HD 172555 Ba,Bb	18:45:37.05	–64:51:46.1	10.517 ± 0.140	9.432 ± 0.050	9.154 ± 0.020	6.096 ± 0.027	29.23 ± 0.60	Physical (A and Ba,Bb in β Pic)
Smethells 20 (HD 173167 B)	18:46:52.56	–62:10:36.7	13.300 ± 0.040	11.831 ± 0.020	11.204 ± 0.020	7.854 ± 0.024	54.00 ± 3.00	
HD 173167 A	18:48:06.36	–62:13:47.0	7.836 ± 0.990	7.337 ± 0.990	...	6.136 ± 0.023		Physical candidate (B in β Pic)
2MASS J18452867–6236003	18:45:28.67	–62:36:00.3	17.722 ± 0.170	16.066 ± 0.010	15.474 ± 0.020	12.005 ± 0.023		Visual
PZ Tel Aa,Ab	18:53:05.87	–50:10:50.0	9.402 ± 0.990	8.503 ± 0.990	...	6.366 ± 0.024	51.49 ± 2.59	
CD–50 12186	18:52:49.76	–50:14:37.0	11.248	10.586 ± 0.030	10.411 ± 0.010	9.059 ± 0.023		Visual
TYC 6872–1011–1	18:58:04.15	–29:53:04.6	13.069 ± 0.040	11.800 ± 0.020	11.267 ± 0.020	8.017 ± 0.021	76.00 ± 5.00	
2MASS J18580464–2953320	18:58:04.66	–29:53:32.2	15.104 ± 0.700	...	13.097 ± 0.050	8.758 ± 0.023		Physical (A and B in β Pic)
η Tel AB	19:22:51.22	–54:25:26.3	5.053 ± 0.990	5.032 ± 0.990	...	5.007 ± 0.033	48.22 ± 0.49	

Table A.4. continued.

Simbad name	α (J2000)	δ (J2000)	B [mag]	V [mag]	r' [mag]	K_s [mag]	d [pc]	Photometric status
η Tel C	19:22:58.95	–54:32:17.1	8.946 ± 0.100	8.760 ± 0.070	8.451 ± 0.010	5.909 ± 0.029	51.81 ± 1.74	Physical (AB and C in β Pic)
2MASS J19233074–5450090	19:23:30.74	–54:50:09.0	17.649 ± 0.700	...	...	12.064 ± 0.026		Visual
1RXS J192338.2–460631	19:23:38.20	–46:06:31.6	13.189 ± 0.020	11.876 ± 0.020	11.298 ± 0.010	8.272 ± 0.027	70.00 ± 4.00	
2MASS J19251419–4553480	19:25:14.19	–45:53:48.0	13.590 ± 0.010	12.810 ± 0.010	12.579 ± 0.010	10.941 ±		Visual
2MASS J19230177–4603243	19:23:01.77	–46:03:24.3	18.829 ± 0.700	...	...	12.920 ± 0.037		Visual
HDE 331149 A	19:43:37.90	+32:25:12.5	12.215 ± 0.990	10.897 ± 0.990	10.020 ± 0.015	7.178 ± 0.017	37.59 ± 8.30	
HDE 331149 B	19:43:36.74	+32:25:20.8	11.880 ± 0.700	...	10.678 ± 0.056	8.081 ± 0.018		Physical (A in β Pic)
2MASS J19541276–5711271	19:54:12.76	–57:11:27.1	18.020 ± 0.700	...	...	10.925 ± 0.025	35.40 ± 3.20	
2MASS J19490300–5653427	19:49:03.00	–56:53:42.7	17.729 ± 0.700	...	...	12.840 ± 0.029		Visual
TYC 7443–1102–1	19:56:04.38	–32:07:37.6	13.008 ± 0.020	11.588 ± 0.020	10.982 ± 0.020	7.846 ± 0.021	55.00 ± 3.00	
1RXS J195602.8–320720 AB	19:56:02.94	–32:07:18.7	14.786 ± 0.030	13.229 ± 0.040	12.619 ± 0.030	8.114 ± 0.027		Physical (A and BC in β Pic)
1RXS J201001.0–280139 AB	20:10:00.02	–28:01:41.0	14.486 ± 0.010	12.987 ± 0.020	12.352 ± 0.020	7.732 ± 0.027	48.00 ± 3.09	
2MASS J20085122–2740536	20:08:51.22	–27:40:53.6	17.959 ± 0.700	...	15.755 ± 0.201	11.779 ± 0.023		Visual
AU Mic	20:45:09.49	–31:20:26.7	10.062 ± 0.020	8.887 ± 0.180	8.635 ± 0.090	4.528 ± 0.020	9.90 ± 0.10	
AU Mic BC (AT Mic AB)	20:41:51.12	–32:26:07.3	11.790 ± 0.090	10.333 ± 0.030	9.727 ± 0.010	4.943 ± 0.042	10.69 ± 0.42	Physical (A and BC in β Pic)
HD 199143 AB	20:55:47.68	–17:06:51.0	7.949 ± 0.990	7.392 ± 0.990	...	5.810 ± 0.020	45.59 ± 1.60	
HD 199143 CD (AZ Cap AB)	20:56:02.75	–17:10:53.9	11.859 ± 0.990	10.732 ± 0.990	9.873	7.039 ± 0.020		Physical (AB and CD in β Pic)
EUVE J2110–19.3	21:10:05.36	–19:19:57.4	13.173 ± 0.040	11.750 ± 0.040	11.152 ± 0.050	7.196 ± 0.017	32.00 ± 2.00	
BPS CS 22898–0066	21:10:04.60	–19:20:30.3	14.673 ± 0.020	13.142 ± 0.040	12.545 ± 0.010	7.552 ± 0.017		Physical (A in β Pic)
2MASS J21103147–2710578	21:10:31.47	–27:10:57.8	16.840 ± 0.080	15.145 ± 0.010	14.569 ± 0.010	9.411 ± 0.021	41.00 ± 3.00	
2MASS J21103096–2710513	21:10:30.96	–27:10:51.3	16.840 ± 0.080	15.145 ± 0.010	14.569 ± 0.010	10.236 ± 0.026	40.00 ± 2.00	Physical (A and B in β Pic)
2MASS J21094649–2728291	21:09:46.49	–27:28:29.1	15.574 ± 0.030	14.314 ± 0.010	13.704 ± 0.010	10.883 ± 0.023		Visual
V390 Pav A	21:21:24.49	–66:54:57.4	10.225 ± 0.990	9.038 ± 0.990	...	6.400 ± 0.017		
V390 Pav B	21:21:28.72	–66:55:06.3	11.961 ± 0.010	10.595 ± 0.010	...	7.008 ± 0.023	30.20 ± 1.30	Physical (A and B in β Pic)
1RXS J215518.2–004603	21:55:17.41	–00:45:47.8	17.340 ± 0.100	15.739 ± 0.010	15.128 ± 0.010	10.196 ± 0.021	47.00 ± 4.00	
2MASS J21551738–0046231	21:55:17.38	–00:46:23.1	17.278 ± 0.100	15.673 ± 0.010	15.038 ± 0.010	10.090 ± 0.021		Physical (B in β Pic)
LSPM J2240+0532	22:40:01.45	+05:32:16.3	19.134 ± 0.700	...	17.180	10.748 ± 0.021	23.60 ± 2.70	
HD 214786	22:40:27.22	+04:34:30.1	8.177 ± 0.990	6.947 ± 0.990	10.670 ± 0.008	4.275 ± 0.029		Visual
CPD–72 2713	22:42:48.96	–71:42:21.1	11.718 ± 0.030	10.423	...	6.894 ± 0.018	37.00 ± 2.00	
2MASS J22353683–7149426	22:35:36.83	–71:49:42.6	18.56* ± 0.32	17.87*	...	12.524 ± 0.021		Visual
2MASS J22372184–7118216	22:37:21.84	–71:18:21.6	17.85* ± 0.29	17.70*	...	12.793 ± 0.034		Visual
WW PsA A	22:44:57.94	–33:15:01.6	13.618 ± 0.030	12.099 ± 0.010	11.493 ± 0.020	6.932 ± 0.029	23.34 ± 1.97	
WW PsA B (TX PsA)	22:45:00.05	–33:15:25.8	14.989 ± 0.040	13.371 ± 0.020	12.777 ± 0.010	7.793 ± 0.026		Physical (A and B in β Pic)
AF Psc	23:31:44.93	–02:44:39.6	16.062 ± 0.070	14.562 ± 0.010	13.923 ± 0.010	8.666 ± 0.019	29.14 ± 2.64	
2MASS J23301129–0237227	23:30:11.30	–02:37:22.7	17.204 ± 0.700	...	15.090 ± 0.056	9.767 ± 0.019		Physical candidate (A in β Pic)

Table A.5. Common proper-motion companion candidates.

WDS identifier	Discovery name	Simbad name	α (J2000)	δ (J2000)	d [pc]	M_J [mag]	Sp. type	ρ [arcsec]	θ [deg]	s [10^3 au]	$\mathcal{M}$ [$M_\odot$]	$-U_g^*$ [10^{33} J]	Comments
		Our common proper-motion candidates											
01376–0645		EX Cet	01:37:35.47	–06:45:37.5	23.95 ± 0.42	4.32 ± 0.04	G5 V				0.92		
	CAB 3	LP 648–20 (EX Cet B)	01:36:55.17	–06:47:37.9		7.81 ± 0.04	M3.5 V	612.1	259	15	0.12	13	In AF11, 1 new star, Her-Lyr?
02017+0117		[SLS2012] PYC J02017+0117N	02:01:46.78	+01:17:16.2	63.7 ± 9.0	5.1 ± 0.3	...				0.73		
	New	[SLS2012] PYC J02017+0117S	02:01:46.93	+01:17:06.0		5.1 ± 0.3	...	10.48	167	0.67	0.71	1400	...
05200+0613		TYC 112–917–1	05 20 00.29	+06 13 03.6	68.5	5.15 ± 0.03	K3				0.70		
	New	2E 1249 AB	05 20 31.83	+06 16 11.5		5.07 ± 0.02	K3	506.2	248	35	0.66+0.15	28	...
08290+1125		[SLS2012] PYC J08290+1125	08:29:04.12	+11:25:05.4	58.8 ± 8.5	5.7 ± 0.3	...				0.50		
	New	2MASS J08274412+1122029	08:27:44.12	+11:22:02.9		6.9 ± 0.3	...	1190	261	70	0.21	2.7	1 new star, co-moving?
12118+1249		2E 2613	12:11:53.09	+12:49:13.5	62.7 ± 8.2	5.5 ± 0.3	m1:				0.59		
	New	2MASS J12120849+1248050	12:12:08.49	+12:48:05.0		5.7 ± 0.3	m0:	235.5	107	15	0.50	35	1 new star
16172+7734		TYC 4571–1414–1	16:17:11.48	+77:33:47.8	65.0 ± 13.5	5.4 ± 0.4	m0:				0.60		
	New	2MASS J16170673+7734028	16:17:06.73	+77:34:02.8		9.0 ± 0.4	...	21.22	315	1.4	0.05	36	1 new star, AB Dor?
18481–6214		HD 173167 A	18:48:06.36	–62:13:47.0		2.75 ± 0.12	F5 V				1.32		
	CAB 8	Smethells 20 (HD 173167 B)	18:46:52.56	–62:10:36.7	54 ± 3	5.08 ± 0.12	M1 Ve	550.4	290	30	0.72	57	In AF11, 1 new star
23317–0245		AF Psc	23:31:44.93	–02:44:39.6	29.2 ± 2.6	7.18 ± 0.19	M4.5				0.18		
	New	2MASS J23301129–0237227	23:30:11.30	–02:37:22.7		8.32 ± 0.19	M6.0	1469	287	43	0.08	0.57	1 new star, co-moving?
		Previously known systems											
00197+1951		RX J0019.7+1951	00:19:43.04	+19:51:11.7	59.4 ± 7.9	6.8 ± 0.3	M4				0.22		
	GWP 40	2MASS J00193931+1951050	00:19:39.31	+19:51:05.1		7.0 ± 0.3	M4	52.95	263	3.2	0.19	24	1 new star
00279–3235		GJ 2006 A	00:27:50.23	–32:33:06.0	33.2 ± 2.8	6.28 ± 0.19	M4.0				0.34		
	LDS 18	GJ 2006 B	00:27:50.35	–32:33:23.8		6.37 ± 0.18	M3.5	17.83	175	0.59	0.31	310	...
02174+2845		HD 14082 A	02:17:25.27	+28:44:42.3	34.5 ± 3.4	3.4 ± 0.2	F5 V				1.11		
	STF 239	HD 14082 B	02:17:24.73	+28:44:30.5		3.9 ± 0.2	G2 V	13.80	211	0.48	0.91	3800	...
02274+3059		AG Tri A	02:27:29.25	+30:58:24.7	40.0 ± 3.6	4.9 ± 0.2	K7 V				0.79		
	INN 1	AG Tri B	02:27:28.05	+30:58:40.5		5.8 ± 0.2	M0	22.11	316	0.88	0.47	75	...
02305–4342		CD–44 753 Aa, Ab	02:30:32.41	–43:42:23.3	35.7	5.26 ± 0.03	K5 V(e)				0.49+0.37		
	SKF 1427	CD–44 753 B	02:30:46.23	–43:43:49.3		6.38 ± 0.02	...	172.9	120	6.2	0.31	76	1 new star, Columba?
04376–0228		*c* Eri A	04:37:36.13	–02:28:24.8	29.43 ± 0.29	2.40 ± 0.04	F0 IV				1.57		
	WAL 32	*c* Eri Ca, Cb	04:37:37.47	–02:29:28.4		4.96 ± 0.03	m0.0+m3.0	66.48	163	2.0	0.67+0.44	1600	...
04481+1441		LDS 5606 A	04:48:00.86	+14:39:58.1	65.0 ± 6	7.6 ± 0.2	M5.0e				0.14		
	LDS 5606	LDS 5606 B	04:48:02.58	+14:39:51.6		7.6 ± 0.2	M5.0e	25.86	105	1.7	0.14	19	...
05069–2135		BD–21 1074A	05:06:49.92	–21:35:09.2	18.3 ± 0.7	5.73 ± 0.09	M1.5 V				0.52		
	DON 93	BD–21 1074Ba, Bb	05:06:49.47	–21:35:03.8		5.69 ± 0.09	M2.5+M5:	8.218	311	0.15	0.31+0.21	3200	...
07295+3556		1RXS J072931.4+355607 AB	07:29:31.09	+35:56:00.4	42.2 ± 4.0	5.5 ± 0.2	m1 V+m3 V				0.54+0.29		
	UC 1586	2MASS J07293670+3554531	07:29:36.70	+35:54:53.1		7.2 ± 0.2	m3:	95.83	135	4.0	0.17	62	1 new star
08228–5727		L 186–67 Aa, Ab	08:22:47.45	–57:26:53.0	11.1 ± 3.3	8.4 ± 0.6	m4.5 V+m5.5 V				0.18+0.14		
	LDS 217	L 186–67 B	08:22:47.99	–57:26:48.1		10.0 ± 0.6	m:	8.589	23	0.10	0.02	110	1 new star, field?
09361+3733		HD 82939 A	09:36:04.28	+37:33:10.4	38.7 ± 1.4	3.94 ± 0.08	G5 V				1.01		
	SKF 254	HD 82939 Ba, Bb	09:36:15.91	+37:31:45.5		5.15 ± 0.08	M2 V+M2 V	162.3	121	6.3	0.38+0.38	220	1 new star, young field?
10596+2527		HD 95174 A	10:59:38.31	+25:26:15.5	22.6 ± 2.0	4.7 ± 0.19	K2				0.84		
	AG 342	HD 95174 B	10:59:38.68	+25:26:13.7		4.8 ± 0.2	K5	5.282	108	0.12	0.79	9800	...
14144–1521		MV Vir Aa, Ab, B	14:14:21.36	–15:21:21.7	30.2 ± 4.5	5.0 ± 0.3	K5.5 Vke				0.52+0.31+0.39		
	LDS 483	MV Vir C	14:14:17.00	–15:21:12.7		7.3 ± 0.3	M3.5	64.33	278	1.9	0.17	190	1 new star

Table A.5. continued.

WDS identifier	Discovery name	Simbad name	α (J2000)	δ (J2000)	d [pc]	M_J [mag]	Sp. type	ρ [arcsec]	θ [deg]	s [10^3 au]	$\mathcal{M}$ [$M_\odot$]	$-U_g^*$ [10^{33} J]	Comments
17174–6657		V824 Ara Aa, Ab	17:17:25.50	–66:57:03.7	31.4 ± 4.9	2.8 ± 0.3	G5 IV+K0 IV–V				1.10+1.00		
	CVN 55	V824 Ara B	17:17:31.29	–66:57:05.6		6.0 ± 0.3	M3 Ve	33.96	93	1.1	0.40	1400	...
18141–3248		V4046 Sgr AB	18:14:10.48	–32:47:34.4	73 ± 18	3.8 ± 0.5	K5+K7				0.91+0.88		
	...	V4046 Sgr C	18:14:22.07	–32:46:10.1		5.1 ± 0.5	M1 Ve	168.8	60	12	0.71	182	Not in WDS
18421–5554		1RXS J184206.5–555426	18:42:06.95	–55:54:25.5	54.0 ± 5.0	5.8 ± 0.2	M3.5				0.47		
	UC 3646	2MASS J18420483–5554126	18:42:04.83	–55:54:12.6		7.0 ± 0.2	M4.5	21.92	306	1.2	0.20	140	1 new star
18454–6452		HD 172555 A	18:45:26.91	–64:52:16.5	28.55 ± 0.16	2.1 ± 0.3	A7 V				1.75		
	SKF 105	HD 172555 Ba, Bb	18:45:37.05	–64:51:46.1		4.63 ± 0.02	K5 Ve	71.38	65	2.0	0.83+0.21	1600	...
18581–2953		TYC 6872–1011–1	18:58:04.15	–29:53:04.6	76 ± 5	4.46 ± 0.14	M0 Ve				0.90		
	SKF 1507	2MASS J18580464–2953320	18:58:04.66	–29:53:32.2		5.22 ± 0.14	...	28.18	167	2.1	0.72	530	...
19229–5425		η Tel AB	19:22:51.22	–54:25:26.3	48.2 ± 0.5	1.68 ± 0.04	A0 V+M7–8 V				2.40+0.05		
	TOK 331	η Tel C	19:22:58.95	–54:32:17.1		2.78 ± 0.03	F6 V	416.3	171	20	1.40	300	...
19437+3225		HDE 331149 A	19:43:37.90	+32:25:12.5	37.6 ± 8.3	5.1 ± 0.5	K0				0.72		
	HJ 1433	HDE 331149 B	19:43:36.74	+32:25:20.8		6.0 ± 0.5	...	16.82	299	0.63	0.43	860	1 new star
19561–3208		TYC 7443–1102–1	19:56:04.38	–32:07:37.6	55 ± 3	5.01 ± 0.12	K9 IVe				0.74		
	UC 4054	1RXS J195602.8–320720 AB	19:56:02.94	–32:07:18.7		5.26 ± 0.12	M4	26.30	316	1.4	0.50+0.38	790	...
20452–3120		AU Mic	20:45:09.49	–31:20:26.7	9.91 ± 0.10	5.46 ± 0.03	M1 Ve				0.45		
	LDS 720	AU Mic BC (AT Mic AB)	20:41:51.12	–32 26 07.3		5.83 ± 0.03	M4 Ve	4681	212	46	0.52	8.9	...
20558–1707		HD 199143 AB	20:55:47.68	–17:06:51.0	45.7 ± 1.6	2.91 ± 0.08	F7V+M2				1.25+0.60		
	TOK 343	HD 199143 CD (AZ Cap AB)	20:56:02.75	–17:10:53.9		4.55 ± 0.08	K7	325.1	138	15	0.90+0.55	320	...
21100–1920		EUVE J2110–19.3	21:10:05.36	–19:19:57.4	32 ± 2	5.59 ± 0.14	M2				0.55		
	LDS 734	BPS CS 22898–0066	21:10:04.60	–19:20:30.3		5.90 ± 0.14	...	34.44	198	1.1	0.44	390	1 new star
21105–2711		2MASS J21103147–2710578	21:10:31.47	–27:10:57.8	41 ± 3	7.23 ± 0.16	M4.5				0.17		
	BRG 32	2MASS J21103096–2710513	21:10:30.96	–27:10:51.3		8.14 ± 0.16	M5	9.474	313	0.39	0.08	67	...
21214–6655		V390 Pav A	21:21:24.49	–66:54:57.4	33.1 ± 1.5	4.43 ± 0.10	K2 V				0.85		
	HJ 5255	V390 Pav B	21:21:28.72	–66:55:06.3		5.28 ± 0.10	K7 V	26.63	110	0.80	0.59	1100	Tuc-Hor?
21553–0046		2MASS J21551738–0046231	21:55:17.38	–00:46:23.1	47 ± 4	7.62 ± 0.19	m5e				0.14		
	CBL 536	1RXS J215518.2–004603	21:55:17.41	–00:45:47.8		7.73 ± 0.19	M4.5	35.34	0	1.7	0.12	18	1 new star
22450–3314		WW PsA A	22:44:57.94	–33:15:01.6	23.3 ± 2.0	5.95 ± 0.19	M4 IVe				0.43		
	LDS 793	WW PsA B (TX PsA)	22:45:00.05	–33:15:25.8		6.84 ± 0.19	M5 IVe	35.91	132	0.84	0.22	200	...