RACE-OC project: Rotation and variability of young stellar associations within 100 pc^{★,★★}

S. Messina¹, S. Desidera², M. Turatto¹, A. C. Lanzafame^{1,3}, and E. F. Guinan⁴

¹ INAF – Catania Astrophysical Observatory, via S. Sofia 78, 95127 Catania, Italy
e-mail: [sergio.messina; massimo.turatto]@oact.inaf.it

² INAF – Padova Astronomical Observatory, vicolo dell’Osservatorio 5, 35122 Padova, Italy
e-mail: silvano.desidera@oapd.inaf.it

³ University of Catania, Dept. of Physics and Astronomy, via S. Sofia 78, 95127 Catania, Italy
e-mail: Alessandro.Lanzafame@oact.inaf.it

⁴ Dept. of Astronomy and Astrophysics, Villanova University, Villanova, 19085 PA, USA
e-mail: edward.guinan@villanova.edu

Received 11 November 2009 / Accepted 14 April 2010

ABSTRACT

Context. Examining the angular momentum of stars and its interplay with their magnetic fields represent a promising way to probe the stellar internal structure and evolution of low-mass stars.

Aims. We attempt to determine the rotational and magnetic-related activity properties of stars at different stages of evolution. We focused our attention primarily on members of clusters and young stellar associations of known ages. In this study, our targets are 6 young loose stellar associations within 100 pc and with ages in the range 8–70 Myr: TW Hydrae (~8 Myr), β Pictoris (~10 Myr), Tucana/Horologium, Columba, Carina (~30 Myr), and AB Doradus (~70 Myr). Additional rotational data for α Persei and the Pleiades from the literature are also considered.

Methods. Rotational periods of stars exhibiting rotational modulation due to photospheric magnetic activity (i.e., starspots) were determined by applying the Lomb-Scargle periodogram technique to photometric time-series data obtained by the All Sky Automated Survey (ASAS). The magnetic activity level was derived from the amplitude of the V lightcurves. The statistical significance of the rotational evolution at different ages was inferred by applying a two-sided Kolmogorov-Smirnov test to subsequent age-bins.

Results. We detected the rotational modulation and measured the rotation periods of 93 stars for the first time, and confirmed the periods of 41 stars already known from the literature. For an additional 10 stars, we revised the period determinations by other authors. The sample was augmented with periods of 21 additional stars retrieved from the literature. In this way, for the first time we were able to determine the largest set of rotation periods at ages of ~8, ~10 and ~30 Myr, as well as increase by 150% the number of known periodic members of AB Dor.

Conclusions. The analysis of the rotation periods in young stellar associations, supplemented by Orion Nebula Cluster (ONC) and NGC 2264 data from the literature, has allowed us to find that in the 0.6–1.2 $M_{\odot}$ range the most significant variations in the rotation period distribution are the spin-up between 9 and 30 Myr and the spin-down between 70 and 110 Myr. Variations of between 30 and 70 Myr are rather doubtful, despite the median period indicating a significant spin-up. The photospheric activity level is found to be correlated with rotation at ages greater than ~70 Myr and to show some additional age dependence besides that related to rotation and mass.

Key words. stars: activity – stars: late-type – stars: rotation – starspots – open clusters and associations: general – stars: pre-main sequence

1. Introduction

Rotation is a basic stellar property that undergoes dramatic changes during the stellar lifetime. These changes depend on both the evolution of the internal structure – e.g., stellar radius contraction during pre main sequence (PMS) and its expansion during post main sequence (post MS) – and on the presence and evolution of intense magnetic fields (Kawaler 1988; MacGregor & Brenner 1991; Krishnamurthi et al. 1997). Stellar magnetic fields play a fundamental role in the rotational history

of late-type stars. During the PMS T-Tauri phase, they are responsible for the star-disk coupling that keeps the star’s rotation rate slow, in spite of the gravitational contraction (see, e.g., Scholz et al. 2007). During the MS and Post MS, they are responsible for the angular momentum loss by means of magnetized stellar winds, as well as the redistribution of angular momentum by means of coupling processes between the internal radiative zone and the external convection zone (e.g., Barnes 2003). Thus, evolution of angular momentum and magnetic activity offer complementary diagnostics to study the mechanisms by which rotation and magnetic fields influence each other.

Our knowledge of the rotation properties at different stellar ages has improved thanks to a number of valuable projects of either decennial long-term monitoring of very young open

* Tables A.1–A.7 and Figs. A.1–A.22 are only available in electronic form at <http://www.aanda.org>

** Based on the All Sky Automated Survey photometric data.

clusters (see, e.g., Herbst & Mundt 2005; Herbst et al. 2007) or seasonal monitoring of intermediate-age open clusters (e.g., MONITOR, Hodgkin et al. 2006; EXPLORE/OC Extrasolar Planet Occultation Research, von Braun et al. 2005). In contrast to field stars, stars in open clusters form samples that are complete in mass and homogeneous in environmental conditions, initial chemical composition, age, and interstellar reddening. These stellar samples allow us to accurately investigate the dependence on age and metallicity of different stellar properties and their mutual relationship.

However, much still needs to be done since the number of studied open clusters, as well as the number of periodic variables discovered in most clusters, have not been large enough to fully constrain the various models proposed to describe the mechanisms driving the angular momentum evolution. In particular, the sequence of ages at which the angular momentum evolution has been studied still contains significant gaps and the sample of available periodic cluster members for a number of clusters is not as complete as necessary. Furthermore, at most ages we have only one representative cluster, which does not allow us to investigate, e.g., the dependence on either metallicity or initial environmental conditions.

RACE-OC, which stands for Rotation and ACTivity Evolution in Open Clusters, is a long-term project designed to study the evolution of the rotational properties and the magnetic activity of late-type members of stellar open clusters (Messina 2007; Messina et al. 2008). The RACE-OC targets are in stellar associations and open clusters with ages in the range from about 1 to about 600 Myr, for which no rotation and activity investigations have been carried out so far. The highest priority was given to the open clusters that fill the gaps in the relationships between age, activity, and rotation. Nonetheless, we also included clusters already extensively studied such as the very young Orion Nebula Cluster (Parihar et al. 2009). The motivation behind this is to increase the sample of periodic rotational variables and to explore the long-term magnetic activity, e.g., to search for activity cycles and surface differential rotation (SDR), by making repeated observations of given clusters over several years.

In the present study, we considered stellar associations at distances smaller than 100 pc and ages younger than about 100 Myr. While very few open clusters are within 100 pc, a number of loose associations of nearby young stars have been successfully identified (Zuckerman & Song 2004; Torres et al. 2008). Like open clusters, the physical association among the members allows a more robust age determination to be made than for isolated field stars. Furthermore, the brightness and the proximity to the Sun make it possible to carry out several complementary observations of individual objects that allow us to put the rotational properties of these stars in a broader astrophysical context. These observations include, e.g., high-resolution spectroscopy, trigonometric parallaxes, census of visual and spectroscopic binaries, IR excess, and searches for planets.

A knowledge of the rotational properties of very young stars, as a function of age and spectral type (=mass), is important for a number of issues. First, some high-precision radial velocity studies of these targets are ongoing (Setiawan et al. 2008; Günther & Esposito 2007), in spite of the challenge represented by the activity-induced radial velocity jitter. Since this jitter is caused by the occurrence of active regions on stellar surface, an independent determination of rotational period is useful for differentiating radial velocity variations caused by rotational modulation from those caused by Keplerian motion (e.g., Lanza 2010a). Second, an accurate knowledge of the rotational properties of

parent stars can illuminate how the star's angular momentum and planet formation influence each other. The planet formation may significantly alter the rotational history of the parent stars and, conversely, "anomalous" rotation may be indicative of planet formation processes (Pont 2009; Lanza 2010b). Third, the knowledge of the rotation periods of young stars allows us to investigate the effect of rotation on the lithium depletion (da Silva et al. 2009) and to establish a connection between rotation and lithium on a firmer basis than when using the projected rotational velocity to estimate rotation. Finally, a comparison between the rotational properties of single stars and stars in binary systems can provide some insight into the effect of binarity on the early stages of the rotational evolution.

The nearby loose young stellar associations that we selected are TW Hydrae, β Pictoris, Tucana/Horologium, Columba, Carina, and AB Doradus. All apart from the last have an age between ~ 8 and ~ 30 Myr, which was quite unexplored by earlier rotational studies. To date no rotation period distribution was known in the age range from ~ 4 Myr (NGC 2264; Lamm et al. 2004) to ~ 40 Myr (IC 4665; Scholz et al. 2009).

This is an important age range in the rotational history of low-mass stars, when circumstellar disks dissipate and stars are free to increase their rotation speed while contracting toward the zero age main sequence (ZAMS). This is also the age range of planet formation. Observations and theoretical studies of our planetary system (see Zuckerman & Song 2004 and references therein) indicate that giant planets form in less than 10 Myr and Earth-like planets in less than 30 Myr. Thus, the study of these stars allows us to shed light on the formation and early evolution of planetary systems. Nearby young stars are indeed the prime targets of searches for planets with the direct imaging technique, as planets are brighter at young ages (Burrows et al. 1997). Several surveys that have been performed with the highest quality state-of-art adaptive optics or space instruments have already observed a number of members of young associations (e.g., Chauvin et al. 2009; Nielsen & Close 2010). Efforts in this direction recently led to the first planet discoveries (e.g., Marois et al. 2008) and there are exciting perspectives for the use of future more sensitive instruments that will be come available within a few years (e.g., Beuzit et al. 2008).

In Sect. 2, we present the young loose associations considered in the present study. In Sect. 3, we describe the photometric data on which this study is based. In Sect. 4, we present the rotation period search. The rotation period distributions and a discussion in the context of angular momentum evolution are given in Sects. 5 and 6. Section 7 presents our conclusions.

2. The sample

The sample of our investigation is taken from the compilations of Zuckerman & Song (2004) and Torres et al. (2008), which include an updated analysis of the membership of nearby associations younger than 100 Myr.

We selected the following associations that have mean distances smaller than 100 pc: TW Hydrae, β Pictoris, Tucana/Horologium, Columba, Carina¹, and AB Doradus. These associations are reported with ages in the range from ~ 8 to ~ 70 Myr.

The Torres et al. (2008) list of members is significantly more extended than the previous ones, thanks to the availability of the SACY (Search for Associations Containing Young stars)

¹ This association should not be confused with the closer but older Carina-Near moving group identified by Zuckerman et al. (2006).

Table 1. Name, abbreviation, age, and mean distance of the nearby associations under study (Torres et al. 2008), together with the number of known members; late-type (later than F) members selected for period search; total number of periodic members; periodic members discovered from ASAS photometry; periodic members with period adopted from the literature; new periods determined from this study (and periods revised by us with respect to earlier literature values).

Association	Abbrev.	Age (Myr)	Distance (pc)	known members	Late-type members	Periodic members	ASAS period	Literature period	New period (+revised)
TW Hydrae	TWA	8	48	36	29	23	12	11	4 (+0)
β Pictoris	β Pic	10	31	51	32	27	25	2	10 (+1)
Tucana/Horologium	Tuc/Hor	30	48	54	35	29	27	2	19 (+5)
Columba	Col	30	82	35	23	19	19	0	15 (+2)
Carina	Car	30	85	23	21	19	19	0	16 (+1)
AB Doradus	AB Dor	70 ^a	34	91	64	48	42	6	29 (+1)

Notes. ^(a) Value taken from the literature but different from our estimate.

database of observation of young stars (Torres et al. 2006). Only a very small number of objects have discrepant membership with respect to previous investigations (Zuckermann & Song 2004).

Our initial target list included nearly 300 stars. As the SACY sample was originally selected from bright ROSAT sources, a large majority of the targets is represented by late-type stars and is then suitable for the photometric search of rotational modulations. We excluded only a fraction ($\sim 30\%$) of stars with spectral types earlier than F9, since they are not expected to show any rotationally-induced variability due to their shallow convective zones. We note that a few members, although of unknown spectral type, were included in the search sample because their $B - V$ colours were consistent with a late spectral type. We excluded stars fainter than $V \sim 13$, as the photometric errors of ASAS data, on which our study is based, are too large for these stars to allow a meaningful analysis. After applying these selection criteria, we are left with 204 stars. The list of our target associations, together with age, mean distance, and number of known late-type members is reported in Table 1.

Stars in young stellar associations have been studied extensively especially when studying the formation of planetary systems. As a result, a significant fraction of the targets have accurate spectroscopic characterisations. The search for planetary companions using direct imaging or radial velocities has also lead to a quite complete census of the binarity and to investigations of circumstellar gaseous or dusty disks. We used these resources to investigate trends and correlations between the rotational periods and other properties.

Most of the spectroscopic observations (spectral types, projected rotational velocity $v \sin i$) are from SACY database (Torres et al. 2006). Information about the binarity of the targets was taken from Torres et al. (2006, 2008), and Bonavita et al. (2010, in prep.). Additional bibliography for individual targets is given in Appendix A.

3. Data

3.1. The ASAS photometry

The All Sky Automated Survey (ASAS) is the major source of photometric observations on which the present analysis is based. The ASAS project started in 1997 with the goal of photometrically monitoring millions of stars brighter than 14 mag in the V band and distributed all over the sky at declinations $\delta < +28^\circ$, to investigate any kind of photometric variability (Pojmanski 1997, 2002).

At present, ASAS is carried out by two observing stations. One is based at Las Campanas Observatory, Chile (since 1997).

It consists of two wide-field telescopes, equipped with F200/2.8 Minolta telephoto lenses and $2K \times 2K$ AP-10 CCD Apogee cameras, covering 8.8×8.8 deg of the sky through the V and I filters. The other station (the Northern Station) is at Haleakala, Hawaii, Maui (since 2006), and is equipped with two wide-field Nikon F200/2.0 APO-G-10 telephoto lenses observing simultaneously in the standard V and I filters. Data acquisition and processing is fully automated. The data reduction pipeline used to process ASAS data is described in detail by Pojmanski (1997). The linear scale at focal plane is 16 arcsec/pixel. The $FWHM$ of stellar images is 1.3–1.8 pixels. Aperture photometry is used to extract stellar magnitudes through 5 apertures (ranging from 1 to 3 pixels in radius, which corresponds to 16 to 48 arcsec). Smaller apertures provide higher accuracy for brighter stars, whereas larger apertures do for the fainter stars. In the following analysis, we selected the magnitudes time series of each target by selecting the aperture giving the highest photometric precision. Because of the low spatial resolution, a check for any star close to the target star is crucial, especially for fainter stars for which larger apertures (up to a 48 arcsec radius) are used to extract the stellar magnitudes. All cases in which nearby stars are not spatially resolved are discussed in Appendix A. The astrometric calibration is currently based on the ACT catalog (Astrographic Catalog 2000 + Tycho, Urban et al. 1998) and achieves an accuracy of around 3 arcsec. Calibration to the standard system is based on the Tycho photometry (Perryman et al. 1997) and is accurate at about the 0.05-mag level. The default exposure time is 2 min in the I , and 3 min in the V filter. The systems routinely secure from 160 to 200 frames per night in V and from 230 to 300 frames per night in I . At this rate, the telescopes can carry out photometry of the available sky in two filters in about 2 days.

3.2. Data from the literature

A few stars in our sample are not in the ASAS database, being located at declination $\delta > +28^\circ$. We checked the bibliographical sources of all targets using ADS (Astrophysical Data System) to see whether previous determinations of rotation period existed. A number of stars had their rotation period determined by the ASAS survey and, therefore, were found listed in the ASAS Catalogue of Variable Stars (ACVS). Nonetheless, we also performed our period search for these stars and, in a number of cases (10), we found a different measurement of the rotation period. These cases are individually discussed.

In Tables A.1–A.6², we list the following information taken from the literature and used to discuss the results of our period

² Available in the online material.

Fig. 1. Representative example of light curves in our sample. *V*-band data time series in the *left panels* and phased light curve in the *right panels* together with the sinusoidal fit to the rotation period (thick solid line). Different symbols and colours help identify measurements collected in different time intervals.

search: target name; coordinates; *V* magnitude; *B* – *V* and *V* – *I* colours; M_V absolute magnitude; distance; projected equatorial velocity; computed stellar mass and radius; spectral type; and notes on membership.

4. Photometry rotation period search

We have used the Lomb-Scargle periodogram method to search for significant periodicities related to the stellar rotation in the data time series. In the following subsections, we briefly describe our procedure to determine the rotation period of our targets.

4.1. Time series sectioning

Since our analysis is focused on solar and late-type stars, we expect to detect the stellar rotation period by analysing the flux modulation induced by surface inhomogeneities unevenly distributed along the stellar longitude. These surface inhomogeneities can be either cool or hot spots arising from magnetic activity, which is particularly efficient in stars with rapid rotation ($P < 10$ – 20 days) and deep outer convection zone (spectral types from G to M). The observed variability is dominated by phenomena that are manifested on different timescales (see, e.g., Messina et al. 2004). The shortest timescale, of the order of seconds to minutes, is related to micro-flaring activity. Its stochastic nature increases the level of intrinsic noise in the observed flux time series. The variability on timescales from several hours to days is mostly related to the star’s rotation. The variability on longer timescales, from months to years, is related to the growth

and decay of active regions (ARGD) as well as the presence of starspot cycles, which may be similar to the ~ 11 yr sunspot cycle.

Long-term monitoring of field stars (see, e.g., Messina & Guinan 2003) shows that, because of ARGD and surface differential rotation, both the lightcurve amplitude and shape change on typical timescales of about 2–3 months, or even less for the most rapid rotators ($P \sim 1$ day). These changes, if not taken into account, can introduce aliases and lead to incorrect results. Therefore, a reasonable approach to the period search is to divide the complete data time series of each target (which is typically about 8 yr in our case) into consecutive intervals not exceeding 2 months and to carry out the period search in each interval separately. Following this approach, we obtained on average 10–15 intervals per target suitable for the period search.

Notwithstanding the 2–3 month timescale of lightcurve variation, Fourier analysis of long timespan series with sufficiently dense measurements can lead to a period determination with much higher confidence level and precision than the analysis of sectioned timeseries (e.g., Parihar et al. 2009). Here we anticipate that, without dividing the data into sections, we successfully detected the significant rotation periods in about 85% of our periodic targets.

In Fig. 1, we plot some representative example light curves and the sinusoidal fit to the rotation period. There are stars such as TWA 2 and HIP 17695, whose amplitudes and phase of minima remain constant in time. Other stars, such as TYC 7587 0925 1 and BD –16 351, exhibit constant phases of minima but variable amplitudes. In these cases, a Fourier

analysis of the complete time series without creating sections resulted in very precise rotation period determinations. On the other hand, stars such as TYC 8852 0264 1 have light-curve phases of minima that change in less than two months. In these cases, an accurate period determination requires timeseries sectioning.

4.2. Lomb-Scargle periodogram

The Lomb-Scargle technique (Press et al. 1992; Scargle 1982; Horne & Baliunas 1986) was developed to search for significant periodicities in unevenly sampled data. The algorithm calculates the normalized power $P_N(\omega)$ for a given angular frequency $\omega = 2\pi\nu$. The highest peaks in the calculated power spectrum (periodogram) correspond to the candidate periodicities in the analyzed time series data. To determine the significance level of any candidate periodic signal, the height of the corresponding power peak is associated with a false alarm probability (FAP), which is the probability that a peak of given height is caused simply by statistical variations, i.e., to Gaussian noise. This method assumes that each observed data point is independent of the others. However, this is not strictly true for our time series data consisting of data that are generally collected with a time sampling of timescale much shorter than those of both the periodic or the irregular intrinsic variabilities we search for ($P^d = 0.1$ –30). This correlation can have a significant impact on the period determination as has been highlighted by, e.g., Herbst & Wittenmyer (1996), Stassun et al. (1999), Rebull (2001), Lamm et al. (2004). We decided to determine the FAP in a slightly different way than Scargle (1982) and Horne & Baliunas (1986), as discussed in the next subsection, to overcome this problem.

4.3. False alarm probability

Following the approach outlined by Herbst et al. (2002), Monte Carlo simulations are used to determine the relationship between the normalized power and the FAP. In particular, after dividing the data time series of each target into a number of intervals, the data of each interval were randomized by scrambling the day numbers of the Julian Day (JD) while keeping photometric magnitudes and the decimal part of the JD unchanged. This method preserves the same time sampling as in the original data set within the same night. We then applied a periodogram analysis to about 1000 “randomized” data time series for each time interval and retained the highest power peak of each computed periodogram. The FAP related to a given power P_N is taken as the fraction of randomised light curves that have the highest power peak exceeding P_N , which, in turn, is the probability that a peak of this height is simply caused by statistical variations, i.e., white noise. As the rotation period, we selected that corresponding to the highest power peak detected in the periodogram and with confidence level larger than 99% (FAP < 0.01), as computed from the aforementioned simulations. The same procedure was repeated for each time interval and all targets.

4.4. Alias detection

To identify the true periodicities in the periodogram, it is crucial to take into account that a few peaks, even those of high power with high confidence levels, may be aliases arising from both the data sampling and the length of the time interval during which the observations are collected. In this respect, an inspection of

the spectral window function helps us to identify which peaks in the periodogram may be aliases.

In Fig. 2, we plot, as an example, the ASAS photometric data time series of one of our targets (TYC 9390 0322 1). The V-band magnitudes together with their uncertainties are plotted versus the Heliocentric Julian Day (HJD) on the top panel. The periodogram in the middle left panel has 4 peaks of significant power exceeding the 99% confidence level (solid horizontal line), but only one is related to the stellar rotation. If we look at the window function in the middle right panel, we find a major peak at about 1d, which is related to the observation timing of about 1 day imposed by the rotation of the Earth and the fixed longitude of the observation site. This inspection allows us to identify the 1-d peak in the periodogram (indicated by a vertical dotted line) as an alias. This peak is generally present in the periodogram of all the targets, the observation timing being similar for all the ASAS targets. The highest peak at $P = 1.858$ days is actually one related to the stellar rotation period, whereas the remaining two peaks (marked by bullets) arise from the convolution between the power spectrum and the window function. These alias periods are beat periods (B) between the star’s rotation period (P) and the data sampling and obey the relation

$$\frac{1}{B} = \frac{1}{P} \pm n \quad (n = 1, 2, 3, \dots). \quad (1)$$

A way of checking whether secondary peaks are beat periods is to perform a prewhitening of the data time series by fitting and removing a sinusoid of the star’s rotation period from the data. After removing the primary frequency from the data time series and recomputing the periodogram, all the other peaks disappear, confirming that they are beat frequencies.

4.5. Uncertainty in the rotation periods

We followed the method used by Lamm et al. (2004) to compute the errors associated with the period determinations. The uncertainty in the period can be written as

$$\Delta P = \frac{\delta\nu P^2}{2}, \quad (2)$$

where $\delta\nu$ is the finite frequency resolution of the power spectrum and is equal to the full width at half maximum of the main peak of the window function $w(\nu)$. If the time sampling is not too non-uniform, which is the case related to our observations, then $\delta\nu \approx 1/T$, where T is the total time span of the observations. From Eq. (2), it is clear that the uncertainty in the determined period depends not only on the frequency resolution (total time span) but is also proportional to the square of the period. We also computed the error in the period determinations following the prescription suggested by Horne & Baliunas (1986) which is based on the formulation of Kovacs (1981). The period uncertainty computed according to Eq. (2) was found to be a factor 5–10 larger than the uncertainty computed by the Horne & Baliunas (1986) technique. In this paper, we report the conservative errors computed using Eq. (2) and, therefore, the precision in the periods may be superior to that quoted in this paper.

4.6. Data precision

The precision of the ASAS photometry of the target stars that we analyse is in the range 0.02–0.03 mag, as shown in Fig. 3. We recall, as discussed in Sect. 3.1, that we use for each star the optimal aperture for extracting the magnitude time series, which

Fig. 2. *Top panel:* stellar V-magnitudes versus (vs.) time of TYC93903221. *Second panel from top:* rotation periods vs. time detected with a confidence level over 99%. *Third panels (left):* periodogram with evidence of 4 peaks with confidence level larger than 99%. Large bullets represent the peaks related to beat periods. *Third panels (right):* window function with evidence of a peak at about 1 day related to the data sampling. The vertical dotted line indicates that the $P = 1.858$ d period is not affected by the window function peak. *Bottom panel:* example light curve with data collected from HJD 2444367 to 2444644 and phased with the $P = 1.858$ d rotation period. The solid line is a sinusoidal fit.

changes from star to star according to its magnitude. Therefore, we compare precisions determined from different apertures in Fig. 3. This is why we do not observe the typical trend of decreasing accuracy with fainter stars in the magnitude range that we analyse. Each star's precision is computed by averaging the uncertainty associated with the data points of the complete time series. We also plot the amplitudes of the light curves of our targets. We see that all stars for which we could determine the rotation period have a light curve amplitude at least a factor 2.5 larger than the corresponding photometric accuracy. This circumstance permits the period search to detect high power peaks in the periodogram with large confidence level and, consequently, to determine reliable rotation periods. We found that the greatest photometric accuracy for our targets was achieved by extracting the magnitude with apertures from 15 to 30 arcsec. Using the ADS and SIMBAD databases, we checked whether our target stars had nearby stars within the aperture radius whose flux contribution may affect our analysis. These cases are indicated in Appendix A, which is dedicated to the discussion of individual cases.

5. Results

We determined the rotation periods of 144 of the selected 204 stars. We determined the rotation periods for the first time

Fig. 3. Photometric precision and peak-to-peak variability amplitude vs. V-band magnitude of target stars.

for 93 of them. We confirmed the period determined by other authors for 41 stars and revised the periods for 10 stars. Rotation periods of an additional 21 stars were retrieved from the literature. We found non-periodic variability in 33 stars. The remaining 6 stars in the sample have neither ASAS data nor periods reported in the literature. A summary for each association is reported in Table 1.

Fig. 4. Our rotation periods as a function of the periods derived from either ACVS or the literature. Straight solid lines represent the loci where our periods are equal to, or are a factor of either 0.5 or 2 longer than the literature values. The curved lines represent the loci of beat periods, according to Eq. (1).

A comparison of our results with previous measurements of rotation period was possible for 51 stars (Fig. 4). We confirm the results reported in the literature in 41 cases. Our periods differ in 10 cases from the periods reported in either the ACVS (in 9 cases) or the literature (only the case of HIP 9892; Koen & Eyer 2002). A close inspection of our periodograms showed that in all 9 cases of disagreement with respect to ACVS, no power peak exists at all at the period value reported in the ACVS (see online Figs. A.1–A.22). Moreover, when we compute the rotation phases using the ACVS period, in all, but the case of HIP 12545, we obtain unconvincing light curves, that is of high phase dispersion and without any evident modulation. In contrast, our rotation periods were detected with a confidence level greater than 99% in both at least 8–10 time intervals into which we divided the complete time-series (i.e. in over 60% of the time intervals) and the periodogram computed without data sectioning. The same holds for HIP 9892, whose periodogram does not exhibit any peak at the period reported by Koen & Eyer (2002). We note that in 6 cases (TYC 8852 0264 1, TYC 8497 0995 1, TYC 7026 0325 1, TYC 7584 1630 1, TYC 8160 0958 1, and HIP 9892) the period is twice our value, which may be caused by two major spot groups located at opposite stellar hemispheres. However, the light curves in this circumstance should be double-peaked when they are phased with the long period, and this is not observed. In another 2 cases (TYC 7617 0549 1 and TYC 5907 1244 1), the ACVS period is consistent with a beat period, according to Eq. (1). Finally, it is possible to reconcile the discrepant results with neither beat periods nor spot groups at opposite hemispheres in just 2 cases (HIP 12545 and HIP 76768).

We note that our rotation period determinations include 10 stars in the TWA and 5 in the Tuc/Hor associations (flagged with an *a* apex in Tables 3 and 5) that were eliminated by Torres et al. (2008) from the high-probability member list, and two other stars, HIP 84586 and V4046 Sgr, that are tidally locked binaries. These stars are expected to have a different rotational

Fig. 5. $v \sin i$ from the literature vs. equatorial velocity $v_{\text{eq}} = 2\pi R/P$. The solid line marks $v \sin i = v_{\text{eq}}$, whereas the dotted line $v \sin i = (\pi/4)v_{\text{eq}}$.

history than single stars, because of higher rotation rates caused by tidal synchronization. All of these 17 stars will not be considered in the following analysis on the rotation period distribution. The results of our period search are summarised in Tables 3–8. To prevent ourselves from overestimating the maximum V-band light-curve amplitude (ΔV_{max}), we considered the difference between the median values of the upper and lower 15% data points of the timeseries section with the largest amplitude (see, e.g., Herbst et al. 2002). In the following analysis, we do not use the brightest observed magnitude V_{min} , but instead the V magnitudes (corrected for duplicity in the case of binary systems) taken from Torres et al. (2008), and reported in the online Tables A.1–A.6. The rotation periods, together with uncertainty and normalized power, determined in the individual time-series sections, are listed in the online Table A.7.

The light curves of all stars for which the ASAS photometry allowed us to determine the rotation period are plotted in the online Figs. A.1–A.22.

In Appendix A, we report in some detail on the nature (binarity and spectral classification) of individual targets and their rotation periods when these were found to disagree with previous determinations.

5.1. $V \sin i$ vs. equatorial velocity

About 75% of the periodic variables in our sample have known projected equatorial velocities ($v \sin i$). We also derived stellar radii by comparing the position of each target in the colour-magnitude diagram with the Baraffe et al. (1998) evolutionary tracks (see Sect. 6.1). When rotation period, $v \sin i$, and stellar radius are known, it is possible to compare the equatorial velocity $v_{\text{eq}} = 2\pi R/P$ and $v \sin i$ to check the consistency between the two and derive the stellar inclination.

In Fig. 5, we compare $v \sin i$ and v_{eq} , by delineating the loci of $v \sin i = v_{\text{eq}}$, corresponding to equator-on orientation, and $v \sin i = \pi/4 v_{\text{eq}}$, corresponding to a randomly orientated rotation axis distribution. The major uncertainty in the equatorial velocity originates in the radius estimate. The reported $v \sin i$ uncertainties are on average 10%. Only 7 stars (flagged with an *a* apex *c* in

Table 2. Summary of results of the comparison between $v \sin i$ and equatorial velocity.

Association	# stars	$\langle \sin i \rangle \pm \sigma$	r	Significance level
TWA	13	0.72 ± 0.35	0.85	a
β Pic	27	0.91 ± 0.34	0.84	a
Tuc/Hor	23	1.02 ± 0.56	0.83	a
Col	12	0.94 ± 0.31	0.86	a
Car	15	0.95 ± 0.25	0.64	b
AB DOR	44	1.02 ± 0.71	0.77	a
all	134	0.95 ± 0.50	0.78	a

Notes. ^(a) Confidence level >99.999%; ^(b) confidence level = 99.995%.

Tables 3–8 and plotted with circled symbols in Fig. 5) have inconsistent $v \sin i/v_{\text{eq}}$ (i.e., much larger than unity). Four of seven stars (TYC 9344 0293 1, TYC 9529 0340 1, TYC 7100 2112 1, and TYC 8586 2431 1) have only one measurement of $v \sin i$, whereas they have well established rotation periods. It is important to carry out additional spectroscopic measurements to check the correctness of the $v \sin i$ value of these stars. Three other stars (TYC 8852 0264 1, TYC 7059 1111 1, and TYC 7598 1488 1) each have 2–3 independent $v \sin i$ measurements, which are similar within the errors. These also have well established rotation periods that are confirmed by literature values. The discrepancy in the case of TYC 7598 1488 1 may arise from an incorrect value of parallax. Cutispoto (1998b) indeed reports a photometric parallax larger than the one reported by Torres et al. (2008) which produces a larger stellar radius and would partly solve the disagreement between v_{eq} and $v \sin i$. In the other two cases, the discrepancy however requires further investigation.

We checked whether the results of the following analysis of the rotation period distribution vary if the seven stars with inconsistent $v \sin i/v_{\text{eq}}$ are either considered or not. One of these stars is in all cases excluded from the following analysis because it is a rejected member of β Pictoris. The average value of $v \sin i$ for each association are reported in Table 2. This is obviously based on the periodic variable sample that excludes members with inconsistent $v \sin i/v_{\text{eq}}$. In Table 2, r represents the correlation coefficient from the linear Pearson statistics, whereas the labels a and b indicate the significance level of the correlation coefficient. The significance level represents the probability of observing a value of the correlation coefficient larger than r for a random sample with the same number of observations and degrees of freedom.

Taken at face values, mean inclinations are inconsistent with the value expected for a completely randomly orientated rotational axis distribution. However, an investigation of the preferential orientations of the rotational axis in young associations must take into account several observational biases and is beyond the scope of this paper.

6. Rotation period evolution

6.1. Color-magnitude diagrams

We use the M_V vs. $V-I$ CMD and a set of low-mass PMS evolutionary tracks to derive masses and radii and check the evolutionary stages of our targets (see Fig. 6). Evolutionary tracks (mass range from 0.2 to $1.0 M_{\odot}$ at steps of 0.1) are taken from Baraffe et al. (1998) (initial metallicity $[M/H] = 0.0$, initial helium mass fraction $Y = 0.275$, initial mixing length parameter $H_p = 1.0$).

The $V-I$ colours of a few stars, with the exception of the β Pictoris members, have never been measured. To overcome this limitation and position all the stars in the same CMD, we derived empirical relations between $V-I$ and $B-V$ using all the stars belonging to the same association and for which both colours are measured. In Fig. 7, we provide an example of the polynomial fit used to obtain $V-I$ colours from $B-V$ in the case of Tucana/Horologium. In Table 9, we list the polynomial coefficients that we determined for each association. The average error in the derived $V-I$ colours is about 0.05 mag.

Figure 6 also includes those targets of the TW Hya and Tuc/Hor associations that were rejected by Torres et al. (2008) from the high-probability member list. Although considered in our period search, their rotation periods are not included in the following rotation period distribution analysis.

There are four stars that deviate significantly from the sequence traced by the other members. In Tucana/Horologium, this is the case for TYC 5908 230 1 whose spectral type is unknown and whose $V-I$ colour is derived from $B-V$. In Columba, it is the case for BD-16351, whose $V-I$ colour is derived from $B-V$. In AB Dor, it is the case for HIP 17695 and TYC 7084 0794 1. Their rotational properties, however, do not deviate from the average of their respective associations.

To more clearly visualize the evolutionary and the rotational stage of our targets, we considered three additional well studied open clusters of known age: α Persei (70 Myr), Pleiades (110 Myr), and NGC 2516 (150 Myr). The more evolved clusters (with respect to our targets) allow us to identify in the CMD the position of the ZAMS in the mass range of our association members. The early-type (more massive) members of all three clusters have already reached the ZAMS, whereas the late-type (low mass) members continue to approach it. The list of confirmed members of the α Persei and Pleiades open clusters is compiled from the WEBDA database. The $(V-I)_c$ colours and Johnson V magnitudes are from Stauffer et al. (1985, 1989) for α Persei, and from Stauffer (1982a, 1982b, 1984) and Prosser et al. (1991) for the Pleiades. The rotation periods are taken from the compilation by Messina et al. (2003, and references therein). The $V-I$ colours, originally given in the Kron system, have been transformed into the Cousin system by using the Bessel (1979) colour-colour relations. Color excess $E(B-V) = 0.10$ and distance modulus $(m-M) = 6.60$ for the α Persei and $E(B-V) = 0.04$ and $(m-M) = 5.60$ for the Pleiades (O'Dell et al. 1994) have been used to position the cluster members in the CMD. Photometry, rotation periods, the colour excess, and the distance modulus of NGC 2516 members are all taken from Irwin et al. (2009).

6.2. Rotation period distribution

A major goal of this paper is to search for statistically relevant differences in the rotation rate of stars in young stellar associations that can be ascribed to angular momentum evolution.

The main influence of stellar mass on the angular momentum evolution is to determine the timescale of contraction towards the ZAMS and, below approximately $1.2 M_{\odot}$, the amount of angular momentum stored in the radiative core (see, e.g., Allain 1998; Bouvier 2008; Keppens et al. 1995). To limit the range of possible variations, a binning in mass of our sample is therefore desirable. The paucity of stars available and the uncertainties in mass, however, allow only a rather broad mass binning. In the following analysis, we consider stars in the range $0.8-1.2 M_{\odot}$ and compare the results with a larger sample in the range $0.6-1.2 M_{\odot}$. In the former case, we limit the range of the angular momentum

Table 3. TW Hydrae association.

Name	ID _{ASAS}	<i>P</i> (d)	ΔP (d)	Timeseries sections	$\Delta V_{\max}$ (mag)	σ_{acc} (mag)	<i>V</i> _{min} (mag)	<i>B</i> – <i>V</i> (mag)	Sp.T.	Mult.	Note	Variable's name
TW Hya	110152–3442.3	2.80	0.04	...	0.25	0.031	11.00	0.97	K6Ve	S	<i>P</i> _{lit}	
TWA 2	110914–3001.7	4.86	0.02	13/16	0.18	0.031	11.10	1.48	M2Ve	V	new	
TWA 3A	111028–3731.9	...	...	...	...	...	12.10	1.47	M4Ve	V	...	
TWA 3B	no-ASAS	...	...	...	...	...	13.07	1.52	M4Ve	V	...	
TWA 4A	112205–2446.7	2.52	0.20	...	0.09	...	8.94	1.17	K5V	Q	<i>P</i> _{lit}	TV Crt
TWA 4B	112205–2446.7	14.8	0.3	9/14	0.09	0.032	8.92	1.17	K5V	Q	new	
TWA 5	113155–3436.5	0.776	0.001	2/15	0.22	0.031	11.56	1.47	M2Ve	T	<i>P</i> = <i>P</i> _{ACVS}	
TWA 6 ^a	101829–3150.0	0.54	...	...	0.49	...	10.88	1.31	M0Ve	S	<i>P</i> _{lit}	
TWA 7	104230–3340.3	5.00 ^b	0.03	1/15	0.11	0.030	11.73	1.46	M2Ve	S	<i>P</i> = <i>P</i> _{lit}	
TWA 8A	113241–2651.9	4.66	0.06	4/14	0.27	0.029	12.14	1.46	M3Ve	V	<i>P</i> = <i>P</i> _{lit}	
TWA 8B	no-ASAS	0.78	...	...	0.08	...	15.20	1.10	M5	V	<i>P</i> _{lit}	
TWA 9A	114824–3728.8	5.01	0.01	13/14	0.18	0.027	11.22	1.26	K5V	V	<i>P</i> ≠ <i>P</i> _{ACVS} ; <i>P</i> = <i>P</i> _{lit}	
TWA 9B	no-ASAS	3.980	...	...	0.08	...	14.00	1.43	M1V	V	<i>P</i> _{lit}	
TWA 10	123504–4136.6	8.4	0.1	2/14	0.33	0.027	13.04	1.43	M2Ve	S	<i>P</i> = <i>P</i> _{lit}	
TWA 12 ^a	112105–3845.3	3.30	0.01	7/14	0.45	0.030	12.70	1.53	M1Ve	S	<i>P</i> = <i>P</i> _{ACVS} = <i>P</i> _{lit}	
TWA 13A	112117–3446.8	5.56	0.03	8/15	0.20	0.031	11.09	1.42	M1Ve	V	= 1/2 <i>P</i> _{ACVS} ; <i>P</i> = <i>P</i> _{lit}	
TWA 13B	112117–3446.8	5.35	0.03	4/12	0.27	0.031	11.96	1.47	M5	V	<i>P</i> = <i>P</i> _{lit}	
TWA 14 ^a	111326–4523.7	0.63	...	...	0.11	...	12.52	1.30 ¹	M0	S	<i>P</i> _{lit}	
TWA 15A ^a	123421–4815.2	0.65	...	...	0.13	...	...	1.45 ¹	M2	V	<i>P</i> _{lit}	
TWA 15B ^a	123420–4815.3	0.72	...	...	0.05	...	...	1.45 ¹	M2	V	<i>P</i> _{lit}	
TWA 16 ^a	123456–4538.1	...	...	...	...	...	12.69	...	M1.5	B	...	
TWA 17 ^a	132045–4611.6	0.69	...	...	0.12	...	...	1.20 ¹	K5	S	<i>P</i> _{lit}	
TWA 18 ^a	132137–4421.9	1.11	...	...	0.08	0.030	13.12	1.30 ¹	M0.5	S	<i>P</i> _{lit}	
TWA 19AB ^a	114721–4953.1	...	...	...	...	...	...	...	K7	V	...	
TWA 20	123138–4559.0	...	...	...	...	...	13.42	1.10	M2	S	...	
TWA 21 ^a	101315–5230.9	4.43	0.02	7/15	0.13	0.037	9.82	1.00	K3Ve	V	new	
TWA 23 ^e	120727–3247.0	...	...	...	...	...	12.81	1.35 ¹	M1	S	...	
TWA 24 ^a	120942–5854.8	0.680 ^b	0.004	6/12	0.08	0.030	10.28	0.94	K1Ve	S	new	
TWA 25	121531–3948.7	5.07	0.02	12/14	0.23	0.032	11.37	1.41	M1Ve	S	<i>P</i> = <i>P</i> _{ACVS}	

Notes. V = visual companion; S = single star; B = binary system; T = triple system; Q = quadruple system; *P*_{lit}: period as given in the literature; *P*_{ACVS}: period in ACVS; ^(a) rejected member and excluded from rotation period distribution; ^(b) period undetected in the periodogram of the complete time series; ^(c) not included in the member list because of incomplete kinematic information; ⁽¹⁾ inferred from spectral type. Summary of period searches: Star's name; ASAS number; rotation period and its uncertainty; fraction of timeseries sections in which the rotation period is detected with confidence level higher than 99%; maximum light curve amplitude ($\Delta V_{\max}$); photometric accuracy (σ_{acc}); brightest *V* magnitude (*V*_{min}); *B* – *V* colour; spectral type and note on binarity; note on period, and variable star designation if it exists. Targets are listed according to increasing TWA number (and increasing ASAS number for the other associations).

Table 4. As in Table 3 for the β Pictoris association.

Name	ID _{ASAS}	<i>P</i> (d)	ΔP (d)	Timeseries sections	$\Delta V_{\max}$ (mag)	σ_{acc} (mag)	<i>V</i> _{min} (mag)	<i>B</i> – <i>V</i> (mag)	Sp.T.	Mult.	Note	Variable's name
TYC 1186 706 1	002335+2014.5	7.7 ^b	0.3	1/6	0.09	0.028	10.80	1.4	K7.5V	S	<i>P</i> = <i>P</i> _{lit}	
HIP 12545	024126+0559.3	1.25	0.01	4/7	0.15	0.031	10.32	1.21	K6Ve	SB1	<i>P</i> = 2 <i>P</i> _{ACVS}	
GJ 3305	043737-0229.5	6.10	...	...	0.03 ¹	...	10.59	1.45	M0.5	T	<i>P</i> _{lit}	
HIP 23200	045935+0147.0	4.37	0.03	9/14	0.15	0.032	10.18	1.39	M0.5Ve	S	<i>P</i> = <i>P</i> _{ACVS} = <i>P</i> _{lit}	V1005 Ori
HIP 23309	050047–5715.4	8.60	0.07	12/15	0.12	0.031	10.02	1.40	M0Ve	S	new	
HIP 23418	050159+0959.0	6.42	0.04	1/10	0.12	0.034	11.57	1.54	M3V	SB2+V	new	
BD-21 1074	050650-2135.1	13.3 ^b	0.2	4/14	0.07	0.034	9.94	1.52	M2	T	new	
HIP 29964	061828–7202.7	2.67	0.01	12/15	0.12	0.032	9.78	1.13	K4Ve	S	<i>P</i> = <i>P</i> _{ACVS}	AO Men
TWA 22	101727–5354.4	...	...	...	...	...	...	...	M5	S	...	
HIP 76629	153857–5742.5	4.3	0.2	7/15	0.12	0.034	7.97	0.81	K0V	SB+V	<i>P</i> = <i>P</i> _{lit}	V343 Nor
HIP 84586 ^(e)	171726–6657.1	1.688	0.003	8/13	0.07	0.034	6.77	0.76	G5IV	SB2+V	<i>P</i> = <i>P</i> _{lit}	V824 Ara
TYC 8728 2262 1	172955–5415.8	1.819	0.007	8/16	0.11	0.036	9.61	0.85	K1V	S	new	
TYC 8742 2065 1	174834–5306.7	2.61	0.02	8/16	0.09	0.033	8.95	0.83	K0IV	SB2+V	new	
HIP 88399	180303-5138.9	...	...	...	...	...	12.50	...	M2+F6V	B	...	
V4046 Sgr ^(e)	181411–3247.5	2.42	0.18	10/14	0.09	0.033	10.57	0.90	K5	SB2+V	<i>P</i> = <i>P</i> _{lit}	V4046 Sgr
UCAC2 18035440	181422–3246.2	...	...	...	...	...	12.78	1.36	M1Ve	SB?	...	
HIP 89829	181952–2916.5	0.57	0.003	8/14	0.19	0.037	8.80	0.69	G1V	S	<i>P</i> = <i>P</i> _{ACVS}	
TYC 9077 2489 1	184537–6451.8	0.345	0.04	7/12	0.16	0.033	9.3	1.19	K5Ve	SB2+V	new	
TYC 9073 0762 1	184653–6210.6	5.37	0.04	10/15	0.33	0.032	12.08	1.46	M1Ve	S	<i>P</i> = <i>P</i> _{ACVS}	
TYC 7408 0054 1	185044–3147.8	1.089	0.002	10/15	0.19	0.033	11.26	1.35	K8Ve	S	new	
HIP 92680	185306–5010.8	0.997	0.001	10/13	0.09	0.032	8.37	0.77	K8Ve	S	<i>P</i> = <i>P</i> _{lit}	PZ Tel
TYC 6872 1011 1	185804–2953.1	0.504	0.004	3/15	0.12	0.032	11.64	1.30	M0Ve	S	new	
TYC 6878 0195 1	191145–2604.2	5.65	0.05	7/12	0.09	0.032	10.33	1.1	K4Ve	V	new	
HIP 102141AB	204151–3226.1	...	...	...	...	...	10.40	1.54	M4+M4.5	B	...	AT Mic
HIP 102409	204510–3120.4	4.85	0.02	6/11	0.10	0.030	8.68	1.49	M1Ve	S	<i>P</i> = <i>P</i> _{lit}	AU Mic
TYC 6349 0200 1	205603–1710.9	3.41	0.05	7/10	0.11	0.028	10.55	1.22	K6Ve+M2	V	<i>P</i> = <i>P</i> _{ACVS}	AZ Cap
TYC 2211 1309 1	220042+2715.2	0.476	0.001	1/1	0.08	0.034	11.39	1.40	M0.0V	S	<i>P</i> = <i>P</i> _{lit}	
TYC 9340 0437 1	224249–7142.3	4.48	0.03	6/12	0.16	0.030	10.65	1.35	K7Ve+K5V:e	B	new	
HIP 112312	224458–3315.1	2.355	0.005	2/11	0.19	0.026	12.12	1.48	M4IVe	V	<i>P</i> = <i>P</i> _{ACVS}	WW PsA
TYC 5832 0666 1	233231–1215.9	5.68	0.05	5/12	0.16	0.028	10.69	1.43	M0Ve	S	<i>P</i> = <i>P</i> _{ACVS}	
HIP 11437	no-ASAS	13.6928	...	...	0.03	...	10.62	1.21	K8	V	<i>P</i> _{lit}	AG Tri
HIP 10679	no-ASAS	...	...	...	...	...	7.75	0.62	G2V+F5V	B	...	

Notes. V = visual companion; S = single star; B = binary system; T = triple system; *P*_{lit}: period as given in the literature; *P*_{ACVS} period in ACVS; ⁽¹⁾ derived from *B*-band light curve; ^(b) period undetected in the periodogram of the complete timeseries; ^(e) tidally-locked binary system, excluded from rotation period distribution.

Table 5. As in Table 3 for the Tucana/Horologium association.

Name	ID _{ASAS}	P (d)	ΔP (d)	Timeseries sections	$\Delta V_{\max}$ (mag)	σ_{acc} (mag)	$V_{\min}$ (mag)	$B - V$ (mag)	Sp.T.	Mult.	Note	Variable's name
HIP 490	000553-4145.2	...	...	...	...	...	7.53	0.59	G0V	S	...	
HIP 1113	001353-7441.3	3.72	0.01	13/17	0.09	0.034	8.79	0.74	G8V	S	new	
HIP 1910	002409-6211.1	1.750	0.003	11/20	0.13	0.031	11.42	1.40	M0Ve	V	new	
HIP 1993	002515-6130.8	4.35	0.02	11/19	0.15	0.031	11.43	1.35	M0Ve	S	new	CT Tuc
HIP 2729	003451-6155.0	0.37	0.002	...	0.10	0.035	9.64	1.05	K4Ve	S	P_{lit}	
TYC 9351 1110 1	004220-7747.7	2.57	0.01	8/14	0.12	0.033	10.24	1.06	K3Ve	S	new	
HIP 3556 ^a	004528-5137.5	...	...	...	...	...	11.91	1.48	M3	...	...	
TYC 8852 0264 1 ^a	011315-6411.6	4.81 ^c	0.02	8/11	0.20	0.029	10.37	0.87	K1V	S	$P = 1/2P_{\text{ACVS}}$	
HIP 6485	012321-5728.9	3.59	0.01	5/13	0.08	0.030	8.57	0.68	G7V	S	$=P_{\text{lit}}$	
HIP 6856	012809-5238.3	...	...	...	...	...	9.07	0.91	K1V	S	...	CC Phe
HIP 9141	015749-2154.1	3.02	0.01	3/12	0.08	0.026	8.05	0.65	G4V	V	new	DK Cet
HIP 9892	020718-5311.9	2.24 ^b	0.03	7/13	0.06	0.030	8.63	0.65	G7V	SB1	$P = 1/2P_{\text{lit}}$	
TYC 8489 1155 1	020732-5940.3	...	...	...	...	...	10.68	1.16	K5Ve	V	...	
RBS 332 ^a	023652-5203.1	1.538	0.001	6/15	0.24	0.032	12.05	1.48	M2Ve	...	new	
TYC 8497 0995 1	024233-5739.6	7.38	0.05	10/16	0.14	0.031	11.07	1.23	K5Ve	S	$P = 1/2P_{\text{ACVS}}$	
TYC 8491 0656 1	024147-5259.9	1.275 ^b	0.005	5/13	0.09	0.030	10.22	1.26	K6Ve	V	new	
AF Hor	024147-5259.5	...	...	...	...	...	12.21	1.49	M2V	V	...	AF Hor
TYC 7026 0325 1	031909-3507.0	8.48	0.10	10/17	0.15	0.028	11.20	1.30	K7Ve	S	$P \neq P_{\text{ACVS}}$	
TYC 8060 1673 1	033049-4555.9	3.74	0.04	7/15	0.09	0.027	9.63	0.95	K3V	S	new	
TYC 7574 0803 1	033156-4359.2	2.94	0.01	12/16	0.15	0.031	10.98	1.30	K6Ve	S	new	
HIP 16853	033653-4957.5	...	...	...	...	...	7.63	0.59	G2V	SB	...	
HIP 21632	043844-2702.0	4.25	0.02	...	0.08	0.031	8.51	0.61	G3V	S	P_{lit}	
TYC 8083 0455 1	044801-5041.4	8.46	0.05	4/15	0.12	0.030	11.53	1.35	K7Ve	S	new	
TYC 5907 1244 1	045249-1955.0	5.20	0.04	12/13	0.11	0.031	9.96	0.87	...	SB2	$P \neq P_{\text{ACVS}}$	
TYC 5908 230 1	045932-1917.7	4.06	0.02	11/17	0.15	0.030	10.68	1.20	...	...	new	
BD-09 1108	051537-0930.8	2.72	0.01	5/12	0.11	0.032	9.87	0.67	G5	S	new	
TYC 7048 1453 1	051829-3001.5	1.70	0.02	2/15	0.09	0.024	11.65	1.27	K4Ve	S	new	
TYC 7600 0516 1 ^a	053705-3932.4	2.45	0.01	7/15	0.10	0.031	9.59	0.80	K1V(e)	S	$P = P_{\text{lit}}$	AT Col
TYC 7065 0879 1 ^a	054234-3415.7	3.89 ^b	0.02	7/15	0.09	0.027	10.64	0.82	K0V	V	new	
HIP 105388	212050-5302.0	3.36	0.01	7/15	0.10	0.033	8.71	0.72	G7V	S	new	
HIP 105404 ^a	212100-5228.7	0.435334 ^{b,d}	0.000002	3/15	0.10	0.033	8.97	0.88	G9V	EB	$P = P_{\text{ACVS}}$	BS Ind
HIP 107345	214430-6058.6	4.50	0.02	5/13	0.10	0.030	11.64	1.41	M0Ve	S	new	
TYC 9344 0293 1	232611-7323.8	1.32 ^c	0.02	8/12	0.13	0.033	11.95	1.39	...	SB	new	
TYC 9529 0340 1	232749-8613.3	2.31 ^c	0.01	11/13	0.11	0.036	9.37	0.69	...	...	new	
HIP 116748AB	233939-6911.8	2.85	0.02	5/12	0.06	0.031	8.26	0.70	G6V+K3Ve	B	new	DS Tuc

Notes. V = visual companion; S = single star; B = binary system; P_{lit} : period as given in the literature; P_{ACVS} period in ACVS. ^(a) Rejected member and excluded from rotation period distribution; ^(b) period undetected in the periodogram of the complete timeseries; ^(c) $v \sin i$ inconsistent with $v_{\text{eq}} = 2\pi R/P$; ^(d) tidally-locked binary system.

evolution timescales and maintain a sufficient number of stars for the statistical analysis; in the latter, we increase the number of stars at the expense of mixing quite different evolution timescales.

Either the colour or spectral type can be used as an indicator of mass. The relationship colour or spectral type vs. mass changes, however, with the age of the stellar system, particularly in the PMS phase, and the MS relationship cannot be applied to PMS stars. Without age discrimination, PMS stars of similar colours or spectral types can belong to quite different mass ranges, especially between ≈ 0.7 and $1 M_{\odot}$ where the evolutionary tracks turn abruptly towards higher temperatures before settling on the ZAMS (see Fig. 6). To take the PMS evolution into account, we derived stellar masses and radii by comparing the position in the CMD with the Baraffe (1998) isochrones. The uncertainties in the estimated mass and radius originate mostly in the uncertainties in: a) $V - I$ colour (especially for the lowest stellar masses); b) V magnitude (subject to variations up to a few tenths of magnitude due to the magnetic activity); c) parallax; and d) metallicity. We estimated the cumulative uncertainty to be approximately $0.1 M_{\odot}$ in mass and $0.05 R_{\odot}$ in radius, which is acceptable for the purposes of our analysis. The derived masses and radii are listed in the online Tables A.1–A.6. The mass histogram of the complete sample of periodic variables is reported in Fig. 8. About 91% of our targets have masses between 0.6 and $1.2 M_{\odot}$, 60% being between 0.8 and $1.2 M_{\odot}$.

The uncertainties in age and the paucity of stars in each association also impose a rather broad binning in age. To maintain statistical significance, almost coeval associations are placed in the same age bin. In this way, we consider TW Hya and

β Pictoris, which have estimated ages of ~ 8 and ~ 10 Myr, in the same age bin; Tucana/Horologium, Carina, and Columba members are considered coeval stars with an estimated age of ~ 30 Myr. The age of AB Dor is estimated to be approximately 70 Myr by Torres et al. (2008), which is therefore coeval with the α Persei cluster. We found, however, that the period distribution vs. $V - I$ is more similar to the Pleiades than α Persei (see Fig. 9 and discussion below), and we therefore assign AB Dor to the 110 Myr age bin together with the Pleiades.

In Fig. 9, we compare the distribution of rotation periods of AB Dor with that of α Persei (top panel) and the Pleiades (bottom panel). Adopting the Barnes (2003) classification scheme, we can easily identify three different groups of stars in Fig. 9. The rotation upper boundary forms a sequence, populated by stars that are subject to the long timescale spin-down controlled by the stellar wind magnetic breaking. The dashed line represents the expected theoretical period distribution according to Eqs. (1) and (2) of Barnes (2003). This group of stars exhibits an almost one-to-one correspondence between rotation period and colour, which is definitively reached by the age of 500–600 Myr as shown by members of the Hyades (Radick et al. 1987) and Coma Berenices (Collier Cameron et al. 2009) open clusters. Very rapid rotators ($P \lesssim 1$ d) form a different sequence; the dotted line in Fig. 9 represents their expected theoretical period distribution computed using Eq. (15) of Barnes (2003). A third intermediate group is populated, according to the Barnes (2003) scheme, by stars that are moving from being very fast rotators to the slow rotators sequence. The identification of these sequences is rather difficult in the period vs. $V - I$ distribution of the younger association shown in Fig. 10, for TW Hya and β Pictoris (top

Table 6. As in Table 3 for the Columba association.

Name	ID _{ASAS}	<i>P</i> (d)	ΔP (d)	Timeseries sections	$\Delta V_{\max}$ (mag)	σ_{acc} (mag)	$V_{\min}$ (mag)	$B - V$ (mag)	Sp.T.	Mult.	Note on period	Variable's name
TYC 8047 0232 1	015215–5219.6	2.40	0.01	5/14	0.11	0.028	10.88	0.95	K2V(e)	BD	new	
BD-16 351	020136–1610.0	3.21	0.01	9/13	0.13	0.029	10.40	1.10 ¹	K5	S	new	
TYC 7558 0655 1	023032–4342.4	8.80	0.23	4/14	0.08	0.025	10.33	1.07	K5V(e)	S	new	
HIP 16413	033121–3031.0	2.25	0.01	4/14	0.07	0.028	9.86	0.64	G7IV	B	new	
TYC 5882 1169 1	040217–1521.5	3.78	0.04	7/15	0.07	0.028	10.12	1.01	K3/4	S	new	
HIP 19775	041423–3819.0	2.345	0.008	3/12	0.07	0.025	9.10	0.58	G3V	S	new	
TYC 6457 2731 1	042110–2432.3	...	...	...	...	...	9.42	0.62	G2V	S	...	
TYC 7584 1630 1	042149–4317.5	2.360	0.008	8/15	0.10	0.029	10.23	0.69	G7V	S	$P = 1/2P_{\text{ACVS}}$	
TYC 7044 0535 1	043451–3547.3	...	...	...	...	...	10.91	0.84	K1Ve	S	...	
TYC 8077 0657 1	045153–4647.2	2.834	0.001	13/20	0.11	0.031	9.81	0.69	G5V	B	new	
new												
TYC 8080 1206 1	045305–4844.6	4.52	0.03	9/18	0.15	0.029	10.79	0.87	K2V(e)	S	$P = P_{\text{ACVS}}$	
new												
TYC 8086 0954 1	052855–4535.0	4.50 ^b	0.05	4/15	0.11	0.030	11.45	0.86	K1V(e)	S	new	
HIP 25709	052924–3430.9	5.96	0.05	2/15	0.04	0.030	8.50	0.65	G3V	SB2	new	
TYC 7597 0833 1	054516–3836.8	...	...	...	...	...	10.95	0.70	G9V	S	...	
TYC 6502 1188 1	055021–2915.3	1.37 ^b	0.04	3/15	0.09	0.026	11.24	0.66	K0V(e)	S	new	
TYC 8520 0032 1	055101–5238.2	1.203 ^b	0.005	8/14	0.10	0.031	10.60	0.75	G9IV	S	new	
TYC 7617 0549 1	062607–4102.9	4.13	0.02	10/15	0.12	0.030	10.08	0.80	K0V	S	$P \neq P_{\text{ACVS}}$	
TYC 8107 1591 1	062806–4826.9	1.293 ^b	0.002	8/15	0.11	0.032	11.01	0.65	G9V	S	new	
TYC 7100 2112 1	065247–3636.3	0.83 ^{b,c}	0.002	11/15	0.12	0.035	11.18	0.62	K2V(e)	S	new	
TYC 8118 0871 1	065623–4646.9	4.38	0.05	12/17	0.14	0.028	10.01	0.78	K0V(e)	S	new	
TYC 7629 2824 1	070152–3922.1	1.335	0.002	9/12	0.14	0.032	11.32	0.63	G9V(e)	S	new	
AG Lep	no-ASAS	1.895	...	...	0.05	...	9.62	0.60	G5V	S	P_{lit}	AG Lep
TYC 5346-132-1	no-ASAS	...	...	...	...	...	9.81	0.74	G7	...	...	

Notes. S = single star; B = binary system; BD = brown dwarf companion. ⁽¹⁾ Inferred from spectral type; ^(b) period undetected in the periodogram of the complete timeseries; ^(c) $v \sin i$ inconsistent with $v_{\text{eq}} = 2\pi R/P$; P_{lit} : period as given in the literature; P_{ACVS} period in ACVS.

Table 7. As in Table 3 for the Carina association.

Name	ID _{ASAS}	<i>P</i> (d)	ΔP (d)	Timeseries sections	$\Delta V_{\max}$ (mag)	σ_{acc} (mag)	$V_{\min}$ (mag)	$B - V$ (mag)	Sp.T.	Mult.	Note on period	Variable's name
TYC 9390 0322 1	055329–8156.9	1.858	0.005	11/12	0.14	0.036	9.20	0.79	K0V	V	new	
HIP 30034	061913–5803.3	3.85	0.01	6/10	0.10	0.031	9.33	0.86	K1V(e)	BD	new	AB Pic
HIP 32235	064346–7158.6	3.83	0.01	9/12	0.09	0.031	9.11	0.70	G6V	S	new	
HIP 33737	070030–7941.8	5.10	0.03	11/12	0.14	0.034	10.16	0.91	K2V	S	$P = P_{\text{ACVS}}$	
TYC 8559 1016 1	072124–5720.6	4.61	0.03	7/12	0.13	0.030	10.80	0.64	K0V	V	new	
TYC 8929 0927 1	082406–6334.1	0.79	0.02	9/12	0.09	0.037	9.89	0.63	G5V	S	new	
TYC 8930 0601 1	084200–6218.4	1.224	0.004	10/14	0.16	0.035	11.04	0.80	K0V	S	new	
TYC 8569 1761 1	084553–5327.5	1.28	0.003	10/16	0.07	0.033	10.46	0.63	G2V	S	new	
TYC 9395 2139 1	085005–7554.6	1.1435	0.005	11/14	0.10	0.032	10.62	0.76	G9V	SB2?	new	
TYC 8569 3597 1	085156–5355.9	1.942	0.005	10/14	0.09	0.033	10.84	0.69	G9V	SB2	new	
TYC 8582 3040 1	085746–5408.6	1.94	0.005	8/14	0.16	0.030	11.71	0.88	K2IV(e)	S	new	
TYC 8160 0958 1	085752–4941.8	2.043	0.001	8/15	0.15	0.027	10.55	0.73	G9V	S	$P = 1/2P_{\text{ACVS}}$	
TYC 8586 2431 1	085929–5446.8	3.64 ^c	0.01	9/14	0.11	0.033	10.16	0.66	G5IV	S	new	
TYC 8586 0518 1	090003–5538.4	0.916	0.36	8/12	0.11	0.031	10.84	0.68	G5V	S	new	
TYC 8587 1126 1	090929–5538.4	0.77 ^b	0.003	2/12	0.05	0.033	10.24	0.73	G8V	S	new	
TYC 8587 2290 1	091317–5529.1	1.50	0.01	4/12	0.05	0.035	10.41	0.66	G5V(e)	S	new	
HIP 46063	092335–6111.6	3.86	0.02	14/14	0.15	0.031	10.27	0.86	K1V(e)	S	$P = P_{\text{ACVS}}$	V479 Car
TYC 8584 2682 1	093226–5237.7	...	...	...	...	...	10.86	0.76	G8V(e)	S	...	
TYC 8946 1225 1	094309–6313.1	1.70 ^b	0.01	2/11	0.07	0.034	10.40	0.68	G6V	S	new	
HD 107722	122329–7740.9	...	...	...	...	...	8.31	0.45	G6V	S	...	
TYC 8634 1393 1	114552–5520.8	5.35 ^b	0.04	3/12	0.05	0.030	10.24	1.01	K5Ve	S	new	

Notes. V = visual companion; BD = brown dwarf companion; S = single star; B = binary system; P_{lit} : period as given in the literature; P_{ACVS} period in ACVS. ^(b) Period undetected in the periodogram of the complete timeseries; ^(c) $v \sin i$ inconsistent with $v_{\text{eq}} = 2\pi R/P$.

panel) and for Tucana/Horologium, Carina, and Columba (bottom panel). In this case, stars continue to contract towards the ZAMS and either remain magnetically locked to their circumstellar disk or have just left this phase.

From the comparison of the rotational period vs. $V - I$ distribution of AB Dor with those of α Persei and the Pleiades shown in Fig. 9, we notice that the population of very fast rotators in α Persei in the colour range $0.5 < V - I < 1.0$ is missing among both AB Dor and Pleiades members. This population is expected to have migrated from the very rapid rotator to the slow rotator sequence between the ages of 70 and 110 Myr. The AB Dor mean and median rotation periods are also much closer to those of the Pleiades than α Persei. A two-sided two-dimensional Kolmogorov-Smirnov test confirms that the AB Dor rotation period distribution is more similar to the Pleiades than α Persei, the KS probability that the periods are drawn from the same

distribution being much lower for AB Dor/ α Persei (0.5%) than for AB Dor/Pleiades (43%). Furthermore, looking at the AB Dor CMD (Fig. 6), we see that the α Persei members are generally redder, which is consistent with a younger age than AB Dor. This is also consistent with the works of Luhman et al. (2005) and Ortega et al. (2007), which suggest that AB Dor and the Pleiades have a common origin.

Among slow rotators, we note two outliers, the α Persei member AP 121 and the Pleiades member HII 2341, whose rotation period is well above the upper boundary. We suggest that the rotation periods of these two targets, taken from the literature, is incorrect and we do not include them in the final sample for which we derive rotation period histograms and distributions.

To place our analysis in the context of earlier stellar angular momentum evolution, we considered also rotational periods for members of the Orion Nebula Cluster (ONC, ~ 1 Myr) and

Table 8. As in Table 3 for the AB Doradus moving group.

Name	ID _{ASAS}	P (d)	ΔP (d)	Timeseries sections	$\Delta V_{\max}$ (mag)	σ_{acc} (mag)	$V_{\min}$ (mag)	$B - V$ (mag)	Sp.T.	Mult.	Note on period	variable's name
HIP 5191	010626-1417.8	7.13	0.05	2/8	0.05	0.025	9.49	0.91	K1V	V	new	
HIP 6276	012032-1128.1	...	...	...	...	...	8.43	0.79	G9V	S	...	
TYC 8042 1050 1	021055-4604.0	1.116 ^b	0.001	7/12	0.15	0.029	11.48	0.91	K3IVe	V	new	
HIP 10272	021216+2357.5	6.13	0.03	2/4	0.07	0.038	7.94	1.13	K1	B	new	
HIP 13027	024727+1922.3	...	...	...	...	...	6.90	0.68	G0+G5	B	...	
HIP 14684	030942-0934.8	5.46	0.08	2/10	0.07	0.026	8.51	0.81	G0	S	new	IS Eri
HIP 14809	031114+2225.0	...	...	...	...	...	8.51	0.71	G5	V	...	
HIP 17695	034723-0158.3	3.87	0.01	4/7	0.15	0.031	11.60	1.51	M3	S	new	
TYC 5899-0026 1	045224-1649.4	...	...	...	...	...	...	...	M3	S	...	
HIP 22738AB	045331-5551.5	1.496	0.01	3/10	0.06	0.031	10.78	1.56	M3Ve	V	new	
TYC 7587 0925 1	050230-3959.2	6.53	0.06	11/12	0.12	0.030	10.71	0.88	K4V	S	new	
HD 32981	050628-1549.5	0.985 ^b	0.01	4/14	0.09	0.030	9.16	0.58	F8V	S	new	
HIP 25283	052430-3858.2	9.34	0.08	7/12	0.07	0.028	9.06	1.25	K6V	S	new	
HIP 25647	052845-6526.9	0.5140	0.0003	2/10	0.13	0.033	6.74	0.83	K0V	Q	$P = P_{\text{lit}}$	AB Dor
TYC 7059 1111 1	052857-3328.3	2.29 ^c	0.01	8/14	0.11	0.027	10.61	1.06	K3Ve	S	$P = P_{\text{lit}}$	UX Col
TYC 7064 0839 1	053504-3417.9	7.82	0.18	1/14	0.15	0.026	11.83	1.08	K4Ve	S	new	
HIP 26373	053657-4757.9	4.52	0.02	6/14	0.09	0.031	7.73	0.85	K0+K6V	V	$P = P_{\text{lit}}$	UY Pic
HIP 26401A	053713-4242.9	...	...	...	...	...	9.55	0.67	G7V+K1V	B	...	WX Col
CP-19 878	053923-1933.5	1.49	0.01	6/13	0.12	0.028	10.57	0.91 ¹	K1V	S	new	
TYC 7605 1429 1	054114-4118.0	2.75 ^b	0.02	3/14	0.15	0.030	12.29	0.87	K4IVe	S	new	
TYC 6494 1228 1	054413-2606.3	1.83	0.01	2/14	0.12	0.029	10.96	0.86	K2Ve	SB?	new	
HIP 27727	055216-2839.4	2.84	0.01	9/14	0.08	0.033	9.12	0.63	G3V	SB?	$P = P_{\text{lit}}$	TZ Col
TYC 7598 1488 1	055751-3804.1	3.73 ^c	0.04	6/11	0.09	0.029	9.64	0.69	G6V(e)	S	$P = P_{\text{lit}}$	TY Col
TYC 7079 0068 1	060834-3402.9	3.38	0.01	9/12	0.14	0.031	10.36	0.79	G9Ve	S	$P = P_{\text{ACVS}}$	
TYC 7084 0794 1	060919-3549.5	1.717	0.004	6/12	0.11	0.031	11.13	1.69	M1Ve	S	$P = P_{\text{ACVS}}$	
HIP 30314	062231-6013.1	...	...	...	...	...	6.54	0.61	G1V	V	...	
HIP 31711	063800-6132.0	2.60	...	...	0.05	...	6.25	0.62	G2V	SB+V	P_{lit}	AK Pic
HIP 31878	063950-6128.7	9.06	0.08	4/10	0.07	0.032	9.78	1.26	K7V(e)	S	new	
TYC 7627 2190 1	064119-3820.6	2.67 ^b	0.02	3/10	0.11	0.027	11.47	1.19	K2Ve	...	new	
UCAC2 06727592	064753-5713.5	6.05	0.05	5/11	0.11	0.032	11.54	0.90 ¹	K4V	S	new	
TYC 8558 1148 1	071051-5736.8	2.94	0.01	4/11	0.07	0.031	10.53	0.68	G2V	S	new	
TYC 1355-214-1	072344+2025.0	2.79	0.02	6/8	0.16	0.036	10.08	1.15	K3	S	$P = P_{\text{lit}}$	
HIP 36108	072618-4940.8	3.89	0.04	1/11	0.05	0.029	9.81	0.43	G7V	B	new	
HIP 36349	072851-3014.8	1.642	0.006	15/15	0.15	0.032	10.01	1.44	M1Ve	B	$P = P_{\text{lit}}$	V372 Pup
TYC 9493 0838 1	073100-8419.5	4.94	0.03	6/11	0.09	0.035	10.04	0.83	G9V	S	new	
HIP 51317	102856+0050.5	...	...	...	...	...	9.65	1.51	...	...	...	
HIP 76768	154028-1841.8	3.70	0.02	4/10	0.09	0.029	10.44	1.24	K3/4V	B	$P \neq P_{\text{ACVS}}$	
HIP 81084	163342-0933.2	7.45	0.11	2/10	0.07	0.030	11.30	1.44	M0.5	S	new	
HIP 82688	165408-0420.4	...	...	...	...	...	7.82	0.59	G0	...	...	
TYC 7379 0279 1	172856-3244.0	...	...	...	...	...	10.40	0.93	...	...	...	
BD-13 4687	173746-1314.8	0.447	0.002	11/11	0.19	0.033	10.10	0.93	K3/4IV	S	new	
HIP 93375	190106-2842.8	...	...	...	...	...	8.55	0.56	G1V	V	...	
HIP 94235	191058-6016.3	2.24	0.01	2/10	0.04	0.031	8.37	0.59	G1V	V	new	
TYC 0486-4943	193304+0345.7	1.35 ^b	0.02	5/10	0.10	0.035	11.20	0.95	K3V	S	new	
HD 189285	195924-0432.1	4.85	0.03	2/12	0.06	0.031	9.54	0.71	G5	S	new	
TYC 5164-567-1	200449-0239.3	4.68	0.06	5/7	0.10	0.032	10.17	1.00	...	...	new	
HD 199058	205421+0902.4	...	...	...	...	...	8.81	0.63	G5	...	...	
TYC 1090-0543	205428+0906.1	2.28	0.007	2/9	0.14	0.029	11.79	1.07	...	...	$P = P_{\text{lit}}$	
TYC 6351 0286 1	211305-1729.2	4.92	0.07	6/10	0.12	0.029	10.69	1.21	K6Ve	S	$P = P_{\text{ACVS}}$	
HIP 106231	213102+2320.1	0.42312 ^b	0.007	4/6	0.10	0.036	9.19	1.05	K8	S	$P = P_{\text{ACVS}} = P_{\text{lit}}$	LO Peg
HIP 107684	214849-3929.1	4.14	0.02	5/10	0.06	0.031	9.67	0.69	G7V	S	new	
HIP 113579	230019-2609.2	2.169 ^b	0.007	1/10	0.06	0.027	7.49	0.65	G5V	B	new	
HIP 113597	230028-2618.7	...	...	...	...	...	9.63	1.34	K7V	S	...	
HIP 114530	231154-4508.0	5.17	0.02	4/10	0.07	0.030	8.82	0.80 ¹	G8V	B	new	
HIP 116910	234154-3558.7	2.294	0.007	6/10	0.11	0.029	9.45	0.71	G8V	S	new	
HIP 118008	235611-3903.1	...	...	...	...	...	8.22	0.97	K3V	S	...	
PW And	no-ASAS	1.762	...	...	0.13	...	8.86	0.92	K2V	S	P_{lit}	PW And
HIP 63742	no-ASAS	6.5400	...	...	0.06	...	7.73	0.85	G5V	B	P_{lit}	PX Vir
HIP 86346	no-ASAS	1.842	...	...	0.02	...	10.29	1.23	M0	T	P_{lit}	
HIP 114066	no-ASAS	4.502	...	...	0.03	...	10.87	1.44	M0	S	P_{lit}	
HIP 16563	no-ASAS	1.430	0.006	...	...	...	8.15	0.80	G5+M0	B	P_{lit}	V577 Per
HIP 12635	no-ASAS	...	...	...	...	...	10.21	0.88	...	B	...	
HIP 12638	no-ASAS	...	...	...	...	...	8.70	0.71	G5	B	...	
HIP 110526AB	no-ASAS	...	...	...	...	...	10.70	1.57	M0	B	...	

Notes. V = visual companion; S = single star; B = binary system; QUAD = quadruple system. ⁽¹⁾ Inferred from spectral type; ^(c) $v \sin i$ inconsistent with $v_{\text{eq}} = 2\pi R/P$; P_{lit} : period as given in the literature; P_{ACVS} period in ACVS; ^(b) period undetected in the periodogram of the complete timeseries.

NGC 2264 (~ 4 Myr). Rotation periods of ONC members were taken from Herbst et al. (2002), and of NGC 2264 members from both Rebull et al. (2002) and Lamm et al. (2004). Age-binned rotation period histograms of the full dataset are shown in Fig. 11.

Figure 12 shows the rotation period evolution from ONC to AB Dor (plus Pleiades) for stars with mass between 0.6 and 1.2 $M_{\odot}$ (left panel) and for the restricted sample with mass between 0.8 and 1.2 $M_{\odot}$ (right panel). Both the mean and median period decrease slowly but systematically with age from ONC

to α Persei, apart from the mean period from ONC to NGC 2264 in the 0.6–1.2 $M_{\odot}$ sample, which is essentially constant. Given the paucity of the data and because the distributions are not Gaussian, we investigated the significance of these variations by performing a two-sided KS test of consecutive samples in age. We expect that, if the variation in the mean and median are significant, the KS probability that the period realisations in two consecutive time bins are drawn from the same distribution will be low. To avoid the ambiguities that arise from the colour

Fig. 6. Colour-magnitude diagrams of the six associations under analysis with overplotted PMS tracks (solid lines) from Baraffe et al. (1998). Different symbols indicate stars belonging to different association/clusters; the symbol size is proportional to the rotation period. Dots represent cluster stars with unknown rotation period. Black symbols represent stars whose $V - I$ colour is derived from $B - V$.

evolution at an early stage, we only apply the one-dimensional two-sided KS test to the restricted mass range $0.8\text{--}1.2 M_{\odot}$ and compare the results with those obtained in the extended $0.6\text{--}1.2 M_{\odot}$ range.

In Table 10, we list, for each age bin and for both the $(0.6\text{--}1.2) M_{\odot}$ and $(0.8\text{--}1.2) M_{\odot}$ ranges, the mean and median rotation period, the number of stars used in the test, and the

two-sided KS probability that the realisations at consecutive sample ages are drawn from the same distribution.

Considering the $0.8\text{--}1.2 M_{\odot}$ range first, we see that the moderate rotation spin-up from ~ 1 to ~ 9 Myr is also associated with a KS probability of 70% for the 1–4 Myr and 63% for the 4–9 Myr age bins. The KS probability decreases to 17% for the 9–30 Myr age bins and increases again to 45% for the

Table 9. Polynomial fit coefficients to derive $V - I$ from $B - V$ colour, for stars with no $V - I$ observations.

	a	b	c	d	e
TW Hya					
$B - V > 0.5$	3.163	-5.014	3.028	...	...
Tucana/Horologium					
$B - V > 0.5$	+0.821	-3.550	+9.978	-9.190	+3.047
Columba					
$B - V > 0.5$	-0.417	2.142	-0.578	...	...
Carina					
$B - V > 0.5$	0.296	0.545	0.260	...	...
AB Dor					
$B - V < 1.6$	+10.19	-44.25	+72.94	-50.35	+12.66
$B - V > 1.6$	+0.648	-0.494	+0.960	...	...

Fig. 7. Empirical relation to derive $V - I$ from $B - V$ colours for the Tucana/Horologium members lacking $V - I$ measurements. **Fig. 8.** Histogram of masses for the complete sample of periodic stars inferred by comparison with Baraffe et al. (1998) evolutionary tracks.

30–70 Myr age bins. The KS probability then decreases for the 70–110 Myr age bins, where we also see an unambiguous rotation spin-down. The most significant variations are then the spin-up between 9 and 30 Myr and the spin-down between 70 and 110 Myr. Between 1 and 9 Myr, the moderate spin-up is poorly supported by the KS test. The KS test on the spin-up between 30 and 70 Myr does not allow us to draw definitive conclusions. For the $0.8\text{--}1.2 M_{\odot}$ range, the analysis is therefore consistent

Fig. 9. Rotation period distribution of AB Dor members as compared to α Persei (top panel) and Pleiades members (bottom panel). Dashed and dotted lines represent the gyro-isochrones from Barnes (2003).

with a considerable disk-locking before 9 Myr, followed by a moderate but unambiguous spin-up from 9 to 30 Myr, consistent with stellar contraction towards the ZAMS. Variations between 30 and 70 Myr are rather doubtful, despite the median indicating a significant spin-up. The mean rotation period does not indicate any spin-up at all and the KS-probability does not support a strong difference in the period distribution at these two age bins. This situation may be due to the heterogeneity of the sample: all stars with masses above $1 M_{\odot}$ are expected to complete their contraction toward the ZAMS at ages earlier than about 30 Myr, but stars with lower mass will end the contraction towards the ZAMS later (around 50 Myr for a star of $0.8 M_{\odot}$). The unambiguous spin-down from 70 to 110 Myr is consistent with, starting from the 70 Myr age bin, all stars in the $0.8\text{--}1.2 M_{\odot}$ mass range having entered the MS phase and therefore the angular momentum evolution being dominated by wind-braking.

The same considerations can be applied to the extended ($0.6\text{--}1.2 M_{\odot}$) range, despite all KS-probabilities being lower than in the $(0.8\text{--}1.2 M_{\odot})$ range. At ages earlier than 9 Myr, evidence of a moderate spin-up is rather poor, the two-sided test giving a probability of about 60% that the distributions in the 1–4 Myr and the 4–9 age bins are the same. The spin-up from 9 to 30 Myr remains unambiguous, with a probability of only 9% that the period distributions in these two age bins are the same. The moderate spin-up from 30 to 70 Myr is somewhat more significant, which is probably due to a higher number of stars ending their contraction towards the ZAMS at ages later than

Fig. 10. Rotation period distribution of TWA and β Pic (*top panel*), and Tucana/Horologium, Columba, and Carina (*bottom panel*).

30 Myr (85 Myr for a star of $0.6 M_{\odot}$). The spin-down between 70 and 110 Myr also remains unambiguous, the KS-probability for these two bins being only 11%.

The most recent work on rotation and activity in PMS stars was carried out by Scholz et al. (2007) using data of four associations in the age range from ~ 4 to ~ 30 Myr (η Chamaleontis, TW Hya, β Pictoris, and Tucana/Horologium). It is based on $v \sin i$ measurements and the stellar mass is inferred from the spectral type in a way different from our comparison with evolutionary tracks. Their study shows a monotonic increase of $v \sin i$ (decrease of rotation period) until an age of about 30 Myr, which is the oldest age considered in their analysis.

Despite some differences with respect to the Scholz et al. (2007) analysis, we mainly confirm their results, but on a firmer basis thanks to the use of rotation periods instead of $v \sin i$ values and of a more numerous sample of associations and members.

6.3. Rotation-photospheric activity connection

The periodic light modulations exhibited by our stars are caused by temperature inhomogeneities (i.e., starspots) on the stellar photosphere. Possibly in a way similar to the Sun, these inhomogeneities originate from photospheric magnetic fields whose total filling factor and distribution depend on the properties of

Fig. 11. Histograms of the rotation period distribution at the ages considered in the present study in the mass range $0.6 < M/M_{\odot} < 1.2$.

the dynamo mechanism operating in the stellar interior. The amplitude of the light curve provides a lower limit to the amount of magnetic fields asymmetrically distributed along the stellar longitude, which is in turn proportional to the total magnetic field filling factor. As shown by Messina et al. (2001, 2003), the upper bound to the light curve amplitude distribution is observed to decrease with increasing rotation period, when the dynamo becomes less efficient. In Fig. 13, we plot the maximum V-band peak-to-peak light curve amplitude vs. rotation period of stars in the associations being analysed. These values represent the largest amplitude ever measured in all time sections in which the complete data time series of each target was divided, as explained in Sect. 4.1. Bullets represent stars with masses $M > 0.6 M_{\odot}$, whereas open triangles indicate stars with masses $M < 0.6 M_{\odot}$. Circled symbols are stars whose measured $v \sin i$ values are inconsistent with the equatorial velocity $v_{\text{eq}} = 2\pi R/P$. In four of six associations, the upper bounds to the light curve amplitude distributions do not show any evident correlation with the rotation period. The only two exceptions are β Pic and AB Dor associations, whose upper light-curve amplitude bound decreases with increasing rotation period. To improve our statistics, we combined data from coeval clusters as well as data from α Persei and Pleiades clusters, as earlier performed for the rotation period distributions. In Fig. 14, we note that the maximum light curve amplitude upper bound (solid line) begins to clearly correlate with the rotation periods starting from an age of ~ 70 Myr. Therefore, the photospheric activity behaviour of the young members of loose associations older than 70 Myr seem to be similar to those observed in older stars where an α - Ω dynamo operates. Unfortunately, we have no data of very low mass (VLM) stars in our associations with which to study differences in magnetic activity with respect to higher-mass stars. Low-mass dM stars have a deep convection zone and stars with masses $< 0.3 M_{\odot}$ (i.e. later than dM3/4) are expected

Fig. 12. Rotation period evolution vs. time in the 0.6–1.2 (left panel) and in the 0.8–1.2 (right panel) solar mass ranges. Small dots represent the individual rotation period measurements. Bullets connected by solid lines are the median periods, whereas asterisks connected by dotted lines are mean periods. Short horizontal lines represent the 25th and 75th percentiles of rotation period.

to be fully convective and may generate magnetic fields via a turbulent α^2 dynamo.

We note that there is evidence of a dependence of the light curve amplitude also on age. Considering stars of similar mass and rotation period, the light amplitudes are observed to be largest in the youngest associations TW Hya and β Pic, where the variability is dominated by hot/cool spots and disk-accretion phenomena. The amplitudes are then observed to decrease until an age of ~ 30 Myr, where we expect that the variability arises chiefly from cool spots. The light curve amplitudes are then observed to increase again reaching a maximum level at ~ 110 Myr, which remains constant until an age of ~ 230 Myr, as shown by a similar study of the members of the intermediate age open cluster M 11 (Messina et al. 2010). After this age, stars appear to exhibit periodic light modulations of smaller amplitudes (see, e.g., Messina et al. 2010; Hartman et al. 2009; Radick et al. 1987). In other words, stars of similar rotation, mass, and internal structure but different ages, produce on average different light curve amplitudes and, consequently, either different amount of magnetic fields or different surface distributions of magnetic fields. Understanding which unknown, yet age-dependent, parameters play a role in the activity level remains a challenge.

7. Conclusions

We have analysed the rotational properties of late-type members of six young associations within 100 pc and of age in the range 8–110 Myr. Our period search was based on photometric time series taken from the ASAS catalog. Our analysis has allowed us to obtain the following results:

- We have newly discovered the rotation period of 93 stars, confirmed the period already known from the literature for

Fig. 13. V-band peak-to-peak light curve amplitude vs. rotation period. Circled symbols are stars whose $v \sin i$ is inconsistent with the equatorial velocity $v_{\text{eq}} = 2\pi R/P$.

Table 10. List of target associations/clusters, age, number of stars used to make the statistics, median and mean rotation period, and significance level that consecutive period distributions are drawn from the same distribution.

Target	age (Myr)	# stars	0.6–1.2 $M_{\odot}$			# stars	0.8–1.2 $M_{\odot}$			
			P_{median} (d)	P_{mean} (d)	KS		P_{median} (d)	P_{mean} (d)	KS	
ONC	1	33	6.83	6.17	0.57	16	6.83	5.93	0.70	1 vs. 4 Myr
NGC 2264	4	26	5.43	6.19	0.59	10	4.72	5.15	0.63	4 vs. 9 Myr
TW Hya + β Pic	9	30	4.83	4.52	0.09	23	3.40	4.31	0.17	9 vs. 30 Myr
Tuc/Hor + Car + Col	30	62	2.85	3.22	0.36	53	2.60	2.87	0.45	30 vs. 70 Myr
α Persei	70	54	0.77	2.39	0.11	48	0.77	2.49	0.26	70 vs. 110 Myr
AB Dor + Pleiades	110	89	2.29	3.16	...	48	3.33	3.32	...	...

Fig. 14. Similar to Fig. 13 but with data of coeval stars plotted together. Solid lines mark the upper bound of the amplitude distribution, which decreases with rotation period.

41 stars, revised the period of 10 stars, and finally retrieved from the literature the period of 21 additional stars. After excluding all the stars rejected by Torres et al. (2008) from the high-probability member list, our final sample consists of 150 periodic confirmed members.

- We have determined for the first time the rotation periods of a number of confirmed members in β Pictoris (10 stars), Tucana/Horologium (17 stars), Columba (15 stars), and Carina (16 stars), as well as increased the number of known periodic members of AB Doradus (+150%) and TWA (+15%).
- A two-dimensional two-sided Kolmogorov-Smirnov test applied to period-colour distributions allowed us to confirm that the AB Dor association is older than 70 Myr (as reported by Torres et al. 2008) and most likely coeval with the Pleiades cluster, i.e., 110 Myr old.
- Comparing the $v \sin i$ values from the literature with the calculated equatorial velocity $v_{\text{eq}} = 2\pi R/P$, where P and R are the rotation period and stellar radius, respectively, we found that the average inclination of the stellar rotation axis in each association is generally higher than expected for a random distribution of stellar axes.
- About 91% of our stars have masses in the $0.6 < M < 1.2 M_{\odot}$ range. We have been able to determine in this mass range the rotation period distributions and derive their

median and mean rotation period. These values are the first available at ages of 8, 10, and 30 Myr in this mass range.

- In the $0.8\text{--}1.2 M_{\odot}$ range, we found the most significant variations in the rotation period distribution to be the spin-up between 9 and 30 Myr and the spin-down between 70 and 110 Myr. Two sided KS tests confirm the significance of these variations. Between 1 and 9 Myr, the existence of a moderate spin-up is poorly supported by the KS test. The KS test on the spin-up between 30 and 70 Myr does not allow us to draw definitive conclusions. Our analysis is therefore consistent with a considerable disk-locking before 9 Myr, followed by a moderate but unambiguous spin-up from 9 to 30 Myr, consistent with stellar contraction towards the ZAMS. Any variations between 30 and 70 Myr are rather uncertain, despite the median being indicative of significant spin-up. The unambiguous spin-down from 70 to 110 Myr is consistent with, starting from the 70 Myr age bin, all stars in the $0.8\text{--}1.2 M_{\odot}$ mass range having entered the MS phase and therefore the angular momentum evolution being dominated by wind-braking.

The same considerations can be applied to the extended ($0.6\text{--}1.2 M_{\odot}$) range, despite all KS-probabilities being lower than in the ($0.8\text{--}1.2 M_{\odot}$) range. The moderate spin-up from 30 to 70 Myr is somewhat more significant, which is most likely caused by a higher number of stars ending their contraction towards the ZAMS at ages later than 30 Myr.

- We found that the photospheric magnetic activity, described by the upper bound of the light curve amplitude distribution, correlates with the rotation period starting from an age of about 70 Myr. Moreover, the activity levels of stars of similar mass and rotation appear to depend on age. This dependence is strongest at ages younger than 10 Myr, where hot spots and accretion processes are dominant. The light curve amplitude is then observed to reach a minimum level at an age of 30 Myr, when only dynamo-generated cool spots are expected to dominate the variability. The level of spot activity then increases again reaching its maximum level at the age of Pleiades. This behaviour suggests that an age-dependent parameter exists, which, apart from rotation and mass, also plays a role in driving the level of photospheric magnetic activity.

Acknowledgements. This work was supported by the Italian Ministero dell'Università, dell'Istruzione e della Ricerca (MIUR) and the Istituto Nazionale di Astrofisica (INAF). The extensive use of the SIMBAD and ADS databases operated by the CDS center, Strasbourg, France, is gratefully acknowledged. The Authors would like to thank Dr. G. Pojmański for the extensive use we made of the ASAS database. The Authors would like to thank the referee for helpful comments.

Appendix A: Individual stars

A.1. TW Hydrae

TW Hya: the most extensive study of the variability of TW Hya was carried out by Rucinsky et al. (2008). It is based on the MOST satellite high-precision photometry and the contemporaneous ASAS photometry. Their analysis detects a number of periodicities probably arising from different mechanisms either operating in the photosphere (starspot activity) or related to accretion processes from its disk (veiling, accretion). The highest power peak detected in our periodograms is at $P = 6.86$ d, which is probably not related to rotation. In the present study, we adopted the ΔV light curve amplitude and the $P = 2.80$ d period determined by Lawson & Crause (2005), which is in good agreement with earlier determinations by Koen & Eyer (2002) and by Alencar & Bathala (2002).

TWA 2: is a visual binary whose components are separated by 0.55 arcsec and differ by $\Delta V = 1.0$ mag.

TWA 3AB: is a visual binary whose components are separated by 1.5 arcsec, differ by $\Delta V = 0.9$ mag, and are not resolved by ASAS system. We were able to determine the rotation period of neither the A nor the B component.

TWA 4: is a quadruple system formed by two pairs of SB at 0.8 arcsec and with $\Delta V = 0.5$. TWA 4A is a SB1 with $P_{\text{orb}} = 262$ d (Torres et al. 1995). TWA 4B is a SB2 with $P_{\text{orb}} = 315$ d (Torres et al. 1995), and Aa, Ba, and Bb have similar brightnesses. One of the components is a classical T Tauri star (CTTS). Our periodogram analysis identified a high confidence level rotation period of $P = 14.29$ d in 9 of the 14 analysed time intervals into which we divided the complete magnitude series. This period differs from the rotation period $P = 2.521$ d reported by Koen & Eyer (2002) and derived from the Hipparcos photometry. Since in both cases the system components are not resolved and have similar brightnesses, they may both be responsible for the observed photometric variability. Assuming that $P = 2.521$ d is the correct period of TWA4A, which is consistent with $v \sin i = 8.9 \text{ km s}^{-1}$ and the derived stellar radius, the $P = 14.29$ d period may be attributed to TWA4B, which may have dominated the observed variability during the ASAS observations.

TWA 5: is a triple system consisting of a binary with period 5.94 yr (Konopacky 2007), $\Delta 0.1$ (JHK) plus a brown dwarf at 2 arcsec (Lowrance et al. 1999). Our analysis shows the highest power peak at $P = 0.776$ d, which is in good agreement with the value of $P = 0.77$ d reported in the ACVS.

TWA 6: we adopt the rotation period from the literature (Lawson & Crause 2005), since the available ASAS photometry did not provide any periodicity. TWA 6 was not included in the high-probability member list of Torres et al. (2008). The $v \sin i$ is taken from Skelly et al. (2008).

TWA 7: we found a rotation period in good agreement with the literature value (Lawson & Crause 2005).

TWA 8AB: is a visual binary whose components have a separation of 13.2 arcsec, a magnitude difference $\Delta V = 3.2$, and are not resolved by the ASAS system. Our rotation period agrees with that reported by Lawson & Crause (2005) for the brighter component TWA8A. For TWA 8B, we adopt the rotation period of Lawson & Crause (2005).

TWA 9AB: is a visual binary whose components have a separation of 5.8 arcsec and $\Delta V = 2.7$. For the brighter component TWA9A, our period agrees with that reported by Lawson & Crause (2005), whereas it disagrees with the $P = 0.83$ d in the ACVS. The ASAS photometry could not resolve the fainter TWA9B component whose rotation period is taken

from Lawson & Crause (2005). The $v \sin i$ of both components are taken from Scholz et al. (2007).

TWA 10: and **TWA 12:** our rotation periods agree with those reported by Lawson & Crause (2005). TWA 12 was not included in the high-probability member list by Torres et al. (2008).

TWA 13AB: is a visual binary whose components are separated by 5.1 arcsec and have $\Delta V = 0.5$. The ASAS system does not resolve the components of the binary. However, the observed variability is most likely due to both components. Our analysis indeed detected two rotation periods: $P = 5.56$ d, which is in agreement with the determination by Lawson & Crause (2005), and $P = 5.35$ d, which is also in good agreement with the rotation period that Lawson & Crause (2005) report for TWA 13B.

TWA 14: our analysis did not reveal any significant periodicity. We adopt the rotation period determined by Lawson & Crause (2005). It was not included in the high-probability member list by Torres et al. (2008).

TWA 15AB: is a visual binary rejected as member of the TW Hya group by Torres et al. (2008). Since our analysis did not measure the rotation period, we adopt the rotation periods from Lawson & Crause (2005). The $v \sin i$ are from Scholz et al. (2007).

TWA 16: is a binary with components separated by 0.7 arcsec. Its membership to the TW Hya group according to Torres et al. (2008) has to be confirmed yet.

TWA 17: our analysis did not reveal any significant periodicity. We adopt the rotation period of Lawson & Crause (2005) and the $v \sin i$ of Reid (2003). It was not included in the high-probability member list of Torres et al. (2008).

TWA 18: our analysis did not reveal any significant periodicity. We adopt the $P = 1.11$ d period and light curve amplitude of Lawson & Crause (2005). The $v \sin i$ is from Scholz et al. (2007). It was not included in the high-probability member list by Torres et al. (2008).

TWA 19AB: is a visual binary with a separation between the components of 37 arcsec and $\Delta V = 2.8$. It was rejected as a member by Torres et al. (2008). The ASAS photometry is probably contaminated by the light contribution of the fainter component. We could not determine any periodicity.

TWA 20: we could not determine any significant periodicity.

TWA 21: and **TWA 24** were rejected as members by Torres et al. (2008).

TWA 23: were not included in the high-probability member list by Torres et al. (2008) due to a lack of complete kinematic data.

A.2. β Pictoris

TYC 1186 706 1: this star was identified as a β Pic member by Lepine & Simon (2009). Our period is in good agreement with the literature value (Norton et al. 2007).

HIP 12545: is classified as SB1 by Torres et al. (2008). The period $P = 0.5569$ d reported in the ACVS is not confirmed by our period analysis (see the periodogram in Fig. A.3). The $v \sin i = 9.5 \text{ km s}^{-1}$ is from Scholz et al. (2007).

GJ 3305: is a close binary (Kasper et al. 2007) and has a probable additional wide companion (51 Eri=HIP 21547, F0V; Feigelson et al. 2006) at an angular distance of 66 arcsec. Our analysis did not reveal any significant periodicity. In our analysis, we adopted the period $P = 6.1$ d of Feigelson et al. (2006). The $v \sin i$ is from Scholz et al. (2007).

HIP 23200: our period is in good agreement with both the literature (Alekseev 1996) and the ACVS values. The $v \sin i$ is from Favata et al. (1995).

HIP 23418: is a triple system consisting of both a SB2 binary (the primary is a M3V) with orbital period $P_{\text{orb}} = 11.96\text{d}$ and eccentricity $e = 0.323$, and a visual companion with $\Delta V \sim 1$ at an angular distance of $0.7\text{--}1.0\text{ arcsec}$ (Delfosse et al. 1999). The $v \sin i$ is from Scholz et al. (2007).

BD-21 1074: is a triple system consisting of a M2V ($V = 10.29$) star and a binary companion at a separation of 23 arcsec (M3, $V = 11.61$). We detected a periodicity of $P = 13.3\text{ d}$ in 4 of the 14 time intervals as well as when the whole time series was analysed. Unfortunately, no $v \sin i$ value is at present available to check the consistency between $v \sin i$ and equatorial velocity.

HIP 76629: is a triple system consisting of a binary system (the primary is a K0V) and a fainter visual component (at a separation of 10.0 arcsec and $\Delta V = 6.8$). The RV trend by Gunther & Esposito (2007) and the Hipparcos acceleration imply the presence of an additional closer companion that has a period of several years. Our rotation period agrees with the period found by Cutispoto (1998a).

TWA 22: was an unconfirmed member of TWA according to Torres et al. (2008) because of incomplete kinematic information. The revised kinematic data by Teixeira et al. (2009) indicate its membership to β Pic moving group, which we adopt here.

HIP 84586: is an SB2 system (G5 IV + K0 IV) with an additional visual companion HD 155555C, 5.6 mag fainter in V at 33 arcsec . Our rotation period is in agreement with the literature values, e.g., by Cutispoto (1998b), Pasquini et al. (1991), Strassmeier & Rice (2000) and with the orbital period. The system is tidally-locked.

TYC 8742 2065 1: is classified as SB2 (the primary is a K0IV) by Torres et al. (2006). It has a very close optical companion (Torres et al. 2008) of similar brightness ($\Delta V = 0.2$). We detected two periodicities of $P = 2.61\text{ d}$ and $P = 1.61\text{ d}$ of comparable power in almost each of about half of the selected time intervals, which probably represent the rotation period of either the SB2 or the optical companion, respectively. We are unable to assign to the SB2 system the corresponding rotation period. However, because of the relatively small difference, an incorrect assignment would not cause a significant difference in the results of the rotation period distribution analysis.

HIP 88399: has a brighter F6V companion at a distance of 6.5 arcsec , which falls within the aperture radius used to extract the ASAS photometry.

V4046 Sgr: is an SB2 (the primary is a K5) tidally-locked binary accreting object (CTTS). Our rotation period agrees with the $P = 2.42\text{ d}$ found by Quast et al. (2000). The $v \sin i$ is from Quast et al. (2000).

UCAC2 18035440: GSC7396-0759 is a probable comoving system at 169 arcsec (Torres et al. 2008). We note in its periodogram numerous peaks at confidence levels higher than 99%. However, we were unable to identify which peak is related to stellar rotation.

TYC 9077 2489 1: is a triple system consisting of a binary (the primary is a K5Ve) with a separation of 0.18 arcsec ($=5.2\text{ AU}$) and $\Delta K = 2.3$ (Chauvin et al. 2009), and a wide companion (HIP 92024, A7V) at a 70 arcsec distance. This distance is sufficiently large to allow the ASAS system to observe the only close visual binary system.

HIP 92680: our rotation period agrees with the period reported by Innis et al. (2007).

TYC 6878 0195 1: is reported by Torres et al. (2006) as a visual binary system (the brighter component is a K4Ve) whose components have separations of 1.10 arcsec and $\Delta V = 3.50$.

HIP 102141: is a binary system formed by two very similar M dwarfs ($\Delta V < 0.05$) at a separation of about 3 arcsec . Our analysis did not identify any rotation period.

HIP 102409: our rotation period is in good agreement with literature values of, e.g., Hebb et al. (2007) and Rodonò et al. (1986).

TYC 6349 0200 1: is reported by Neuhauser et al. (2003) as a visual binary (the brighter star is a K6Ve) with separations of 2.2 arcsec and $\Delta K = 1.6$.

TYC 2211 1309 1: this star was discovered to be a β Pic member by Lepine & Simon (2009). Our period is in good agreement with the literature value (Norton et al. 2007).

HIP 112312: its companion TX PsA is sufficiently distant (36 arcsec) not to contribute to the observed variability.

HIP 11437: is at declination $+30$ and no ASAS photometry exists. The rotation period is taken from Norton et al. (2007). It has a companion at an angular distance of 22 arcsec and $\Delta V = 2.4$. The $v \sin i$ is from Cutispoto et al. (2000).

HIP 10679: has a nearby F5V companion (HIP 10680) at a distance of 13.8 arcsec .

A.3. Tucana/Horologium

HIP 490: the $v \sin i$ is from Cutispoto et al. (2002).

HIP 1910: is a binary system, its components having a separation of 0.7 arcsec and $\Delta V = 2.4$.

HIP 2729: our analysis did not find any significant periodicity. We adopt the $P = 0.37\text{ d}$ rotation period found by Koen & Eyer (2002) using the Hipparcos photometry.

TYC 8852 0264 1: our analysis revealed a rotation period $P = 4.8\text{ d}$ which we detected with high confidence level in 8 of 11 time intervals and is about half the value reported in the ACVS. The latter has no power peak in our periodogram. Nonetheless, the 4.8 d period, together with computed stellar radius, infer an equatorial velocity that is inconsistent with the three independent measurements of $v \sin i$ that agree within errors ($30.22 \pm 1.09\text{ km s}^{-1}$ Scholz et al. 2007; $32.7 \pm 1.8\text{ km s}^{-1}$, Torres et al. 2006; 32 km s^{-1} De La Reza & Pinzon 2004). In any case, the star is not included when determining the rotation period distribution because it was rejected as a member of Tuc/Hor by Torres et al. (2008).

HIP 6485: our rotation period agrees with the period found by Koen & Eyer (2002) using the Hipparcos photometry.

HIP 9141: is a binary system, its components having a separation of 0.15 arcsec , and $\Delta H = 0.1$ (Biller et al. 2007). The $v \sin i$ is from Nordstrom et al. (2004).

HIP 9892: is a SB1 system with long period but no other orbital elements determined (Gunther & Esposito 2007). Our rotation period is about half the period from the literature $P = 4.3215\text{ d}$ (Koen & Eyer 2002). As shown in the online Fig. A.7, the latter period is not present at all in our periodogram.

TYC 8489 1155 1: is the wide companion of the F7V star HIP 9902. The components are sufficiently separated to be resolved by the ASAS photometry. However, we could not determine the rotation period.

TYC 8497 0995 1: our analysis revealed a rotation period of $P = 7.38\text{ d}$, which is about half the period reported in the ACVS. The latter period is not present in our periodogram as shown in the online Fig. A.8

AF Hor and TYC 8491 0656 1: are M2V and K6V stars, respectively, separated by about 22 arcsec . They are too close to be resolved by the ASAS photometry. Our analysis revealed a period of $P = 1.275\text{ d}$, which probably represents the rotation

period of the brighter star (TYC 8491 0656 1) dominating the observed variability.

TYC 7026 0325 1: in the ACVS is reported to have a rotation period of $P = 2.2613$ d. However, our analysis revealed the $P = 8.48$ d to be the only significant periodicity.

TYC 8060 1673 1: the $v \sin i$ is from Viana Almeida et al. (2009).

HIP 16853: is a binary system with an astrometric orbit ($P = 200$ d).

HIP 21632: we adopt the rotation period from Koen & Eyer (2002), since the analysis of ASAS photometry did not identify any significant periodicity.

TYC 5907 1244 1: is classified as SB2 by Torres et al. (2008). However, neither its orbital elements nor spectral type are known. In the ACVS, this star is reported with a rotation period of $P = 1.10473$ d, whereas our analysis infers that the $P = 5.21$ d is the most significant periodicity.

TYC 7600 0516 1: was rejected as a member of Tuc/Hor association by Torres et al. (2008). Our period is in good agreement with the $P = 2.47$ d reported by Cutispoto et al. (1999).

TYC 7065 0879 1: is a close visual binary with very similar components according to Torres et al. (2006). It is rejected as a member of Tuc/Hor association by Torres et al. (2008).

HIP 105404: is the only eclipsing binary star in our sample. It is a triple system composed of a very short-period eclipsing binary and a long-period SB ($P = 3$ y, Guenther et al. 2007). Since the Lomb-Scargle periodogram is most suitable for identifying single sinusoidal flux variations, it fails to detect the correct orbital period. However, using as a first guess the rotation period available from the literature and the phase dispersion minimization the ASAS extended time series has allowed us to improve the estimation of the orbital period. It is rejected as a member of the Tuc/Hor association by Torres et al. (2008).

TYC 9344 0293 1: is a binary system whose components have a separation of 0.2 arcsec (Torres et al. 2008). The rotation period, which we detected with high confidence level in 8 of 12 time intervals, when combined with the stellar radius, infers an equatorial velocity inconsistent with the only available measurements of $v \sin i = 61 \text{ km s}^{-1}$ (Torres et al. 2006). We may conclude that the $v \sin i$ value was overestimated due to line blending, since the binary components have a very small separation.

TYC 9529 0340 1: we have information about neither its spectral type nor its binarity. The $P = 2.31$ d rotation period, which we detected with high confidence level in 11 of 13 time intervals, and its computed stellar radius provide an equatorial velocity inconsistent with the only available measurement of $v \sin i = 73.90 \text{ km s}^{-1}$ (Torres et al. 2006).

HIP 116748AB: is a binary system whose components have a separation of 5.3 arcsec and $\Delta V = 1.3$.

A.4. Columba

TYC 8047 0232 1: has a brown dwarf companion at 3.2 arcsec (Chauvin et al. 2003).

HIP 16413: is a binary system whose components have a separation of 0.90 arcsec and $\Delta V = 1.90$.

TYC 5882 1169 1: although previously classified as a member of the Tuc/Hor association, it is proposed by Torres et al. (2008) as high-probability member of Columba association. The $v \sin i$ is from Scholz et al. (2007).

TYC 6457 2731 1: the $v \sin i$ is from Viana Almeida et al. (2009).

TYC 7584 1630 1: the rotation period that we found is half the value reported in the ACVS, which is absent in our periodogram (see online Fig. A.11).

TYC 8077 0657 1: is a binary system whose components have a separation of 21.3 arcsec and $\Delta V = 3.20$ (Torres et al. 2006). The ASAS photometry does not resolve this star from UCAC2 11686780.

HIP 25709: is classified as SB2 by Torres et al. (2008), but no orbital elements were derived.

TYC 7617 0549 1: in the ACVS is reported with a rotation period of $P = 1.3038$ d. However, in the periodogram no significant power peak is evident other than that at $P = 4.1395$ d.

TYC 7100 2112 1: the rotation period, which we detected with a high confidence level in 11 of 15 time intervals, when combined with the stellar radius, provides an equatorial velocity inconsistent with the only available measurements of $v \sin i = 170 \text{ km s}^{-1}$ (Torres et al. 2006).

AG Lep: the rotation period is retrieved from the literature (Messina et al. 2001), no ASAS photometry being available. The $v \sin i$ is from Cutispoto et al. (1999).

A.5. Carina

HIP 30034: is a member of Tuc/Hor according to Zuckerman & Song (2004). In the present study, it is considered to be a member of Carina according to Torres et al. (2008). It has a brown dwarf companion at wide separation (Chauvin et al. 2005).

HIP 32235: and **HIP 33737** are members of Tuc/Hor according to Zuckerman & Song (2004). In the present study, they are assumed to be members of Carina according to Torres et al. (2008).

TYC 8559 1016 1: is a visual binary whose components have a separation of 5.8 arcsec and $\Delta V = 3.0$ (Torres et al. 2006).

TYC 8929 0927 1: we find two peaks of comparable power and very high confidence level. However, only the $P = 0.73$ d period combined with the computed stellar radius gives an equatorial velocity consistent with the measured $v \sin i$.

TYC 8569 3597 1: is a SB2, with orbital period $P_{\text{orb}} = 24.06$ d (Torres et al. 2008).

TYC 8160 0958 1: the rotation period that we found is half the period reported in the ACVS, which is absent in our periodogram.

TYC 8586 2431 1: the rotation period, which we detected with high confidence level in 9 of 14 time intervals, when combined with the stellar radius computed from PMS tracks, gives an equatorial velocity inconsistent with the only available measurements of $v \sin i = 128 \text{ km s}^{-1}$ (Torres et al. 2006). The luminosity class IV assigned to this star may indicate that the star has already left the MS and its radius has already started increasing. However, a stellar radius larger than about $6 R_{\odot}$ would reconcile $v \sin i$ and v_{eq} .

A.6. AB Doradus

HIP 5191: is a visual binary whose components are separated by 23 arcsec.

TYC 8042 1050 1: is a visual binary whose components are separated by 21.7 arcsec.

HIP 10272: is a binary whose components are separated by 1.8 arcsec and have $\Delta V = 1.6$.

HIP 13027: is a binary whose components are separated by 3.6 arcsec and with $\Delta V = 0.8$.

HIP 14809: and **HIP 14807** represent a binary whose components are separated by 33.2 arcsec and with $\Delta V = 2.0$.

HIP 22738AB: is a binary whose components are separated by 7.8 arcsec and have $\Delta V = 0.9$. The ASAS system could not resolve the components.

HIP 25647: is a quadruple system (very low mass star at about 1 AU + close pair of M dwarfs at 9 arcsec). Our rotation period agrees with periods from the literature, e.g., Cutispoto & Rodonò (1988). The $v \sin i$ is from Wichmann et al. (2003).

TYC 7059 1111 1: our period is in good agreement with the literature value (Cutispoto et al. 2003). However, the derived $v_{\text{eq}} = 2\pi R/P$ is inconsistent with two independent measurements of $v \sin i$, which agree within errors ($41.5 \pm 3.5 \text{ km s}^{-1}$, Torres et al. 2006; 40 km s^{-1} , Tagliaferri et al. 1994).

HIP 26373–HIP 26369: is a binary system whose components are separated by 18.3 arcsec and with $\Delta V = 1.9$. Our rotation period agrees with that from Cutispoto et al. (1999). The ASAS photometry does not resolve the component of this K0+K6 system.

HIP 27727: is a possible binary system, which has yet to be confirmed. Our rotation period agrees with the period from the literature (Strassmeier et al. 1997).

TYC 7598 1488 1: our period is in good agreement with the literature value reported by Cutispoto et al. (2001). However, when it is combined with the stellar radius, the derived equatorial velocity is inconsistent with two independent measurements (Torres et al. 2006; Tagliaferri et al. 1994), which give the same value of $v \sin i$ (55 km s^{-1}). A larger stellar radius of about $3\text{--}4 R_{\odot}$, reported by Cutispoto (1998b) and based on a photometric distance $d > 86 \text{ pc}$, would partly solve the disagreement of v_{eq} with $v \sin i$.

HIP 30314: is a binary whose components are separated by 16.2 arcsec.

HIP 31711: is a binary whose components are separated by 0.8 arcsec and for which $\Delta V = 2.3$. Since our periodogram exhibits several peaks of similar power, we adopt the period from Cutispoto et al. (1999), which gives a reasonably smooth light curve.

TYC 1355 214 1: our rotation period agrees with that determined by Norton et al. (2007).

HIP 36108: is a binary whose components are separated by 1.20 arcsec and with $\Delta V = 1.2$.

HIP 36349: is a binary whose components are separated by 0.3 arcsec and with $\Delta V = 1.9$. Our period agrees with the period $P = 1.642 \text{ d}$ of Koen & Eyer (2002) derived from the Hipparcos photometry.

HIP 76768: is a binary whose components are separated by 0.9 arcsec and with $\Delta V = 1.3$. Our period $P = 3.70 \text{ d}$ differs from the period $P = 0.336 \text{ d}$ reported in the ACVS, which is absent in our periodogram. The latter period, if correct, and $v \sin i = 8.0 \text{ km s}^{-1}$ would imply a pole-on orientation of the rotation axis.

BD-13 4687: the $v \sin i = 140.0 \text{ km s}^{-1}$ is from da Silva et al. (2009).

HIP 93375: is a binary whose components are separated by 11.2 arcsec (Torres et al. 2008). The $v \sin i$ is from Nordstrom et al. (2004).

HIP 94235: the $v \sin i$ is from Nordstrom et al. (2004).

TYC 1090-0543: our analysis gives a rotation period in agreement with the period $P = 2.2374 \text{ d}$ found by Norton et al. (2007).

HIP 106231: our period analysis inferred the most significant periodicity to be $P = 0.42312$, which agrees with the known LO Peg rotation period from both ACVS and the literature (e.g., Jeffries et al. 1994). The $v \sin i$ is from Barnes et al. (2005).

HIP 113597: is a binary whose components are separated by 1.8 arcsec and with $\Delta V = 0.6$.

HIP 114530: is a binary whose components are separated by 19.6 arcsec and with $\Delta V = 4.2$.

PW And: the rotation period is taken from the literature (Strassmeier & Rice 2006), no ASAS photometry being available. The $v \sin i$ is from Strassmeier & Rice (2006).

HIP 26401: is a binary whose components are separated by 3.9 arcsec and with $\Delta V = 1.1$.

HIP 63742: is an astrometric (Hipparcos) and spectroscopic (Gunther & Esposito 2007) binary. We adopt the rotation period from Gaidos et al. (2000), no ASAS photometry being available. The $v \sin i$ is from Zuckerman et al. (2004).

HIP 86346: is a triple system whose brightest component has a close companion at 0.2 arcsec (Hortmuth et al. 2007) and a companion at 19.1 arcsec. We adopt the rotation period from Henry et al. (1995), no ASAS photometry being available. Both $B - V$ and $V - I$ colours are taken from Weis (1993). The $v \sin i$ is from Zuckerman et al. (2004).

HIP 114066: we adopt the rotation period of Koen & Eyer (2002), no ASAS photometry being available. The $v \sin i$ is from Zuckerman et al. (2004).

HIP 16563: is a binary whose components are separated by 9.5 arcsec and have $\Delta V = 2.9$. We adopt the rotation period of Messina (1998), no ASAS photometry being available.

HIP 12635-12638: is a binary whose components are separated by 14.6 arcsec and for which $\Delta V = 1.5$.

HIP 110526AB is a binary whose components are separated by 1.8 arcsec and for which $\Delta V = 0.1$.

References

- Alekseev, I. Y. 1996, *Astron. Rep.*, 40, 74
 Alencar, S. H. P., & Bathala, C. 2002, *ApJ*, 571, 378
 Allain, S. 1998, *A&A*, 333, 629
 Baraffe, I., Chabrier, G., Allard, F., & Hauschildt, P. 1998, *A&A*, 337, 403
 Barnes, S. 2003, *ApJ*, 586, 464
 Barnes, J. R., Collier Cameron, A., Lister, T. A., Pointer, G. R., & Still, M. D. 2005, *MNRAS*, 356, 1501
 Bessel, M. S. 1979, *PASP*, 91, 589
 Beuzit, J.-L., Feldt, M., Dohlen, K., et al. 2008, *Ground-based and Airborne Instrumentation for Astronomy II*, ed. I. S. McLean, & M. M. Casali, *Proc. SPIE*, 7014, 701418
 Biller, B. A., Close, L. M., Masciadri, E., et al. 2007, *ApJS*, 173, 143
 Bouvier, J. 2008, *A&A*, 489, 53
 Burrows, A., Marley, M., Hubbard, W. B., et al. 1997, *ApJ*, 491, 856
 Chauvin, G., Thomson, M., Dumas, C., et al. 2003, *A&A*, 404, 157
 Chauvin, G., Lagrange, A.-M., Zuckerman, B., et al. 2005, *A&A*, 438, 29
 Chauvin, G., Lagrange, A.-M., Bonavita, M., et al. 2009, *A&A*, 509, 52
 Collier Cameron, A., Davidson, V. A., Hebb, L., et al. 2009, *MNRAS*, 400, 451
 Cutispoto, G. 1998a, *A&AS*, 127, 207
 Cutispoto, G. 1998b, *A&AS*, 131, 321
 Cutispoto, G., & Rodonò, M. 1988, *IBVS*, 3232
 Cutispoto, G., Pastori, L., Tagliaferri, G., Messina, S., & Pallavicini, R. 1999, *A&AS*, 138, 87
 Cutispoto, G., Pastori, L., Guerrero, A., et al. 2000, *A&A*, 364, 205
 Cutispoto, G., Messina, S., & Rodonò, M. 2001, *A&A*, 367, 910
 Cutispoto, G., Pastori, L., Pasquini, L., et al. 2002, *A&A*, 384, 491
 Cutispoto, G., Messina, S., & Rodonò, M. 2003, *A&A*, 400, 659
 da Silva, L., Torres, C. A. O., de la Reza, R., et al. 2009, *A&A*, 508, 833
 De La Reza, R., & Pinzon, G. 2004, *AJ*, 128, 1812
 Delfosse, X., Forveille, T., Beuzit, J.-L., et al. 1999, *A&A*, 344, 897
 Favata, F., Barbera, M., Micela, G., & Sciortino, S. 1995, *A&A*, 295, 147
 Feigelson, E. D., Lawson, W. A., Stark, M., Townsley, L., & Garmire, G. P. 2006, *AJ*, 131, 1730
 Gaidos, E. J., Henry, G. W., & Henry, S. M. 2000, *AJ*, 120, 1006
 Guenther, E. W., & Esposito, M. 2007 [arXiv:0701293]
 Guenther, E. W., Esposito, M., Mundt, R., et al. 2007, *A&A*, 467, 1147
 Jeffries, R. D., Byrne, P. B., Doyle, J. G., et al. 1994, *MNRAS*, 270, 153
 Hartman, J. D., Gaudi, B. S., Pinsonneault, M. H., et al. 2009, *ApJ*, 691, 342
 Hebb, L., Petro, L., Ford, H. C., et al. 2007, *MNRAS*, 379, 63

- Henry, G. W., Fekel, F. C., Hall, D. S. 1995, *AJ*, 110, 2926
- Herbst, W., & Mundt, R. 2005, *ApJ*, 633, 967
- Herbst, W., & Wittenmyer, R. 1996, *BA&AS*, 28, 1338
- Herbst, W., Bailer-Jones, C. A. L., Mundt, R., Meisenheimer, K., & Wackermann, R. 2002, *A&A*, 396, 513
- Herbst, W., Eisloffel, J., Mundt, R., & Scholz, A. 2007, *Protostars and Planets V*, ed. B. Reipurth, D. Jewitt, & K. Keil (Tucson: University of Arizona Press), 951, 297
- Hodgkin, S. T., Irwin, J. M., Aigrain, S., et al. 2006, *AN*, 327, 9
- Hormuth, F., Brandner, W., Hippler, S., Janson, M., & Henning, T. 2007, *A&A*, 463, 707
- Horne, J. H., & Baliunas, S. L. 1986, *ApJ*, 302, 757
- Kasper, M., Apai, D., Janson, M., & Brandner, W. 2007, *A&A*, 472, 321
- Kawaler, S. D. 1988, *ApJ*, 333, 236
- Keppens, R., MacGregor, K. B., & Charbonneau, P. 1995, *A&A*, 294, 469
- Koen, C., & Eyer, L. 2002, *MNRAS*, 331, 45
- Konopacky, Q. M., Ghez, A. M., Duchêne, G., McCabe, C., & Macintosh, B. A. 2007, *AJ*, 133, 2008
- Kovacs, G. 1981, *Ap&SS*, 78, 175
- Krishnamurthi, A., Pinsonneault, M. H., Barnes, S., & Sofia, S. 1997, *ApJ*, 480, 303
- Innis, J., Coates, D. W., Kaye, T. G., Borisova, A., Tsvetkov, M. 2007, *Peremennye Zvezdy*, 27, 4
- Irwin, J., Aigrain, S., Bouvier, J., et al. 2009, *MNRAS*, 392, 1456
- Lamm, M. H., Bailer-Jones, C. A. L., Mundt, R., Herbst, W., & Scholz, A. 2004, *A&A*, 417, 557
- Lanza, A. F. 2010, *A&A*, 512, A77
- Lanza, A. F., Bonomo, A. S., Moutou, C., et al. 2010, *A&A*, in press [arXiv:1005.3602]
- Lawson, W. A., & Crause, L. A. 2005, *MNRAS*, 357, 1399
- Lepine, S., & Simon, M. 2009, *AJ*, 137, 3632
- Lowrance, P. J., McCarthy, C., & Becklin, E. E. 1999, *ApJ*, 512, 69
- Luhman, K. L., Stauffer, J. R., & Mamajek, E. E., 2005, *ApJ*, 628, L69
- MacGregor, K. B., & Brenner, M. 1991, *ApJ*, 376, 204
- Marois, C., Macintosh, B., Barman, T., et al. 2008, *Sci*, 322, 1348
- Messina, S. 1998, Ph.D. Thesis, University of Catania
- Messina, S. 2007, *Mem. Soc. Astron. Ital.*, 78, 628
- Messina, S., Rodonó, M., & Guinan, E. F. 2001, *A&A*, 366, 215
- Messina, S., Pizzolato, N., Guinan, E. F., & Rodonó, M. 2003, *A&A*, 410, 671
- Messina, S., Rodonó, M., & Cutispoto, G. 2004, *AN*, 325, 660
- Messina, S., Distefano, E., Parihar, P., et al. 2008, *A&A*, 483, 253
- Messina, S., Parihar, P., Koo, J.-R., et al. 2010, *A&A*, 513A, 29
- Neuhäuser, R., Guenther, E. W., Alves, J., et al. 2003, *AN*, 324, 535
- Nielsen, E. L., & Close, L. M. 2010, *ApJ*, 717, 878
- Nordstrom, B., Mayor, M., Andersen, J., et al. 2004, *A&A*, 418, 989
- Norton, A. J., Wheatley, P. J., West, R. G., et al. 2007, *A&A*, 467, 785
- O'Dell, M. A., Hendry, M. A., & Collier Cameron, A. 1994, *MNRAS*, 268, 181
- Ortega, V. G., Jilinski, E., de la Reza, R., & Bazzanella, B. 2007, *MNRAS*, 377, 441
- Parihar, P., Messina, S., Distefano, E., Shantikumar N., S., & Medhi, B. J. 2009, *MNRAS*, 400, 603
- Pasquini, L., Cutispoto, G., Gratton, R., & Mayor M. 1991, *A&A* 248, 72, 80
- Perryman, M. A. C., Lindegren, L., Kovalevsky, J., et al. 1997, *A&A*, 323, 49
- Pojmanski G. 1997, *Acta Astron.*, 47, 467
- Pojmanski G. 1998, *Acta Astron.*, 48, 35
- Pojmanski G. 2002, *Acta Astron.*, 52, 397
- Pojmanski G. 2003, *Acta Astron.*, 53, 341
- Pont, F. 2009, *MNRAS*, 396, 1789
- Press, W. H., Teukolsky, S. A., Vetterling, W. T., & Flannery, B. P. 1992, *Numerical Recipes*, Cambridge University
- Prosser, C. F., Stauffer, J., & Kraft, R. P. 1991, *AJ*, 101, 1361
- Quast, G. R., Torres, C. A. O., de La Reza, R., et al. 2000, *The Formation of Binary Stars*, ed. Bo Reipurth, & Hans Zinnecker, *IAU Symp.* 200, 28
- Radick, R. R., Thompson, D. T., Lockwood, G. W., Duncan, D. K., & Bagget, W. E. 1987, *ApJ*, 321, 459
- Rebull, L. M., Madikou, R. B., Strom, S. E., et al. 2002, *AJ*, 123, 1528
- Rebull, L. M., Wolff, S. C., & Strom, S. E. 2004, *AJ*, 127, 1029
- Reid, N. 2003 *MNRAS*, 342, 837
- Rhode, K. L., Herbst, W., & Mathieu, R. D. 2001, *AJ*, 122, 3258
- Rodonó, M., Cutispoto, G., Pazzani, V., et al. 1986, *A&A*, 165, 135
- Rucinski, S. M., & Krautter, J. 1983, *A&A*, 121, 217
- Rucinski, S. M., Slavek, M., Matthews, J. M., et al. 2008, *MNRAS*, 391, 1913
- Scargle, J. D. 1982, *ApJ*, 263, 835
- Schwarnberg-Czerny, A. 1989, *MNRAS*, 241, 153
- Scholz, A., Coffey, J., Brandeker, A., & Jayawardhana, R. 2007, *ApJ*, 662, 1254
- Scholz, A., Eisloffel, J., & Mundt, R. 2009, *MNRAS*, 400, 1548
- Setiawan, J., Weise, P., Henning, Th., et al. 2008, in *Precision Spectroscopy in Astrophysics*, ed. N.C. Santos, L. Pasquini, A. C. M. Correia, & M. Romaniello, 201 [arXiv:0704.2145]
- Skelly, M. B., Unruh, Y. C., Collier Cameron, A., et al. 2008, *MNRAS*, 385, 708
- Stassun, K. G., Mathieu, R. D., Mazeh, T., & Vrba, F. 1999, *AJ*, 117, 2941
- Stauffer, J. R. 1982a, *AJ*, 87, 899
- Stauffer, J. R. 1982b, *AJ*, 87, 1507
- Stauffer, J. R. 1984, *Optical and infrared photometry of late type stars in the Pleiades*, *ApJ*, 280, 189
- Stauffer, J. R., Hartmann, L. W., Burnham, J. N., & Jones, B. F. 1985, *ApJ*, 289, 247
- Stauffer, J. R., Hartmann, L. W., & Jones, B. F. 1989, *ApJ*, 346, 160
- Strassmeier, K. G., & Rice, J. B. 2000 *A&A*, 360, 1019
- Strassmeier, K. G., & Rice, J. B. 2006, *A&A*, 460, 715
- Strassmeier, K. G., Bartus, J., Cutispoto, G. & Rodonó, M. 1997, *A&AS*, 125, 11
- Tagliaferri, G., Cutispoto, G., Pallavicini, R., Randich, S., & Pasquini, L. 1994, *A&A*, 285, 272
- Teixeira, R., Ducourant, C., Chauvin, G., et al. 2009, *A&A*, 503, 281
- Torres, G., Stefanik, R. P., Latham, D. W., & Mazeh, T. 1995, *ApJ*, 452, 870
- Torres, C. A. O., Quast, G. R., da Silva, L., et al. 2006, *A&A*, 460, 695
- Torres, C. A. O., Quast, G. R., Melo, C. H. F., & Sterzik, M. F. 2008, *Handbook of Star Forming Regions, II: The Southern Sky ASP Monograph Publications*, ed. Bo Reipurth, 5, 757 [arXiv:0808.3362]
- Urban, S. E., Corbin, T. E., & Wycoff, G. L. 1998, *AJ*, 115, 2161
- Viana Almeida, P., Santos, N. C., Melo, C., et al. 2009, *A&A*, 501, 965
- von Braun, Lee, B. L., Seager, S., et al. 2005, *PASP*, 117, 141
- Weis, E. W. 1993, *AJ*, 195, 1962
- Wichmann, R., Schmitt, J. H. M. M., & Hubrig, S. 2003, *A&A* 399, 983
- Zuckerman, B., & Song, I. 2004, *Ann. Rev. Astron. Astr.*, 42, 685
- Zuckerman, B., Song, I., & Bessell, M. S. 2004, *ApJ*, 613, L65
- Zuckerman, B., Bessell, M. S., Song, I., & Kim, S. 2006, *ApJ*, 649, L11

Table A.1. TW Hydrae association.

Name		RA (2000.0)	Dec (2000.0)	V (mag)	$B - V$ (mag)	$V - I$ (mag)	M_V (mag)	d (pc)	$v \sin i$ (km s ⁻¹)	Mass ($M_\odot$)	Radius ($R_\odot$)	Sp.T	mgr	n1	n2
TWHya	HIP 53911	11 1 51.90	-34 42 17.0	10.50	0.97	1.70	6.88	53.00	6.00	1.0	1.4	K6Ve	TWA	-	m
TWA2	CD-298887	11 9 13.80	-30 1 40.0	11.07	1.48	2.24	8.01	41.00	12.60	0.6	1.5	M2Ve	TWA	-	m
TWA4	HIP 55505	11 22 5.30	-24 46 40.0	9.42	1.17	1.39	6.20	44.00	8.90	1.0	1.2	K5V	TWA	-	m
TWA5A	CD-337795	11 31 55.30	-34 36 27.0	12.12	1.47	2.36	8.85	45.00	53.50	0.4	1.1	M2Ve	TWA	-	m
TWA7	GSC7190-2111	10 42 30.10	-33 40 17.0	11.65	1.46	2.44	9.41	28.00	4.40	0.3	1.0	M2Ve	TWA	-	m
TWA8A	CD-268623A	11 32 41.20	-26 51 56.0	12.23	1.46	2.41	9.27	39.00	6.60	0.4	1.0	M3Ve	TWA	-	m
TWA8B	xxxxx	11 32 41.16	-26 52 9.00	15.20	1.50	3.72	12.19	40.00	11.00	0.2	0.6	M6	TWA	-	m
TWA9A	HIP 57589	11 48 24.30	-37 28 49.0	11.26	1.26	1.62	7.10	68.00	11.26	0.9	1.1	K5V	TWA	-	m
TWA9B	CD-387429B	11 48 24.30	-37 28 49.0	14.00	1.43	2.58	9.84	68.00	8.39	0.3	0.9	M1V	TWA	-	m
TWA10	GSC 7766-0743	12 35 4.20	-41 36 39.0	12.96	1.43	2.47	9.38	52.00	3.00	0.3	1.0	M2Ve	TWA	-	m
TWA13A	CD-347390A	11 21 17.20	-34 46 46.0	11.46	1.42	1.89	7.76	55.00	12.30	0.8	1.1	M1Ve	TWA	-	m
TWA13B	CD-347390B	11 21 17.40	-34 46 50.0	11.96	1.47	2.08	8.26	55.00	12.00	0.7	1.0	M5	TWA	-	m
TWA20	xxx	12 31 38.10	-45 58 59.0	13.00	1.10	2.30	8.68	73.00	30.00	0.5	1.0	M2	TWA	-	m
TWA25	CD-397538	12 15 30.70	-39 48 43.0	11.44	1.41	1.94	7.90	51.00	12.90	0.8	1.1	M1Ve	TWA	-	m

Notes. Summary data from the literature and mass derived from evolutionary tracks. Note n1 = 1 indicates that $V - I$ is derived from $B - V$. Note n2 = m indicates a confirmed member.

Table A.2. β Pictoris association.

Name		RA (2000.0)	Dec (2000.0)	V (mag)	$B - V$ (mag)	$V - I$ (mag)	M_V (mag)	d (pc)	$v \sin i$ (km s ⁻¹)	Mass ($M_\odot$)	Radius ($R_\odot$)	Sp.T	mgr	n1	n2
HIP 12545	BD+05378	2 41 25.90	5 59 18.0	10.37	1.21	1.59	7.41	39.00	40.00	0.8	0.9	K6Ve	BPIC	-	m
HIP 23200	V 1005Ori	4 59 34.83	1 47 0.68	10.05	1.39	1.84	8.15	24.00	14.00	0.7	0.8	M0.5Ve	BPIC	-	m
HIP 23309	CD-571054	5 0 47.10	-57 15 25.0	10.00	1.40	1.79	7.91	26.20	5.80	0.8	1.0	M0Ve	BPIC	-	m
HIP 23418	GJ3322	5 1 58.80	9 59 0.00	11.45	1.54	2.46	8.79	34.00	7.67	0.4	1.2	M3V	BPIC	-	m
HIP 29964	HD 45081	6 18 28.20	-72 2 41.0	9.80	1.13	1.32	6.87	38.60	16.40	0.8	0.8	K4Ve	BPIC	-	m
HIP 76629	HD 139084A	15 38 57.50	-57 42 27.0	7.97	0.81	0.95	4.98	39.70	16.60	1.0	1.2	K0V	BPIC	-	m
HIP 84586	HD 155555AB	17 17 25.50	-66 57 4.00	7.23	0.76	0.84	4.75	31.40	31.00	1.0	1.2	G5IV	BPIC	-	m
TYC 8728 2262 1	CD-547336	17 29 55.10	-54 15 49.0	9.55	0.85	0.95	5.45	66.00	35.30	1.0	1.0	K1V	BPIC	-	m
TYC 8742 2065 1	HD 161460	17 48 33.70	-53 6 43.0	9.61	0.83	0.86	5.26	74.00	10.00	1.0	1.0	K0IV	BPIC	-	m
V4046Sgr	HD 319139	18 14 10.50	-32 47 33.0	10.44	0.95	1.33	6.15	72.00	14.2	1.0	1.2	K5	BPIC	-	m
HIP 89829	HD 168210	18 19 52.20	-29 16 33.0	8.89	0.69	0.78	4.51	75.20	114.70	1.0	1.3	G1V	BPIC	-	m
TYC 9073 0762 1	AC4357199	18 46 52.60	-62 10 36.0	12.08	1.46	2.09	8.46	53.00	9.90	0.6	1.1	M1Ve	BPIC	-	m
TYC 7408 0054 1	CD-3116041	18 50 44.50	-31 47 47.0	11.20	1.35	1.76	7.71	50.00	49.70	0.8	0.9	K8Ve	BPIC	-	m
HIP 92680	HD 174429	18 53 5.90	-50 10 50.0	8.29	0.77	0.85	4.80	49.80	69.00	1.0	1.2	K8Ve	BPIC	-	m
TYC 6872 1011 1	AC3111475	18 58 4.20	-29 53 5.00	11.78	1.30	1.80	7.32	78.00	33.80	0.9	1.2	M0Ve	BPIC	-	m
TYC 6878 0195 1	CD-2613904	19 11 44.70	-26 4 9.00	10.27	1.05	1.18	5.78	79.00	9.80	1.0	1.0	K4V(e)	BPIC	-	m
HIP 102141A	HD 196982	20 41 51.20	-32 26 7.00	10.99	1.54	2.99	11.10	9.50	10.10	0.2	0.8	M4+M4	BPIC	-	m
HIP 102409	HD 197481	20 45 9.50	-31 20 27.0	8.73	1.49	2.09	8.75	9.90	9.30	0.6	0.8	M1Ve	BPIC	-	m
TYC 6349 0200 1	HD 358623	20 56 2.70	-17 10 54.0	10.62	1.22	1.49	7.31	46.00	15.60	0.8	0.9	K6Ve+M	BPIC	-	m
TYC 9340 0437 1	CP-722713	22 42 48.90	-71 42 21.0	10.60	1.35	1.73	7.82	36.00	7.50	0.8	1.0	K7Ve+K	BPIC	-	m
HIP 112312	GJ871.1A	22 44 58.00	-33 15 2.00	11.70	1.48	2.80	10.19	20.00	12.10	0.2	1.0	M4IVe	BPIC	-	m
TYC 5832 0666 1	BD-136424	23 32 30.90	-12 15 52.0	10.54	1.43	1.98	8.30	28.00	8.80	0.7	M0Ve	0.9	BPIC	-	m
HIP 11437	BD+30397A	2 27 29.25	30 58 24.6	10.12	1.21	1.34	6.95	43.00	5.00	0.8	K8	0.8	BPIC	-	m
GJ3305	RBS561	4 37 37.30	-2 29 28.0	10.59	1.45	2.00	8.22	29.80	5.30	0.7	1.0	M0.5	BPIC	-	m
BD-211074A	GJ3331A	5 6 49.90	-21 35 9.00	10.29	1.52	2.43	9.01	18.00	999.00	0.4	1.2	M2	BPIC	1	m

Notes. Summary data from the literature and mass derived from evolutionary tracks. Note n1=1 indicates that $V - I$ is derived from $B - V$. Note n2 = m indicates a confirmed member.

Table A.3. Tucana/Horologium association.

Name		RA (2000.0)	Dec (2000.0)	V (mag)	B - V (mag)	V - I (mag)	M _V (mag)	d (pc)	<i>v</i> sin <i>i</i> (km s ⁻¹)	Mass (M _⊙)	Radius (R _⊙)	Sp.T	mgr	n1	n2
HIP 1113	HD 987	0 13 53.00	-74 41 18.0	8.78	0.74	0.82	5.57	43.90	7.30	1.0	1.0	G8V	TUC	-	m
HIP 1910	GSC 8841-0065	0 24 9.00	-62 11 4.00	11.55	1.40	1.77	8.33	44.00	20.90	0.7	0.8	M0Ve	TUC	-	m
HIP 1993	GSC 8841-1145	0 25 14.70	-61 30 48.0	11.47	1.35	1.81	8.30	43.00	7.30	0.7	0.8	M0Ve	TUC	-	m
HIP 2729	HD 3221	0 34 51.20	-61 54 58.0	9.61	1.05	1.10	6.30	45.90	122.80	0.9	0.8	K4Ve	TUC	-	m
TYC 9351 1110 1	CD-7824	0 42 20.30	-77 47 40.0	10.21	1.06	1.22	6.72	50.00	19.50	0.8	0.8	K3Ve	TUC	-	m
HIP 6485	HD 8558	1 23 21.30	-57 28 51.0	8.51	0.68	0.77	5.05	49.30	13.80	1.0	1.1	G7V	TUC	-	m
HIP 9141	HD 12039	1 57 49.00	-21 54 5.00	8.00	0.65	0.72	4.86	42.40	15.00	1.0	1.2	G4V	TUC	-	m
HIP 9892	HD 13183	2 7 18.10	-53 11 56.0	8.63	0.65	0.76	5.12	50.30	24.00	1.0	1.1	G7V	TUC	-	m
TYC 8497 0995 1	CD-58553	2 42 33.00	-57 39 37.0	10.98	1.23	1.47	7.49	50.00	5.60	0.7	0.7	K5Ve	TUC	-	m
TYC 7026 0325 1	CD-351167	3 19 8.70	-35 7 0.00	11.12	1.30	1.58	7.90	44.00	6.10	0.7	0.7	K7Ve	TUC	1	m
TYC 8060 1673 1	CD-461064	3 30 49.10	-45 55 57.0	9.63	0.95	1.06	6.41	44.00	10.0	0.9	0.9	K3V	TUC	1	m
TYC 7574 0803 1	CD-441173	3 31 55.70	-43 59 14.0	10.90	1.30	1.58	7.78	42.00	10.70	0.7	0.8	K6Ve	TUC	-	m
TYC 5907 1244 1	BD-20951	4 52 49.50	-19 55 2.00	10.12	0.87	0.98	5.83	72.00	999.00	0.9	0.9	XX	TUC	1	m
TYC 5908 230 1	BD-191062	4 59 32.00	-19 17 42.0	10.60	1.20	1.37	6.44	68.00	999.00	1.0	1.2	XX	TUC	1	m
BD-091108	xxxx	5 15 36.50	-9 30 51.0	9.79	0.67	0.95	5.33	78.00	999.00	1.0	1.1	G5	TUC	-	m
TYC 7048 1453 1	CD-302310	5 18 29.00	-30 1 32.0	11.66	1.27	1.53	7.56	66.00	7.10	0.8	0.7	K4Ve	TUC	-	m
HIP 105388	HD 202917	21 20 50.00	-53 2 3.00	8.69	0.72	0.80	5.38	45.90	15.40	1.0	1.0	G7V	TUC	-	m
HIP 107345	GSC 9116-1363	21 44 30.10	-60 58 39.0	11.61	1.41	1.83	8.25	47.00	8.20	0.7	0.8	M0Ve	TUC	-	m
TYC 9344 0293 1	AC4600438	23 26 10.70	-73 23 50.0	11.82	1.39	1.91	8.51	46.00	61.00	0.7	0.8	XX	TUC	-	m
HIP 116748A	HD 222259A	23 39 39.50	-69 11 45.0	8.49	0.70	0.77	5.16	46.30	18.30	1.0	1.1	G6V+K3	TUC	-	m
RBS332	GSC 8056-0482	2 36 51.70	-52 3 4.00	12.11	1.48	2.33	9.38	35.10	36.00	0.4	0.9	M2V	TUC	-	n
TYC 7600 0516 1	CD-392075	5 37 5.30	-39 32 26.0	9.52	0.80	0.97	5.87	53.80	20.40	0.9	0.9	K1V(e)	TUC	-	n
TYC 7065 0879 1	CD-342406	5 42 34.30	-34 15 42.0	11.35	0.82	0.93	6.04	115.10	14.20	0.9	0.9	K0V	TUC	-	n
HIP 105404	HD 202947	21 20 59.80	-52 28 40.0	9.82	0.88	1.04	6.50	46.10	12.80	0.8	0.8	G9V	TUC	-	n
HIP 16853	HD 22705	3 36 53.40	-49 57 28.9	7.62	0.59	0.66	4.52	41.70	19.00	1.0	1.3	G2V	TUC	-	m
HIP 21632	HD 29615	4 38 43.90	-27 2 2.00	8.47	0.61	0.68	4.78	54.60	17.53	1.0	1.2	G3V	TUC	-	m

Notes. Summary data from the literature and mass derived from evolutionary tracks. Note n1=1 indicates that $V - I$ is derived from $B - V$. Note n2 = m indicates a confirmed member; n2 = n indicates a rejected member.

Table A.4. Columba association.

Name		RA (2000.0)	Dec (2000.0)	V (mag)	<i>B</i> − <i>V</i> (mag)	<i>V</i> − <i>I</i> (mag)	<i>M</i> _{<i>V</i>} (mag)	d (pc)	<i>v</i> sin <i>i</i> (km s ^{−1})	Mass (<i>M</i> _⊙)	Radius (<i>R</i> _⊙)	Sp.T	mgr	n1	n2
TYC 8047 0232 1	CD-52381	1 52 14.60	−52 19 33.0	10.89	0.95	1.08	6.07	92.00	19.80	0.9	0.9	K2V(e)	COL	−	m
BD-16351	xxx	2 1 35.60	−16 10 0.00	10.40	1.10	1.25	5.94	78.00	999.00	1.0	1.2	K5	COL	1	m
TYC 7558 0655 1	CD-44753	2 30 32.40	−43 42 23.0	10.42	1.07	1.22	6.84	52.00	7.00	0.8	0.8	K5V(e)	COL	1	m
HIP 16413	HD 21955	3 31 20.80	−30 30 59.0	9.93	0.64	0.73	4.50	122.00	22.30	1.0	1.3	G7IV	COL	−	m
HIP 19775	HD 26980	4 14 22.60	−38 19 2.00	9.08	0.58	0.65	4.50	82.60	13.90	1.0	1.3	G3V	COL	−	m
TYC 6457 2731 1	HD 27679	4 21 10.30	−24 32 21.0	9.43	0.62	0.69	5.05	75.00	11.00	1.0	1.3	G2V	COL	1	m
TYC 7584 1630 1	CD-431395	4 21 48.70	−43 17 33.0	10.18	0.69	0.77	4.40	143.00	25.70	1.0	1.3	G7V	COL	−	m
TYC 7044 0535 1	CD-361785	4 34 50.80	−35 47 21.0	10.84	0.84	0.99	6.41	77.00	9.10	0.9	0.9	K1Ve	COL	−	m
TYC 8077 0657 1	HD 31242	4 51 53.50	−46 47 13.0	9.85	0.69	0.76	5.56	72.00	999.00	1.0	1.0	G5V	COL	−	m
TYC 8080 1206 1	HD 272836	4 53 5.20	−48 44 39.0	10.78	0.87	1.00	6.38	76.00	999.90	0.9	0.9	K2V(e)	COL	1	m
HIP 25709	HD 36329	5 29 24.10	−34 30 56.0	9.18	0.65	0.71	4.82	74.60	8.30	1.0	1.2	G3V	COL	−	m
TYC 6502 1188 1	CD-292531	5 50 21.40	−29 15 21.0	11.31	0.66	0.74	5.44	149.00	999.00	1.0	1.0	K0V(e)	COL	1	m
TYC 7617 0549 1	CD-402458	6 26 6.90	−41 2 54.0	10.00	0.80	0.92	5.20	91.00	11.60	1.0	1.0	K0V	COL	1	m
TYC 7100 2112 1	CD-363202	6 52 46.70	−36 36 17.0	11.22	0.62	0.69	5.57	135.00	170.00	1.0	1.0	K2V(e)	COL	1	m
TYC 8118 0871 1	HD 51797	6 56 23.50	−46 46 55.0	9.84	0.78	0.89	5.46	75.00	15.60	1.0	1.0	K0V(e)	COL	1	m
TYC 7629 2824 1	CD-393026	7 1 51.80	−39 22 40.0	11.05	0.63	0.70	4.67	189.00	999.00	1.0	1.2	G9V(e)	COL	1	m
AGLep	BD-191194	5 30 19.00	−19 16 3.00	9.62	0.60	0.66	4.39	111.00	20.00	1.0	1.3	G5V	COL	1	m
TYC 5882 1169 1	BD-15705	4 2 16.50	−15 21 30.0	10.17	1.01	1.12	6.72	49.00	6.80	0.8	0.8	K3/4 ^a	COL	1	m

Notes. Summary data from the literature and mass derived from evolutionary tracks. Note n1 = 1 indicates that $V - I$ is derived from $B - V$. Note n2 = m indicates a confirmed member.

Table A.5. Carina association.

Name	RA (2000.0)	Dec (2000.0)	V (mag)	$B - V$ (mag)	$V - I$ (mag)	M_V (mag)	d (pc)	$v \sin i$ (km s ⁻¹)	Mass ($M_\odot$)	Radius ($R_\odot$)	Sp.T	mgr	n1	n2	
TYC 9390 0322 1	HD 42270	5 53 29.30	-81 56 53.0	9.14	0.79	0.97	5.29	59.00	30.30	1.0	1.2	K0V+VI	CAR	-	m
TYC 8559 1016 1	CD-571709	7 21 23.70	-57 20 37.0	10.72	0.64	0.76	5.72	100.00	11.70	0.9	1.0	K0V+D	CAR	1	m
TYC 8929 0927 1	CD-63408	8 24 6.00	-63 34 3.00	9.87	0.63	0.75	4.78	104.00	73.00	1.0	1.2	G5V	CAR	-	m
TYC 8569 1761 1	CP-531875	8 45 52.70	-53 27 28.0	10.29	0.63	0.75	4.48	145.00	45.00	1.0	1.0	G2V	CAR	1	m
TYC 9395 2139 1	CD-75392	8 50 5.40	-75 54 38.0	10.59	0.76	0.82	5.57	101.00	43.80	1.0	1.0	G9V	CAR	-	m
TYC 8569 3597 1	CD-532515	8 51 56.40	-53 55 57.0	11.06	0.69	0.79	5.31	141.00	29.00	1.0	1.0	G9V	CAR	-	m
TYC 8160 0958 1	CD-494008	8 57 52.20	-49 41 51.0	10.51	0.73	0.80	5.28	111.00	33.20	1.0	1.0	G9V	CAR	-	m
TYC 8586 0518 1	CP-551885	9 0 3.40	-55 38 24.0	10.83	0.68	0.78	5.40	122.00	44.00	1.0	1.0	G5V	CAR	-	m
TYC 8587 1126 1	CD-552543	9 9 29.40	-55 38 27.0	10.20	0.73	0.83	4.58	133.00	14.60	1.0	1.3	G8V	CAR	1	m
TYC 8587 2290 1	CD-542644	9 13 16.90	-55 29 3.00	11.36	0.66	0.79	5.76	132.00	39.50	0.9	1.0	G5V(e)	CAR	-	m
HIP 46063	HD 81544	9 23 35.00	-61 11 36.0	10.86	0.86	0.96	6.22	84.70	14.70	0.9	0.9	K1V(e)	CAR	-	m
TYC 8946 1225 1	CP-621293	9 43 8.80	-63 13 4.00	10.44	0.68	0.82	6.01	77.00	35.30	0.9	0.9	G6V	CAR	-	m
HIP 30034	HD 44627	6 19 12.90	-58 3 16.0	9.13	0.86	0.90	5.84	45.50	11.50	0.9	0.9	K1V(e)	CAR	-	m
HIP 32235	HD 49855	6 43 46.20	-71 58 35.0	8.94	0.70	0.76	5.18	56.50	12.40	1.0	1.1	G6V ^a	CAR	-	m
HIP 33737	HD 55279	7 0 30.50	-79 41 46.0	10.11	0.91	0.95	6.08	64.10	9.30	0.9	0.9	K2V ^a	CAR	-	m

Notes. Summary data from the literature and mass derived from evolutionary tracks. Note n1 = 1 indicates that $V - I$ is derived from $B - V$. Note n2 = m indicates a confirmed member.

Table A.6. AB Doradus association.

Name		RA (2000.0)	Dec (2000.0)	V (mag)	B - V (mag)	V - I (mag)	M _V (mag)	d (pc)	<i>v</i> sin <i>i</i> (km s ⁻¹)	Mass (M _☉)	Radius (R _☉)	Sp.T	mgr	n1	n2	
HIP 5191	HD 6569	1 6 26.15	-14 17 47.1	9.50	0.91	0.95	6.01	50.00	10.00	0.9	0.9	K1V	ABDOR	-	m	
TYC 8042 1050 1	CD-46644	2 10 55.40	-46 3 59.0	11.24	0.91	1.16	6.53	87.40	36.00	0.9	0.8	K3IVe	ABDOR	-	m	
HIP 10272	HD 13482	2 12 15.41	23 57 29.5	7.94	1.13	0.93	5.39	32.30	6.00	1.0	1.1	K1	ABDOR	-	m	
HIP 14684	ISEri	3 9 42.30	-9 34 47.0	8.48	0.81	0.84	5.46	40.20	7.00	1.0	1.0	G0	ABDOR	-	m	
HIP 17695	EUVEJ0347-01.9	3 47 23.34	-1 58 19.9	11.59	1.51	2.16	10.53	16.30	18.00	0.4	0.4	M3	ABDOR	-	m	
HIP 22738AB	CD-561032B	4 53 30.50	-55 51 32.0	11.16	1.56	2.56	10.91	11.20	999.00	0.2	0.6	M3Ve	ABDOR	-	m	
TYC 7587 0925 1	CD-401701	5 2 30.40	-39 59 13.0	10.57	0.88	1.02	6.24	73.60	6.80	0.9	0.9	K4V	ABDOR	1	m	
HIP 25283	HD 35650	5 24 30.17	-38 58 10.7	9.08	1.25	1.42	7.84	17.70	4.00	0.7	0.7	K6V	ABDOR	1	m	
HIP 25647	HD 36705A	5 28 44.83	-65 26 54.8	6.74	0.83	0.94	5.87	14.90	53.00	0.9	0.9	K0V	ABDOR	-	m	
TYC 7059 1111 1	UXCol	5 28 56.50	-33 28 16.0	10.46	1.06	1.25	6.90	51.50	41.50	0.8	0.8	K3Ve	ABDOR	-	m	
HIP 26373	HD 37572	5 36 56.85	-47 57 52.8	7.86	0.85	0.88	5.93	24.30	17.70	0.9	0.9	K0V	ABDOR	-	m	
CP-19878	xxxx	5 39 23.20	-19 33 29.0	10.71	0.91	1.06	6.45	71.00	32.00	0.9	0.9	K1V	ABDOR	-	m	
HIP 27727	HD 39576	5 52 16.00	-28 39 25.0	9.04	0.63	0.69	4.33	87.70	20.90	1.0	1.3	G3V	ABDOR	-	m	
TYC 7598 1488 1	TYCol	5 57 50.80	-38 4 3.00	9.56	0.69	0.82	5.26	72.50	55.00	1.0	1.0	G6V(e)	ABDOR	-	m	
TYC 7079 0068 1	CD-342676	6 8 33.90	-34 2 55.0	10.17	0.79	0.86	5.55	83.80	4.70	1.0	1.0	G9Ve	ABDOR	1	m	
TYC 7084 0794 1	CD-352722	6 9 19.20	-35 49 31.0	10.98	1.69	2.56	12.40	5.20	13.00	0.2	0.3	M1Ve	ABDOR	1	m	
HIP 31878	CD-611439	6 39 50.02	-61 28 41.5	9.71	1.26	1.53	8.01	21.90	12.00	0.7	0.7	K7V(e)	ABDOR	-	m	
UCAC 206727592	GSC8544-1037	6 47 53.40	-57 13 32.0	11.50	0.90	1.20	6.49	100.30	7.00	0.9	0.8	K4V	ABDOR	-	m	
TYC 8558 1148 1	CD-571654	7 10 50.60	-57 36 46.0	10.44	0.68	0.70	4.80	134.50	29.20	1.0	1.2	G2V	ABDOR	1	m	
TYC 1355 214 1	BD+201790	7 10 50.60	-57 36 46.0	9.93	1.15	1.34	7.84	26.20	0.00	0.7	0.7	K3	ABDOR	1	m	
HIP 36108	HD 59169	7 26 17.70	-49 40 51.0	10.22	0.43	0.61	4.87	117.60	11.00	1.0	1.2	G7V	ABDOR	1	m	
HIP 36349	V372Pup	7 28 51.37	-30 14 48.5	9.96	1.44	1.78	8.99	15.60	20.50	0.6	0.6	M1Ve	ABDOR	-	m	
TYC 9493 0838 1	CD-8480	7 30 59.50	-84 19 28.0	9.96	0.83	0.93	5.73	70.20	3.00	1.0	1.0	G9V	ABDOR	1	m	
HIP 76768	HD 139751	15 40 28.39	-18 41 46.1	10.44	1.24	1.40	7.56	37.60	8.00	0.7	0.7	K3/K4V	ABDOR	-	m	
HIP 81084	LP745-70	16 33 41.61	-9 33 11.9	11.30	1.44	1.77	8.78	31.90	7.00	0.6	0.6	M0.5	ABDOR	-	m	
TYC 7379 0279 1	HD 317617	17 28 55.60	-32 43 57.0	10.45	0.93	1.10	6.71	56.00	4.00	0.8		XX	ABDOR	1	m	
BD-134687	HD 159911	17 37 46.47	-13 14 46.6	10.17	0.93	1.10	6.31	59.10	140.00	0.9	0.9	K3/K4I	ABDOR	1	m	
HIP 93375	HD 176367	19 1 6.00	-28 42 50.0	8.48	0.56	0.62	4.49	62.90	17.00	1.0	1.3	G1V	ABDOR	-	m	
HIP 94235	HD 178085	19 10 57.90	-60 16 20.0	8.34	0.59	0.66	4.56	57.10	24.00	1.0	1.3	G1V	ABDOR	-	m	
TYC 0486 4943	xxx	19 33 3.80	3 45 40.0	11.29	0.95	1.22	7.03	71.00	11.00	0.8	0.8	K3V	ABDOR	-	m	
HD 189285	BD-044987	19 59 24.10	-4 32 6.00	9.46	0.71	0.74	4.99	78.20	9.00	1.0	1.1	G5	ABDOR	1	m	
TYC 5164 567 1	BD-034778	20 4 49.40	-2 39 20.0	10.17	0.90	1.05	6.27	60.30	8.00	0.9	0.9	XX	ABDOR	1	m	
TYC 1090 0543	xxxx	20 54 28.00	9 6 7.00	11.73	1.07	1.27	7.35	75.00	18.00	0.7	0.7	XX	ABDOR	1	m	
TYC 6351 0286 1	HD201919	21 13 5.30	-17 29 13.0	10.64	1.21	1.42	7.56	41.30	7.90	0.7	0.7	K6Ve	ABDOR	-	m	
HIP 106231	LOPeg	21 31 1.71	23 20 7.37	9.19	1.05	1.23	7.19	25.10	65.85	0.8	0.7	K8	ABDOR	-	m	
HIP 107684	HD 207278	21 48 48.50	-39 29 9.00	9.66	0.69	0.75	5.04	84.00	10.40	1.0	1.1	G7V	ABDOR	-	m	
HIP 114530	HD 218860A	23 11 52.05	-45 8 10.6	8.75	0.80	0.79	5.23	50.60	6.60	1.0	1.0	G8V	ABDOR	-	m	
HIP 116910	HD 222575	23 41 54.30	-35 58 40.0	9.39	0.71	0.80	5.41	62.50	31.10	1.0	1.0	G8V	ABDOR	-	m	
PWAnd	HD1405	0 18 20.89	30 57 22.2	8.86	0.92	1.08	6.31	32.40	23.90	0.9		K2V	0.9	ABDOR	1	m
HIP 31711	HD 48189	6 38 0.36	-61 32 0.19	6.15	0.62	0.69	4.47	21.70	17.60	1.0	1.3	G2V	ABDOR	-	m	
HIP 63742	HD 113449	13 3 49.65	-5 9 42.5	7.69	0.85	0.89	5.97	22.10	5.20	0.9	0.9	G5V	ABDOR	-	m	
HIP 86346	HD 160934	17 38 39.63	61 14 16.1	10.45	1.23	1.46	7.86	33.00	17.00	0.7	0.7	M0	ABDOR	-	m	
HIP 114066	GJ9809	23 6 4.84	63 55 34.3	10.87	1.44	1.77	8.89	24.90	8.00	0.6	0.6	M0	ABDOR	-	m	
HIP 16563	HD 21845	3 33 13.49	46 15 26.5	8.15	0.80	0.81	5.51	33.80	7.00	1.0	1.0	G5+M0	ABDOR	-	m	
HD 32981	BD-161042	5 6 27.70	-15 49 30.0	9.13	0.58	0.67	4.39	88.60	6.00	1.0	1.3	F8V	ABDOR	1	m	
TYC 6494 1228 1	CD-262415	5 44 13.40	-26 6 15.0	10.88	0.86	0.98	6.10	90.20	999.90	0.9	0.9	K2Ve	ABDOR	1	m	
HIP 30314	HD 45270	6 22 30.94	-60 13 7.15	6.53	0.61	0.66	4.67	23.50	17.60	1.0	1.2	G1V	ABDOR	-	m	
HIP 113579	HD 217343	23 0 19.29	-26 9 13.5	7.47	0.65	0.72	4.94	32.00	12.40	1.0	1.2	G5V	ABDOR	-	m	
HIP 113597	HD 217379	23 0 27.95	-26 18 42.8	10.45	1.34	1.59	8.06	30.00	6.40	0.7	0.7	K7V	ABDOR	-	m	

Notes. Summary data from the literature and mass derived from evolutionary tracks. Note n1 = 1 indicates that $V - I$ is derived from $B - V$. Note n2 = m indicates a confirmed member.

Table A.7. Summary of period search.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
TW Hydrae							
TWA2	110914-3001.7	1869.8491	1971.7092	4.845	0.107	13.06	6.07
TWA2	110914-3001.7	1971.7092	2080.4703	4.860	0.072	5.49	5.00
TWA2	110914-3001.7	2577.8675	2683.7281	4.932	0.148	6.57	5.14
TWA2	110914-3001.7	2683.7281	2784.5825	4.845	0.107	12.63	7.49
TWA2	110914-3001.7	2971.8337	3072.8017	4.833	0.106	7.04	5.41
TWA2	110914-3001.7	3702.8454	3804.7395	4.833	0.106	10.39	5.73
TWA2	110914-3001.7	3804.7395	3906.6103	4.863	0.072	13.31	6.04
TWA2	110914-3001.7	4192.7428	4294.5382	4.827	0.071	9.23	3.86
TWA2	110914-3001.7	4530.6658	4631.5631	4.845	0.071	5.54	4.22
TWA4	112205-2446.7	1869.8517	1971.7029	14.306	0.621	2.59	2.56
TWA4	112205-2446.7	1971.7029	2080.4765	14.823	0.667	10.29	5.33
TWA4	112205-2446.7	2577.8698	2678.7525	13.773	1.152	8.95	4.25
TWA4	112205-2446.7	2678.7525	2783.5668	14.350	0.625	18.49	5.72
TWA4	112205-2446.7	2957.8519	3061.6796	13.435	0.820	5.69	4.20
TWA4	112205-2446.7	3061.6796	3162.6211	14.900	0.674	6.74	4.96
TWA4	112205-2446.7	3356.8211	3458.7097	14.066	0.904	8.33	6.18
TWA4	112205-2446.7	4089.8363	4192.6453	14.413	0.943	12.62	4.90
TWA4	112205-2446.7	4429.8464	4531.7230	14.712	0.983	9.06	6.92
TWA5A	113155-3436.5	2971.8337	3073.7926	0.770	0.003	5.50	3.59
TWA5A	113155-3436.5	4530.6658	4631.5631	0.776	0.002	8.04	7.08
TWA7	104230-3340.3	2678.7318	2782.6014	5.120	0.119	6.07	5.19
TWA8A	113241-2651.9	3704.8468	3805.7131	4.612	0.097	7.74	5.35
TWA8A	113241-2651.9	3805.7131	3907.5635	4.669	0.066	8.53	5.25
TWA8A	113241-2651.9	4089.8363	4193.6730	4.681	0.100	8.54	5.41
TWA8A	113241-2651.9	4431.8477	4535.6905	4.642	0.098	5.96	3.59
TWA9A	114824-3728.8	1870.8445	1971.7291	5.021	0.115	15.86	5.90
TWA9A	114824-3728.8	1971.7291	2078.4546	4.962	0.075	8.28	4.77
TWA9A	114824-3728.8	2222.8428	2266.8058	4.944	0.261	6.29	3.47
TWA9A	114824-3728.8	2622.8176	2722.8229	5.010	0.114	6.87	4.75
TWA9A	114824-3728.8	2722.8229	2827.4612	4.956	0.075	7.48	5.18
TWA9A	114824-3728.8	2973.8497	3075.7272	5.001	0.114	8.95	6.76
TWA9A	114824-3728.8	3075.7272	3177.5869	4.965	0.075	12.57	7.01
TWA9A	114824-3728.8	3459.6810	3560.5429	5.024	0.077	7.21	6.13
TWA9A	114824-3728.8	3701.8557	3802.6876	5.034	0.115	8.26	5.61
TWA9A	114824-3728.8	3802.6876	3904.5237	5.021	0.077	9.99	6.94
TWA9A	114824-3728.8	4205.7224	4311.5306	5.019	0.076	9.59	5.33
TWA9A	114824-3728.8	4435.8292	4536.7339	5.024	0.115	8.82	4.36
TWA9A	114824-3728.8	4536.7339	4639.5002	5.016	0.076	13.46	5.36
TWA10	123504-4136.6	1870.8577	1971.7490	8.385	0.319	5.60	4.86
TWA10	123504-4136.6	3456.7380	3559.5201	8.394	0.214	8.91	4.06
TWA12	112105-3845.3	1869.8421	1971.7064	3.302	0.050	21.94	6.01
TWA12	112105-3845.3	1971.7064	2080.4637	3.305	0.033	8.56	5.58
TWA12	112105-3845.3	2622.7856	2723.8191	3.296	0.049	14.28	6.88
TWA12	112105-3845.3	2723.8191	2826.4769	3.323	0.034	6.02	4.16
TWA12	112105-3845.3	3699.8381	3801.7085	1.431	0.009	11.62	4.38
TWA12	112105-3845.3	4091.7926	4194.7590	3.311	0.050	7.09	6.69
TWA12	112105-3845.3	4194.7590	4296.5018	3.314	0.033	5.73	4.73
TWA12	112105-3845.3	4532.6565	4639.4970	3.302	0.033	15.11	7.27
TWA13A	112117-3446.8	1869.8491	1971.7092	5.485	0.137	21.44	5.58
TWA13A	112117-3446.8	1971.7092	2080.4703	5.676	0.098	6.76	5.69
TWA13A	112117-3446.8	2679.7256	2782.6166	5.377	0.131	11.02	5.82
TWA13A	112117-3446.8	2782.6166	2868.4663	5.485	0.091	7.10	4.47
TWA13A	112117-3446.8	2971.8337	3073.7926	5.470	0.136	6.19	5.76
TWA13A	112117-3446.8	3357.8303	3458.7145	5.335	0.130	9.88	4.28
TWA13A	112117-3446.8	3458.7145	3561.5009	5.458	0.090	9.19	4.74
TWA13A	112117-3446.8	3702.8454	3804.7395	5.306	0.128	9.29	5.46
TWA13A	112117-3446.8	3804.7395	3906.6103	5.449	0.090	15.12	5.92
TWA13A	112117-3446.8	4192.7428	4294.5382	5.494	0.092	8.47	3.67

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
TWA13A	112117-3446.8	4429.8408	4530.6658	5.515	0.138	8.07	4.58
TWA13A	112117-3446.8	4530.6658	4631.5631	5.228	0.083	6.28	3.89
TWA21	101315-5230.9	2117.4793	2217.8209	4.441	0.243	7.01	4.48
TWA21	101315-5230.9	2680.7207	2782.5468	4.367	0.058	10.36	2.27
TWA21	101315-5230.9	2782.5468	2908.8949	4.433	0.149	8.59	6.03
TWA21	101315-5230.9	2908.8949	3010.7677	4.436	0.089	8.99	4.81
TWA21	101315-5230.9	3010.7677	3111.7718	4.456	0.090	5.52	4.31
TWA21	101315-5230.9	4192.7016	4293.4843	4.334	0.057	6.53	4.46
TWA21	101315-5230.9	4524.6437	4626.5014	4.385	0.058	6.97	5.47
TWA24	120942-5854.8	2622.7870	2723.8621	0.647	0.001	7.04	5.28
TWA24	120942-5854.8	2978.8378	3085.7643	0.686	0.002	5.25	2.94
TWA24	120942-5854.8	3458.7211	3562.5278	0.686	0.001	6.40	4.61
TWA24	120942-5854.8	4103.8367	4204.6921	0.686	0.002	6.36	3.76
TWA24	120942-5854.8	4438.8378	4540.6524	0.686	0.002	8.83	4.98
TWA25	121531-3948.7	1870.8445	1971.7291	5.057	0.116	17.88	5.90
TWA25	121531-3948.7	1971.7291	2078.4546	5.075	0.078	12.37	5.33
TWA25	121531-3948.7	2622.8176	2722.8229	5.066	0.117	12.94	6.07
TWA25	121531-3948.7	2722.8229	2827.4612	5.072	0.078	11.89	6.00
TWA25	121531-3948.7	2973.8497	3075.7272	5.051	0.116	10.28	4.17
TWA25	121531-3948.7	3075.7272	3177.5869	5.066	0.078	11.50	4.95
TWA25	121531-3948.7	3457.6827	3558.5267	5.030	0.077	9.29	5.29
TWA25	121531-3948.7	3701.8557	3802.6876	5.063	0.116	6.81	5.62
TWA25	121531-3948.7	3802.6876	3904.5237	2.525	0.019	10.00	5.50
TWA25	121531-3948.7	4089.8199	4190.7446	5.057	0.116	9.90	4.68
TWA25	121531-3948.7	4190.7446	4291.5889	5.096	0.079	8.67	6.28
TWA25	121531-3948.7	4435.8292	4536.7053	5.069	0.117	17.23	6.44
TWA25	121531-3948.7	4536.7053	4639.5002	5.096	0.079	19.77	5.31
β Pictoris members							
TYC 1186 706 1	002335+2014.5	2869.9122	2932.9122	7.710	0.361	5.81	4.54
HIP 12545	024126+0559.3	2812.9288	2915.7638	4.85	0.10	6.39	2.24
HIP 12545	024126+0559.3	2915.7638	3018.5612	4.82	0.10	12.35	4.80
HIP 12545	024126+0559.3	3562.9116	3663.7348	4.84	0.07	7.40	5.92
HIP 12545	024126+0559.3	4284.9221	4386.7595	4.82	0.07	7.29	5.01
HIP 23200	045935+0147.0	2621.6619	2723.5293	4.420	0.089	9.94	5.29
HIP 23200	045935+0147.0	2943.7331	3044.5393	4.352	0.058	6.65	4.82
HIP 23200	045935+0147.0	3044.5393	3110.4715	4.391	0.088	6.82	5.31
HIP 23200	045935+0147.0	4090.6508	4192.5137	4.376	0.087	8.94	3.60
HIP 23200	045935+0147.0	4302.9399	4406.7829	4.453	0.090	7.02	4.97
HIP 23200	045935+0147.0	4406.7829	4509.5594	4.441	0.060	9.78	4.50
HIP 23200	045935+0147.0	4509.5594	4576.4667	4.415	0.089	6.61	5.73
HIP 23200	045935+0147.0	4684.9082	4786.7110	4.394	0.059	14.24	5.33
HIP 23200	045935+0147.0	4786.7110	4888.5813	4.391	0.087	17.95	6.14
HIP 23309	050047-5715.4	1868.6855	1978.5925	8.867	0.357	8.36	4.42
HIP 23309	050047-5715.4	2104.9392	2206.7750	8.705	0.344	14.10	6.70
HIP 23309	050047-5715.4	2206.7750	2262.6303	8.660	0.571	11.81	5.53
HIP 23309	050047-5715.4	2574.7130	2675.5558	8.669	0.459	8.29	4.43
HIP 23309	050047-5715.4	2675.5558	2776.4572	8.663	0.341	3.68	3.40
HIP 23309	050047-5715.4	2877.8545	2979.6915	8.645	0.339	10.17	4.44
HIP 23309	050047-5715.4	2979.6915	3080.5359	8.648	0.340	9.11	5.68
HIP 23309	050047-5715.4	3355.6052	3460.5059	8.891	0.359	12.35	4.59
HIP 23309	050047-5715.4	3618.8440	3720.7068	8.654	0.227	7.20	4.22
HIP 23309	050047-5715.4	3720.7068	3821.5471	8.744	0.347	11.25	3.98
HIP 23309	050047-5715.4	4333.8507	4435.6749	8.720	0.231	17.61	6.99
HIP 23309	050047-5715.4	4435.6749	4538.5658	8.630	0.338	9.02	4.47
HIP 23418	050159+0959.0	2562.7588	2664.5912	6.331	0.305	4.59	3.64
HIP 23418	050159+0959.0	3400.5408	3468.4777	6.280	0.180	5.10	4.76
HIP 23418	050159+0959.0	4091.6549	4196.5100	6.499	0.128	5.79	5.48
HIP 23418	050159+0959.0	4332.8993	4437.6879	3.102	0.029	5.54	5.04

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
BD-211074A	050650-2135.1	1868.7126	1978.5976	14.129	0.906	7.35	6.42
BD-211074A	050650-2135.1	2206.7909	2264.6563	16.327	2.030	5.67	4.25
BD-211074A	050650-2135.1	3618.9036	3720.8036	13.615	0.563	6.17	3.21
BD-211074A	050650-2135.1	4440.6650	4541.5737	13.358	0.542	7.04	3.38
BD-211074A	050650-2135.1	4802.6655	4905.5599	14.063	0.898	5.38	5.36
HIP 29964	061828-7202.7	2621.7497	2722.6239	2.668	0.032	16.83	6.44
HIP 29964	061828-7202.7	2722.6239	2841.9405	2.683	0.022	4.18	3.61
HIP 29964	061828-7202.7	2841.9405	2943.7870	2.647	0.032	5.56	4.72
HIP 29964	061828-7202.7	2943.7870	3044.6415	2.662	0.032	11.26	5.01
HIP 29964	061828-7202.7	3044.6415	3146.5163	2.662	0.021	17.06	4.72
HIP 29964	061828-7202.7	3355.6876	3457.5443	2.659	0.032	8.46	5.05
HIP 29964	061828-7202.7	3457.5443	3578.9303	2.656	0.022	5.91	3.96
HIP 29964	061828-7202.7	3578.9303	3680.8310	2.710	0.033	4.01	3.33
HIP 29964	061828-7202.7	3680.8310	3787.7105	2.680	0.033	7.76	3.47
HIP 29964	061828-7202.7	3787.7105	3890.4766	2.668	0.022	21.23	8.07
HIP 29964	061828-7202.7	4305.9301	4408.7451	2.651	0.021	5.18	4.54
HIP 29964	061828-7202.7	4508.7861	4610.4743	2.647	0.021	6.44	3.33
HIP 76629	153857-5742.5	1919.8473	2025.6697	4.322	0.113	5.74	5.50
HIP 76629	153857-5742.5	2775.6861	2877.6380	4.334	0.057	12.35	4.17
HIP 76629	153857-5742.5	3131.7534	3190.6892	4.304	0.141	8.33	5.52
HIP 76629	153857-5742.5	3490.7282	3592.5170	4.328	0.057	15.25	5.55
HIP 76629	153857-5742.5	3592.5170	3663.4951	4.271	0.111	7.82	4.38
HIP 76629	153857-5742.5	3764.8304	3865.7344	4.352	0.086	6.10	3.77
HIP 76629	153857-5742.5	4329.5272	4389.4948	4.406	0.118	5.55	5.01
HIP 84586	171726-6657.1	2678.8486	2782.7538	1.667	0.013	12.00	2.15
HIP 84586	171726-6657.1	3390.8716	3492.7999	1.676	0.013	8.03	5.55
HIP 84586	171726-6657.1	3492.7999	3597.6768	1.685	0.009	12.73	8.19
HIP 84586	171726-6657.1	4129.8669	4231.7809	1.685	0.013	5.59	3.29
HIP 84586	171726-6657.1	4231.7809	4332.5306	1.688	0.009	9.64	3.83
HIP 84586	171726-6657.1	4332.5306	4411.5321	1.673	0.017	12.50	3.05
HIP 84586	171726-6657.1	4517.8652	4618.7335	1.646	0.012	7.08	5.34
HIP 84586	171726-6657.1	4618.7335	4720.6061	1.682	0.013	12.57	4.25
TYC 8728 2262 1	172955-5415.8	1939.8804	2040.7846	1.810	0.015	7.72	5.35
TYC 8728 2262 1	172955-5415.8	2441.6492	2543.6223	1.825	0.015	14.99	2.18
TYC 8728 2262 1	172955-5415.8	2782.7686	2883.5521	1.831	0.015	9.88	5.45
TYC 8728 2262 1	172955-5415.8	3057.8933	3159.7084	1.822	0.015	9.13	4.88
TYC 8728 2262 1	172955-5415.8	3404.8696	3508.8079	1.825	0.015	6.01	2.72
TYC 8728 2262 1	172955-5415.8	4133.8735	4234.8409	1.828	0.015	7.59	5.27
TYC 8728 2262 1	172955-5415.8	4517.8930	4623.7322	1.807	0.015	5.79	3.26
TYC 8728 2262 1	172955-5415.8	4623.7322	4725.6221	1.828	0.010	11.59	4.71
TYC 8742 2065 1	174834-5306.7	1939.8804	2052.7022	2.618	0.021	8.22	4.70
TYC 8742 2065 1	174834-5306.7	2052.7022	2156.4923	2.615	0.021	10.53	5.39
TYC 8742 2065 1	174834-5306.7	2441.6492	2543.6223	2.630	0.031	7.64	5.67
TYC 8742 2065 1	174834-5306.7	2678.8716	2782.7686	2.585	0.030	2.81	2.54
TYC 8742 2065 1	174834-5306.7	2883.5521	2954.5032	2.594	0.031	5.96	3.98
TYC 8742 2065 1	174834-5306.7	3057.8933	3159.7084	2.618	0.031	6.83	4.84
TYC 8742 2065 1	174834-5306.7	3508.8079	3616.5523	2.606	0.021	6.86	5.00
TYC 8742 2065 1	174834-5306.7	4517.8930	4622.8466	2.618	0.031	7.44	4.89
V4046Sgr	181411-3247.5	2083.6515	2184.5314	2.420	0.018	5.75	5.42
V4046Sgr	181411-3247.5	2442.6656	2544.5826	2.417	0.026	7.55	5.56
V4046Sgr	181411-3247.5	2683.8689	2784.7339	2.408	0.026	5.38	4.91
V4046Sgr	181411-3247.5	3055.8855	3156.7094	2.414	0.026	7.55	6.85
V4046Sgr	181411-3247.5	3411.8850	3517.7802	2.420	0.027	7.69	2.55
V4046Sgr	181411-3247.5	3786.8135	3887.7507	2.408	0.026	12.22	4.20
V4046Sgr	181411-3247.5	4622.7401	4725.6340	2.414	0.018	9.56	3.44
V4046Sgr	181411-3247.5	4725.6340	4775.5246	2.396	0.035	7.92	3.27
HIP 89829	181952-2916.5	2786.7180	2888.5939	0.572	0.001	7.51	4.73
HIP 89829	181952-2916.5	2888.5939	2959.5088	0.569	0.002	20.31	5.86
HIP 89829	181952-2916.5	3059.8771	3162.7454	0.569	0.002	13.00	6.22
HIP 89829	181952-2916.5	3162.7454	3191.8820	0.569	0.004	13.78	4.40

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
HIP 89829	181952-2916.5	3792.8775	3893.7454	0.572	0.002	4.68	2.92
HIP 89829	181952-2916.5	4256.7767	4359.4978	0.569	0.001	13.85	7.21
HIP 89829	181952-2916.5	4622.8527	4728.5967	0.569	0.001	13.77	4.59
TYC 9077 2489 1	184537-6451.8	2683.8879	2784.7688	0.354	0.001	5.13	3.44
TYC 9077 2489 1	184537-6451.8	2886.5303	2969.5206	0.354	0.001	6.26	4.85
TYC 9077 2489 1	184537-6451.8	3538.7476	3643.5140	0.354	0.000	8.50	4.93
TYC 9077 2489 1	184537-6451.8	4254.6904	4356.6371	0.354	0.000	10.14	5.12
TYC 9077 2489 1	184537-6451.8	4531.8626	4633.7455	0.354	0.001	7.13	6.42
TYC 9073 0762 1	184653-6210.6	1954.8712	2055.7403	5.407	0.089	7.55	5.37
TYC 9073 0762 1	184653-6210.6	2055.7403	2164.4855	5.315	0.086	6.59	4.28
TYC 9073 0762 1	184653-6210.6	2164.4855	2234.5129	5.419	0.178	8.21	6.78
TYC 9073 0762 1	184653-6210.6	2442.6901	2544.6317	2.674	0.033	7.03	5.26
TYC 9073 0762 1	184653-6210.6	2683.8879	2784.7688	2.680	0.033	6.78	4.63
TYC 9073 0762 1	184653-6210.6	2784.7688	2886.5303	5.362	0.087	8.88	4.67
TYC 9073 0762 1	184653-6210.6	2886.5303	2969.5206	5.374	0.131	10.04	4.74
TYC 9073 0762 1	184653-6210.6	3072.8783	3176.6964	5.341	0.130	9.33	6.92
TYC 9073 0762 1	184653-6210.6	3426.8762	3538.7476	5.359	0.130	13.55	5.47
TYC 9073 0762 1	184653-6210.6	3538.7476	3643.5140	5.359	0.087	11.91	6.10
TYC 9073 0762 1	184653-6210.6	3803.8883	3905.7481	5.404	0.133	9.65	5.92
TYC 9073 0762 1	184653-6210.6	4633.7455	4736.6036	5.309	0.086	8.19	4.24
TYC 7408 0054 1	185044-3147.8	2442.6802	2544.5857	1.042	0.005	7.55	4.25
TYC 7408 0054 1	185044-3147.8	2684.8814	2786.7180	1.090	0.005	7.38	5.80
TYC 7408 0054 1	185044-3147.8	2786.7180	2892.5890	1.090	0.005	60.73	5.20
TYC 7408 0054 1	185044-3147.8	3059.8895	3162.7709	1.087	0.005	6.58	4.56
TYC 7408 0054 1	185044-3147.8	3517.7967	3621.6109	1.042	0.003	4.69	3.69
TYC 7408 0054 1	185044-3147.8	3792.8796	3893.7552	1.042	0.005	14.72	3.40
TYC 7408 0054 1	185044-3147.8	4160.8893	4269.7754	1.042	0.005	7.33	3.84
TYC 7408 0054 1	185044-3147.8	4269.7754	4371.5816	1.042	0.003	11.55	6.28
TYC 7408 0054 1	185044-3147.8	4631.7562	4733.6386	1.042	0.003	9.17	4.13
TYC 7408 0054 1	185044-3147.8	4733.6386	4793.5118	1.042	0.007	5.47	3.46
HIP 92680	185306-5010.8	2440.6899	2544.6414	0.940	0.004	10.86	7.00
HIP 92680	185306-5010.8	2683.8827	2786.7313	0.943	0.004	12.77	5.81
HIP 92680	185306-5010.8	2786.7313	2888.7253	0.940	0.003	6.58	6.45
HIP 92680	185306-5010.8	2888.7253	2964.5136	0.940	0.005	5.50	5.09
HIP 92680	185306-5010.8	3064.8814	3170.7550	0.946	0.004	8.32	5.09
HIP 92680	185306-5010.8	3418.8868	3523.8097	0.946	0.004	6.99	6.00
HIP 92680	185306-5010.8	3796.8804	3900.7680	0.949	0.004	6.32	4.07
HIP 92680	185306-5010.8	4519.8811	4623.7031	0.943	0.004	4.76	4.19
TYC 6872 1011 1	185804-2953.1	2694.8885	2795.7456	0.498	0.008	57.21	4.73
TYC 6872 1011 1	185804-2953.1	2795.7456	2897.6609	0.548	0.002	32.30	2.68
TYC 6878 0195 1	191145-2604.2	2065.7160	2167.5015	5.772	0.152	9.98	7.15
TYC 6878 0195 1	191145-2604.2	2442.7047	2546.5665	5.596	0.142	6.25	4.34
TYC 6878 0195 1	191145-2604.2	2699.8909	2808.8642	5.802	0.153	10.47	5.98
TYC 6878 0195 1	191145-2604.2	2808.8642	2909.5902	5.733	0.100	6.24	5.72
TYC 6878 0195 1	191145-2604.2	3550.7505	3655.5094	5.611	0.096	6.08	4.10
TYC 6878 0195 1	191145-2604.2	3798.8878	3901.7812	5.700	0.147	8.38	6.99
TYC 6878 0195 1	191145-2604.2	4639.7619	4742.5516	5.605	0.095	6.56	4.88
HIP 102409	204510-3120.4	1982.8977	2085.7160	4.824	0.071	6.56	4.78
HIP 102409	204510-3120.4	2085.7160	2187.5341	4.824	0.071	7.26	6.14
HIP 102409	204510-3120.4	2439.7776	2545.6510	4.893	0.073	11.33	5.60
HIP 102409	204510-3120.4	3098.9117	3191.7908	4.848	0.107	8.07	5.62
HIP 102409	204510-3120.4	3560.7740	3661.5945	4.851	0.071	10.02	4.05
HIP 102409	204510-3120.4	3821.9007	3907.8846	4.971	0.112	6.96	3.55
TYC 6349 0200 1	205603-1710.9	2086.6786	2189.5217	3.398	0.035	8.77	3.72
TYC 6349 0200 1	205603-1710.9	2443.7596	2545.6374	3.413	0.053	14.23	5.60
TYC 6349 0200 1	205603-1710.9	2714.9075	2816.8622	3.413	0.053	6.05	5.23
TYC 6349 0200 1	205603-1710.9	3446.9053	3547.8077	3.392	0.052	5.73	5.26
TYC 6349 0200 1	205603-1710.9	3811.9060	3913.8320	3.404	0.053	9.53	3.07
TYC 6349 0200 1	205603-1710.9	4278.7821	4381.6692	3.395	0.035	10.40	4.83
TYC 6349 0200 1	205603-1710.9	4547.9087	4648.7876	3.407	0.053	5.86	3.14

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
TYC 2211-1309-1	220042+2715.2	2886.9104	2946.9104	0.477	0.001	6.02	5.56
TYC 9340 0437 1	224249-7142.3	2443.8408	2544.7693	4.456	0.090	13.30	3.78
TYC 9340 0437 1	224249-7142.3	2544.7693	2645.5351	4.480	0.061	8.43	5.67
TYC 9340 0437 1	224249-7142.3	2866.7478	2968.5674	4.486	0.061	7.53	3.62
TYC 9340 0437 1	224249-7142.3	3497.8854	3602.7470	4.486	0.061	5.76	4.42
TYC 9340 0437 1	224249-7142.3	4329.7434	4431.5524	4.385	0.058	6.65	3.97
TYC 9340 0437 1	224249-7142.3	4585.8958	4691.6991	4.453	0.060	8.19	4.38
HIP 112312	224458-3315.1	2011.9152	2113.8034	2.366	0.025	7.61	6.41
HIP 112312	224458-3315.1	4329.7515	4432.5878	2.345	0.025	5.93	4.77
TYC 5832 0666 1	233231-1215.9	2130.7996	2232.5430	5.772	0.152	7.80	7.08
TYC 5832 0666 1	233231-1215.9	2444.8179	2545.7861	5.754	0.150	7.26	5.04
TYC 5832 0666 1	233231-1215.9	2859.7308	2961.5931	5.688	0.098	13.22	4.79
TYC 5832 0666 1	233231-1215.9	3511.8937	3619.6926	5.700	0.148	6.69	6.51
TYC 5832 0666 1	233231-1215.9	3619.6926	3722.5561	5.644	0.097	11.07	3.68
TYC 5832 0666 1	233231-1215.9	4691.7744	4792.5695	5.682	0.002	6.30	5.84
Tucana/Horologium members							
HIP 1113	001353-7441.3	1873.5807	1949.5159	3.709	0.084	9.43	4.44
HIP 1113	001353-7441.3	2015.9238	2094.9238	7.431	0.335	3.75	3.17
HIP 1113	001353-7441.3	2094.9238	2173.9238	3.721	0.063	12.85	4.77
HIP 1113	001353-7441.3	2173.9238	2252.9238	3.727	0.084	19.36	14.42
HIP 1113	001353-7441.3	2446.8718	2525.8718	3.736	0.064	11.73	5.13
HIP 1113	001353-7441.3	2604.8718	2683.8718	3.721	0.084	15.31	3.85
HIP 1113	001353-7441.3	2871.8490	2958.8490	3.691	0.062	17.14	6.16
HIP 1113	001353-7441.3	2958.8490	3045.8490	3.703	0.062	20.40	5.44
HIP 1113	001353-7441.3	3512.9315	3600.9315	3.727	2.022	9.30	7.67
HIP 1113	001353-7441.3	3688.9315	3776.9315	3.745	0.064	9.18	4.76
HIP 1113	001353-7441.3	3861.9271	3911.9184	3.676	0.103	12.91	4.57
HIP 1113	001353-7441.3	4322.9159	4415.9159	3.598	0.059	38.60	4.48
HIP 1113	001353-7441.3	4415.9159	4508.9159	3.583	0.039	15.30	5.39
HIP 1910	002409-6211.1	1872.6035	1948.5159	1.744	0.018	18.63	6.05
HIP 1910	002409-6211.1	2186.8901	2262.8901	1.715	0.018	11.31	4.40
HIP 1910	002409-6211.1	2598.8992	2677.8992	1.754	0.019	17.32	4.45
HIP 1910	002409-6211.1	2849.9221	2942.9221	1.744	0.009	12.27	5.39
HIP 1910	002409-6211.1	3357.5784	3414.5152	1.748	0.019	8.58	4.24
HIP 1910	002409-6211.1	3599.9243	3686.9243	1.750	0.014	15.29	5.29
HIP 1910	002409-6211.1	3686.9243	3773.9243	1.756	0.014	12.83	4.56
HIP 1910	002409-6211.1	3850.9230	3912.9226	1.742	0.018	4.86	3.88
HIP 1910	002409-6211.1	4397.9306	4565.9306	1.744	0.014	27.38	6.71
HIP 1910	002409-6211.1	4565.9306	4733.9306	1.748	0.009	11.43	7.32
HIP 1993	002515-6130.8	2034.8901	2110.8901	4.352	0.115	11.26	4.89
HIP 1993	002515-6130.8	2110.8901	2186.8901	4.325	0.086	31.50	5.23
HIP 1993	002515-6130.8	2186.8901	2262.8901	4.358	0.115	37.35	4.18
HIP 1993	002515-6130.8	2849.9221	2942.9221	4.319	0.057	10.30	6.39
HIP 1993	002515-6130.8	2942.9221	3035.9221	4.373	0.058	14.45	6.51
HIP 1993	002515-6130.8	3126.9283	3210.9164	4.376	0.116	11.59	5.68
HIP 1993	002515-6130.8	3512.9013	3599.9013	4.364	0.116	12.56	5.16
HIP 1993	002515-6130.8	3599.9013	3686.9013	4.289	0.084	10.76	5.89
HIP 1993	002515-6130.8	3850.9230	3912.9226	4.397	0.117	11.24	3.67
HIP 1993	002515-6130.8	4398.9083	4566.9083	4.391	0.059	13.32	4.91
TYC 9351 1110 1	004220-7747.7	2098.9028	2179.9028	2.558	0.030	19.18	4.43
TYC 9351 1110 1	004220-7747.7	2179.9028	2260.9028	2.561	0.030	8.03	5.36
TYC 9351 1110 1	004220-7747.7	2440.8720	2641.8720	2.576	0.020	26.32	5.71
TYC 9351 1110 1	004220-7747.7	2842.8720	3043.8720	2.582	0.020	10.98	8.79
TYC 9351 1110 1	004220-7747.7	3503.9326	3593.9326	2.426	0.027	5.34	4.26
TYC 9351 1110 1	004220-7747.7	4229.9222	4321.9222	2.555	0.040	7.55	7.39
TYC 9351 1110 1	004220-7747.7	4321.9222	4413.9222	2.579	0.020	14.59	5.19
TYC 9351 1110 1	004220-7747.7	4674.9125	4771.9125	2.564	0.020	9.53	4.80
TYC 8852 0264 1	011315-6411.6	2053.9349	2121.9349	4.857	0.143	9.15	5.86

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
TYC 8852 0264 1	011315-6411.6	2121.9349	2189.9349	4.740	0.103	11.40	4.92
TYC 8852 0264 1	011315-6411.6	2189.9349	2257.9349	4.797	0.140	21.17	4.29
TYC 8852 0264 1	011315-6411.6	2445.8437	2529.8437	4.770	0.138	4.86	3.99
TYC 8852 0264 1	011315-6411.6	2613.8437	2697.8437	4.839	0.142	5.97	3.89
TYC 8852 0264 1	011315-6411.6	3606.9243	3700.9243	4.782	0.104	9.73	5.28
TYC 8852 0264 1	011315-6411.6	3700.9243	3794.9243	4.767	0.069	11.34	5.97
TYC 8852 0264 1	011315-6411.6	4426.9293	4524.9293	4.794	0.070	9.88	4.78
HIP 6485	012321-5728.9	2446.8471	2534.8471	3.473	0.073	6.13	4.96
HIP 6485	012321-5728.9	2534.8471	2622.8471	3.509	0.131	7.81	3.15
HIP 6485	012321-5728.9	2622.8471	2710.8471	3.389	0.052	7.49	5.39
HIP 6485	012321-5728.9	2975.9163	3069.9163	3.535	0.038	6.11	5.84
HIP 6485	012321-5728.9	3610.9188	3707.9188	3.628	0.060	4.99	3.94
HIP 9141	015749-2154.1	2446.8910	2531.8910	3.006	0.055	6.42	5.44
HIP 9141	015749-2154.1	2616.8910	2701.8910	3.033	0.042	11.18	4.63
HIP 9141	015749-2154.1	2892.9073	2978.9073	3.024	0.042	9.45	3.28
HIP 9892	020718-5311.9	2124.9349	2192.9349	2.525	0.029	5.70	5.17
HIP 9892	020718-5311.9	2447.8841	2540.8841	2.366	0.034	6.80	4.84
HIP 9892	020718-5311.9	2904.9084	2998.9084	2.232	0.023	10.22	2.92
HIP 9892	020718-5311.9	2998.9084	3092.9084	2.393	0.026	10.13	6.07
HIP 9892	020718-5311.9	3625.9216	3723.9216	2.268	0.023	7.62	4.62
HIP 9892	020718-5311.9	4349.9253	4450.9253	2.292	0.024	3.03	2.62
HIP 9892	020718-5311.9	4450.9253	4551.9253	2.229	0.015	7.36	4.08
RBS332	023652-5203.1	2124.9349	2192.9349	1.538	0.011	7.56	7.17
RBS332	023652-5203.1	2633.8841	2726.8841	1.541	0.011	7.27	5.01
RBS332	023652-5203.1	2810.9084	2904.9084	1.529	0.007	5.18	4.94
RBS332	023652-5203.1	2904.9084	2998.9084	1.538	0.011	8.38	3.99
RBS332	023652-5203.1	3382.7614	3470.7614	1.538	0.011	7.44	6.83
RBS332	023652-5203.1	3731.9216	3833.9216	1.526	0.007	8.37	6.25
TYC 8491 0656 1	024147-5259.9	1872.6255	1917.6255	1.275	0.012	6.54	5.05
TYC 8491 0656 1	024147-5259.9	2124.9349	2192.9349	1.272	0.007	7.37	3.64
TYC 8491 0656 1	024147-5259.9	2192.9349	2260.9349	1.278	0.007	7.54	4.65
TYC 8491 0656 1	024147-5259.9	4370.9442	4461.9442	1.272	0.007	8.70	4.48
TYC 8497 0995 1	024233-5739.6	1871.6346	1932.6346	7.428	0.335	22.39	3.25
TYC 8497 0995 1	024233-5739.6	2124.9349	2192.9349	7.273	0.242	9.67	5.65
TYC 8497 0995 1	024233-5739.6	2192.9349	2260.9349	7.396	0.250	18.60	5.53
TYC 8497 0995 1	024233-5739.6	2446.9107	2540.9107	7.449	0.337	12.98	5.36
TYC 8497 0995 1	024233-5739.6	2634.9107	2728.9107	7.201	0.235	18.57	7.28
TYC 8497 0995 1	024233-5739.6	2806.9349	2902.9349	7.324	0.244	13.31	3.53
TYC 8497 0995 1	024233-5739.6	2902.9349	2998.9349	7.417	0.250	26.45	6.37
TYC 8497 0995 1	024233-5739.6	2998.9349	3094.9349	7.348	0.164	11.23	5.97
TYC 8497 0995 1	024233-5739.6	4416.9394	4573.9394	7.336	0.082	9.83	2.87
TYC 8497 0995 1	024233-5739.6	4573.9394	4730.9394	7.428	0.251	6.02	4.48
TYC 7026 0325 1	031909-3507.0	1871.6343	1933.6343	8.493	0.438	14.44	5.21
TYC 7026 0325 1	031909-3507.0	2125.9395	2194.9395	8.502	0.330	17.62	4.88
TYC 7026 0325 1	031909-3507.0	2194.9395	2263.9395	8.544	0.334	27.35	5.08
TYC 7026 0325 1	031909-3507.0	2445.9253	2543.9253	8.702	0.230	6.37	5.00
TYC 7026 0325 1	031909-3507.0	2641.9253	2739.9253	8.627	0.226	5.61	4.49
TYC 7026 0325 1	031909-3507.0	2812.9380	2909.9380	8.376	0.319	7.85	3.82
TYC 7026 0325 1	031909-3507.0	2909.9380	3006.9380	8.493	0.328	16.92	5.13
TYC 7026 0325 1	031909-3507.0	3006.9380	3103.9380	8.478	0.218	10.37	6.49
TYC 7026 0325 1	031909-3507.0	3641.9329	3737.9329	8.463	0.325	10.95	4.74
TYC 7026 0325 1	031909-3507.0	4284.9312	4379.9312	8.562	0.223	7.06	4.87
TYC 8060 1673 1	033049-4555.9	2911.9380	3011.9380	3.745	0.064	10.54	4.29
TYC 8060 1673 1	033049-4555.9	3011.9380	3111.9380	3.909	0.046	7.71	2.33
TYC 8060 1673 1	033049-4555.9	3407.8290	3480.8290	3.802	0.066	10.10	5.89
TYC 8060 1673 1	033049-4555.9	3657.9219	3752.9219	3.775	0.065	6.44	4.82
TYC 8060 1673 1	033049-4555.9	4373.9392	4472.9392	3.775	0.065	8.39	4.01
TYC 8060 1673 1	033049-4555.9	4472.9392	4571.9392	3.733	0.042	5.78	2.99
TYC 8060 1673 1	033049-4555.9	4629.9390	4724.9390	3.787	0.065	7.41	4.47
TYC 7574 0803 1	033156-4359.2	1871.6523	1934.6523	2.953	0.053	9.78	6.07

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
TYC 7574 0803 1	033156-4359.2	2133.9410	2195.9410	2.958	0.053	7.06	3.93
TYC 7574 0803 1	033156-4359.2	2195.9410	2257.9410	2.943	0.040	10.56	4.30
TYC 7574 0803 1	033156-4359.2	2558.8800	2655.8800	2.934	0.039	2.93	2.44
TYC 7574 0803 1	033156-4359.2	3011.9380	3111.9380	2.934	0.026	4.70	4.56
TYC 7574 0803 1	033156-4359.2	3398.8290	3462.8290	2.923	0.065	6.31	4.29
TYC 7574 0803 1	033156-4359.2	3544.9406	3640.9406	2.941	0.026	5.29	4.70
TYC 7574 0803 1	033156-4359.2	3640.9406	3736.9406	2.923	0.039	10.51	4.82
TYC 7574 0803 1	033156-4359.2	3736.9406	3832.9406	2.926	0.026	10.59	6.10
TYC 7574 0803 1	033156-4359.2	4274.9392	4370.9392	2.920	0.026	7.77	5.47
TYC 7574 0803 1	033156-4359.2	4370.9392	4466.9392	2.938	0.039	11.32	4.10
TYC 7574 0803 1	033156-4359.2	4629.9390	4725.9390	2.946	0.039	6.54	4.72
TYC 8083 0455 1	044801-5041.4	2087.9266	2174.9266	8.388	0.320	5.99	3.13
TYC 8083 0455 1	044801-5041.4	2174.9266	2261.9266	8.592	0.337	8.47	5.79
TYC 8083 0455 1	044801-5041.4	3563.9255	3662.9255	8.511	0.220	8.85	4.38
TYC 8083 0455 1	044801-5041.4	4498.9314	4711.9314	8.215	0.205	9.57	5.77
TYC 5907 1244 1	045249-1955.0	1872.6985	1940.6985	5.231	0.125	17.39	5.22
TYC 5907 1244 1	045249-1955.0	2089.9401	2178.9401	5.171	0.121	8.86	5.82
TYC 5907 1244 1	045249-1955.0	2178.9401	2267.9401	5.177	0.122	23.33	5.33
TYC 5907 1244 1	045249-1955.0	2466.9353	2564.9353	5.153	0.081	7.72	6.73
TYC 5907 1244 1	045249-1955.0	2564.9353	2662.9353	5.228	0.083	4.33	3.56
TYC 5907 1244 1	045249-1955.0	2662.9353	2760.9353	5.117	0.080	4.26	2.84
TYC 5907 1244 1	045249-1955.0	2832.9296	2930.9296	5.111	0.119	6.89	4.99
TYC 5907 1244 1	045249-1955.0	2930.9296	3028.9296	5.222	0.124	8.73	5.55
TYC 5907 1244 1	045249-1955.0	3028.9296	3126.9296	5.192	0.082	8.28	5.41
TYC 5907 1244 1	045249-1955.0	3416.6812	3475.6812	5.213	0.166	6.60	5.65
TYC 5907 1244 1	045249-1955.0	3666.9245	3758.9245	5.317	0.128	10.74	4.49
TYC 5907 1244 1	045249-1955.0	4748.9310	4830.9310	5.273	0.126	8.14	4.44
TYC 5908 230 1	045932-1917.7	2096.9386	2176.9386	4.053	0.100	7.09	4.53
TYC 5908 230 1	045932-1917.7	2945.8955	3035.8955	3.960	0.048	7.03	4.79
TYC 5908 230 1	045932-1917.7	3035.8955	3125.8955	4.119	0.077	10.03	5.41
TYC 5908 230 1	045932-1917.7	3357.6812	3416.6812	4.044	0.100	6.97	5.70
TYC 5908 230 1	045932-1917.7	3666.9245	3758.9245	4.026	0.074	7.05	5.16
TYC 5908 230 1	045932-1917.7	3758.9245	3850.9245	4.065	0.075	7.98	5.82
TYC 5908 230 1	045932-1917.7	4390.9278	4481.9278	4.035	0.099	6.62	5.12
TYC 5908 230 1	045932-1917.7	4481.9278	4572.9278	4.083	0.051	14.27	4.43
TYC 5908 230 1	045932-1917.7	4749.9310	4832.9310	4.235	0.081	4.76	3.85
TYC 5908 230 1	045932-1917.7	4832.9310	4915.9310	4.029	0.014	6.14	4.71
BD-091108	051537-0930.8	2183.9378	2261.9378	2.755	0.035	8.82	2.57
BD-091108	051537-0930.8	2582.8871	2671.8871	2.725	0.045	7.32	6.36
BD-091108	051537-0930.8	2671.8871	2760.8871	2.719	0.034	9.40	5.15
BD-091108	051537-0930.8	3029.9378	3123.9378	2.728	0.034	7.77	1.82
BD-091108	051537-0930.8	4492.9364	4582.9364	2.740	0.140	5.90	5.44
TYC 7048 1453 1	051829-3001.5	2664.9322	2762.9322	1.694	0.009	5.68	3.25
TYC 7048 1453 1	051829-3001.5	2936.9408	3038.9408	1.697	0.013	9.33	5.15
TYC 7600 0516 1	053705-3932.4	1872.7106	1951.7106	2.465	0.037	11.65	6.01
TYC 7600 0516 1	053705-3932.4	3428.6342	3500.6342	2.462	0.028	5.37	3.48
TYC 7600 0516 1	053705-3932.4	3562.9387	3664.9387	2.450	0.018	10.46	6.00
TYC 7600 0516 1	053705-3932.4	3766.9387	3868.9387	2.459	0.018	10.53	4.93
TYC 7600 0516 1	053705-3932.4	4090.7715	4162.7715	2.420	0.027	6.80	5.42
TYC 7600 0516 1	053705-3932.4	4162.7715	4234.7715	2.474	0.028	7.81	4.23
TYC 7600 0516 1	053705-3932.4	4442.9398	4586.9398	2.453	0.018	20.66	5.11
TYC 7065 0879 1	054234-3415.7	1871.7231	1950.7231	3.897	0.069	26.03	5.65
TYC 7065 0879 1	054234-3415.7	1950.7231	2029.7231	3.882	0.115	6.98	4.66
TYC 7065 0879 1	054234-3415.7	2105.9249	2183.9249	3.855	0.090	6.57	4.99
TYC 7065 0879 1	054234-3415.7	2183.9249	2261.9249	3.820	0.067	15.82	5.37
TYC 7065 0879 1	054234-3415.7	2468.9322	2692.9322	3.811	0.044	9.55	8.57
TYC 7065 0879 1	054234-3415.7	2692.9322	2916.9322	3.948	0.047	5.59	5.03
TYC 7065 0879 1	054234-3415.7	2916.9322	3140.9322	3.879	0.023	19.91	4.76
TYC 7065 0879 1	054234-3415.7	4504.9385	4605.9385	3.890	0.000	6.80	2.97
HIP 105388	212050-5302.0	2081.9042	2167.9042	3.497	0.056	7.91	3.55

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
HIP 105388	212050-5302.0	2440.7815	2506.7815	3.535	0.076	9.44	4.50
HIP 105388	212050-5302.0	2506.7815	2572.7815	3.601	0.079	7.84	2.55
HIP 105388	212050-5302.0	3638.8837	3730.8837	3.359	0.034	6.14	2.02
HIP 105388	212050-5302.0	4279.8981	4367.8981	3.365	0.052	7.53	4.92
HIP 105388	212050-5302.0	4367.8981	4455.8981	3.398	0.070	5.37	1.72
HIP 105388	212050-5302.0	4548.8991	4609.8991	3.410	0.088	7.88	3.73
HIP 105404	212100-5228.7	1995.9042	2081.9042	3.829	0.044	4.71	4.59
HIP 105404	212100-5228.7	2715.9063	2809.9063	0.408	0.001	5.36	4.99
HIP 107345	214430-6058.6	2084.8985	2168.8985	4.567	0.095	6.43	4.77
HIP 107345	214430-6058.6	2168.8985	2252.8985	4.540	0.094	7.61	5.31
HIP 107345	214430-6058.6	4284.9087	4374.9087	4.516	0.093	10.18	5.45
HIP 107345	214430-6058.6	4374.9087	4464.9087	4.519	0.093	5.20	4.51
HIP 107345	214430-6058.6	4642.9073	4731.9073	4.480	0.061	7.69	5.90
TYC 9344 0293 1	232611-7323.8	1873.5505	2002.5505	1.329	0.011	4.08	3.76
TYC 9344 0293 1	232611-7323.8	2131.5505	2260.5505	1.335	0.008	7.90	6.74
TYC 9344 0293 1	232611-7323.8	2444.8408	2699.8408	1.326	0.005	17.68	5.97
TYC 9344 0293 1	232611-7323.8	2699.8408	2954.8408	1.326	0.005	8.58	5.02
TYC 9344 0293 1	232611-7323.8	2954.8408	3209.8408	1.323	0.008	10.89	5.45
TYC 9344 0293 1	232611-7323.8	4609.5559	4871.5559	1.326	0.005	13.97	6.39
TYC 9529 0340 1	232749-8613.3	1871.6867	1998.6867	2.304	0.024	10.36	6.83
TYC 9529 0340 1	232749-8613.3	1998.6867	2125.6867	2.325	0.016	9.93	8.93
TYC 9529 0340 1	232749-8613.3	2125.6867	2252.6867	2.307	0.016	14.38	13.28
TYC 9529 0340 1	232749-8613.3	2440.8676	2673.8676	2.316	0.016	16.83	7.15
TYC 9529 0340 1	232749-8613.3	2906.8676	3139.8676	2.357	0.017	11.52	7.64
TYC 9529 0340 1	232749-8613.3	3356.6151	3541.6151	2.298	0.008	8.74	8.38
TYC 9529 0340 1	232749-8613.3	3541.6151	3726.6151	2.307	0.016	12.49	6.34
TYC 9529 0340 1	232749-8613.3	3726.6151	3911.6151	2.340	0.008	11.34	5.18
TYC 9529 0340 1	232749-8613.3	4218.5287	4351.5287	2.345	0.017	7.99	5.10
TYC 9529 0340 1	232749-8613.3	4351.5287	4484.5287	2.360	0.017	4.84	4.61
TYC 9529 0340 1	232749-8613.3	4674.8070	4806.8070	2.366	0.025	12.30	6.55
HIP 116748A	233939-6911.8	2179.9238	2261.9238	2.860	0.050	11.44	4.73
HIP 116748A	233939-6911.8	2604.8718	2683.8718	2.938	0.052	5.76	5.17
HIP 116748A	233939-6911.8	3671.9162	3774.9162	2.851	0.037	5.26	3.90
HIP 116748A	233939-6911.8	3850.9230	3911.9184	2.839	0.049	7.94	3.72
HIP 116748A	233939-6911.8	4561.8751	4727.8751	2.851	0.025	10.24	3.46
Columba members							
TYC 8047 0232 1	015215-5219.6	2056.8962	2124.8962	2.396	0.035	4.26	3.76
TYC 8047 0232 1	015215-5219.6	2975.9163	3069.9163	2.402	0.018	6.21	3.28
TYC 8047 0232 1	015215-5219.6	3513.9289	3643.9289	2.402	0.026	12.63	5.39
TYC 8047 0232 1	015215-5219.6	3643.9289	3773.9289	2.426	0.018	4.78	4.61
TYC 8047 0232 1	015215-5219.6	4466.9094	4685.9094	2.384	0.017	8.98	4.76
BD-16351	020136-1610.0	1872.6217	1948.5239	3.195	0.062	6.02	4.26
BD-16351	020136-1610.0	2125.9315	2193.9315	3.222	0.047	4.43	4.22
BD-16351	020136-1610.0	2193.9315	2261.9315	3.213	0.047	7.37	7.10
BD-16351	020136-1610.0	2612.9066	2695.9066	3.201	0.047	3.86	3.82
BD-16351	020136-1610.0	2890.9140	2974.9140	3.177	0.031	10.52	4.41
BD-16351	020136-1610.0	2974.9140	3058.9140	3.189	0.046	7.26	5.27
BD-16351	020136-1610.0	3364.6163	3433.5054	3.236	0.048	7.74	6.41
BD-16351	020136-1610.0	3710.9287	3793.9287	3.186	0.046	7.44	4.99
BD-16351	020136-1610.0	4443.9093	4523.9093	3.147	0.045	6.50	5.42
TYC 7558 0655 1	023032-4342.4	1871.6245	1917.6245	8.995	0.616	5.75	4.87
TYC 7558 0655 1	023032-4342.4	2123.9320	2190.9320	9.249	0.391	8.69	5.82
TYC 7558 0655 1	023032-4342.4	2190.9320	2257.9320	9.207	0.518	7.22	4.70
TYC 7558 0655 1	023032-4342.4	2446.8960	2539.8960	9.019	0.372	11.90	4.76
TYC 7558 0655 1	023032-4342.4	2632.8960	2725.8960	9.895	0.447	6.03	2.92
TYC 7558 0655 1	023032-4342.4	2884.9272	2981.9272	10.248	0.319	5.94	5.35
TYC 7558 0655 1	023032-4342.4	2981.9272	3078.9272	10.215	0.317	5.93	2.29
HIP 16413	033121-3031.0	1872.6550	1933.6550	2.271	0.031	5.96	3.59

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
HIP 16413	033121-3031.0	2543.9253	2641.9253	2.109	0.020	5.37	5.20
HIP 16413	033121-3031.0	2910.9380	3008.9380	2.256	0.023	6.41	5.85
HIP 16413	033121-3031.0	4284.9312	4379.9312	2.157	0.014	6.26	2.58
HIP 16413	033121-3031.0	4474.9312	4569.9312	2.205	0.001	6.21	5.24
TYC 5882 1169 1	040217-1521.5	1872.6855	1925.6855	3.805	0.088	2.38	2.17
TYC 5882 1169 1	040217-1521.5	2174.9385	2261.9385	3.793	0.066	8.72	4.13
TYC 5882 1169 1	040217-1521.5	2644.9310	2739.9310	3.787	0.043	8.50	3.32
TYC 5882 1169 1	040217-1521.5	2924.9155	3016.9155	3.834	0.067	8.80	3.37
TYC 5882 1169 1	040217-1521.5	3414.6681	3471.6681	3.867	0.091	5.73	5.58
TYC 5882 1169 1	040217-1521.5	4298.9239	4389.9239	3.763	0.043	5.63	4.43
TYC 5882 1169 1	040217-1521.5	4480.9239	4571.9239	3.805	0.066	3.62	2.69
HIP 19775	041423-3819.0	1872.6680	1933.6680	2.459	0.037	5.54	5.29
HIP 19775	041423-3819.0	3545.9422	3664.9422	2.337	0.017	9.36	3.29
HIP 19775	041423-3819.0	3664.9422	3783.9422	2.337	0.025	7.60	6.00
TYC 7584 16301	042149-4317.5	2081.9435	2142.9435	2.342	0.042	4.07	3.67
TYC 7584 16301	042149-4317.5	2142.9435	2203.9435	2.372	0.043	19.84	7.05
TYC 7584 16301	042149-4317.5	2203.9435	2264.9435	2.369	0.034	18.81	4.59
TYC 7584 16301	042149-4317.5	2941.9302	3189.9302	2.366	0.009	21.13	8.70
TYC 7584 16301	042149-4317.5	3789.9433	3906.9433	2.372	0.017	5.44	4.72
TYC 8077 06571	045153-4647.2	1871.6793	1951.6793	2.824	0.048	24.89	4.59
TYC 8077 06571	045153-4647.2	2174.9266	2261.9266	2.857	0.037	15.30	5.23
TYC 8077 06571	045153-4647.2	2466.9322	2565.9322	2.411	0.026	4.89	4.82
TYC 8077 06571	045153-4647.2	2664.9322	2763.9322	2.943	0.026	10.16	7.13
TYC 8077 06571	045153-4647.2	2831.9237	2931.9237	2.854	0.025	7.72	4.26
TYC 8077 06571	045153-4647.2	3031.9237	3131.9237	2.836	0.024	6.89	3.95
TYC 8077 06571	045153-4647.2	3424.8336	3497.8336	2.872	0.050	6.36	5.17
TYC 8077 06571	045153-4647.2	3563.9255	3664.9255	2.827	0.024	11.82	4.46
TYC 8077 06571	045153-4647.2	3664.9255	3765.9255	2.857	0.037	9.46	5.42
TYC 8077 06571	045153-4647.2	4091.8181	4161.8181	2.734	0.057	6.32	4.73
TYC 8077 06571	045153-4647.2	4498.9278	4598.9278	2.839	0.025	12.30	6.55
TYC 8077 06571	045153-4647.2	4752.9355	4839.9355	2.884	0.038	6.00	5.44
TYC 8077 06571	045153-4647.2	4839.9355	4926.9355	2.842	0.037	6.95	4.74
TYC 8080 12061	045305-4844.6	1871.6793	1951.6793	4.573	0.127	28.52	5.77
TYC 8080 12061	045305-4844.6	1951.6793	2031.6793	4.573	0.159	8.51	5.59
TYC 8080 12061	045305-4844.6	2087.9266	2174.9266	4.612	0.097	15.85	5.91
TYC 8080 12061	045305-4844.6	2174.9266	2261.9266	4.507	0.093	16.49	5.62
TYC 8080 12061	045305-4844.6	2664.9322	2763.9322	4.612	0.065	12.98	5.87
TYC 8080 12061	045305-4844.6	2931.9237	3031.9237	4.612	0.097	18.24	5.38
TYC 8080 12061	045305-4844.6	3474.8336	3670.8336	4.627	0.065	11.22	6.05
TYC 8080 12061	045305-4844.6	4091.8181	4161.8181	4.468	0.152	5.46	5.30
TYC 8080 12061	045305-4844.6	4498.9278	4598.9278	4.606	0.064	9.44	6.26
TYC 8086 09541	052855-4535.0	1872.7055	1951.7055	4.471	0.121	5.45	4.59
TYC 8086 09541	052855-4535.0	2666.9111	2763.9111	4.737	0.068	6.86	2.49
TYC 8086 09541	052855-4535.0	3432.8336	3509.8336	4.462	0.091	6.98	5.54
TYC 8086 09541	052855-4535.0	4706.9411	4917.9411	4.717	0.067	5.98	5.91
HIP 25709	052924-3430.9	2178.9416	2261.9416	6.095	0.170	6.75	6.02
HIP 25709	052924-3430.9	2936.9408	3038.9408	5.614	0.143	6.17	4.00
HIP 25709	052924-3430.9	4833.9369	4916.9369	5.608	0.001	5.63	5.35
TYC 6502 1188 1	055021-2915.3	2181.9412	2257.9412	1.371	0.009	13.86	5.75
TYC 6502 1188 1	055021-2915.3	3777.9306	3876.9306	1.407	0.006	8.64	6.34
TYC 6502 1188 1	055021-2915.3	4308.9280	4407.9280	1.395	0.009	6.08	4.98
TYC 8520 0032 1	055101-5238.2	1872.7159	1951.7159	1.200	0.007	6.22	4.08
TYC 8520 0032 1	055101-5238.2	2177.9479	2257.9479	1.203	0.007	16.69	7.19
TYC 8520 0032 1	055101-5238.2	2498.8650	2729.8650	1.206	0.004	12.74	7.16
TYC 8520 0032 1	055101-5238.2	2729.8650	2960.8650	1.197	0.004	10.62	6.77
TYC 8520 0032 1	055101-5238.2	3356.6414	3434.6414	1.206	0.007	10.37	3.87
TYC 8520 0032 1	055101-5238.2	3680.9338	3784.9338	1.200	0.006	13.46	4.34
TYC 8520 0032 1	055101-5238.2	3784.9338	3888.9338	1.197	0.004	12.09	6.17
TYC 8520 0032 1	055101-5238.2	4504.9365	4605.9365	1.212	0.004	6.38	3.98
TYC 7617 0549 1	062607-4102.9	1872.7794	1933.7794	4.232	0.082	13.49	8.04

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
TYC 7617 0549 1	062607-4102.9	1933.7794	1994.7794	4.247	0.082	7.17	4.62
TYC 7617 0549 1	062607-4102.9	2716.9017	2935.9017	4.250	0.055	8.22	4.60
TYC 7617 0549 1	062607-4102.9	2935.9017	3154.9017	4.128	0.026	18.35	5.52
TYC 7617 0549 1	062607-4102.9	3442.6705	3526.6705	4.187	0.080	8.61	2.37
TYC 7617 0549 1	062607-4102.9	3684.9365	3788.9365	4.116	0.077	10.92	4.86
TYC 7617 0549 1	062607-4102.9	3788.9365	3892.9365	4.139	0.052	10.54	6.33
TYC 7617 0549 1	062607-4102.9	4315.9349	4516.9349	4.175	0.053	7.30	3.60
TYC 7617 0549 1	062607-4102.9	4717.9349	4918.9349	4.152	0.001	4.85	4.41
TYC 8107 1591 1	062806-4826.9	1932.7833	1992.7833	1.293	0.013	6.17	2.70
TYC 8107 1591 1	062806-4826.9	2590.9327	2691.9327	1.299	0.010	5.87	3.13
TYC 8107 1591 1	062806-4826.9	2691.9327	2792.9327	1.287	0.005	10.64	4.15
TYC 8107 1591 1	062806-4826.9	2962.8999	3063.8999	1.287	0.007	9.18	6.30
TYC 8107 1591 1	062806-4826.9	3063.8999	3164.8999	1.293	0.008	12.72	5.34
TYC 8107 1591 1	062806-4826.9	3695.9264	3797.9264	1.284	0.007	5.22	4.60
TYC 8107 1591 1	062806-4826.9	4092.6751	4173.6751	1.296	0.008	6.07	4.18
TYC 8107 1591 1	062806-4826.9	4521.9320	4627.9320	1.290	0.005	9.55	4.50
TYC 7100 2112 1	065247-3636.3	1872.7794	1933.7794	0.806	0.004	5.95	5.31
TYC 7100 2112 1	065247-3636.3	2116.9301	2189.9301	0.842	0.004	4.27	4.10
TYC 7100 2112 1	065247-3636.3	2189.9301	2262.9301	0.803	0.003	5.85	4.92
TYC 7100 2112 1	065247-3636.3	2497.9017	2716.9017	0.803	0.002	10.15	6.43
TYC 7100 2112 1	065247-3636.3	2716.9017	2935.9017	0.806	0.002	12.48	6.38
TYC 7100 2112 1	065247-3636.3	3357.7025	3442.7025	0.710	0.002	4.30	3.49
TYC 7100 2112 1	065247-3636.3	3797.9196	3899.9196	0.806	0.002	6.44	5.08
TYC 7100 2112 1	065247-3636.3	4091.6931	4271.6931	0.803	0.002	16.28	5.06
TYC 7100 2112 1	065247-3636.3	4271.6931	4451.6931	0.803	0.003	6.70	4.61
TYC 7100 2112 1	065247-3636.3	4764.9332	4843.9332	0.806	0.003	6.56	4.23
TYC 8118 0871 1	065623-4646.9	1872.7833	1932.7833	4.570	0.128	6.69	4.77
TYC 8118 0871 1	065623-4646.9	1932.7833	1992.7833	4.468	0.152	7.92	4.25
TYC 8118 0871 1	065623-4646.9	2132.9039	2195.9039	4.310	0.085	5.03	3.84
TYC 8118 0871 1	065623-4646.9	2195.9039	2258.9039	4.337	0.086	12.82	5.40
TYC 8118 0871 1	065623-4646.9	2590.9327	2691.9327	4.334	0.114	9.37	4.81
TYC 8118 0871 1	065623-4646.9	2691.9327	2792.9327	4.420	0.059	12.24	6.29
TYC 8118 0871 1	065623-4646.9	2962.8999	3063.8999	4.382	0.087	7.04	4.73
TYC 8118 0871 1	065623-4646.9	3063.8999	3164.8999	4.516	0.093	9.69	5.13
TYC 8118 0871 1	065623-4646.9	3695.9264	3797.9264	4.352	0.086	5.08	3.83
TYC 8118 0871 1	065623-4646.9	3797.9264	3899.9264	4.504	0.062	12.58	4.95
TYC 8118 0871 1	065623-4646.9	4092.6751	4173.6751	4.439	0.090	8.43	5.02
TYC 8118 0871 1	065623-4646.9	4521.9320	4627.9320	4.403	0.059	10.31	4.03
TYC 7629 2824 1	070152-3922.1	1871.8279	1933.8279	1.344	0.011	11.65	4.08
TYC 7629 2824 1	070152-3922.1	2191.9308	2253.9308	1.314	0.008	9.21	4.48
TYC 7629 2824 1	070152-3922.1	2497.9017	2716.9017	1.338	0.005	14.80	5.75
TYC 7629 2824 1	070152-3922.1	2716.9017	2935.9017	1.332	0.005	8.78	8.41
TYC 7629 2824 1	070152-3922.1	2935.9017	3154.9017	1.335	0.003	23.08	6.94
TYC 7629 2824 1	070152-3922.1	3359.7081	3540.7081	1.323	0.003	13.06	4.97
TYC 7629 2824 1	070152-3922.1	3721.7081	3902.7081	1.332	0.003	16.65	4.99
TYC 7629 2824 1	070152-3922.1	4091.7082	4173.7082	1.332	0.011	5.68	5.26
TYC 7629 2824 1	070152-3922.1	4529.9261	4628.9261	1.332	0.005	12.76	4.90
Carina members							
TYC 9390 0322 1	055329-8156.9	1871.7145	2001.7145	1.855	0.010	20.74	5.46
TYC 9390 0322 1	055329-8156.9	2131.7145	2261.7145	1.885	0.016	32.05	2.14
TYC 9390 0322 1	055329-8156.9	2442.4686	2681.4686	1.858	0.010	12.58	7.38
TYC 9390 0322 1	055329-8156.9	2681.4686	2920.4686	1.888	0.011	20.07	5.32
TYC 9390 0322 1	055329-8156.9	2920.4686	3159.4686	1.867	0.011	12.64	10.34
TYC 9390 0322 1	055329-8156.9	3356.7548	3539.7548	1.858	0.005	21.44	4.34
TYC 9390 0322 1	055329-8156.9	3539.7548	3722.7548	1.858	0.005	5.51	5.17
TYC 9390 0322 1	055329-8156.9	3722.7548	3905.7548	1.858	0.010	10.71	3.03
TYC 9390 0322 1	055329-8156.9	4090.6982	4367.6982	1.888	0.005	14.10	6.25
TYC 9390 0322 1	055329-8156.9	4367.6982	4644.6982	1.855	0.010	37.50	9.59

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
TYC 9390 0322 1	055329-8156.9	4644.6982	4921.6982	1.864	0.011	9.10	5.66
HIP 30034	061913-5803.3	1872.7600	1950.7600	3.855	0.068	10.61	6.86
HIP 30034	061913-5803.3	2719.8995	2940.8995	3.858	0.045	13.15	8.64
HIP 30034	061913-5803.3	2940.8995	3161.8995	3.876	0.045	10.25	5.96
HIP 30034	061913-5803.3	3356.6656	3536.6656	3.864	0.023	17.28	5.88
HIP 30034	061913-5803.3	4303.6852	4515.6852	3.841	0.044	7.50	3.75
HIP 30034	061913-5803.3	4515.6852	4727.6852	3.888	0.046	11.59	6.10
HIP 32235	064346-7158.6	1933.7747	1994.7747	3.781	0.087	7.48	5.57
HIP 32235	064346-7158.6	2192.9178	2255.9178	3.939	0.095	6.82	5.44
HIP 32235	064346-7158.6	2489.9234	2715.9234	3.858	0.045	12.88	8.42
HIP 32235	064346-7158.6	2715.9234	2941.9234	3.927	0.047	3.43	3.14
HIP 32235	064346-7158.6	2941.9234	3167.9234	3.834	0.044	15.41	4.79
HIP 32235	064346-7158.6	3538.6876	3720.6876	3.834	0.044	9.40	4.56
HIP 32235	064346-7158.6	3720.6876	3902.6876	3.846	0.022	16.92	4.59
HIP 32235	064346-7158.6	4271.6662	4450.6662	3.888	0.069	6.88	5.24
HIP 33737	070030-7941.8	1872.7181	2002.7181	5.129	0.080	46.88	8.47
HIP 33737	070030-7941.8	2002.7181	2132.7181	5.108	0.198	8.68	5.08
HIP 33737	070030-7941.8	2132.7181	2262.7181	5.060	0.116	9.96	5.62
HIP 33737	070030-7941.8	2442.4686	2690.4686	5.054	0.077	19.30	6.72
HIP 33737	070030-7941.8	2690.4686	2938.4686	5.102	0.118	26.75	8.08
HIP 33737	070030-7941.8	2938.4686	3186.4686	5.102	0.079	24.04	4.61
HIP 33737	070030-7941.8	3357.7072	3539.7072	5.108	0.040	10.87	5.05
HIP 33737	070030-7941.8	3539.7072	3721.7072	5.099	0.118	12.38	7.08
HIP 33737	070030-7941.8	3721.7072	3903.7072	5.120	0.079	12.01	4.26
HIP 33737	070030-7941.8	4091.6662	4302.6662	5.099	0.079	31.23	9.11
HIP 33737	070030-7941.8	4302.6662	4513.6662	5.108	0.079	19.77	5.65
TYC 8559 1016 1	072124-5720.6	1871.7711	1936.7711	4.878	0.109	7.15	6.77
TYC 8559 1016 1	072124-5720.6	2192.9344	2255.9344	4.681	0.133	9.43	4.62
TYC 8559 1016 1	072124-5720.6	2499.9145	2725.9145	4.576	0.063	15.04	4.47
TYC 8559 1016 1	072124-5720.6	2725.9145	2951.9145	4.618	0.065	17.80	7.09
TYC 8559 1016 1	072124-5720.6	2951.9145	3177.9145	4.603	0.064	21.78	7.17
TYC 8559 1016 1	072124-5720.6	3714.7778	3904.7778	4.591	0.032	10.76	4.61
TYC 8559 1016 1	072124-5720.6	4513.9391	4715.9391	4.723	0.068	8.07	2.57
TYC 8929 0927 1	082406-6334.1	2195.9273	2249.9273	0.794	0.004	5.55	5.49
TYC 8929 0927 1	082406-6334.1	2546.8234	2758.8234	0.788	0.014	*****	3.03
TYC 8929 0927 1	082406-6334.1	2758.8234	2970.8234	0.788	0.002	13.20	5.45
TYC 8929 0927 1	082406-6334.1	3622.9003	3716.9003	0.788	0.003	5.83	4.09
TYC 8929 0927 1	082406-6334.1	4090.7246	4368.7246	0.797	0.001	12.01	5.38
TYC 8929 0927 1	082406-6334.1	4368.7246	4646.7246	0.788	0.002	5.18	2.92
TYC 8929 0927 1	082406-6334.1	4646.7246	4924.7246	0.797	0.002	9.89	2.58
TYC 8930 0601 1	084200-6218.4	1872.8598	1942.8598	1.221	0.007	8.50	7.61
TYC 8930 0601 1	084200-6218.4	2172.8936	2248.7278	1.224	0.007	8.13	7.30
TYC 8930 0601 1	084200-6218.4	2546.8234	2642.8234	1.224	0.040	78.38	6.48
TYC 8930 0601 1	084200-6218.4	2642.8234	2738.8234	1.227	0.007	14.36	4.78
TYC 8930 0601 1	084200-6218.4	2738.8234	2834.8234	1.227	0.005	8.59	5.84
TYC 8930 0601 1	084200-6218.4	2887.9059	2986.9059	1.224	0.007	8.50	5.15
TYC 8930 0601 1	084200-6218.4	2986.9059	3085.9059	1.224	0.007	12.70	4.54
TYC 8930 0601 1	084200-6218.4	3085.9059	3184.9059	1.227	0.005	12.46	4.44
TYC 8930 0601 1	084200-6218.4	3723.8886	3814.8886	1.221	0.007	7.18	5.25
TYC 8930 0601 1	084200-6218.4	4559.9091	4663.9091	1.224	0.005	5.76	3.54
TYC 8569 1761 1	084553-5327.5	1872.7631	1941.7631	1.287	0.008	9.74	5.04
TYC 8569 1761 1	084553-5327.5	2640.8299	2734.8299	1.260	0.007	7.49	5.57
TYC 8569 1761 1	084553-5327.5	2734.8299	2828.8299	1.257	0.005	9.01	4.62
TYC 8569 1761 1	084553-5327.5	2985.9180	3084.9180	1.287	0.007	7.84	2.33
TYC 8569 1761 1	084553-5327.5	3084.9180	3183.9180	1.173	0.004	5.12	3.82
TYC 8569 1761 1	084553-5327.5	3810.9120	3904.9120	1.260	0.005	9.74	2.90
TYC 8569 1761 1	084553-5327.5	4090.7318	4279.7318	1.287	0.003	5.79	3.21
TYC 8569 1761 1	084553-5327.5	4279.7318	4468.7318	1.293	0.005	6.08	5.91
TYC 8569 1761 1	084553-5327.5	4468.7318	4657.7318	1.260	0.002	14.59	6.40
TYC 8569 1761 1	084553-5327.5	4728.9038	4791.9038	1.290	0.015	4.99	4.94

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
TYC 9395 2139 1	085005-7554.6	1871.7871	2000.7871	1.147	0.004	24.85	5.34
TYC 9395 2139 1	085005-7554.6	2000.7871	2129.7871	1.149	0.006	4.69	4.47
TYC 9395 2139 1	085005-7554.6	2129.7871	2258.7871	1.153	0.006	8.92	6.25
TYC 9395 2139 1	085005-7554.6	2441.5036	2689.5036	1.143	0.002	7.28	5.38
TYC 9395 2139 1	085005-7554.6	2689.5036	2937.5036	1.143	0.004	3.67	3.04
TYC 9395 2139 1	085005-7554.6	2937.5036	3185.5036	1.159	0.004	2.81	2.45
TYC 9395 2139 1	085005-7554.6	3424.7719	3492.7719	1.137	0.008	4.66	4.57
TYC 9395 2139 1	085005-7554.6	3622.8983	3716.8983	1.159	0.006	5.80	3.78
TYC 9395 2139 1	085005-7554.6	3716.8983	3810.8983	1.141	0.006	11.26	3.71
TYC 9395 2139 1	085005-7554.6	3810.8983	3904.8983	1.149	0.004	12.37	4.19
TYC 9395 2139 1	085005-7554.6	4368.7481	4646.7481	1.153	0.004	8.11	5.46
TYC 8569 3597 1	085156-5355.9	1872.7631	1941.7631	2.053	0.019	9.92	5.97
TYC 8569 3597 1	085156-5355.9	1941.7631	2010.7631	1.867	0.026	5.42	3.34
TYC 8569 3597 1	085156-5355.9	2640.8499	2734.8499	1.942	0.017	11.38	4.87
TYC 8569 3597 1	085156-5355.9	2985.9180	3084.9180	2.103	0.020	9.09	4.70
TYC 8569 3597 1	085156-5355.9	2985.9180	3084.9180	1.903	0.016	8.12	3.32
TYC 8569 3597 1	085156-5355.9	3084.9180	3183.9180	1.894	0.011	6.97	6.16
TYC 8569 3597 1	085156-5355.9	3358.7697	3425.7697	2.046	0.032	5.66	5.18
TYC 8569 3597 1	085156-5355.9	3425.7697	3492.7697	1.924	0.017	5.26	5.25
TYC 8569 3597 1	085156-5355.9	3810.9120	3904.9120	1.906	0.011	5.68	4.01
TYC 8569 3597 1	085156-5355.9	4091.7565	4367.7565	1.897	0.005	7.84	3.83
TYC 8569 3597 1	085156-5355.9	4643.7565	4919.7565	1.942	0.006	9.14	5.26
TYC 8582 3040 1	085746-5408.6	1918.7631	1964.7631	1.984	0.030	5.33	5.08
TYC 8582 3040 1	085746-5408.6	2173.8772	2248.7399	1.990	0.024	6.38	5.13
TYC 8582 3040 1	085746-5408.6	2640.8499	2734.8499	1.939	0.017	10.91	5.39
TYC 8582 3040 1	085746-5408.6	2734.8499	2828.8499	1.700	0.009	6.24	4.85
TYC 8582 3040 1	085746-5408.6	3716.9120	3810.9120	1.948	0.017	6.62	5.35
TYC 8582 3040 1	085746-5408.6	3810.9120	3904.9120	2.005	0.012	6.86	3.82
TYC 8582 3040 1	085746-5408.6	4367.7565	4643.7565	1.942	0.011	9.08	4.14
TYC 8582 3040 1	085746-5408.6	4643.7565	4919.7565	2.055	0.006	9.12	4.20
TYC 8160 0958 1	085752-4941.8	1872.8675	1942.8675	2.043	0.019	16.26	6.73
TYC 8160 0958 1	085752-4941.8	1942.8675	2012.8675	1.978	0.030	9.28	4.75
TYC 8160 0958 1	085752-4941.8	2638.8816	2735.8816	2.041	0.019	11.46	7.15
TYC 8160 0958 1	085752-4941.8	2986.9163	3085.9163	1.975	0.018	5.57	4.17
TYC 8160 0958 1	085752-4941.8	3085.9163	3184.9163	2.038	0.013	7.10	4.65
TYC 8160 0958 1	085752-4941.8	3356.7807	3424.7807	2.043	0.025	7.50	3.88
TYC 8160 0958 1	085752-4941.8	4455.9129	4559.9129	1.960	0.017	6.58	5.12
TYC 8586 2431 1	085929-5446.8	1872.7631	1941.7631	3.667	0.061	8.01	4.51
TYC 8586 2431 1	085929-5446.8	1941.7631	2010.7631	3.592	0.098	7.12	4.48
TYC 8586 2431 1	085929-5446.8	2172.8936	2248.7399	3.607	0.059	13.38	5.44
TYC 8586 2431 1	085929-5446.8	2886.9180	2985.9180	3.598	0.059	7.03	3.13
TYC 8586 2431 1	085929-5446.8	3084.9180	3183.9180	3.583	0.039	6.55	5.81
TYC 8586 2431 1	085929-5446.8	3425.7697	3492.7697	3.595	0.059	9.42	7.59
TYC 8586 2431 1	085929-5446.8	3716.9120	3810.9120	3.655	0.061	6.54	4.58
TYC 8586 2431 1	085929-5446.8	4367.7565	4643.7565	3.637	0.040	9.94	5.07
TYC 8586 2431 1	085929-5446.8	4643.7565	4919.7565	3.568	0.019	9.66	6.28
TYC 8586 0518 1	090003-5538.4	1872.7631	1941.7631	0.916	0.004	10.34	5.72
TYC 8586 0518 1	090003-5538.4	2640.8499	2734.8499	0.919	0.004	14.74	5.21
TYC 8586 0518 1	090003-5538.4	2734.8499	2828.8499	0.922	0.003	5.77	5.06
TYC 8586 0518 1	090003-5538.4	2886.9180	2985.9180	0.566	0.002	6.15	3.61
TYC 8586 0518 1	090003-5538.4	3716.9120	3810.9120	0.925	0.004	7.66	4.76
TYC 8586 0518 1	090003-5538.4	4090.7912	4366.7912	0.919	0.001	12.14	4.84
TYC 8586 0518 1	090003-5538.4	4366.7912	4642.7912	0.922	0.003	11.75	4.86
TYC 8587 1126 1	090929-5538.4	1872.7631	1943.7631	0.776	0.003	17.96	5.82
TYC 8587 1126 1	090929-5538.4	1943.7631	2014.7631	0.776	0.005	6.38	4.27
TYC 8587 1126 1	090929-5538.4	2758.8499	2970.8499	0.773	0.002	5.94	4.37
TYC 8587 2290 1	091317-5529.1	1872.7631	1943.7631	1.502	0.010	11.87	7.75
TYC 8587 2290 1	091317-5529.1	2172.8936	2248.7550	1.511	0.014	6.03	5.42
TYC 8587 2290 1	091317-5529.1	2759.8499	2972.8499	1.472	0.007	7.61	3.91
TYC 8587 2290 1	091317-5529.1	3714.8327	3904.8327	1.472	0.006	8.57	3.85

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
HIP 46063	092335-6111.6	1872.8598	1942.8598	3.891	0.069	13.92	4.11
HIP 46063	092335-6111.6	2193.8505	2248.7550	3.885	0.092	9.84	3.64
HIP 46063	092335-6111.6	2558.8324	2650.8324	3.844	0.067	6.12	4.81
HIP 46063	092335-6111.6	2650.8324	2742.8324	3.841	0.067	3.95	3.49
HIP 46063	092335-6111.6	2742.8324	2834.8324	4.002	0.049	6.75	3.83
HIP 46063	092335-6111.6	2895.9043	2991.9043	3.882	0.068	8.58	6.69
HIP 46063	092335-6111.6	3087.9043	3183.9043	3.864	0.045	9.20	3.23
HIP 46063	092335-6111.6	3357.8059	3425.8059	3.891	0.092	6.25	4.73
HIP 46063	092335-6111.6	3631.8996	3722.8996	3.900	0.069	5.95	4.47
HIP 46063	092335-6111.6	3722.8996	3813.8996	3.781	0.065	5.70	3.90
HIP 46063	092335-6111.6	4090.7246	4281.7246	3.918	0.023	15.21	4.74
HIP 46063	092335-6111.6	4472.7246	4663.7246	3.853	0.045	14.06	5.72
HIP 46063	092335-6111.6	4790.9017	4857.9017	3.853	0.090	8.41	4.28
HIP 46063	092335-6111.6	4857.9017	4924.9017	3.909	0.093	6.58	6.28
TYC 8946 1225 1	094309-6313.1	4471.8949	4568.8949	1.697	0.013	3.55	3.52
TYC 8946 1225 1	094309-6313.1	4568.8949	4665.8949	1.697	0.009	10.17	6.80
TYC 8634 1393 1	114552-5520.8	1881.8257	1964.8257	5.288	0.170	6.60	5.67
TYC 8634 1393 1	114552-5520.8	2707.7870	2791.7870	5.356	0.087	7.95	6.34
TYC 8634 1393 1	114552-5520.8	4611.8385	4701.8385	5.237	0.000	4.37	4.37
AB Doradus members							
HIP 5191	010626-1417.8	4333.9186	4419.9186	6.971	0.295	5.00	2.12
HIP 5191	010626-1417.8	4419.9186	4505.9186	7.192	0.157	5.14	2.70
TYC 8042 1050 1	021055-4604.0	2123.9320	2190.9320	1.045	0.005	5.11	4.68
TYC 8042 1050 1	021055-4604.0	2190.9320	2257.9320	1.120	0.006	7.04	3.31
TYC 8042 1050 1	021055-4604.0	2631.8814	2723.8814	1.117	0.006	8.58	7.06
TYC 8042 1050 1	021055-4604.0	3623.9216	3719.9216	1.120	0.006	9.26	7.91
TYC 8042 1050 1	021055-4604.0	4629.9149	4720.9149	1.117	0.008	5.67	3.46
TYC 8042 1050 1	021055-4604.0	4720.9149	4811.9149	1.120	0.004	8.29	6.32
TYC 8042 1050 1	021055-4604.0	4811.9149	4902.9149	1.120	0.006	6.82	6.16
HIP 10272	021216+2357.5	2915.9213	2998.9213	6.349	0.184	5.45	4.13
HIP 10272	021216+2357.5	3267.7378	3353.6747	6.197	0.410	7.28	5.44
HIP 14684	030942-0934.8	2159.9383	2236.9383	5.578	0.142	8.03	4.03
HIP 14684	030942-0934.8	2904.9340	2995.9340	5.440	0.090	11.67	2.28
HIP 17695	034723-0158.3	2154.9427	2221.9427	3.861	0.091	8.33	4.32
HIP 17695	034723-0158.3	3649.9320	3733.9320	3.903	0.069	7.26	5.52
HIP 17695	034723-0158.3	3733.9320	3817.9320	3.867	0.068	6.35	3.92
HIP 17695	034723-0158.3	4460.9336	4543.9336	3.853	0.068	6.81	4.95
HIP 22738AB	045331-5551.5	1872.6868	1934.6868	1.502	0.010	6.46	5.12
HIP 22738AB	045331-5551.5	2182.9392	2259.9392	1.487	0.010	7.41	6.36
HIP 22738AB	045331-5551.5	2466.9125	2686.9125	1.526	0.004	6.65	6.19
TYC 7587 0925 1	050230-3959.2	1872.7106	1951.7106	6.552	0.261	15.21	5.63
TYC 7587 0925 1	050230-3959.2	2182.9443	2267.9443	6.409	0.188	7.34	5.87
TYC 7587 0925 1	050230-3959.2	2689.9171	2910.9171	6.537	0.130	28.75	3.00
TYC 7587 0925 1	050230-3959.2	2910.9171	3131.9171	6.535	0.129	24.33	6.07
TYC 7587 0925 1	050230-3959.2	3356.6342	3428.6342	6.316	0.182	5.34	4.93
TYC 7587 0925 1	050230-3959.2	3428.6342	3500.6342	6.388	0.249	5.14	4.77
TYC 7587 0925 1	050230-3959.2	3664.9387	3766.9387	6.385	0.185	6.72	5.76
TYC 7587 0925 1	050230-3959.2	3766.9387	3868.9387	6.585	0.132	8.39	6.06
TYC 7587 0925 1	050230-3959.2	4090.7715	4367.7715	6.567	0.065	15.19	5.84
TYC 7587 0925 1	050230-3959.2	4367.7715	4644.7715	6.576	0.066	10.76	4.83
TYC 7587 0925 1	050230-3959.2	4644.7715	4921.7715	6.526	0.129	18.47	7.86
HD 32981	050628-1549.5	2183.9313	2261.9313	0.985	0.004	8.53	4.69
HD 32981	050628-1549.5	2672.8959	2759.8959	1.009	0.005	9.29	4.38
HD 32981	050628-1549.5	2855.9090	2946.9090	0.988	0.004	7.17	2.46
HD 32981	050628-1549.5	2946.9090	3037.9090	0.988	0.004	7.96	6.68
HIP 25283	052430-3858.2	1872.7106	1951.7106	9.943	0.600	13.26	6.43
HIP 25283	052430-3858.2	2097.9443	2182.9443	9.450	0.542	5.01	4.97
HIP 25283	052430-3858.2	2182.9443	2267.9443	9.521	0.414	6.35	5.31

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
HIP 25283	052430-3858.2	2472.9173	2691.9173	9.333	0.263	9.30	5.29
HIP 25283	052430-3858.2	2910.9173	3129.9173	9.321	0.262	10.09	6.82
HIP 25283	052430-3858.2	3766.9387	3868.9387	9.734	0.288	6.58	6.29
HIP 25283	052430-3858.2	4522.7715	4738.7715	9.527	0.276	6.64	5.24
HIP 25647	052845-6526.9	2502.8914	2721.8914	0.5874	0.0010	6.68	5.98
TYC 7059 1111 1	052857-3328.3	1872.7203	1934.7203	2.298	0.024	10.73	8.74
TYC 7059 1111 1	052857-3328.3	2178.9416	2261.9416	2.298	0.024	12.93	6.44
TYC 7059 1111 1	052857-3328.3	2936.9408	3038.9408	2.289	0.024	8.90	4.71
TYC 7059 1111 1	052857-3328.3	3038.9408	3140.9408	2.301	0.016	8.34	5.36
TYC 7059 1111 1	052857-3328.3	3428.7683	3500.7683	2.301	0.032	7.20	6.12
TYC 7059 1111 1	052857-3328.3	4833.9369	4916.9369	2.262	0.015	5.12	5.01
TYC 7064 0839 1	053504-3417.9	2566.9322	2664.9322	7.608	0.263	6.78	4.31
HIP 26373	053657-4757.9	3355.8336	3432.8336	4.899	0.146	10.76	6.48
HIP 26373	053657-4757.9	3432.8336	3509.8336	4.433	0.090	7.34	3.67
HIP 26373	053657-4757.9	3677.9228	3782.9228	4.914	0.110	10.14	4.89
HIP 26373	053657-4757.9	3782.9228	3887.9228	4.917	0.073	7.97	2.22
HIP 26373	053657-4757.9	4092.6573	4168.6573	4.579	0.096	8.27	4.92
HIP 26373	053657-4757.9	4302.9365	4403.9365	4.543	0.002	6.40	4.73
CP-19878	053923-1933.5	2580.9266	2671.9266	1.523	0.018	7.60	2.88
CP-19878	053923-1933.5	2671.9266	2762.9266	1.493	0.010	10.10	5.46
CP-19878	053923-1933.5	2863.9101	2955.9101	1.496	0.014	11.58	4.59
CP-19878	053923-1933.5	2955.9101	3047.9101	1.493	0.010	9.48	4.69
CP-19878	053923-1933.5	3356.6632	3428.6632	1.323	0.011	6.49	5.17
CP-19878	053923-1933.5	3428.6632	3500.6632	1.499	0.010	6.84	4.53
CP-19878	053923-1933.5	4762.9202	4838.9202	1.520	0.011	6.14	3.57
TYC 7605 1429 1	054114-4118.0	1871.7293	1951.7293	2.815	0.036	5.08	4.32
TYC 7605 1429 1	054114-4118.0	2106.9241	2183.9241	2.761	0.035	5.98	4.24
TYC 7605 1429 1	054114-4118.0	2183.9241	2260.9241	2.737	0.034	7.59	4.36
TYC 6494 1228 1	054413-2606.3	3771.9326	3867.9326	1.843	0.010	7.51	6.92
TYC 6494 1228 1	054413-2606.3	4405.9280	4502.9280	1.825	0.015	6.36	3.15
HIP 27727	055216-2839.4	2181.9412	2257.9412	2.845	0.037	10.43	6.80
HIP 27727	055216-2839.4	2587.9252	2685.9252	2.848	0.037	8.16	5.82
HIP 27727	055216-2839.4	2685.9252	2783.9252	2.851	0.037	10.74	4.60
HIP 27727	055216-2839.4	2940.9410	3039.9410	2.851	0.037	9.08	5.58
HIP 27727	055216-2839.4	3039.9410	3138.9410	2.860	0.025	7.65	6.78
HIP 27727	055216-2839.4	4308.9280	4405.9280	2.857	0.037	6.67	5.02
HIP 27727	055216-2839.4	4845.9131	4925.9131	2.842	0.082	4.72	3.21
TYC 7598 1488 1	055751-3804.1	2182.9376	2257.9376	3.634	0.060	12.26	6.06
TYC 7598 1488 1	055751-3804.1	2498.8942	2716.8942	3.655	0.040	9.25	8.16
TYC 7598 1488 1	055751-3804.1	2716.8942	2934.8942	3.787	0.043	13.56	5.64
TYC 7598 1488 1	055751-3804.1	2934.8942	3152.8942	3.763	0.021	11.38	5.42
TYC 7598 1488 1	055751-3804.1	3532.7210	3707.7210	3.589	0.039	8.81	6.47
TYC 7598 1488 1	055751-3804.1	4435.6734	4607.6734	3.724	0.021	12.42	5.65
TYC 7079 0068 1	060834-3402.9	1872.7432	1951.7432	3.383	0.052	14.97	6.11
TYC 7079 0068 1	060834-3402.9	2181.9412	2257.9412	3.446	0.054	10.27	5.96
TYC 7079 0068 1	060834-3402.9	2587.9252	2685.9252	3.374	0.052	8.96	3.66
TYC 7079 0068 1	060834-3402.9	2685.9252	2783.9252	3.389	0.052	15.10	5.51
TYC 7079 0068 1	060834-3402.9	2940.9410	3039.9410	3.410	0.053	10.02	6.48
TYC 7079 0068 1	060834-3402.9	3039.9410	3138.9410	3.374	0.035	12.80	5.09
TYC 7079 0068 1	060834-3402.9	3435.6648	3514.6648	3.413	0.053	4.50	3.59
TYC 7079 0068 1	060834-3402.9	3777.9306	3876.9306	3.577	0.039	3.24	2.86
TYC 7079 0068 1	060834-3402.9	4403.9385	4504.9385	3.416	0.053	6.54	4.17
TYC 7084 0794 1	060919-3549.5	1872.7403	1951.7403	1.712	0.013	18.40	6.64
TYC 7084 0794 1	060919-3549.5	2182.9376	2257.9376	1.718	0.013	10.61	4.15
TYC 7084 0794 1	060919-3549.5	2489.9252	2710.9252	1.721	0.009	7.28	4.71
TYC 7084 0794 1	060919-3549.5	2710.9252	2931.9252	1.715	0.009	9.34	5.53
TYC 7084 0794 1	060919-3549.5	2931.9252	3152.9252	1.721	0.004	11.25	4.68
HIP 31878	063950-6128.7	1871.7637	1951.7637	9.067	0.376	6.55	6.47
HIP 31878	063950-6128.7	2863.9170	2966.9170	9.234	0.387	7.22	5.10
HIP 31878	063950-6128.7	3358.6865	3540.6865	8.885	0.119	7.87	4.36

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
HIP 31878	063950-6128.7	3540.6865	3722.6865	9.016	0.245	9.24	4.82
TYC 7627 2190 1	064119-3820.6	2497.9017	2716.9017	2.716	0.022	6.83	4.04
TYC 7627 2190 1	064119-3820.6	4366.6992	4641.6992	2.704	0.011	9.49	6.87
UCAC 206727592	064753-5713.5	1871.7711	1999.7711	5.978	0.108	9.97	5.51
UCAC 206727592	064753-5713.5	2127.7711	2255.7711	6.086	0.168	8.71	6.25
UCAC 206727592	064753-5713.5	2950.8995	3176.8995	6.119	0.113	9.84	5.74
UCAC 206727592	064753-5713.5	4368.6852	4645.6852	6.029	0.110	8.09	6.48
UCAC 206727592	064753-5713.5	4645.6852	4922.6852	6.056	0.111	16.86	5.70
TYC 8558 1148 1	071051-5736.8	1871.7711	1936.7711	2.932	0.039	14.50	4.80
TYC 8558 1148 1	071051-5736.8	1936.7711	2001.7711	2.890	0.051	5.09	4.12
TYC 8558 1148 1	071051-5736.8	2499.9145	2725.9145	2.953	0.026	10.54	5.30
TYC 1355 2141	072344+2025.0	2625.7468	2691.7468	2.794	0.048	15.67	4.74
TYC 1355 2141	072344+2025.0	2691.7468	2757.7468	2.767	0.035	9.18	6.46
TYC 1355 2141	072344+2025.0	2913.8868	2985.8868	2.797	0.048	7.57	3.47
TYC 1355 2141	072344+2025.0	2985.8868	3057.8868	2.806	0.036	18.01	5.92
TYC 1355 2141	072344+2025.0	3057.8868	3129.8868	2.815	0.036	9.67	4.35
TYC 1355 2141	072344+2025.0	3292.8812	3357.8812	2.806	0.085	38.86	12.46
HIP 36108	072618-4940.8	2497.9271	2722.9271	3.822	0.044	8.62	5.82
HIP 36349	072851-3014.8	1873.8217	1934.8217	1.643	0.017	29.76	4.38
HIP 36349	072851-3014.8	1934.8217	1995.8217	1.640	0.021	12.81	4.93
HIP 36349	072851-3014.8	2184.9192	2238.9192	1.652	0.021	6.31	4.63
HIP 36349	072851-3014.8	2596.9238	2695.9238	1.649	0.012	10.28	5.46
HIP 36349	072851-3014.8	2695.9238	2794.9238	1.643	0.012	14.32	4.58
HIP 36349	072851-3014.8	2861.9222	2963.9222	1.643	0.012	11.95	6.61
HIP 36349	072851-3014.8	2963.9222	3065.9222	1.640	0.012	13.74	4.81
HIP 36349	072851-3014.8	3065.9222	3167.9222	1.646	0.008	9.11	5.91
HIP 36349	072851-3014.8	3442.7025	3527.7025	1.643	0.016	15.16	4.82
HIP 36349	072851-3014.8	3620.9050	3713.9050	1.640	0.012	10.93	4.92
HIP 36349	072851-3014.8	3713.9050	3806.9050	1.640	0.012	7.47	4.91
HIP 36349	072851-3014.8	3806.9050	3899.9050	1.646	0.008	6.33	4.20
HIP 36349	072851-3014.8	4152.7220	4213.7220	1.640	0.016	7.91	6.58
HIP 36349	072851-3014.8	4436.9238	4538.9238	1.643	0.012	8.92	6.17
HIP 36349	072851-3014.8	4538.9238	4640.9238	1.643	0.012	5.26	3.70
TYC 9493 0838 1	073100-8419.5	2442.4557	2670.4557	4.782	0.069	4.90	2.55
TYC 9493 0838 1	073100-8419.5	3356.6151	3539.6151	4.983	0.038	8.67	3.05
TYC 9493 0838 1	073100-8419.5	3539.6151	3722.6151	4.962	0.112	9.90	5.83
TYC 9493 0838 1	073100-8419.5	4091.6662	4368.6662	4.815	0.035	9.87	4.63
TYC 9493 0838 1	073100-8419.5	4368.6662	4645.6662	5.102	0.079	17.93	6.35
TYC 9493 0838 1	073100-8419.5	4645.6662	4922.6662	5.114	0.079	12.72	3.84
HIP 76768	154028-1841.8	1922.8648	2000.8648	3.583	0.058	7.83	5.35
HIP 76768	154028-1841.8	2000.8648	2078.8648	3.706	0.063	6.13	4.71
HIP 76768	154028-1841.8	2078.8648	2156.8648	3.601	0.079	7.84	3.69
HIP 76768	154028-1841.8	2816.8696	2901.8696	3.574	0.039	7.92	4.22
HIP 81084	163342-0933.2	4298.8789	4381.8789	7.443	0.253	5.48	4.16
HIP 81084	163342-0933.2	4580.8779	4656.8779	7.423	0.252	5.99	4.66
BD-134687	173746-1314.8	2031.8767	2111.8767	0.447	0.001	5.56	5.23
BD-134687	173746-1314.8	2442.6568	2500.6568	0.447	0.001	10.53	5.87
BD-134687	173746-1314.8	2687.8671	2769.8671	0.447	0.001	11.30	4.78
BD-134687	173746-1314.8	2769.8671	2851.8671	0.447	0.001	6.69	5.04
BD-134687	173746-1314.8	2851.8671	2933.8671	0.447	0.001	10.31	5.96
BD-134687	173746-1314.8	3780.8387	3842.8387	0.447	0.001	12.47	2.80
BD-134687	173746-1314.8	4158.8722	4238.8722	0.447	0.001	7.34	5.47
BD-134687	173746-1314.8	4238.8722	4318.8722	0.447	0.001	6.01	3.24
BD-134687	173746-1314.8	4601.8772	4682.8772	0.447	0.001	9.30	4.58
BD-134687	173746-1314.8	4682.8772	4763.8772	0.447	0.001	6.05	5.45
HIP 94235	191058-6016.3	1966.8737	2054.8737	2.076	0.013	4.41	3.55
HIP 94235	191058-6016.3	2684.8879	2778.8879	2.223	0.022	4.38	2.64
TYC 0486 4943	193304+0345.7	2793.9023	2874.9023	1.320	0.008	4.62	3.97
TYC 0486 4943	193304+0345.7	3076.9058	3133.9058	1.356	0.014	7.82	5.04
TYC 0486 4943	193304+0345.7	3602.9050	3676.9050	1.359	0.008	5.54	5.44

Table A.7. continued.

Target	ASAS number	JD initial	JD final	Period (d)	ΔP (d)	Normalized power	Power at 99% confidence level
TYC 0486 4943	193304+0345.7	4258.9028	4332.9028	1.362	0.011	5.28	4.97
TYC 0486 4943	193304+0345.7	4332.9028	4406.9028	1.347	0.008	4.13	3.68
HD 189285	195924-0432.1	2796.8976	2879.8976	4.749	0.103	5.51	4.36
HD 189285	195924-0432.1	4714.9012	4791.9012	4.797	0.140	4.62	3.54
TYC 5164 567 1	200449-0239.3	2882.8999	2962.8999	4.690	0.134	3.18	2.97
TYC 5164 567 1	200449-0239.3	3528.9023	3601.9023	4.702	0.101	6.74	2.81
TYC 5164 567 1	200449-0239.3	4348.8947	4426.8947	4.657	0.099	7.71	2.63
TYC 5164 567 1	200449-0239.3	4633.9012	4706.9012	4.723	0.135	6.21	3.68
TYC 5164 567 1	200449-0239.3	4706.9012	4779.9012	4.788	0.105	5.47	4.18
TYC 1090 0543	205428+0906.1	4294.8995	4360.8995	2.268	0.024	6.25	4.51
TYC 1090 0543	205428+0906.1	4708.9154	4782.9154	2.250	0.031	6.18	3.23
TYC 6351 0286 1	211305-1729.2	2080.9030	2159.9030	4.884	0.109	10.97	6.88
TYC 6351 0286 1	211305-1729.2	2159.9030	2238.9030	4.893	0.145	11.35	4.80
TYC 6351 0286 1	211305-1729.2	2440.7907	2529.7907	4.860	0.108	10.97	6.29
TYC 6351 0286 1	211305-1729.2	3540.9084	3626.9084	4.839	0.142	14.84	4.86
TYC 6351 0286 1	211305-1729.2	3626.9084	3712.9084	4.761	0.138	4.77	4.70
TYC 6351 0286 1	211305-1729.2	4722.9102	4810.9102	5.019	0.114	5.62	4.08
HIP 106231	213102+2320.1	2820.9154	2880.9154	0.423	0.001	2.27	1.45
HIP 106231	213102+2320.1	4666.9163	4741.9163	0.423	0.001	12.14	5.86
HIP 107684	214849-3929.1	2173.9128	2261.9128	4.008	0.073	5.44	4.82
HIP 107684	214849-3929.1	2446.7835	2509.7835	4.074	0.101	6.97	5.24
HIP 107684	214849-3929.1	2509.7835	2572.7835	4.163	0.106	5.40	3.96
HIP 107684	214849-3929.1	2903.9108	2993.9108	4.181	0.053	7.24	4.62
HIP 107684	214849-3929.1	3548.9082	3640.9082	4.146	0.052	6.37	4.40
HIP 113579	230019-2609.2	3568.9086	3653.9086	2.157	0.021	5.06	4.77
HIP 114530	231154-4508.0	2445.8956	2517.8956	5.216	0.124	4.51	3.88
HIP 114530	231154-4508.0	2924.9105	3017.9105	5.234	0.083	5.94	4.32
HIP 114530	231154-4508.0	3480.9116	3573.9116	5.162	0.162	4.93	4.13
HIP 114530	231154-4508.0	3573.9116	3666.9116	5.171	0.081	10.12	4.19
HIP 116910	234154-3558.7	2178.9184	2258.9184	2.265	0.031	11.03	2.79
HIP 116910	234154-3558.7	2445.8158	2520.8158	2.349	0.025	5.38	4.51
HIP 116910	234154-3558.7	2955.7556	3017.7556	2.283	0.040	12.80	5.06
HIP 116910	234154-3558.7	3511.8980	3595.8980	2.307	0.024	5.37	4.48
HIP 116910	234154-3558.7	4406.9214	4494.9214	2.295	0.016	8.94	2.96
HIP 116910	234154-3558.7	4674.9208	4760.9208	2.304	0.024	4.70	4.18

Fig. A.1. ASAS V-band light curves of TW Hydrae (confirmed and rejected) members. *Top panel:* V-band data time series, where different colour are used to mark different time intervals. *second panel from top:* rotation period vs. time detected with a confidence level over 99%; *third panels:* periodogram (*left*) and spectral window function (*right*). Horizontal line indicate the power level corresponding to a 99% confidence level. Vertical solid line in the periodogram indicates the peak corresponding to the adopted rotation period. Bullets are beats of the rotation period. The vertical dotted line indicates that rotation period differs from the period at the spectral window function maximum. *Bottom panel:* light curve phase with the adopted rotation period. Solid line is a sinusoidal fit with the rotation period.

Fig. A.2. TWA members: continued from Fig. A.1.

Fig. A.3. ASAS V-band light curves of β Pictoris members. See Fig. A.1 for explanation.

Fig. A.4. β Pictoris members: continued from Fig. A.3.

Fig. A.5. β Pictoris members: continued from Fig. A.4.

Fig. A.6. β Pictoris members: continued from Fig. A.5.

Fig. A.7. ASAS V-band light curves of Tucana/Horologium members. See Fig. A.1 for explanation.

Fig. A.8. Tucana/Horologium members: continued from Fig. A.7.

Fig. A.9. Tucana/Horologium members: continued from Fig. A.8.

Fig. A.10. Tucana/Horologium members: continued from Fig. A.9.

Fig. A.11. ASAS V-band light curves of Columba members. See Fig. A.1 for explanation.

Fig. A.12. Columba members: continued from Fig. A.11.

Fig. A.13. Columba members: continued from Fig. A.12.

Fig. A.14. ASAS V-band light curves of Carina members. See Fig. A.1 for explanation.

Fig. A.15. Carina members: continued from Fig. A.14.

Fig. A.16. Carina members: continued from Fig. A.15.

Fig. A.17. ASAS V-band light curves of AB Doradus members. See Fig. A.1 for explanation.

Fig. A.18. AB Doradus members: continued from Fig. A.17.

Fig. A.19. AB Doradus members: continued from Fig. A.18.

Fig. A.20. AB Doradus members: continued from Fig. A.19.

Fig. A.21. AB Doradus members: continued from Fig. A.20.

Fig. A.22. AB Doradus members: continued from Fig. A.21.