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# A spectroscopy study of nearby late-type stars, possible members of stellar kinematic groups⋆,⋆⋆,⋆⋆⋆

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**ABSTRACT**

*Context.* Nearby late-type stars are excellent targets for seeking young objects in stellar associations and moving groups. The origin of these structures is still misunderstood, and lists of moving group members often change with time and also from author to author. Most members of these groups have been identified by means of kinematic criteria, leading to an important contamination of previous lists by old field stars.

*Aims.* We attempt to identify unambiguous moving group members among a sample of nearby-late type stars by studying their kinematics, lithium abundance, chromospheric activity, and other age-related properties.

*Methods.* High-resolution echelle spectra ($R \sim 57\,000$) of a sample of nearby late-type stars are used to derive accurate radial velocities that are combined with the precise Hipparcos parallaxes and proper motions to compute galactic-spatial velocity components. Stars are classified as possible members of the classical moving groups according to their kinematics. The spectra are also used to study several age-related properties for young late-type stars, i.e., the equivalent width of the lithium Li I 6707.8 Å line or the $R'_{\rm HK}$ index. Additional information like X-ray fluxes from the ROSAT All-Sky Survey or the presence of debris discs is also taken into account. The different age estimators are compared and the moving group membership of the kinematically selected candidates are discussed.

*Results.* From a total list of 405 nearby stars, 102 have been classified as moving group candidates according to their kinematics. i.e., only ~25.2% of the sample. The number reduces when age estimates are considered, and only 26 moving group candidates (25.5% of the 102 candidates) have ages in agreement with the star having the same age as an MG member.

**Key words.** stars: late-type – stars: kinematics and dynamics – open clusters and associations: general

## 1. Introduction

The past years have been very productive in identifying small associations and kinematic groups of young late-type stars in the solar vicinity. Although the study of moving groups (MGs) goes back more than one century, their origin and evolution remain still unclear, and this term is commonly used in the literature to indicate any system of stars sharing a common spatial motion. The best-studied MGs are the so-called *classical* MGs. Examples are Castor, IC 2391, Ursa Major, the Local Association and the Hyades (e.g. Montes et al. 2001b; López-Santiago et al. 2006, 2009, 2010, and references therein).

In the classical theory of MGs developed by Eggen (Eggen 1994), moving groups are the *missing link* between stars in open clusters and associations on one hand and field stars on the other. Open clusters are disrupted by the gravitational interaction with massive objects in the Galaxy (like giant molecular clouds), and as a result, the open cluster members are stretched out into a "tube-like" structure and dissolve after several galactic orbits. The result of the stretching is that the stars appear, if the Sun happens to be inside the "tube", all over the sky, but they may be identified as a group through their common space velocity.

Clusters disperse on time scales of a few hundred years (Wielen 1971); therefore, most of these groups should be moderately young (~50–650 Myr). However, Eggen's hypothesis is controversial and some of the MGs may also be the result of resonant dynamical structures. For instance, Famaey et al. (2007) studied a large sample of stars in the Hyades MG, and determined that it is a mixture of stars evaporated from the Hyades cluster and a group of older stars trapped at a resonance. MGs may also be produced by the dissolution of larger stellar aggregates, such as stellar complexes or fragments of old spiral arms.

The *young* MGs (8–50 Myr) are probably the most immediate dissipation products of the youngest associations. Examples of such associations are TW Hya, $\beta$ Pic, AB Dor, $\eta$ Cha, $\epsilon$ Cha, Octans, Argus, the Great Austral complex (GAYA), and

⋆ Based on observations collected at the Centro Astronómico Hispano Alemán (CAHA) at Calar Alto, operated jointly by the Max-Planck Institut für Astronomie and the Instituto de Astrofísica de Andalucía (CSIC) and observations made with the Italian Telescopio Nazionale Galileo (TNG) operated on the island of La Palma by the Fundación Galileo Galilei of the INAF (Istituto Nazionale di Astrofisica) at the Spanish Observatorio del Roque de los Muchachos of the Instituto de Astrofísica de Canarias.

⋆⋆ Appendices and Tables 1, 5–15 are available in electronic form at http://www.aanda.org

⋆⋆⋆ Table 1 is also available in electronic form at the CDS via anonymous ftp to cdsarc.u-strasbg.fr (130.79.128.5) or via http://cdsarc.u-strasbg.fr/viz-bin/qcat?J/A+A/521/A12 the Hercules-Lyra association (Zuckerman & Song 2004; Torres et al. 2008; Fuhrmann 2004; López-Santiago et al. 2006; Montes 2010). Some of the young MGs are in fact related to star-forming regions like the Scorpius-Centaurs-Lupus complex (Zuckerman & Song 2004), Ophiuchus or Corona Australis (Makarov 2007).

The availability of accurate parallaxes provided by the Hipparcos satellite became a milestone in the study of MGs. Statistical, unbiased studies of large samples of stars have confirmed the existence of the classical MGs and have given rise to new clues and theories about the origin of such structures. Examples of these studies are those by Chereul et al. (1999), Asiain et al. (1999), Skuljan et al. (1999), and Antoja et al. (2008).

Identifying a star or group of stars as members of an MG is not a trivial task, and in fact, lists of members change among different works. Most members of MGs have been identified by means of kinematic criteria; however, this is not sufficient since many old stars can share the same spatial motion of those stars in MGs. For example, López-Santiago et al. (2009) show that among previous lists of Local Association members, roughly 30% are old field stars. The membership issue can be partially solved if high-resolution spectroscopy is used. Recent studies have shown that stars belonging to a given MG share similar spectroscopic properties (e.g. Montes et al. 2001a; López-Santiago et al. 2009, 2010). These studies exploit the many advantages of the nearby late-type stars. First, spectra of late-type stars are full of narrow absorption lines, allowing determination of accurate radial velocities. In addition, it is unlikely that an old star by chance shares chromospheric indices or a lithium abundance similar to those of young solar-like stars, which provides means for assessing the likelihood of membership of a given star that are independent of its kinematics (e.g. Soderblom & Mayor 1993b).

In this paper we present a search for classical MG members by analysing the kinematic and spectroscopic properties of a sample of nearby late-type stars. Section 2 describes the stellar sample and the observations and data reduction are described in Sect. 3. A detailed analysis of the kinematic properties of the stars is given in Sect. 4. Age indicators for solar-like stars are analysed in Sect. 5. A combination of the results from Sects. 4 and 5 is used in Sect. 6 to analyse the MG membership of the stars. Section 7 summarizes our results.

## 2. The stellar sample

Our reference stellar sample consists of main-sequence (luminosity classes V/IV-V) FGK stars located at distances less than 25 pc. The stars have been selected from the the Hipparcos catalogue (ESA 1997), since it constitutes a homogeneous database especially for distance estimates – parallax errors are typically about 1 milliarcsec. In this work we have taken the revised parallaxes computed by van Leeuwen (2007) from Hipparcos' raw data. No other selection criteria have been applied to the sample.

The sample is most likely complete for FG-type stars; i.e., it constitutes a volume-limited sample since the Hipparcos catalogue is complete for these spectral types. In the case of K-type stars, Hipparcos is incomplete beyond ~15 pc; however, the number of the K-type stars is high enough for our purposes. The final selection contains 126, 220, and 477 stars of spectral types F, G and K respectively. In this contribution we present our first results for an observed subsample of 405 stars. The completeness of the observed sample can be seen in Fig. 1 where the

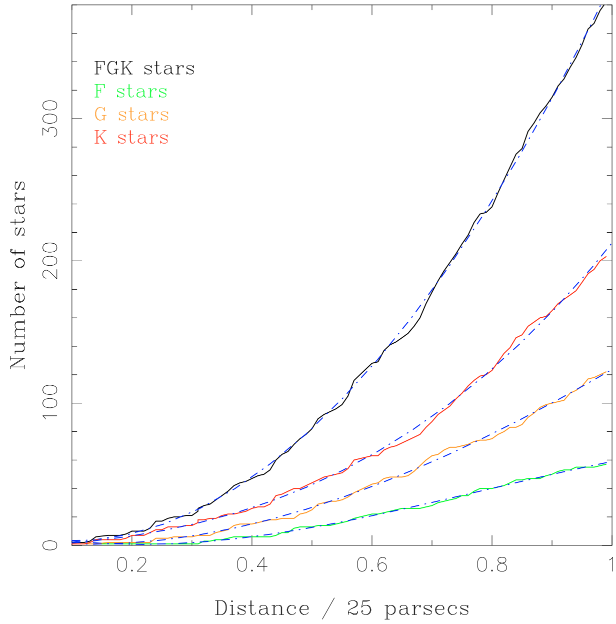


**Fig. 1.** Number of stars versus distance (normalized to 25 pc) for the F stars (green), G stars (orange), K stars (red) and for the observed 405 stars. Fits to cubic laws are plotted in blue.

number of objects is plotted as a function of distance, and the distribution fits well a cubic law, which indicates that they are homogeneously distributed. M-type stars have in principle been excluded from this study; nevertheless, six M-type stars, members or candidate member of MGs, which exhibit high levels of chromospheric activity and are suspected to be young, have been included in order to better understand the properties of such stellar groups.

The observed stars are listed in Table 1, and Fig. 2 shows the HR diagram of the sample. Several stars are clearly under the main sequence: HIP 4845, HIP 42525, HIP 49986, HIP 57939, HIP 72981, and HIP 96285. Hipparcos' spectral types for these stars are quite similar to those reported in other catalogues such as Wright et al. (2003), Skiff (2009), or SIMBAD. Only for HIP 72981 is incomplete, giving simply "K:", whereas SIMBAD gives M1 and the most updated reference in Skiff (2009) gives M2. However, the colour index $B-V = 1.17$ suggests an early type, around K5. HIP 42525 is a star in a double system and has a large uncertainty in the parallax ($\sigma_\pi = \pm 15.51$ mas). Stars with uncertainties over 10 milliarcsec are identified with a symbol † in Table 1. The original selection (and therefore the observations) of the sample was made before the release of the revised Hipparcos parallaxes (van Leeuwen 2007), and some of our stars are now out of the 25 pc distance because their revised parallaxes are slightly smaller. These stars are identified with a symbol ‡ in Table 1. The most "extreme" case is HIP 1692 whose parallax has changed from $43.42 \pm 1.88$ mas to $3.23 \pm 1.43$ mas. This new parallax places the star in the giant branch as is clearly shown in Fig. 2 (square in the upper right corner).

## 3. Observations and data reduction

High-resolution spectra of 315 stars were obtained at the Calar Alto (Almería, Spain) and La Palma (Canary Islands, Spain)

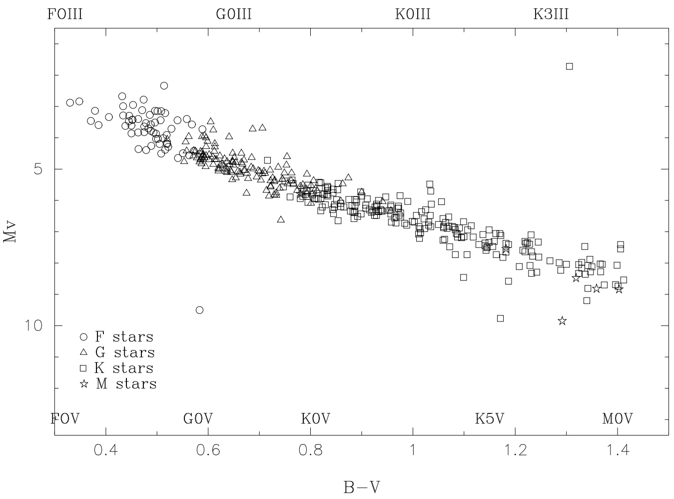


**Fig. 2.** HR Diagram for our sample of nearby late-type stars. F-type stars are plotted with circles; G-type stars with triangles; K-type stars with squares and M-type stars with stars.

observatories during eight observing runs. Some stars (the most active ones) were observed more than once.

The Calar Alto observations were taken with the fiber optics echelle spectrograph FOCES (Pfeiffer et al. 1998) attached at the Cassegrian focus of the 2.2 m telescope. FOCES spectra have a resolution of ~57 000 and cover a spectral range $\lambda\lambda$ 3800–10 000 Å. La Palma observations were done at the 3.56 m Telescopio Nazionale Galileo (TNG) using the cross dispersed echelle spectrograph SARG (Gratton et al. 2001). In this case the resolution and spectral range are ~57 000 and $\lambda\lambda$ 4960–10 110 Å, respectively. Further details are given in Table 2.

The spectra were reduced using the standard procedures in the IRAF[1] packages *imred, ccdred,* and *echelle*, i.e. overscan, scattered light correction, and flat-fielding. Spectral orders were extracted with the routine *apall* and were normalized using the IRAF task *continuum* in order to compare the intensity of the lines and to measure equivalent widths. Thorium-Argon spectra were used for wavelength calibration. Figure 3 shows examples of representative stars in different spectral regions.

Since observations were done from northern observatories, most targets have $\delta > -25°$. Therefore additional spectra from public libraries have also been analysed. Specifically, 90 spectra were taken from the public library "S$^4$N" (Allende Prieto et al. 2004), which contains spectra taken with the 2dcoudé spectrograph at Mc Donald Observatory and the FEROS instrument at the ESO 1.52 m telescope in La Silla. Both the resolution and the spectral range are similar to those of our own observations ($R$ ~ 57 000, $\lambda\lambda$ 3620–9210 Å). FEROS spectra contribute partially to covering for the lack of southern targets.

## 4. Kinematic analysis

### 4.1. Radial velocities

Radial velocities were measured by cross-correlating order by order, using the IRAF routine *fxcor*, the spectra of our programm stars with spectra of radial velocity standard stars of similar spectral types (Table 3), taken from Barnes et al. (1986), Beavers et al. (1979), and Udry et al. (1999a,b). Spectral orders with chromospheric features and prominent telluric lines were excluded when determining the mean radial velocity. Typical uncertainties are between 0.15 and 0.25 km s$^{-1}$, while maximum uncertainties are around 1–2 km s$^{-1}$. Column 9 of Table 1, gives our results for the radial velocities. A large number of stars in our sample (51) are known spectroscopic binaries and are listed in *The 9th catalogue of spectroscopic binaries* (Pourbaix et al. 2004, hereafter SB9) and *The 3rd Catalogue of Chromospherically Active Binary Stars* (Eker et al. 2008). They are identified in Table 1 with the label "Spec. Binary". For those stars we have considered the radial velocity of the centre of mass of the system.

We have compared our results with radial velocity estimates by Kharchenko et al. (2007, hereafter KH07), Nordström et al. (2004, hereafter NO04), Valenti & Fischer (2005, hereafter VF05), and Nidever et al. (2002, hereafter NI02). These values are also given in Cols. 10 to 13 of Table 1. Of the 405 stars in our sample, 366 are found in KH07, and the differences among the radial velocity values in that work and our results are less than 2 km s$^{-1}$ for 290 stars, i.e., 79.2% of the common stars. A comparison with the NO04 data shows that, for 215 out of 251 common stars (i.e. 85.6%), the corresponding differences between the radial velocities are less than 2 km s$^{-1}$. A similar result, 85.3% (177 out of the 151 common stars), is found when considering VF05 data. The comparison with NI02 is even better, because 179 out of 190 stars (i.e. 94.2%) show differences lower than 2 km s$^{-1}$.

Figure 4 illustrates these comparisons. One can see that the differences are slightly greater with KH07, likely because of the non-homogeneous origin of their radial velocities values, mainly taken from *The general catalogue or radial velocities* (Barbier-Brossat & Figon 2000).

### 4.2. Identification of moving group candidates

Soderblom & Mayor (1993a) argued that, in order to be convincingly classified as a kinematic group, a group of stars should be moving through space at the same rate and in the same direction, and they should share the same velocity in the direction of the Galactic rotation $V$. This is because while motions in $U$ and $W$ lead to oscillations of the star about the mean motion of the group, diffusion in $V$ removes the star from its cohort forever. However, stars identified as group members show different structures tilted in the $(U, V)$ plane, i.e., do not form flat bars o ellipses with small $\sigma_V$ (e.g. Skuljan et al. 1997), and therefore both $U, V$ velocity components must be used to define more realistic membership criteria.

**Table 2.** Observing runs between 2005 and 2008.

| Date | Instrument | Spectral range (Å) | Orders | Dispersion (Å/pixel) | *FWHM* (Å) |
|---|---|---|---|---|---|
| July 05 | FOCES | 3470–10 700 | 111 | 0.04–0.13 | 0.07–0.42 |
| Jan. 06 | FOCES | 3470–10 700 | 111 | 0.05–0.13 | 0.09–0.39 |
| Feb. 06 | SARG | 5600–10 000 | 50 | 0.02–0.04 | 0.09–0.14 |
| Dec. 06 | FOCES | 3640–10 700 | 106 | 0.05–0.13 | 0.09–0.22 |
| Jan. 07 | SARG | 5600–10 000 | 50 | 0.02–0.04 | 0.09–0.14 |
| Apr. 07 | SARG | 5600–10 000 | 50 | 0.02–0.04 | 0.10–0.13 |
| 07A$^{\ddagger}$ | FOCES | 3470–10 700 | 106 | 0.04–0.13 | 0.09–0.25 |
| Nov. 08 | SARG | 5600–10 000 | 50 | 0.02–0.04 | 0.09–0.14 |

**Notes.** $^{(\ddagger)}$ First semester 07. Service Mode.

[1] IRAF is distributed by the National Optical Astronomy Observatory, which is operated by the Association of Universities for Research in Astronomy, Inc., under contract with the National Science Foundation.

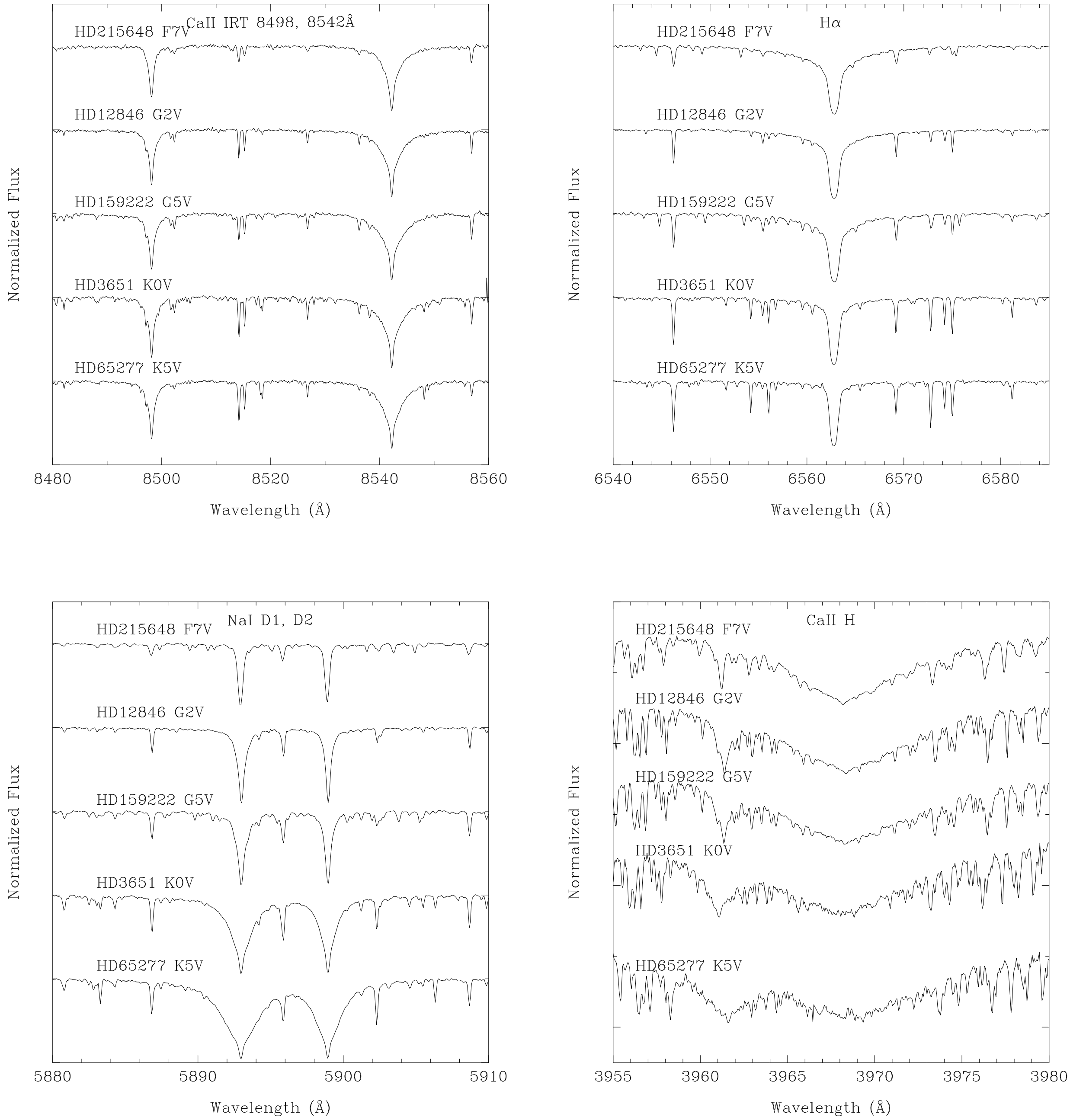


**Fig. 3.** FOCES spectra of representative stars in the Ca II IRT regions, $H\alpha$, Na I $D_1$, $D_2$, and Ca II H & K regions.

Galactic spatial-velocity components ($U, V, W$) were computed using our radial velocity results listed in Table 1, together with Hipparcos parallaxes (van Leeuwen 2007) and Tycho-2 proper motions (Høg et al. 2000). To compute ($U, V, W$) we followed the procedure of Montes et al. (2001b) who updated the original algorithm of Johnson & Soderblom (1987) to epoch J2000 in the International Celestial Reference System (ICRS) as described in Sect. 1.5 of The Hipparcos and Tycho Catalogues' (ESA 1997). To take the possible correlation between the astrometric parameters into account, the full covariance matrix was used in computing the uncertainties. To identify possible members of MGs we proceeded in two steps:

– *i) Selection of young stars.* Young stars are assembled in a specific region of the ($U, V$) plane with ($-50$ km s$^{-1}$ $< U <$ 20 km s$^{-1}$; $-30$ km s$^{-1}$ $<$ V $<$ 0 km s$^{-1}$), although the shape is not a square, see Fig. 5.
– *ii) Selection of possible members of MGs with small V dispersion.* Considering previous results (Skuljan et al. 1997, 1999; Montes et al. 2001b), a dispersion of 8 km s$^{-1}$ in the $U$, $V$ components with respect to the central position of the MG in the ($U, V$) plane is allowed. The same dispersion is considered when taking the $W$ component into account.

One hundred two stars of the sample have been classified as possible members of the different MGs: 29 for the Local Association, 29 for the Hyades, 18 for the Ursa Major, 19 for IC 2391, and 7 for Castor. Column 2 of Table 4 lists these numbers, while the specific stars are listed in Tables 9 to 13. Their contents are described in Appendix A. Another 78 stars have been selected as *young disc stars*. These stars are inside or in the boundaries that determine the young disc population, but their possible inclusion in one of the stellar kinematic groups is not clear. The identified young disc stars are given in Table 14.

**Table 3.** Radial velocity standard stars.

| Star | SpT | $V_r \pm \sigma_{V_r}$ (km s$^{-1}$) | Reference |
|---|---|---|---|
| HD 102870 | F8V | 4.30 | a |
| HD 50692 | G0V | −15.05 | a |
| HD 84737 | G0.5 | 6.0 ± 1.1 | b |
| HD 20630 | G5V | 18.0 ± 1.0 | b |
| HD 159222 | G5V | −51.60 | a |
| HD 82885 | G8III | 14.40 | a |
| HD 65583 | G8V | 14.80 | a |
| HD 144579 | G8V | −59.45 | a |
| HD 182488 | G8V | −21.55 | a |
| HD 102494 | G9IV | −22.1 ± 0.3 | c |
| HD 62509 | K0III | 3.2 ± 0.3 | c |
| HD 100696 | K0III | 0.2 ± 0.5 | b |
| HD 3651 | K0V | −32.96 ± 0.8 | b |
| HD 38230 | K0V | −29.25 | a |
| HD 136442 | K0V | −45.6 ± 0.8 | b |
| HD 92588 | K1IV | 43.5 ± 0.3 | d |
| HD 10476 | K1V | −33.9 ± 0.9 | b |
| HD 73667 | K1V | −12.10 | a |
| HD 124897 | K2III | −5.3 ± 0.3 | c |
| HD 4628 | K2V | −10.1 ± 0.4 | d |
| HD 82106 | K3V | 29.75 | a |
| HD 139323 | K3V | −67.20 | a |
| HD 29139 | K5III | 54.29 ± 0.2 | c |

**References.** a) Udry et al. (1999b); b) Barnes et al. (1986); c) Udry et al. (1999a); d) Beavers et al. (1979).

Figure 5 shows the $(U, V)$ and $(W, V)$ planes, usually known as Bottlinger's diagrams, for these stars.

### 4.3. Eggen's astrometric criteria

To test whether a star "belongs" to a kinematic group, Eggen tried to establish "strict" criteria for MG-membership (Eggen 1958, 1995). Eggen's criteria basically treat MGs, whose stars are extended in space, like open clusters whose stars are concentrated in space. Therefore, it is assumed that the total space velocities of the stars in the MG are parallel and move towards a common convergent point. The same relations of the moving-cluster method for the total and tangential velocities are applied, but taking into account only the components of the proper motion ($\mu$) oriented towards the convergence point ($\nu$) and the component of the proper motion oriented perpendicularly to the great circle between the star and the convergence point ($\tau$). The total ($V_{\rm T}$) and tangential velocity (denoted as Peculiar Velocity, *PV*, by Eggen) can be combined to define a predicted radial velocity ($\rho_{\rm c}$).

The first membership criterion, namely the *peculiar velocity criterion*, is to compare the proper motion of the candidate to the proper motion expected if the star were a member of the MG; i.e., the candidate is accepted as an MG member if the ratio $\tau/\nu$ or $PV/V_{\rm Total}$ is "sufficiently small". Eggen (1995) considered a candidate to be a member if its peculiar velocity is less than 10% of the total space velocity.

The second membership criterion, the *radial velocity criterion*, compares the observed and the predicted radial velocities. Eggen (1958) considered a star to be a member if the difference between both radial velocities is less than 4–8 km s$^{-1}$. A more detailed discussion of these criteria can be found in Montes et al. (2001b).

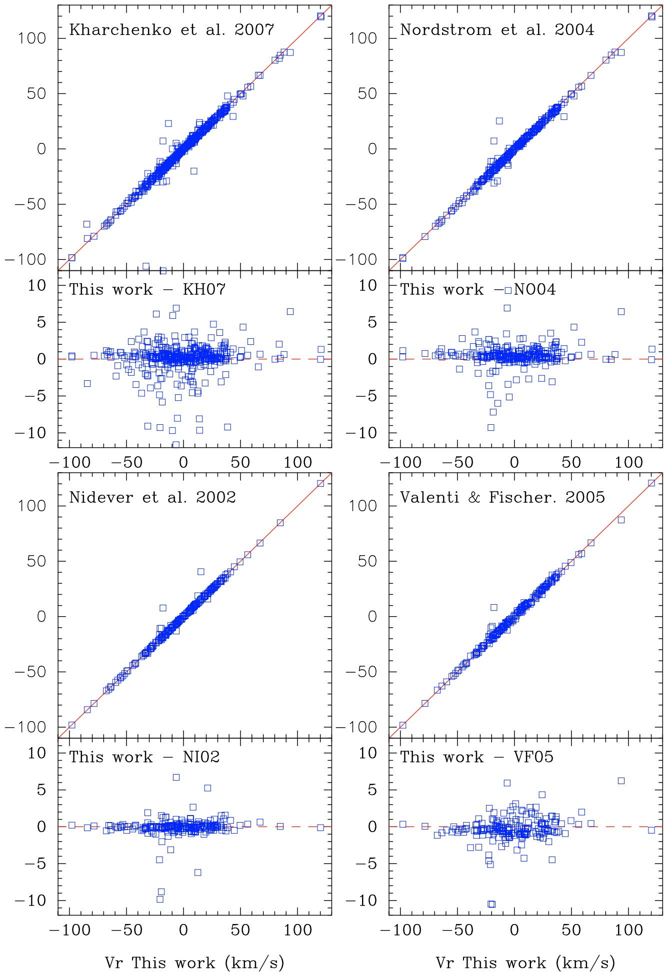


**Fig. 4.** Comparison of radial velocities taken from the literature and obtained in this work. *Top left panel*: Kharchenko et al. (2007); *top right panel*: Nordström et al. (2004); *bottom left panel*: Nidever et al. (2002); *bottom right panel*: Valenti & Fischer (2005)

**Table 4.** Number of MGs candidates according to Eggen's criteria.

| Group | Total stars | Both criteria | Only *PV* | Only $\rho_{\rm c}$ |
|---|---|---|---|---|
| Local association | 29 | 14 | 9 | 1 |
| IC 2391 | 19 | 3 | 7 | 5 |
| Castor | 7 | 2 | 0 | 4 |
| Ursa Major | 18 | 6 | 1 | 7 |
| Hyades SC | 29 | 9 | 5 | 9 |

Table 4 gives the number of stars in each MG that satisfy both criteria (Col. 3), only the peculiar velocity criterion (Col. 4), and only the radial velocity criterion (Col. 5). Only a low percentage of the MGs members selected in the previous section satisfies both criteria (from ≈49% in the Local Association to roughly 16% in the IC 2391 MG). The results for individual stars are given in Cols. 8 and 9 of Tables 9 to 13. For both *PV* (Col. 8) and $\rho_{\rm c}$ (Col. 9) criteria, there is a label, "Y" or "N", which indicates if the star satisfies the criteria.

Eggen's criteria are not conclusive since they assumed a constant *V* within the stars of a given MG. Anticipating some of the results in Sect. 6, some stars for which both age estimates and $(U, V, W)$ components indicate that they are probable MG members do not satisfy these criteria.

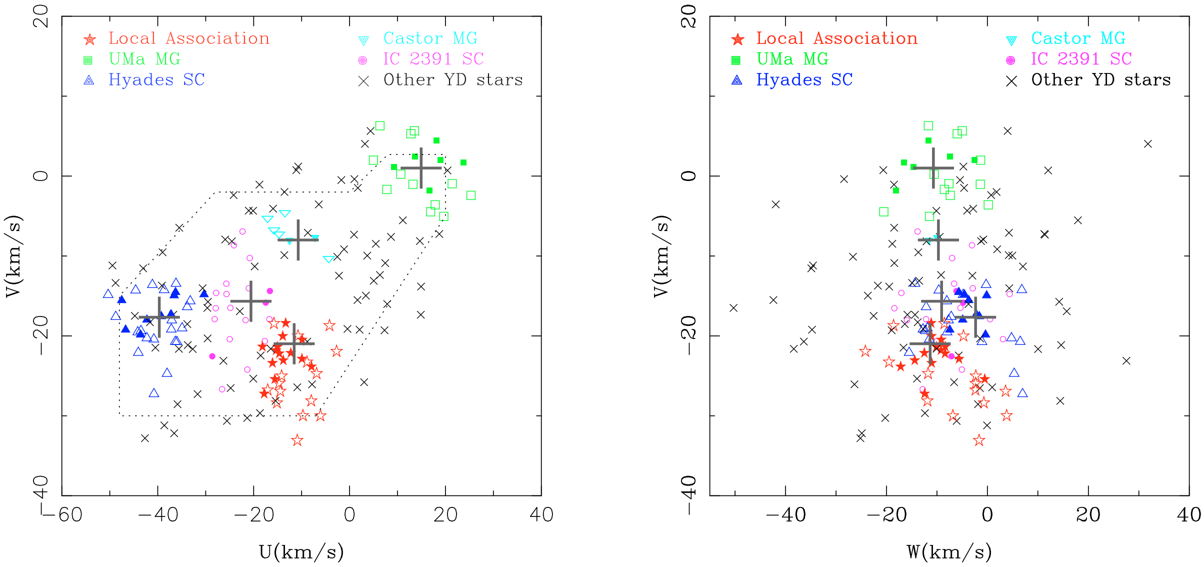


**Fig. 5.** ($U$, $V$) and ($W$, $V$) planes for the observed stars. Different colours and symbols indicate membership to different MGs. Large crosses represent the convergence point of the young MGs shown in the figure. The dotted line represents the boundary of the young disc population as defined by Eggen (Eggen 1984, 1989). Stars that satisfy both Eggen's criteria are shown with filled symbols, while open symbols indicate stars that do not satisfy at least one of the Eggen's criteria.

## 5. Age estimates

Members of a given MG should be coeval and moderately young (only several Myr old, see Sect. 1) therefore it is expected that MGs members share age related-properties, such as similar chromospheric emission or lithium abundance. This provides the means of assessing the likelihood of membership for a given star that is independent of its kinematics.

### 5.1. Lithium abundance

Lithium abundance in late-type stars is a well-known age indicator since this element is destroyed as the convective motions gradually mix the stellar envelope with the hotter ($T \sim 2.5 \times 10^6$ K) inner regions. However, it should only be regarded as an additional age indicator when compared with others since Li i equivalent width has a wide spread at a given age and mass, and consequently, the relation lithium-age is poorly constrained. Furthermore, for late K, M-type stars, lithium is burned so rapidly that it is only detectable for extremely young stars. Thus, the use of Li i as an age tracer is biased toward young stars, and it only provides low limits for stars of the age of the Hyades or older.

An age estimate of the stars in our sample can be carried out by comparing their Li i equivalent width, with those of stars in well known young open clusters of different ages (e.g. Montes et al. 2001a; López-Santiago et al. 2006). Lithium *EW*s have been obtained using the IRAF task *sbands*, performing an integration within a band of 1.6 Å centred in the lithium line. At the spectral resolution of our observations, the Li i 6707.8 Å line is blended with the Fe i 6707.41 Å line. To correct for a possible contamination by Fe i, Soderblom et al. (1990) obtained an empirical relationship between the colour index ($B-V$) and the Fe i equivalent width, measured in stars that showed only the Fe i feature and no Li i. Soderblom's equation was obtained by using main-sequence and subgiant stars, so it does not account for possible luminosity-class effects. Therefore we have built a new relationship, using only main-sequence stars without lithium detected in the spectrum:

$$\text{Fe I}(EW) = (0.020 \pm 0.005)(B-V) - (0.003 \pm 0.0015)(\text{Å}). \quad (1)$$

Which is fairly similar to the one obtained by Soderblom:

$$\text{Fe I}(EW) = 0.040(B-V) - 0.015(\text{Å}). \quad (2)$$

The *EW*s obtained are shown in Col. 10 in Tables 9 to 13, for each individual MG and in Col. 6 in Tables 14 to 15 for the stars classified as *Other young disc stars* and for the stars not selected as possible MGs, respectively.

Figure 6 shows the *EW* Li i versus colour index ($B-V$) diagram. We have overplotted the upper envelope of the Li i *EW* of IC 2602 (10–35 Myr) given by Montes et al. (2001a), the Pleiades cluster (78–125 Myr) upper envelope determined by Neuhaeuser et al. (1997), and the lower envelope adopted by Soderblom & Mayor (1993a), as well as the Hyades open cluster (600 Myr) envelope adopted by Soderblom et al. (1990). These clusters cover the range of ages of the MGs studied here (35–600 Myr).

Nearly 4% of the stars are between the Pleiades envelopes, consistent with an age of ~80 Myr. Roughly 8% of the stars are between the Hyades and the Pleiades lower envelope with an age similar to those stars in the Ursa Major ~300 Myr. Stars with lithium *EW* below the Hyades envelope are likely to be older than 600 Myr. They are around the 23% of the sample. Thus, approximately 35% of the stars are moderately young (younger than 1 Gyr). Roughly 50% of the stars lie below the Pleaides lower envelope (but not below the Hyades' one). For these stars we can only state that they should be older than the Pleiades. Finally, stars with no photospheric Li i detected are expected to be older than 1 Gyr (around 15% of the whole sample).

Concerning spectral types, the majority of the F stars are in the Hyades-like region of the diagram, with only five out of 61 stars in the Pleiades-like region. For G-type stars, 71 out of 129 are in the Hyades-like region, 34 in the Ursa Major-like region and only HIP 63742 shows an *EW* comparable to those

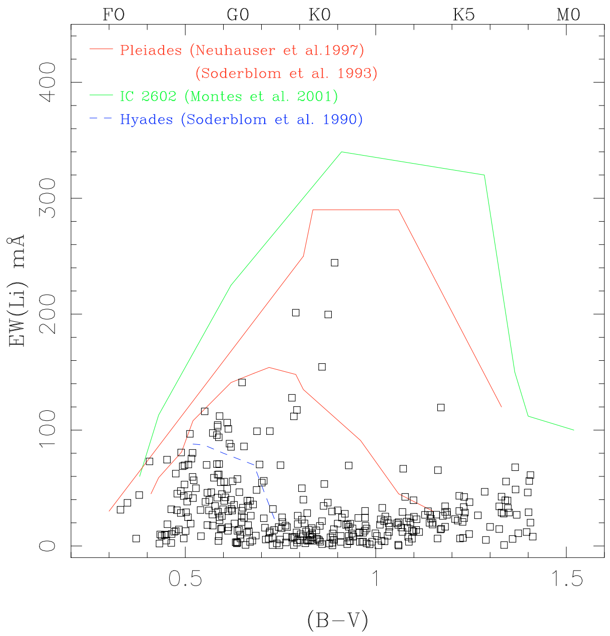


**Fig. 6.** Li I vs. $(B - V)$ diagram. Lines indicate the envelopes for the IC 2602 (green), Pleiades (red), and Hyades (dashed blue).

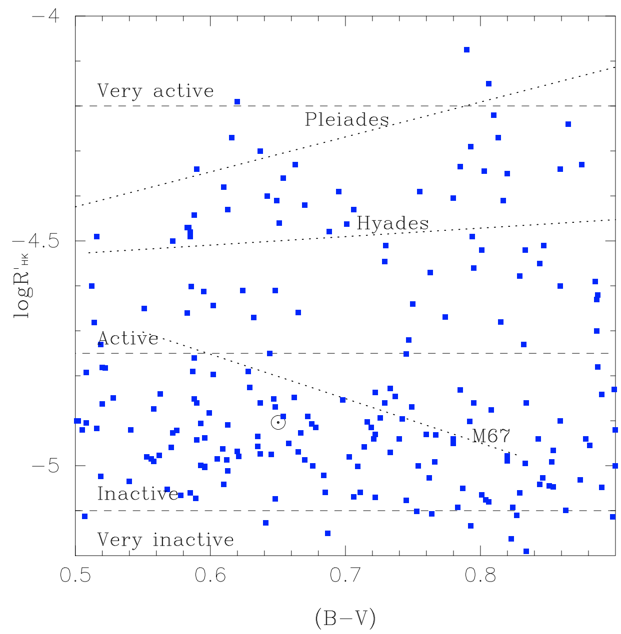


**Fig. 7.** $\log R'_{\rm HK}$ vs. $(B - V)$ colour. The position of the Pleiades (∼120 Myr), Hyades (600 Myr), and M67 (4 Gyr) stars are indicated with dotted lines (Mamajek & Hillenbrand 2008). The position of the Sun is also shown with a dotted circle. Dashed lines are the limits for very active, active, inactive, and very inactive stars, according to Henry et al. (1996).

stars in the Pleiades. Finally, six out of 209 K-type stars are in the Pleiades-like region and 15 in the Ursa Major-like.

The stars with the largest Li I *EW* are HIP 46816, HIP 46843, HIP 13402, HIP 63742 HIP 75809, HIP 75829 (in this order). According to their kinematics, HIP 46816 has been classified in the *young discs stars* category, whereas the three other stars have velocity-components $(U, V, W)$ in the boundaries of the Local Association (discussed in some detail in Sect. 6.1).

### 5.2. Stellar activity indicators

It is well known that for cool stars with convective outer-layers, chromospheric activity and rotation are linked by the stellar dynamo (e.g. Kraft 1967; Noyes et al. 1984; Montesinos et al. 2001) and both (activity and rotation) diminish as the stars evolve. Thus, activity/rotation tracers, such as $R'_{\rm HK}$, $L_{\rm X}$ or rotational periods are often used to estimate stellar ages (for a recent detailed work on this subject see Mamajek & Hillenbrand 2008).

#### 5.2.1. Chromospheric emission: Ca II H & K lines

The stellar chromospheric activity is usually quantified by the $R'_{\rm HK}$ index, defined as the ratio of the chromospheric emission in the cores of the broad Ca II H & K absorption lines to the total bolometric emission of the star (e.g. Noyes et al. 1984). The $R'_{\rm HK}$ values used in this work were taken from Martínez-Arnáiz et al. (2010) since they were obtained from the spectra in this paper. For those stars with no $R'_{\rm HK}$ value in Martínez-Arnáiz et al. (2010), the $R'_{\rm HK}$ values have been taken from the literature (see references in Appendix A).

Several relations between $\log R'_{\rm HK}$ and stellar chromospheric age are available in the literature (e.g. Soderblom et al. 1991). In this paper we take those given by Mamajek & Hillenbrand (2008, Eq. (3)):

$$\log(\tau/{\rm yr}) = -38.053 - 17.912 \log R'_{\rm HK} - 1.6675 \log R'^{2}_{\rm HK}, \qquad (3)$$

which is valid between $\log R'_{\rm HK}$ values of –4.0 and –5.1 (i.e. $\log \tau$ of 6.7 and 9.9). Although the stars used in the calibration of Eq. (3) are all stars with $(B - V) < 0.9$, we assume it holds for the entire $(B - V)$ range of our stars. As in the case of the lithium abundance, activity indicators are also biased towards younger stars. The accuracy of Mamajek's relation is 15–20% for young stars (younger than 0.5 Gyr), but beyond this age, uncertainties can grow up to more than 60%. The $\log R'_{\rm HK}$ values and derived ages are shown in Cols. 11 and 12 in Tables 9 to 13, and Cols. 7 and 8 in Tables 14 to 15.

Figure 7 shows the $\log R'_{\rm HK}$ versus $(B - V)$ diagram of stars in clusters of known ages. Following Henry et al. (1996), we used $\log R'_{\rm HK}$ to classify stars into "very inactive" ($\log R'_{\rm HK} < -5.1$), "inactive" ($-5.1 < \log R'_{\rm HK} < -4.75$), "active" ($-4.75 < \log R'_{\rm HK} < -4.2$), and "very active" if $\log R'_{\rm HK} > -4.2$. The percentages of stars in each region are 8%, 47%, 41%, and 4%, respectively. Mean $\log R'_{\rm HK}$ value for inactive stars is –4.93 with a standard deviation of 0.09, and $\langle \log R'_{\rm HK} \rangle = -4.53$ with a standard deviation of 0.13 for active stars. These numbers are quite similar to those found by Henry et al. (1996) and Gray et al. (2003).

Most of the stars in the "very active" category are, according to their kinematics, candidate members to MGs. HIP 46843 and HIP 86346 (Local Association), HIP 21482, and HIP 25220 (Hyades), HIP 8486 (Ursa Major), HIP 66252 (IC 2391) HIP 33560 and HIP 46816 (young disc population). Three of the stars in this "very active" region, namely HIP 45963, HIP 21482 and HIP 91009 are well-known variable chromospherically active binaries (included in The 3rd Catalogue of chromospherically active binary stars Eker et al. 2008). In those systems, stellar activity/rotation are enhanced by tidal interaction with the companion star, leading to high levels of chromospheric and coronal emission, up to two orders of magnitude higher than the level expected for a single star with the same rotation period (Basri et al. 1985; Simon & Fekel 1987; Montes et al. 1996). Therefore their $\log R'_{\rm HK}$ values cannot provide any information on their age or membership to MGs. Lithium abundance is also affected in this kind of systems, showing overabundances with respect to the typical values for single stars of the same mass and evolutionary stage (Barrado y Navascués et al. 1997).

### 5.2.2. Coronal emission: ROSAT data

In addition to their chromospheric activity, the rapid rotation of young stars drives a vigorous stellar dynamo, producing a strong, coronal X-ray emission. Even though there are $L_{\rm X}$ values already published in several catalogues (e.g. Hünsch et al. 1999), in order to be self-consistent we have re-computed them with the revised Hipparcos parallaxes (van Leeuwen 2007) used in this work.

To compute $L_{\rm X}$, we searched for X-ray counterparts in the ROSAT All-Sky Survey Bright Source Catalogue (Voges et al. 1999) and the Faint Source Catalogue (Voges et al. 2000). To determine the X-ray fluxes we used the count rate-to-energy flux conversion factor ($C_{\rm X}$) relation given by Fleming et al. (1995):

$$C_{\rm X} = (8.31 + 5.30\ {\rm HR1})10^{-12} {\rm erg\,cm^{-2}\ counts^{-1}}. \qquad (4)$$

Where HR1 is the hardness ratio of the star in the ROSAT energy band 0.1–2.4 KeV. Combining the X-ray count rate, $f_{\rm X}$(counts s$^{-1}$), and the conversion factor $C_{\rm X}$ with the distance $D$, the stellar X-ray luminosity $L_{\rm X}$(erg s$^{-1}$) can be estimated:

$$L_{\rm X} = 4\pi D^2 C_{\rm X} f_{\rm x}. \qquad (5)$$

Figure 8 shows the fractional X-ray luminosity $L_{\rm X}/L_{\rm Bol}$ versus the colour index $(B-V)$. Bolometric corrections were derived from the $(B-V)$ colour by interpolating in Flower (1996, Table 3) Data for the Pleaides (Stauffer et al. 1994) and Hyades (Stern et al. 1995) clusters have been overplotted for a comparison. Approximately 23% of the stars are in the Pleiades region of the diagram, 51% of the stars are in the Hyades region, and ∼26% of the stars are below the Hyades' sequence.

To compute the stellar age from the X-ray luminosity, we followed the work by Garcés et al. (2010, in prep):

$$\begin{aligned} L_{\rm X} &= 6.3\times10^{-4}\ L_{\rm Bol} \qquad (\tau<\tau_i)\\ L_{\rm X} &= 1.89\times10^{28}\ \tau^{-1.55} \quad (\tau>\tau_i). \end{aligned} \qquad (6)$$

With $\tau_i = 2\times10^{20} L_{\rm Bol}^{-0.65}$, and both $L_{\rm X}$ and $L_{\rm Bol}$ are expressed in erg/s and $\tau$ is given in Gyr. Cols. 13 and 14 in Tables 9 to 13 show the $L_{\rm X}/L_{\rm Bol}$ values and derived ages, while in Tables 14 to 15 these data are in Cols. 9 and 10.

The critical parameter $\tau_i$ marks the change from a non-saturated regime in which there is an inverse relation between the stellar rotation and $L_{\rm X}$ and the saturated regime in which the star reaches a maximum $L_{\rm X}$ such that $L_{\rm X}/L_{\rm Bol}\approx 10^{-3}$ (e.g. Pizzolato et al. 2003, and references therein). Only one star, HIP 86346, is in the saturated regime. For this star, Eq. (6) only provides an upper limit to the age, close to the "real" age of the star. This star is discussed in some detail in Sect. 6.1.

Most of the stars included in the "very inactive" category defined before do not have ROSAT data, and for the few of them that do, X-ray data place them below the Hyades' sequence (Fig. 8). Lithium abundance shows a similar behaviour, and these stars are below the Hyades' envelope or do not show lithium at all. Although some of them have been identified by means of their kinematics as young disc stars or MG members, age diagnostics show that they are, however, old stars. For the stars in the "very active" category, the situation is the opposite one. All of them have ROSAT data, and most of them have fractional X-ray luminosities similar to those of the Pleiades (Fig. 8). They also show higher lithium abundances than the "very inactive" or the "inactive" stars.

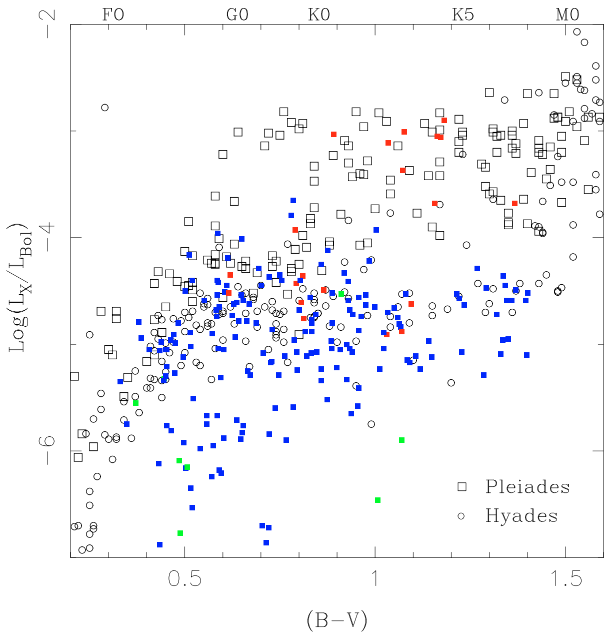


**Fig. 8.** Fractional X-ray luminosity $\log(L_{\rm X}/L_{\rm Bol})$ vs. colour index $B-V$. Stars classified as "very active" and "very inactive" according to their $\log R'_{\rm HK}$ value are plotted in red and green colours, respectively.

### 5.2.3. Age from stellar rotation: gyrochronology

Stars are born with relatively high rotational velocities. In the course of their evolution, rotation decreases due to the loss of angular momentum with stellar winds and magnetic breaking (Weber & Davis 1967; Jianke & Collier Cameron 1993; Aibéo et al. 2007). Thus stellar rotation can be used to estimate stellar ages, and it is well known that solar-type stars follow a law of the form $P_{\rm Rot}\propto t^{1/2}$ (Skumanich 1972). Subsequent works have refined this relationship, e.g., by establishing a mass dependence in the evolution of rotational periods (e.g. Kawaler 1989) or deriving a rotation-age relationship as a function of the stellar colour (Barnes 2007; Mamajek & Hillenbrand 2008).

To compute ages, we follow the relationship given by Mamajek & Hillenbrand (2008):

$$P_{\rm Rot} = 0.407((B-V)-0.495)^{0.325}\times t^{0.566}. \qquad (7)$$

With the age of the star, $t$, given in Myr and the period in days.

Rotational periods have been taken from Noyes et al. (1984), Baliunas et al. (1996), Saar & Osten (1997), and Messina et al. (2001). Unfortunately, only 17.3% of the stars have measured rotational periods. Rotational periods and derived ages are given in columns 15 and 16 in Tables 9 to 13 and Cols. 11 and 12 in Tables 14 to 15. Figure 9 shows the rotation period for the stars of our sample as a function of the colour index $(B-V)$. Percentages of Pleiades-like, Hyades-like, and older stars are 22%, 28%, and 50% respectively. All stars with rotation periods lower than seven days are MGs candidates. The fastest rotator is HIP 86346 with a period of only 1.8 days, while the slowest ones are HIP 3093 and HIP 104217 with 48 days.

### 5.2.4. Discussion

Figure 10 shows the age distribution for the different activity indicators. The results can be compared with those of Mamajek & Hillenbrand (2008, Fig. 14). Chromospheric age shows an enhancement of the star formation rate in the last 2 Gyr, then the

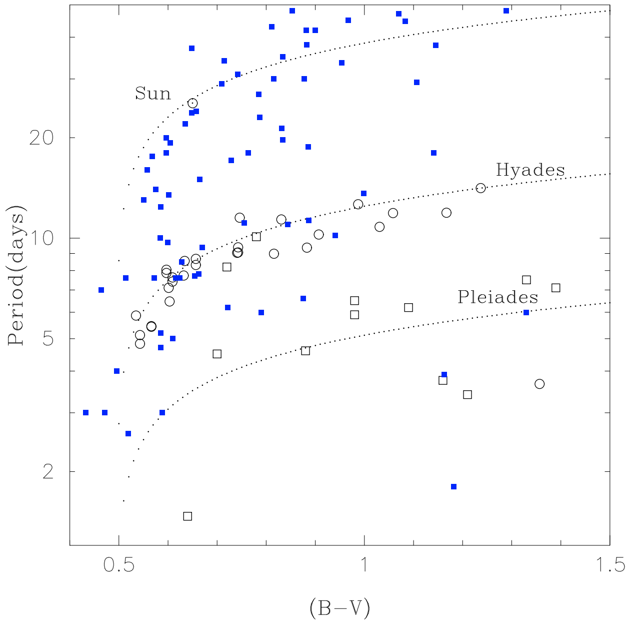


**Fig. 9.** Rotation periods vs. $(B-V)$ colour. Data from the Pleiades were taken from Prosser et al. (1995), whereas data from the Hyades are from Radick et al. (1987). Three gyrochrones (at the ages of the Pleiades, Hyades, and the Sun) have been overplotted for a comparison.

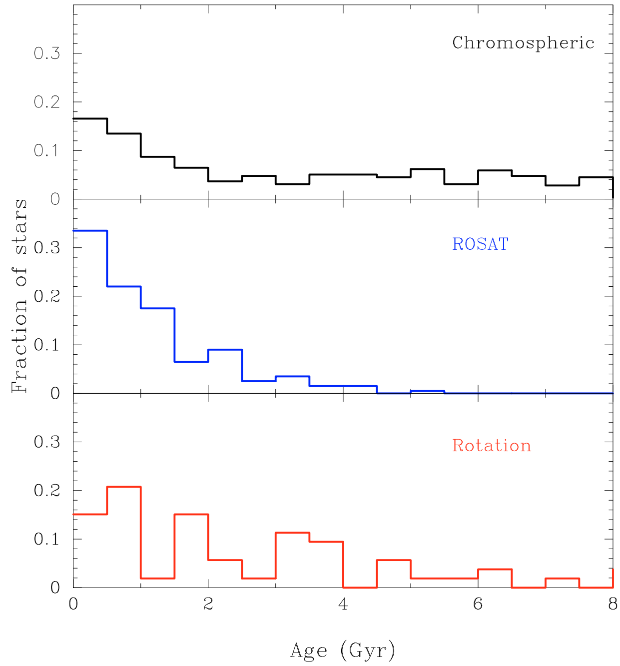


**Fig. 10.** Age distribution for chromospheric-derived ages (black solid line), ROSAT ages (blue line), and rotational ages (red line).

distribution becomes more or less flat. We do not find a clear minimum at 2 Gyr, the so-called *Vaughan-Preston gap* (Vaughan & Preston 1980). ROSAT ages are biased towards stars younger than 3–4 Gyr; i.e., older stars have negligible (or undetectable) X-ray emission, and therefore their distribution does not offer information on the stellar formation history. As far as rotational ages are concerned, there are not enough stars with measured rotational periods to draw robust conclusions.

Although the agreement between the ROSAT and the chromospheric distribution is overall good, when considering individual stars there can be discrepancies, which can for to different reasons. For example, some stars present variability in their levels of activity, which leads to very different age estimates if the activity indicators are taken in different epochs of the activity cycle. For example, HIP 37349 is a known variable observed three times: $\log R'_{\rm HK}$ values are –4.54, –4.57, and –4.28 (Martínez-Arnáiz et al. 2010), which lead to ages 800, 950, and 115 Myr, respectively, while the ROSAT-derived age is 1.17 Gyr, which is compatible with 800–950 Myr but not with 115 Myr. In addition, stellar rotation can be influenced by tidal interaction in binary systems, leading to completely different ages. Finally there could be other aspects like possible mismatches of X-ray sources with their optical counterparts.

### 5.3. Additional criteria

#### 5.3.1. Presence of debris discs

It is now well established that debris discs are more common around young stars (e.g. Habing et al. 2001; Zuckerman et al. 2004; Siegler et al. 2007). As stars age they are on average orbited by increasingly fewer dust particles so a high value of the fractional dust luminosity, $f_{\rm d}$, can be used as an additional indicator of youth. There is evidence that debris systems of high infrared luminosity are more intimately linked to young stellar kinematic groups than the majority of normal stars (e.g Moór et al. 2006); indeed, several of the stars with the strongest infrared excesses are members of MGs (e.g., $\beta$ Pic, Barrado y Navascués et al. 1999).

However, $f_{\rm d}$ is a rather inaccurate age diagnostic. First, the amount of excess emission shows large differences among stars within the same age range (e.g Siegler et al. 2007, Fig. 7). Even though stars with significant excess emissions should in principle be young, no further information can be given without additional age estimates. Moreover, there are relatively old systems (age $\gtrsim$500 Myr) with high $f_{\rm d}$ values ($f_{\rm d} \simeq 10^{-3}$) possibly associated with stochastic collisional events.

Stars with known infrared excesses and their inclusion to MGs are given Table 5. As shown in that table, the IR excesses of those stars are relatively moderate ($f_{\rm d} \simeq 10^{-5}$) and most stars with excess are not related to MGs. For example, the three stars with the largest IR-excess (HIP 76375, HIP 40693, and HIP 32480) are old field stars. Both kinematics and activity-derived age confirm this.

#### 5.3.2. Metallicity

Moving group members are supposed to have formed in the same molecular cloud, so, they should have similar metallicity. Local Association and Ursa Major members are expected to have metallicities compatible with the solar value. Recently, Soderblom et al. (2009) have obtained [Fe/H] = +0.03 for a sample of 20 Pleiades' stars with statistical and systematic uncertainties of +0.002 and +0.05, respectively. For members of the Ursa Major Group, Boesgaard & Friel (1990) found [Fe/H] = −0.085, $\sigma$ = 0.021. Hyades' members should be slightly metal rich [Fe/H] = +0.14, $\sigma$ = 0.05. Therefore we discard very metal-poor stars as "good" MG candidates. Considering that the "old" (2 Gyr) and metal-rich MG HR1614 has a mean metallicity of [Fe/H] = +0.19 ± 0.06 (Feltzing & Holmberg 2000), stars with metal overabundances over ≈+0.20 should also be discarded.

Reliable spectroscopic determinations of the metallicity for our stars were taken from the literature (Fuhrmann 2008, 2004; Santos et al. 2004; Sousa et al. 2008; Takeda et al. 2005; Valenti & Fischer 2005). When no spectroscopic metallicities were found there, they were computed from Strömgren indices (Hauck & Mermilliod 1997) by using the calibrations given by Schuster & Nissen (1989). These values are given in Cols. 17 (Tables 9 to 13) and 13 (Tables 14 to 15).

An inspection of the metallicities obtained reveals that there are no MGs candidates among the most metal-poor stars. However, some MGs candidates have positive metallicities. This is especially evident in the Hyades MG where the 45% of the candidates are more metal-rich than the Sun. Between them we find HIP 43587 and HIP 67275, which are among the most metal rich in our sample, [Fe/H] = +0.35, [Fe/H] > +0.30, respectively, and they both are known to have planets. As we will see in Sect. 6.2, their age estimates confirm that they are old stars and not "good" Hyades' members.

## 6. Comparison between kinematic and age estimates. Final membership.

Tables 9 to 13 show a summary of the kinematic and spectroscopic properties, as well as age estimates, of the stars which are candidate members to the different MG, according to their $(U, V, W)$ velocity components. Each table refers to one specific MG. This summary classifies the MGs candidates into three different categories, which are similar to the ones by Soderblom & Mayor (1993a):

- *Probable non-member*: if the derived ages from the different indicators agree, but they are in conflict with the object having an age as an MG member;
- *Doubtful member*: if there is important disagreement among the different age indicators, including here the assigned age of the corresponding MG, or there is lack of information (i.e., some age indicators are not available);
- *Probable member*: if age indicators agree and also do with the position of the star in the $(U, V)$ plane.

The following subsections describe the membership of the stars studied in this work and the properties of each MG individually

### *6.1. Membership and properties of the Local Association candidates*

The concept of a Local Association of stars was introduced by Eggen (e.g. Eggen 1975). This association, also known as Pleiades MG or Pleiades stream, includes stars in the Pleiades, $\alpha$ Persei, and IC 2602 clusters, as well as stars in the Scorpius-Centaurus star-forming region. In the past years, small associations or groups of very young stars have been detected among Local Association members (AB Dor, TW Hydrae, $\beta$ Pic, and others). The spatial motions of these new associations are quite similar, but they present a wide range in ages and distributions around the Sun (e.g. Zuckerman & Song 2004), which leads to the question of whether it is reasonable to consider the Local Association as a single entity. Addressing this problem is beyond the scope of this paper, so we consider the Local Association as a single MG.

There are 29 stars (Table 9) that have velocity components $(U, V, W)$ consistent with the stars being candidates to the Local Association. Eight out of the 29 stars do not satisfy other criteria; i.e., their age estimates suggest that they are older than 20–150 Myr commonly adopted for the Local Association, and we consider them to be non-members; Seven out of the 29 stars are considered as doubtful members while, 14 are good candidates, i.e., probable members. Although the number of candidates is too small to draw robust conclusions we can infer that the contamination by old main-sequence stars vary from roughly 25% to 50%.

Table 6 lists the candidates and our final classification (Col. 3) for the Local Association stellar membership. Some of our candidates have already been classified as members of the young association around the star AB Dor or members of the so-called Hercules-Lyra association introduced by Fuhrmann (2004), which are listed in Cols. 4 to 6 of Table 6. All the previously proposed members of AB Dor or Hercules-Lyra fall into our classification of probable Local Association members, with the only exception of HIP 62523, which we have classified as a "doubtful member". Thirteen out of our 29 candidates have not been included in these previous studies.

Among the Local Association members there are some interesting stars:

- HIP 13402 (HD 17925): Although it is classified as an RS CVn variable (Eker et al. 2008), Cutispoto et al. (2001) shows that the binary hypothesis does not seem to be consistent with the Hipparcos photometric data. The estimated *EW* Li I = 182.52 ± 4.63 mÅ agrees with the 208 mÅ given by Montes et al. (2001a) and the 197 mÅ given by Favata et al. (1995), which suggests an age similar to the Pleaides (≈80 Myr). In addition, the different age estimates agree very well and confirm that it is a young star; furthermore, the star is known to have IR-excess at 70 $\mu$m, see Table 5 (Trilling et al. 2008). Thus, we consider that it is a reliable member of the Local Association.
- HIP 18859 (HD 25457): This star is classified as a weak-line T Tauri (e.g. Li et al. 2000), and has a remarkable infrared excess of $f_{\rm d} = 1.0 \pm 0.2 \times 10^{-4}$, Table 5 (Moór et al. 2006). The *EW* Li I and age estimates confirm its young evolutionary state.
- HIP 86346 (HD 160934): This star is one of the few Hipparcos' M-type stars we have observed in this project. Available spectral types in the literature vary between K7 to M0 (Reid et al. 1995; Zuckerman et al. 2004). This object is a flare star identified as a spectroscopic binary by Gálvez et al. (2006). A close companion was detected using lucky imaging techniques by Hormuth et al. (2007). Our radial velocities vary between –25.37 and –28.39 km s$^{-1}$. In all epochs the main optical activity tracers (Ca II IRT, $H_{\alpha}$, Na I $D_1$, $D_2$, Ca II H & K) are in emission. This star is a very rapid rotator (for an M-type star) with $v \sin i$ between 21 and 23 km s$^{-1}$. Our *EW*s Li I measurements vary from 11.1 to 55.7 mÅ and are agree with the 40 mÅ reported by Zuckerman et al. (2004). ROSAT-age indicates a star younger than 100 Myr (it is in the "saturated" regime in the log $L_{\rm X}/L_{\rm Bol}$ vs. age diagram), the position of the star in a colour–magnitude diagram ($M_V = 7.55 \pm 0.15$; $(V - I) = 2.58 \pm 0.91$) suggests it is a pre-main sequence star.

### *6.2. Membership and properties of the Hyades candidates*

The Hyades MG group or Hyades Supercluster[2] has a venerable history in the study of MGs since references to the Hyades MG

[2] The terms moving group and supercluster are used here without distinction.

group go back in time to the first works in this area (Proctor 1869). It is commonly related with the Hyades and Praesepe clusters, both of them with ages around 600 Myr. Recently, Famaey et al. (2007) has found that the MG is in reality a mixture of two different populations: a group of coeval stars related to the Hyades cluster (the evaporating halo of the cluster) and a second group of old stars with similar space motions. Age diagnostics analysed in Sect. 5 allow us, in principle, to distinguish between the two populations.

There are 29 stars in the region of the $(U, V, W)$ planes occupied by the Hyades MG. Eleven out of these 29 candidates have been classified as probable members[3], nine as probable non-members, whereas the classification of the other nine stars remains unclear (Table 10).

Our selection contains 14 stars in common with López-Santiago et al. (2010). A comparison between our final classification and those given by López-Santiago et al. (2010) is shown in Table 7. There is good agreement with two exceptions, HIP 17420 (for which our age estimates suggest an old star) and HIP 19335 (discussed below).

We briefly describe some interesting stars concerning this MG:

- HIP 19335 (HD 25998): This F7V star has been identified as a T-Tauri star in the surroundings of the Taurus-Auriga star formation region (Li & Hu 1998), although it is located at a significantly shorter distance, 21 pc, than the commonly accepted distance of ∼140 pc to that star forming region. The Li I *EW* = 93.1 ± 3.0 mÅ confirms its youth and agrees well with the rest of age indicators, between 96 and 300 Myr. The star has infrared-excesses at both Spitzer 24 $\mu$m and 70 $\mu$m MIPS bands (Beichman et al. 2006). All this information also confirms the youth of this star, but it is likely too young to be a member of the Hyades MG.
- HIP 43726 (HD 76151): The Li I *EW* of 31.42 ± 3.66 mÅ of this star, as well as the estimated chromospheric and rotational ages of ∼1.0 Gyr, suggests that it is not a member of the Hyades MG. Interestingly, this is a relatively old star with a debris disc (Trilling et al. 2008; Beichman et al. 2006).
- HIP 67275 (HD 120136, $\tau$ Boo): $\tau$ Boo is one of the first cases where an exoplanet was found (Butler et al. 1997). There is a strong disagreement between the X-ray age estimate, 0.36 Gyr, and the chromospheric age, 4.78 Gyr. Li I *EW* also suggests an old star. This agrees with other published ages, 1.3 Gyr (Valenti & Fischer 2005), 2.1 Gyr (Nordström et al. 2004), and 2.52 Gyr (Saffe et al. 2005). It is therefore unlikely that HIP 67275 is a member of the Hyades MG.

### 6.3. Membership and properties of the Ursa Major moving group

The concept of a group of stars sharing the same kinematic as Sirius goes back more than one century ago. Nowadays the group includes more than 100 stars (Eggen 1992; Soderblom & Mayor 1993b; King et al. 2003; Fuhrmann 2004; Ammler-von Eiff & Guenther 2009). Eighteen stars have velocity components $(U, V, W)$ consistent with the star being a candidate for Ursa Major (Table 11). Four out of the 18 stars do not satisfy other criteria, and their age estimates indicate that they are older than the 300 Myr commonly adopted for the Ursa Major MG. Another eight out of the 18 stars are considered as doubtful members, while six stars are probable members.

Table 8 shows a comparison between our classification and those reported in the literature. There is good agreement specially in the stars classified as good members. Three candidates of this MG are of special interest:

- HIP 42438 (HD 72905): this star is known to have infrared excesses at 60 and 70 $\mu$m (Spangler et al. 2001; Bryden et al. 2006). All age estimates agree with an age of ≈300 Myr, which indicate that it is a probable member of the group;
- HIP 71395 (HD 128311): this object is an example of a star with a planetary system (Butler et al. 2003; Vogt et al. 2005) in a debris disc (excess at 70 $\mu$m found by Trilling et al. 2008). Our chromospheric-derived age of 430 Myr agrees with the 390 Myr given by Saffe et al. (2005) and confirms that this star is a probable member of the Ursa Major group;
- HIP 80337 (HD 147513): this star is also known to have a planet (Mayor et al. 2004). Due to a problem with the header's spectra, no radial velocity could be obtained so we have adopted the value given by NO04. Measured Li I *EW* = 35.51 ± 3.5 mÅ suggests that it is older than the Hyades, which agrees with both chromospheric and rotational ages, around 700 Myr. However the ROSAT age is much shorter, only 370 Myr. Therefore, we have classified this star as a "doubtful" member.

### 6.4. Membership and properties of the IC 2391 moving group

The identification of an MG related to the IC 2391 cluster is from Eggen (1991, 1995). Most of the stars listed as members of this MG are in fact early-type star members of the cluster. By using the member's position in colour–magnitude diagrams Eggen obtained an age of ∼100 Myr, within an interval spreading from 80 to 250 Myr. Recently, López-Santiago et al. (2010) has suggested the presence of two subgroups mixed in the $(U, V)$ plane with ages of 200–300 and 700 Myr.

Table 12 summarizes our membership criteria for the IC 2391 MG. Five out of 19 candidate stars have been classified as probable members, 10 as doubtful, and four as probable non-members. Our sample contains three stars in common with López-Santiago et al. (2010). We confirm that HIP 11072 is a doubtful member and HIP 59280 is a member of the old subgroup, but our age estimates for HIP 25119 disagree with López-Santiago et al. (2010). We therefore consider this star as a "non" member instead of a member of the old subgroup since both chromospheric and ROSAT ages are around 3–5 Gyr.

We have identified four new stars as probable-members of the young subgroup: HIP 19076, HIP 22263, HIP 29568, and HIP 66252. In addition, HIP 71743 has been classified as a probable member of the old subgroup. HIP 66252 (HD 118100, EQ Vir) is known to have flares, and therefore chromospheric and ROSAT ages can be greater than our estimates, although the lithium abundance confirms that it is a young star. HIP 34567 (ages between 320 and 470 Myr) should remain in the "doubtful category" since it is a known chromospherically active binary (Eker et al. 2008).

### 6.5. Membership and properties of the Castor moving group

The Castor MG was originally suggested by Anosova & Orlov (1991). This group includes, among other stars, three spectroscopic binaries (Castor A, Castor B, and YY Gem) and two

[3] To avoid confusion we recall that by "probable member" of the Hyades supercluster we mean member of the group of coeval stars evaporated from the primordial Hyades cluster.

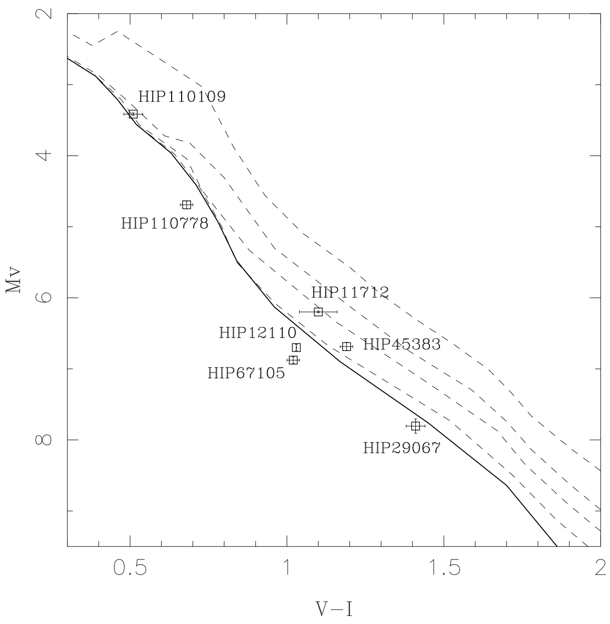


**Fig. 11.** Colour–magnitude diagram for the Castor MG candidates. Pre-main sequence isochrones from Siess et al. (2000) are plotted at 10, 20, 30 and 50 Myr.

prototypes of the $\beta$ Pic stars (Vega and Fomalhaut). Barrado y Navascués (1998) estimated an evolutionary age for this association of 200 ± 100 Myr.

Only seven stars have been identified on the basis of their kinematics as candidate members of this group (Table 13). Four were classified as probable members and three as doubtful members. HIP 29067 and HIP 109176 have been previously studied in detail by Barrado y Navascués (1998), and since we obtain similar results, we concentrate on the rest of candidates:

– HIP 12110 (HD 16270): there is a strong discrepancy between ROSAT and chromospheric ages, therefore the star remains as a doubtful member;
– HIP 45383 (HD 79555): this star is a long-period astrometric binary (Mason et al. 2001). Both ROSAT and chromospheric ages agree with the star being coeval with Castor MG members. As an additional test of youth, we plotted the star in a $M_V$ vs. $(V-I)$ diagram (Fig. 11). The position of the star in this diagram suggests an age around 35 Myr. Therefore we conclude that HIP 45383 is a young star and a probable Castor member;
– HIP 67105 (HD 119802): there is a strong discrepancy between ROSAT and chromospheric ages, therefore the star remains as doubtful member;
– HIP 110778 (HD 212697): both ROSAT and calcium ages agree with the star being coeval with the Castor MG. Since this is a star in a multiple system, we have confirmed its youth nature by using colour–magnitude diagrams.;
– HIP 117712 (HD 22378): this star is a known spectroscopic binary. Chromospheric ages suggest a moderately young star, between 600 and 860 Myr. The position of the star in colour magnitude diagrams suggests also it is a young star, and hence a probable Castor MG member.

## 7. Summary

In this paper we have addressed the problem of identifying unambiguous MG members. Making use of a large quantity of data from the literature and data from our own spectroscopic observations, we were able to study the kinematics and age of the nearby late-type population, identifying a considerable group of stars that are members of moderately young (35–600 Myr) kinematic groups. Based on both the kinematics and different age estimates, our results allow us to identify new members, confirm previously suggested members of MGs, and discard previously claimed members.

We find that approximately ∼25% of the nearby stars can be classified as members of MGs according to their kinematics, but that only 10% have ages that agree with the accepted ages of the corresponding MG members. Specifically, we find that among the stars studied in this work, the bona fide members for each MG are 14 stars (out of 29 kinematic candidates) for the Local Association, 11 (29 of kinematic candidates) for the Hyades MG, six (out of 18 kinematic candidates) for the Ursa Major MG, six (out of 19 kinematic candidates) for IC 2391, and four (out of seven kinematic candidates) for the Castor MG.

Some of the bona fide members identified here have not been reported before (at least to our knowledge), especially when considering the less-studied groups: Hyades (four new probable members), IC 2391 (five new probable members), and Castor (three new probable members). We find discrepancies with previously reported lists in eight stars. Additional observations are required to identify new bona fide members in each group and to address further investigations as suggested in Appendix B.

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## Appendix A: Tables

Results produced in the framework of this project are published in electronic format only. Table 1 is also available at the CDS via anonymous ftp to `cdsarc.u-strasbg.fr (130.79.128.5)` or via http://cdsarc.u-strasbg.fr/viz-bin/qcat?J/A+A/vol/pg

Table 1 contains the following information: HIP number (Col. 1), HD number (Col. 2), right ascension and declination (ICRSJ2000) (Cols. 3 and 4), parallax and its uncertainty (Col. 5), proper motions in right ascension and declination with their uncertainties (Cols. 6 and 7), observing run identifier (Col. 8), radial velocity used in this work and its uncertainty (Col. 9), and radial velocities reported in KH07, NO04, NI02, and VF05 works (Cols. 10 to 13) with their uncertainties, if available. Column 14 contains important notes: spectroscopic binaries radial velocities standards, and stars in chromospherically active binary systems are identified in this column.

Tables 9 to 13 contain the properties of the potential candidates to MG members for the different MGs studied in this work. These tables give: HIP number (Col. 1), $(B-V)$ colour (Col. 2), spatial-velocity components $(U, V, W)$ with their uncertainties (Cols. 3–5), $V_{\rm Total}$, $V_{\rm T}$, $PV$ and $\rho_{\rm c}$ as defined by Eggen (Cols. 6–9), measured Li I $EW$ (Col. 10), $R'_{\rm H,K}$ value and derived age (columns 11 and 12), $\log(L_{\rm X}/L_{\rm Bol})$ and derived age (Cols. 13 and 14), rotational period and derived age (Cols. 15 and 16) and metallicity (Col. 17). For each Eggen's criteria, PV and $\rho_{\rm c}$ (Cols. 8 and 9), there is label indicating if the star satisfies the criteria (label "Y") or not (label "N").

Tables 14 to 15 are similar to the previous ones, but they show the properties of the stars classified as *Other young disc stars* and stars not selected as possible MG members, respectively.

References in Tables 9 to 15 are indicated in parenthesis: (1) Martínez-Arnáiz et al. (2010) (2) Baliunas et al. (1996); (3) Duncan et al. (1991) calculated using equations in Noyes et al. (1984); (4) Gray et al. (2003); (5) Gray et al. (2006); (6) Hall et al. (2007); (7) Henry et al. (1996); (8) Jenkins et al. (2006); (9) Saffe et al. (2005); (10) Wright et al. (2004); (11) estimated form ROSAT-data using equation A1 in Mamajek & Hillenbrand (2008); (12) Noyes et al. (1984); (13) Saar & Osten (1997); (14) Messina et al. (2001).

## Appendix B: Further applications of MGs members

Lists of nearby MGs members constitute promising targets for a wide variety of further investigations. We briefly summarized some of them:

First, we investigated whether there is a connection between the so-called "solar-analogues" (e.g. Porto de Mello & da Silva 1997; Meléndez et al. 2009; Ramírez et al. 2009) and MGs members. Taking as a reference the list of analogues published by Gaidos et al. (2000), we have found 25 matches between their list and our sample, where 22 out of these 25 stars, have been classified as bona fide MG members. Another three stars, HIP 29525, HIP 80337, and HIP 116613, also candidates for MGs, satisfy Gaidos' criteria for being considered as solar analogues. These stars are listed in Table B.1. These "young-suns" are essential to study the history and formation of our own Solar System, indeed three of them, namely HIP 15457, HIP 42438, and HIP 64394, are included in the ambitious project *The Sun in Time* aimed at reconstructing the spectral irradiance evolution of the Sun (e.g Ribas et al. 2005).

**Table B.1.** Solar analogues and their ascription to MGs. Label "Y" indicates probable members, "?" doubtful members, and "N" probable non-members, respectively.

| HIP | MG | Membership | HIP | MG | Membership |
|---|---|---|---|---|---|
| 544 | LA | Y | 46 843 | LA | Y |
| 1803 | HS | Y | 54 745 | LA | Y |
| 5944 | UMa | Y | 63 742 | LA | Y |
| 7576 | LA | Y | 65 515 | LA | Y |
| 8362 | IC2 | N | 71 743 | IC2 | Y |
| 8486 | UMa | Y | 72 567 | | |
| 15 457 | YD | Y | 74 702 | UMa | N |
| 22 263 | IC2 | Y | 77 408 | LA | Y |
| 26 779 | LA | Y | 80 337 | UMa | ? |
| 29 525 | YD | Y | 82 588 | | |
| 29 568 | IC2 | Y | 94 346 | HS | Y |
| 42 074 | HS | Y | 107 350 | LA | Y |
| 42 333 | HS | Y | 115 331 | | |
| 42 438 | UMa | Y | 116 613 | HS | Y |

**Notes.** LA: Local Association; HS: Hyades; UMa: Ursa Major. IC2: IC 2391; Cas: Castor.

As we have shown in Sect. 5.3.1, debris discs are linked to stars in MGs. It is therefore natural to check if there is a similar relation between stars with known planets and MGs. Nineteen stars of our sample have detected planets[4], and seven of them are MGs candidates: HIP 21482 (Hyades MG, but it is doubtful member and in addition the planet is not confirmed); HIP 43587 (Hyades MG, but it is a doubtful member), HIP 71395 (Ursa Major MG, probable member); HIP 80337 (Ursa Major, doubtful member); HIP 95319 (IC 2391 MG, but doubtful member and the planet is not confirmed); HIP 49669 and HIP 53721 (young disc stars according to their kinematics, but their calcium ages suggest that they are old stars).

Other applications are related to activity studies, i.e., flux-flux and rotation-activity-age relationships (e.g Martínez-Arnáiz et al. 2010), or search programmes to detect stellar and substellar companions (e.g Hormuth et al. 2007). Finally, we point out that an important fraction of the stars analysed in this paper will be observed in the framework of the DUNES (DUst around NEarby Stars) programme, an approved Herschel Open Time Key Project with the aim of detecting cool faint dusty discs, at flux levels as low as the Solar EKB (Maldonado et al. 2010; Eiroa et al. 2010).

[4] The Extrasolar Planets Encyclopedia, http://www.obspm.fr/encycl/es-encycl.html

**Table 1.** Positions, proper motions and radial velocities for the observed stars.

| HIP | HD | $\alpha$ (h, m, s) | $\delta$ (°, ",") | $\pi$ (mas) | $\mu_\alpha \times \cos\delta$ (mas/yr) | $\mu_\delta$ (mas/yr) | Obs.run[♯] | Radial velocity: This work (km s$^{-1}$) | *KH*07 (km s$^{-1}$) | *NO*04 (km s$^{-1}$) | *NI*02 (km s$^{-1}$) | *VF*05 (km s$^{-1}$) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| 171 | 224930 | 00 02 10.1552 | +27 04 56.122 | 82.18 ± 2.23 | 829.90 ± 1.20 | –989.40 ± 1.10 | [9] | –37.90 | –36.90 ± 5.24 | –36.90 ± 0.40 | | | Spec. Binary |
| 544 | 166 | 00 06 36.7839 | +29 01 17.406 | 73.16 ± 0.56 | 380.50 ± 0.90 | –177.90 ± 0.90 | [8] | –6.66 ± 0.07 | –6.90 ± 0.22 | –6.90 ± 0.10 | –6.54 | –5.8 | |
| | | | | | | | [9] | –6.69 ± 0.04 | | | | | |
| 910 | 693 | 00 11 15.8573 | –15 28 04.719 | 53.33 ± 0.64 | –82.50 ± 0.90 | –270.90 ± 1.00 | [8] | 16.70 ± 0.08 | 14.90 ± 0.71 | 14.90 ± 0.10 | | | |
| 1499⋆ | 1461 | 00 18 41.8677 | –08 03 10.805 | 43.02 ± 0.51 | 419.00 ± 1.00 | –145.10 ± 0.90 | [1] | –10.13 ± 0.10 | –10.49 ± 0.43 | –10.50 ± 0.10 | –10.17 | –9.9 | |
| 1532 | | 00 19 05.5619 | –09 57 53.474 | 47.43 ± 1.65 | –36.50 ± 1.60 | –305.30 ± 1.80 | [4] | –10.88 ± 0.23 | –11.10 ± 0.30 | | | | |
| 1598 | 1562 | 00 20 00.4085 | +38 13 38.629 | 40.32 ± 0.59 | –141.80 ± 1.00 | –276.70 ± 1.10 | [1] | 15.27 ± 0.70 | 15.08 ± 2.62 | 15.10 ± 0.20 | | | |
| 1599 | 1581 | 00 20 04.2601 | –64 52 29.246 | 116.46 ± 0.16 | 1708.40 ± 0.80 | 1164.80 ± 0.80 | [10] | 10.47 ± 0.07 | 9.09 ± 0.36 | 9.10 ± 0.10 | | 8.8 | |
| 1692‡ | 1690 | 00 21 13.3193 | –08 16 52.209 | 3.23 ± 1.43 | 12.90 ± 1.10 | 1.70 ± 1.20 | [1] | 18.22 ± 0.45 | | | | | Giant star |
| 1803 | 1835 | 00 22 51.7883 | –12 12 33.977 | 47.93 ± 0.53 | 393.90 ± 1.10 | 61.00 ± 1.00 | [8] | –2.71 ± 0.09 | –2.72 ± 0.29 | –2.70 ± 0.10 | –2.41 | –3.1 | |
| 2941 | 3443 | 00 37 20.7007 | –24 46 02.162 | 64.89 ± 1.84 | 1391.00 ± 2.30 | –13.00 ± 2.30 | [8] | 18.44 | 18.47 ± 0.25 | 18.50 ± 0.20 | | | Spec. Binary, CAB |
| 3093⋆ | 3651 | 00 39 21.8061 | +21 15 01.701 | 90.43 ± 0.32 | –460.60 ± 0.80 | –369.80 ± 0.70 | [1, 2, 4, 5, 8, 9] | –32.96 ± 0.80 | –33.42 ± 0.16 | –33.50 ± 0.10 | –32.96 | –33.3 | RV standard |
| 3206 | 3765 | 00 40 49.2696 | +40 11 13.824 | 57.74 ± 0.80 | 357.60 ± 1.00 | –668.60 ± 1.10 | [1] | –63.62 ± 0.21 | –63.87 ± 0.53 | –63.90 ± 0.10 | –63.20 | –62.8 | |
| 3418 | | 00 43 32.8596 | +33 50 40.441 | 48.60 ± 0.92 | –204.40 ± 1.00 | –358.80 ± 1.00 | [1] | –36.19 ± 0.19 | –35.00 ± 1.00 | | | | |
| 3535 | 4256 | 00 45 04.8943 | +01 47 07.876 | 46.37 ± 0.62 | –47.80 ± 1.00 | –571.90 ± 1.00 | [1] | 9.24 ± 0.80 | 7.80 ± 0.90 | | 9.46 | 9.9 | |
| 3765 | 4628 | 00 48 22.9772 | +05 16 50.214 | 134.13 ± 0.51 | 757.30 ± 2.90 | –1135.40 ± 2.80 | [2, 4, 5, 8, 9] | –10.10 ± 0.40 | –10.78 ± 0.63 | –10.80 ± 0.10 | –10.23 | –9.6 | RV standard |
| 3810 | 4676 | 00 48 58.7083 | +16 56 26.318 | 42.64 ± 0.27 | –1.90 ± 0.80 | –200.60 ± 0.80 | [1] | 4.10 | 3.63 ± 1.84 | 3.10 ± 1.90 | | | Spec. Binary |
| 3821 | 4614 | 00 49 06.2912 | +57 48 54.674 | 168.01 ± 0.48 | 1086.60 ± 0.40 | –559.42 ± 0.33 | [9] | | 8.21 ± 0.71 | 8.20 ± 0.10 | 8.31 | 9.0 | Spec. Binary |
| 3979 | 4915 | 00 51 10.8481 | –05 02 21.402 | 46.46 ± 0.66 | 263.60 ± 1.20 | –118.90 ± 1.20 | [1] | –4.38 ± 0.17 | –3.90 ± 0.10 | –3.90 ± 0.10 | –3.74 | –2.9 | |
| 3998 | 4913 | 00 51 21.7545 | +18 44 21.306 | 46.78 ± 1.59 | 52.10 ± 1.10 | –266.80 ± 1.10 | [1] | 6.16 ± 0.19 | 6.80 ± 1.30 | | | | |
| 4148 | 5133 | 00 53 01.1351 | –30 21 24.895 | 70.57 ± 0.60 | 622.20 ± 1.20 | 31.80 ± 1.20 | [10] | –6.37 ± 0.06 | –13.28 ± 2.62 | –13.30 ± 0.20 | –13.07 | –12.3 | |
| 4845 | | 01 02 21.1317 | –10 25 25.909 | 49.06 ± 1.88 | 27.00 ± 1.40 | –176.20 ± 1.50 | [8] | 9.14 ± 0.18 | –20.00 | | | | |
| 5286 | 6660 | 01 07 37.8719 | +22 57 17.914 | 47.52 ± 0.94 | 101.70 ± 1.00 | –491.60 ± 0.90 | [1] | 6.88 ± 0.90 | 4.80 ± 1.10 | | | | |
| 5336 | 6582 | 01 08 16.3942 | +54 55 13.221 | 132.40 ± 0.82 | 3412.30 ± 6.60 | –1600.10 ± 6.50 | [9] | –98.00 | –98.30 ± 7.59 | –98.30 ± 0.20 | | | Spec. Binary |
| 5799 | 7439 | 01 14 24.0398 | –07 55 22.173 | 42.75 ± 0.30 | 124.60 ± 0.70 | 278.70 ± 0.80 | [1] | 22.08 ± 0.14 | 22.03 ± 0.43 | 22.00 ± 0.10 | | | |
| 5944 | 7590 | 01 16 29.2530 | +42 56 21.911 | 43.11 ± 0.45 | –112.00 ± 1.10 | –29.50 ± 1.10 | [1] | –13.04 ± 0.11 | –13.30 ± 0.20 | –13.30 ± 0.20 | –13.07 | –12.6 | |
| 5957 | | 01 16 39.3579 | +25 19 53.309 | 42.31 ± 1.76 | 431.10 ± 1.50 | –100.60 ± 1.50 | [1] | –23.88 ± 0.22 | –30.00 | | | | |
| 6290 | | 01 20 40.7457 | +57 19 40.479 | 49.78 ± 2.10 | –290.50 ± 3.40 | 435.80 ± 3.40 | [5] | 13.91 ± 0.15 | 22.00 | | | | |
| 6917 | 8997 | 01 29 04.8961 | +21 43 23.397 | 42.14 ± 0.68 | 456.60 ± 0.80 | –185.00 ± 0.80 | [1] | 21.83 | 21.70 ± 0.72 | 21.70 ± 0.20 | | | Spec. Binary; CAB |
| 7235 | 9540 | 01 33 15.8087 | –24 10 40.662 | 52.50 ± 0.46 | 272.70 ± 1.40 | –159.40 ± 1.40 | [8] | 2.24 ± 0.07 | 2.20 ± 1.14 | 2.20 ± 0.20 | | 5.4 | |
| 7339 | 9407 | 01 34 33.2635 | +68 56 53.293 | 48.41 ± 0.40 | –376.80 ± 1.20 | 114.60 ± 1.30 | [8] | –33.47 ± 0.05 | –31.50 ± 0.80 | | –33.29 | –33.0 | |
| 7513⋆ | 9826 | 01 36 47.8428 | +41 24 19.652 | 74.14 ± 0.19 | –173.33 ± 0.20 | –381.79 ± 0.13 | [9] | –28.62 ± 0.03 | –28.89 ± 0.71 | –28.90 ± 0.10 | –28.67 | –28.4 | |
| 7576 | 10008 | 01 37 35.4661 | –06 45 37.525 | 41.74 ± 0.75 | 171.90 ± 1.40 | –97.70 ± 1.40 | [1] | 11.67 ± 0.10 | 11.10 ± 0.10 | 11.10 ± 0.10 | | | |
| 7751 | 10360 | 01 39 47.5430 | –56 11 47.041 | 127.99 ± 2.29 | 302.60 ± 1.40 | –14.10 ± 1.30 | [10] | 24.25 ± 0.06 | 21.35 ± 0.54 | 21.50 ± 0.20 | | 19.9 | |
| 7918 | 10307 | 01 41 47.1429 | +42 36 48.128 | 78.52 ± 0.54 | 806.60 ± 1.00 | –152.20 ± 1.00 | [8, 9] | 3.12 ± 0.13 | 3.35 ± 0.30 | 3.00 ± 0.30 | | | Spec. Binary |
| 7981 | 10476 | 01 42 29.7619 | +20 16 06.616 | 132.76 ± 0.50 | –300.60 ± 1.00 | –673.70 ± 0.90 | [1, 2, 4, 5, 8, 9] | –33.90 ± 0.90 | –34.12 ± 0.16 | –34.20 ± 0.10 | –33.65 | –34.1 | RV standard |
| 8102 | 10700 | 01 44 04.0829 | –15 56 14.928 | 273.96 ± 0.17 | –1721.05 ± 0.17 | 854.16 ± 0.15 | [9] | –16.56 ± 0.04 | –16.96 ± 0.16 | –17.10 ± 0.10 | –16.62 | –16.7 | |
| 8275 | 10853 | 01 46 38.7185 | +12 24 42.378 | 41.63 ± 1.22 | 31.20 ± 1.20 | –73.00 ± 1.10 | [4] | 21.62 ± 0.10 | 20.70 ± 0.80 | | | | |
| 8362 | 10780 | 01 47 44.8347 | +63 51 09.004 | 99.34 ± 0.53 | 582.60 ± 1.00 | –246.10 ± 1.10 | [9] | 2.73 ± 0.02 | 2.64 ± 0.22 | 2.50 ± 0.10 | 2.76 | 3.1 | |
| 8486 | 11131 | 01 49 23.3569 | –10 42 12.816 | 44.33 ± 3.02 | –150.00 ± 0.90 | –91.10 ± 0.90 | [2] | –4.57 ± 0.07 | –4.88 ± 1.28 | –5.00 ± 0.40 | | | |
| | | | | | | | [7] | –3.50 ± 0.08 | | | | | |
| 8768 | 11507 | 01 52 49.1717 | –22 26 05.484 | 90.86 ± 1.16 | 845.30 ± 1.80 | 0.40 ± 1.80 | [8] | 12.66 ± 0.24 | 17.00 ± 1.70 | | | | |
| | | | | | | | [8] | 12.67 ± 0.23 | | | | | |
| 9269 | 12051 | 01 59 06.6329 | +33 12 34.849 | 40.06 ± 0.58 | 243.80 ± 1.00 | –352.40 ± 1.10 | [2] | –35.35 ± 0.06 | –36.10 ± 1.50 | | –35.10 | –34.7 | |
| | | | | | | | [8] | –34.98 ± 0.07 | | | | | |

**Table 1.** continued.

| HIP | HD | $\alpha$ | $\delta$ | $\pi$ | $\mu_\alpha \times \cos\delta$ | $\mu_\delta$ | Obs.run[♯] | Radial velocity | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (h, m, s) | (°, ′, ″) | (mas) | (mas/yr) | (mas/yr) | | This work (km s$^{-1}$) | *KH*07 (km s$^{-1}$) | *NO*04 (km s$^{-1}$) | *NI*02 (km s$^{-1}$) | *VF*05 (km s$^{-1}$) | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| | | | | | | | [8] | –35.26 ± 0.05 | | | | | |
| 9829 | 12846 | 02 06 30.2437 | +24 20 02.375 | 43.89 ± 0.57 | 6.70 ± 1.00 | –147.80 ± 1.00 | [2] | –4.77 ± 0.60 | –5.10 ± 0.20 | –5.10 ± 0.20 | –4.66 | –4.3 | |
| 10138* | 13445 | 02 10 25.9342 | –50 49 25.408 | 92.75 ± 0.32 | 2150.30 ± 2.50 | 673.20 ± 2.40 | [10] | 58.98 ± 0.07 | 56.60 ± 1.27 | 56.70 ± 0.30 | | 57.0 | |
| 10337 | | 02 13 12.1658 | –21 11 47.235 | 44.87 ± 1.60 | 377.90 ± 2.00 | 55.00 ± 1.80 | [8] | 3.29 ± 0.15 | 3.20 ± 1.10 | | | | |
| 10416 | 13789 | 02 14 13.5703 | –03 38 06.733 | 44.02 ± 1.02 | –12.90 ± 1.00 | –218.00 ± 1.30 | [4] | –8.47 ± 0.06 | | | | | |
| 10644 | 13974 | 02 17 03.2301 | +34 13 27.232 | 92.74 ± 0.39 | 1153.80 ± 0.80 | –245.10 ± 0.80 | [9] | –5.90 | –7.66 ± 0.72 | –7.70 ± 0.20 | | | Spec. Binary |
| 10798 | 14412 | 02 18 58.5045 | –25 56 44.474 | 78.94 ± 0.35 | –217.70 ± 0.90 | 445.20 ± 0.90 | [9] | 7.33 ± 0.03 | 7.19 ± 0.54 | 7.20 ± 0.20 | 7.38 | 5.2 | |
| 11072 | 14802 | 02 22 32.5468 | –23 48 58.774 | 45.52 ± 0.82 | 196.61 ± 0.81 | –4.99 ± 0.58 | [8] | 12.62 ± 0.07 | 17.24 ± 2.05 | 15.30 ± 2.30 | 18.82 | | |
| 11452 | 15285 | 02 27 45.8620 | +04 25 55.749 | 58.31 ± 1.07 | 86.73 ± 1.35 | 239.82 ± 0.95 | [4] | 5.28 ± 0.23 | 5.70 ± 0.30 | | | | |
| 11565 | 15468 | 02 29 01.6922 | –19 58 44.994 | 51.15 ± 1.33 | 613.99 ± 1.01 | 189.11 ± 1.06 | [8] | 26.68 ± 0.08 | 26.10 ± 3.70 | | | | |
| 12110 | 16270 | 02 36 00.7765 | –23 31 16.775 | 47.00 ± 0.94 | 87.10 ± 1.70 | 15.00 ± 1.40 | [8] | 16.65 ± 0.08 | | | | | |
| 12114 | 16160 | 02 36 04.8937 | +06 53 12.733 | 139.27 ± 0.45 | 1807.81 ± 0.89 | 1444.00 ± 0.40 | [4] | 25.79 ± 0.06 | 25.70 ± 0.10 | 25.10 ± 0.10 | 25.77 | 26.8 | |
| | | | | | | | [8] | 25.93 ± 0.06 | | | | | |
| 12709 | 16909 | 02 43 20.9201 | +19 25 45.279 | 52.95 ± 1.03 | 429.00 ± 1.10 | –12.10 ± 1.10 | [4] | 32.20 | 32.20 | | | | Spec. Binary |
| 12777 | 16895 | 02 44 11.9863 | +49 13 42.412 | 89.88 ± 0.23 | 334.66 ± 0.17 | –89.99 ± 0.17 | [9] | 24.18 ± 0.04 | 24.35 ± 0.29 | 24.30 ± 0.10 | 24.45 | 23.7 | |
| 12843 | 17206 | 02 45 06.1851 | –18 34 21.225 | 70.31 ± 1.83 | 331.40 ± 1.00 | 34.50 ± 1.00 | [9] | | 16.96 ± 0.91 | 25.90 ± 0.80 | | | Spec. Binary |
| 12929 | 17230 | 02 46 17.2777 | +11 46 30.864 | 62.46 ± 1.38 | 265.20 ± 1.20 | –209.50 ± 1.20 | [4] | 10.97 ± 0.12 | 10.40 ± 3.00 | | 11.06 | | |
| 13081 | 17382 | 02 48 09.1429 | +27 04 07.075 | 40.58 ± 1.28 | 274.50 ± 1.10 | –122.60 ± 1.10 | [8] | 9.34 ± 0.21 | 6.90 ± 0.90 | | | | Spec. Binary |
| 13258 | 17660 | 02 50 36.8923 | +15 42 35.691 | 43.98 ± 0.91 | 343.50 ± 1.00 | –395.50 ± 1.00 | [4] | –28.90 ± 0.11 | –25.00 | | –28.90 | | |
| 13402 | 17925 | 02 52 32.1287 | –12 46 10.972 | 96.61 ± 0.40 | 397.30 ± 1.20 | –189.90 ± 1.30 | [8] | 17.83 ± 0.07 | 17.61 ± 0.22 | 17.50 ± 0.10 | 18.07 | 16.4 | CAB |
| | | | | | | | [9] | 18.24 ± 0.05 | | | | | |
| 13642 | 18143 | 02 55 39.0575 | +26 52 23.580 | 42.52 ± 0.84 | 274.00 ± 1.70 | –185.40 ± 1.60 | [2] | 31.88 ± 0.08 | 31.80 | | 31.95 | 32.5 | |
| 13976 | 18632 | 03 00 02.8130 | +07 44 59.106 | 41.00 ± 1.12 | 330.60 ± 1.50 | 19.30 ± 1.50 | [8] | 28.78 ± 0.08 | 28.70 ± 0.20 | | 28.83 | 29.3 | |
| 14150 | 18803 | 03 02 26.0271 | +26 36 33.263 | 48.46 ± 0.47 | 232.80 ± 1.00 | –167.90 ± 1.00 | [8] | 9.58 ± 0.06 | 9.50 ± 1.91 | 9.50 ± 0.10 | 9.88 | 10.3 | |
| 14286 | 18757 | 03 04 09.6364 | +61 42 20.989 | 41.27 ± 0.58 | 722.00 ± 1.10 | –693.70 ± 1.30 | [2] | –5.63 ± 0.90 | –2.22 ± 1.14 | –2.20 ± 0.20 | | | |
| 14632 | 19373 | 03 09 04.0197 | +49 36 47.799 | 94.87 ± 0.23 | 1262.60 ± 0.80 | –91.50 ± 0.80 | [9] | 49.63 ± 0.05 | 49.40 ± 0.43 | 49.40 ± 0.10 | 49.45 | 48.8 | |
| 14879 | 20010 | 03 12 04.5277 | –28 59 15.425 | 70.24 ± 0.45 | 370.88 ± 0.30 | 611.30 ± 0.42 | [9] | –16.94 ± 0.05 | –19.39 ± 0.60 | –19.40 ± 0.60 | | | |
| 15099 | 20165 | 03 14 47.2272 | +08 58 50.851 | 44.13 ± 0.83 | 400.90 ± 1.30 | –402.90 ± 1.30 | [2] | –16.85 ± 0.70 | –17.49 ± 0.92 | –17.40 ± 0.20 | –16.68 | –16.5 | |
| 15330 | 20766 | 03 17 46.1635 | –62 34 31.159 | 83.29 ± 0.20 | 1338.40 ± 1.10 | 650.30 ± 1.10 | [10] | | 12.10 ± 0.53 | 12.10 ± 0.10 | | 12.3 | |
| 15371 | 20807 | 03 18 12.8189 | –62 30 22.907 | 83.11 ± 0.19 | 1330.74 ± 0.21 | 647.09 ± 0.19 | [10] | 12.16 ± 0.01 | 11.59 ± 0.54 | 11.60 ± 0.20 | | 11.6 | |
| 15442‡ | 20619 | 03 19 01.8932 | –02 50 35.501 | 39.64 ± 0.74 | 254.70 ± 1.10 | –101.50 ± 1.10 | [8] | 23.54 ± 0.07 | 22.49 ± 1.25 | 22.50 ± 0.10 | 22.69 | 23.1 | |
| 15457 | 20630 | 03 19 21.6960 | +03 22 12.712 | 109.39 ± 0.27 | 269.70 ± 0.60 | 93.60 ± 0.60 | [9] | 18.00 ± 1.00 | 18.76 ± 0.16 | 18.70 ± 0.10 | 19.02 | 17.8 | |
| 15510 | 20794 | 03 19 55.6505 | –43 04 11.221 | 165.48 ± 0.19 | 3038.20 ± 0.70 | 728.30 ± 0.70 | [10] | 93.63 ± 0.06 | 87.19 ± 0.49 | 87.20 ± 0.10 | | 87.4 | |
| 15673 | 232781 | 03 21 54.7559 | +52 19 53.453 | 42.81 ± 1.03 | –312.00 ± 1.20 | –264.60 ± 1.20 | [4] | –40.05 ± 0.08 | | | | | |
| 15919 | 21197 | 03 24 59.7309 | –05 21 49.520 | 64.95 ± 0.71 | –229.28 ± 0.84 | –769.03 ± 0.58 | [2] | –13.21 ± 0.80 | –13.68 ± 0.49 | –13.70 ± 0.10 | –13.11 | | |
| 16134 | 21531 | 03 27 52.4061 | –19 48 16.137 | 80.06 ± 0.98 | 535.00 ± 1.40 | 304.10 ± 1.50 | [4] | 34.62 ± 0.17 | 33.91 ± 0.82 | 33.80 ± 0.60 | | | |
| | | | | | | | [6] | 35.12 ± 0.14 | | | | | |
| | | | | | | | [8] | 37.21 ± 0.14 | | | | | |
| 16537* | 22049 | 03 32 55.8442 | –09 27 29.744 | 310.95 ± 0.16 | –976.10 ± 0.30 | 18.10 ± 0.40 | [4] | 16.31 ± 0.05 | 16.15 ± 0.10 | 16.00 ± 0.10 | 16.33 | 17.3 | |
| | | | | | | | [9] | 16.52 ± 0.05 | | | | | |
| 16852 | 22484 | 03 36 52.3832 | +00 24 05.982 | 71.60 ± 0.54 | –233.40 ± 0.70 | –482.10 ± 0.70 | [9] | 27.99 ± 0.03 | 27.80 ± 0.53 | 27.80 ± 0.10 | 28.08 | 26.9 | |
| 17147‡ | 22879 | 03 40 22.0645 | –03 13 01.133 | 39.13 ± 0.57 | 691.60 ± 1.10 | –212.80 ± 1.10 | [2] | 120.23 ± 0.11 | 120.26 ± 0.29 | 120.30 ± 0.10 | 120.36 | 120.7 | |
| 17420 | 23356 | 03 43 55.3429 | –19 06 39.238 | 71.67 ± 0.67 | 308.70 ± 1.50 | 156.70 ± 1.40 | [9] | 25.24 ± 0.04 | 25.20 ± 0.20 | | 25.29 | 26.8 | |
| 17496 | | 03 44 51.1263 | +11 55 12.001 | 44.33 ± 1.11 | 314.40 ± 1.20 | 126.40 ± 1.10 | [4] | 83.92 ± 0.11 | 81.90 | | | | |
| 17651 | 23754 | 03 46 50.8875 | –23 14 59.002 | 56.79 ± 0.19 | –159.90 ± 0.60 | –529.10 ± 0.50 | [8] | 6.89 ± 0.29 | 7.23 ± 0.45 | 7.30 ± 0.20 | | | |
| 18267 | 24496 | 03 54 28.0332 | +16 36 57.793 | 48.98 ± 0.70 | 220.10 ± 0.80 | –166.60 ± 0.80 | [2] | 18.79 ± 0.70 | 18.51 ± 1.70 | 18.50 ± 0.10 | 18.94 | 19.5 | |

**Table 1.** continued.

| HIP | HD | $\alpha$ | $\delta$ | $\pi$ | $\mu_\alpha \times \cos\delta$ | $\mu_\delta$ | Obs.run[♯] | Radial velocity This work | Radial velocity $KH07$ | Radial velocity $NO04$ | Radial velocity $NI02$ | Radial velocity $VF05$ | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (h, m, s) | (°, ′, ″) | (mas) | (mas/yr) | (mas/yr) | | (km s$^{-1}$) | (km s$^{-1}$) | (km s$^{-1}$) | (km s$^{-1}$) | (km s$^{-1}$) | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| 18324 | 24238 | 03 55 03.8424 | +61 10 00.508 | 47.60 ± 0.84 | 436.60 ± 1.20 | –246.40 ± 1.40 | [2] | 38.69 ± 0.05 | 47.90 | | 38.81 | 39.3 | |
| 18413 | 24409 | 03 56 11.5211 | +59 38 30.796 | 45.51 ± 0.62 | –265.10 ± 0.90 | 169.70 ± 1.00 | [4] | –18.16 ± 0.04 | –18.80 ± 0.40 | –19.00 ± 0.30 | | | |
| 18774 | 24451 | 04 01 19.6235 | +76 09 33.732 | 61.55 ± 0.70 | 330.80 ± 1.10 | –546.80 ± 1.20 | [8] | 17.76 ± 0.07 | 17.20 ± 2.62 | 17.20 ± 0.10 | 17.67 | | |
| 18859 | 25457 | 04 02 36.7449 | –00 16 08.123 | 53.09 ± 0.32 | 150.70 ± 0.90 | –252.00 ± 0.90 | [8] | | 17.74 ± 0.32 | 17.60 ± 0.20 | | | |
| 19076 | 25680 | 04 05 20.2581 | +22 00 32.059 | 59.03 ± 0.34 | 172.20 ± 0.70 | –130.20 ± 0.70 | [8] | 24.16 ± 0.09 | 23.78 ± 0.22 | 23.80 ± 0.10 | 24.03 | 23.7 | |
| 19335 | 25998 | 04 08 36.6163 | +38 02 23.040 | 47.63 ± 0.26 | 166.80 ± 1.20 | –203.10 ± 1.30 | [8] | 27.01 ± 0.27 | 26.23 ± 0.38 | 26.20 ± 0.20 | | | |
| 19422 | 25665 | 04 09 35.0403 | +69 32 29.013 | 53.33 ± 0.71 | 73.60 ± 1.00 | –298.80 ± 1.10 | [8] | –13.39 ± 0.07 | –14.09 ± 1.25 | –14.10 ± 0.10 | –13.55 | –13.3 | |
| 19832 | | 04 15 09.5321 | –04 25 05.940 | 48.07 ± 3.45 | 88.10 ± 1.60 | –91.10 ± 1.60 | [4] | 24.32 ± 0.12 | | | | | |
| 19849 | 26965 | 04 15 16.3201 | –07 39 10.336 | 200.61 ± 0.23 | –2240.12 ± 0.23 | –3420.26 ± 0.20 | [9] | –42.12 ± 0.05 | –42.92 ± 0.16 | –43.00 ± 0.10 | –42.33 | –42.3 | |
| 20917 | 28343 | 04 29 00.1250 | +21 55 21.727 | 87.78 ± 0.97 | –65.70 ± 0.90 | 174.70 ± 0.80 | [4] | –35.46 ± 0.15 | –36.17 ± 0.63 | –36.20 ± 0.10 | –35.07 | | |
| 21482[⋆] | 283750 | 04 36 48.2425 | +27 07 55.897 | 55.65 ± 1.43 | 233.20 ± 0.80 | –148.60 ± 0.80 | [4] | 36.00 | 35.19 ± 1.00 | | | | Spec. Binary; CAB |
| 22263 | 30495 | 04 47 36.2918 | –16 56 04.042 | 75.33 ± 0.36 | 130.40 ± 1.00 | 169.80 ± 1.00 | [9] | 22.00 ± 0.05 | 21.66 ± 0.22 | 21.60 ± 0.10 | | 23.0 | |
| 22449 | 30652 | 04 49 50.4106 | +06 57 40.592 | 123.94 ± 0.17 | 462.90 ± 0.50 | 11.80 ± 0.50 | [9] | 24.11 ± 0.08 | 24.29 ± 3.54 | 24.00 ± 5.00 | | 24.9 | |
| 22498[‡] | | 04 50 25.0912 | +63 19 58.625 | 34.53 ± 1.67 | 220.40 ± 3.30 | –196.20 ± 3.30 | [4] | 59.22 ± 0.13 | | | | | |
| 23311 | 32147 | 05 00 49.0001 | –05 45 13.231 | 114.84 ± 0.50 | 550.40 ± 1.20 | –1110.20 ± 1.10 | [9] | 21.72 ± 0.07 | 21.06 ± 0.43 | 21.00 ± 0.10 | 21.55 | 20.3 | |
| 23693 | 33262 | 05 05 30.6558 | –57 28 21.734 | 85.88 ± 0.18 | –31.90 ± 0.80 | 118.10 ± 0.80 | [10] | | –1.26 ± 0.35 | –0.80 ± 0.30 | | | |
| 23786 | 32850 | 05 06 42.2177 | +14 26 46.445 | 42.25 ± 0.92 | 282.80 ± 1.10 | –239.90 ± 1.10 | [2] | 31.82 ± 0.90 | 28.22 ± 2.40 | 28.30 ± 2.20 | | | |
| 23835 | 32923 | 05 07 27.0061 | +18 38 42.188 | 64.81 ± 0.33 | 537.40 ± 0.70 | 19.30 ± 0.70 | [5] | 20.93 ± 0.07 | 20.40 ± 0.10 | 20.30 ± 0.10 | 20.56 | 21.2 | |
| 24786[‡] | 34721 | 05 18 50.4722 | –18 07 48.182 | 39.97 ± 0.40 | 385.50 ± 0.90 | 62.50 ± 0.90 | [8] | 41.31 ± 0.06 | 40.40 ± 1.42 | 40.40 ± 0.10 | 40.45 | 40.9 | |
| 24813 | 34411 | 05 19 08.4745 | +40 05 56.586 | 79.18 ± 0.28 | 518.99 ± 0.26 | –665.05 ± 0.13 | [9] | 67.14 ± 0.03 | 66.48 ± 0.36 | 66.50 ± 0.10 | 66.51 | 66.7 | |
| 24819 | 34673 | 05 19 12.6591 | –03 04 25.714 | 64.71 ± 1.11 | 696.90 ± 1.90 | 127.10 ± 2.00 | [2] | 88.22 ± 0.07 | 87.60 ± 1.25 | 87.60 ± 0.10 | | | |
| 24874 | 34865 | 05 19 59.5765 | –15 50 22.722 | 41.14 ± 1.14 | 174.30 ± 1.30 | 201.20 ± 1.40 | [4] | –14.01 ± 0.06 | –15.10 ± 0.20 | –15.10 ± 0.20 | | | |
| 25119 | 35112 | 05 22 37.4901 | +02 36 11.486 | 49.44 ± 1.17 | 69.70 ± 1.30 | –152.10 ± 1.30 | [4] | 36.42 ± 0.07 | 36.40 ± 0.20 | 36.40 ± 0.20 | | | |
| 25220 | 35171 | 05 23 38.3810 | +17 19 26.830 | 71.01 ± 1.34 | 251.90 ± 1.10 | –3.30 ± 1.00 | [2] | 38.24 ± 0.10 | 37.89 ± 0.43 | 37.90 ± 0.10 | | | |
| 25623 | 36003 | 05 28 26.0963 | –03 29 58.399 | 76.78 ± 0.76 | –305.70 ± 1.40 | –796.90 ± 1.50 | [4] | –55.39 ± 0.10 | –56.30 ± 1.27 | –56.30 ± 0.10 | –55.53 | | |
| 26505 | 37008 | 05 38 11.8615 | +51 26 44.664 | 49.59 ± 0.72 | –549.60 ± 1.10 | 105.60 ± 1.10 | [2] | –45.80 ± 0.80 | –44.00 | | | –45.5 | |
| 26779 | 37394 | 05 41 20.3357 | +53 28 51.808 | 81.44 ± 0.54 | 3.50 ± 1.10 | –523.60 ± 1.10 | [9] | 1.27 ± 0.03 | 0.96 ± 0.16 | 0.90 ± 0.10 | 1.21 | 0.6 | |
| 27072 | 38393 | 05 44 27.7904 | –22 26 54.176 | 112.01 ± 0.18 | –291.67 ± 0.14 | –368.98 ± 0.15 | [10] | | –9.51 ± 0.54 | –9.50 ± 0.20 | | | |
| 27207 | 38230 | 05 46 01.8857 | +37 17 04.735 | 45.79 ± 0.76 | 488.10 ± 1.00 | –509.50 ± 1.10 | [2] | –29.25 ± 1.10 | –29.70 ± 0.78 | –29.70 ± 0.10 | –29.18 | –28.7 | |
| 27435 | 38858 | 05 48 34.9407 | –04 05 40.732 | 65.90 ± 0.41 | 62.20 ± 0.70 | –228.60 ± 0.70 | [6] | 33.05 ± 0.09 | 31.25 ± 0.22 | 31.20 ± 0.10 | 31.54 | 31.6 | |
| 27913 | 39587 | 05 54 22.9825 | +20 16 34.228 | 115.42 ± 0.27 | –174.60 ± 0.70 | –89.90 ± 0.70 | [9] | –13.47 ± 0.30 | –13.45 ± 0.20 | –13.90 ± 0.20 | –12.17 | –13.2 | Spec. Binary |
| 28103 | 40136 | 05 56 24.2929 | –14 10 03.721 | 67.21 ± 0.25 | –42.06 ± 0.19 | 139.25 ± 0.17 | [5] | –1.12 ± 0.56 | –1.65 ± 0.54 | –1.60 ± 0.20 | | | |
| 28267 | 40397 | 05 58 21.5357 | –04 39 02.404 | 42.46 ± 0.63 | 73.60 ± 1.00 | –206.50 ± 1.10 | [4] | 144.09 ± 0.07 | 143.30 ± 0.10 | 143.30 ± 0.10 | 143.62 | 144.1 | |
| 29067 | | 06 07 55.2511 | +67 58 36.544 | 40.90 ± 1.85 | –48.80 ± 1.80 | –113.80 ± 1.90 | [4] | –2.03 ± 0.18 | 1.60 | | | | |
| 29271 | 43834 | 06 10 14.4735 | –74 45 10.963 | 98.05 ± 0.14 | 122.00 ± 0.70 | –212.70 ± 0.70 | [10] | | 35.55 ± 0.54 | 35.60 ± 0.20 | | 37.1 | |
| 29432 | 42618 | 06 12 00.5665 | +06 46 59.068 | 42.54 ± 0.55 | 197.10 ± 1.30 | –253.30 ± 1.40 | [4] | –53.20 ± 0.04 | –53.69 ± 0.99 | –53.70 ± 0.10 | –53.50 | –53.2 | |
| 29525 | 42807 | 06 13 12.5028 | +10 37 37.718 | 55.73 ± 0.44 | 77.30 ± 1.30 | –297.30 ± 1.20 | [2] | 5.96 ± 0.80 | 5.70 ± 0.78 | 5.70 ± 0.10 | | | |
| 29568 | 43162 | 06 13 45.2957 | –23 51 42.977 | 59.81 ± 0.49 | –45.40 ± 1.10 | 113.20 ± 1.20 | [8] | 22.23 ± 0.09 | 21.67 ± 0.22 | 21.60 ± 0.10 | | | |
| 29650 | 43042 | 06 14 50.8767 | +19 09 23.213 | 48.06 ± 0.34 | –96.90 ± 0.70 | –181.90 ± 0.70 | [6] | 36.65 ± 0.13 | 34.60 ± 0.25 | 34.30 ± 0.20 | | 35.3 | |
| 29800 | 43386 | 06 16 26.6196 | +12 16 19.787 | 51.98 ± 0.27 | 81.90 ± 0.50 | 186.90 ± 0.60 | [6] | 9.50 ± 0.60 | 9.10 ± 0.47 | 9.50 ± 0.60 | | | |
| 29860 | 43587 | 06 17 16.1377 | +05 06 00.403 | 51.95 ± 0.40 | –195.40 ± 1.00 | 164.60 ± 1.00 | [6] | 8.43 ± 0.05 | 9.68 ± 0.32 | 9.80 ± 0.20 | 5.78 | 12.7 | |
| 30422[‡] | 44770 | 06 23 46.5007 | +04 35 44.925 | 26.77 ± 0.88 | –16.90 ± 0.50 | 11.80 ± 0.40 | [4] | | 16.30 | | | | |
| 32010 | 47752 | 06 41 15.7114 | +23 57 27.774 | 57.32 ± 1.16 | 206.70 ± 1.00 | –277.00 ± 1.00 | [4] | –44.44 ± 0.08 | –44.86 ± 0.29 | –44.90 ± 0.10 | –44.25 | –43.8 | |
| | | | | | | | [4] | –44.72 ± 0.10 | | | | | |
| 32423[‡] | 263175 | 06 46 05.0519 | +32 33 20.437 | 38.12 ± 1.01 | –453.60 ± 1.10 | 98.60 ± 1.10 | [4] | –32.09 ± 0.11 | –34.50 | | | | |
| | | | | | | | [4] | –32.08 ± 0.11 | | | | | |

**Table 1.** continued.

| HIP | HD | $\alpha$ (h, m, s) | $\delta$ (°, ′, ″) | $\pi$ (mas) | $\mu_\alpha \times \cos\delta$ (mas/yr) | $\mu_\delta$ (mas/yr) | Obs.run$^\sharp$ | Radial velocity: This work (km s$^{-1}$) | Radial velocity: *KH*07 (km s$^{-1}$) | Radial velocity: *NO*04 (km s$^{-1}$) | Radial velocity: *NI*02 (km s$^{-1}$) | Radial velocity: *VF*05 (km s$^{-1}$) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| 32439 | 46588 | 06 46 14.1506 | +79 33 53.320 | 55.95 ± 0.27 | –98.70 ± 0.60 | –603.30 ± 0.60 | [8] | | 15.31 ± 0.71 | 15.30 ± 0.10 | | | Spec. Binary |
| 32480 | 48682 | 06 46 44.3388 | +43 34 38.737 | 59.82 ± 0.30 | –0.80 ± 0.70 | 165.30 ± 0.70 | [4] | –23.90 ± 0.07 | –23.98 ± 0.22 | –24.00 ± 0.10 | –23.93 | –23.6 | |
| 32919 | 49601 | 06 51 32.3922 | +47 22 04.149 | 53.89 ± 0.98 | –245.30 ± 1.10 | –694.30 ± 1.10 | [4] | 19.12 ± 0.17 | 22.20 | | | | |
| | | | | | | | [4] | 18.84 ± 0.15 | | | | | |
| 32984 | 50281 | 06 52 18.0501 | –05 10 25.367 | 114.81 ± 0.44 | –544.20 ± 1.30 | –2.50 ± 1.30 | [4] | –7.65 ± 0.09 | –7.72 ± 0.71 | –7.70 ± 0.10 | –7.08 | –5.4 | |
| 33277 | 50692 | 06 55 18.6677 | +25 22 32.511 | 58.02 ± 0.41 | –36.70 ± 0.70 | 25.30 ± 0.70 | [4] | –15.05 | –15.15 ± 0.22 | –15.20 ± 0.10 | –15.02 | –14.9 | RV standard |
| 33373 | | 06 56 28.1185 | +40 04 27.584 | 40.67 ± 1.34 | 114.96 ± 1.31 | –436.21 ± 0.89 | [4] | 50.89 ± 0.11 | 49.80 ± 0.60 | | | | |
| | | | | | | | [4] | 51.17 ± 0.17 | | | | | |
| 33537 | 51419 | 06 58 11.7499 | +22 28 33.193 | 40.59 ± 0.53 | 48.10 ± 0.70 | 97.50 ± 0.70 | [4] | –26.77 ± 0.05 | –27.10 ± 0.20 | –27.10 ± 0.20 | | –26.3 | |
| 33560 | 51849 | 06 58 26.0503 | –12 59 30.565 | 46.10 ± 1.23 | 57.01 ± 1.65 | –147.14 ± 1.21 | [6] | –4.43 ± 0.14 | –3.10 ± 2.10 | | | | |
| 33852 | 51866 | 07 01 38.5885 | +48 22 43.220 | 49.79 ± 0.85 | 545.00 ± 1.10 | –432.50 ± 1.20 | [4] | –21.62 ± 0.06 | –22.80 | | –21.62 | | |
| 33955 | 52919 | 07 02 42.9176 | -06 47 57.212 | 54.22 ± 0.94 | –198.80 ± 1.20 | –313.60 ± 1.40 | [6] | –30.79 ± 0.14 | | | | | |
| 34017 | 52711 | 07 03 30.4587 | +29 20 13.491 | 52.27 ± 0.41 | 156.50 ± 0.70 | –827.80 ± 0.60 | [4] | 24.60 ± 0.08 | 24.44 ± 0.16 | 24.30 ± 0.10 | 24.60 | 24.3 | |
| 34567$^\ddagger$ | 54371 | 07 09 35.3899 | +25 43 43.136 | 39.75 ± 0.54 | –124.30 ± 0.80 | -175.30 ± 0.80 | [7] | 19.80 | 19.72 ± 6.00 | 18.10 ± 8.30 | | | Spec. Binary; CAB |
| 35136 | 55575 | 07 15 50.1385 | +47 14 23.870 | 59.21 ± 0.33 | 29.60 ± 0.90 | –186.10 ± 1.00 | [4] | 84.85 ± 0.05 | 84.75 ± 0.25 | 84.90 ± 0.20 | 84.81 | | |
| 36357 | | 07 29 01.7705 | +31 59 37.824 | 56.62 ± 0.93 | 159.70 ± 1.00 | 175.80 ± 1.10 | [5] | –3.79 ± 0.23 | –4.30 ± 1.70 | | –3.95 | | |
| | | | | | | | [7] | –4.25 ± 0.11 | | | | | |
| 36366 | 58946 | 07 29 06.7191 | +31 47 04.381 | 55.41 ± 0.25 | 157.20 ± 0.60 | 186.90 ± 0.60 | [7] | | –3.00 ± 6.19 | –19.00 ± 8.70 | | | |
| 36439 | 58855 | 07 29 55.9561 | +49 40 20.866 | 49.41 ± 0.36 | 109.60 ± 1.20 | –83.00 ± 1.30 | [4] | –27.13 ± 0.10 | –27.50 ± 0.38 | –27.60 ± 0.20 | | | |
| 36551 | 59582 | 07 31 07.7109 | +14 36 50.919 | 48.06 ± 1.13 | 76.50 ± 1.20 | –288.10 ± 1.10 | [4] | 65.65 ± 0.12 | 66.70 ± 1.10 | | | | |
| 36827 | 60491 | 07 34 26.1657 | –06 53 48.040 | 40.72 ± 1.00 | –80.90 ± 1.10 | –42.50 ± 1.10 | [6] | –10.17 ± 0.10 | –9.70 ± 0.20 | | –9.67 | –9.2 | |
| 37279 | 61421 | 07 39 18.1183 | +05 13 29.975 | 284.52 ± 1.27 | –714.56 ± 2.07 | –1036.82 ± 1.15 | [9] | –4.10 | –4.20 ± 1.26 | –4.20 ± 0.20 | | –2.7 | Spec. Binary |
| 37288 | | 07 39 23.0386 | +02 11 01.186 | 68.59 ± 1.47 | –147.60 ± 1.60 | –247.30 ± 1.50 | [6] | 18.90 ± 0.27 | 18.5 | | | | |
| | | | | | | | [8] | 20.70 ± 0.21 | | | | | |
| 37349 | 61606 | 07 39 59.3282 | –03 35 51.026 | 70.38 ± 0.64 | 71.70 ± 1.20 | –276.10 ± 1.30 | [2] | –18.14 ± 0.50 | –18.61 ± 0.49 | –18.60 ± 0.10 | –18.21 | –17.6 | |
| | | | | | | | [6] | –18.56 ± 0.08 | | | | | |
| | | | | | | | [9] | –18.06 ± 0.04 | | | | | |
| 38382 | 64096 | 07 51 46.3026 | –13 53 52.903 | 60.58 ± 0.58 | –60.00 ± 0.70 | –338.90 ± 0.70 | [6] | –21.20 | –21.50 ± 0.79 | –21.50 ± 0.50 | | | Spec. Binary |
| 38657 | 64468 | 07 54 54.0671 | +19 14 10.824 | 48.31 ± 0.86 | 94.50 ± 0.90 | -456.40 ± 1.00 | [4] | –19.44 ± 0.08 | –18.70 | | –10.62 | –8.9 | |
| 38784 | 62613 | 07 56 17.2303 | +80 15 55.953 | 58.17 ± 0.36 | –474.80 ± 1.00 | 87.70 ± 1.10 | [8] | –7.79 ± 0.05 | –7.84 ± 0.22 | –7.90 ± 0.10 | | | |
| 38931 | 65277 | 07 57 57.7861 | –00 48 51.903 | 56.14 ± 1.22 | –164.40 ± 1.00 | 3.10 ± 1.00 | [2] | –4.44 ± 0.06 | –4.00 | | –4.42 | –4.3 | |
| 39064 | 65430 | 07 59 33.9341 | +20 50 37.994 | 42.16 ± 0.71 | 180.10 ± 1.10 | –550.80 ± 1.00 | [4] | –28.43 ± 0.30 | –29.34 ± 1.01 | –29.40 ± 0.30 | –28.71 | –28.9 | Spec. Binary |
| 39157 | 65583 | 08 00 32.1290 | +29 12 44.481 | 59.64 ± 0.56 | –171.50 ± 1.20 | –1164.90 ± 1.30 | [4] | 14.80 | 14.48 ± 0.53 | 14.50 ± 0.10 | 14.83 | 13.0 | RV standard |
| 40035 | 68146 | 08 10 39.8261 | –13 47 57.146 | 44.68 ± 0.30 | –250.30 ± 0.80 | 58.10 ± 0.70 | [8] | 34.19 ± 0.13 | 32.82 ± 1.25 | 32.80 ± 0.10 | | | |
| 40118 | 68017 | 08 11 38.6440 | +32 27 25.667 | 45.90 ± 0.55 | –464.70 ± 0.80 | –646.50 ± 0.80 | [4] | 29.67 ± 0.05 | 29.60 ± 0.57 | 29.60 ± 0.10 | 29.58 | 30.3 | |
| 40170$^\ddagger$ | | 08 12 14.4328 | +51 54 25.508 | 39.18 ± 2.11 | –116.60 ± 2.00 | –205.40 ± 2.00 | [7] | 5.70 ± 0.21 | | | | | |
| | | | | | | | [7] | 3.97 ± 0.23 | | | | | |
| 40375 | 68834 | 08 14 35.9131 | +13 01 22.170 | 53.10 ± 1.11 | –421.30 ± 1.00 | 95.70 ± 1.00 | [6] | 21.19 ± 0.16 | | | | | |
| 40671 | | 08 18 10.7804 | +30 36 02.936 | 44.08 ± 1.22 | –283.60 ± 1.40 | –822.10 ± 1.30 | [4] | 13.08 ± 0.11 | 11.60 | | | | |
| | | | | | | | [4] | 13.98 ± 0.12 | | | | | |
| | | | | | | | [7] | 13.12 ± 0.13 | | | | | |
| 40693$^\star$ | 69830 | 08 18 23.9473 | –12 37 55.824 | 80.04 ± 0.35 | 280.30 ± 1.00 | –989.50 ± 0.90 | [9] | 30.18 ± 0.04 | 29.82 ± 0.49 | 29.80 ± 0.10 | | 32.2 | |
| 40843 | 69897 | 08 20 03.8603 | +27 13 03.745 | 54.73 ± 0.32 | –17.60 ± 0.60 | –376.50 ± 0.60 | [4] | 32.87 ± 0.08 | 32.62 ± 0.29 | 32.60 ± 0.10 | 32.73 | 33.3 | |
| 41484 | 71148 | 08 27 36.7855 | +45 39 10.753 | 44.94 ± 0.46 | –20.70 ± 1.10 | –351.90 ± 1.10 | [7] | –32.62 ± 0.11 | –32.42 ± 0.16 | –32.60 ± 0.10 | –32.34 | –32.0 | |
| 41926 | 72673 | 08 32 51.4959 | –31 30 03.070 | 81.91 ± 0.46 | –1113.70 ± 1.00 | 763.10 ± 1.00 | [9] | 15.00 ± 0.05 | 14.42 ± 1.26 | 14.40 ± 0.20 | 14.79 | 13.0 | |
| 42074 | 72760 | 08 34 31.6497 | –00 43 33.840 | 47.31 ± 0.72 | –197.50 ± 1.00 | 18.90 ± 0.90 | [4] | 36.50 ± 0.11 | 34.20 ± 0.10 | 34.20 ± 0.10 | 34.93 | 35.5 | |

**Table 1.** continued.

| HIP | HD | $\alpha$ | $\delta$ | $\pi$ | $\mu_\alpha \times \cos\delta$ | $\mu_\delta$ | Obs.run[♯] | Radial velocity | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (h, m, s) | (°, ′, ″) | (mas) | (mas/yr) | (mas/yr) | | This work (km s$^{-1}$) | *KH*07 (km s$^{-1}$) | *NO*04 (km s$^{-1}$) | *NI*02 (km s$^{-1}$) | *VF*05 (km s$^{-1}$) | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| | | | | | | | [6] | 36.50 ± 0.11 | | | | | |
| 42173[‡] | 72946 | 08 35 51.2716 | +06 37 21.993 | 38.08 ± 0.78 | –133.50 ± 6.20 | –132.20 ± 5.40 | [2] | 43.48 ± 0.90 | 29.34 ± 0.32 | 29.20 ± 0.20 | | | |
| 42333 | 73350 | 08 37 50.2932 | –06 48 24.786 | 41.71 ± 0.70 | –298.20 ± 1.40 | 45.60 ± 1.40 | [2] | 35.29 ± 0.06 | 35.50 ± 0.20 | 35.50 ± 0.20 | 35.37 | 36.0 | |
| 42430 | 73752 | 08 39 07.9003 | –22 39 42.750 | 51.61 ± 0.63 | –260.80 ± 3.50 | 429.70 ± 3.30 | [6] | 52.25 ± 0.11 | 47.90 ± 1.50 | 47.90 ± 1.50 | | | |
| 42438 | 72905 | 08 39 11.7040 | +65 01 15.264 | 69.67 ± 0.37 | –228.90 ± 1.00 | 88.50 ± 1.00 | [9] | –213.62 ± 0.05 | –212.85 ± 0.51 | –212.80 ± 0.20 | | | |
| 42499 | 73667 | 08 39 50.7917 | +11 31 21.621 | 55.12 ± 0.71 | –2108.60 ± 0.90 | –2500.30 ± 0.90 | [2] | –212.10 ± 1.50 | –212.50 ± 1.06 | –212.50 ± 0.10 | –212.09 | –211.5 | RV standard |
| 42525[†] | | 08 40 11.9441 | +41 17 07.458 | 68.54 ± 15.51 | –236.20 ± 1.40 | –230.90 ± 1.30 | [7] | 58.85 ± 0.26 | | | | | |
| | | | | | | | [7] | 60.61 ± 0.21 | | | | | |
| 42808 | 74576 | 08 43 18.0304 | –38 52 56.566 | 89.76 ± 0.37 | –300.40 ± 1.30 | 342.90 ± 1.20 | [10] | | 12.51 ± 1.25 | 12.50 ± 0.10 | | | |
| 43557 | 75767 | 08 52 16.3907 | +08 03 46.513 | 41.64 ± 1.02 | 154.30 ± 1.30 | –236.80 ± 1.30 | [2] | 3.50 | 3.85 ± 5.59 | 3.90 ± 2.80 | | | Spec. Binary |
| 43587[⋆] | 75732 | 08 52 35.8112 | +28 19 50.947 | 80.55 ± 0.70 | –484.80 ± 0.70 | –233.50 ± 0.70 | [9] | 27.50 ± 0.08 | 27.80 ± 0.20 | | 27.35 | 27.8 | |
| 43726 | 76151 | 08 54 17.9475 | –05 26 04.054 | 57.51 ± 0.39 | –412.10 ± 1.20 | 28.20 ± 1.20 | [4] | 32.29 ± 0.04 | 31.80 ± 0.36 | 31.80 ± 0.10 | 32.00 | 31.1 | |
| | | | | | | | [6] | 33.64 ± 0.09 | | | | | |
| 44075 | 76932 | 08 58 43.9331 | –16 07 57.817 | 47.54 ± 0.31 | 244.50 ± 1.10 | 213.00 ± 1.00 | [7] | 120.65 ± 0.19 | 119.33 ± 0.53 | 119.30 ± 0.10 | | | |
| 44248 | 76943 | 09 00 38.3707 | +41 46 58.480 | 62.22 ± 0.67 | –474.30 ± 0.85 | –204.25 ± 0.68 | [4, 5, 7] | 27.20 | 27.99 ± 5.59 | 28.10 ± 2.80 | | | Spec. Binary |
| 44897 | 78366 | 09 08 51.0705 | +33 52 55.981 | 52.13 ± 0.33 | –192.10 ± 1.40 | –116.70 ± 1.50 | [8] | 27.14 ± 0.07 | 26.09 ± 0.22 | 26.00 ± 0.10 | 26.12 | 26.8 | |
| 45038 | 78154 | 09 10 23.5455 | +67 08 02.465 | 49.07 ± 0.37 | 7.10 ± 0.80 | –95.10 ± 0.90 | [8] | –2.00 ± 0.06 | –2.91 ± 0.22 | –3.00 ± 0.10 | | | |
| 45170 | 79096 | 09 12 17.5488 | +14 59 45.733 | 49.11 ± 0.55 | –522.80 ± 0.80 | 245.80 ± 0.80 | [2] | 50.20 | 49.90 ± 5.24 | 49.90 ± 0.50 | | | Spec. Binary |
| 45333 | 79028 | 09 14 20.5406 | +61 25 23.943 | 51.11 ± 0.32 | –9.80 ± 1.10 | –30.60 ± 1.20 | [8] | –14.60 | –14.32 ± 5.79 | –8.60 ± 8.00 | | | Spec. Binary |
| 45343 | 79210 | 09 14 22.7935 | +52 41 11.849 | 172.14 ± 6.32 | –1555.60 ± 0.90 | –570.00 ± 1.00 | [8] | 10.45 ± 0.30 | 10.84 ± 0.10 | 10.5 ± 0.10 | 11.14 | | |
| 45383 | 79555 | 09 14 53.6615 | +04 26 34.440 | 55.67 ± 1.41 | –114.40 ± 1.30 | 26.80 ± 1.30 | [2] | 10.02 ± 0.70 | 8.50 ± 1.70 | | | | |
| 45617 | 79969 | 09 17 53.4561 | +28 33 37.861 | 57.93 ± 0.76 | 52.80 ± 1.20 | –510.50 ± 1.10 | [2] | –20.65 ± 0.90 | –20.94 ± 0.43 | –21.00 ± 0.10 | | | |
| 45839 | 80632 | 09 20 44.3177 | –05 45 14.293 | 42.81 ± 1.44 | –364.60 ± 1.40 | –111.50 ± 1.40 | [2] | 37.10 ± 0.11 | 39.20 ± 2.30 | | | | |
| 45963 | 80715 | 09 22 25.9452 | +40 12 03.818 | 40.08 ± 0.65 | –340.70 ± 0.80 | –359.30 ± 0.80 | [2] | –3.20 | –3.71 ± 5.23 | –3.70 ± 0.10 | | | CAB |
| 46509 | 81997 | 09 29 08.8977 | –02 46 08.270 | 57.70 ± 2.14 | 98.99 ± 2.34 | –2.66 ± 1.39 | [5,8] | 10.85 ± 0.28 | 9.70 ± 0.30 | 10.90 ± 0.30 | | | Spec. Binary |
| 46580 | 82106 | 09 29 54.8245 | +05 39 18.484 | 77.47 ± 0.64 | –502.40 ± 1.00 | 109.70 ± 1.10 | [4,6] | 29.75 | 29.58 ± 0.63 | 29.60 ± 0.10 | 29.84 | 30.3 | RV standard |
| 46816 | 82558 | 09 32 25.5683 | –11 11 04.685 | 53.70 ± 0.84 | –247.50 ± 1.10 | 35.50 ± 1.10 | [7] | 5.81 ± 0.35 | 9.20 ± 1.20 | | | 8.7 | |
| | | | | | | | [5] | 7.67 ± 0.65 | | | | | |
| 46843 | 82443 | 09 32 43.7592 | +26 59 18.709 | 56.19 ± 0.60 | –147.80 ± 1.40 | –246.70 ± 1.30 | [7] | 8.00 ± 0.09 | 11.20 ± 1.30 | | | | |
| | | | | | | | [7] | 9.49 ± 0.33 | | | | | |
| | | | | | | | [6] | 8.12 ± 0.12 | | | | | |
| 47080 | 82885 | 09 35 39.5023 | +35 48 36.481 | 87.96 ± 0.32 | –723.00 ± 1.30 | –247.80 ± 1.40 | [2, 6, 8, 9] | 14.40 | 14.80 ± 0.20 | | | | RV standard |
| 47592 | 84117 | 09 42 14.4168 | –23 54 56.048 | 66.62 ± 0.20 | –400.30 ± 1.10 | 263.20 ± 1.00 | [8] | 35.97 ± 0.09 | 34.48 ± 0.32 | 34.40 ± 0.20 | | 35.3 | |
| 48113 | 84737 | 09 48 35.3714 | +46 01 15.629 | 54.45 ± 0.28 | 222.00 ± 0.80 | –93.50 ± 0.90 | [4, 5, 6, 7] | 6.00 ± 1.10 | 4.96 ± 0.16 | 4.80 ± 0.10 | 4.90 | 6.1 | RV standard |
| 48411 | 85488 | 09 52 11.3626 | +03 13 18.631 | 48.86 ± 1.23 | –425.60 ± 1.20 | 17.20 ± 1.10 | [3] | 29.65 ± 0.12 | 21.50 ± 1.00 | | | | |
| | | | | | | | [6] | 21.58 ± 0.14 | | | | | |
| 49081 | 86728 | 10 01 00.6566 | +31 55 25.220 | 66.47 ± 0.32 | –529.10 ± 0.60 | –430.20 ± 0.70 | [4] | 56.31 ± 0.06 | 55.79 ± 0.71 | 55.80 ± 0.10 | 55.96 | 56.0 | |
| 49366 | 87424 | 10 04 37.6601 | –11 43 46.930 | 41.63 ± 0.95 | –189.80 ± 1.00 | –25.20 ± 1.00 | [3] | –11.52 ± 0.07 | –12.20 ± 0.20 | | –12.13 | –11.8 | |
| 49699[⋆] | 87883 | 10 08 43.1395 | +34 14 32.135 | 54.93 ± 0.54 | –65.10 ± 1.20 | –60.70 ± 1.30 | [2] | 9.35 ± 0.06 | 9.20 ± 0.20 | | 9.25 | 10.1 | |
| | | | | | | | [6] | 8.94 ± 0.09 | | | | | |
| 49908 | 88230 | 10 11 22.1411 | +49 27 15.252 | 205.20 ± 0.54 | –1359.80 ± 1.00 | –505.70 ± 1.00 | [4] | –26.58 ± 0.17 | –26.73 ± 0.22 | –26.80 ± 0.10 | –25.73 | | |
| | | | | | | | [6] | –26.57 ± 0.20 | | | | | |
| 49986 | | 10 12 17.6681 | –03 44 44.384 | 127.06 ± 1.90 | –150.70 ± 1.40 | –245.20 ± 1.50 | [8] | 7.33 ± 0.11 | 9.0 ± 1.40 | | 7.93 | | |
| 50125 | 233719 | 10 13 57.3822 | +52 30 24.208 | 43.28 ± 1.36 | 86.30 ± 1.14 | –760.67 ± 0.80 | [3] | –21.78 ± 0.11 | –24.80 | | | | |
| 50384 | 89125 | 10 17 14.5385 | +23 06 22.391 | 43.82 ± 0.35 | –412.70 ± 0.90 | –97.90 ± 0.80 | [4] | 37.41 ± 0.09 | 37.40 ± 1.25 | 37.40 ± 0.10 | | | |
| 50505 | 89269 | 10 18 51.9488 | +44 02 53.962 | 49.40 ± 0.50 | 61.90 ± 0.80 | –299.70 ± 0.90 | [3] | –6.54 ± 0.07 | –8.20 ± 1.27 | –8.20 ± 0.30 | –7.55 | –7.3 | |

**Table 1.** continued.

| HIP | HD | $\alpha$ | $\delta$ | $\pi$ | $\mu_\alpha \times \cos\delta$ | $\mu_\delta$ | Obs.run[♯] | Radial velocity This work | Radial velocity $KH07$ | Radial velocity $NO04$ | Radial velocity $NI02$ | Radial velocity $VF05$ | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (h, m, s) | (°, ′, ″) | (mas) | (mas/yr) | (mas/yr) | | (km s$^{-1}$) | (km s$^{-1}$) | (km s$^{-1}$) | (km s$^{-1}$) | (km s$^{-1}$) | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| 51248 | 90508 | 10 28 03.8823 | +48 47 05.644 | 43.67 ± 0.43 | 82.60 ± 1.50 | –881.90 ± 1.50 | [7] | –6.09 ± 0.17 | –7.11 ± 0.29 | –7.10 ± 0.10 | | | |
| 51459 | 90839 | 10 30 37.5798 | +55 58 49.931 | 78.26 ± 0.29 | –177.70 ± 0.70 | –32.80 ± 0.80 | [9] | 8.47 ± 0.04 | 8.60 ± 0.22 | 8.50 ± 0.10 | 8.53 | 9.4 | |
| 51502 | 90089 | 10 31 04.6638 | +82 33 30.915 | 46.51 ± 1.40 | –82.20 ± 0.30 | 24.20 ± 0.30 | [8] | | 7.93 ± 2.68 | 8.60 ± 3.70 | | | |
| 51525 | | 10 31 24.2173 | +45 31 33.783 | 63.52 ± 1.09 | –568.30 ± 1.10 | –595.90 ± 1.00 | [3] | 21.44 ± 0.16 | 20.10 ± 1.13 | 20.10 ± 0.10 | 21.05 | | |
| 51933[‡] | 91889 | 10 36 32.3829 | –12 13 48.436 | 39.86 ± 0.37 | 268.60 ± 0.70 | –672.40 ± 0.70 | [7] | –6.37 ± 0.11 | –6.30 ± 1.25 | –6.30 ± 0.10 | | | |
| 52369 | 92719 | 10 42 13.3215 | –13 47 15.768 | 41.96 ± 0.48 | 236.40 ± 1.20 | –171.40 ± 1.20 | [7] | –17.06 ± 0.08 | –18.20 ± 0.10 | –18.20 ± 0.10 | | | |
| | | | | | | | [5] | –17.68 ± 0.08 | | | | | |
| 53486 | 94765 | 10 56 30.7983 | +07 23 18.506 | 57.79 ± 0.87 | –256.80 ± 1.30 | –77.30 ± 1.30 | [3] | 6.12 ± 0.06 | 5.40 ± 0.20 | | 5.53 | 6.4 | |
| 53721[⋆] | 95128 | 10 59 27.9737 | +40 25 48.925 | 71.11 ± 0.25 | –317.20 ± 0.70 | 56.60 ± 0.70 | [9] | 11.39 ± 0.07 | 11.19 ± 0.22 | 11.10 ± 0.10 | 11.24 | 11.7 | |
| 54155[‡] | 96064 | 11 04 41.4733 | –04 13 15.924 | 38.09 ± 0.99 | –178.60 ± 1.20 | –102.90 ± 1.20 | [7] | 20.03 ± 0.14 | 18.00 ± 0.20 | 18.00 ± 0.20 | | | |
| | | | | | | | [3] | 19.23 ± 0.08 | | | | | |
| 54426 | 96612 | 11 08 14.0145 | +38 25 35.873 | 44.29 ± 0.84 | –214.30 ± 1.50 | 41.30 ± 1.60 | [4] | –35.60 ± 0.05 | –36.40 ± 0.90 | | | | |
| 54646 | 97101 | 11 11 05.1724 | +30 26 45.662 | 84.22 ± 0.86 | 590.80 ± 1.10 | –197.70 ± 1.10 | [4] | –16.66 ± 0.17 | –16.40 ± 0.10 | –17.20 ± 0.10 | –16.38 | | |
| | | | | | | | [7] | –15.12 ± 0.16 | | | | | |
| | | | | | | | [8] | –16.02 ± 0.15 | | | | | |
| 54651 | 97214 | 11 11 10.7010 | –10 57 03.195 | 49.39 ± 0.96 | –939.40 ± 1.70 | 593.40 ± 1.70 | [7] | 38.30 ± 0.19 | 36.80 ± 2.62 | 36.80 ± 0.10 | | | |
| | | | | | | | [5] | 37.72 ± 0.01 | | | | | |
| 54677 | 97233 | 11 11 33.1223 | –14 59 28.996 | 46.34 ± 1.31 | 716.80 ± 1.60 | –596.90 ± 1.50 | [7] | –10.49 ± 0.17 | –11.30 ± 3.28 | –11.40 ± 0.70 | | | |
| | | | | | | | [6] | –12.17 ± 0.15 | | | | | |
| 54745 | 97334 | 11 12 32.3508 | +35 48 50.689 | 45.60 ± 0.44 | –248.60 ± 1.40 | –151.90 ± 1.40 | [4] | –3.31 ± 0.06 | –3.66 ± 0.22 | –3.70 ± 0.10 | –3.66 | –5.5 | |
| 54810 | 97503 | 11 13 13.2332 | +04 28 56.443 | 54.71 ± 1.23 | –315.50 ± 1.00 | –35.70 ± 1.00 | [5] | 17.10 ± 0.18 | 15.90 ± 1.83 | 15.90 ± 0.10 | | | |
| 54906 | 97658 | 11 14 33.1624 | +25 42 37.385 | 47.36 ± 0.75 | –106.00 ± 1.50 | 49.30 ± 1.30 | [4] | –1.27 ± 0.07 | 0.90 ± 1.40 | | –1.65 | –4.0 | |
| 54966[†] | | 11 15 20.8893 | –18 08 42.152 | 70.25 ± 29.70 | 341.29 ± 24.49 | –690.34 ± 20.14 | [6] | 7.44 ± 0.25 | 6.91 ± 2.62 | 6.90 ± 0.10 | | | |
| 55210 | 98281 | 11 18 22.0115 | –05 04 02.288 | 46.37 ± 0.64 | 794.60 ± 0.90 | –151.50 ± 1.00 | [4] | 13.73 ± 0.06 | 12.89 ± 1.25 | 12.90 ± 0.10 | 13.33 | 11.1 | |
| 55848[⋆] | 99492 | 11 26 46.2771 | +03 00 22.781 | 55.71 ± 1.45 | –728.30 ± 1.00 | 185.70 ± 1.00 | [6] | 4.17 ± 0.08 | 3.10 ± 0.36 | 3.10 ± 0.10 | 3.73 | 4.1 | |
| 56242 | 100180 | 11 31 44.9451 | +14 21 52.218 | 42.87 ± 1.21 | –328.40 ± 1.00 | –190.10 ± 0.90 | [4] | –4.68 ± 0.05 | –4.87 ± 0.79 | –4.90 ± 0.20 | –4.85 | –4.4 | |
| 56452 | 100623 | 11 34 29.4871 | –32 49 52.823 | 104.61 ± 0.37 | –669.90 ± 1.10 | 825.20 ± 1.00 | [9] | –21.99 ± 0.05 | –22.31 ± 0.53 | –22.30 ± 0.10 | –21.96 | –24.5 | |
| 56809 | 101177 | 11 38 44.9009 | +45 06 30.296 | 43.06 ± 0.73 | –594.00 ± 1.20 | 15.10 ± 1.30 | [7] | –18.93 ± 0.24 | –16.32 ± 2.42 | –17.30 ± 0.20 | –16.91 | –17.0 | Spec. Binary |
| 56997 | 101501 | 11 41 03.0153 | +34 12 05.888 | 104.03 ± 0.26 | –12.80 ± 0.80 | –380.60 ± 0.80 | [9] | –5.55 ± 0.06 | –5.82 ± 0.16 | –5.90 ± 0.10 | –5.57 | –4.3 | |
| 57443 | 102365 | 11 46 31.0720 | –40 30 01.274 | 108.45 ± 0.23 | –1530.10 ± 0.80 | 402.50 ± 0.70 | [10] | | 16.77 ± 0.53 | 16.80 ± 0.10 | | 17.3 | |
| 57494[‡] | 102392 | 11 47 03.8343 | –11 49 26.573 | 39.44 ± 1.10 | –191.00 ± 1.50 | –64.80 ± 1.40 | [7] | 18.68 ± 0.10 | 18.30 ± 1.40 | | | | |
| | | | | | | | [7] | 20.29 ± 0.22 | | | | | |
| 57757 | 102870 | 11 50 41.7185 | +01 45 52.985 | 91.50 ± 0.22 | 740.30 ± 0.40 | –271.70 ± 0.40 | [9] | 4.30 | 4.11 ± 0.53 | 4.10 ± 0.10 | 4.45 | 5.3 | RV standard |
| 57939 | 103095 | 11 52 58.7691 | +37 43 07.239 | 109.98 ± 0.41 | 4003.98 ± 0.37 | –5813.62 ± 0.23 | [7] | –96.79 ± 0.29 | –98.30 ± 0.10 | –99.00 ± 0.10 | –98.07 | –98.2 | |
| | | | | | | | [8] | –98.27 ± 0.18 | | | | | |
| 59000 | 105065 | 12 05 50.6575 | –18 52 30.915 | 45.44 ± 1.39 | –13.50 ± 1.70 | –314.00 ± 2.40 | [7] | 52.81 ± 0.19 | | | | | |
| | | | | | | | [6] | 12.19 ± 0.20 | | | | | |
| 59280 | 105631 | 12 09 37.2563 | +40 15 07.399 | 40.76 ± 0.66 | –314.30 ± 0.70 | –51.30 ± 0.80 | [7] | –2.86 ± 0.06 | –2.10 ± 1.50 | | –2.43 | –1.7 | |
| | | | | | | | [7] | –1.15 ± 0.15 | | | | | |
| 59750 | 106516 | 12 15 10.5577 | –10 18 44.641 | 44.77 ± 0.81 | 34.80 ± 1.00 | –1014.80 ± 1.10 | [7] | 4.69 ± 0.14 | 7.07 ± 3.61 | 4.00 ± 5.00 | | | Spec. Binary |
| 60866 | 108581 | 12 28 31.5943 | –18 17 50.237 | 40.67 ± 1.05 | 170.00 ± 1.70 | –175.50 ± 1.60 | [7] | –5.42 ± 0.16 | 2.70 | | | | |
| | | | | | | | [6] | –5.24 ± 0.14 | | | | | |
| 61317 | 109358 | 12 33 44.5446 | +41 21 26.927 | 118.49 ± 0.20 | –704.90 ± 0.60 | 292.40 ± 0.60 | [9] | | 6.30 ± 0.71 | 6.30 ± 0.10 | 6.26 | 8.9 | Spec. Binary |
| 61901 | 110315 | 12 41 06.4805 | +15 22 35.991 | 70.52 ± 0.73 | 122.10 ± 0.70 | –390.50 ± 0.70 | [5] | 24.17 ± 0.09 | 23.70 ± 1.10 | | 24.60 | | |
| 61941 | 110379 | 12 41 39.6423 | –01 26 57.750 | 85.00 ± 0.58 | –614.29 ± 0.86 | 60.71 ± 0.46 | [9] | –21.42 ± 0.66 | –19.56 ± 0.75 | –19.50 ± 0.80 | | | |
| 62207 | 110897 | 12 44 59.4051 | +39 16 44.099 | 57.55 ± 0.32 | –360.20 ± 0.80 | 139.00 ± 0.80 | [7] | 80.01 ± 0.10 | 80.29 ± 0.71 | 80.30 ± 0.10 | | | |

**Table 1.** continued.

| | | | | | | | | Radial velocity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP (1) | HD (2) | $\alpha$ (h, m, s) (3) | $\delta$ (°, ′, ″) (4) | $\pi$ (mas) (5) | $\mu_\alpha \times \cos\delta$ (mas/yr) (6) | $\mu_\delta$ (mas/yr) (7) | Obs.run♯ (8) | This work (km s$^{-1}$) (9) | *KH*07 (km s$^{-1}$) (10) | *NO*04 (km s$^{-1}$) (11) | *NI*02 (km s$^{-1}$) (12) | *VF*05 (km s$^{-1}$) (13) | Notes (14) |
| | | | | | | | [7] | 81.70 ± 0.23 | | | | | |
| 62505 | 111312 | 12 48 32.3079 | –15 43 10.103 | 41.95 ± 3.00 | 59.90 ± 1.90 | 39.20 ± 1.70 | [6] | 1.25 ± 0.15 | 0.20 ± 0.40 | | 0.62 | | |
| 62523 | 111395 | 12 48 47.0484 | +24 50 24.813 | 59.04 ± 0.45 | –335.00 ± 1.20 | –106.00 ± 1.10 | [1] | –8.70 ± 0.70 | –9.26 ± 0.29 | –9.30 ± 0.10 | | –6.0 | |
| | | | | | | | [7] | –7.95 ± 0.09 | | | | | |
| | | | | | | | [7] | –7.92 ± 0.08 | | | | | |
| | | | | | | | [6] | –7.38 ± 0.08 | | | | | |
| 63257 | 112575 | 12 57 43.9570 | –14 27 48.626 | 41.61 ± 1.55 | –355.60 ± 1.40 | 22.20 ± 1.40 | [5] | –6.51 ± 0.07 | 5.10 | | | | |
| 63366 | 112758 | 12 59 01.5624 | –09 50 02.705 | 47.86 ± 0.91 | –824.60 ± 1.10 | 197.70 ± 1.10 | [7] | 3.97 ± 0.12 | 3.69 ± 1.84 | 3.70 ± 0.20 | | | |
| 63742 | 113449 | 13 03 49.6555 | –05 09 42.524 | 46.09 ± 0.81 | –189.60 ± 0.70 | –223.20 ± 0.80 | [6] | –13.08 ± 0.08 | 0.00 | | | | |
| | | | | | | | [7] | –2.56 ± 0.09 | | | | | |
| 64241 | 114378 | 13 09 59.2766 | +17 31 45.953 | 56.14 ± 0.90 | –430.10 ± 0.90 | 137.80 ± 0.90 | [9] | –18.58 ± 0.23 | –12.76 ± 0.32 | –11.40 ± 0.20 | | | |
| 64394 | 114710 | 13 11 52.3935 | +27 52 41.459 | 109.53 ± 0.17 | –800.90 ± 0.50 | 882.20 ± 0.50 | [9] | 5.30 ± 0.05 | 5.04 ± 0.36 | 5.00 ± 0.10 | 5.30 | 6.2 | |
| 64792 | 115383 | 13 16 46.5155 | +09 25 26.963 | 56.93 ± 0.26 | –334.90 ± 0.80 | 191.00 ± 0.70 | [1] | –27.73 ± 0.13 | –27.22 ± 0.16 | –27.40 ± 0.10 | –27.14 | –26.6 | |
| 64797 | 115404 | 13 16 51.0523 | +17 01 01.857 | 90.36 ± 0.74 | 623.90 ± 1.20 | –259.00 ± 1.10 | [9] | 7.71 ± 0.06 | 9.00 | | | | |
| 64924⋆ | 115617 | 13 18 24.3146 | –18 18 40.306 | 116.89 ± 0.22 | –1070.37 ± 0.23 | –1063.69 ± 0.13 | [6] | –5.80 ± 0.09 | –8.10 ± 0.16 | –8.20 ± 0.10 | –7.85 | –9.4 | |
| | | | | | | | [9] | –8.96 ± 0.03 | | | | | |
| 65343 | 116495 | 13 23 32.7842 | +29 14 14.930 | 53.18 ± 0.98 | –467.90 ± 1.70 | 244.70 ± 1.50 | [7] | –39.37 ± 0.18 | –38.60 ± 0.20 | | | | |
| 65352 | 116442 | 13 23 39.1545 | +02 43 23.970 | 64.73 ± 1.33 | 13.30 ± 1.30 | 199.60 ± 1.30 | [3] | 28.69 ± 0.07 | 28.00 ± 0.20 | 28.00 ± 0.20 | 28.42 | 28.9 | |
| 65515 | 116956 | 13 25 45.5321 | +56 58 13.776 | 46.31 ± 0.51 | –218.30 ± 0.90 | 10.70 ± 1.10 | [7] | –12.72 ± 0.08 | –12.60 ± 0.20 | –12.60 ± 0.20 | | | |
| | | | | | | | [7] | –12.70 ± 0.10 | | | | | |
| 65721⋆ | 117176 | 13 28 25.8094 | +13 46 43.634 | 55.59 ± 0.24 | –234.00 ± 0.60 | –575.70 ± 0.60 | [7] | 6.15 ± 0.14 | 4.72 ± 0.16 | 4.60 ± 0.10 | 5.04 | 3.9 | |
| 66147 | 117936 | 13 33 32.4003 | +08 35 12.351 | 52.46 ± 0.89 | –509.00 ± 1.70 | 93.50 ± 1.60 | [3] | –5.79 ± 0.07 | –6.20 ± 0.20 | | –6.09 | –5.7 | |
| 66252 | 118100 | 13 34 43.2057 | –08 20 31.333 | 49.47 ± 0.72 | –288.70 ± 1.60 | –87.40 ± 1.60 | [7] | –21.05 ± 0.24 | –23.00 ± 2.62 | –23.00 ± 0.10 | | | |
| 66886 | 119291 | 13 42 26.0357 | –01 41 10.580 | 41.43 ± 1.20 | –287.90 ± 1.20 | –154.50 ± 1.10 | [3] | –42.52 ± 0.09 | –42.90 ± 0.30 | | | | |
| 67105 | 119802 | 13 45 14.7165 | +08 50 09.515 | 47.65 ± 0.98 | –67.30 ± 1.30 | –97.90 ± 1.30 | [3] | –12.76 ± 0.07 | –13.20 ± 0.30 | | | | |
| 67275 | 120136 | 13 47 15.7429 | +17 27 24.862 | 64.03 ± 0.20 | –480.80 ± 0.40 | 50.40 ± 0.40 | [5] | –21.02 ± 0.31 | –16.18 ± 0.36 | –16.20 ± 0.10 | –16.54 | –15.9 | |
| 67422 | 120476 | 13 49 03.9957 | +26 58 47.678 | 74.48 ± 0.77 | –436.00 ± 1.90 | –110.80 ± 1.80 | [9] | –20.50 ± 0.06 | –19.90 ± 0.50 | | –20.38 | –20.3 | |
| 68030 | 121560 | 13 55 49.9935 | +14 03 23.411 | 40.23 ± 0.37 | –290.60 ± 0.80 | 9.70 ± 0.80 | [5] | –10.83 ± 0.18 | –10.74 ± 0.86 | –10.70 ± 0.20 | –10.53 | –10.2 | |
| 68184 | 122064 | 13 57 32.0575 | +61 29 34.301 | 99.37 ± 0.32 | –31.40 ± 1.20 | 217.20 ± 1.40 | [9] | –26.62 ± 0.08 | –25.30 | | –26.47 | –26.3 | |
| 68337 | 122120 | 13 59 19.4025 | +22 52 11.116 | 40.32 ± 0.96 | –161.70 ± 1.00 | 13.60 ± 1.00 | [1] | –57.59 ± 0.17 | –56.70 ± 1.10 | | –57.44 | | |
| 68682 | 122742 | 14 03 32.3515 | +10 47 12.404 | 58.87 ± 0.62 | 91.10 ± 1.20 | –307.50 ± 1.20 | [1] | –11.20 ± 0.30 | –12.30 ± 2.66 | –12.30 ± 0.70 | –8.08 | –8.5 | Spec. Binary |
| 69357 | 124106 | 14 11 46.1709 | –12 36 42.358 | 42.75 ± 1.21 | –256.20 ± 1.10 | –180.40 ± 1.10 | [1] | 3.10 ± 0.11 | 2.86 ± 1.26 | 2.80 ± 0.20 | 3.29 | 3.7 | |
| 69414 | 124292 | 14 12 45.2397 | –03 19 12.304 | 45.35 ± 0.54 | –162.20 ± 1.00 | –323.10 ± 1.20 | [1] | 37.20 ± 0.10 | 37.44 ± 0.71 | 37.50 ± 0.10 | 37.77 | 38.0 | |
| 69526 | 124642 | 14 13 57.0781 | +30 13 01.874 | 57.39 ± 1.06 | –398.50 ± 1.40 | 173.80 ± 1.40 | [1] | –16.47 ± 0.19 | –16.30 ± 0.20 | | –16.24 | | |
| 69701 | 124850 | 14 16 00.8697 | –06 00 01.968 | 44.98 ± 0.19 | –26.32 ± 0.19 | –419.38 ± 0.14 | [4] | 13.07 ± 0.42 | 12.46 ± 0.29 | 12.40 ± 0.10 | | | |
| 69962 | 125354 | 14 18 58.2805 | –06 36 13.125 | 45.97 ± 1.60 | –15.60 ± 1.50 | –425.60 ± 1.80 | [5] | 7.35 ± 0.17 | 12.30 ± 1.40 | | | | |
| | | | | | | | [7] | 9.65 ± 0.37 | | | | | |
| 69972 | 125072 | 14 19 04.8348 | –59 22 44.533 | 84.74 ± 0.69 | –454.37 ± 0.93 | –809.50 ± 0.72 | [10] | –22.50 ± 0.08 | –18.89 ± 1.25 | –18.90 ± 0.10 | | –17.9 | |
| 70016 | 125455 | 14 19 34.8641 | –05 09 04.302 | 47.91 ± 0.81 | –632.70 ± 1.00 | –121.70 ± 1.20 | [3] | –9.74 ± 0.07 | –10.19 ± 0.71 | –10.20 ± 0.10 | –9.81 | –9.5 | |
| 70218 | | 14 21 57.2165 | +29 37 46.626 | 69.70 ± 0.83 | –631.40 ± 1.10 | –306.70 ± 1.10 | [3] | –36.49 ± 0.13 | –37.81 ± 0.29 | –37.80 ± 0.10 | | | |
| | | | | | | | [7] | –35.69 ± 0.13 | | | | | |
| 70319 | 126053 | 14 23 15.2847 | +01 14 29.648 | 58.17 ± 0.52 | 223.30 ± 1.10 | –477.80 ± 1.20 | [7] | –17.99 ± 0.17 | –19.58 ± 0.53 | –19.60 ± 0.10 | –19.24 | –19.9 | |
| 71284 | 128167 | 14 34 40.8171 | +29 44 42.468 | 63.16 ± 0.26 | 189.10 ± 0.70 | 131.60 ± 0.70 | [5] | 0.22 ± 0.25 | 0.58 ± 0.43 | 0.60 ± 0.10 | 0.14 | 1.4 | |
| 71395⋆ | 128311 | 14 36 00.5607 | +09 44 47.466 | 60.58 ± 0.83 | 204.50 ± 1.10 | –250.10 ± 1.10 | [1] | –9.98 ± 0.10 | –15.30 | | –9.57 | –8.8 | |
| | | | | | | | [6] | –9.83 ± 0.10 | | | | | |
| | | | | | | | [7] | –8.11 ± 0.11 | | | | | |

**Table 1.** continued.

| HIP | HD | $\alpha$ (h, m, s) | $\delta$ (°, ′, ″) | $\pi$ (mas) | $\mu_\alpha \times \cos\delta$ (mas/yr) | $\mu_\delta$ (mas/yr) | Obs.run[♯] | Radial velocity: This work (km s$^{-1}$) | *KH*07 (km s$^{-1}$) | *NO*04 (km s$^{-1}$) | *NI*02 (km s$^{-1}$) | *VF*05 (km s$^{-1}$) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| 71681[†] | 128621 | 14 39 35.0803 | –60 50 13.761 | 796.77 ± 25.82 | –3614.38 ± 20.43 | 803.21 ± 19.48 | [10] | –22.44 ± 0.00 | –25.09 ± 5.24 | –25.10 ± 0.30 | | –18.6 | Spec. Binary |
| 71683 | 128620 | 14 39 36.4951 | –60 50 02.308 | 754.85 ± 4.11 | –3679.27 ± 3.88 | 473.67 ± 3.23 | [10] | –22.44 ± 0.00 | –25.09 ± 5.24 | –25.10 ± 0.30 | | –21.4 | Spec. Binary |
| 71743 | 128987 | 14 40 31.1061 | –16 12 33.444 | 42.24 ± 0.54 | –116.10 ± 1.70 | –65.10 ± 1.40 | [6] | –22.66 ± 0.09 | –23.30 ± 0.20 | –23.30 ± 0.20 | | | |
| 72146 | 130004 | 14 45 24.1821 | +13 50 46.734 | 52.90 ± 0.83 | –230.80 ± 1.00 | –226.70 ± 1.00 | [1] | –19.41 ± 0.11 | –10.00 ± 1.00 | | | | |
| | | | | | | | [7] | –10.19 ± 0.09 | | | | | |
| | | | | | | | [7] | –10.17 ± 0.16 | | | | | |
| | | | | | | | [6] | –8.21 ± 0.11 | | | | | |
| 72237 | | 14 46 23.2809 | +16 29 48.135 | 58.02 ± 1.00 | –109.47 ± 1.07 | –918.87 ± 0.88 | [3] | 43.25 ± 0.11 | 42.13 ± 0.49 | 42.10 ± 0.10 | | | |
| | | | | | | | [7] | 44.17 ± 0.17 | | | | | |
| 72567 | 130948 | 14 50 15.8112 | +23 54 42.639 | 55.01 ± 0.34 | 144.30 ± 1.20 | 30.60 ± 1.10 | [7] | –1.60 ± 0.09 | –2.79 ± 0.43 | –2.80 ± 0.10 | –2.50 | –3.1 | |
| 72603 | 130819 | 14 50 41.1813 | –15 59 50.053 | 43.38 ± 0.39 | –136.40 ± 0.40 | –58.96 ± 0.26 | [6] | –23.47 ± 0.15 | –24.63 ± 0.83 | –24.70 ± 0.40 | | | Spec. Binary |
| 72659 | 131156 | 14 51 23.3785 | +19 06 01.656 | 149.03 ± 0.48 | 154.93 ± 0.40 | –66.40 ± 0.45 | [9] | 1.39 ± 0.08 | 1.50 ± 0.20 | | 1.30 | 0.4 | |
| 72848 | 131511 | 14 53 23.7664 | +19 09 10.074 | 86.87 ± 0.46 | –441.00 ± 1.20 | 217.10 ± 1.10 | [9] | –31.27 ± 0.30 | –22.18 ± 0.76 | –33.40 ± 1.00 | –31.81 | –28.5 | Spec. Binary; CAB |
| 72875 | 131582 | 14 53 41.5709 | +23 20 42.625 | 42.48 ± 1.12 | –824.40 ± 0.80 | 11.00 ± 0.80 | [1] | –32.48 ± 0.10 | –31.87 ± 1.30 | –32.00 ± 0.50 | | | |
| 72981 | | 14 54 53.4814 | +09 56 36.562 | 40.78 ± 2.48 | –313.50 ± 2.70 | –402.00 ± 2.70 | [6] | –1.20 ± 0.24 | | | | | |
| 73184 | 131977 | 14 57 27.9996 | –21 24 55.710 | 171.21 ± 0.94 | 1035.70 ± 1.80 | –1734.90 ± 1.90 | [6] | 26.49 ± 0.10 | 26.32 ± 0.71 | 26.30 ± 0.10 | 26.96 | 26.0 | CAB |
| 73457 | 132683 | 15 00 43.4112 | –11 08 06.464 | 51.69 ± 1.97 | –16.90 ± 1.30 | –482.00 ± 1.30 | [7] | 14.24 ± 0.24 | 14.00 | | | | |
| | | | | | | | [7] | 12.47 ± 0.28 | | | | | |
| | | | | | | | [7] | 14.41 ± 0.21 | | | | | |
| 73695 | 133640 | 15 03 47.3040 | +47 39 14.616 | 79.90 ± 1.55 | –443.70 ± 1.20 | 9.90 ± 1.20 | [9] | –17.89 ± 0.40 | –29.86 ± 0.35 | –30.80 ± 0.30 | | | Spec. Binary |
| 73786 | | 15 04 53.5267 | +05 38 17.150 | 53.80 ± 2.80 | –606.50 ± 1.90 | –508.40 ± 1.90 | [1] | –84.80 ± 0.23 | –68.00 | | | | |
| 73996 | 134083 | 15 07 18.0659 | +24 52 09.104 | 51.14 ± 0.31 | 184.90 ± 0.70 | –163.80 ± 0.70 | [1] | –9.36 ± 0.86 | –8.92 ± 3.59 | –10.00 ± 5.00 | | –11.2 | |
| 74537 | 135204 | 15 13 50.8948 | –01 21 04.995 | 56.62 ± 0.49 | –1270.00 ± 1.10 | –502.10 ± 1.20 | [3] | –69.45 ± 0.10 | –69.87 ± 0.63 | –69.90 ± 0.10 | | | |
| 74702 | 135599 | 15 15 59.1667 | +00 47 46.905 | 63.11 ± 0.71 | 178.20 ± 1.00 | –136.90 ± 1.10 | [5] | –4.23 ± 0.08 | –3.20 ± 0.20 | | –3.15 | –2.8 | |
| 75201 | | 15 22 04.1017 | –04 46 38.836 | 52.92 ± 1.60 | –296.70 ± 1.60 | –13.60 ± 1.50 | [6] | –20.06 ± 0.23 | –17.40 ± 1.10 | | | | |
| 75253 | 136713 | 15 22 36.6948 | –10 39 40.044 | 45.22 ± 1.12 | –57.00 ± 1.00 | –203.80 ± 1.10 | [7] | –5.15 ± 0.12 | –6.30 ± 0.30 | | –6.04 | –5.7 | |
| | | | | | | | [7] | –6.39 ± 0.08 | | | | | |
| 75277 | 136923 | 15 22 46.8337 | +18 55 08.257 | 51.02 ± 0.63 | –230.90 ± 1.10 | 77.20 ± 1.10 | [1] | –7.55 ± 0.90 | –10.70 | | –7.04 | –6.6 | |
| 75542 | 137303 | 15 25 58.5030 | –26 42 20.816 | 41.52 ± 1.26 | –818.20 ± 1.50 | –8.80 ± 1.40 | [6] | –133.45 ± 0.18 | –133.03 ± 7.43 | –133.10 ± 0.30 | | | |
| 75718 | 137763 | 15 28 09.6115 | –09 20 53.050 | 52.06 ± 1.18 | 76.40 ± 1.00 | –359.00 ± 1.00 | [7] | 6.82 ± 0.04 | 6.48 ± 0.89 | 6.60 ± 0.60 | | | Spec. Binary |
| 75722 | 137778 | 15 28 12.2103 | –09 21 28.296 | 48.77 ± 0.90 | 80.50 ± 1.10 | –355.90 ± 1.10 | [7] | 9.01 ± 0.09 | 7.21 ± 0.49 | 7.20 ± 0.10 | 7.75 | 8.2 | |
| | | | | | | | [6] | –39.30 ± 0.08 | | | | | |
| 75809 | 139777 | 15 29 11.1826 | +80 26 54.968 | 45.77 ± 0.37 | –223.20 ± 1.20 | 107.80 ± 1.20 | [7] | –16.40 ± 0.14 | –16.67 ± 0.57 | –16.70 ± 0.10 | | | |
| | | | | | | | [7] | –14.39 ± 0.14 | | | | | |
| 75829 | 139813 | 15 29 23.5924 | +80 27 00.961 | 46.48 ± 0.49 | –218.00 ± 1.20 | 105.80 ± 1.20 | [7] | –14.59 ± 0.07 | –29.00 ± 3.70 | –29.00 ± 3.70 | | –15.4 | |
| | | | | | | | [7] | –16.39 ± 0.14 | | | | | |
| | | | | | | | [7] | –14.61 ± 0.14 | | | | | |
| 76051[†‡] | | 15 31 54.0449 | +09 39 26.904 | 13.46 ± 11.21 | –39.30 ± 1.60 | –4.20 ± 1.60 | [1] | –34.62 ± 0.15 | –38.30 ± 2.20 | –38.30 ± 2.20 | | | |
| 76375 | 139323 | 15 35 56.5661 | +39 49 52.023 | 44.69 ± 0.58 | –447.50 ± 0.80 | 50.70 ± 0.90 | [1] | –67.65 ± 0.13 | –68.80 ± 1.20 | | –67.10 | –66.5 | |
| 76602 | 139460 | 15 38 39.9468 | –08 47 40.970 | 41.02 ± 3.75 | 18.20 ± 2.60 | –23.80 ± 2.70 | [6] | –4.54 ± 0.15 | 0.68 ± 1.27 | 0.60 ± 0.30 | | | |
| 76603[‡] | 139461 | 15 38 40.0817 | –08 47 29.364 | 37.57 ± 4.31 | 20.30 ± 2.60 | –34.00 ± 2.70 | [6] | –1.26 ± 0.10 | –1.25 ± 2.77 | –1.40 ± 1.30 | | | Spec. Binary |
| 76779 | 139763 | 15 40 34.5693 | –18 02 56.498 | 64.28 ± 1.39 | 161.70 ± 1.70 | 88.80 ± 1.60 | [6] | 4.55 ± 0.18 | | | | | |
| 77052 | 140538 | 15 44 01.8197 | +02 30 54.624 | 68.21 ± 0.66 | –48.00 ± 0.80 | –147.20 ± 0.80 | [7] | 20.36 ± 0.11 | 18.70 ± 0.36 | 18.70 ± 0.10 | | 19.5 | |
| 77257 | 141004 | 15 46 26.6133 | +07 21 11.063 | 82.48 ± 0.31 | –224.50 ± 0.90 | –69.20 ± 0.80 | [9] | | –66.20 ± 0.71 | –66.80 ± 0.10 | –66.42 | –65.3 | Spec. Binary |
| 77408 | 141272 | 15 48 09.4630 | +01 34 18.262 | 46.96 ± 0.80 | –176.50 ± 1.10 | –165.80 ± 1.00 | [1] | –26.58 ± 0.80 | –26.92 ± 1.26 | –26.90 ± 0.20 | | | |
| | | | | | | | [6] | –24.70 ± 0.09 | | | | | |

**Table 1.** continued.

| HIP (1) | HD (2) | α (h, m, s) (3) | δ (°, ′, ″) (4) | π (mas) (5) | $\mu_\alpha \times \cos\delta$ (mas/yr) (6) | $\mu_\delta$ (mas/yr) (7) | Obs.run♯ (8) | Radial velocity: This work (km s$^{-1}$) (9) | *KH*07 (km s$^{-1}$) (10) | *NO*04 (km s$^{-1}$) (11) | *NI*02 (km s$^{-1}$) (12) | *VF*05 (km s$^{-1}$) (13) | Notes (14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | [7] | –25.06 ± 0.12 | | | | | |
| 78072 | 142860 | 15 56 27.1828 | +15 39 41.821 | 88.85 ± 0.18 | 310.93 ± 0.20 | –1282.19 ± 0.18 | [1] | 6.53 ± 0.31 | 6.40 ± 0.63 | 6.40 ± 0.10 | 6.54 | 7.5 | |
| | | | | | | | [9] | 6.46 ± 0.10 | | | | | |
| 78709 | 144287 | 16 04 03.7132 | +25 15 17.436 | 44.99 ± 0.79 | –532.90 ± 1.00 | 683.00 ± 1.10 | [6] | –48.15 ± 0.04 | –46.74 ± 1.23 | –46.80 ± 0.40 | | | Spec. Binary |
| 78775 | 144579 | 16 04 56.7932 | +39 09 23.433 | 68.88 ± 0.33 | –571.90 ± 0.90 | 52.20 ± 1.00 | [9] | –59.45 | –59.88 ± 0.53 | –59.90 ± 0.10 | –59.43 | –59.0 | RV standard |
| 78843 | 144253 | 16 05 40.4714 | –20 27 00.216 | 53.42 ± 1.23 | 300.20 ± 1.60 | –349.10 ± 1.60 | [6] | 36.66 ± 0.09 | 36.67 ± 2.34 | 36.60 ± 0.30 | | | CAB |
| 79190 | 144628 | 16 09 42.7934 | –56 26 42.536 | 68.16 ± 0.64 | –135.24 ± 0.62 | 333.39 ± 0.58 | [10] | 33.03 ± 0.09 | 36.11 ± 2.62 | 36.10 ± 0.20 | | 37.5 | |
| 79492 | 145958 | 16 13 18.4525 | +13 31 36.880 | 42.03 ± 1.12 | 183.07 ± 0.94 | –420.12 ± 0.93 | [1] | 18.27 ± 0.80 | 18.20 ± 1.00 | | 18.42 | 16.3 | |
| | | | | | | | [6] | 18.97 ± 0.08 | | | | | |
| 79672 | 146233 | 16 15 37.2703 | –08 22 09.990 | 71.93 ± 0.37 | 231.10 ± 0.80 | –494.60 ± 0.80 | [9] | 12.05 ± 0.05 | 11.62 ± 0.29 | 11.60 ± 0.10 | 11.75 | 12.2 | |
| 79755 | 147379 | 16 16 42.7461 | +67 14 19.847 | 93.57 ± 0.95 | –493.80 ± 1.30 | 83.80 ± 1.30 | [1] | –19.09 ± 0.20 | –20.7 ± 1.40 | | –18.79 | | |
| 80337⋆ | 147513 | 16 24 01.2899 | –39 11 34.729 | 78.27 ± 0.38 | 72.30 ± 0.70 | 3.30 ± 0.70 | [10] | | 12.56 ± 0.53 | 12.60 ± 0.10 | | 14.8 | |
| 80366 | 147776 | 16 24 19.8100 | –13 38 29.973 | 46.47 ± 1.07 | –220.10 ± 1.50 | –205.70 ± 1.40 | [6] | 6.66 ± 0.11 | 9.00 | | 7.34 | 8.2 | |
| 80644 | 148467 | 16 27 56.9082 | +07 18 19.618 | 57.09 ± 1.26 | –247.60 ± 1.80 | –262.00 ± 1.80 | [1] | –36.72 ± 0.15 | –32.10 ± 2.90 | | –36.21 | | |
| 80686 | 147584 | 16 28 28.1435 | –70 05 03.843 | 82.54 ± 0.52 | 197.80 ± 0.70 | 111.50 ± 0.70 | [10] | 7.60 | 5.48 ± 3.01 | 4.80 ± 2.10 | | | Spec. Binary; CAB |
| 80725 | 148653 | 16 28 52.6657 | +18 24 50.597 | 50.96 ± 0.80 | –339.90 ± 1.20 | 383.30 ± 1.30 | [1] | –31.45 ± 0.13 | –31.90 ± 0.60 | | | | |
| 81300 | 149661 | 16 36 21.4493 | –02 19 28.501 | 102.55 ± 0.41 | 455.00 ± 0.70 | –308.10 ± 0.70 | [9] | –12.73 ± 0.06 | –13.27 ± 0.29 | –13.30 ± 0.10 | –12.86 | –12.7 | |
| 81375 | 149806 | 16 37 08.4277 | +00 15 15.631 | 49.18 ± 0.62 | 92.40 ± 0.90 | 74.60 ± 1.10 | [1] | 9.68 ± 0.70 | 6.00 | | 10.39 | 10.8 | |
| 82588 | 152391 | 16 52 58.8026 | –00 01 35.116 | 57.96 ± 0.66 | –709.30 ± 1.40 | –1483.70 ± 1.40 | [1] | 45.08 ± 0.90 | 44.80 ± 0.29 | 44.80 ± 0.10 | 45.07 | 45.5 | |
| | | | | | | | [1] | 44.57 ± 0.11 | | | | | |
| 83591 | 154363 | 17 05 03.3941 | –05 03 59.427 | 93.41 ± 0.94 | –915.60 ± 0.70 | –1139.20 ± 0.80 | [6] | 33.69 ± 0.14 | 33.60 ± 0.71 | 33.60 ± 0.10 | 34.15 | | |
| 83601 | 154417 | 17 05 16.8193 | +00 42 09.213 | 48.39 ± 0.40 | –16.80 ± 0.90 | –334.80 ± 0.90 | [6] | –15.44 ± 0.10 | –17.01 ± 0.53 | –17.00 ± 0.10 | –16.74 | –16.3 | |
| 84195 | 155712 | 17 12 37.6225 | +18 21 04.295 | 47.70 ± 0.93 | 101.90 ± 1.10 | –117.50 ± 1.00 | [1] | 19.20 ± 0.11 | 20.10 ± 0.90 | | | | |
| | | | | | | | [6] | 19.32 ± 0.08 | | | | | |
| 84478 | 156026 | 17 16 13.3626 | –26 32 46.128 | 167.50 ± 0.61 | –480.40 ± 0.90 | –1123.30 ± 0.90 | [6] | –0.59 ± 0.13 | –0.49 ± 0.71 | –0.50 ± 0.10 | 0.15 | | |
| 84720 | 156274 | 17 19 03.8337 | –46 38 10.444 | 113.67 ± 0.69 | 1053.50 ± 2.10 | 144.00 ± 2.00 | [10] | –13.14 ± 0.07 | 23.0 | 25.3 ± 0.10 | | | |
| 84862 | 157214 | 17 20 39.5672 | +32 28 03.876 | 69.80 ± 0.25 | 135.80 ± 0.70 | –1039.90 ± 0.70 | [9] | –78.44 ± 0.07 | –78.96 ± 0.16 | –79.20 ± 0.10 | –78.55 | –78.5 | |
| 85235 | 158633 | 17 25 00.0985 | +67 18 24.137 | 78.11 ± 0.30 | –529.40 ± 1.20 | 2.10 ± 1.30 | [9] | –38.53 ± 0.05 | –39.09 ± 0.43 | –39.10 ± 0.10 | | –35.7 | |
| 85295 | 157881 | 17 25 45.2321 | +02 06 41.120 | 129.87 ± 0.73 | –579.10 ± 0.90 | –1183.20 ± 1.00 | [6] | –24.21 ± 0.11 | –24.40 ± 1.34 | –24.40 ± 0.10 | –23.20 | | |
| 85561 | 158233 | 17 29 06.5570 | –23 50 10.020 | 53.04 ± 1.73 | –289.90 ± 2.40 | –74.70 ± 2.30 | [6] | –32.90 ± 0.18 | –106.00 | | | | |
| 85810 | 159222 | 17 32 00.9926 | +34 16 16.128 | 41.81 ± 0.35 | –240.00 ± 1.30 | 63.30 ± 1.50 | [6, 7] | –51.60 | –51.80 ± 0.16 | –52.00 ± 0.10 | –51.61 | –51.3 | RV standard |
| 86036 | 160269 | 17 34 59.5940 | +61 52 28.394 | 70.48 ± 0.38 | 265.40 ± 3.30 | –520.90 ± 3.20 | [9] | –16.30 | –14.85 ± 0.20 | –14.60 ± 0.20 | | | Spec. Binary |
| 86346‡ | 160934 | 17 38 39.6261 | +61 14 16.125 | 30.19 ± 2.00 | –21.80 ± 3.00 | 43.70 ± 3.00 | [1] | –25.69 ± 0.35 | | | | | |
| | | | | | | | [1] | –26.48 ± 0.37 | | | | | |
| | | | | | | | [1] | –26.56 ± 0.37 | | | | | |
| | | | | | | | [1] | –26.66 ± 0.42 | | | | | |
| | | | | | | | [4] | –27.99 ± 0.28 | | | | | |
| | | | | | | | [6] | –28.37 ± 0.51 | | | | | |
| | | | | | | | [7] | –28.39 ± 0.35 | | | | | |
| | | | | | | | [7] | –25.37 ± 0.45 | | | | | |
| | | | | | | | [7] | –27.84 ± 0.36 | | | | | |
| | | | | | | | [7] | –27.65 ± 0.44 | | | | | |
| 86400 | 160346 | 17 39 16.9159 | +03 33 18.860 | 90.91 ± 0.68 | –178.50 ± 0.70 | –99.80 ± 0.70 | [9] | 21.19 ± 0.08 | 20.46 ± 0.75 | 19.90 ± 0.70 | 15.95 | | Spec. Binary;CAB |
| 86722 | 161198 | 17 43 15.6433 | +21 36 33.153 | 44.14 ± 0.88 | –123.10 ± 1.10 | –628.00 ± 1.00 | [1] | 23.88 ± 0.04 | 25.58 ± 0.89 | 26.50 ± 0.60 | 23.95 | | Spec. Binary |
| 87579 | | 17 53 29.9367 | +21 19 31.050 | 41.05 ± 1.04 | –71.40 ± 1.00 | 57.00 ± 0.90 | [1] | –13.77 ± 0.10 | –12.70 ± 0.90 | | | | |
| 88601 | 165341 | 18 05 27.2855 | +02 30 00.358 | 196.66 ± 0.84 | 276.30 ± 2.30 | –1091.80 ± 2.30 | [9] | –6.97 ± 0.10 | –9.30 ± 0.63 | –10.40 ± 0.50 | | | Spec. Binary |

**Table 1.** continued.

| HIP | HD | $\alpha$ | $\delta$ | $\pi$ | $\mu_\alpha \times \cos\delta$ | $\mu_\delta$ | Obs.run[♯] | Radial velocity | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (h, m, s) | (°, ′, ″) | (mas) | (mas/yr) | (mas/yr) | | This work (km s$^{-1}$) | *KH*07 (km s$^{-1}$) | *NO*04 (km s$^{-1}$) | *NI*02 (km s$^{-1}$) | *VF*05 (km s$^{-1}$) | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| 88622 | 165401 | 18 05 37.4564 | +04 39 25.822 | 41.81 ± 0.59 | –26.00 ± 1.10 | –316.70 ± 1.10 | [1] | –119.09 ± 0.10 | –119.88 ± 0.72 | –119.90 ± 0.20 | | | |
| 88972 | 166620 | 18 09 37.4165 | +38 27 27.997 | 90.71 ± 0.30 | –318.90 ± 1.40 | –467.80 ± 1.40 | [6] | –19.64 ± 0.07 | –19.92 ± 0.22 | –20.00 ± 0.10 | –19.42 | –19.1 | |
| | | | | | | | [9] | –19.41 ± 0.04 | | | | | |
| 89937 | 170153 | 18 21 03.3826 | +72 43 58.235 | 124.10 ± 0.87 | 531.21 ± 1.03 | –349.71 ± 0.94 | [9] | 32.02 ± 0.26 | 32.43 ± 0.82 | 32.40 ± 0.60 | | | Spec. Binary |
| 90656 | 170493 | 18 29 52.4073 | –01 49 05.173 | 53.72 ± 0.91 | 173.30 ± 0.80 | –193.50 ± 0.90 | [1] | –54.81 ± 0.12 | –55.68 ± 0.57 | –55.70 ± 0.10 | –54.75 | –54.1 | |
| 90790 | 170657 | 18 31 18.9597 | –18 54 31.722 | 75.47 ± 0.70 | –138.80 ± 1.10 | –195.50 ± 1.10 | [9] | –43.14 ± 0.06 | –44.10 ± 1.30 | | –43.13 | –42.8 | |
| 91009 | 234677 | 18 33 55.7728 | +51 43 08.905 | 61.15 ± 0.68 | 186.00 ± 1.30 | –325.90 ± 1.30 | [8] | –24.50 | –24.50 | | | | Spec. Binary; CAB |
| 91438 | 172051 | 18 38 53.4005 | –21 03 06.736 | 76.42 ± 0.46 | –74.10 ± 0.70 | –152.50 ± 0.70 | [10] | | 36.71 ± 0.29 | 36.60 ± 0.10 | 37.10 | 37.4 | |
| 92043 | 173667 | 18 45 39.7254 | +20 32 46.708 | 52.06 ± 0.24 | –9.00 ± 0.30 | –336.20 ± 0.40 | [1] | 22.59 ± 0.27 | 22.48 ± 0.45 | 22.40 ± 0.20 | 23.04 | 24.0 | |
| 92200 | 173818 | 18 47 27.2503 | –03 38 23.391 | 70.05 ± 1.17 | –132.60 ± 1.20 | –276.30 ± 1.20 | [1] | 15.21 ± 0.19 | 16.20 ± 1.50 | | 15.54 | | |
| 92283 | 174080 | 18 48 29.2256 | +10 44 43.620 | 59.31 ± 0.83 | 126.90 ± 1.30 | –437.20 ± 1.20 | [1] | –7.57 ± 0.09 | –7.71 ± 1.83 | –7.70 ± 0.10 | | –6.1 | |
| 93017 | 176051 | 18 57 01.6105 | +32 54 04.585 | 67.25 ± 0.37 | 201.96 ± 0.28 | –145.47 ± 0.35 | [8] | –45.82 ± 0.69 | –48.20 ± 0.25 | –48.60 ± 0.20 | | | Spec. Binary |
| 93871 | 178126 | 19 07 02.0420 | +07 36 57.156 | 40.35 ± 1.41 | –321.70 ± 1.30 | –761.80 ± 1.40 | [1] | 8.53 ± 0.19 | 12.00 | | | | |
| 94346 | 180161 | 19 12 11.3578 | +57 40 19.133 | 49.96 ± 0.32 | 217.50 ± 0.90 | 408.60 ± 0.90 | [1] | –27.22 ± 0.05 | –26.50 ± 1.00 | | | | |
| 95319* | 182488 | 19 23 34.0126 | +33 13 19.078 | 63.44 ± 0.35 | 79.30 ± 1.20 | 162.40 ± 1.20 | [1] | –21.55 | –21.70 ± 0.16 | –22.00 ± 0.10 | –21.51 | –21.2 | RV standard |
| 95995 | 184467 | 19 31 07.9736 | +58 35 09.637 | 58.94 ± 0.64 | –508.90 ± 0.90 | –396.80 ± 1.00 | [8] | 11.40 | 11.80 ± 0.10 | 11.80 ± 0.10 | | | Spec. Binary |
| 96085 | 183870 | 19 32 06.7047 | –11 16 29.792 | 56.72 ± 0.72 | 236.70 ± 1.10 | 18.60 ± 1.10 | [1] | –48.83 ± 0.09 | –49.26 ± 0.16 | –49.50 ± 0.20 | –48.86 | –48.3 | |
| 96100 | 185144 | 19 32 21.5908 | +69 39 40.232 | 173.77 ± 0.18 | 599.20 ± 1.90 | –1734.70 ± 2.00 | [9] | 26.58 ± 0.04 | 26.64 ± 0.16 | 26.30 ± 0.10 | 26.69 | 26.9 | |
| 96183 | 184385 | 19 33 25.5531 | +21 50 25.186 | 48.63 ± 0.63 | –21.30 ± 0.90 | –204.70 ± 0.90 | [1] | 10.70 ± 0.80 | 11.00 ± 2.83 | 11.00 ± 0.10 | 11.41 | 11.7 | |
| 96285 | 184489 | 19 34 39.8401 | +04 34 57.059 | 69.32 ± 1.55 | 524.50 ± 1.40 | 311.30 ± 1.40 | [1] | –59.10 ± 0.24 | –56.80 ± 1.20 | | | | |
| 97944 | 188088 | 19 54 17.7456 | –23 56 27.854 | 71.17 ± 0.42 | –123.10 ± 0.70 | –410.40 ± 0.70 | [10] | –5.10 | –5.70 ± 3.37 | –6.10 ± 1.00 | | | Spec. Binary |
| 98677 | 190067 | 20 02 34.1558 | +15 35 31.471 | 52.70 ± 0.65 | –161.70 ± 1.40 | –581.10 ± 1.30 | [1] | 19.68 ± 0.80 | 20.00 ± 1.48 | 20.00 ± 0.10 | 20.39 | 21.0 | |
| 98698 | 190007 | 20 02 47.0447 | +03 19 34.278 | 77.75 ± 0.53 | –88.20 ± 1.10 | 121.60 ± 1.10 | [6] | –31.19 ± 0.11 | –28.90 ± 1.20 | | –30.30 | | |
| 98819 | 190406 | 20 04 06.2247 | +17 04 12.624 | 56.28 ± 0.35 | –392.50 ± 1.10 | –407.60 ± 1.00 | [1] | 3.89 ± 0.90 | 4.88 ± 0.22 | 4.80 ± 0.10 | 4.76 | 4.2 | |
| | | | | | | | [6] | 5.39 ± 0.07 | | | | | |
| | | | | | | | [7] | 4.13 ± 0.13 | | | | | |
| 98828 | 190470 | 20 04 10.0452 | +25 47 24.827 | 45.54 ± 0.77 | –76.20 ± 1.20 | –39.30 ± 1.10 | [1] | –7.58 ± 0.10 | –7.10 ± 1.40 | | | | |
| 99240 | 190248 | 20 08 43.6084 | –66 10 55.446 | 163.71 ± 0.17 | 1211.20 ± 0.90 | –1131.00 ± 0.90 | [10] | | –21.90 ± 0.53 | –21.90 ± 0.10 | | –19.3 | |
| 99316 | 191499 | 20 09 34.3037 | +16 48 20.757 | 42.30 ± 0.99 | 3.90 ± 1.40 | 167.90 ± 1.40 | [1] | –31.10 ± 0.12 | –32.60 | | | | |
| 99452 | 191785 | 20 11 06.0744 | +16 11 16.799 | 49.07 ± 0.65 | –413.10 ± 1.20 | 398.20 ± 1.10 | [1] | –49.78 ± 0.80 | –49.00 ± 0.70 | | –49.29 | –49.0 | |
| 99461 | 191408 | 20 11 11.9381 | –36 06 04.366 | 166.24 ± 0.27 | 458.40 ± 1.10 | –1569.30 ± 1.10 | [10] | | –129.41 ± 0.53 | –129.40 ± 0.10 | | –126.9 | |
| 99711* | 192263 | 20 13 59.8451 | –00 52 00.757 | 51.76 ± 0.78 | –62.70 ± 0.90 | 262.00 ± 1.10 | [1] | –20.58 ± 0.80 | –11.30 ± 13.44 | –11.30 ± 0.20 | –10.74 | –10.1 | |
| 99764 | | 20 14 28.1911 | –07 16 55.110 | 49.33 ± 1.45 | 12.50 ± 2.20 | –270.70 ± 2.40 | [1] | 7.07 ± 0.22 | | | | | |
| 99825 | 192310 | 20 15 17.3909 | –27 01 58.716 | 112.23 ± 0.30 | 1241.90 ± 0.70 | –180.80 ± 0.70 | [10] | | –54.73 ± 0.38 | –54.80 ± 0.20 | | –55.1 | |
| 101345 | 195564 | 20 32 23.6956 | –09 51 12.181 | 40.97 ± 0.33 | 307.20 ± 0.70 | 103.70 ± 0.70 | [1] | 8.93 ± 0.08 | 9.40 ± 1.91 | 9.40 ± 0.10 | 9.54 | 10.0 | |
| 101955 | 196795 | 20 39 37.7092 | +04 58 19.265 | 59.80 ± 3.42 | 873.90 ± 1.60 | 90.60 ± 1.50 | [1] | –39.20 | –41.90 ± 1.20 | | | | Spec. Binary |
| 101997 | 196761 | 20 40 11.7558 | –23 46 25.923 | 69.54 ± 0.40 | 500.20 ± 0.90 | 460.80 ± 0.90 | [8] | –41.82 ± 0.06 | –42.11 ± 2.62 | –42.10 ± 0.20 | –41.99 | –41.6 | |
| 102485 | 197692 | 20 46 05.7330 | –25 16 15.231 | 68.13 ± 0.27 | –51.95 ± 0.24 | –156.56 ± 0.21 | [8] | | 25.59 ± 2.74 | 20.30 ± 3.80 | | | |
| 103256 | | 20 55 06.8608 | +13 10 36.307 | 44.62 ± 0.94 | 552.10 ± 1.30 | 377.40 ± 1.20 | [1] | –41.65 ± 0.13 | –38.20 ± 1.10 | | | | |
| 104092 | 200779 | 21 05 19.7454 | +07 04 09.474 | 66.41 ± 0.95 | 80.10 ± 1.30 | –564.20 ± 1.30 | [1] | –66.85 ± 0.15 | –67.47 ± 0.71 | –67.50 ± 0.10 | | | |
| 104214 | 201091 | 21 06 53.9434 | +38 44 57.898 | 286.83 ± 6.77 | 4168.30 ± 6.56 | 3269.11 ± 12.07 | [8] | –64.82 ± 0.09 | –66.46 ± 0.49 | –66.50 ± 0.10 | –65.73 | | |
| | | | | | | | [8] | –66.10 ± 0.08 | | | | | |
| 104217 | 201092 | 21 06 55.2648 | +38 44 31.400 | 285.89 ± 0.55 | 4117.10 ± 2.00 | 3128.00 ± 2.00 | [8] | –64.17 ± 0.15 | –64.90 ± 0.10 | –65.30 ± 0.10 | –64.02 | | |
| | | | | | | | [8] | –63.61 ± 0.15 | | | | | |
| 104239 | 200968 | 21 07 10.3807 | –13 55 22.547 | 56.89 ± 0.60 | 382.30 ± 0.90 | –39.90 ± 0.80 | [1] | –33.27 ± 0.10 | –34.00 ± 2.10 | | | –32.1 | |
| 104858 | 202275 | 21 14 28.8152 | +10 00 25.132 | 54.09 ± 0.66 | 39.70 ± 1.30 | –304.20 ± 1.20 | [4] | –15.80 | –16.16 ± 0.74 | –16.20 ± 0.30 | | | Spec. Binary |

**Table 1.** continued.

| HIP | HD | $\alpha$ (h, m, s) | $\delta$ (°, ′, ″) | $\pi$ (mas) | $\mu_\alpha \times \cos\delta$ (mas/yr) | $\mu_\delta$ (mas/yr) | Obs.run♯ | Radial velocity: This work (km s$^{-1}$) | $KH07$ (km s$^{-1}$) | $NO04$ (km s$^{-1}$) | $NI02$ (km s$^{-1}$) | $VF05$ (km s$^{-1}$) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| 105038 | 202575 | 21 16 32.4674 | +09 23 37.772 | 61.02 ± 0.89 | 143.40 ± 1.60 | –116.70 ± 1.60 | [1] | –18.23 ± 0.12 | –18.78 ± 0.91 | –18.80 ± 0.10 | –18.07 | –17.3 | |
| 105152 | 202751 | 21 18 02.9749 | +00 09 41.686 | 50.46 ± 1.04 | 467.70 ± 1.00 | –187.50 ± 1.00 | [1] | –27.43 ± 0.11 | –28.09 ± 0.91 | –28.10 ± 0.10 | –27.43 | –26.9 | |
| 105858 | 203608 | 21 26 26.6056 | –65 21 58.314 | 107.98 ± 0.19 | 80.57 ± 0.12 | 800.59 ± 0.14 | [10] | –31.83 ± 0.07 | –29.65 ± 0.20 | –29.90 ± 0.20 | | | |
| 106147 | 204587 | 21 30 02.7534 | –12 30 36.252 | 54.34 ± 1.18 | 1020.20 ± 1.20 | –259.40 ± 1.20 | [1] | –84.32 ± 0.23 | –81.00 ± 1.60 | | –84.19 | | |
| 106400 | 205434 | 21 33 01.0691 | +62 00 08.824 | 43.02 ± 0.96 | 371.80 ± 2.10 | 193.50 ± 2.00 | [8] | –11.14 ± 0.10 | –10.50 ± 0.60 | | | | |
| 107310 | 206826 | 21 44 08.5777 | +28 44 33.476 | 45.06 ± 0.43 | 277.40 ± 2.70 | –251.10 ± 2.60 | [7] | 18.11 ± 0.22 | 16.80 ± 0.30 | 16.20 ± 0.30 | | | |
| | | | | | | | [5] | 15.86 ± 0.44 | | | | | |
| 107350 | 206860 | 21 44 31.3299 | +14 46 18.981 | 55.92 ± 0.45 | 231.20 ± 1.20 | –113.90 ± 1.10 | [7] | –15.70 ± 0.09 | –17.13 ± 0.22 | –17.20 ± 0.10 | –16.83 | –16.2 | |
| | | | | | | | [8] | –15.08 ± 0.15 | | | | | |
| 108028 | 208038 | 21 53 05.3528 | +20 55 49.863 | 43.41 ± 0.75 | –4.30 ± 0.90 | –100.80 ± 0.90 | [1] | 3.84 ± 0.80 | | | | | |
| 108156 | 208313 | 21 54 45.0401 | +32 19 42.851 | 50.12 ± 0.80 | 209.30 ± 1.60 | –233.30 ± 1.50 | [1] | –13.96 ± 0.10 | –15.40 ± 0.90 | | –13.25 | –12.5 | |
| 109176 | 210027 | 22 07 00.6661 | +25 20 42.402 | 85.29 ± 0.63 | 297.40 ± 0.50 | 26.40 ± 0.50 | [9] | –5.50 | –5.52 ± 12.88 | –14.80 ± 18.20 | | | Spec. Binary |
| 109378⋆ | 210277 | 22 09 29.8657 | –07 32 55.155 | 46.38 ± 0.48 | 83.90 ± 0.80 | –450.60 ± 0.80 | [8] | –19.35 ± 0.06 | –22.30 ± 0.70 | | –20.87 | –20.4 | |
| 109527 | 210667 | 22 11 11.9133 | +36 15 22.787 | 43.65 ± 0.53 | 27.20 ± 1.50 | –251.90 ± 1.50 | [1] | –19.55 ± 0.09 | –19.80 ± 1.20 | | –19.44 | –19.0 | |
| 110109 | 211415 | 22 18 15.6152 | –53 37 37.465 | 72.53 ± 0.36 | 436.80 ± 0.90 | –632.80 ± 0.90 | [10] | –12.62 ± 0.04 | –13.03 ± 0.58 | –13.00 ± 0.20 | | | |
| 110778 | 212697 | 22 26 34.2753 | –16 44 31.697 | 49.32 ± 1.21 | 251.10 ± 4.30 | –20.60 ± 4.50 | [8] | 4.84 ± 0.12 | 1.86 ± 1.01 | 2.10 ± 0.30 | | | |
| 111449 | 213845 | 22 34 41.6369 | –20 42 29.577 | 44.09 ± 0.26 | 221.40 ± 0.70 | –145.50 ± 0.70 | [8] | | –3.44 ± 0.80 | –5.20 ± 0.90 | | | |
| 111888 | 214683 | 22 39 50.7668 | +04 06 58.015 | 41.51 ± 0.77 | 180.40 ± 1.20 | 110.40 ± 1.20 | [1] | 14.15 ± 0.10 | 23.80 ± 0.90 | | | | |
| 112190 | 215152 | 22 43 21.3025 | –06 24 02.956 | 46.47 ± 0.90 | –152.60 ± 1.20 | –289.40 ± 1.30 | [1] | –13.86 ± 0.70 | –14.10 ± 0.80 | | –13.80 | | |
| 112447 | 215648 | 22 46 41.5806 | +12 10 22.396 | 61.37 ± 0.20 | 233.60 ± 0.90 | –492.20 ± 0.90 | [1] | –5.41 ± 0.10 | –6.08 ± 0.71 | –6.10 ± 0.10 | –5.86 | –4.5 | |
| 112870 | 216259 | 22 51 26.3576 | +13 58 11.937 | 46.97 ± 1.01 | 405.10 ± 0.80 | 202.60 ± 0.80 | [1] | 1.02 ± 0.13 | –1.90 ± 1.30 | | 1.29 | –2.1 | |
| 113357⋆ | 217014 | 22 57 27.9805 | +20 46 07.796 | 64.09 ± 0.38 | 207.90 ± 0.70 | 59.80 ± 0.60 | [8] | –31.32 ± 0.05 | –33.69 ± 0.22 | –33.70 ± 0.10 | –33.23 | –32.4 | |
| 113576 | 217357 | 23 00 16.1209 | –22 31 27.648 | 121.68 ± 0.69 | –900.10 ± 1.50 | 58.60 ± 1.50 | [8] | 16.31 ± 0.18 | 15.31 ± 0.78 | 15.30 ± 0.10 | 16.42 | | |
| 113718 | 217580 | 23 01 51.5444 | –03 50 55.444 | 58.71 ± 0.92 | 397.50 ± 0.90 | –208.20 ± 1.00 | [1] | –44.73 ± 0.05 | –44.70 ± 1.00 | | | | Spec. Binary |
| 114622 | 219134 | 23 13 16.9754 | +57 10 06.078 | 152.77 ± 0.29 | 2074.50 ± 0.70 | 295.40 ± 0.70 | [8] | –17.52 ± 0.07 | –19.10 ± 2.26 | –19.10 ± 0.10 | –18.56 | –19.2 | |
| | | | | | | | [8] | –18.59 ± 0.07 | | | | | |
| | | | | | | | [8] | –18.47 ± 0.05 | | | | | |
| | | | | | | | [9] | –18.40 ± 0.07 | | | | | |
| 114886 | 219538 | 23 16 18.1579 | +30 40 12.746 | 41.64 ± 0.72 | 358.30 ± 1.10 | 90.20 ± 1.00 | [1] | 9.88 ± 0.15 | 8.30 ± 2.20 | | 9.99 | 10.1 | |
| 115331 | 220182 | 23 21 36.5128 | +44 05 52.378 | 46.47 ± 0.53 | 636.20 ± 0.80 | 218.70 ± 0.90 | [1] | 3.37 ± 0.09 | 3.03 ± 0.29 | 3.00 ± 0.10 | | | |
| 115341 | 220221 | 23 21 44.4519 | +45 10 33.807 | 48.82 ± 0.93 | 195.90 ± 1.10 | –71.00 ± 1.10 | [1] | –13.86 ± 0.12 | | | | | |
| 115445 | 220339 | 23 23 04.8947 | –10 45 51.278 | 52.27 ± 0.86 | 452.40 ± 0.80 | 260.60 ± 0.80 | [1] | 35.06 ± 0.12 | 33.41 ± 1.25 | 33.40 ± 0.10 | 34.00 | 34.4 | |
| 116613 | 222143 | 23 37 58.4882 | +46 11 57.972 | 42.85 ± 0.42 | 356.90 ± 1.20 | –12.00 ± 1.20 | [1] | –0.65 ± 0.09 | –0.30 ± 0.51 | –0.30 ± 0.20 | –0.17 | 0.2 | |
| 116771 | 222368 | 23 39 57.0409 | +05 37 34.650 | 72.91 ± 0.15 | 376.30 ± 0.30 | –436.50 ± 0.30 | [9] | 5.55 ± 0.03 | 5.39 ± 0.53 | 5.40 ± 0.10 | 5.66 | 6.6 | |
| 117712 | 223778 | 23 52 25.3197 | +75 32 40.518 | 91.82 ± 0.30 | 325.80 ± 1.00 | 45.60 ± 1.10 | [9] | 1.70 | 4.50 ± 2.62 | 4.50 ± 0.10 | | | Spec. Binary; CAB |
| 120005 | 79211 | 09 14 24.6984 | +52 41 10.954 | 156.20 ± 8.63 | –1560.80 ± 0.80 | –660.60 ± 0.90 | [8] | 13.17 ± 0.32 | 12.00 ± 0.10 | 11.90 ± 0.10 | 12.50 | | |

**Notes.** (†) Star with uncertainty in the parallax larger than 10 milliarcsec; (⋆) Star with known planets; (♯) Observing Run: [1] Foces05; [2] Foces06A; [3] Sarg06; [4] Foces06B; [5] Sarg07A; [6] Sarg07B; [7] Foces07; [8] Sarg08; [9] S4N-McD; [10] S4N-La Silla.

**Table 5.** Stars with known debris discs.

| HIP | HD | $f_{\rm d}$ ($10^{-5}$) | Reference | MG | Age (Myr) |
|---|---|---|---|---|---|
| 544 | 166 | 5.9 | [4] | LA | 20–150 |
| 1599 | 1581 | 0.2–1.6 | [4] | | |
| 13402 | 17925 | 2.2–4.4 | [4] | LA | 20–150 |
| 15371 | 20807 | 0.4–1.5 | [4] | | |
| 16537 | 22049 | 8.3 | [3] | | |
| 16852 | 22484 | 1.2–4.3 | [4] | YD | |
| 18859 | 25457 | $10 \pm 2$ | [2] | LA | 20–150 |
| 19335 | 25998 | 2.7 | [1] | HS | 600 |
| 22263 | 30495 | 2.0–3.0 | [4] | IC 2391 | 35–55 |
| 23693 | 33262 | 0.2–1.1 | [4] | | |
| 27072 | 38393 | 0.77 | [3] | UMa | 300 |
| 27435 | 38858 | 10 | [1] | YD | |
| 28103 | 40136 | 2.04 | [3] | | |
| 32480 | 48682 | 11 | [1] | | |
| 40693 | 69830 | 20 | [2] | | |
| 42430 | 73752 | 3.21 | [3] | | |
| 42438 | 72905 | 0.6–1.5 | [4] | UMa | 300 |
| 43726 | 76151 | 0.4–1.0 | [4] | HS | 600 |
| 51502 | 90089 | 0.85 | [1] | | |
| 62207 | 110897 | 1.4–2.3 | [4] | | |
| 64924 | 115617 | 1.9–3.3 | [4] | | |
| 65721 | 117176 | 1.8–7.7 | [4] | | |
| 71284 | 128167 | 0.49 | [3] | | |
| 71395 | 128311 | 1.3–2.7 | [4] | UMa | 300 |
| 76375 | 139323 | 78.6 | [3] | | |
| 85235 | 158633 | 4.1 | [1] | | |
| 107350 | 206860 | 0.6–1.5 | [4] | LA | 20–150 |

**References.** [1] Beichman et al. (2006); [2] Moór et al. (2006); [3] Rhee et al. (2007); [4] Trilling et al. (2008).

**Table 6.** Comparison between our final membership for the Local Association and previous studies[†].

| HIP | HD | This work | Hercules-Lyra FU04 | Hercules-Lyra L06 | AB Dor ZU04 |
|---|---|---|---|---|---|
| 544 | 166 | Y | Y | Y | |
| 3979 | 4915 | N | | | |
| 7576 | 10008 | Y | | Y | |
| 7751 | 10360 | N | | | |
| 12929 | 17230 | N | | | |
| 13402 | 17925 | Y | Y | ? | |
| 18859 | 25457 | Y | | | Y |
| 19422 | 25665 | ? | | | |
| 26779 | 37394 | N | | | |
| 37288 | | ? | | | |
| 46843 | 82443 | Y | | ? | |
| 54155 | 96064 | Y | | ? | |
| 54745 | 97334A | Y | Y | | |
| 57494 | 102392 | ? | | | |
| 62523 | 111395 | ? | Y | ? | |
| 63742 | 113449 | Y | ? | | Y |
| 65515 | 116956 | Y | Y | ? | |
| 69357 | 124106 | N | | | |
| 72146 | 130004 | ? | | | |
| 73695 | 133640 | ? | | | |
| 75809 | 139777 | Y | Y | ? | |
| 75829 | 139813 | Y | Y | ? | |
| 77408 | 141272 | Y | Y | ? | |
| 79755 | 147379 | N | | | |
| 86346 | 160934 | Y | | | Y |
| 105038 | 202575 | ? | | | |
| 107350 | 206860 | Y | | Y | |
| 108156 | 208313 | N | | | |
| 115341 | 220221 | N | | | |

**Notes.** [†] Label "Y" indicates probable members, "?" doubtful members and "N" probable non-members, respectively.

**References.** FU04: Fuhrmann (2004); ZU04: Zuckerman et al. (2004); L06: López-Santiago et al. (2006).

**Table 7.** Comparison between our final memberships for the Hyades MG and those given by López-Santiago et al. (2010)[†] .

| HIP | HD | This work | LS10 |
|---|---|---|---|
| 1803 | 1835 | Y | Y |
| 4148 | 5133 | N | |
| 12709 | 16909 | Y | |
| 13976 | 18632 | Y | ? |
| 16134 | 21531 | Y | ? |
| 17420 | 23356 | N | Y |
| 18774 | 24451 | ? | |
| 19335 | 25998 | N | Y |
| 21482 | 283750 | ? | |
| 25220 | 35171 | ? | Y |
| 40035 | 68146 | N | |
| 42074 | 72760 | Y | Y |
| 42333 | 73350 | Y | |
| 43587 | 75732 | ? | ? |
| 43726 | 76151 | N | |
| 44248 | 76943 | ? | |
| 46580 | 82106 | Y | |
| 47592 | 84117 | N | |
| 48411 | 85488 | ? | ? |
| 63257 | 112575 | ? | |
| 66147 | 117936 | N | |
| 67275 | 120136 | N | ? |
| 69526 | 124642 | ? | |
| 72848 | 131511 | Y | |
| 90790 | 170657 | N | |
| 94346 | 180161 | Y | ? |
| 96085 | 183870 | ? | ? |
| 104239 | 200968 | Y | ? |
| 116613 | 222143 | Y | ? |

**Notes.** [(†)] Label "Y" indicates probable members, "?" doubtful members and "N" probable non-members, respectively.

**Table 8.** Comparison between our final memberships for the Ursa Major MG and those previously reported in the literature[†].

| HIP | HD | This work | SO93 | KI03 | FU04 | LS10 |
|---|---|---|---|---|---|---|
| 5944 | 7590 | Y | | | Y | |
| 8486 | 11131 | Y | Y | Y? | Y | Y |
| 27072 | 38393 | N | ? | Y? | | Y |
| 27913 | 39587 | ? | Y | Y | Y | |
| 33277 | 50692 | N | N | ? | | |
| 36827 | 60491 | ? | | N?/? | | ? |
| 37349 | 61606A | ? | | N? | | Y |
| 42438 | 72905 | Y | Y | Y? | Y | ? |
| 60866 | 108581 | ? | | | | |
| 71395 | 128311 | Y | | ? | | Y |
| 72659 | 131156A | Y | Y | ? | Y | ? |
| 73996 | 134083 | N | | N? | | Y |
| 74702 | 135599 | N | | ? | Y | |
| 80337 | 147513A | ? | Y | N?/? | | Y |
| 80686 | 147584 | ? | | Y | | |
| 96183 | 184385 | ? | | | | |
| 102485 | 197692 | Y | | | | |
| 108028 | 208038 | ? | | | | |

**References.** S093: Soderblom & Mayor (1993b); KI03: King et al. (2003); FU04: Fuhrmann (2004); LS10: López-Santiago et al. (2010).

**Notes.** [(†)] Label "Y" indicates probable members, "?" doubtful members and "N" probable non-members, respectively.

**Table 9.** Membership criteria for the Local Association candidate stars. (Convergence Point: 5.98 h, –35.15 degrees; $U = -11.6$ km s$^{-1}$, $V = -21.0$ km s$^{-}$, $W = -11.4$ km s$^{-1}$; Age: 20–150 Myr).

| | | Kinematics | | | | | | | Lithium | CaII H, K | | ROSAT-data | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP<br>(1) | $(B-V)$<br>(2) | $U$ (km s$^{-1}$)<br>(3) | $V$ (km s$^{-1}$)<br>(4) | $W$ (km s$^{-1}$)<br>(5) | $V_{Total}$ (km s$^{-1}$)<br>(6) | $V_T$ (km s$^{-1}$)<br>(7) | $PV^\star$ (km s$^{-1}$)<br>(8) | $\rho_c^\star$ (km s$^{-1}$)<br>(9) | $EW$(LiI) (mÅ)<br>(10) | $R'_{HK}$ (log)<br>(11) | Age (Gyr)<br>(12) | $L_X/L_{Bol}$ (log)<br>(13) | Age (Gyr)<br>(14) | Prot (days)<br>(15) | Age (Gyr)<br>(16) | [Fe/H]<br>(17) |
| | | | | | | | *Probable Non-members* | | | | | | | | | |
| 3979 | 0.68 | –15.58 ± 0.32 | –25.43 ± 0.42 | –0.53 ± 0.18 | 29.83 | 29.83 | 5.48 Y | –7.01 Y | 35.84 ± 3.72 | –4.92 [4] | 5.04 | | | | | –0.19 |
| 7751 | 0.88 | –4.19 ± 0.16 | –18.73 ± 0.14 | –18.60 ± 0.07 | 26.72 | 15.16 | –0.06 Y | 10.19 N | 2.14 ± 4.65 | –4.94 [1] | 5.49 | | | 30 [13] | 3.46 | –0.23 |
| 12929 | 1.18 | –14.65 ± 0.21 | –22.21 ± 0.58 | –8.39 ± 0.12 | 27.90 | 27.82 | 4.30 Y | 11.59 Y | 34.29 ± 6.13 | –4.57 [3] | 0.97 | | | | | |
| 26779 | 0.84 | –13.82 ± 0.10 | –23.07 ± 0.18 | –14.40 ± 0.13 | 30.50 | 30.44 | –1.69 Y | 0.68 Y | 13.54 ± 4.49 | –4.55 [1] | 0.84 | –4.72 | 0.66 | 11 [2] | 0.62 | 0.16 |
| 69357 | 0.86 | –10.90 ± 0.42 | –33.09 ± 0.98 | –1.65 ± 0.19 | 34.88 | 36.13 | 5.33 Y | 11.26 N | 21.43 ± 4.56 | –4.60 [1] | 1.14 | –5.34 | 2.02 | | | –0.15 |
| 79755 | 1.32 | –9.71 ± 0.15 | –29.99 ± 0.22 | 3.82 ± 0.22 | 31.75 | 32.24 | –17.23 N | –26.32 N | | –4.58 [3] | 1.03 | –4.72 | 2.45 | | | |
| 108156 | 0.93 | –2.70 ± 0.16 | –21.94 ± 0.18 | –24.19 ± 0.49 | 32.77 | 35.10 | –13.76 N | –23.30 N | 18.73 ± 4.88 | –4.68 [1] | 1.79 | –5.33 | 2.04 | | | –0.08 |
| 115341 | 1.06 | –9.89 ± 0.30 | –20.49 ± 0.19 | –9.14 ± 0.28 | 24.52 | 23.37 | 0.44 Y | –11.71 Y | 18.15 ± 5.52 | –4.73 [1] | 2.31 | –4.75 | 0.99 | | | |
| | | | | | | | *Doubtful Members* | | | | | | | | | |
| 19422 | 0.96 | –7.92 ± 0.26 | –23.86 ± 0.23 | –17.19 ± 0.22 | 3-0.46 | 28.17 | –4.37 Y | –8.04 Y | 4.54 ± 5.02 | –4.86 [3] | 4.08 | | | | | –0.06 |
| 37288 | 1.40 | –12.25 ± 0.17 | –22.15 ± 0.27 | –12.50 ± 0.39 | 28.23 | 28.58 | 0.31 Y | 20.51 Y | 43.42 ± 7.27 | –4.72 [3] | 2.2 | | | | | |
| 57494 | 1.17 | –14.43 ± 0.52 | –26.95 ± 0.44 | 3.59 ± 0.33 | 30.78 | 23.66 | 6.46 N | 3.76 N | 14.26 ± 6.09 | –4.80 [1] | 3.2 | | | | | |
| 62523 | 0.71 | –18.16 ± 0.20 | –21.36 ± 0.23 | –8.35 ± 0.05 | 29.25 | 30.17 | 5.74 Y | –12.14 Y | 22.48 ± 3.85 | –4.43 [1] | 0.37 | –5.08 | 0.83 | | | 0.08 |
| 72146 | 0.93 | –6.08 ± 0.09 | –30.02 ± 0.48 | –6.84 ± 0.10 | 31.38 | 38.31 | –4.74 Y | –25.49 N | 8.69 ± 4.89 | –4.84 [1] | 3.72 | | | | | |
| 73695 | 0.59 | –17.06 ± 0.32 | –26.77 ± 0.41 | –2.37 ± 0.42 | 31.83 | 46.30 | –1.67 Y | –38.12 N | 29.62 ± 3.30 | –4.60 [3] | 1.16 | –3.96 | 0.12 | | | –0.19 |
| 105038 | 1.04 | –10.74 ± 0.16 | –20.02 ± 0.16 | –4.74 ± 0.25 | 23.21 | 18.27 | –0.34 Y | –11.30 N | 12.14 ± 5.40 | –4.69 [1] | 1.89 | | | | | –0.10 |
| | | | | | | | *Probable Members* | | | | | | | | | |
| 544 | 0.75 | –15.02 ± 0.15 | –21.38 ± 0.14 | –10.12 ± 0.12 | 28.02 | 27.92 | 3.44 Y | –7.12 Y | 79.89 ± 4.05 | –4.320 [3] | 0.16 | –4.35 | 0.32 | | | 0.12 |
| 7576 | 0.79 | –13.31 ± 0.25 | –18.41 ± 0.42 | –11.14 ± 0.12 | 25.31 | 24.45 | 2.34 Y | 9.95 Y | 117.41 ± 4.25 | –4.29 [1] | 0.13 | –4.43 | 0.44 | | | –0.03 |
| 13402 | 0.88 | –15.30 ± 0.07 | –21.81 ± 0.11 | –9.21 ± 0.06 | 28.19 | 28.78 | 4.06 Y | 19.44 Y | 182.52 ± 4.63 | –4.33 [1] | 0.17 | –4.12 | 0.30 | 6.6 [12] | 0.24 | 0.10 |
| 18859 | 0.51 | –7.98 ± 0.18 | –28.15 ± 0.21 | –11.89 ± 0.15 | 31.58 | 37.55 | –1.77 Y | 26.94 N | 96.79 ± 2.98 | –4.291 [4] | 0.13 | –4.16 | 0.12 | | | –0.01 |
| 46843 | 0.79 | –9.93 ± 0.13 | –22.89 ± 0.26 | –5.64 ± 0.18 | 25.58 | 24.18 | –4.59 Y | 4.17 Y | 192.41 ± 4.24 | -4.08 [1] | 0.02 | –3.93 | 0.22 | 6 [2] | 0.23 | |
| 54155 | 0.79 | –15.14 ± 0.38 | –28.39 ± 0.44 | –0.70 ± 0.42 | 32.18 | 26.27 | 2.33 Y | 6.12 N | 103.69 ± 4.22 | –4.34 [1] | 0.18 | –3.65 | 0.12 | | | –0.09 |
| 54745 | 0.62 | –16.07 ± 0.23 | –23.41 ± 0.29 | –11.04 ± 0.12 | 30.47 | 30.87 | 1.94 Y | –6.30 Y | 88.31 ± 3.44 | –4.27 [1] | 0.11 | –4.52 | 0.29 | 7.6 [12] | 0.59 | 0.08 |
| 63742 | 0.86 | –8.87 ± 0.15 | –23.28 ± 0.51 | –19.50 ± 0.22 | 31.64 | 29.87 | –6.54 N | –5.26 Y | 140.60 ± 4.56 | –4.34 [4] | 0.19 | –4.25 | 0.38 | | | |
| 65515 | 0.81 | –15.76 ± 0.24 | –18.47 ± 0.18 | –8.52 ± 0.08 | 25.73 | 29.12 | 2.85 Y | –18.87 N | 39.95 ± 4.33 | –4.22 [1] | 0.07 | –4.36 | 0.36 | | | –0.10 |
| 75809 | 0.65 | –14.73 ± 0.22 | –25.95 ± 0.17 | –2.33 ± 0.14 | 29.93 | 32.31 | –9.56 N | –21.82 N | 141.10 ± 3.59 | –4.41 [1] | 0.32 | –4.01 | 0.15 | | | –0.29 |
| 75829 | 0.78 | –14.16 ± 0.26 | –25.03 ± 0.18 | -2.30 ± 0.14 | 28.85 | 31.11 | –9.19 N | –21.02 N | 127.81 ± 4.19 | –4.41 [4] | 0.31 | –3.79 | 0.15 | | | 0.07 |
| 77408 | 0.80 | –17.81 ± 0.10 | –27.25 ± 0.44 | –12.44 ± 0.13 | 34.85 | 34.04 | 3.56 Y | –23.96 Y | 10.37 ± 4.30 | –4.35 [1] | 0.2 | –4.40 | 0.43 | | | –0.05 |
| 86346 | 1.18 | –6.86 ± 0.68 | –24.72 ± 0.30 | –11.76 ± 0.46 | 28.22 | 16.54 | –2.27 Y | –14.83 N | 28.19 ± 6.25 | –3.96 [11] | | –2.90 | 0.10[†] | 1.8 [14] | | |
| 107350 | 0.59 | –13.92 ± 0.13 | –20.05 ± 0.10 | –11.10 ± 0.18 | 26.81 | 26.73 | 2.55 Y | –15.61 Y | 91.91 ± 3.30 | –4.48 [1] | 0.53 | –4.40 | 0.24 | 4.7 [12] | 0.3 | –0.01 |

**Notes.** (†) Upper limit ; (⋆) "Y", "N" labels indicate if the star satisfies or not the criteria.

**Table 10.** Membership criteria for the Hyades candidate stars. (Convergence Point: 6.40 h, 6.50 degrees; $U = -39.7$ km s$^{-1}$, $V = -17.7$ km s$^{-1}$, $W = -2.4$ km s$^{-1}$; Age: 600 Myr).

| | | Kinematics | | | | | | | Lithium | CaII H, K | | ROSAT-data | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP (1) | $(B-V)$ (2) | $U$ (km s$^{-1}$) (3) | $V$ (km s$^{-1}$) (4) | $W$ (km s$^{-1}$) (5) | $V_{\rm Total}$ (km s$^{-1}$) (6) | $V_{\rm T}$ (km s$^{-1}$) (7) | $PV^{\star}$ (km s$^{-1}$) (8) | $\rho_c^{\star}$ (km s$^{-1}$) (9) | $EW$(LiI) (mÅ) (10) | $R'_{\rm HK}$ (log) (11) | Age (Gyr) (12) | $L_{\rm X}/L_{\rm Bol}$ (log) (13) | Age (Gyr) (14) | Prot (days) (15) | Age (Gyr) (16) | [Fe/H] (17) |
| | | | | | | | *Probable Non-members* | | | | | | | | | |
| 4148 | 0.90 | –36.34 ± 0.32 | –20.72 ± 0.20 | 6.50 ± 0.06 | 42.33 | 41.64 | –4.63 N | –2.13 Y | | –4.83 [1] | 3.64 | –5.22 | 2.04 | | | –0.15 |
| 17420 | 0.93 | –30.35 ± 0.18 | –14.81 ± 0.12 | –4.58 ± 0.16 | 34.08 | 31.28 | –0.89 Y | 21.33 Y | 4.20 ± 4.91 | –5.04 [1] | 7.35 | –5.04 | 1.45 | | | –0.12 |
| 19335 | 0.52 | –33.23 ± 0.26 | –15.64 ± 0.23 | –8.05 ± 0.16 | 37.60 | 36.64 | –6.08 N | 26.37 Y | 93.12 ± 3.01 | –4.401 [2] | 0.30 | –4.40 | 0.16 | 2.6 [12] | 0.22 | 0.07 |
| 40035 | 0.49 | –37.17 ± 0.16 | –19.18 ± 0.13 | –12.77 ± 0.16 | 43.73 | 45.72 | –10.54 N | 38.19 Y | 31.97 ± 2.88 | –4.81 [5] | 3.27 | | | | | –0.22 |
| 43726 | 0.67 | –40.82 ± 0.19 | –20.43 ± 0.08 | –11.53 ± 0.20 | 47.08 | 52.25 | –7.81 N | 40.40 N | 31.42 ± 3.66 | –4.66 [2] | 1.60 | –5.25 | 0.89 | 15 [2] | 0.16 | 0.09 |
| 47592 | 0.52 | –40.79 ± 0.14 | –27.27 ± 0.09 | 6.96 ± 0.09 | 49.56 | 40.25 | 4.49 N | 21.86 N | 28.83 ± 3.01 | –4.86 [5] | 4.14 | | | | | –0.05 |
| 66147 | 1.02 | –42.27 ± 0.72 | –20.27 ± 0.40 | 4.78 ± 0.20 | 47.12 | 48.65 | 0.86 Y | –13.46 N | 7.38 ± 5.34 | –4.70 [1] | 1.99 | –4.89 | 1.28 | | | 0.07 |
| 67275 | 0.50 | –34.92 ± 0.13 | –19.03 ± 0.07 | –11.90 ± 0.30 | 41.51 | 37.27 | –4.35 N | –11.29 N | 2.73 ± 2.91 | –4.90 [1] | 4.78 | –5.12 | 0.36 | 4 [2] | | 0.25 |
| 90790 | 0.86 | –38.06 ± 0.07 | –24.73 ± 0.15 | 5.31 ± 0.07 | 45.69 | 50.10 | –10.42 N | -48.90 Y | 1.64 ± 4.56 | –4.90 [1] | 4.78 | –5.23 | 1.81 | | | –0.15 |
| | | | | | | | *Doubtful Members* | | | | | | | | | |
| 18774 | 1.12 | –48.75 ± 0.44 | –17.60 ± 0.36 | –7.18 ± 0.18 | 52.33 | 51.33 | –5.37 N | 15.56 Y | | –4.56 [1] | 0.90 | –5.23 | 2.74 | | | |
| 21482 | 1.08 | –39.25 | –17.55 | –1.59 | 43.02 | 43.50 | 0.67 Y | 36.58 Y | 42.40 ± 5.60 | –4.06 [4] | 0.01 | –3.01 | 0.09 | | | |
| 25220 | 1.10 | –38.68 ± 0.10 | –14.25 ± 0.21 | 6.81 ± 0.28 | 41.77 | 44.58 | 9.34 N | 42.33 Y | 13.25 ± 5.69 | –4.13 [1] | 0.03 | –4.62 | 1.15 | | | |
| 43587 | 0.86 | –37.07 ± 0.17 | –18.04 ± 0.11 | –7.70 ± 0.23 | 41.94 | 47.93 | –0.55 Y | 35.99 N | 34.60 ± 4.58 | –5.10 [4] | | | | | | 0.35 |
| 44248 | 0.45 | –44.62 | –14.29 | –9.63 | 47.83 | 50.80 | 7.55 N | 33.02 Y | 18.80 ± 2.73 | –4.55 [4] | 0.83 | –5.21 | 0.30 | | | 0.13 |
| 48411 | 1.22 | –44.17 ± 0.84 | –19.52 ± 0.14 | –7.99 ± 0.65 | 48.95 | 52.39 | –2.47 Y | 32.29 N | 37.12 ± 6.32 | –4.68 [4] | 1.77 | | | | | |
| 63257 | 1.06 | –37.22 ± 1.32 | –17.31 ± 0.81 | –2.20 ± 0.17 | 41.11 | 41.18 | –0.49 Y | –6.97 Y | | –4.78 [5] | 2.93 | | | | | |
| 69526 | 1.07 | –36.30 ± 0.62 | –14.54 ± 0.24 | –5.67 ± 0.26 | 39.51 | 38.12 | 1.95 Y | –12.93 Y | 12.10 ± 5.57 | –4.28 [1] | 0.12 | –4.88 | 1.38 | | | |
| 96085 | 0.92 | –50.34 ± 0.14 | –14.85 ± 0.13 | –4.80 ± 0.23 | 52.71 | 62.49 | 6.43 N | –59.60 N | | –4.52 [1] | 0.69 | | | | | –0.06 |
| | | | | | | | *Probable Members* | | | | | | | | | |
| 1803 | 0.65 | –36.58 ± 0.45 | –14.94 ± 0.20 | –0.15 ± 0.10 | 39.52 | 39.40 | 1.72 Y | –1.13 Y | 67.36 ± 3.61 | –4.36 [1] | 0.22 | –4.59 | 0.34 | 7.7 [12] | 0.52 | 0.22 |
| 12709 | 1.08 | –47.52 | –15.55 | –3.70 | 50.13 | 46.75 | 2.77 Y | 26.78 Y | 21.09 ± 5.63 | –4.48 [4] | 0.52 | –4.53 | 0.83 | | | |
| 13976 | 0.94 | –43.59 ± 0.71 | –19.85 ± 0.77 | –0.38 ± 0.62 | 47.90 | 49.55 | 0.85 Y | 31.46 Y | | –4.40 [1] | 0.30 | –4.72 | 0.75 | 10.2 [14] | | 0.18 |
| 16134 | 1.27 | –46.71 ± 0.40 | –19.24 ± 0.18 | –7.47 ± 0.30 | 51.06 | 47.04 | 1.80 Y | 29.81 Y | 19.12 ± 6.54 | –4.61 [1] | 1.21 | –4.29 | 0.98 | | | |
| 42074 | 0.81 | –36.00 ± 0.24 | –20.75 ± 0.12 | –1.08 ± 0.27 | 41.56 | 35.84 | –2.61 Y | 29.93 N | 15.34 ± 4.34 | –4.454 [4] | 0.44 | –4.76 | 0.69 | | | 0.03 |
| 42333 | 0.64 | –43.52 ± 0.42 | –19.37 ± 0.17 | –12.32 ± 0.45 | 49.20 | 57.06 | –7.33 N | 46.20 N | 46.42 ± 3.56 | –4.40 [1] | 0.30 | –4.78 | 0.46 | | | 0.04 |
| 46580 | 1.00 | –41.11 | –13.60 | –0.27 | 43.30 | 43.08 | 4.77 N | 29.81 Y | 6.68 ± 5.23 | –4.50 [1] | 0.61 | –4.65 | 0.94 | 13.6 [13] | | –0.04 |
| 72848 | 0.83 | –36.20 ± 0.19 | –13.45 ± 0.10 | –14.34 ± 0.27 | 41.20 | 31.56 | 2.39 Y | –16.80 N | 11.00 ± 4.44 | –4.52 [1] | 0.69 | –4.77 | 0.69 | | | 0.09 |
| 94346 | 0.80 | –44.05 ± 0.30 | –22.10 ± 0.06 | –15.52 ± 0.10 | 51.67 | 46.88 | –11.21 N | –19.88 N | 5.13 ± 4.29 | –4.52 [10] | 0.69 | –4.68 | 0.56 | | | |
| 104239 | 0.89 | –42.25 ± 0.25 | –17.98 ± 0.08 | –4.90 ± 0.29 | 46.18 | 49.04 | 0.16 Y | –37.14 Y | 10.84 ± 4.69 | –4.496 [3] | 0.59 | –4.52 | 0.55 | | | 0.02 |
| 116613 | 0.65 | –33.85 ± 0.39 | –16.38 ± 0.20 | –12.13 ± 0.19 | 39.51 | 38.26 | –10.05 N | –2.12 Y | 30.39 ± 3.58 | –4.555 [4] | 0.87 | –4.54 | 0.30 | | | 0.12 |

**Notes.** $^{(\star)}$ "Y", "N" labels indicate if the star satisfies or not the criteria.

**Table 11.** Membership criteria for the Ursa Major MG candidate stars. (Convergence Point: 20.55 h, –38.10 degrees; $U$ = 14.9 km s$^{-1}$, $V$ = 1.0 km s$^{-1}$, $W$ = −10.7 km s$^{-1}$; Age: 300 Myr).

| | | **Kinematics** | | | | | | | **Lithium** | **CaII H, K** | | **ROSAT-data** | | **Rotation** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP (1) | $(B-V)$ (2) | $U$ (km s$^{-1}$) (3) | $V$ (km s$^{-1}$) (4) | $W$ (km s$^{-1}$) (5) | $V_{Total}$ (km s$^{-1}$) (6) | $V_T$ (km s$^{-1}$) (7) | $PV^\star$ (km s$^{-1}$) (8) | $\rho_c{}^\star$ (km s$^{-1}$) (9) | $EW$(LiI) (mÅ) (10) | $R'_{HK}$ (log) (11) | Age (Gyr) (12) | $L_X/L_{Bol}$ (log) (13) | Age (Gyr) (14) | Prot (days) (15) | Age (Gyr) (16) | [Fe/H] (17) |
| | | | | | | | *Probable Non-members* | | | | | | | | | |
| 27072 | 0.49 | 18.18 ± 0.13 | 4.44 ± 0.13 | −11.67 ± 0.09 | 22.06 | 20.82 | 1.62 Y | –6.32 Y | 68.82 ± 2.90 | –4.78 [7] | 2.93 | | | | | –0.09 |
| 33277 | 0.60 | 13.53 | 5.66 | –4.98 | 15.48 | 2.72 | 3.47 N | –2.48 N | 15.28 ± 3.35 | –4.94 [3] | 5.45 | | | | | –0.13 |
| 73996 | 0.45 | 16.71 ± 0.39 | –1.81 ± 0.27 | –18.15 ± 0.75 | 24.74 | 23.13 | –1.39 Y | –3.54 Y | | –4.85 [3] | 3.95 | –5.34 | 0.50 | | | 0.05 |
| 74702 | 0.82 | 9.28 ± 0.17 | 1.13 ± 0.09 | –14.68 ± 0.16 | 17.40 | 17.04 | 0.34 Y | –2.35 Y | | –4.35 [1] | 0.20 | –5.11 | 1.34 | | | –0.09 |
| | | | | | | | *Doubtful Members* | | | | | | | | | |
| 27913 | 0.59 | 13.63 ± 0.30 | 2.46 ± 0.06 | –7.40 ± 0.05 | 15.70 | 12.78 | 1.27 Y | –10.00 Y | 102.91 ± 3.30 | –4.49 [1] | 0.57 | –4.54 | 0.30 | 5.2 [12] | 0.36 | –0.01 |
| 36827 | 0.87 | 6.34 ± 0.13 | 6.30 ± 0.13 | –11.69 ± 0.32 | 14.72 | 10.01 | 7.72 N | –6.82 Y | 53.47 ± 4.59 | –4.24 [1] | 0.08 | –4.49 | 0.61 | | | –0.26 |
| 37349 | 0.96 | 25.33 ± 0.14 | –2.41 ± 0.17 | –7.36 ± 0.11 | 26.49 | 24.24 | –9.54 N | –17.59 Y | 8.58 ± 5.02 | –4.46 [1] | 0.47 | –4.87 | 1.17 | | | –0.05 |
| 80337 | 0.63 | 13.23 ± 0.10 | –1.03 ± 0.06 | –1.40 ± 0.06 | 13.34 | 5.50 | 1.65 N | 3.70 N | 35.52 ± 3.49 | –4.53 [7] | 0.69 | –4.62 | 0.37 | 8.5 [12] | 0.68 | 0.05 |
| 60866 | 1.16 | 23.76 ± 0.72 | 1.69 ± 0.19 | –16.49 ± 0.39 | 28.97 | 29.02 | 0.36 Y | –5.58 Y | 26.68 ± 6.05 | –5.14 [1] | | | | | | |
| 80686 | 0.55 | 12.80 | 5.30 | –5.99 | 15.09 | 17.66 | 3.89 N | 12.53 Y | 116.12 ± 3.15 | –4.65 [1] | 1.52 | –4.59 | 0.29 | 13 [13] | 0.24 | –0.08 |
| 96183 | 0.75 | 21.40 ± 0.49 | –0.95 ± 0.69 | –7.63 ± 0.16 | 22.74 | 21.54 | –6.61 N | 10.26 Y | | –4.75 [4] | 2.56 | | | | | 0.11 |
| 108028 | 0.92 | 7.78 ± 0.25 | –1.68 ± 0.71 | –8.53 ± 0.38 | 11.67 | 12.04 | –2.91 N | 5.66 Y | 27.80 ± 4.85 | –4.40 [1] | 0.30 | –4.33 | 0.60 | | | |
| | | | | | | | *Probable Members* | | | | | | | | | |
| 5944 | 0.58 | 17.87 ± 0.17 | –3.60 ± 0.14 | 0.16 ± 0.14 | 18.23 | 11.82 | 5.46 N | –2.74 N | 95.70 ± 3.29 | –4.47 [1] | 0.50 | –4.68 | 0.39 | | | –0.07 |
| 8486 | 0.62 | 18.93 ± 1.21 | 2.03 ± 0.22 | –2.55 ± 0.45 | 19.21 | 19.35 | 1.82 Y | –5.05 Y | 91.56 ± 3.46 | –4.19 [1] | 0.05 | –4.35 | 0.27 | | | –0.11 |
| 42438 | 0.61 | 10.69 ± 0.06 | 0.24 ± 0.07 | –10.55 ± 0.07 | 15.02 | 13.07 | 2.25 N | –11.65 Y | 106.36 ± 3.41 | –4.38 [1] | 0.26 | –4.45 | 0.29 | 5 [2] | 0.29 | –0.20 |
| 71395 | 0.98 | 16.90 ± 0.32 | –4.47 ± 0.12 | –20.53 ± 0.19 | 26.96 | 24.75 | –5.66 N | –2.33 N | 12.30 ± 5.12 | –4.45 [1] | 0.43 | –4.54 | 0.70 | | | 0.02 |
| 72659 | 0.72 | 4.99 ± 0.04 | 1.99 ± 0.02 | –1.35 ± 0.07 | 5.54 | 5.25 | 1.33 N | 0.75 Y | 99.03 ± 3.92 | –4.36 [2] | 0.23 | –4.37 | 0.37 | 6.2 [12] | 0.29 | –0.10 |
| 102485 | 0.43 | 19.67 ± 2.91 | –5.05 ± 1.06 | –11.47 ± 2.21 | 23.32 | 50.17 | 1.39 Y | 48.86 N | –8.08 ± 2.66 | –4.40 [5] | 0.31 | –5.06 | 0.30 | | | 0.00 |

**Notes.** $^{(\star)}$ "Y", "N" labels indicate if the star satisfies or not the criteria.

**Table 12.** Membership criteria for the IC 2391 MG candidate stars. (Convergence Point: 5.82 h, –12.44 degrees; $U = -20.6$ km s$^{-1}$, $V = -15.7$ km s$^{-1}$, $W = -9.1$ km s$^{-1}$; Age: 35–55 Myr).

| | | Kinematics | | | | | | | Lithium | CaII H, K | | ROSAT-data | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP (1) | $(B-V)$ (2) | $U$ (km s$^{-1}$) (3) | $V$ (km s$^{-1}$) (4) | $W$ (km s$^{-1}$) (5) | $V_{Total}$ (km s$^{-1}$) (6) | $V_T^\star$ (km s$^{-1}$) (7) | $PV^\star$ (km s$^{-1}$) (8) | $\rho_c$ (km s$^{-1}$) (9) | $EW$(LiI) (mÅ) (10) | $R'_{HK}$ (log) (11) | Age (Gyr) (12) | $L_X/L_{Bol}$ (log) (13) | Age (Gyr) (14) | Prot (days) (15) | Age (Gyr) (16) | [Fe/H] (17) |
| | | | | | | | *Probable Non-members* | | | | | | | | | |
| 8362 | 0.79 | –24.86 ± 0.13 | –16.48 ± 0.11 | –5.36 ± 0.07 | 30.30 | 29.81 | 4.72 N | 0.58 Y | 7.98 ± 4.22 | –5.05 [1] | 7.54 | –4.96 | 0.89 | 23 [2] | 2.53 | 0.02 |
| 18267 | 0.73 | –21.33 ± 0.62 | –24.22 ± 0.41 | –5.06 ± 0.34 | 32.66 | 40.76 | 3.16 Y | 30.95 N | | –4.89 [4] | 4.67 | –5.17 | 1.03 | | | –0.01 |
| 25119 | 0.94 | –26.59 ± 0.17 | –26.68 ± 0.40 | –12.84 ± 0.14 | 39.80 | 56.71 | 0.30 Y | 54.40 N | 10.76 ± 4.93 | –4.88 [4] | 4.42 | –5.65 | 3.46 | | | –0.23 |
| 54810 | 1.23 | –24.97 ± 0.54 | –20.40 ± 0.31 | 3.09 ± 0.32 | 32.39 | 27.57 | 3.24 N | 3.73 N | | –4.50 [1] | 0.61 | –5.07 | 2.34 | | | |
| | | | | | | | *Doubtful Members* | | | | | | | | | |
| 11072 | 0.61 | –17.46 ± 0.27 | –15.84 ± 0.27 | –4.79 ± 0.15 | 24.06 | 26.58 | –1.79 Y | 17.04 Y | 35.24 ± 3.39 | –4.99 [5] | 6.32 | –4.51 | 0.14 | 19.3 [13] | 3.25 | –0.06 |
| 19832 | 1.18 | –16.71 ± 0.23 | –17.91 ± 0.93 | –12.15 ± 0.25 | 27.34 | 27.13 | –5.37 N | 24.67 Y | 25.86 ± 6.13 | –4.66 [1] | 1.61 | | | | | |
| 22449 | 0.48 | –25.65 ± 0.07 | –14.77 ± 0.03 | 4.37 ± 0.04 | 29.92 | 25.13 | 14.35 N | 22.89 Y | 12.88 ± 2.82 | –4.79 [3] | 3.04 | –4.99 | 0.32 | | | –0.03 |
| 34567 | 0.70 | –21.68 | –18.03 | –15.92 | 32.39 | 37.46 | 2.59 Y | 27.44 N | 54.66 ± 3.82 | –4.46 [4] | 0.47 | –4.45 | 0.32 | | | 0.00 |
| 40170 | 1.21 | –17.68 ± 0.78 | –20.66 ± 1.22 | –10.07 ± 0.74 | 29.00 | 29.90 | –3.70 N | 9.55 Y | 23.26 ± 6.43 | –5.15 [1] | | | | | | |
| 53486 | 0.93 | –16.63 ± 0.29 | –14.39 ± 0.22 | –6.15 ± 0.21 | 22.83 | 22.40 | –0.94 Y | 4.32 Y | | –4.59 [1] | 1.08 | –4.59 | 0.67 | | | –0.03 |
| 75201 | 1.30 | –28.10 ± 0.47 | –17.90 ± 0.61 | 0.50 ± 0.48 | 33.32 | 37.79 | 10.37 N | –28.78 N | 16.31 ± 6.77 | –4.54 [1] | 0.79 | | | | | |
| 76051 | 0.77 | –27.90 ± 4.87 | –16.55 ± 8.59 | –18.44 ± 6.25 | 37.31 | 25.02 | 0.45 Y | –20.80 N | | –4.67 [4] | 1.69 | | | | | |
| 95319 | 0.81 | –21.00 | –14.04 | -2.91 | 25.43 | 24.42 | 5.82 N | –21.16 Y | 22.77 ± 4.31 | –5.08 [3] | | | | | | 0.16 |
| | | | | | | | *Probable Members* | | | | | | | | | |
| 19076 | 0.64 | –25.68 ± 0.09 | –13.46 ± 0.12 | –6.61 ± 0.07 | 29.74 | 24.74 | 4.18 N | 18.14 N | 44.90 ± 3.53 | –4.30 [1] | 0.14 | –4.61 | 0.34 | | | 0.04 |
| 22263 | 0.62 | –24.11 ± 0.08 | –8.65 ± 0.07 | –3.06 ± 0.08 | 25.80 | 39.73 | 8.25 N | 38.27 N | 55.79 ± 3.47 | –4.511 [2] | 0.65 | –4.73 | 0.44 | 7.6 [12] | 0.57 | 0.00 |
| 29568 | 0.70 | –20.82 ± 0.12 | –10.26 ± 0.11 | –7.01 ± 0.10 | 24.24 | 43.31 | 1.05 Y | 42.23 N | 51.29 ± 3.79 | -4.39 [1] | 0.28 | –4.29 | 0.28 | | | –0.01 |
| 59280 | 0.80 | –28.62 ± 0.50 | –22.55 ± 0.40 | –7.13 ± 0.10 | 37.13 | 37.79 | –1.89 Y | –7.77 Y | 26.16 ± 4.26 | –4.56 [1] | 0.90 | –5.24 | 1.26 | | | 0.14 |
| 66252 | 1.16 | –27.83 ± 0.34 | –14.63 ± 0.39 | –17.03 ± 0.22 | 35.76 | 31.50 | 0.34 Y | –12.54 N | 65.40 ± 6.06 | –3.89 [1] | | –3.05 | 0.15 | 3.9 [13] | | |
| 71743 | 0.73 | –22.30 ± 0.18 | –6.93 ± 0.27 | –13.83 ± 0.15 | 27.14 | 18.29 | –0.15 Y | –10.56 N | 34.70 ± 3.96 | –4.51 [1] | 0.65 | –4.86 | 0.68 | | | 0.04 |

**Notes.** $^{(\star)}$ "Y", "N" labels indicate if the star satisfies or not the criteria.

**Table 13.** Membership criteria for the Castor MG candidate stars. (Convergence Point: 4.57 h, –18.44 degrees; $U = -10.7$ km s$^{-1}$, $V = -8.0$ km s$^{-1}$, $W = -9.7$ km s$^{-1}$; Age: 200 Myr).

| | | Kinematics | | | | | | | Lithium | CaII H, K | | ROSAT-data | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP | $(B-V)$ | $U$ (km s$^{-1}$) | $V$ (km s$^{-1}$) | $W$ (km s$^{-1}$) | $V_{\rm Total}$ (km s$^{-1}$) | $V_{\rm T}$ (km s) | $PV^{\star}$ (km s$^{-1}$) | $\rho_c^{\star}$ (km s$^{-1}$) | $EW$(LiI) (mÅ) | $R'_{\rm HK}$ (log) | Age (Gyr) | $L_{\rm X}/L_{\rm Bol}$ (log) | Age (Gyr) | Prot (days) | Age (Gyr) | [Fe/H] |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) |
| | | | | | | | *Doubtful Members* | | | | | | | | | |
| 12110 | 1.06 | –12.52 ± 0.22 | –8.05 ± 0.20 | –11.63 ± 0.13 | 18.89 | 17.47 | 0.99 Y | 15.06 Y | | –4.40 [1] | 0.30 | –4.81 | 1.16 | | | 0.06 |
| 67105 | 1.09 | –4.32 ± 0.14 | –10.06 ± 0.30 | –13.51 ± 0.10 | 17.39 | 13.24 | –7.30 N | –9.43 Y | 5.15 ± 5.68 | –4.39 [1] | 0.28 | –5.17 | 2.15 | | | |
| 109176 | 0.45 | –14.69 | –7.00 | –6.39 | 17.48 | 16.40 | 5.19 N | –4.54 Y | 74.47 ± 2.73 | –5.06 [9] | 7.72 | –5.76 | 0.89 | | | –0.05 |
| | | | | | | | *Probable Members* | | | | | | | | | |
| 29067 | 1.25 | –7.16 ± 0.46 | –7.69 ± 0.40 | –9.98 ± 0.49 | 14.49 | 14.33 | 0.89 Y | –0.57 Y | 37.82 ± 6.47 | –4.40 [1] | 0.30 | | | | | |
| 45383 | 1.00 | –13.47 ± 0.48 | –4.33 ± 0.44 | –0.52 ± 0.45 | 14.16 | 8.75 | 5.68 N | 2.96 N | 8.68 ± 5.25 | –4.31 [1] | 0.15 | –3.93 | 0.33 | | | |
| 110778 | 0.61 | –17.08 ± 0.67 | –5.03 ± 0.47 | –17.11 ± 0.45 | 24.69 | 23.47 | 5.97 N | 0.43 Y | 83.22 ± 3.43 | –4.43 [1] | 0.37 | –4.19 | 0.18 | | | –0.17 |
| 117712 | 0.96 | –15.75 | –6.48 | –1.20 | 17.07 | 15.32 | 8.18 N | 3.64 Y | | –4.55 [3] | 0.86 | –4.56 | 0.64 | | | –0.32 |

**Notes.** $^{(\star)}$ "Y", "N" labels indicate if the star satisfies or not the criteria.

**Table 14.** Properties of the stars classified as Other young discs stars.

| | | Kinematics | | | Lithium | Ca II H, K | | X-ray | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP (1) | $(B-V)$ (2) | $U$ (km s$^{-1}$) (3) | $V$ (km s$^{-1}$) (4) | $W$ (km s$^{-1}$) (5) | $EW$ Li I ($m$Å) (6) | $R'_{HK}$ (log) (7) | Age (Gyr) (8) | $L_X/L_{Bol}$ (log) (9) | Age (Gyr) (10) | Prot (Days) (11) | Age (Gyr) (12) | [Fe/H] (13) |
| 1692 | 1.31 | –18.78 ± 8.10 | –1.08 ± 3.74 | –18.51 ± 1.00 | | | | | | | | |
| 3810 | 0.52 | 7.43 | –10.88 | –18.45 | | –4.92 [4] | 5.07 | –6.35 | 1.88 | | | –0.07 |
| 3998 | 1.22 | 3.40 ± 0.27 | –14.96 ± 0.68 | –23.70 ± 0.68 | 21.94 ± 6.34 | –4.96 [3] | 5.80 | –4.53 | 1.18 | | | |
| 4845 | 1.10 | 5.05 ± 0.32 | –13.10 ± 0.62 | –13.53 ± 0.26 | 4.35 ± 5.90 | –4.54 [1] | 0.79 | | | | | |
| 7235 | 0.75 | –10.89 ± 0.18 | –26.44 ± 0.29 | 0.94 ± 0.08 | | –4.72 [1] | 2.20 | –5.29 | 1.45 | | | -0.04 |
| 7918 | 0.61 | –38.63 ± 0.28 | –31.20 ± 0.26 | –0.07 ± 0.07 | 7.60 ± 3.42 | –4.99 [3] | 6.36 | | | | | 0.06 |
| 8275 | 1.02 | –11.10 ± 0.15 | 0.75 ± 0.30 | –20.62 ± 0.19 | 4.53 ± 5.34 | –4.51 [1] | 0.65 | | | | | |
| 8768 | 1.40 | –35.88 ± 0.45 | –28.55 ± 0.38 | –1.87 ± 0.22 | 26.69 ± 7.20 | –4.59 [1] | 1.08 | –4.52 | 1.92 | | | |
| 9829 | 0.65 | 6.34 ± 0.41 | –12.38 ± 0.35 | –9.20 ± 0.41 | 6.47 ± 3.57 | –4.98 [4] | 6.13 | | | | | –0.20 |
| 10337 | 1.37 | –32.70 ± 1.18 | –21.64 ± 0.83 | 10.03 ± 0.50 | 13.06 ± 7.18 | –4.68 [1] | 1.79 | –4.49 | 1.27 | | | |
| 13081 | 0.83 | –24.79 ± 0.60 | –26.53 ± 0.99 | –1.49 ± 0.19 | | –4.58 [4] | 1.00 | –4.56 | 0.48 | | | –0.08 |
| 13642 | 0.90 | –40.49 ± 0.35 | –21.47 ± 0.71 | –16.62 ± 0.17 | | –5.11 [3] | | | | | | 0.21 |
| 14150 | 0.70 | –18.54 ± 0.13 | –22.45 ± 0.28 | –5.69 ± 0.10 | | –4.85 [4] | 4.01 | | | | | 0.12 |
| 15442 | 0.64 | –25.57 ± 0.22 | –30.64 ± 0.57 | –6.09 ± 0.24 | 5.90 ± 3.56 | –4.75 [1] | 2.55 | | | | | –0.20 |
| 15457 | 0.67 | –21.03 ± 0.73 | –4.33 ± 0.04 | –4.02 ± 0.68 | 38.88 ± 3.68 | –4.42 [2] | 0.35 | –4.62 | 0.40 | 9.4 [12] | 0.70 | 0.11 |
| 16852 | 0.57 | 1.66 ± 0.18 | –15.51 ± 0.12 | –42.40 ± 0.19 | 46.48 ± 3.22 | –5.05 [3] | 7.59 | | | 17.6 [13] | 3.50 | –0.04 |
| 23835 | 0.64 | –26.31 ± 0.08 | –23.11 ± 0.13 | 27.54 ± 0.19 | 13.06 ± 3.55 | –5.13 [4] | | | | | | –0.16 |
| 27435 | 0.62 | –18.69 ± 0.10 | –29.66 ± 0.12 | –12.38 ± 0.07 | 33.59 ± 3.46 | –4.97 [4] | 6.00 | | | | | –0.22 |
| 29525 | 0.66 | 3.04 ± 0.76 | –25.79 ± 0.37 | –6.62 ± 0.16 | 39.19 ± 3.65 | –4.33 [1] | 0.17 | –4.78 | 0.55 | 7.8 [14] | | –0.10 |
| 29650 | 0.45 | –33.85 ± 0.13 | –18.52 ± 0.12 | –16.37 ± 0.16 | 4.90 ± 2.72 | –4.71 [4] | 2.13 | –5.30 | 0.51 | | | 0.07 |
| 30422 | 0.45 | –15.95 | -4.07 | –2.82 | 4.66 ± 2.72 | –4.58 [4] | 0.99 | –5.05 | 0.40 | | | |
| 33560 | 1.07 | 14.67 ± 0.37 | –8.13 ± 0.36 | –1.26 ± 0.19 | 58.70 ± 5.62 | –4.14 [1] | 0.03 | –3.37 | 0.22 | | | |
| 37279 | 0.43 | 5.48 | –8.48 | –18.84 | 2.10 ± 2.65 | –4.78 [2] | 2.89 | –6.12 | 0.99 | 3.0 [2] | | 0.00 |
| 42808 | 0.93 | –25.93 ± 0.12 | –7.93 ± 0.10 | –0.82 ± 0.07 | 69.52 ± 4.89 | –4.48 [1] | 0.53 | –4.41 | 0.57 | | | –0.03 |
| 44897 | 0.58 | –30.64 ± 0.14 | –14.03 ± 0.16 | 4.33 ± 0.16 | 28.44 ± 3.29 | –4.47 [1] | 0.50 | –4.74 | 0.36 | 10.0 [2] | 1.15 | 0.03 |
| 45038 | 0.49 | –1.13 ± 0.08 | –9.16 ± 0.11 | 1.93 ± 0.09 | | –5.31 [3] | | –6.09 | 1.32 | | | –0.05 |
| 45333 | 0.59 | 8.64 | –7.61 | –9.46 | 60.35 ± 3.32 | –5.07 [4] | | | | | | –0.13 |
| 45343 | 1.36 | –39.13 ± 1.18 | –13.70 ± 0.58 | –21.71 ± 1.08 | | –4.56 [3] | 0.91 | –4.59 | 2.37 | | | |
| 46509 | 0.46 | 0.94 ± 0.36 | –7.33 ± 0.22 | 11.37 ± 0.35 | 3.36 ± 2.77 | –4.83 [3] | 3.61 | –4.96 | 0.27 | | | –0.01 |
| 46816 | 0.89 | –20.11 ± 0.33 | –4.35 ± 0.25 | –10.13 ± 0.28 | 202.25 ± 4.72 | –3.66 [1] | | –3.03 | 0.08 | | | –0.21 |
| 47080 | 0.76 | –36.76 | –17.35 | –15.85 | 10.43 ± 4.11 | –4.57 [1] | 0.95 | –5.11 | 0.83 | 18.0 [2] | 1.72 | 0.33 |
| 48113 | 0.61 | 11.12 ± 0.72 | –5.54 ± 0.13 | 17.93 ± 0.84 | 28.30 ± 3.41 | –5.04 [3] | 7.39 | | | | | 0.13 |
| 49699 | 0.97 | –8.69 ± 0.11 | –7.09 ± 0.13 | 4.27 ± 0.09 | 11.26 ± 5.09 | –5.00 [4] | 6.58 | | | | | 0.04 |
| 49908 | 1.33 | –8.81 ± 0.10 | –20.71 ± 0.05 | –36.38 ± 0.11 | 37.55 ± 6.82 | –5.00 [1] | 6.60 | –5.09 | 3.46 | 6.0 [14] | | |
| 49986 | 1.29 | –2.20 ± 0.07 | –12.46 ± 0.15 | –2.99 ± 0.15 | 14.13 ± 6.75 | –4.41 [11] | 0.32 | –4.47 | 3.86 | | | |
| 51459 | 0.52 | –13.58 ± 0.05 | –1.99 ± 0.05 | 1.82 ± 0.05 | 56.71 ± 3.02 | –4.78 [3] | 2.97 | –5.51 | 1.02 | | | –0.05 |
| 53721 | 0.61 | –24.18 ± 0.09 | –2.38 ± 0.05 | 0.74 ± 0.08 | 16.15 ± 3.42 | –4.91 [3] | 4.93 | | | | | 0.03 |
| 54426 | 0.98 | –6.42 ± 0.48 | –3.54 ± 0.21 | –41.94 ± 0.22 | 2.23 ± 5.12 | –4.77 [1] | 2.80 | | | | | |
| 54906 | 0.83 | –10.70 ± 0.25 | 1.19 ± 0.15 | –4.76 ± 0.11 | 5.05 ± 4.42 | –5.06 [4] | 7.72 | | | | | –0.27 |
| 56242 | 0.58 | –21.34 ± 0.67 | –30.27 ± 0.94 | –20.26 ± 0.47 | 58.86 ± 3.26 | –4.92 [2] | 5.16 | –5.95 | 2.09 | 14.0 [12] | 2.21 | –0.02 |
| 56997 | 0.73 | 7.85 ± 0.04 | –16.01 ± 0.06 | –3.74 ± 0.06 | 7.26 ± 3.95 | –4.55 [2] | 0.82 | –5.16 | 1.08 | 17.1 [12] | 1.70 | –0.03 |
| 61941 | 0.38 | –35.51 ± 0.27 | –6.47 ± 0.31 | –18.47 ± 0.58 | 43.96 ± 2.44 | –4.50 [11] | 0.61 | –4.79 | 0.18 | | | |
| 62505 | 0.93 | 4.37 ± 0.36 | 5.64 ± 0.50 | 4.00 ± 0.28 | 12.13 ± 4.92 | –4.57 [5] | 0.96 | –4.68 | 0.68 | | | |
| 64241 | 0.47 | –39.00 ± 0.61 | –9.53 ± 0.22 | –13.70 ± 0.24 | 12.33 ± 2.81 | –4.53 [2] | 0.74 | –4.91 | 0.21 | 3.0 [12] | | –0.21 |

**Table 14.** continued.

| | | Kinematics | | | Lithium | Ca II H, K | | X-ray | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP | $(B-V)$ | $U$ (km s$^{-1}$) | $V$ (km s$^{-1}$) | $W$ (km s$^{-1}$) | $EW$ Li I ($m$Å) | $R'_{HK}$ (log) | Age (Gyr) | $L_X/L_{Bol}$ (log) | Age (Gyr) | Prot (Days) | Age (Gyr) | [Fe/H] |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| 65343 | 1.40 | –49.45 ± 0.89 | –11.19 ± 0.22 | –34.57 ± 0.20 | 46.18 ± 7.24 | –4.59 [11] | 1.08 | –5.10 | 3.06 | | | |
| 65352 | 0.80 | 3.20 ± 0.18 | 4.04 ± 0.28 | 31.80 ± 0.15 | | –5.07 [4] | 7.81 | | | | | –0.30 |
| 66886 | 1.25 | –35.59 ± 0.52 | –21.62 ± 0.99 | –38.36 ± 0.13 | | –4.67 [4] | 1.67 | | | | | |
| 67422 | 1.22 | –20.07 ± 0.21 | –25.35 ± 0.27 | –13.95 ± 0.09 | 6.49 ± 6.30 | –4.68 [1] | 1.79 | –4.57 | 1.09 | | | –0.35 |
| 68030 | 0.51 | –29.60 ± 0.29 | –20.32 ± 0.25 | –1.46 ± 0.20 | 32.74 ± 2.95 | –4.92 [10] | 5.13 | | | | | –0.41 |
| 68184 | 1.03 | –2.56 ± 0.07 | –10.09 ± 0.07 | –26.64 ± 0.08 | 19.60 ± 5.39 | | | | | | | 0.10 |
| 68337 | 1.16 | –29.65 ± 0.39 | –16.50 ± 0.30 | –50.29 ± 0.21 | 6.46 ± 6.02 | –4.72 [1] | 2.20 | | | | | |
| 68682 | 0.75 | 14.92 ± 0.26 | –13.83 ± 0.20 | –19.46 ± 0.30 | 5.62 ± 4.04 | –4.87 [3] | 4.25 | | | | | –0.02 |
| 69972 | 1.03 | –43.04 ± 0.24 | –11.54 ± 0.24 | –34.89 ± 0.29 | 25.50 ± 5.35 | –5.01 [5] | 6.79 | | | | | 0.22 |
| 72603 | 0.41 | –24.54 ± 0.14 | –8.16 ± 0.15 | –12.07 ± 0.10 | 71.44 ± 2.54 | –4.58 [11] | 1.01 | –5.05 | 0.30 | | | –0.09 |
| 75253 | 0.97 | –0.44 ± 0.16 | –19.12 ± 0.55 | –12.74 ± 0.28 | 30.26 ± 5.10 | –4.83 [1] | 3.64 | | | | | 0.11 |
| 75277 | 0.79 | –19.79 ± 0.52 | –11.30 ± 0.30 | 7.04 ± 0.75 | 11.75 ± 4.25 | –4.90 [4] | 4.81 | | | | | –0.07 |
| 75722 | 0.91 | 2.08 ± 0.33 | –19.22 ± 0.42 | –34.75 ± 0.47 | 15.80 ± 4.81 | –5.18 [3] | | –4.53 | 0.57 | | | 0.18 |
| 76602 | 0.51 | –1.70 ± 0.30 | –0.50 ± 0.35 | –5.43 ± 0.40 | 65.11 ± 2.97 | –4.79 [4] | 3.10 | | | | | 0.11 |
| 76603 | 0.49 | 1.72 ± 0.40 | –1.48 ± 0.41 | –4.63 ± 0.56 | 73.03 ± 2.88 | –4.86 [4] | 4.12 | | | | | 0.00 |
| 77052 | 0.67 | 18.73 ± 0.10 | –7.24 ± 0.11 | 11.28 ± 0.09 | 26.13 ± 3.69 | –4.89 [7] | 4.61 | –5.29 | 1.10 | | | 0.06 |
| 81300 | 0.83 | 1.00 ± 0.07 | –0.38 ± 0.04 | –28.39 ± 0.10 | 15.43 ± 4.43 | –4.73 [1] | 2.31 | –5.08 | 1.19 | 21.3 [12] | 2.00 | 0.05 |
| 85561 | 1.24 | –33.73 ± 0.18 | –21.14 ± 0.72 | 14.61 ± 0.66 | 2.79 ± 6.51 | –4.40 [1] | 0.30 | | | | | |
| 86400 | 0.95 | 20.44 ± 0.07 | 0.70 ± 0.09 | 12.03 ± 0.07 | 24.20 ± 5.01 | –4.76 [1] | 2.67 | –5.58 | 3.15 | 33.5 [12] | | –0.16 |
| 87579 | 0.96 | –13.61 ± 0.17 | –9.89 ± 0.11 | 4.23 ± 0.27 | 3.65 ± 5.06 | –4.43 [1] | 0.37 | –4.74 | 1.04 | | | |
| 88601 | 0.83 | 7.29 ± 0.11 | –19.30 ± 0.10 | –18.97 ± 0.10 | 7.40 ± 4.44 | –4.86 [1] | 4.11 | –4.88 | 0.76 | 19.7 [12] | 1.76 | 0.04 |
| 90656 | 1.10 | –42.67 ± 0.15 | –32.80 ± 0.15 | –25.17 ± 0.38 | 39.46 ± 5.71 | | | | | | | 0.19 |
| 98698 | 1.11 | –22.88 ± 0.09 | –16.92 ± 0.10 | 15.71 ± 0.10 | 29.15 ± 5.74 | –4.69 [2] | 1.91 | –5.11 | 2.03 | 29.3 [12] | | |
| 98828 | 0.93 | 3.69 ± 0.17 | –9.96 ± 0.12 | 4.92 ± 0.15 | 16.57 ± 4.89 | –4.81 [1] | 3.34 | | | | | |
| 99240 | 0.75 | –48.79 ± 0.08 | –13.38 ± 0.06 | –14.92 ± 0.06 | 24.75 ± 4.07 | –5.00 [7] | 6.60 | | | | | 0.30 |
| 99316 | 0.80 | –29.52 ± 0.36 | –15.73 ± 0.28 | 14.22 ± 0.30 | | –5.08 [4] | | | | | | |
| 99452 | 0.82 | –31.69 ± 0.45 | –27.29 ± 0.69 | 61.66 ± 0.73 | 13.97 ± 4.40 | –5.09 [4] | | | | | | –0.09 |
| 99764 | 1.37 | 14.87 ± 0.38 | –17.35 ± 0.67 | –14.35 ± 0.45 | 10.96 ± 7.36 | –4.71 [1] | 2.09 | | | | | |
| 105152 | 1.03 | –36.58 ± 0.50 | –32.18 ± 0.32 | –24.89 ± 0.85 | 8.82 ± 5.39 | –5.11 [3] | 8.53 | | | | | –0.09 |
| 106400 | 1.16 | –41.62 ± 1.05 | –18.29 ± 0.21 | –13.82 ± 0.40 | 22.26 ± 6.02 | –3.98 [1] | 0.01 | –3.68 | | | | |
| 111449 | 0.45 | –16.42 ± 0.40 | –21.61 ± 0.32 | –10.08 ± 0.77 | | –4.55 [5] | 0.83 | –5.05 | 0.31 | | | 0.00 |
| 113357 | 0.65 | –15.42 ± 0.12 | –28.13 ± 0.05 | 14.43 ± 0.06 | 12.20 ± 3.58 | –5.07 [2] | | | | 37.0 [2] | 8.49 | 0.18 |
| 116771 | 0.51 | –7.82 ± 0.03 | –26.07 ± 0.07 | –26.35 ± 0.06 | 24.82 ± 2.96 | –5.11 [3] | | –6.15 | 1.59 | | | –0.05 |
| 120005 | 1.40 | –44.78 ± 1.97 | –17.49 ± 1.11 | –22.54 ± 1.75 | 3.47 ± 7.15 | –4.39 [1] | 0.28 | –4.59 | 2.09 | | | |

**Table 15.** Properties of the stars non-members of moving groups.

| | | Kinematics | | | Lithium | Ca II H, K | | X-ray | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP (1) | $(B-V)$ (2) | $U$ (km s$^{-1}$) (3) | $V$ (km s$^{-1}$) (4) | $W$ (km s−1) (5) | $EW$ Li I ($m$Å) (6) | $R'_{HK}$ (log) (7) | Age (Gyr) (8) | $L_X/L_{Bol}$ (log) (9) | Age (Gyr) (10) | Prot (Days) (11) | Age (Gyr) (12) | [Fe/H] (13) |
| 171 | 0.65 | –8.36 | –76.17 | –33.38 | | –4.85 [3] | 3.96 | –5.89 | 3.23 | | | –0.52 |
| 910 | 0.48 | 18.82 ± 0.26 | –12.66 ± 0.23 | –19.95 ± 0.09 | 28.53 ± 2.83 | –4.79 [5] | 3.04 | | | | | –0.34 |
| 1499 | 0.69 | –31.47 ± 0.42 | –38.69 ± 0.45 | –1.61 ± 0.17 | 9.01 ± 3.75 | –5.06 [4] | 7.70 | | | | | 0.17 |
| 1532 | 1.23 | 18.83 ± 0.70 | –26.56 ± 0.85 | 1.71 ± 0.38 | 42.26 ± 6.47 | | | | | | | |
| 1598 | 0.62 | 18.02 ± 0.47 | 10.64 ± 0.58 | –33.64 ± 0.52 | 32.07 ± 3.46 | –4.98 [4] | 6.21 | | | | | –0.41 |
| 1599 | 0.56 | –71.53 ± 0.12 | –4.39 ± 0.04 | –45.35 ± 0.08 | 39.59 ± 3.20 | –4.84 [7] | 3.79 | | | | | –0.17 |
| 2941 | 0.72 | –85.72 | –52.37 | –23.99 | | –4.90 [2] | 4.83 | | | | | |
| 3093 | 0.85 | 39.89 ± 0.31 | –19.53 ± 0.52 | 8.50 ± 0.53 | 10.50 ± 4.53 | –4.99 [2] | 6.43 | | | 48.0 [12] | 8.25 | 0.14 |
| 3206 | 0.96 | 17.95 ± 0.22 | –82.78 ± 0.50 | –27.33 ± 0.76 | | –5.02 [3] | 6.96 | –5.41 | 2.20 | | | 0.12 |
| 3418 | 1.10 | 43.02 ± 0.53 | –30.44 ± 0.18 | –12.44 ± 0.60 | 6.29 ± 5.70 | –4.71 [3] | 2.04 | | | | | |
| 3535 | 1.02 | 29.79 ± 0.50 | –36.44 ± 0.66 | –36.23 ± 0.80 | 32.96 ± 5.32 | –5.05 [3] | 7.59 | | | | | 0.22 |
| 3765 | 0.88 | –1.26 ± 0.16 | –47.44 ± 0.28 | –13.30 ± 0.35 | | –5.41 [1] | | | | 38.0 [12] | 5.21 | –0.22 |
| 3821 | 0.57 | | | | 27.12 ± 3.24 | –4.96 [3] | 5.83 | –6.24 | 3.56 | | | –0.19 |
| 5286 | 1.11 | 4.43 ± 0.47 | –28.76 ± 0.87 | –41.33 ± 0.94 | 12.06 ± 5.79 | –4.59 [1] | 1.08 | | | | | |
| 5336 | 0.68 | –42.40 | –157.40 | –35.23 | | –4.91 [3] | 4.90 | | | | | –0.81 |
| 5799 | 0.45 | –33.17 ± 0.25 | 21.12 ± 0.18 | –9.34 ± 0.16 | 9.47 ± 2.70 | –5.46 [3] | | –5.32 | 0.44 | | | –0.33 |
| 5957 | 1.35 | –23.43 ± 1.53 | –48.75 ± 1.48 | 10.24 ± 0.29 | 32.64 ± 7.15 | –4.78 [3] | 2.89 | | | | | |
| 6290 | 1.34 | 15.32 ± 1.05 | 33.23 ± 0.98 | 36.63 ± 1.70 | | –4.40 [1] | 0.30 | | | | | |
| 6917 | 0.98 | –45.69 | –31.09 | –22.23 | | –4.56 [4] | 0.88 | –4.63 | 0.58 | | | –0.32 |
| 7339 | 0.68 | 50.88 ± 0.30 | –4.15 ± 0.22 | 1.12 ± 0.14 | | –5.02 [4] | 6.99 | | | | | |
| 7513 | 0.54 | 28.77 ± 0.04 | –22.50 ± 0.02 | –14.28 ± 0.07 | 31.01 ± 3.10 | –5.04 [3] | 7.26 | –5.98 | 1.24 | | | 0.11 |
| 7981 | 0.83 | 34.82 ± 0.52 | –24.97 ± 0.45 | 2.61 ± 0.60 | 3.69 ± 4.44 | –5.19 [1] | | | | 35.0 [2] | 4.87 | –0.04 |
| 8102 | 0.71 | 18.71 ± 0.01 | 29.42 ± 0.02 | 12.80 ± 0.04 | | –4.96 [2] | 5.82 | –6.86 | 16.30 | 34.0 [2] | 5.95 | –0.46 |
| 9269 | 0.79 | 8.32 ± 0.25 | –60.07 ± 0.61 | –11.59 ± 0.46 | | –5.13 [4] | | | | | | 0.15 |
| 10138 | 0.82 | –99.05 ± 0.38 | –77.08 ± 0.22 | –31.44 ± 0.12 | 2.31 ± 4.35 | –4.68 [1] | 1.79 | | | 30.0 [13] | 3.83 | –0.22 |
| 10416 | 1.05 | 17.30 ± 0.35 | –17.85 ± 0.44 | –2.60 ± 0.26 | | –4.30 [1] | 0.14 | –4.66 | 0.99 | | | –0.06 |
| 10644 | 0.60 | –35.30 | –47.96 | 11.12 | 38.93 ± 3.37 | –4.64 [3] | 1.47 | –5.05 | 0.65 | | | |
| 10798 | 0.73 | –11.03 ± 0.08 | 26.81 ± 0.15 | –9.94 ± 0.04 | 0.76 ± 3.95 | –4.86 [7] | 4.11 | | | | | –0.46 |
| 11452 | 1.41 | –16.43 ± 0.30 | 10.70 ± 0.22 | 8.56 ± 0.30 | 61.17 ± 7.23 | | | | | | | |
| 11565 | 1.22 | –59.01 ± 1.29 | –27.82 ± 0.65 | –0.90 ± 0.63 | | –4.58 [1] | 1.01 | | | | | |
| 12114 | 0.97 | –76.46 ± 0.20 | 0.41 ± 0.03 | 32.01 ± 0.17 | 1.15 ± 5.07 | –4.96 [2] | 5.82 | | | 45.0 [12] | | |
| 12777 | 0.50 | –30.27 ± 0.05 | 1.28 ± 0.05 | –0.85 ± 0.02 | 69.56 ± 2.92 | –5.07 [3] | 7.92 | –5.92 | 1.46 | | | 0.04 |
| 12843 | 0.48 | | | | 14.25 ± 2.85 | –4.52 [5] | 0.71 | –4.80 | 0.25 | | | –0.07 |
| 13258 | 1.23 | 11.52 ± 0.26 | –62.02 ± 1.17 | 6.66 ± 0.28 | 33.57 ± 6.38 | –4.76 [1] | 2.67 | | | | | |
| 14286 | 0.67 | –71.34 ± 1.28 | –85.48 ± 1.32 | –29.36 ± 0.47 | 3.47 ± 3.68 | –4.99 [4] | 6.36 | | | | | –0.26 |
| 14632 | 0.59 | –75.90 ± 0.10 | –15.61 ± 0.12 | 21.45 ± 0.08 | 54.94 ± 3.33 | –5.00 [3] | 6.58 | | | | | 0.13 |
| 14879 | 0.50 | –38.59 ± 0.29 | 16.45 ± 0.07 | 29.26 ± 0.10 | 12.88 ± 2.93 | –4.90 [5] | 4.79 | –4.50 | 0.12 | | | –0.19 |
| 15099 | 0.89 | 5.75 ± 0.56 | –62.45 ± 1.20 | 8.88 ± 0.47 | 5.34 ± 4.71 | –4.84 [3] | 3.82 | | | | | –0.04 |
| 15330 | 0.64 | –70.01 ± 0.20 | –46.56 ± 0.13 | 15.82 ± 0.11 | 2.83 ± 3.53 | –4.86 [1] | 4.11 | –5.71 | 2.15 | | | –0.22 |
| 15371 | 0.59 | –69.72 ± 0.17 | –46.46 ± 0.09 | 15.85 ± 0.06 | 4.36 ± 3.31 | –4.79 [7] | 3.06 | | | | | –0.23 |
| 15510 | 0.70 | –79.86 ± 0.08 | –96.10 ± 0.07 | –34.11 ± 0.07 | | –4.98 [7] | 6.22 | –6.70 | 10.59 | | | –0.34 |
| 15673 | 1.01 | 42.65 ± 0.26 | –14.07 ± 0.25 | –40.49 ± 1.05 | 22.95 ± 5.31 | –4.54 [1] | 0.79 | | | | | |
| 15919 | 1.15 | 48.04 ± 0.69 | –29.02 ± 0.36 | –21.33 ± 0.69 | 20.02 ± 5.95 | –4.60 [1] | 1.14 | –5.12 | 1.99 | | | |
| 16537 | 0.89 | –3.60 ± 0.03 | 7.06 ± 0.01 | –20.70 ± 0.03 | 7.30 ± 4.69 | –4.62 [1] | 1.28 | –4.80 | 0.94 | 11.3 [12] | 0.61 | –0.04 |

**Table 15.** continued.

| | | Kinematics | | | Lithium | Ca II H, K | | X-ray | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP | $(B-V)$ | $U$ (km s$^{-1}$) | $V$ (km s$^{-1}$) | $W$ (km s$^{-1}$) | $EW$ Li I ($m$Å) | $R'_{HK}$ (log) | Age (Gyr) | $L_X/L_{Bol}$ (log) | Age (Gyr) | Prot (Days) | Age (Gyr) | [Fe/H] |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| 17147 | 0.54 | –111.06 ± 0.39 | –89.27 ± 1.11 | –42.84 ± 0.60 | 8.46 ± 3.11 | –4.92 [10] | 5.13 | | | | | –0.79 |
| 17496 | 1.18 | –89.58 ± 0.51 | –6.83 ± 0.35 | –16.85 ± 0.74 | 16.62 ± 6.15 | –4.71 [3] | 2.06 | | | | | |
| 17651 | 0.43 | 35.18 ± 0.20 | –22.45 ± 0.14 | –20.85 ± 0.23 | 0.51 ± 2.66 | –4.68 [5] | 1.83 | –6.88 | 3.70 | | | 0.04 |
| 18324 | 0.85 | –59.46 ± 0.54 | –16.91 ± 0.75 | 12.98 ± 0.25 | | –5.03 [3] | 7.11 | | | | | –0.32 |
| 18413 | 0.67 | 33.35 ± 0.27 | 16.10 ± 0.38 | –5.75 ± 0.12 | 12.72 ± 3.67 | –4.93 [4] | 5.25 | | | | | –0.10 |
| 19849 | 0.81 | 96.26 ± 0.08 | –12.27 ± 0.03 | –41.12 ± 0.08 | | –5.38 [1] | | | | 43.0 [2] | 7.30 | –0.23 |
| 20917 | 1.34 | 33.30 ± 0.14 | 6.86 ± 0.13 | 14.26 ± 0.08 | 55.68 ± 6.90 | –4.62 [1] | 1.28 | –4.45 | 1.25 | | | |
| 22498 | 1.34 | –69.12 ± 1.06 | –1.81 ± 1.71 | 19.17 ± 0.58 | 27.95 ± 6.93 | –4.55 [11] | 0.84 | –4.96 | 1.88 | | | |
| 23311 | 1.07 | 4.64 ± 0.12 | –54.29 ± 0.21 | –10.90 ± 0.05 | 29.34 ± 5.56 | –5.29 [1] | | –5.90 | 5.25 | 47.0 [2] | | 0.30 |
| 23693 | 0.52 | –6.12 ± 0.05 | 2.55 ± 0.24 | –1.51 ± 0.18 | 75.41 ± 3.00 | –4.49 [1] | 0.57 | –5.02 | 0.52 | | | –0.12 |
| 23786 | 0.79 | –28.29 ± 0.86 | –44.02 ± 0.94 | 2.34 ± 0.40 | 5.04 ± 4.26 | –4.49 [1] | 0.57 | –5.07 | 1.22 | | | –0.17 |
| 24786 | 0.56 | –37.98 ± 0.14 | –44.72 ± 0.25 | 20.22 ± 0.42 | 27.63 ± 3.20 | –4.98 [5] | 6.17 | | | | | –0.08 |
| 24813 | 0.61 | –76.26 ± 0.05 | –34.97 ± 0.18 | 4.41 ± 0.02 | 29.94 ± 3.42 | –5.01 [3] | 6.81 | | | | | 0.10 |
| 24819 | 1.01 | –84.37 ± 0.21 | –56.47 ± 0.43 | 13.01 ± 0.82 | | –4.53 [1] | 0.74 | | | | | |
| 24874 | 1.03 | –8.38 ± 0.55 | 10.71 ± 0.18 | 30.86 ± 0.71 | 22.59 ± 5.39 | –4.14 [1] | 0.03 | –4.91 | 1.46 | | | 0.09 |
| 25623 | 1.14 | 74.23 ± 0.30 | –2.04 ± 0.28 | –18.18 ± 0.39 | 30.00 ± 5.89 | –4.60 [1] | 1.14 | | | | | –0.20 |
| 26505 | 0.82 | 47.65 ± 0.74 | 20.43 ± 0.60 | –47.67 ± 0.61 | 4.71 ± 4.39 | –5.16 [4] | | | | | | –0.31 |
| 27207 | 0.84 | 21.36 ± 1.10 | –74.47 ± 1.20 | 13.76 ± 0.31 | 6.32 ± 4.49 | –5.04 [3] | 7.39 | | | | | –0.02 |
| 28103 | 0.35 | –6.01 ± 0.41 | 8.23 ± 0.34 | 1.62 ± 0.18 | 22.18 ± 2.33 | –4.78 [11] | 2.93 | –5.75 | 0.64 | | | |
| 28267 | 0.71 | –106.69 ± 0.22 | –92.53 ± 0.34 | –37.64 ± 0.13 | 5.55 ± 3.87 | –5.06 [4] | 7.70 | | | | | –0.09 |
| 29271 | 0.72 | 18.97 ± 0.06 | –30.21 ± 0.17 | –11.64 ± 0.10 | 11.36 ± 3.91 | –4.94 [7] | 5.49 | –6.72 | 8.88 | | | 0.08 |
| 29432 | 0.64 | 61.84 ± 0.20 | –12.69 ± 0.50 | 11.15 ± 0.20 | 13.08 ± 3.53 | –4.97 [4] | 6.11 | | | | | –0.09 |
| 29800 | 0.44 | –13.07 ± 0.57 | 7.80 ± 0.21 | 14.32 ± 0.11 | 13.04 ± 2.67 | –4.51 [1] | 0.65 | –4.98 | 0.32 | | | –0.14 |
| 29860 | 0.60 | –15.87 ± 0.09 | 16.53 ± 0.19 | –9.46 ± 0.12 | 43.55 ± 3.35 | –5.00 [2] | 6.62 | | | 20.0 [2] | 3.63 | –0.08 |
| 32010 | 1.02 | 49.16 ± 0.14 | –19.57 ± 0.59 | –1.36 ± 0.16 | 4.00 ± 5.35 | –4.38 [1] | 0.26 | –5.04 | 1.91 | | | –0.18 |
| 32423 | 0.97 | 18.90 ± 0.34 | 35.10 ± 0.91 | –52.65 ± 1.21 | 11.43 ± 5.09 | –4.64 [1] | 1.44 | | | | | –0.18 |
| 32439 | 0.52 | | | | 44.74 ± 3.01 | –5.02 [3] | 7.05 | –6.53 | 4.34 | | | –0.16 |
| 32480 | 0.56 | 25.61 ± 0.07 | 8.92 ± 0.09 | –2.76 ± 0.06 | 70.00 ± 3.17 | –4.99 [3] | 6.32 | | | | | 0.09 |
| 32919 | 1.22 | –40.58 ± 0.44 | –43.65 ± 0.88 | –31.68 ± 0.71 | 30.23 ± 6.33 | –5.06 [1] | 7.72 | | | | | |
| 32984 | 1.07 | 0.47 ± 0.08 | 13.15 ± 0.08 | –19.76 ± 0.10 | 15.91 ± 5.55 | –4.36 [1] | 0.22 | –4.84 | 1.36 | | | –0.02 |
| 33373 | 1.10 | –53.29 ± 0.19 | –49.11 ± 1.73 | 10.55 ± 0.23 | 25.23 ± 5.73 | –4.51 [1] | 0.65 | | | | | |
| 33537 | 0.64 | 25.58 ± 0.05 | 14.29 ± 0.14 | 4.37 ± 0.16 | 2.24 ± 3.52 | –4.94 [4] | 5.40 | | | | | –0.33 |
| 33955 | 1.09 | 34.33 ± 0.23 | 7.57 ± 0.25 | –27.68 ± 0.50 | | –4.74 [4] | 2.43 | –5.15 | 2.35 | | | –0.17 |
| 34017 | 0.59 | –18.07 ± 0.09 | –77.69 ± 0.59 | –9.00 ± 0.15 | 24.82 ± 3.32 | –4.94 [3] | 5.54 | | | | | –0.11 |
| 35136 | 0.57 | –79.85 ± 0.06 | –1.63 ± 0.12 | 32.37 ± 0.07 | 17.60 ± 3.24 | –4.93 [4] | 5.25 | | | | | –0.33 |
| 36357 | 0.93 | 9.05 ± 0.13 | 10.60 ± 0.20 | 14.78 ± 0.29 | 6.40 ± 4.88 | –4.38 [1] | 0.25 | –5.00 | 1.46 | | | |
| 36366 | 0.33 | 22.75 ± 8.04 | 13.51 ± 1.01 | 9.86 ± 3.17 | 31.29 ± 2.26 | –4.66 [11] | 1.61 | –5.35 | 0.36 | | | |
| 36439 | 0.46 | 25.58 ± 0.11 | –15.42 ± 0.16 | –4.26 ± 0.13 | 31.70 ± 2.77 | –5.31 [3] | | | | | | –0.35 |
| 36551 | 1.14 | –47.20 ± 0.28 | –52.83 ± 0.66 | 12.47 ± 0.18 | | –4.44 [1] | 0.40 | | | | | |
| 38382 | 0.60 | 27.94 | 2.47 | –19.69 | 22.01 ± 3.36 | –4.88 [5] | 4.49 | | | 9.7 [14] | 0.99 | –0.02 |
| 38657 | 0.97 | 30.56 ± 0.27 | –36.15 ± 0.79 | –15.14 ± 0.18 | 24.29 ± 5.10 | –5.15 [4] | | | | | | 0.09 |
| 38784 | 0.72 | –8.99 ± 0.12 | 8.77 ± 0.12 | –38.09 ± 0.23 | 8.08 ± 3.92 | –4.84 [3] | 3.75 | –5.84 | 2.95 | | | –0.14 |
| 38931 | 1.01 | –3.54 ± 0.18 | 5.97 ± 0.11 | –12.82 ± 0.28 | | –5.05 [4] | 7.52 | –5.23 | 2.43 | | | –0.23 |
| 39064 | 0.83 | 45.98 ± 0.46 | –52.11 ± 1.06 | –14.95 ± 0.19 | 9.21 ± 4.41 | –5.11 [4] | | | | | | –0.04 |
| 39157 | 0.72 | –13.31 | –88.96 | –29.79 | 6.29 ± 3.91 | –4.92 [3] | 5.04 | | | | | –0.48 |

**Table 15.** continued.

| HIP | $(B-V)$ | Kinematics $U$ (km s$^{-1}$) | $V$ (km s$^{-1}$) | $W$ (km s$^{-1}$) | Lithium $EW$ Li I ($m$Å) | Ca II H, K $R'_{HK}$ (log) | Age (Gyr) | X-ray $L_X/L_{Bol}$ (log) | Age (Gyr) | Rotation Prot (Days) | Age (Gyr) | [Fe/H] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| 40118 | 0.66 | –48.25 ± 0.29 | –60.95 ± 0.69 | –39.98 ± 0.68 | 11.67 ± 3.64 | –4.85 [3] | 3.92 | | | | | –0.30 |
| 40375 | 1.19 | –39.30 ± 0.51 | 3.93 ± 0.32 | –19.41 ± 0.63 | 15.10 ± 6.16 | –4.56 [4] | 0.87 | | | | | |
| 40671 | 1.09 | –21.87 ± 0.32 | –83.58 ± 2.26 | –38.22 ± 1.26 | 24.01 ± 5.66 | –4.64 [1] | 1.44 | | | | | |
| 40693 | 0.77 | 28.41 ± 0.21 | –60.96 ± 0.17 | –9.88 ± 0.10 | 8.03 ± 4.12 | –4.99 [5] | 6.43 | –5.90 | 3.32 | | | –0.04 |
| 40843 | 0.48 | –24.26 ± 0.08 | –38.80 ± 0.21 | 7.19 ± 0.09 | 62.43 ± 2.82 | –5.19 [3] | 9.83 | | | | | –0.22 |
| 41484 | 0.62 | 20.11 ± 0.13 | –38.97 ± 0.39 | –22.89 ± 0.12 | 30.59 ± 3.47 | –4.91 [4] | 5.00 | | | | | –0.01 |
| 41926 | 0.78 | –75.43 ± 0.41 | 6.06 ± 0.13 | –24.57 ± 0.17 | | –4.95 [7] | 5.67 | | | | | –0.37 |
| 42173 | 0.69 | –33.42 ± 0.86 | –36.33 ± 0.82 | –0.79 ± 0.96 | 98.98 ± 3.77 | –4.48 [3] | 0.53 | –4.80 | 0.51 | | | 0.08 |
| 42430 | 0.87 | –62.62 ± 0.64 | –27.29 ± 0.31 | 13.98 ± 0.36 | 24.67 ± 4.63 | –5.03 [5] | 7.18 | –5.52 | 1.60 | | | 0.30 |
| 42499 | 0.82 | 18.00 ± 1.09 | –30.28 ± 0.89 | –29.05 ± 0.80 | 4.59 ± 4.38 | –4.99 [3] | 6.39 | | | | | –0.36 |
| 42525 | 0.58 | –49.27 ± 0.40 | –2.01 ± 0.44 | 34.20 ± 0.50 | 70.66 ± 3.45 | | | | | | | |
| 43557 | 0.63 | 19.51 | –25.38 | 4.81 | 3.19 ± 3.51 | –4.67 [1] | 1.70 | –4.93 | 0.52 | | | –0.14 |
| 44075 | 0.52 | –48.67 ± 0.14 | –91.58 ± 0.18 | 69.61 ± 0.25 | ± | –4.78 [5] | 2.94 | | | | | –0.90 |
| 45170 | 0.74 | –75.01 | –1.37 | 1.41 | ± | –4.85 [4] | 3.89 | –5.60 | 1.59 | | | –0.30 |
| 45617 | 0.99 | 24.59 ± 0.65 | –35.93 ± 0.60 | –17.17 ± 0.62 | 3.65 ± 5.18 | –4.51 [1] | 0.65 | | | | | 0.07 |
| 45839 | 1.15 | –39.21 ± 0.79 | –36.68 ± 0.36 | –16.62 ± 1.22 | 18.50 ± 6.01 | –4.78 [4] | 2.90 | | | | | |
| 45963 | 1.04 | –24.69 | –43.60 | –30.49 | ± | –4.10 [4] | 0.02 | –3.11 | 0.05 | | | |
| 49081 | 0.67 | –56.14 ± 0.13 | –44.12 ± 0.19 | 20.90 ± 0.13 | 17.99 ± 3.66 | –4.97 [3] | 6.02 | | | | | 0.19 |
| 49366 | 0.91 | –12.45 ± 0.41 | 4.06 ± 0.16 | –20.89 ± 0.38 | | –4.54 [1] | 0.79 | –5.05 | 1.41 | | | –0.14 |
| 50125 | 1.11 | 22.51 ± 0.35 | –82.97 ± 2.48 | 10.69 ± 0.90 | 5.62 ± 5.77 | –4.81 [4] | 3.30 | | | | | |
| 50384 | 0.50 | –51.29 ± 0.29 | –29.25 ± 0.18 | 4.33 ± 0.23 | 53.08 ± 2.92 | –5.02 [3] | 6.96 | | | | | –0.39 |
| 50505 | 0.68 | 12.09 ± 0.13 | –27.44 ± 0.31 | 2.47 ± 0.12 | 5.29 ± 3.71 | –5.00 [4] | 6.60 | | | | | –0.18 |
| 51248 | 0.59 | 20.38 ± 0.25 | –91.34 ± 0.91 | 22.88 ± 0.34 | 14.63 ± 3.33 | –4.91 [3] | 4.88 | | | | | –0.40 |
| 51502 | 0.39 | –10.86 ± 1.92 | 5.56 ± 2.44 | –1.22 ± 2.03 | | –4.55 [11] | 0.84 | –4.94 | 0.30 | | | –0.30 |
| 51525 | 1.35 | –40.54 ± 0.52 | –50.66 ± 0.92 | 5.20 ± 0.27 | 27.67 ± 6.93 | –4.88 [1] | 4.44 | –4.59 | 1.38 | | | |
| 51933 | 0.53 | 69.87 ± 0.66 | –35.35 ± 0.39 | –36.38 ± 0.32 | 49.82 ± 3.05 | –4.85 [5] | 3.93 | | | | | –0.21 |
| 52369 | 0.63 | 34.72 ± 0.42 | 9.05 ± 0.12 | –10.15 ± 0.11 | 27.56 ± 3.50 | –4.83 [5] | 3.58 | | | | | –0.10 |
| 54646 | 1.33 | 38.38 ± 0.35 | 2.45 ± 0.06 | –2.01 ± 0.16 | 54.96 ± 6.84 | –4.86 [1] | 4.11 | | | | | |
| 54651 | 1.08 | –107.88 ± 2.12 | –20.98 ± 0.19 | 26.81 ± 0.13 | | –4.94 [4] | 5.47 | | | | | |
| 54677 | 1.13 | 94.05 ± 2.75 | –2.09 ± 0.38 | –19.65 ± 0.42 | 21.42 ± 5.90 | –4.73 [5] | 2.35 | | | | | |
| 54966 | 1.34 | 43.38 ± 18.37 | –22.70 ± 7.29 | –18.94 ± 10.14 | 26.16 ± 6.87 | | | | | | | |
| 55210 | 0.74 | 77.36 ± 1.12 | 8.89 ± 0.28 | 31.03 ± 0.31 | 2.29 ± 4.01 | –4.94 [10] | 5.49 | | | | | –0.22 |
| 55848 | 1.04 | –62.03 ± 1.62 | –12.75 ± 0.31 | –9.85 ± 0.37 | 4.09 ± 5.41 | | | | | | | 0.24 |
| 56452 | 0.80 | –47.58 ± 0.17 | 19.65 ± 0.05 | 12.37 ± 0.10 | 18.93 ± 4.26 | –4.86 [7] | 4.11 | | | | | –0.32 |
| 56809 | 0.58 | –50.90 ± 1.01 | –27.36 ± 0.46 | –36.02 ± 0.40 | 34.53 ± 3.27 | –5.07 [3] | 7.83 | | | | | –0.17 |
| 56829 | 0.98 | –29.95 | 34.34 | 1.33 | | –4.34 [11] | 0.19 | –4.22 | 0.53 | | | |
| 57443 | 0.66 | –59.64 ± 0.15 | –38.48 ± 0.10 | 5.17 ± 0.05 | 0.95 ± 3.63 | –4.95 [7] | 5.67 | | | 24.0 [13] | 3.81 | –0.27 |
| 57757 | 0.56 | 40.39 | 3.45 | 6.65 | 18.12 ± 3.18 | –4.99 [6] | 6.41 | –5.75 | 0.84 | | | 0.14 |
| 57939 | 0.74 | 277.96 ± 0.94 | –157.18 ± 0.57 | –13.57 ± 0.33 | | –4.90 [2] | 4.71 | | | 31.0 [2] | 4.71 | –1.22 |
| 59000 | 1.37 | 20.65 ± 0.47 | –42.11 ± 0.62 | –0.88 ± 0.77 | 45.91 ± 7.16 | –4.12 [1] | 0.03 | –3.68 | 0.44 | | | |
| 59750 | 0.46 | 53.11 ± 0.98 | –71.06 ± 1.28 | –60.92 ± 1.20 | 10.35 ± 2.78 | –4.65 [2] | 1.53 | –5.81 | 1.69 | 7.0 [2] | | –0.76 |
| 61317 | 0.59 | | | | 8.51 ± 3.31 | –4.85 [3] | 3.96 | | | | | –0.16 |
| 61901 | 1.09 | 22.47 ± 0.24 | –22.12 ± 0.21 | 18.62 ± 0.10 | | –5.02 [4] | 6.98 | | | | | |
| 62207 | 0.55 | –41.67 ± 0.19 | 6.94 ± 0.08 | 75.31 ± 0.09 | 38.10 ± 3.16 | –4.98 [3] | 6.24 | | | | | –0.50 |
| 63366 | 0.81 | –74.85 ± 1.47 | –34.15 ± 0.64 | 17.35 ± 0.30 | 8.40 ± 4.32 | –4.88 [3] | 4.37 | | | | | –0.30 |

**Table 15.** continued.

| HIP | $(B-V)$ | Kinematics $U$ (km s$^{-1}$) | Kinematics $V$ (km s$^{-1}$) | Kinematics $W$ (km s$^{-1}$) | Lithium $EW$ Li I ($m$Å) | Ca II H, K $R'_{\rm HK}$ (log) | Ca II H, K Age (Gyr) | X-ray $L_X/L_{\rm Bol}$ (log) | X-ray Age (Gyr) | Rotation Prot (Days) | Rotation Age (Gyr) | [Fe/H] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| 64394 | 0.59 | –49.98 ± 0.08 | 11.49 ± 0.03 | 7.59 ± 0.05 | 61.55 ± 3.30 | –5.06 [1] | 7.72 | –5.67 | 1.38 | 12.4 [12] | 1.67 | 0.07 |
| 64792 | 0.59 | –38.05 ± 0.18 | 1.68 ± 0.08 | –18.68 ± 0.13 | 93.75 ± 3.31 | –4.44 [2] | 0.41 | –4.42 | 0.16 | 3.0 [2] | 0.13 | 0.21 |
| 64797 | 0.89 | 35.45 ± 0.29 | 7.42 ± 0.10 | 1.92 ± 0.08 | 0.52 ± 4.69 | –4.63 [1] | 1.36 | –5.04 | 1.47 | 18.8 [12] | 1.50 | –0.16 |
| 64924 | 0.71 | –23.92 ± 0.04 | –47.07 ± 0.10 | –32.13 ± 0.05 | 13.36 ± 3.86 | –5.00 [2] | 6.62 | | | 29.0 [2] | 4.55 | 0.06 |
| 65721 | 0.71 | 13.33 ± 0.09 | –51.59 ± 0.24 | –2.70 ± 0.14 | 56.23 ± 3.84 | –5.07 [3] | 7.89 | | | | | –0.06 |
| 69414 | 0.75 | 23.91 ± 0.13 | –43.67 ± 0.46 | 18.25 ± 0.19 | 16.33 ± 4.03 | –5.08 [4] | | | | | | –0.11 |
| 69701 | 0.51 | 24.48 ± 0.26 | –36.99 ± 0.18 | –12.82 ± 0.34 | 19.37 ± 2.99 | –4.68 [2] | 1.81 | –4.89 | 0.13 | 7.6 [12] | 1.71 | –0.01 |
| 69962 | 1.41 | 21.86 ± 0.64 | –34.68 ± 1.19 | –17.56 ± 0.86 | 36.21 ± 7.26 | –4.80 [1] | 3.20 | | | | | |
| 70016 | 0.85 | –43.38 ± 0.67 | –47.22 ± 0.87 | 6.94 ± 0.28 | | –5.05 [3] | 7.44 | | | | | –0.17 |
| 70218 | 1.23 | –23.39 ± 0.20 | –51.71 ± 0.52 | –19.00 ± 0.20 | 22.27 ± 6.37 | –4.44 [1] | 0.40 | –4.63 | 1.51 | | | |
| 70319 | 0.64 | 21.80 ± 0.34 | –15.14 ± 0.22 | –38.29 ± 0.28 | 3.40 ± 3.52 | –4.96 [2] | 5.80 | | | 22.0 [2] | 3.56 | –0.29 |
| 71284 | 0.37 | 2.22 ± 0.09 | 16.31 ± 0.11 | –5.31 ± 0.23 | 3.93 ± 2.41 | –5.48 [3] | | –5.55 | 0.68 | | | –0.33 |
| 71681 | 0.90 | –28.33 ± 0.42 | 2.86 ± 0.43 | 13.34 ± 0.46 | 30.82 ± 4.76 | –4.92 [7] | 5.13 | | | 42.0 [13] | 6.07 | 0.15 |
| 71683 | 0.90 | –29.87 ± 0.08 | 1.29 ± 0.08 | 12.34 ± 0.07 | 19.38 ± 4.76 | –5.00 [7] | 6.60 | | | | | 0.19 |
| 72237 | 1.32 | 62.48 ± 0.74 | –55.13 ± 1.06 | 25.84 ± 0.23 | 11.65 ± 6.87 | –4.56 [1] | 0.87 | | | | | |
| 72567 | 0.59 | 5.09 ± 0.14 | 9.71 ± 0.16 | –6.64 ± 0.11 | 112.06 ± 3.32 | –4.34 [1] | 0.19 | –4.65 | 0.33 | | | –0.04 |
| 72875 | 0.99 | –68.61 ± 1.49 | –68.13 ± 1.61 | 13.05 ± 1.12 | | –4.45 [1] | 0.43 | | | | | –0.23 |
| 72981 | 1.17 | 5.18 ± 0.53 | –59.04 ± 3.67 | 0.82 ± 0.32 | 112.96 ± 9.71 | | | | | | | |
| 73184 | 1.08 | 47.75 ± 0.18 | –21.90 ± 0.10 | –32.74 ± 0.28 | 23.84 ± 5.63 | –4.63 [1] | 1.36 | | | 44.6 [13] | | 0.10 |
| 73457 | 1.37 | 24.74 ± 0.59 | –35.60 ± 1.31 | –16.43 ± 1.01 | 67.94 ± 7.13 | –4.63 [5] | 1.34 | | | | | |
| 73786 | 1.41 | –58.06 ± 0.37 | –73.38 ± 3.61 | –57.43 ± 0.53 | 8.09 ± 8.12 | –5.12 [3] | | | | | | |
| 74537 | 0.76 | –86.28 ± 0.35 | –101.23 ± 0.91 | –14.28 ± 0.33 | | –5.11 [4] | | | | | | |
| 75542 | 1.06 | –161.25 ± 1.44 | –22.71 ± 1.94 | –4.35 ± 1.59 | | –4.88 [1] | 4.44 | | | | | –0.35 |
| 75718 | 0.82 | 20.60 ± 0.36 | –20.24 ± 0.48 | –18.15 ± 0.53 | 28.38 ± 4.38 | –4.98 [3] | 6.19 | | | | | 0.01 |
| 76375 | 0.95 | –44.23 ± 0.37 | –64.51 ± 0.40 | –27.23 ± 0.38 | | –5.14 [3] | | | | | | 0.26 |
| 76779 | 1.29 | 7.84 ± 0.20 | 11.99 ± 0.33 | –0.76 ± 0.17 | 37.26 ± 6.67 | –4.78 [1] | 2.93 | –5.29 | 4.40 | | | |
| 77257 | 0.60 | | | | 25.80 ± 3.35 | –5.00 [2] | 6.67 | –6.21 | 2.36 | 18.0 [12] | 3.00 | 0.04 |
| 78072 | 0.49 | 56.89 ± 0.12 | –33.91 ± 0.08 | –24.71 ± 0.09 | 28.46 ± 2.88 | –5.11 [3] | | –6.77 | 4.38 | | | –0.13 |
| 78709 | 0.76 | –101.33 ± 1.37 | –14.21 ± 0.19 | 13.46 ± 0.87 | | –5.03 [3] | 7.11 | | | | | –0.07 |
| 78775 | 0.73 | –36.14 | –58.79 | –18.25 | | –4.97 [3] | 6.04 | | | | | –0.49 |
| 78843 | 1.06 | 48.75 ± 0.39 | –10.39 ± 0.25 | –22.99 ± 0.93 | 12.13 ± 5.50 | –5.02 [5] | 6.90 | | | | | |
| 79190 | 0.84 | 33.82 ± 0.10 | –10.82 ± 0.09 | 21.36 ± 0.23 | | –4.94 [7] | 5.49 | | | | | –0.36 |
| 79492 | 0.77 | 50.99 ± 1.03 | –12.68 ± 0.53 | –16.44 ± 0.78 | 13.07 ± 4.13 | –4.93 [3] | 5.32 | | | | | –0.07 |
| 79672 | 0.65 | 27.36 ± 0.11 | –14.35 ± 0.11 | –22.03 ± 0.17 | 25.60 ± 3.58 | –4.87 [3] | 4.25 | | | 23.7 [12] | 3.86 | 0.04 |
| 80366 | 0.96 | 5.05 ± 0.12 | –30.28 ± 0.74 | 6.80 ± 0.19 | 5.05 ± 5.04 | –4.60 [1] | 1.14 | | | | | –0.26 |
| 80644 | 1.23 | –21.06 ± 0.22 | –39.81 ± 0.66 | –14.69 ± 0.22 | 24.05 ± 6.36 | –4.84 [3] | 3.82 | | | | | |
| 80725 | 0.85 | –54.63 ± 0.57 | –10.99 ± 0.15 | 12.45 ± 0.53 | 6.07 ± 4.50 | –4.51 [1] | 0.65 | –5.07 | 1.39 | | | |
| 81375 | 0.83 | 6.86 ± 0.59 | 13.25 ± 0.25 | 1.44 ± 0.36 | 7.71 ± 4.44 | –5.00 [4] | 6.51 | –4.80 | 0.66 | | | 0.17 |
| 82588 | 0.76 | 85.11 ± 0.55 | –112.93 ± 1.45 | 9.12 ± 0.18 | 200.57 ± 4.07 | –4.39 [1] | 0.28 | –4.40 | 0.36 | 11.1 [12] | 0.75 | –0.05 |
| 83591 | 1.14 | 46.65 ± 0.21 | –63.49 ± 0.73 | 20.70 ± 0.11 | 17.64 ± 5.92 | | | | | | | –0.62 |
| 83601 | 0.57 | 2.75 ± 0.17 | –30.34 ± 0.24 | –19.71 ± 0.15 | 90.95 ± 3.24 | –4.50 [1] | 0.61 | –4.90 | 0.44 | 7.6 [12] | 0.77 | 0.03 |
| 84195 | 0.92 | 22.73 ± 0.22 | 9.42 ± 0.11 | –2.30 ± 0.26 | 13.44 ± 4.86 | –4.99 [4] | 6.37 | | | | | |
| 84478 | 1.14 | –0.68 ± 0.13 | –33.84 ± 0.13 | –7.07 ± 0.04 | 15.10 ± 5.91 | –4.66 [2] | 1.63 | –4.97 | 2.18 | 18.0 [12] | | |
| 84720 | 0.78 | –6.22 ± 0.08 | 33.42 ± 0.21 | –31.36 ± 0.23 | 7.29 ± 4.19 | –4.94 [7] | 5.49 | | | | | –0.27 |
| 84862 | 0.61 | 25.49 ± 0.24 | –80.78 ± 0.12 | –63.65 ± 0.10 | | –4.96 [3] | 5.91 | | | | | –0.26 |

**Table 15.** continued.

| | | Kinematics | | | Lithium | Ca II H, K | | X-ray | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP | $(B-V)$ | $U$ (km s$^{-1}$) | $V$ (km s$^{-1}$) | $W$ (km s$^{-1}$) | $EW$ Li I ($m$Å) | $R'_{\rm HK}$ (log) | Age (Gyr) | $L_{\rm X}/L_{\rm Bol}$ (log) | Age (Gyr) | Prot (Days) | Age (Gyr) | [Fe/H] |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| 85235 | 0.76 | 1.59 ± 0.08 | –49.84 ± 0.09 | 5.49 ± 0.12 | | –4.93 [10] | 5.31 | | | | | –0.33 |
| 85295 | 1.35 | 0.01 ± 0.15 | –52.91 ± 0.26 | –9.92 ± 0.05 | 28.77 ± 6.92 | –4.72 [1] | 2.20 | –4.95 | 2.68 | | | |
| 85810 | 0.65 | –31.01 | –49.90 | –1.88 | 33.56 ± 3.59 | –4.46 [1] | 0.46 | –5.83 | 1.92 | | | 0.09 |
| 86036 | 0.59 | 35.97 | –4.43 | –22.33 | 61.79 ± 3.31 | –4.76 [1] | 2.67 | –5.04 | 0.55 | | | –0.17 |
| 86722 | 0.78 | 67.13 ± 1.05 | –28.04 ± 0.90 | –1.06 ± 0.27 | 7.55 ± 4.20 | –5.09 [4] | 8.32 | | | | | –0.34 |
| 88622 | 0.60 | –78.72 ± 0.32 | –88.27 ± 0.43 | –38.62 ± 0.26 | | –4.61 [3] | 1.23 | –5.31 | 1.07 | | | –0.49 |
| 88972 | 0.88 | 16.61 ± 0.11 | –31.28 ± 0.07 | 0.33 ± 0.08 | 12.59 ± 4.66 | –4.96 [2] | 5.76 | | | 42.0 [12] | 6.24 | –0.05 |
| 89937 | 0.50 | 3.64 ± 0.10 | 39.90 ± 0.24 | –3.15 ± 0.18 | 29.09 ± 2.94 | –4.90 [11] | 4.78 | –6.16 | 2.29 | | | –0.40 |
| 91009 | 1.17 | 18.22 | –17.57 | –28.39 | 4.29 ± 6.06 | –3.66 [1] | | –3.06 | 0.10 | | | |
| 91438 | 0.65 | 38.24 ± 0.10 | –2.15 ± 0.08 | –4.50 ± 0.05 | 24.36 ± 3.61 | –4.89 [7] | 4.61 | –5.76 | 2.55 | | | –0.24 |
| 92043 | 0.47 | 37.18 ± 0.20 | 1.21 ± 0.22 | –8.01 ± 0.08 | | –4.90 [3] | 4.74 | –5.27 | 0.29 | | | 0.04 |
| 92200 | 1.23 | 23.39 ± 0.25 | –10.67 ± 0.34 | –0.75 ± 0.10 | 6.96 ± 6.37 | –4.65 [1] | 1.52 | | | | | |
| 92283 | 1.06 | 14.11 ± 0.30 | –23.24 ± 0.29 | –25.33 ± 0.38 | 20.56 ± 5.52 | –4.68 [1] | 1.79 | | | | | 0.06 |
| 93017 | 0.56 | –15.02 ± 0.30 | –37.95 ± 0.60 | –27.23 ± 0.19 | 42.51 ± 3.18 | –4.87 [2] | 4.34 | –5.67 | 1.39 | 16.0 [2] | 3.21 | –0.15 |
| 93871 | 1.06 | 70.55 ± 2.26 | –66.91 ± 2.56 | –7.61 ± 0.33 | 1.12 ± 5.55 | | | | | | | |
| 95995 | 0.85 | 45.27 | 3.20 | 27.64 | | –5.05 [4] | 7.48 | | | | | –0.26 |
| 96100 | 0.79 | 31.40 ± 0.07 | 43.23 ± 0.05 | –18.93 ± 0.06 | 0.78 ± 4.21 | –4.83 [2] | 3.67 | –5.59 | 2.66 | 27.0 [2] | 3.37 | –0.16 |
| 96285 | 1.19 | –69.51 ± 0.63 | –14.56 ± 0.60 | –13.72 ± 0.51 | 29.42 ± 6.18 | –5.08 [1] | | | | | | |
| 97944 | 1.03 | 3.24 | –28.81 | 0.37 | ± | –4.58 [5] | 1.03 | –4.70 | 0.49 | | | |
| 98677 | 0.73 | 52.84 ± 0.70 | –15.60 ± 0.77 | –17.19 ± 0.26 | 13.84 ± 3.97 | –4.83 [3] | 3.61 | | | | | –0.30 |
| 98819 | 0.60 | 42.36 ± 0.27 | –20.31 ± 0.17 | 9.52 ± 0.12 | 53.60 ± 3.37 | –4.80 [2] | 3.16 | –5.88 | 2.01 | 13.5 [12] | 1.75 | 0.04 |
| 99461 | 0.85 | –118.41 ± 0.09 | –51.77 ± 0.08 | 47.08 ± 0.07 | | –5.39 [1] | | | | | | –0.44 |
| 99711 | 0.94 | –22.84 ± 0.59 | 4.19 ± 0.58 | 22.21 ± 0.38 | 8.15 ± 4.95 | –4.60 [1] | 1.14 | –5.07 | 1.49 | | | –0.05 |
| 99825 | 0.89 | –73.00 ± 0.19 | –11.63 ± 0.06 | –18.69 ± 0.17 | 14.56 ± 4.70 | –5.05 [5] | 7.50 | | | | | –0.02 |
| 101345 | 0.69 | –18.58 ± 0.24 | 18.86 ± 0.15 | –28.04 ± 0.23 | 48.37 ± 3.76 | –5.15 [3] | | | | | | 0.04 |
| 101955 | 1.34 | –68.74 | –16.82 | –37.14 | 0.87 ± 6.94 | –4.97 [3] | 6.08 | –4.36 | 1.31 | | | |
| 101997 | 0.72 | –58.88 ± 0.18 | 20.34 ± 0.21 | 4.22 ± 0.14 | | –4.93 [7] | 5.31 | | | | | –0.28 |
| 103256 | 1.01 | –81.52 ± 1.33 | –8.01 ± 0.56 | –8.59 ± 0.52 | 18.34 ± 5.29 | –4.50 [1] | 0.61 | | | | | |
| 104092 | 1.15 | –15.09 ± 0.31 | –76.68 ± 0.42 | 3.91 ± 0.40 | 23.52 ± 5.95 | –5.23 [1] | | | | | | |
| 104214 | 1.15 | –94.40 ± 2.10 | –54.60 ± 0.26 | –8.28 ± 0.45 | | –4.76 [2] | 2.72 | | | 37.9 [12] | | |
| 104217 | 1.29 | –92.19 ± 0.18 | –53.34 ± 0.11 | –9.41 ± 0.06 | | –4.89 [2] | 4.62 | | | 48.0 [12] | | |
| 104858 | 0.51 | 5.77 | –28.95 | –10.05 | 44.03 ± 2.96 | –4.91 [4] | 4.86 | | | | | –0.15 |
| 105858 | 0.48 | –14.30 ± 0.05 | 44.80 ± 0.06 | 7.01 ± 0.05 | 45.15 ± 2.84 | –4.49 [5] | 0.57 | | | | | –0.64 |
| 109378 | 0.75 | 5.01 ± 0.17 | –49.87 ± 0.42 | –7.53 ± 0.25 | 4.65 ± 4.06 | –5.10 [3] | | | | | | 0.20 |
| 109527 | 0.82 | 14.04 ± 0.27 | –25.35 ± 0.14 | –17.31 ± 0.37 | 12.56 ± 4.36 | –4.41 [1] | 0.32 | –4.88 | 0.70 | | | 0.16 |
| 110109 | 0.59 | –29.52 ± 0.13 | –42.13 ± 0.24 | 6.19 ± 0.06 | 22.21 ± 3.32 | –4.86 [7] | 4.11 | –6.18 | 3.45 | | | –0.19 |
| 111888 | 0.89 | –20.60 ± 0.50 | 13.18 ± 0.16 | –13.63 ± 0.16 | 29.77 ± 4.69 | –4.59 [1] | 1.08 | –4.97 | 1.52 | | | |
| 112190 | 0.97 | 22.56 ± 0.60 | –27.20 ± 0.58 | 7.55 ± 0.57 | 17.36 ± 5.11 | –4.93 [4] | 5.22 | | | | | –0.10 |
| 112447 | 0.50 | 3.87 ± 0.08 | –31.77 ± 0.14 | –27.86 ± 0.14 | 43.13 ± 2.91 | –5.28 [3] | | | | | | –0.18 |
| 112870 | 0.85 | –45.31 ± 1.01 | 1.20 ± 0.12 | –5.99 ± 0.17 | 3.65 ± 4.54 | –4.97 [3] | 5.96 | | | | | –0.47 |
| 113576 | 1.32 | 34.84 ± 0.19 | 16.95 ± 0.11 | 0.11 ± 0.19 | 26.85 ± 6.80 | –4.63 [1] | 1.36 | | | | | |
| 113718 | 0.94 | –28.52 ± 0.37 | –47.12 ± 0.42 | 16.73 ± 0.35 | 15.17 ± 4.94 | –5.09 [4] | | | | | | |
| 114622 | 1.01 | –52.91 ± 0.12 | –39.48 ± 0.05 | –14.27 ± 0.04 | | –5.10 [3] | | –6.46 | 12.36 | | | 0.09 |
| 114886 | 0.91 | –41.75 ± 0.74 | –1.78 ± 0.24 | –10.97 ± 0.19 | 8.63 ± 4.79 | –5.11 [1] | | | | | | –0.05 |
| 115331 | 0.81 | –66.57 ± 0.77 | –16.76 ± 0.25 | –2.91 ± 0.10 | 49.87 ± 4.31 | –4.15 [1] | 0.04 | –4.61 | 0.55 | | | –0.01 |

**Table 15.** continued.

| | | Kinematics | | | Lithium | Ca II H, K | | X-ray | | Rotation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HIP | $(B-V)$ | $U$ ($\mathrm{km\,s^{-1}}$) | $V$ ($\mathrm{km\,s^{-1}}$) | $W$ ($\mathrm{km\,s^{-1}}$) | $EW$ Li I ($m$Å) | $R'_{\rm HK}$ (log) | Age (Gyr) | $L_{\rm X}/L_{\rm Bol}$ (log) | Age (Gyr) | Prot (Days) | Age (Gyr) | [Fe/H] |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| 115445 | 0.89 | –40.46 ± 0.78 | 19.41 ± 0.13 | –38.17 ± 0.16 | 2.95 ± 4.69 | –4.70 [1] | 1.99 | | | | | –0.29 |