# Pulsating Components in Binary and Multiple Stellar Systems — A Catalog of Oscillating Binaries \*

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**Abstract** We present an up-to-date catalog of pulsating binaries, i.e. the binary and multiple stellar systems containing pulsating components, along with a statistics on them. Compared to the earlier compilation by Soydugan et al.(2006a) of 25  $\delta$  Scuti-type 'oscillating Algol-type eclipsing binaries' (oEA), the recent collection of 74 oEA by Liakos et al.(2012), and the collection of Cepheids in binaries by Szabados (2003a), the numbers and types of pulsating variables in binaries are now extended. The total numbers of pulsating binary/multiple stellar systems have increased to be 515 as of 2014 October 26, among which 262+ are oscillating eclipsing binaries and the oEA containing  $\delta$  Scuti components are updated to be 96. The catalog is intended to be a collection of various pulsating binary stars across the Hertzsprung-Russell diagram. We reviewed the open questions, advances and prospects connecting pulsation/oscillation and binarity. The observational implication of binary systems with pulsating components, to stellar evolution theories is also addressed. In addition, we have searched the Simbad database for candidate pulsating binaries. As a result, 322 candidates were extracted. Furthermore, a brief statistics on Algol-type eclipsing binaries (EA) based on the existing catalogs is given. We got 5315 EA, of which there are 904 EA with spectral types A and F. The present catalog has a sortable web version allowing easy updating and maintenance (http://www.chjaa.org/COB/).

**Key words:** stars: oscillation (pulsation) — stars: binaries: eclipsing: Algol — stars: variables:  $\beta$  Cephei, Cepheids,  $\delta$  Scuti,  $\gamma$  Doradus, HADS, SX Phe, Red Giant Branch, RR Lyrae, sdBV/sdOV, SPB, post-AGB, pulsating White Dwarf, CV, Wolf-Rayet, Be/X-ray

# 1 MOTIVATION

What has caused the observational studies of eclipsing binaries (EB) with pulsating components important? Let us see the case of an oscillating Algol-type eclipsing binary system (designated as oEA, following Kim et al. 2003). An oEA's light variations would contain that due to the reflect and proximity effects, in addition to the eclipse, while the remained periodic variations are intrinsic variability to one of the components (usually the primary one) of the binary system. Figure 1 shows an example of such superimposed light variations. The photometric analysis of such binaries is unavoidably affected by intrinsic variations due to pulsation. In some case, if the big-sized component is pulsating, then periodic intrinsic pulsation can be seen during the whole orbital period, even in full eclipse. Most oEA stars exhibit the pulsational properties of a typical  $\delta$  Scuti star. However, their evolutionary history is entirely different with respect to single pulsators. This evokes not only one's observational interests but it also brings about a challenge to both stellar evolutionary and pulsational theories in characterizing the pulsators and binary systems. Eclipsing binaries, as one of the fundamental

<sup>\*</sup> An update to arXiv:1002.2729v5 based on the literature as of October 26, 2014. The web version at http://www.chjaa.org/COB/provides the latest updates. This edition is dedicated to my wife JYZ who suggests me to make the catalog searchable, sortable, and easy to update.

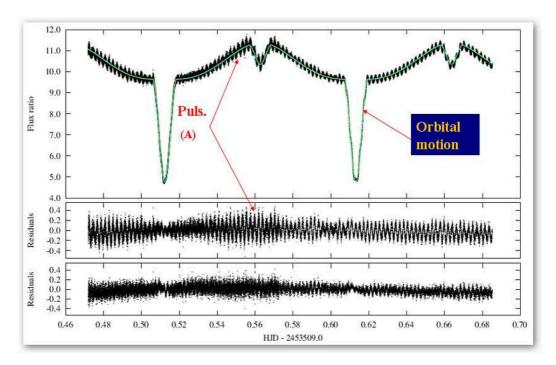


Fig. 1 Sample light curves of PG 1336–018, an eclipsing binary with a pulsating subdwarf B component. Adopted from Vučković et al.(2007).

astrophysical objects, when coupled with asteroseismology, they provide two independent methods to obtain masses and radii and excellent opportunities to develop highly constrained stellar models.

Research suggests that many stars are part of either binary star systems or star systems with more than two stars, called multiple stellar systems. Some 67% of the stars with spectral types ranged G to M in the vicinity of the Sun are binaries (Mayor et al. 2001). Moreover, 75% high-mass binaries are found in star clusters and stellar associations (of O–B types, Mason et al. 2001).

Pulsation has been detected in stars of almost every kind of spectral types. Pulsating variables cover a wide range of masses and almost every stage in stellar evolution. Pulsating variables and binary systems are connected with each other over a long history. Almost all types of pulsating stars (see Fig. 1 or its original version, fig.1 of Jeffery 2008) are found as members of binary systems. For example, nearly a half of the 60 spectroscopically monitored  $\gamma$  Doradus stars in northern sky are binaries (Mathias et al. 2004); the majority of classical Cepheids have one or more companions (Szabados 2003b).

The period-luminosity relationship of Cepheids makes their study one of the most effective ways to measure the distance to nearby galaxies and thus to map out the scale of the whole universe. This useful feature of Cepheids has earned them the nickname "standard candles". Unfortunately, despite their importance for the improvement in the cosmic distance scale, Cepheids are not fully understood. Predictions of their masses derived from the theory of pulsating stars are 20% less than predictions from the theory of stellar evolution. The find of eclipsing binaries containing a Cepheid will help in accurately measuring the orbital motion, sizes and masses of the two stars. It is the best approach to solving the above mass discrepancy. Unfortunately neither Cepheids nor eclipsing binaries are common, so the chance of finding such an unusual pair seemed incredibly rare. None are known in the Milky Way by now. MACHO 81.8997.87 was first identified as an eclipsing Cepheid (in first overtone mode) in the Large Magellanic Cloud (LMC) by OGLE (Udalski et al. 1999), and it is reconfirmed by MACHO (Lepischak et al. 2004). Eclipsing binary systems with Cepheid components in the LMC is a key to the extragalactic distance scale (Guinan et al. 2005). The discovery of the eclipsing double star OGLE-LMC-CEP 0227 in the LMC (Pietrzyński et al. 2010), where a 3d 8-pulsating Cepheid variable orbiting another star in a period of 310 days. The rare alignment of the orbits of the two stars in this eclipsing system has allowed a

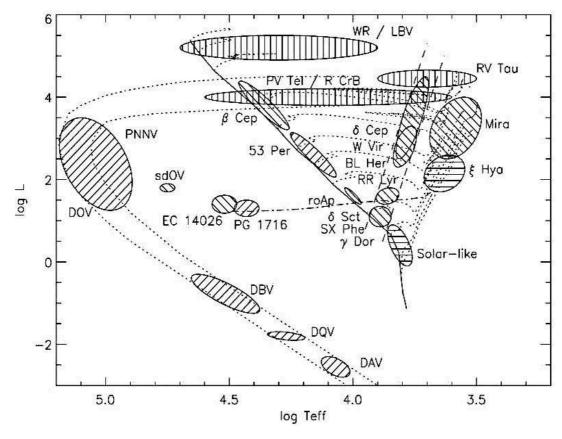


Fig. 2 A version of the Hertzsprung-Russell diagram of pulsating stars. Adopted from Jeffery (2008).

measurement of the Cepheid mass with unprecedented accuracy. The new result shows that the prediction from stellar pulsation theory is spot on, while the prediction from stellar evolution theory is at odds with the new observations.

Similar to Cepheids, because of their constant mean luminosities  $\sim 45\,L_{\odot}$  ( $\langle M_V \rangle \sim +0.5$  mag) and easily recognizable light curves, RR Lyr variables have long served as the "cornerstone" of the Pop. II distance scale in our galaxy and for local group galaxies. However, there are few fundamental data available for RR Lyr stars. In fact, except the trigonometric parallax determination of RR Lyr itself from HST measurements (Benedict et al. 2002), there are few direct measures of their most fundamental properties — such as mass, radius and luminosity. The astrophysical and cosmological consequences of finding an RR Lyr star in an EB are considerable, because the masses and absolute radii of the components of eclipsing binaries can be determined to within a few percent from analyses of their light and radial velocity curves. RW Ari was early suspected to be in an EB system (Wiśniewski 1971) but it was not supported by late observations (e.g. Dahm 1994). The RR Lyr star TU UMa was highly suspected to be a member of a binary system by Wade et al. (1999), but without follow-up confirmation. OGLE data could have discovered three candidates in the LMC which simultaneously reveal RR Lyr-type and eclipsing-type variability (Soszyński et al. 2003). One of the three candidates OGLE J052218.07-692827.4 apparently showed detached eclipsing binary signature. The RR Lyr primary component has a pulsation period of 0.564876 days. It was suspected to be the only bona fide EB with an RR Lyr component (Guinan et al. 2007). However, HST/WFPC2 observations of the star resolved 5 distinct sources within a 1.3" region — the typical OGLE resolution, proving that it is also an optical blend, does not seem to correspond to a physically plausible system. The source is likely another background RR Lyr star. As of 2008, there is still no an RR Lyr star discovered in an eclipsing binary system (Prša et al. 2008). Most recently, using the OGLE-III database, Soszyński et al. (2011) reported the breakthrough discovery of an RR Lyr star OGLE-BLG-RRLYR-02792 with additional eclipsing variability with the orbital period of 15.2447 days. These authors have identified further three RR Lyr stars being likely in EB systems.

Recent discoveries of various oscillating stars in eclipsing binaries have motivated the researchers, who are specialized in the fields of binaries and pulsating variables, to draw their observational attention onto oscillating binary systems. For example, the discovery of non-radial pulsations in the Herbig Ae type spectroscopic binary RS Cha (Böhm et al. 2009); the discovery of slow X-ray pulsations in the high-mass X-ray binary 4U 2206+54 (Reig et al. 2009); the search for planets around pulsating subdwarf B stars (Schuh et al. 2010); the detection of a tertiary brown dwarf companion in the sdB-type eclipsing binary HS 0705+6700 (Qian et al. 2009) and circumbinary planets orbiting the sdB binary NY Vir (Qian et al. 2012); the detection of a giant extrasolar planet orbiting the eclipsing polar DP Leo (Qian et al. 2010), which is identified as a cataclysmic binary by Beuermann et al. (2011).

Most recently, a search for radio pulsations from neutron star companions of four subdwarf B stars (Coenen et al. 2011) leads to the results that they orbit a companion in the neutron star mass range. Such companions are thought to play an important role in the poorly understood formation of subdwarf B stars.

## 2 RATIONALE AND BENEFIT OF STUDYING BINARY SYSTEMS OSCILLATING COMPONENTS

There are only two underlying mechanisms for driving stellar pulsations: the self excitation in the layers (which operate as a heat engine) and the stochastic oscillations by turbulent convection. The former instability mechanism excites pulsations in most stars, beginning from classical instability strip stars, through B type main sequence stars, hot subdwarfs to white dwarfs. The second stochastic excitation drives solar-like oscillations, including those observed in the Sun, and is expected in all stars with extended convective outer layers (Daszyńska-Daszkiewicz 2009). That is not the whole story of stellar pulsation. In pulsation modelling, pulsation modes are needed to be observationally identified first. More importantly, the stellar mass must be well determined as a key input parameter before applying asteroseismic techniques.

How can we measure the mass of a distant star? As known, stellar mass (together with radius) can be independently and uniquely determined only if the star is a component of a double-lined spectroscopic eclipsing binary by the Kepler's third law:

$$\frac{G(M_1 + M_2)}{a^3} = \frac{4\pi^2}{P^2} \quad \text{or} \quad M_1 + M_2 = \frac{a^3}{P^2} \,, \tag{1}$$

if one measures orbital period P in years, semimajor axis of the orbit a (or separation of the two components) in astronomical units (AU) and each component's mass  $(M_1, M_2)$  in solar masses. The orbital velocity amplitudes  $(K_1, K_2)$  are used to determine a directly by the relation

$$|K_1| + |K_2| = \frac{2\pi}{P} a \sin i \ . \tag{2}$$

A general mass function for the secondary companion can be written as

$$M_2 \sin i = \left(\frac{P}{2\pi G}\right)^{1/3} \frac{K_1 \sin i}{(M_1 + M_2)^{2/3}},\tag{3}$$

where  $K_1 \sin i$  is the line-of-sight velocity component of the orbital motion of the primary companion about the center of mass, G is the universal gravitational constant. If the orbital plane of a binary system is perpendicular to the plane of the sky, that is, we are observing in the orbital plane (edge-on, orbital inclination  $i = 90^{\circ}$ , which is true if the system is eclipsing), then the solution to the above equation is straightforward. By using eq.(3), orbital eccentricity is neglected and circular orbit has been assumed. Thus if an eclipsing binary is a double-lined spectroscopic system, the fundamental physical properties (mass, radius, temperature and luminosity) can be directly determined from the analysis of the combined radial velocity and photometric observations. The parameter relations given in eqs.(1)–(3) is one of the main concerns on the study of eclipsing binary systems with pulsating components.

To summarize, the common interests in studying the pulsators in binary and multiple stellar systems relies at least on following advantages:

(1) If no mechanism damping pulsations in close binaries, percentage of pulsating stars expected among A–F components of detached and semi-detached eclipsing binaries should be at least the same as for single A–F type stars.

- (2) Pulsation characteristics of oscillating binaries are similar to those of single pulsators, but their evolutions are quite different due to mass accretion.
- (3) Precise estimation of the accretion rate using the pulsation period changes of the gainer(i.e. accreting star) caused by accretion.
- (4) Possibility of precise dynamical mass and radius determinations the masses and radii for each component in eclipsing (double-lined) spectroscopic binaries could be accurately determined.
  - (5) With a certain mass, it should help to model the pulsating spectra.
- (6) The possibility of (non-radial) mode identification during the eclipse orbital phases (i.e. the primary minima) using the observed pulsational amplitude and phase changes during the eclipse (Nather & Robinson 1974). This has been explored by, for instance, Reed et al. (2005) and Bíró & Nuspl (2011).
- (7) Higher probability of detection of the sectorial modes due to equator-on visibility of components in close eclipsing binaries.
- (8) When applying asteroseismic diagnostic tools to studying the dynamics of mass transfer between components in semi-detached eclipsing binaries, the possibility of precise estimation of the accretion rate would become higher if using the pulsation period changes of the gainer star caused by accretion.
- (9) The study of pulsational properties of the pulsating components in eclipsing binaries is in its blossom state, whereas asteroseismology of these stars is very attractive in comparison to single stars pulsational properties can be constrained using spectroscopic eclipsing binary systems (say Creevey et al. 2011).
- (10) The connection between asteroseismology and exoplanet research, i.e. the study of pulsating stars harboring planets. Two early discussions can be found in Moya (2013) and Vauclair (2008, 2012). A recent technique progress using photometric data to derive radial velocity is presented by Shibahashi & Kurtz (2012) and Murphy et al. (2014). This technique has opened a new era in the EB study.
- (11) Eclipsing binaries containing pulsating stars provide a unique opportunity to improve calibration of the cosmic distance scale and to better calibrate stellar evolutionary models.

By now, more than ten types of pulsating stars are found as members of various binary systems. Those planet-hosting oscillators can also be regarded as a special case of binary systems. At the time of observational efforts rolling into this field, the binary, triple or multiple stellar systems with pulsating components are needed to be collected in a catalog. We have attempted to catalog both the Galactic and extragalactic stellar systems with pulsating components. However, the number of pulsating binaries is increasing. As of this writing, some oscillating multiple stellar systems might have not been collected. The readers should be aware that other kinds of pulsating binary systems not mentioned in current version are possible. Regarding this, the missing materials will be supplied in future updates.

## 3 NOTES TO THE CATALOG

# 3.1 General notes

Labels used in the catalog:

- (1) Sp.(A+B) spectral types of the primary (A) and secondary component (B)
- (2)  $\langle V \rangle$  mean magnitude in V band
- (3)  $\langle B \rangle$  mean magnitude in B band
- (4)  $P_{\rm orb}$  orbital period in days
- (5)  $P_{\text{pul}}$  main pulsation period in days (except those indicated units)
- (6) Comments key characteristics of the pulsating multiple stellar systems, membership of a cluster, other identifications, etc. Full identification in the survey project is provided, some object names used short nomenclature following the original references.

Table 1 A statistics on pulsating binaries based on the presented catalog. Candidates follow the plus '+' sign.

| Type of Pulsators                 |            |           | Classes of stella | r systems |                     |
|-----------------------------------|------------|-----------|-------------------|-----------|---------------------|
|                                   | Group      | Eclipsing | Spectroscopic     | Visual    | Others <sup>†</sup> |
|                                   | Sum        | Binaries  | Binaries          | Binaries  |                     |
| (1) DCEP: Galactic <sup>††</sup>  | 154 + 34   | 3         | 123               | 20        | 20                  |
| DCEP: Extragalactic               | 4 + 0      | 4         | 0                 | 0         | _                   |
| Type II Cepheids(CWA,CWB,RV):     | 14 + 18    | 7         | 7                 | 0         | _                   |
| (2) DSCT: $\delta$ Scuti-type     | 112 + 53   | 96        | 13                | 1         | 7                   |
| (3) solar-like oscillators + RGB  | 71 + 0     | 65        | 4                 | 2         | 1                   |
| (4) sdBV: pulsating subdwarf B/O  | 41 + 20    | 15        | 24                | _         | 1                   |
| (5) CV: cataclysmic variable      | 32 + 28    | 29        | 3                 | 0         | 0                   |
| (6) BCEP: $\beta$ Cep-type        | 26 + 9     | 10        | 11                | _         | 5                   |
| (7) SPB: slowly pulsating B stars | 15 + 0     | 3         | 10                | 2         | 2                   |
| (8) GDOR: $\gamma$ Dor-type       | 12 + 30    | 10        | 2                 | 0         | _                   |
| (9) Be/X-ray pulsators            | 10 + 0     | 9         | 0                 | 0         | _                   |
| (10) WD: pulsating white dwarf    | 6 + 57     | 3         | 3                 | 0         | _                   |
| (11) WR: Wolf-Rayet stars         | 3 + 0      | 3         | 0                 | 0         | _                   |
| (12) SX Phe-type                  | 6 + 3      | 2         | 0                 | 0         | _                   |
| (13) BY Dra-type                  | 1 + 0      | 1         | 0                 | 0         | _                   |
| (14) HADS: high-amplitude DSCT    | 2 + 0      | 1         | 0                 | 0         | _                   |
| (15) RR: RR Lyr-type              | 4 + 59     | 1         | 0                 | 0         | _                   |
| (16) non-classified               | 2 + 11     | 1         | 1                 | 0         | _                   |
| Total                             | 515 + 322* | 262       | 201               | 23        | 36                  |

<sup>†:</sup> Column 'Others' for triple/multiple systems and unidentified;

- (7) EB; EA Eclipsing binary (system); Eclipsing binary of Algol-type
- (8) oEA oscillating EA (eclipsing binaries of Algol-type)
- (9) SB refers to spectroscopic binary: SB1 (single-lined), SB2 (double-lined).
- (10) SB+orbit stands for spectroscopic binary with known orbital elements available in literature.
- (11) comp.? photometric companion, physical relation should be investigated.
- (12) References key references related to the pulsational properties and binarity. Some data were adopted from Soydugan et al. (2006a), which is not always listed when original papers or latest results are cited. Columns missing data will be populated in the future updates.

# 3.2 Comments on each subgroup of the pulsating multiple stellar systems

Under the scope of pulsating components in binaries, we have summarized, as a catalog in Table 3, all the types of pulsating stars currently discovered in various groups of binary systems. We describe each type of pulsating stars and binary systems briefly according to the GCVS as a conceptual background knowledge.

## 3.2.1 Types of Binary Systems Involved

1. EB: Eclipsing binary (systems). These are binary systems with orbital planes so close to the observer's line of sight (the inclination of the orbital plane to the plane orthogonal to the line of sight is close to 90°) that the components periodically eclipse each other. Consequently, the observer finds changes of the apparent combined brightness of the system with the period coincident with that of the components' orbital motion.

<sup>††:</sup> Galactic classical Cepheids in binaries are adopted from Szabados (2003a);

<sup>\*:</sup> These candidates were extracted from Simbad database without literature check for their identities.

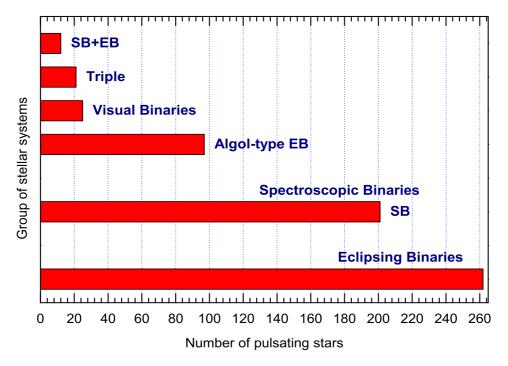


Fig. 3 Number of pulsators in different groups of multiple stellar systems.

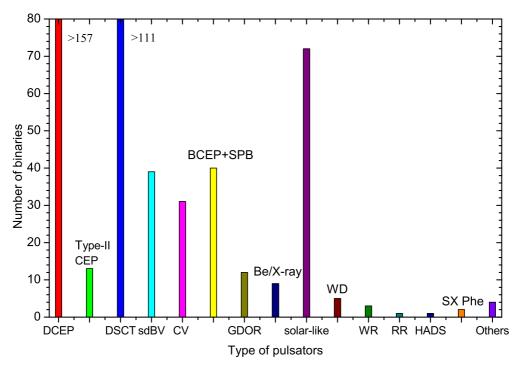


Fig. 4 Distribution of binaries (and multiples) containing different type pulsators. The columns for Galactic DCEP and  $\delta$  Sct are cutoff in order to display others better.

2. EA: eclipsing binaries of Algol ( $\beta$  Persei)-type, are binaries with spherical or slightly ellipsoidal (usually semi-detached or detached) components. It is possible to specify, for their light curves, the moments of the beginning and end of the eclipses. Between eclipses the light remains almost constant or varies insignificantly because of reflection effects, slight ellipsoidality of components, or physical variations. Secondary minima may be absent. An extremely wide range of periods is observed, from 0.1167 (HW Vir) to  $\geq$  10 000 days ( $\epsilon$  Aur). Light amplitudes are also quite different and may reach several magnitudes. For the oscillating Algol-type eclipsing binaries (widely recognized as

- oEA systems), usually the primary components are intrinsic pulsating variable stars (e.g.  $\delta$  Scuti-type pulsators), while the late-type secondary fills its Roche lobe. Distribution of a sample of 434 confirmed EA with respect to spectral types is given in Fig. 6. These binaries are provided in appendix.
- 3. EB( $\beta$ ):  $\beta$  Lyrae-type eclipsing systems. These are eclipsing systems having ellipsoidal components and light curves for which it is impossible to specify the exact times of onset and end of eclipses because of a continuous change of a system's apparent combined brightness between eclipses; secondary minimum is observed in all cases, its depth usually being considerably smaller than that of the primary minimum; periods are mainly longer than 1 day. The components generally belong to early spectral types (B-A). Light amplitudes are usually < 2 mag in V.
- 4. EW: W Ursae Majoris-type eclipsing variables (W UMa-type). These are eclipsing binaries with periods shorter than 1 day, consisting of ellipsoidal components almost in contact (some even overcontact) and having light curves for which it is impossible to specify the exact times of onset and end of eclipses. The depths of the primary and secondary minima are almost equal or differ insignificantly. Light amplitudes are usually <0.8 mag in V. The components generally belong to spectral types F–G and later. Only eight pulsating components are identified in EW by now. However, several additional candidates were suggested (e.g. Michalska & Pigulski 2008).
- 5. SB: single- or double-lined spectroscopic binaries (SB1, SB2).
- 6. X: Close binary systems that are sources of strong, variable X-ray emission and which do not belong to or are not yet attributed to any of the above types of variable stars. One of the components of the system is a hot compact object (white dwarf, neutron star, or possibly a black hole). X-ray emission originates from the infall of matter onto the compact object or onto an accretion disk surrounding the compact object. In turn, the X-ray emission is incident upon the atmosphere of the cooler companion of the compact object and is re-radiated in the form of optical high-temperature radiation (reflection effect), thus making that area of the cooler companion's surface an earlier spectral type. These effects lead to quite a peculiar complex character of optical variability in such systems. Be/X-ray pulsating binary systems is a type of this class.

# 3.2.2 δ Sct Pulsators in Binaries

Variables of the  $\delta$  Scuti type (DSCT) are pulsating variables of spectral types A0-F5 with luminosity classes V to III displaying light amplitudes from 0.003 to 0.9 mag in V band (usually several hundredths of a magnitude) and periods from 0.01 to 0.2 days. The shapes of the light curves, periods, and amplitudes usually vary greatly. Radial as well as nonradial pulsations are observed. The variability of some members of this type appears sporadically and sometimes completely ceases, this being a consequence of strong amplitude modulation with the lower value of the amplitude not exceeding 0.001 mag in some cases. The maximum of the surface layer expansion does not lag behind the maximum light for more than 0.1 periods. DSCT stars are representatives of the galactic disk and are phenomenologically close to the SX Phe variables. They pulsate in radial and nonradial p (pressure, and possibly also g – gravity) modes. After white dwarfs, they are the second most abundant pulsating variables in our Galaxy.

 $\delta$  Sct type pulsators are driven by the so-called  $\kappa$  mechanism. These stars pulsate mostly in low-radial-order pressure-mode with pulsation constants usually less than 0.03 d. Seeds (1972) argued that about one third of 155  $\delta$  Sct stars are binary, but as of 1974, only two (AB Cas and Y Cam) were known in eclipsing binaries. Fitch (1976) suggested that high-amplitude DSCT are single, while the low-amplitude ones probably have companions. However, probably due to difficulty in observing small-amplitude oscillations in comparison with large light variation caused by the eclipsing phenomenon, only nine  $\delta$  Sct-type pulsating components in EB systems were reported as of 2001 (Rodríguez & Breger 2001). Nevertheless, with high-precision CCD photometry and various surveys including the space missions CoRoT and Kepler, the number has been inspiringly increased largely to more than 90 in recent years.

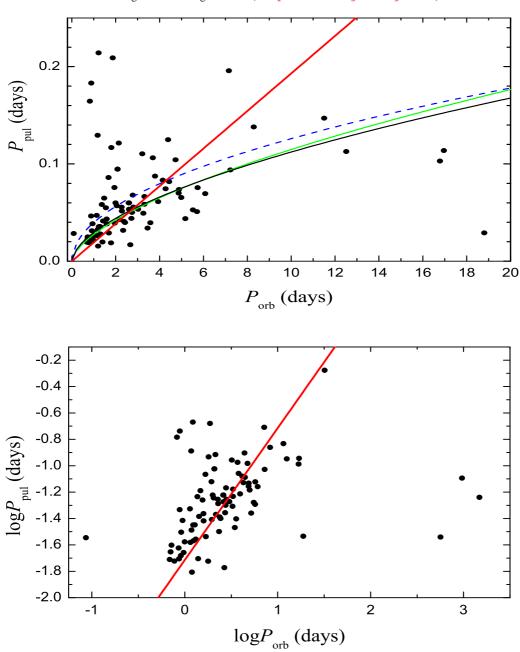


Fig. 5 Correlation between the orbital and pulsational periods of the known 93 oEA with  $\delta$  Sct components (DSCT-oEA). A few with longer orbital periods are cutoff. Red lines in both panels based upon a sample of 73 DSCT-oEA:  $\log P_{\rm pul} = -1.7 + \log P_{\rm orb}$  (Zhang et al. 2013); Top: black solid line for a collection of 74 DSCT-oEA by Liakos et al.(2012):  $\log P_{\rm pul} = -1.53 + 0.58 \log P_{\rm orb}$  [eq.(3)]; while the blue dash for semi-detached DSCT-oEA:  $\log P_{\rm pul} = -1.4 + 0.52 \log P_{\rm orb}$  [eq.(2)], green line for detached DSCT-oEA:  $\log P_{\rm pul} = -1.56 + 0.62 \log P_{\rm orb}$  [eq.(1)].

# 3.2.3 $\beta$ Cep and SPB Pulsators in Binaries

There are two classes of B-type main sequence pulsators:  $\beta$  Cephei pulsators (BCEP) and slowly pulsating B stars (SPB). Variables of the  $\beta$  Cephei type (prototype  $\beta$  Cep,  $\beta$  CMa), are pulsating O8-B6 I-V stars with periods of light and radial-velocity variations in the range of 0.1–0.6 days and light amplitudes from 0.01 to 0.3 mag in V band. The light curves are similar in shape to average radial-velocity curves but lag in phase by a quarter of the period, so that maximum brightness corresponds to maximum contraction, i.e., to minimum stellar radius. The majority of these stars probably show radial pulsations, but some (say V649 Per) display nonradial pulsations. Multiperiodicity is characteristic of many of these stars. BCEP stars with masses larger than  $8M_{\odot}$  and spectral types B0-B2.5, in which mainly pressure (p) modes are excited.

SPB stars are pulsating in high-order, low degree gravity (*g*) modes with typical periods of the order of a few days. These modes are excited by the opacity mechanism acting on the metal-bump. They are trapped deep in the interior of these hot stars, making them very interesting from an asteroseismic point of view. The theoretical pulsation frequency spectra of SPB stars are very dense, the observed amplitudes are low, and most of the currently known SPBs are multiperiodic, giving rise to beat periods of the order of months or even years. Rotation is a serious complication for mode identification in these stars because rotational splitting is large enough to cause multiplets of adjacent radial orders to overlap. Together with longer pulsation periods and rich eigen-spectra, great promise and obstacles coexist. These stars present serious observational and theoretical challenges. Currently, at least 51 confirmed and 65 candidate galactic SPB stars are known (Aerts et al. 2006 and references therein), of which 15 are in open clusters.

SPBs with spectral types B3–B9 and masses smaller than  $8M_{\odot}$ . SPBs are somewhat similar to BCEP stars. Several BCEP/SPB hybrids are currently known, for example,  $\gamma$  Peg (Handler 2009a,b),  $\nu$  Eri and 12 Lac (Dziembowski & Pamyatnykh 2008) have been confirmed to present both BCEP and SPB types of variations, i.e. pressure and gravity modes pulsation. The existence of excited p and q modes should allow the simultaneous study of both the external and the internal zones of the stars. It may also help to refine the limits of the SPBs instability zone.

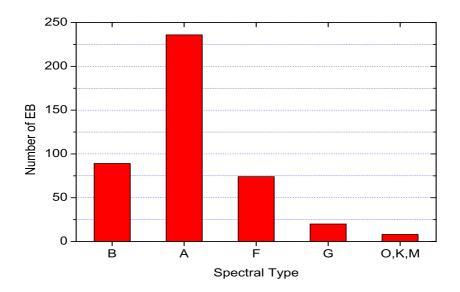
## 3.2.4 Cepheids in Binaries

Cepheids (CEP) are radially pulsating, high luminosity (classes Ib-II) massive variables with periods in the range of 1– 135 days and amplitudes from several hundredths to 2 mag in V (in the B band, the amplitudes are greater). Light curves show a rapid rise in brightness followed by a more gradual decline, shaped like a shark fin. Spectral type at maximum light is F; at minimum, the types are G-K. The longer the period of light variation, the later is the spectral type. The maximum of the surface-layer expansion velocity almost coinciding with maximum light. (1) Classical Cepheids (Pop. I, prototype  $\delta$  Cephei) or called  $\delta$  Cephei-type (DCEP) variables, are comparatively young objects that have left the main sequence and evolved into the instability strip of the Hertzsprung-Russell (H-R) diagram, they obey the well-known Cepheid period-luminosity relation and belong to the young disk population. DCEP stars are present in open clusters. They display a certain relation between the shapes of their light curves and their periods. (2) Type II Cepheids: metalpoor, low mass, population II. They are divided into three subclasses: BL Herculis-type (P=1-5 days), W Virginis-type (P=~10-20 days), and RV Tauri-type (P>20 days). W Vir Cepheids (CW) are pulsating variables of the galactic spherical component (old disk) population with periods of approximately 0.8 to 35 days and amplitudes from 0.3 to 1.2 mag in V. They obey a period-luminosity relation different from that for DCEP variables. For an equal period value, the CW stars are fainter than the DCEP stars by 0.7-2 mag. The light curves of CW variables for some period intervals differ from those of DCEP variables for corresponding periods either by amplitudes or by the presence of humps on their descending branches, sometimes turning into broad flat maxima. CW variables are present in globular clusters and at high galactic latitudes. DCEP and CW are distinct groups of entirely different objects in different evolutionary stages. A few RV Tauri-type pulsating variables were found in post-Asymptotic Giant Branch (post-AGB) binaries.

During the last few years, observations have revealed that (1) nonradial modes in classical Cepheids (Moskalik & Kolaczkowski 2008); (2) eclipsing binaries containing Cepheids (Soszyński et al. 2008b; Pietrzyński et al. 2010); (3) triple-mode Cepheids (Soszyński et al. 2008a), etc. Most stellar systems containing Cepheids are spectroscopic binaries, a few are eclipsing binaries. Moreover, the orbital period of these binaries usually are quite long (up to tens of years), see details in the present catalog.

The astrophysical and cosmological importance of finding a Cepheid as a member of an eclipsing binary is considerable. If an eclipsing binary is a double-lined system, the mass, radius, and luminosity can be directly determined from the analysis of the light and radial velocity curves. Moreover, the study of Cepheids in eclipsing binaries offers an important opportunity to investigate the structure and evolution of Cepheids as well as tests of pulsational theories. These systems

provide opportunity to minimize the dependence of the Cosmic Distance Scale and Hubble's constant on uncertainties in assumed "zero-points". Unfortunately, there are no Cepheids in eclipsing binary systems known so far in the Milky Way.



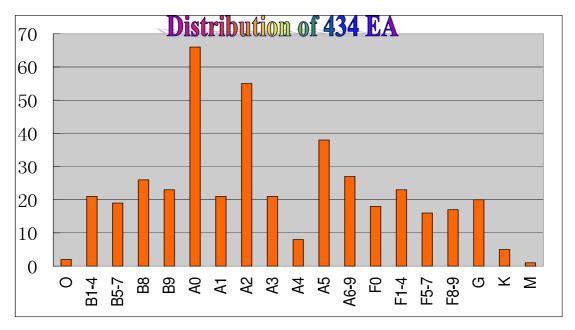


Fig. 6 Distribution of the identified 434 Algol-type eclipsing binaries over spectral types.

# 3.2.5 $\gamma$ Dor Pulsators in Binaries

 $\gamma$  Doradus-type stars (GDOR, prototype  $\gamma$  Dor) are early type F dwarfs showing multiple periods from several tenths of a day to slightly in excess of one day. Amplitudes usually do not exceed 0.1 mag. Presumably low degree gravity-mode non-radial pulsators and high-radial-order g-mode pulsators. Presently feasible driving mechanism is flux-blocking mechanism at the base of their relatively thin convective envelopes. They usually have pulsation constants higher than 0.23 d.  $\gamma$  Dor and  $\delta$  Sct stars have commensurate pulsational periods.

#### 3.2.6 sdB/sdO Pulsators in Binaries

Pulsating subdwarf B (sdB) variable stars are low-mass ( $\sim$ 0.5  $\rm M_{\odot}$ ) core helium-burning horizonal branch stars with very thin outer hydrogen layers, making them quite luminous. They are evolved, compact (typical values  $\log g \sim 5.8$ ) and hotter ( $T_{\rm eff} \gtrsim 20\,000\,\rm K$ ) B subdwarfs. Since its discovery in 1997, over 30 of the sdBV stars have been identified to be multimode pulsators, with typical pulsation periods of 100–250 seconds in a total range of about 60–600 seconds, and with pulsation amplitudes generally less than a few hundredths of a magnitude. These pulsating sdB stars are officially V361 Hya stars, which were commonly known as EC 14026 stars after the prototype and referred to as sdBV stars.

## 3.2.7 RR Lyr Pulsators in Binaries

RR Lyrae stars (RR) are variables of the RR Lyrae type, they are old population II, mostly found in globular clusters, which are radially-pulsating giant stars with spectral types in A7–F5, having amplitudes  $\Delta V \sim 0^{\rm m}3-2^{\rm m}0$  and periods in 1.5–24 hr. Cases of variable light-curve shapes as well as variable periods are known. If these changes are periodic, they are called the "Blazhko effect." The majority of these stars belong to the spherical component of the Galaxy; they are present, sometimes in large numbers, in some globular clusters, where they are known as pulsating horizontal-branch stars. Like Cepheids, maximum expansion velocities of surface layers for these stars practically coincide with maximum light. They are further classified into four subgroups: (1) RR(B): RR Lyrae variables showing two simultaneously operating pulsation modes, the fundamental tone with the period  $P_0$  and the first overtone,  $P_1$  (AQ Leo). The ratio  $P_1/P_0$  is approximately 0.745; (2) RRab: RR Lyrae variables with asymmetric light curves (steep ascending branches), periods from 0.3 to 1.2 days, and amplitudes from 0.5 to 2 mag in V; pulsating in fundamental mode. (3) RRc: RR Lyrae variables with nearly symmetric, sometimes sinusoidal, light curves, periods from 0.2 to 0.5 days, and amplitudes not greater than 0.8 mag in V (e.g. SX UMa). Overtone pulsators. (4) RRd: RR Lyrae pulsators in first overtone and fundamental double radial modes.

## 3.2.8 SX Phe-type Pulsators in Binaries

Phenomenologically, these SXPHE resemble DSCT variables and are pulsating subdwarfs of the spherical component, or old disk galactic population, with spectral types in the range A2–F5. They may show several simultaneous periods of oscillation, generally in the range 0.04–0.08 days, with variable-amplitude light changes that may reach 0.7 mag in V band. These stars are Pop. II, metal-poor with high spatial motions, mostly in blue-straggler region in globular clusters. Multiperiodicity and nonradial pulsational contents are discovered recently in some of them.

## 3.2.9 WDA/WDB Pulsators in Binaries

White dwarf (WD) pulsators (showing absorption lines with FWHM  $>1500 \text{ km s}^{-1}$ ) with Balmer lines only (WDA) or white-dwarf white-dwarf binaries (WDB). Binaries consisting of sdB and WD are listed together under sdB type.

## 3.2.10 Oscillating Red Giant (Branch) Stars in Eclipsing Binaries

Solar-like oscillations have been identified in 15 more red-giant branch (RGB) stars belonging to eclipsing binary systems in *Kepler* data (Gaulme et al. 2013,2014). The first detection was the 408-day period system KIC 8410637 (Hekker et al. 2010). So far, all the stars known to both display acoustic modes and belong to EBs are red-giants. We group them as red giants in eclipsing binaries (hereafter RGEBs or RG/EBs), which span a range of orbital eccentricities, periods, and spectral types F, G, K, and M for the companion of the red giant.

## 3.2.11 Other Pulsators in Binaries

In this contribution, we also collected a few other types of pulsating stars in EB systems, including three Wolf-Rayet stars, one BY Dra-type star, and those eclipsing cataclysmic variables (CVs), especially the subgroup of post-common envelope binaries known or suspected to possess planets. CVs are a class of interacting binary star system which display a huge diversity of physical phenomena. The majority of them are composed of a white dwarf and a low-mass and unevolved secondary star, plus an accretion disc through which material passes from the secondary star (the donor) to the WD. The importance of eclipsing CVs lies in the information which can be extracted from them: detailed modelling of their eclipses allows one to obtain the basic physical properties of the system, including the masses and radii of the stellar components. Such information is valuable in understanding the evolution of CVs.

# 4 STATISTICS AND OPEN QUESTIONS

Based on the catalog, several statistics were made in Table 1 and Figs.3–6. We address such stellar systems' observational implication to stellar evolutionary theory by gathering the interesting topics and open questions from publications (Lampens 2006 and others) as followings:

- 1. How can binarity modify the pulsation properties? in what manner? e.g. how binary tidal interactions affect pulsations when compared to the single-star case.
- 2. How can binarity/multiplicity help to identify the pulsation modes? Regarding that the amplitude and phase of the pulsating mode change during an eclipse (Breger 2005), the eclipse mapping technique was attempted by e.g. Reed et al. (2005), Bíró & Nuspl (2011) and the direct fitting of spherical harmonics by Latković & Bíró (2008).
- 3. Can we understand stellar pulsations when other processes (e.g. mass exchange/loss) are also present?
- 4. What is the link between orbital motion, rotation and pulsation?
- 5. We need improved models which can take into account deformed stellar shapes, including rotational and tidal distortions.
- 6. How to discriminate properly between forced oscillations and modified or unaffected free oscillations in close binaries?
- 7. Possible small cyclic variations of the oscillation frequencies, due to variable shape of the star in close eccentric-orbit binaries, and the light-time effect in the wide ones.
- 8. binary constraints for asteroseismology of pulsating stars, e.g. the studies by Creevey (2008) and Creevey et al. (2011); establishing pulsating binary models, e.g. the work by Nie et al.(2010).
- 9. search for solar-like p-mode oscillations in eclipsing binary systems.
- 10. search for solar-like oscillations in metal-poor stars.
- 11. search for pulsating M, K giants and subgiant stars.
- 12. search for extra-solar planets orbiting a pulsator: eclipsing binaries consisting of planetary companions have been found from high-precision photometry, e.g. Silvotti et al.(2007), Qian et al.(2010).
- 13. search for extragalactic eclipsing binaries containing pulsating stars (e.g. RR Lyr and Cepheids).

Recalling the open questions, progress and prospects connecting oscillation and binarity, the study of pulsating components in binaries becomes increasingly important.

# **5 THE CATALOG**

The catalog is arranged in different types of pulsating stars. Entries for member stars in each group are listed in the order of ascending Right Ascension. The orbital and pulsational data were adopted from literature. FK5 coordinates

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(equinox=2000.0), spectral types and B, V, J, H, g, r magnitudes when unavailable in publications were adopted from the SIMBAD astronomical database<sup>1</sup> and other databases on the Internet.

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# Appendix A: CATALOG OF IDENTIFIED ALGOL-TYPE ECLIPSING BINARIES

For the convenience of selecting a candidate EA to search for pulsation, currently confirmed 435 Algol-type eclipsing binaries are cataloged. As seen in Fig. 1, pulsation could be excited in almost everywhere across the H–R diagram, so spectral types is not an exclusive criterion in the selection of candidate pulsators. Entries for member stars are listed in the order of ascending Right Ascension. Some oEA systems have been included in this collection. Other data and references to stars are not given for simplicity. These materials are an update to the 434 entries given in the post-doctoral report of Dr. Yang Y.-G. (2010).

Besides this catalog, several catalogs from various survey projects are available for reference. For instance, the OGLE catalog of 2580+1351 EBs in LMC and SMC (Wyrzykowski et al. 2003, 2004), 11099 EBs in ASAS catalog (Paczynski et al. 2006); a catalog of 773 EBs in the TrES survey (Devor et al. 2008; https://www.cfa.harvard.edu/~jdevor/Catalog.html); Kepler EB stars catalog of 1879 EBs in its first data release (http://astro4.ast.villanova.edu/aprsa/kepler; Prsa et al. 2011) and the second data release has increased the total number of identified EBs to 2165 (http://keplerEBs.villanova.edu; Slawson et al. 2011, Matijevic et al. 2012). We investigated these catalogues and summarize them in Table A.1. In addition, the fruitful searches (e.g. Mkrtichian et al. 2002, Kim et al. 2003) and those fruitless attempts (e.g. Pazhouhesh et al. 2009) can be referenced in selecting candidates.

http://simbad.u-strasbg.fr/simbad/

Table A.1 A statistics on Algol-type eclipsing binaries.

| 4.03, GCVS V4.2<br>4.03, GCVS V4.2<br>2.03, HEASARC_GCVS version<br>3.10,<br>95.09, from GCVS | http://www.sai.msu.su/gcvs/cgi-bin/search.htm http://www.sai.msu.su/gcvs/gcvs/iii/iii.dat http://heasarc.gsfc.nasa.gov/W3Browse/all/gcvs.html Avvakumova et al. 2013, AN, 334, 860   |
|---|--|
| 2.03, HEASARC_GCVS version 3.10,  | http://heasarc.gsfc.nasa.gov/W3Browse/all/gcvs.html  |
| 3.10,   |  |
| ,   | Avvakumova et al. 2013, AN, 334, 860   |
| 05.09 from GCVS   | , , , ,  |
| 3.07, HOIII GC V B  | Malkov et al. 2006, A&A, 446, 785  |
| 3.11, Kepler EB   | Kepler Eclipsing Binaries [Revision 3(beta)], http://keplerebs.villanova.edu   |
| 1 OGLE-III  | EB in LMC (Graczyk et al. 2011, Acta Astron., 61, 103 arXiv:1108.0446)   |
| 3 OGLE-III  | EB in SMC (Pawlak et al. 2013, Acta Astron., 63, 323 arXiv:1310.3272)  |
|   | http://ogle.astrouw.edu.pl ftp://ftp.astrouw.edu.pl/ogle3/OIII-CVS/lmc/ecl/  |
| $08.02$ , ASAS ( $V < 14^{\rm m}_{\cdot}0$ )  | 627 DSCT/BCEP in EC/ED/ESD: Paczyński B. et al. 2006, MNRAS, 368, 1311(astro-ph/0601026)   |
|   | 2758Detached, 2957SD, 5384C; 11099EB of 50122 variables. http://www.astrouw.edu.pl/asas/   |
| 98 TrES   | Devor, J., Charbonneau, D., ODonovan, F. T., Mandushev, G., & Torres, G., 2008, AJ, 135, 850   |
| 2, GSCVS 4, Vol.V   | Extragalactic Variable Stars; Extragalactic eclipsing binaries   |
| 0/2741 not presented in 3395  |  |
| 2/910 not presented in 4062   |  |
| 0/3395 not presented in 4062: 502+5   | 529+4062=5093 EA   |
| 502 + 152/529 +67/4062 = 315/5093   | 3 not presented in 4866:   |
| 3538 not presented in 4866:   |  |
| 5 + 45 + 4866 = 5226  |  |
| 315 + 6/45 + 880/4866 = 904/5226  | — maximum EA with A and F spectral types   |
| 26 + 89/10980 = 5315 EA—the max   | imum number of EA as of October 26, 2014   |
| 3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3   | 3.11, Kepler EB 1 OGLE-III 3 OGLE-III 8.02, ASAS (V < 14 <sup>m</sup> 0) 8 TrES 2, GSCVS 4, Vol.V  /2741 not presented in 3395 /910 not presented in 4062 /3395 not presented in 4062: 502+5 502 + 152/529 +67/4062 = 315/509 8538 not presented in 4866: + 45 + 4866 =5226 815 + 6/45 + 880/4866 = 904/5226 |

<sup>†:</sup> The missing stars in the late catalogs were not investigated. EV=Eclipsing Variables.

<sup>‡:</sup> Up-to-date version of this table at http://www.chjaa.org/COB/

| Type of<br>Pulsators | Binary or<br>Multiple | RA<br>hh:mm:ss | DEC °: ': " | Sp.(A+B)        | $\langle V \rangle$ (mag) | $\langle B \rangle$ (mag) | P <sub>orb</sub> (day) | $P_{ m pul}$ (day) | Comments                    | References                          |
|----------------------|-----------------------|----------------|-------------|-----------------|---------------------------|---------------------------|------------------------|--------------------|-----------------------------|-------------------------------------|
| Cepheids:            | CG Cas                | 00:00:59       | +60:57:32   | F5              | 11.37                     | 12.59                     |                        | 4.3652             | SB                          | [443]                               |
| Galactic             | SY Cas                | 00:15:10       | +58:25:27   | F5              | 9.92                      | 10.69                     |                        | 4.0738             | SB                          | [446]                               |
| DCEP                 | DL Cas                | 00:29:58       | +60:12:43   | F7.5Ib + B9V    | 8.71                      | 9.79                      | 684.39                 | 7.9983             | SB+orbit, in NGC 129        | [29, 113, 159, 187, 306]            |
|                      | BY Cas                | 01:47:12       | +61:25:21   | F5              | 10.41                     | 11.5                      | 563                    | 3.2211             | SB+orbit, visual            | [165, 166, 167, 453]                |
|                      | CI Per                | 02:05:02       | +57:08:34   | _               | 12.7                      | 13.00                     |                        | 3.2961             | SB                          | [352]                               |
|                      | UX Per                | 02:13:07       | +58:04:48   | F5 +            | 11.0                      | 11.3                      |                        | 4.5709             | SB,visual                   | [450, 453]                          |
|                      | V440 Per              | 02:23:52       | +55:21:53   | F7Ib +          | 6.3                       | 7.11                      |                        | 7.5683             | SB, unconfirmed,=ADS 1820   | [165, 168]                          |
|                      | VY Per                | 02:27:35       | +58:55:02   | F5 +            | 11.26                     | 12.79                     |                        | 5.5335             | SB                          | [445]                               |
|                      | $\alpha$ UMi          | 02:31:49       | +89:15:51   | F7:Ib-IIv + F0V | 2.0                       | 2.59                      | 10800                  | 3.9719             | SB+orbit, triple, =ADS 1477 | [113, 123, 120, 218, 219, 357, 491] |
| 10                   | SU Cas                | 02:51:59       | +68:53:18   | F5Ib + B9.5V    | 5.94                      | 6.60                      | 406.76                 | 1.9498             | SB+orbit                    | [108, 165, 172, 366, 444]           |
|                      | RW Cam                | 03:54:22       | +58:39:12   | F8              | 8.72                      | 10.02                     |                        | 16.4059            | SB                          | [37, 112, 291, 453]                 |
|                      | RX Cam                | 04:04:58       | +58:39:35   | G1Ib            | 7.70                      | 8.85                      | 1116                   | 7.9068             | SB+orbit                    | [208, 165, 172, 366]                |
|                      | SZ Tau                | 04:37:15       | +18:32:35   | F6.7:Ib         | 6.50                      | 7.28                      |                        | 3.1477             | SB, in NGC 1647             | [109, 165, 168]                     |
|                      | AW Per                | 04:47:46       | +36:43:22   | F0 + B8.2V      | 7.51                      | 8.46                      | 14594                  | 6.4565             | SB+orbit, triple            | [112, 113, 127, 165, 291, 482, 487] |
|                      | SV Per                | 04:49:48       | +42:17:23   | F8 + B8.00III   | 9.0                       | 9.74                      |                        | 11.1173            | SB                          | [37, 112, 158, 291]                 |
|                      | AN Aur                | 04:59:41       | +40:50:10   | F6              | 10.21                     | 11.35                     |                        | 10.2802            | SB                          | [291, 444]                          |
|                      | RX Aur                | 05:01:23       | +39:57:37   | G0Iabv          | 7.62                      | 8.49                      |                        | 11.6145            | SB                          | [168, 292, 441]                     |
|                      | YZ Aur                | 05:15:22       | +40:04:41   | G5              | 10.38                     | 11.08                     |                        | 18.1970            | SB                          | [291, 292, 450]                     |
|                      | EU Tau                | 05:45:40       | +18:39:25   | G5 +            | 8.08                      | 8.71                      |                        | 2.1038             | SB, unconfirmed             | [165]                               |
| 20                   | AS Aur                | 06:05:24       | +28:47:23   | F6              | 11.8                      | 11.80                     |                        | 3.1769             | SB                          | [450]                               |
|                      | RZ Gem                | 06:02:36       | +22:14:03   | F5              | 9.91                      | 10.83                     |                        | 5.5335             | SB                          | [291, 292, 444]                     |
|                      | CR Ori                | 06:05:45       | +13:14:24   | F7              | 12.3                      | 12.97                     |                        | 4.9091             | SB                          | [446]                               |
|                      | AA Gem                | 06:06:35       | +26:19:45   | K0              | 9.91                      | 11.0                      |                        | 11.2980            | SB                          | [126, 450]                          |
|                      | CS Ori                | 06:07:25       | +11:09:07   | F5              | 11.37                     | 12.29                     |                        | 3.8905             | SB                          | [450]                               |
|                      | RS Ori                | 06:22:13       | +14:40:41   | F4Ib +          | 8.42                      | 9.34                      |                        | 7.5683             | SB                          | [125, 291, 444]                     |
|                      | T Mon                 | 06:25:13       | +07:05:08   | G3Iabv + B9.8V  | 6.2                       | 7.6                       | 32449                  | 27.0396            | SB+orbit                    | [113, 118, 157, 165, 172]           |
|                      | RT Aur                | 06:28:34       | +30:29:35   | F8Ibv +         | 5.75                      | 6.49                      |                        | 0.572              | SB, verification needed     | [471, 447]                          |
|                      | CS Mon                | 06:32:11       | +06:39:11   | _               | 11.0                      | _                         |                        | 6.7298             | Visual                      | [126]                               |
|                      | DX Gem                | 06:33:54       | +14:28:17   | _               | 10.53                     | 11.20                     |                        | 3.1405             | SB                          | [49]                                |
| 30                   | V495 Mon              | 06:37:03       | -02:49:27   | _               | 12.4                      | 13.69                     |                        | 4.0926             | SB                          | [450]                               |
|                      | CV Mon                | 06:37:05       | +03:03:50   | _               | 10.3                      | 11.08                     |                        | 5.3827             | comp.? in cluster           | [126, 160, 291, 341, 469]           |
|                      | AD Gem                | 06:43:07       | +20:56:21   | F5              | 9.80                      | 10.42                     |                        | 3.7844             | SB                          | [444]                               |
|                      | TX Mon                | 06:50:52       | -01:25:45   | F6              | 11.0                      | 11.76                     |                        | 8.7096             | SB                          | [450]                               |
|                      | XX Mon                | 06:52:12       | -02:48:25   | F6              | 11.91                     | 13.10                     |                        | 5.4576             | SB                          | [291, 446, 481]                     |

| Galactic         AC Mon         07:01:00         -08:42:32         F5         10.1         10.81         8.0168         SB         (351]           DCEP         ζ Gem         07:04:06         +20:34:13         GOlbv         4.01         4.89         10.1391         SB,visual,=ADS 5742         [357]           V465 Mon         07:08:09         -00:03:56         G0 + AOV         10.4         11.07         2.7102         SB         [29, 49, 113]           40         RY CMa         07:16:37         -11:29:14         KO         8.19         8.99         4.6774         SB         [481]           40         RZ CMa         07:21:33         -16:41:14         F6         9.72         10.75         4.2560         comp.?         [291, 292, 341]           SS CMa         07:26:02         -25:55:26         F6         9.84         10.99         12.3595         SB         [126, 446]           VZ CMa         07:26:28         -25:55:56         F5II         9.11         9.96         3.1261         SB,=AX Pup         [437, 446]           VW Pup         07:31:49         -20:08:59         F5 +         11.38         12.50         4.2855         SB         [450]           W Pup         07:51:49   | Type of<br>Pulsators | Binary or<br>Multiple | RA<br>hh:mm:ss | DEC °: ': " | Sp.(A+B)    | $\langle V \rangle$ (mag) | $\langle B \rangle$ (mag) | $P_{ m orb}$ (day) | $P_{ m pul}$ (day) | Comments                    | References          |
|---|----------------------|-----------------------|----------------|-------------|-------------|---------------------------|---------------------------|--------------------|--------------------|-----------------------------|---------------------|
| DCEP   Vafes Mon   07:04:06   +20:34:13   GOIbv   4.01   4.89   10.1391   SB.visual,=ADS 5742   3571  | Cepheids:            | TZ Mon                | 06:58:01       | -00:22:33   | F6          | 10.8                      | 11.8                      |                    | 7.4302             | SB                          | [446]               |
| V465 Mon   O7:08:09   -00:03:56   GO + AOV   10.4   11.07   2.7102   SB   29, 91;13]  | Galactic             | AC Mon                | 07:01:00       | -08:42:32   | F5          | 10.1                      | 10.81                     |                    | 8.0168             | SB                          | [351]               |
| RY CMa  | DCEP                 | ζ Gem                 | 07:04:06       | +20:34:13   | G0Ibv       | 4.01                      | 4.89                      |                    | 10.1391            | SB,visual,=ADS 5742         | [357]               |
| RZ CMa  |                      | V465 Mon              | 07:08:09       | -00:03:56   | G0 + A0V    | 10.4                      | 11.07                     |                    | 2.7102             | SB                          | [29, 49, 113]       |
| SS CMa  |                      | RY CMa                | 07:16:37       | -11:29:14   | K0          | 8.19                      | 8.99                      |                    | 4.6774             | SB                          | [481]               |
| VZ CMa  | 40                   | RZ CMa                | 07:21:33       | -16:41:14   | F6          | 9.72                      | 10.75                     |                    | 4.2560             | comp.?                      | [291, 292, 341]     |
| VW Pup         07:31:49         -20:08:59         F5+         11.38         12.50         4.2855         SB         [450]           BM Pup         07:50:03         -28:15:18         —         10.7         11.6         7.1945         Visual         [453]           AP Pup         07:57:46         -40:07:24         F8II +         7.37         8.13         5.0816         SB         [284]           AQ Pup         07:58:22         -29:07:48         F5Ib +         8.54         9.70         30.6068         SB         [126,292,481]           LS Pup         07:58:59         -29:18:28         —         10.7         11.7         14.1579         SB         [453]           HL Pup         08:11:11         -33:30:57         —         10.7         11.6         3.4834         Visual         [453]           AH Vel         08:12:20         -36:36:37         F5 + A2V         8.07         8.83         6.6681         SB         [113, 156]           V Car         08:28:43         -6007:21         G2lab         7.31         8.14         6.6988         SB         [109,442]           T Vel         08:37:41         -47:21:43         G0II+         8.06         8.92         4.6345 <t< td=""><td></td><td>SS CMa</td><td>07:26:07</td><td>-25:15:26</td><td>F6</td><td>9.84</td><td>10.99</td><td></td><td>12.3595</td><td>SB</td><td>[126, 446]</td></t<> |                      | SS CMa                | 07:26:07       | -25:15:26   | F6          | 9.84                      | 10.99                     |                    | 12.3595            | SB                          | [126, 446]          |
| BM Pup   07:50:03   -28:15:18     10.7   11.6   7.1945   Visual   [453]   |                      | VZ CMa                | 07:26:28       | -25:55:36   | F5II        | 9.11                      | 9.96                      |                    | 3.1261             | SB,=AX Pup                  | [437, 446]          |
| AP Pup  |                      | VW Pup                | 07:31:49       | -20:08:59   | F5 +        | 11.38                     | 12.50                     |                    | 4.2855             | SB                          | [450]               |
| AQ Pup   07:58:22   -29:07:48   F5lb +   8.54   9.70   30.0608   SB   [126, 292, 481]   |                      | BM Pup                | 07:50:03       | -28:15:18   | _           | 10.7                      | 11.6                      |                    | 7.1945             | Visual                      | [453]               |
| LS Pup  |                      | AP Pup                | 07:57:46       | -40:07:24   | F8II +      | 7.37                      | 8.13                      |                    | 5.0816             | SB                          | [284]               |
| HL Pup 08:11:11 -33:30:57 — 10.7 11.6 3.4834 Visual [453]  AH Vel 08:12:00 -46:38:40 F7Ib-II + 5.76 6.35 4.2267 SB [154, 284]  AT Pup 08:12:22 -36:56:37 F5 + A2V 8.07 8.83 6.6681 SB [113, 156]  V Car 08:28:43 -60:07:21 G2Iab 7.31 8.14 6.6988 SB [109, 442]  T Vel 08:37:41 -47:21:43 G0II + 8.06 8.92 4.6345 SB [104, 452]  BG Vel 09:08:16 -51:26:11 F7/F8II + 7.69 8.82 6.9183 comp.? [104]  DK Vel 09:17:17 -53:05:05 — 10.7 11.4 2.4774 Visual [452, 453]  V Vel 09:22:16 -55:57:37 F8II + 7.57 8.29 4.3752 SB [109, 442]  DP Vel 09:30:16 -53:03:31 — 11.8 — 5.4828 SB [446]  YZ Car 10:33:11 -58:29:55 F2 + B9.0V 8.69 9.72 657.3 18:1552 SB+orbit [69, 113, 116, 343]  Y Car 10:42:23 -61:09:57 — 10.7 11.3 2.8774 SB [113]  WZ Car 10:55:19 -60:56:24 F8 9.37 10.40 23.0144 comp.? [386]  XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15:7036 SB [28]  WZ Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]   |                      | AQ Pup                | 07:58:22       | -29:07:48   | F5Ib +      | 8.54                      | 9.70                      |                    | 30.0608            | SB                          | [126, 292, 481]     |
| AH Vel 08:12:00 -46:38:40 F7Ib-II + 5.76 6.35 4.2267 SB [154, 284]  AT Pup 08:12:22 -36:56:37 F5 + A2V 8.07 8.83 6.6681 SB [113, 156]  V Car 08:28:43 -60:07:21 G2Iab 7.31 8.14 6.6988 SB [109, 442]  T Vel 08:37:41 -47:21:43 G0II + 8.06 8.92 4.6345 SB [104, 452]  BG Vel 09:08:16 -51:26:11 F7/F8II + 7.69 8.82 6.9183 comp.? [104]  DK Vel 09:17:17 -53:05:05 — 10.7 11.4 2.4774 Visual [452, 453]  V Vel 09:22:16 -55:57:37 F8II + 7.57 8.29 4.3752 SB [109, 442]  DP Vel 09:30:16 -53:03:31 — 11.8 — 5.4828 SB [446]  YZ Car 10:28:17 -59:21:00 G5 + B8-A0V 8.69 9.72 657.3 18.1552 SB+orbit [69, 113, 116, 343]  Y Car 10:33:11 -58:29:55 F2 + B9.0V 8.16 8.75 993 3.6392 SB+orbit,double-mode,triple [35, 113, 121, 343]  VY Car 10:42:23 -61:09:57 — 10.7 11.3 2.8774 SB [113]  WZ Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28]  U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]   |                      | LS Pup                | 07:58:59       | -29:18:28   | _           | 10.7                      | 11.7                      |                    | 14.1579            | SB                          | [446]               |
| 50         AT Pup         08:12:22         -36:56:37         F5 + A2V         8.07         8.83         6.6681         SB         [113, 156]           V Car         08:28:43         -60:07:21         G2lab         7.31         8.14         6.6988         SB         [109, 442]           T Vel         08:37:41         -47:21:43         G0II +         8.06         8.92         4.6345         SB         [104]           BG Vel         09:08:16         -51:26:11         F7/F8II +         7.69         8.82         6.9183         comp.?         [104]           DK Vel         09:17:17         -53:05:05         —         10.7         11.4         2.4774         Visual         [452, 453]           V Vel         09:22:16         -55:57:37         F8II +         7.57         8.29         4.3752         SB         [109, 442]           DP Vel         09:30:16         -53:03:31         —         11.8         —         5.4828         SB         [446]           YZ Car         10:28:17         -59:21:00         G5 + B8-A0V         8.69         9.72         657.3         18.1552         SB+orbit         [69, 113, 116, 343           Y Car         10:33:11         -58:29:55         F2 + B9.0V   |                      | HL Pup                | 08:11:11       | -33:30:57   | _           | 10.7                      | 11.6                      |                    | 3.4834             | Visual                      | [453]               |
| V Car         08:28:43 -60:07:21         G2Iab         7.31         8.14         6.6988         SB         [109, 442]           T Vel         08:37:41 -47:21:43         G0II +         8.06         8.92         4.6345         SB         [104, 452]           BG Vel         09:08:16 -51:26:11         F7/F8II +         7.69         8.82         6.9183         comp.?         [104]           DK Vel         09:17:17 -53:05:05         -         10.7         11.4         2.4774         Visual         [452, 453]           V Vel         09:22:16 -55:57:37         F8II +         7.57         8.29         4.3752         SB         [109, 442]           DP Vel         09:30:16 -53:03:31         -         11.8         -         5.4828         SB         [446]           YZ Car         10:28:17 -59:21:00         G5 + B8-A0V         8.69         9.72         657.3         18.1552         SB+orbit         [69, 113, 116, 343           Y Car         10:33:11 -58:29:55         F2 + B9.0V         8.16         8.75         993         3.6392         SB+orbit,double-mode,triple         [35, 113, 121, 343           VY Car         10:44:32         -57:33:55         F7Iab         7.03         7.71         18.9234         SB,in Car OB1   |                      | AH Vel                | 08:12:00       | -46:38:40   | F7Ib-II +   | 5.76                      | 6.35                      |                    | 4.2267             | SB                          | [154, 284]          |
| T Vel 08:37:41 -47:21:43 G0II + 8.06 8.92 4.6345 SB [104, 452]  BG Vel 09:08:16 -51:26:11 F7/F8II + 7.69 8.82 6.9183 comp.? [104]  DK Vel 09:17:17 -53:05:05 — 10.7 11.4 2.4774 Visual [452, 453]  V Vel 09:22:16 -55:57:37 F8II + 7.57 8.29 4.3752 SB [109, 442]  DP Vel 09:30:16 -53:03:31 — 11.8 — 5.4828 SB [446]  YZ Car 10:28:17 -59:21:00 G5 + B8-A0V 8.69 9.72 657.3 18.1552 SB+orbit [69, 113, 116, 343]  Y Car 10:33:11 -58:29:55 F2 + B9.0V 8.16 8.75 993 3.6392 SB+orbit,double-mode,triple [35, 113, 121, 343]  VY Car 10:44:32 -57:33:55 F7Iab 7.03 7.71 18.9234 SB, in Car OB1 [126, 446, 452, 45]  EY Car 10:55:19 -60:56:24 F8 9.37 10.40 23.0144 comp.? [386]  XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28]  U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]  | 50                   | AT Pup                | 08:12:22       | -36:56:37   | F5 + A2V    | 8.07                      | 8.83                      |                    | 6.6681             | SB                          | [113, 156]          |
| BG Vel 09:08:16 -51:26:11 F7/F8II + 7.69 8.82 6.9183 comp.? [104]  DK Vel 09:17:17 -53:05:05 — 10.7 11.4 2.4774 Visual [452, 453]  V Vel 09:22:16 -55:57:37 F8II + 7.57 8.29 4.3752 SB [109, 442]  DP Vel 09:30:16 -53:03:31 — 11.8 — 5.4828 SB [446]  YZ Car 10:28:17 -59:21:00 G5 + B8-AOV 8.69 9.72 657.3 18.1552 SB+orbit [69, 113, 116, 343]  Y Car 10:33:11 -58:29:55 F2 + B9.0V 8.16 8.75 993 3.6392 SB+orbit,double-mode,triple [35, 113, 121, 343]  VY Car 10:44:32 -57:33:55 F71ab 7.03 7.71 18.9234 SB,in Car OB1 [126, 446, 452, 45]  EY Car 10:42:23 -61:09:57 — 10.7 11.3 2.8774 SB [113]  WZ Car 10:55:19 -60:56:24 F8 9.37 10.40 23.0144 comp.? [386]  XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28]  U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]  |                      | V Car                 | 08:28:43       | -60:07:21   | G2Iab       | 7.31                      | 8.14                      |                    | 6.6988             | SB                          | [109, 442]          |
| DK Vel 09:17:17 -53:05:05 — 10.7 11.4 2.4774 Visual [452, 453]  V Vel 09:22:16 -55:57:37 F8II + 7.57 8.29 4.3752 SB [109, 442]  DP Vel 09:30:16 -53:03:31 — 11.8 — 5.4828 SB [446]  YZ Car 10:28:17 -59:21:00 G5 + B8-A0V 8.69 9.72 657.3 18.1552 SB+orbit [69, 113, 116, 343]  Y Car 10:33:11 -58:29:55 F2 + B9.0V 8.16 8.75 993 3.6392 SB+orbit,double-mode,triple [35, 113, 121, 343]  VY Car 10:44:32 -57:33:55 F7Iab 7.03 7.71 18.9234 SB,in Car OB1 [126, 446, 452, 45]  EY Car 10:55:19 -60:56:24 F8 9.37 10.40 23.0144 comp.? [386]  XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28]  U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:20 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]  |                      | T Vel                 | 08:37:41       | -47:21:43   | G0II +      | 8.06                      | 8.92                      |                    | 4.6345             | SB                          | [104, 452]          |
| V Vel         09:22:16         -55:57:37         F8II +         7.57         8.29         4.3752         SB         [109, 442]           DP Vel         09:30:16         -53:03:31         —         11.8         —         5.4828         SB         [446]           YZ Car         10:28:17         -59:21:00         G5 + B8-A0V         8.69         9.72         657.3         18.1552         SB+orbit         [69, 113, 116, 343]           Y Car         10:33:11         -58:29:55         F2 + B9.0V         8.16         8.75         993         3.6392         SB+orbit, double-mode, triple         [35, 113, 121, 343]           VY Car         10:44:32         -57:33:55         F7Iab         7.03         7.71         18.9234         SB, in Car OB1         [126, 446, 452, 45]           60         EY Car         10:42:23         -61:09:57         —         10.7         11.3         2.8774         SB         [113]           WZ Car         10:55:19         -60:56:24         F8         9.37         10.40         23.0144         comp.?         [386]           XX Car         10:57:48         -59:43:55         G0Ib         6.86         6.67         38.8150         SB         [28]           FO Car  |                      | BG Vel                | 09:08:16       | -51:26:11   | F7/F8II +   | 7.69                      | 8.82                      |                    | 6.9183             | comp.?                      | [104]               |
| DP Vel 09:30:16 -53:03:31 — 11.8 — 5.4828 SB [446]  YZ Car 10:28:17 -59:21:00 G5 + B8-A0V 8.69 9.72 657.3 18.1552 SB+orbit [69, 113, 116, 343]  Y Car 10:33:11 -58:29:55 F2 + B9.0V 8.16 8.75 993 3.6392 SB+orbit,double-mode,triple [35, 113, 121, 343]  VY Car 10:44:32 -57:33:55 F71ab 7.03 7.71 18.9234 SB,in Car OB1 [126, 446, 452, 45]  EY Car 10:42:23 -61:09:57 — 10.7 11.3 2.8774 SB [113]  WZ Car 10:55:19 -60:56:24 F8 9.37 10.40 23.0144 comp.? [386]  XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28]  U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]   |                      | DK Vel                | 09:17:17       | -53:05:05   | _           | 10.7                      | 11.4                      |                    | 2.4774             | Visual                      | [452, 453]          |
| YZ Car 10:28:17 -59:21:00 G5 + B8-A0V 8.69 9.72 657.3 18.1552 SB+orbit [69, 113, 116, 343] Y Car 10:33:11 -58:29:55 F2 + B9.0V 8.16 8.75 993 3.6392 SB+orbit,double-mode,triple [35, 113, 121, 343] VY Car 10:44:32 -57:33:55 F7Iab 7.03 7.71 18.9234 SB,in Car OB1 [126, 446, 452, 45] EY Car 10:42:23 -61:09:57 — 10.7 11.3 2.8774 SB [113]  WZ Car 10:55:19 -60:56:24 F8 9.37 10.40 23.0144 comp.? [386] XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28] U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28] FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446] HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453] GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156] FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]  |                      | V Vel                 | 09:22:16       | -55:57:37   | F8II +      | 7.57                      | 8.29                      |                    | 4.3752             | SB                          | [109, 442]          |
| Y Car 10:33:11 -58:29:55 F2 + B9.0V 8.16 8.75 993 3.6392 SB+orbit,double-mode,triple [35, 113, 121, 343]  VY Car 10:44:32 -57:33:55 F7Iab 7.03 7.71 18.9234 SB,in Car OB1 [126, 446, 452, 45]  EY Car 10:42:23 -61:09:57 — 10.7 11.3 2.8774 SB [113]  WZ Car 10:55:19 -60:56:24 F8 9.37 10.40 23.0144 comp.? [386]  XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28]  U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]   |                      | DP Vel                | 09:30:16       | -53:03:31   | _           | 11.8                      | _                         |                    | 5.4828             | SB                          | [446]               |
| VY Car 10:44:32 -57:33:55 F7Iab 7.03 7.71 18.9234 SB,in Car OB1 [126, 446, 452, 45]  EY Car 10:42:23 -61:09:57 — 10.7 11.3 2.8774 SB [113]  WZ Car 10:55:19 -60:56:24 F8 9.37 10.40 23.0144 comp.? [386]  XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28]  U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]   |                      | YZ Car                | 10:28:17       | -59:21:00   | G5 + B8-A0V | 8.69                      | 9.72                      | 657.3              | 18.1552            | SB+orbit                    | [69, 113, 116, 343] |
| 60 EY Car 10:42:23 -61:09:57 — 10.7 11.3 2.8774 SB [113]  WZ Car 10:55:19 -60:56:24 F8 9.37 10.40 23.0144 comp.? [386]  XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28]  U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]   |                      | Y Car                 | 10:33:11       | -58:29:55   | F2 + B9.0V  | 8.16                      | 8.75                      | 993                | 3.6392             | SB+orbit,double-mode,triple | [35, 113, 121, 343] |
| WZ Car       10:55:19 -60:56:24       F8       9.37 10.40       23.0144 comp.?       [386]         XX Car       10:57:09 -65:08:05       G0       9.42 10.46       15.7036 SB       [28]         U Car       10:57:48 -59:43:55       G0Ib       6.86 6.67       38.8150 SB       [28]         FO Car       11:01:30 -62:17:27 —       10.7 11.8       10.3514 SB       [446]         HK Car       11:03:45 -60:38:32 G5       10.71 10.90       6.6988 Visual binary       [453]         GI Car       11:14:00 -57:54:39 F4Iab       8.33 9.01       4.4361 comp.?       [156]         FR Car       11:14:21 -60:03:10 G5       9.64 10.7       10.7152 SB       [446]   |                      | VY Car                | 10:44:32       | -57:33:55   | F7Iab       | 7.03                      | 7.71                      |                    | 18.9234            | SB,in Car OB1               | [126, 446, 452, 453 |
| XX Car 10:57:09 -65:08:05 G0 9.42 10.46 15.7036 SB [28]  U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]   | 60                   | EY Car                | 10:42:23       | -61:09:57   | _           | 10.7                      | 11.3                      |                    | 2.8774             | SB                          | [113]               |
| U Car 10:57:48 -59:43:55 G0Ib 6.86 6.67 38.8150 SB [28]  FO Car 11:01:30 -62:17:27 — 10.7 11.8 10.3514 SB [446]  HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453]  GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]  FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]  |                      | WZ Car                | 10:55:19       | -60:56:24   | F8          | 9.37                      | 10.40                     |                    | 23.0144            | comp.?                      | [386]               |
| FO Car       11:01:30       -62:17:27       —       10.7       11.8       10.3514       SB       [446]         HK Car       11:03:45       -60:38:32       G5       10.71       10.90       6.6988       Visual binary       [453]         GI Car       11:14:00       -57:54:39       F4Iab       8.33       9.01       4.4361       comp.?       [156]         FR Car       11:14:21       -60:03:10       G5       9.64       10.7       10.7152       SB       [446]  |                      | XX Car                | 10:57:09       | -65:08:05   | G0          | 9.42                      | 10.46                     |                    | 15.7036            | SB                          | [28]                |
| HK Car 11:03:45 -60:38:32 G5 10.71 10.90 6.6988 Visual binary [453] GI Car 11:14:00 -57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156] FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]   |                      | U Car                 | 10:57:48       | -59:43:55   | G0Ib        | 6.86                      | 6.67                      |                    | 38.8150            | SB                          | [28]                |
| GI Car 11:14:00 –57:54:39 F4Iab 8.33 9.01 4.4361 comp.? [156]<br>FR Car 11:14:21 –60:03:10 G5 9.64 10.7 10.7152 SB [446]  |                      | FO Car                | 11:01:30       | -62:17:27   |             | 10.7                      | 11.8                      |                    | 10.3514            | SB                          | [446]               |
| FR Car 11:14:21 -60:03:10 G5 9.64 10.7 10.7152 SB [446]   |                      | HK Car                | 11:03:45       | -60:38:32   | G5          | 10.71                     | 10.90                     |                    | 6.6988             | Visual binary               | [453]               |
|   |                      | GI Car                | 11:14:00       | -57:54:39   | F4Iab       | 8.33                      | 9.01                      |                    | 4.4361             | comp.?                      | [156]               |
| UZ Cen 11:40:58 –62:41:33 F3Ib-II 8.68 8.87 3.3343 Visual,double-mode [357, 452]  |                      | FR Car                | 11:14:21       | -60:03:10   | G5          | 9.64                      | 10.7                      |                    | 10.7152            | SB                          | [446]               |
|   |                      | UZ Cen                | 11:40:58       | -62:41:33   | F3Ib-II     | 8.68                      | 8.87                      |                    | 3.3343             | Visual,double-mode          | [357, 452]          |

| Type of   | Binary or | RA       | DEC       | Sp.(A+B)           | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\rm orb}$ | $P_{\mathrm{pul}}$ | Comments              | References                     |
|-----------|-----------|----------|-----------|--------------------|---------------------|---------------------|---------------|--------------------|-----------------------|--------------------------------|
| Pulsators | Multiple  | hh:mm:ss | °:′:″     |                    | (mag)               | (mag)               | (day)         | (day)              |                       |                                |
| Cepheids: | RT Mus    | 11:44:33 | -67:18:19 | F8                 | 9.0                 | 9.69                |               | 3.0832             | SB                    | [446]                          |
| Galactic  | BK Cen    | 11:49:16 | -63:04:43 | G5                 | 10.27               | 11.06               |               | 3.1769             | Visual,double-mode    | [453]                          |
| DCEP      | TY Cru    | 12:06:40 | -62:35:49 | _                  | 13.70               | 13.77               |               | 5.0003             | SB                    | [351]                          |
|           | S Mus     | 12:12:47 | -70:09:06 | F6Ib + B3.5V       | 6.1                 | 7.44                | 505.15        | 9.6605             | SB+orbit              | [35, 113, 172, 284, 342, 343]  |
|           | SU Cru    | 12:18:17 | -63:16:48 | M                  | 9.54                | 11.05               |               | 12.8529            | SB,visual             | [446, 453, 481]                |
|           | T Cru     | 12:21:21 | -62:16:54 | G2Ib               | 6.57                | 7.42                |               | 6.7298             | SB                    | [28, 109]                      |
|           | R Cru     | 12:23:38 | -61:37:45 | F7Ib/II            | 6.90                | 7.75                |               | 5.8210             | SB                    | [198]                          |
|           | BG Cru    | 12:31:40 | -59:25:26 | F7Ib-II            | 5.50                | 6.07                |               | 3.3420             | SB                    | [442]                          |
|           | VX Cru    | 12:34:23 | -61:14:15 | _                  | 11.38               | 12.75               |               | 12.2180            | SB                    | [446]                          |
|           | AG Cru    | 12:41:26 | -59:47:39 | F8Ib/II            | 7.90                | 8.30                |               | 3.8371             | SB                    | [104, 155, 341]                |
|           | R Mus     | 12:42:05 | -69:24:27 | F7Ib +             | 6.3                 | 7.00                |               | 7.5162             | SB                    | [246, 284]                     |
| 80        | OO Cen    | 13:26:30 | -63:09:45 | _                  | 12.01               | 13.78               |               | 12.8825            | SB                    | [446]                          |
|           | V659 Cen  | 13:31:33 | -61:34:56 | F6/F7Ib + B6.0V    | 6.66                | 7.40                |               | 5.6234             | SB                    | [111, 112, 453]                |
|           | VW Cen    | 13:33:59 | -64:03:20 |                    | 10.24               | 11.5                |               | 15.0314            | SB                    | [291, 292, 341, 446]           |
|           | KN Cen    | 13:36:37 | -64:33:30 | + B6.0V            | 9.85                | 11.3                |               | 34.0408            | SB                    | [37, 112, 291, 442]            |
|           | XX Cen    | 13:40:19 | -57:36:47 | F7/F8II + A1V      | 7.82                | 8.72                | 924.1         | 10.9648            | SB+orbit              | [113, 172, 443]                |
|           | V339 Cen  | 14:21:48 | -61:32:58 | F7II               | 8.57                | 9.68                |               | 9.4624             | Visual                | [453]                          |
|           | TX Cen    | 14:35:12 | -60:59:52 |                    | 10.52               | 12.30               |               | 71.4496            | Visual                | [291, 357]                     |
|           | BP Cir    | 14:46:42 | -61:27:43 | F2/F3II + B6.0V    | 7.52                | 8.12                |               | 2.3988             | SB                    | [112, 115]                     |
|           | AV Cir    | 14:50:30 | -67:29:51 | F7II               | 7.40                | 8.00                |               | 3.0620             | Visual                | [452]                          |
|           | AX Cir    | 14:52:35 | -63:48:35 | F8II + B6.0V       | 5.96                | 6.66                | 6532          | 5.2723             | SB+orbit,visual       | [109, 113, 284, 342, 343, 442] |
| 90        | R TrA     | 15:19:46 | -66:29:46 | F7Ib/II + A5V      | 6.74                | 7.48                |               | 3.3884             | SB                    | [113, 155, 284]                |
|           | GH Lup    | 15:24:38 | -52:51:14 | G2Iab              | 7.6                 | 9.05                |               | 9.2683             | SB                    | [341, 442]                     |
|           | SY Nor    | 15:54:43 | -54:33:59 | + B4.5V            | 9.5                 | 11.0                |               | 12.6474            | SB                    | [29, 37, 112, 291, 357, 452]   |
|           | S Nor     | 16:18:52 | -57:53:59 | F9Ib + B9.5V       | 6.45                | 6.94                | 3584          | 9.7499             | SB+orbit, in NGC 6087 | [111, 126, 172, 291, 306, 442] |
|           | V340 Ara  | 16:45:19 | -51:20:33 | _                  | 10.2                | 11.5                |               | 20.7970            | SB, metal-rich        | [340]                          |
|           | RV Sco    | 16:58:20 | -33:36:33 | G0Ib +             | 7.1                 | 7.64                |               | 6.0674             | SB                    | [109, 357, 442, 452]           |
|           | BF Oph    | 17:06:05 | -26:34:50 | G0II +             | 7.37                | 8.19                |               | 4.0644             | SB                    | [284, 442]                     |
|           | V636 Sco  | 17:22:46 | -45:36:51 | F7/F8Ib/II + B9.5V | 6.74                | 7.67                | 1362          | 6.7920             | SB+orbit              | [36, 111, 113, 284, 343]       |
|           | V482 Sco  | 17:30:48 | -33:36:35 | F9II +             | 7.91                | 8.78                |               | 4.5290             | SB                    | [108, 481]                     |
|           | X Sgr     | 17:47:34 | -27:49:51 | F7II +             | 4.56                | 5.26                | 573.6         | 7.0146             | SB+orbit              | [109, 172, 443]                |
| 100       | V500 Sco  | 17:48:37 | -30:28:33 | K0 +               | 8.8                 | 10.07               |               | 9.3111             | comp.?                | [291, 292, 442]                |
|           | RY Sco    | 17:50:52 | -33:42:20 | F6Ib +             | 8.0                 | 9.69                |               | 20.3236            | Visual                | [126, 357, 452]                |
|           | Y Oph     | 17:52:39 | -06:08:37 | F8Iab +            | 6.18                | 7.51                | 2612          | 17.1396            | SB+orbit              | [2, 109, 442]                  |

| Type of Pulsators | Binary or<br>Multiple | RA<br>hh:mm:ss | DEC °: ': " | Sp.(A+B)         | $\langle V \rangle$ (mag) | $\langle B \rangle$ (mag) | P <sub>orb</sub> (day) | $P_{ m pul}$ (day) | Comments                    | References                           |
|-------------------|-----------------------|----------------|-------------|------------------|---------------------------|---------------------------|------------------------|--------------------|-----------------------------|--------------------------------------|
| Cepheids:         | AV Sgr                | 18:04:49       | -22:43:57   | _                | 11.29                     | 13.39                     |                        | 15.4170            | SB, metal-rich              | [446, 340]                           |
| Galactic          | W Sgr                 | 18:05:01       | -29:34:48   | F7.2Ib + A0V     | 4.66                      | 5.4                       | 1651                   | 7.6033             | SB+orbit,triple,=ADS 11029  | [7, 29, 27, 122, 172, 357, 343, 452] |
| DCEP              | VY Sgr                | 18:12:05       | -20:42:15   | F6 +             | 11.45                     | 13.46                     |                        | 13.5519            | SB, metal-rich              | [351, 340]                           |
|                   | AP Sgr                | 18:13:02       | -23:07:02   | F7/F8Ib/II +     | 7.08                      | 8.00                      |                        | 5.0582             | SB                          | [155]                                |
|                   | WZ Sgr                | 18:17:00       | -19:04:33   | F7III +          | 8.1                       | 9.10                      |                        | 21.8273            | SB, in cluster              | [28, 442, 470]                       |
|                   | Y Sgr                 | 18:21:23       | -18:51:36   | F8II +           | 5.77                      | 6.59                      |                        | 5.7677             | SB                          | [28, 109, 442]                       |
|                   | X Sct                 | 18:31:20       | -13:06:29   | F5 +             | 10.01                     | 11.18                     |                        | 4.1976             | comp.?                      | [126, 291]                           |
| 110               | UZ Sct                | 18:31:22       | -12:55:43   | G0 +             | 11.3                      | 13.15                     |                        | 14.7571            | SB, metal-rich              | [351, 340]                           |
|                   | U Sgr                 | 18:31:53       | -19:07:30   | G1Ib+            | 6.36                      | 7.25                      |                        | 6.7453             | SB, in M25, =ADS 11433      | [29, 357, 452]                       |
|                   | BQ Ser                | 18:36:16       | +04:23:53   | F5III +          | 9.54                      | 10.86                     |                        | 4.2756             | SB unconfirmed              | [165]                                |
|                   | EV Sct                | 18:36:40       | -08:11:05   | G0II +           | 10.2                      | 11.3                      |                        | 3.0903             | SB unconfirmed, in NGC 6664 | [247, 306]                           |
|                   | Y Sct                 | 18:38:03       | -08:22:08   | F7 +             | 9.69                      | 11.2                      |                        | 10.3514            | comp.?                      | [315, 442]                           |
|                   | RU Sct                | 18:41:56       | -04:06:38   | G5 +             | 9.5                       | 11.2                      |                        | 19.6789            | SB,in Tr 35                 | [446]                                |
|                   | TY Sct                | 18:42:08       | -04:17:36   | F5 +             | 10.9                      | 12.53                     |                        | 11.0408            | SB                          | [291, 351]                           |
|                   | V350 Sgr              | 18:45:17       | -20:38:50   | F8Ib/II + B9.0V  | 7.47                      | 8.33                      | 1482                   | 5.1523             | Visual                      | [111, 117, 124, 165, 167, 284, 343]  |
|                   | YZ Sgr                | 18:49:29       | -16:43:23   | G2Ib+            | 7.38                      | 8.36                      |                        | 9.5499             | SB                          | [446]                                |
|                   | BB Sgr                | 18:51:00       | -20:17:43   | G0Ib+            | 6.92                      | 7.84                      |                        | 6.6374             | SB                          | [155]                                |
| 120               | FF Aql                | 18:58:15       | +17:21:39   | F5Iab + A9-F3V   | 5.31                      | 5.85                      | 1432.4                 | 4.4668             | SB+orbit                    | [27, 165, 172, 357, 366]             |
|                   | V496 Aql              | 19:08:21       | -07:26:16   | G5 + A1-A2       | 7.79                      | 8.88                      | 1331                   | 6.8077             | SB+orbit                    | [172, 442]                           |
|                   | V916 Aql              | 19:10:00       | +12:32:11   | _                | 10.86                     | 12.22                     |                        | 13.4277            | SB                          | [168]                                |
|                   | FN Aql                | 19:12:47       | +03:33:26   | G5               | 8.42                      | 9.58                      |                        | 9.4842             | comp.?                      | [104, 441, 473]                      |
|                   | U Aql                 | 19:29:21       | -07:02:39   | F8Ib-IIv + B9.8V | 6.5                       | 7.32                      | 1856.4                 | 7.0307             | SB+orbit, triple            | [1, 37, 111, 113, 121, 284, 357]     |
|                   | U Vul                 | 19:36:38       | +20:19:58   | F5:Iabv +        | 7.15                      | 8.36                      | 2510                   | 7.9983             | SB+orbit                    | [208, 172, 444, 446]                 |
|                   | SU Cyg                | 19:44:49       | +29:15:53   | F2Iab + B8.0V    | 6.98                      | 7.58                      | 549.24                 | 3.8459             | SB+orbit,triple,in cluster  | [107, 113, 172, 207, 291, 366, 486]  |
|                   | V1154 Cyg             | 19:48:15       | +43:07:37   | G0 +             | 9.14                      | 9.92                      |                        | 4.9204             | SB                          | [168]                                |
|                   | S Vul                 | 19:48:24       | +27:17:11   | K0 +             | 9.20                      | 11.15                     |                        | 68.3912            | SB                          | [168]                                |
|                   | SV Vul                | 19:51:31       | +27:27:37   | G2.5:Iab         | 7.35                      | 8.88                      |                        | 44.9780            | SB, in Vul OB1              | [109, 446]                           |
| 130               | $\eta$ Aql            | 19:52:28       | +01:00:20   | F6Iab + B9.8V    | 3.88                      | 4.62                      |                        | 7.1779             | SB                          | [37, 108]                            |
|                   | S Sge                 | 19:56:01       | +16:38:05   | G5Ibv + A7-F0V   | 5.72                      | 6.60                      | 675.72                 | 8.3753             | SB+orbit,triple             | [44, 113, 165, 167, 172]             |
|                   | KL Aql                | 20:01:10       | +15:48:12   | F6Iab +          | 10.14                     | 10.95                     |                        | 6.1094             | SB                          | [341, 444]                           |
|                   | MW Cyg                | 20:12:23       | +32:52:18   | F8Ib +           | 9.45                      | 10.71                     | 437.3                  | 5.9566             | SB+orbit                    | [208, 165, 167, 366]                 |
|                   | SZ Cyg                | 20:32:54       | +46:36:04   | F8Ib +           | 9.37                      | 10.80                     |                        | 15.1008            | SB                          | [291, 444]                           |
|                   | BZ Cyg                | 20:46:00       | +45:18:25   | F8Ib +           | 10.2                      | 11.8                      |                        | 10.1391            | comp.?                      | [292, 444]                           |
|                   | T Vul                 | 20:51:28       | +28:15:02   | F5Ib + A0.8V     | 5.61                      | 6.18                      |                        | 4.4361             | SB                          | [110]                                |

Table 2—Continued

| Type of   | Binary or           | RA           | DEC          | Sp.(A+B)     | $\langle V \rangle$ | $\langle B \rangle$ | $P_{ m orb}$ | $P_{ m pul}$ | Comments             | References                |
|-----------|---------------------|--------------|--------------|--------------|---------------------|---------------------|--------------|--------------|----------------------|---------------------------|
| Pulsators | Multiple            | hh:mm:ss     | °:′:″        |              | (mag)               | (mag)               | (day)        | (day)        |                      |                           |
| Cepheids: | V386 Cyg            | 21:14:40     | +41:42:59    | F5Ib +       | 9.75                | 11.12               |              | 5.2602       | SB                   | [291, 444]                |
| Galactic  | V1334 Cyg           | 21:19:22     | +38:14:15    | F1II + B7.0V | 5.89                | 6.35                | 1937.5       | 3.3343       | SB+orbit, =ADS 14859 | [109, 113, 114, 121, 119] |
| DCEP      | V532 Cyg            | 21:20:33     | +45:28:03    | F5 +         | 9.11                | 10.08               |              | 3.2810       | comp.?               | [165, 291, 444, 473]      |
| 140       | VZ Cyg              | 21:51:41     | +43:08:02    | G0 +         | 9.10                | 10.02               | 2092         | 4.8641       | SB+orbit             | [172, 366]                |
|           | CP Cep              | 21:57:53     | +56:09:50    | F5Ib         | 10.58               | 12.23               |              | 17.8649      | comp.?               | [291]                     |
|           | IR Cep              | 21:57:52     | +61:01:08    | G0           | 7.86                | 8.68                |              | 2.1135       | Visual               | [452]                     |
|           | BG Lac              | 22:00:25     | +43:26:43    | G0.7         | 8.59                | 9.33                |              | 5.3333       | SB                   | [291, 292, 444]           |
|           | Y Lac               | 22:09:03     | +51:02:45    | F8 + A0.5V   | 9.13                | 9.79                |              | 4.3251       | SB                   | [111, 125, 168, 291, 444] |
|           | AK Cep              | 22:28:50     | +58:12:39    | F8           | 11.20               | 12.53               |              | 7.2277       | comp.?               | [291, 481]                |
|           | δ Cep               | 22:29:10     | +58:24:55    | F5Iab        | 4.07                | 4.81                |              | 5.3703       | Visual               | [357]                     |
|           | V351 Cep            | 22:33:41     | +57:19:06    | F8Ib         | 9.50                | 10.31               |              | 2.8054       | SB                   | [168]                     |
|           | Z Lac               | 22:40:52     | +56:49:46    | F6Ib + A5    | 8.57                | 9.71                | 382.63       | 10.8893      | SB+orbit             | [208, 113, 165, 172, 438] |
|           | RR Lac              | 22:41:26     | +56:25:58    | K0 +         | 8.87                | 9.68                |              | 6.4121       | SB                   | [168]                     |
| 150       | X Lac               | 22:49:03     | +56:25:41    | G5 +         | 8.42                | 9.21                |              | 5.4450       | SB                   | [168, 284, 473]           |
|           | RY Cas              | 23:52:07     | +58:44:30    | G2 +         | 9.95                | 11.32               |              | 12.1339      | Visual binary        | [452]                     |
|           | DD Cas              | 23:57:35     | +62:43:05    | F7 +         | 9.85                | 10.96               |              | 9.8175       | comp.?               | [291, 292]                |
|           | CE Cas(a)           | 23:58:09     | +61:12:49    | F9Ibv+F8Ib   | 10.63               | _                   |              | 5.1404       | Visual, in NGC 7790  | [387]                     |
| 154       | CE Cas(b)           | 23:58:09     | +61:12:49    |              | _                   | _                   |              | 4.4771       | =TYC 4281-1042-2     | [387]                     |
|           | V1330 Tau           | 04:42:18.609 | +01:17:39.94 | K5           | 11.88               | 14.14               |              |              | cC*+SB: candidate    | cC*= classical Cepheids   |
|           | OGLE LMC-CEP-336    | 04:54:38.50  | -68:17:14.4  |              | 16.738              |                     |              |              | cC*+EB: candidate    |                           |
|           | HV 883              | 05:00:07.507 | -68:27:00.16 | F8/G0Ia      | 11.63               | 13.86               |              |              | cC*+SB: candidate    |                           |
|           | OGLE LMC-SC10 95827 | 05:11:04.07  | -69:17:57.8  |              | 16.141              | 16.67               |              |              | cC*+EB: candidate    |                           |
|           | HV 914              | 05:12:47.02  | -69:06:08.9  |              | 14.926              | 18.800              |              |              | cC*+SB: candidate    |                           |
|           | V1852 Ori           | 05:13:05.819 | +08:51:31.44 | K2+M2        | 12.59               | 13.800              |              |              | cC*+SB: candidate    |                           |
|           | OGLE LMC-CEP-1386   | 05:15:35.84  | -70:30:27.8  |              | 18.529              |                     |              |              | cC*+EB: candidate    |                           |
|           | OGLE LMC100.2 55731 | 05:21:54.92  | -69:21:50.1  |              | 15.190              | 15.706              |              |              | cC*+EB: candidate    |                           |
|           | HV 12024            | 05:23:07.71  | -69:33:49.9  |              | 16.707              | 17.360              |              |              | cC*+EB: candidate    |                           |
|           | HV 5834             | 05:25:58.65  | -70:09:49.2  |              | 15.280              | 15.74               |              |              | cC*+EB: candidate    |                           |
|           | OGLE LMC-SC17 59796 | 05:38:04.14  | -69:57:05.2  |              | 16.317              | 18.300              |              |              | cC*+EB: candidate    |                           |
|           | OGLE LMC177.4 136   | 05:40:07.871 | -70:15:04.48 |              | 17.30               | 18.61               |              |              | cC*+EB: candidate    |                           |
|           | X Pup               | 07:32:47.034 | -20:54:34.88 | K0           | 8.46                | 9.56                |              |              | cC*+SB: candidate    |                           |
|           | AD Pup              | 07:48:03.852 | -25:34:40.01 | F8           | 9.99                | 10.81               |              |              | cC*+SB: candidate    |                           |
|           | RZ Vel              | 08:37:01.303 | -44:06:52.83 | G1Ib         | 7.128               | 8.199               |              |              | cC*+SB: candidate    |                           |
|           | ST Vel              | 08:44:55.892 | -50:33:36.14 | K            | 9.69                | 10.89               |              |              | cC*+SB: candidate    |                           |

Table 2—Continued

| Type of           | Binary or               | RA           | DEC          | Sp.(A+B)    | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\mathrm{orb}}$ | $P_{\mathrm{pul}}$ | Comments                      | References                             |
|-------------------|-------------------------|--------------|--------------|-------------|---------------------|---------------------|--------------------|--------------------|-------------------------------|--|
| Pulsators         | Multiple                | hh:mm:ss     | °:′:″        |             | (mag)               | (mag)               | (day)              | (day)              |                               |  |
|                   | GH Car                  | 11:10:44.593 | -60:45:01.00 | F8          | 9.04                | 9.92                |                    |                    | cC*+SB: candidate             |  |
|                   | V898 Cen                |              | -54:33:25.26 | F3III       | 7.97                | 8.55                |                    |                    | cC*+SB: candidate             |  |
|                   | V419 Cen                | 11:30:54.430 | -56:53:55.83 | F7II        | 8.19                | 8.90                |                    |                    | cC*+SB: candidate             |  |
|                   | S Mus                   | 12:12:47.018 | -70:09:06.44 | F6Ib+B3V    | 6.17                | 7.01                |                    |                    | cC*+SB: candidate             |  |
|                   | V445 Vir                | 13:05:29.120 | +12:49:35.50 | G4V         | 10.11               | 10.96               |                    |                    | cC*+SB: candidate             |  |
|                   | LR TrA                  | 15:30:49.823 | -65:35:57.58 | F8II        | 7.80                | 8.61                |                    |                    | cC*+SB: candidate             |  |
|                   | V479 Ser                | 15:51:07.584 | +11:16:18.77 | K5IV/Ve     | 12.79               |                     |                    |                    | cC*+SB: candidate             |  |
|                   | Y Oph                   | 17:52:38.702 | -06:08:36.87 | F8Iab:      | 6.21                | 7.61                |                    |                    | cC*+SB: candidate             |  |
|                   | V676 Her                | 18:13:39.133 | +37:28:34.25 |             |                     | 13.5                |                    |                    | cC*+EB: candidate             |  |
|                   | AY Sgr                  | 18:23:19.151 | -18:34:29.15 | F6          | 10.49               | 11.99               |                    |                    | cC*+SB: candidate             |  |
|                   | TYC 1031-1262-1         | 18:26:11.503 | +12:12:34.80 | F8II+G6II   | 11.51               | 11.92               |                    |                    | cC*+EB: candidate             |  |
|                   | 2MASS J19173621+3928300 | 19:17:36.213 | +39:28:30.04 |             | 14.041              | 13.62               |                    |                    | V* +EB: candidate             | V*= Variable star                      |
|                   | KIC 5095098             | 19:22:01.200 | +40:15:59.97 |             |                     |                     |                    |                    | V* +EB: candidate             |  |
|                   | KIC 5196301             | 19:37:36.658 | +40:20:14.46 |             |                     |                     |                    |                    | V* +EB: candidate             |  |
|                   | KIC 3965879             | 19:37:54.096 | +39:00:13.97 |             |                     |                     |                    |                    | EW+Ce*: candidate             | Ce*= Cepheids                          |
|                   | KIC 5217688             | 19:55:42.422 | +40:19:47.24 |             |                     |                     |                    |                    | V* +EB: candidate             |  |
|                   | BX Scl                  | 23:43:54.454 | -28:18:34.50 | A           | 13.56               | 13.82               |                    |                    | SX*+SB: candidate             | SX*= SX Phe-type pulsators             |
|                   | BY Scl                  | 23:51:32.250 | -25:45:46.53 | A0          | 13.85               | 14.05               |                    |                    | SX*+SB: candidate             |  |
| Cepheids:         | OGLE-LMC-CEP-227        | 04:52:16     | -70:14:31    | _           | 15.317              |                     | 310                | 3.797              | ЕВ                            | [344, 419, 356, 295]                   |
| Extragalactic     | MACHO 6.6454.5          | 05:20:25.00  | -70:11:08.7  | _           | 14.767              | R=14.638            | 397.14             | 4.97               | EB in LMC, by MACHO           | [8, 173]                               |
| DCEP              |                         |              |              |             |                     |                     |                    |                    | =OGLE LMC-SC21 40876=         | =397d LMC EB                           |
|                   | OGLE-LMC-CEP-1812       | 05:23:08     | -69:33:50    | _           | 16.707              |                     |                    | 1.3129             | oEA                           | [419]                                  |
|                   | OGLE-LMC-CEP-2532       | 05:36:04     | -70:01:55    | $+ \ K/M$   | 17.297              |                     | 800.5              | 2.035              | 1st overtone EB in LMC        | [8, 173, 274, 419]                     |
|                   |                         |              |              |             |                     |                     |                    |                    | =OGLE LMC-SC16 119952         | 2=MACHO 81.8997.87                     |
| Type II Cepheids: | OGLE-SMC-T2CEP-23       | 00:55:01     | -73:09:47    | _           | 15.99               |                     | 17.6753            | 156.884            | in SMC, OGLE-III data         | [420]                                  |
| W Vir-type        | OGLE-SMC-T2CEP-28       | 00:57:32     | -73:32:11    | _           | 15.91               |                     | 15.2643            | 141.835            | in SMC, OGLE-III data         | [420]                                  |
|                   | OGLE LMC-T2CEP-93       | 05:19:26     | -69:51:51    | _           | 15.86               | 16.347              | 419.718            | 17.68              | eclipsing Cepheid in LMC      | [8]                                    |
|                   |                         |              | =OGLE I      | MC-SC7 2396 | 598=MACF            | IO 78.6338.24       | 4=MACHO            | J051926.9-         | 695152,W Vir class type II Ce | pheid with a smaller, dimmer companion |
|                   | TX Del                  | 20:50:13     | +03:39:08    | F8          | 9.21                | 9.95                | 133.3              | 6.1660             | SB1+orbit,W Vir-type          | [165, 188, 185, 366]                   |
|                   | OGLE LMC130.1 160       | 04:59:34.97  | -71:15:31.2  |             | 16.580              |                     |                    |                    | CWA+EB: candidate             | CWA=Type II Cepheids of W Vir type     |
|                   | HV 12509                | 05:00:13.00  | -67:42:43.7  |             | 16.101              |                     |                    |                    | CWA+EB: candidate             |  |
|                   | OGLE LMC112.7 9733      | 05:09:59.34  | -69:58:28.7  |             | 16.861              |                     |                    |                    | CWA+EB: candidate             |  |
|                   | OGLE LMC-SC8 194670     | 05:16:21.44  | -69:36:59.2  |             | 18.039              | 18.460              |                    |                    | CWA+EB: candidate             |  |
|                   | OGLE LMC-SC8 306227     | 05:17:07.50  | -69:27:34.1  |             | 17.841              |                     |                    |                    | CWA+EB: candidate             |  |

| Type of        | Binary or                | RA          | DEC          | Sp.(A+B)       | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\rm orb}$ | $P_{\mathrm{pul}}$        | Comments                         | References                      |
|----------------|--------------------------|-------------|--------------|----------------|---------------------|---------------------|---------------|---------------------------|----------------------------------|---------------------------------|
| Pulsators      | Multiple                 | hh:mm:ss    | °:′:″        |                | (mag)               | (mag)               | (day)         | (day)                     |                                  |                                 |
|                | HV 5756                  | 05:19:26.45 | -69:51:51.0  |                | 15.861              | 16.347              |               |                           | CWA+EB: candidate                |                                 |
|                | OGLE LMC-SC21 40876      | 05:20:25.00 | -70:11:08.7  |                | 14.767              |                     |               |                           | CWA+EB: candidate                |                                 |
|                | OGLE LMC-T2CEP-110       | 05:22:19.51 | -68:53:49.9  |                | 17.649              | 17.800              |               |                           | CWA+EB: candidate                |                                 |
|                | OGLE LMC-T2CEP-151       | 05:34:35.74 | -69:59:14.8  |                | 17.198              |                     |               |                           | CWA+EB: candidate                |                                 |
|                | OGLE LMC-SC17 24613      | 05:38:04.32 | -70:20:29.2  |                | 16.933              | 17.52               |               |                           | CWA+EB: candidate                |                                 |
|                | V1834 Sgr                | 18:16:16.6  | -33:37:49    |                |                     | 13.3                |               |                           | CWA+EB: candidate                |                                 |
|                | AU Peg                   | 21:24:00.24 | +18:16:43.78 | F8             | 9.18                | 10.03               |               |                           | CWA+SB: candidate                |                                 |
| BL Her-type    | IX Cas                   | 00:04:51    | +50:14:05    | F7 +           | 11.19               | 11.73               |               | 9.2                       | SB1,                             | [188]                           |
|                | AU Peg                   | 21:24:00    | +18:16:44    | F8 +           | 9.18                | 10.03               | 53.26         | 2.411                     | SB1, double-mode                 | [217, 186]                      |
| RV Tau-type    | OGLE-SMC-T2CEP-29        | 00:57:38    | -72:18:12    | _              | 14.49               | 15.3                | 33.6765       | 608.6                     | in SMC, OGLE-III data,=HV 1214   | 0 [420]                         |
| (in post-AGB)  | V390 Vel                 | 08:56:14    | -44:43:11    | F3e +          | 9.13                | 10.48               | 507.8         | 71.7                      | =IRAS 08544-4431                 | [240, 477]                      |
|                | AF Crt=IRAS 11472-0800   | 11:49:48.0  | -08:17:20.4  | F5Iab +        | 11.17               | 11.72               | years         | 31.16                     | semi-regular,extremely depleted  | [478]                           |
|                | HD 108015                | 12:24:53    | -47:09:07    | F3Ib +         | 7.95                |                     | 913.8         | 60.5                      | =IRAS 12222-4652=NSV 5601        | [240, 477]                      |
|                | EN TrA                   | 14:57:00    | -68:50:23    | F2Ib +         | 8.77                |                     | 1493          | 37.04                     | =HD 131356=IRAS 14524-6838       | [240, 477]                      |
|                | IRAS 15469-5311          | 15:50:44    | -53:20:43    | F3 +           | 10.56               |                     | 389.9         | 54.5                      |                                  | [240, 477]                      |
|                | IRAS 19125+0343          | 19:15:01    | +03:48:43    | F2 +           | 10.16               |                     | 519.6         | 42.3                      |                                  | [240, 477]                      |
|                | IRAS 19157-0247          | 19:18:23    | -02:42:11    | F3 +           | 10.70               |                     | 119.5         | 22.5                      |                                  | [240, 477]                      |
|                | HV 1586                  | 00:53:35.98 | -72:34:21.8  |                | 15.890              | 16.61               |               |                           | EB+RV*: candidate                | RV*=Variable Star of RV Tau ty  |
|                | OGLE LMC-T2CEP-16        | 04:55:45.98 | -69:07:46.3  |                | 15.681              | 16.900              |               |                           | EB+RV*: candidate                |                                 |
|                | OGLE J050926.21-685005.1 | 05:09:26.15 | -68:50:05.1  |                | 15.661              |                     |               |                           | EB+RV*: candidate                |                                 |
|                | OGLE LMC106.7 74         | 05:16:55.33 | -71:41:41.5  |                | 16.065              |                     |               |                           | EB+RV*: candidate                |                                 |
|                | OGLE LMC-T2CEP-192       | 05:53:55.69 | -70:17:11.4  |                | 16.148              |                     |               |                           | EB+RV*: candidate                |                                 |
|                | BG Gem                   | 06:03:30.81 | +27:41:50.7  |                |                     | 13.6                |               |                           | EB+RV*: candidate                |                                 |
| $\delta$ Scuti | WY Cet                   | 01:35:36    | -11:56:31    | A2 + F0V       | 9.6                 | 9.60                | 1.93969       | 0.0757                    | oEA, third body                  | [278, 280]                      |
| (DSCT)         | HD 232486                | 01:38:41    | +52:31:08    | A5 + F3        | 9.69                | 10.02               | 2.3723        | 0.0409                    | =HIP 7666, detached              | [103]                           |
|                | X Tri                    | 02:00:33    | +27:53:19    | A7V +          | 9.00                | 9.30                | 0.971         | 0.022                     | oEA,detached                     | [468]                           |
|                | AB Cas                   | 02:37:31    | +71:18:16    | A3V + K0IV     | 10.17               | 10.59               | 1.3669        | 0.0583                    | oEA, semi-detached               | [378, 381, 383, 429, 459]       |
|                | RZ Cas                   | 02:48:55    | +69:38:03    | A3V + K0IV     | 6.26                | 6.41                | 1.1953        | 0.0156                    | oEA, semi-detached [16           | 3, 164, 270, 272, 326, 382, 426 |
|                | IU Per                   | 02:59:37    | +43:55:18    | A4 +           | 10.56               | 10.85               | 0.8570        | 0.0238                    | oEA, detached                    | [235, 503]                      |
|                | V1241 Tau                | 03:24:23    | -00:42:15    | F0V + G5III-IV | 9.38                | 9.87                | 0.8233        | 0.1645                    | oEA, semi-detached, WX Eri is wr | ong [15]                        |
|                | TT Hor                   | 03:27:04.4  | -45:52:56.4  | F0-F2 +        | J=10.327            | 9.8                 | 2.6081        | $15 - 38 \mathrm{d}^{-1}$ | oEA, semi-detached               | [317]                           |
|                | AS Eri                   | 03:32:25    | -03:18:48    | A3V + K0IV     | 8.29                | 8.49                | 2.6641        | 0.0169                    | oEA, semi-detached, roAp         | [311]                           |
| 10             | V1229 Tau                | 03:47:29    | +24:17:18    | A0V +          | 6.83                | 6.90                |               |                           | oEA + SB2, =HD 23642             | [171]                           |
|                | AB Per                   | 03:37:45    | +40:45:49    | A5V + G9IV     | 10.40               | 10.12               | 7.1603        | 0.1958                    | oEA, semi-detached               | [229, 232]                      |

| Type of        | Binary or        | RA           | DEC          | Sp.(A+B)     | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\rm orb}$ | $P_{ m pul}$                 | Comments                                    | References        |
|----------------|------------------|--------------|--------------|--------------|---------------------|---------------------|---------------|------------------------------|---|-------------------|
| Pulsators      | Multiple         | hh:mm:ss     | °:′:″        |              | (mag)               | (mag)               | (day)         | (day)                        |   |                   |
| $\delta$ Scuti | TZ Eri           | 04:21:40     | -06:01:09    | A5V + K0III  | 9.80                | 9.95                | 2.6062        | 0.0534                       | oEA, semi-detached                          | [276, 278]        |
| (DSCT)         | $\theta^2$ Tau   | 04:28:39     | +15:52:15    | A7III +      | 3.41                | 3.59                |               |                              | SB, in Hyades                               | [355, 465]        |
|                | AC Tau           | 04:37:06.3   | +01:41:31.2  | A8 +         | 11.09               | 11.51               | 2.0434        | 0.05703                      | oEA, [semi-]detached                        | [280]             |
|                | ζ Aur            | 05:02:28     | +41:04:33    | K4Ib-II +    | 3.77                | 4.93                |               |                              | oEA   | [100]             |
|                | FL Ori           | 05:07:46.6   | -02:44:38.2  | A3V +        | 11.42               | 11.77               | 1.55098       | 0.05501                      | oEA, [semi-]detached                        | [280]             |
|                | RR Lep           | 05:12:10.5   | -13:11:58.6  | A4III +      | 10.14               | 10.29               | 0.91543       | 0.03138                      | oEA, semi-detached                          | [280]             |
|                | V417 Aur         | 05:13:32     | +35:39:11    | A0 +         | 7.90                | 7.99                | 1.8655        | 0.2091                       | oEA, likely DSCT primary                    | [131]             |
|                | KW Aur=14 Aur    | 05:15:24     | +32:41:15    | A9IV +       | 5.01                | 5.21                | 3.789         | 0.0875                       | SB,   | [202]             |
| 20             | FO Ori           | 05:28:09     | +03:37:23    | A3 +         | 9.48                | 9.59                | 18.80         | 0.0292                       | oEA, detached                               | [468]             |
|                | EY Ori           | 05:31:18     | -05:42:13    | A7V +        | 9.49                | 10.21               | 16.78         | 0.103                        | oEA, detached                               | [468]             |
|                | RY Lep           | 05:48:10     | -20:01:25    | A9V +        | 8.2                 | 8.9                 |               |                              | SB  | [86, 377]         |
|                | FR Ori           | 05:51:05.721 | +09:26:37.46 | A7 +         | 10.64               | 11.05               |               |                              | oEA, semi-detached, beta Lyr type,HD 248406 | [502]             |
|                | UCAC4 605-026193 | 05:51:57     | +30:54:54    | B - V = 0.44 | 14.5                |                     | 1.179         | $30.7\mathrm{d}^{-1}$        | oEA,=USNO-A2.0 1200-03937339                | [277]             |
|                | V551 Aur         | 06:02:38.2   | +49:53:04.7  | F+           | 14.27               | 15.11               | 1.1732        | 7.727,15.45                  | oEA, detached,g-mode                        | [283]             |
|                | HD 50870         | 06:54:56.7   | -03:20:21.9  | F0IV +       | 8.85                | 9.17                |               | $6-9,13-18  \mathrm{d}^{-1}$ | SB, seen with CoRoT & HARPS                 | [294]             |
|                | R CMa            | 07:19:28     | -16:23:42    | F0V + K1IV   | 5.70                | 6.05                | 1.1359        | 0.0471                       | oEA   | [309, 310]        |
|                | HM Pup           | 07:19:37.7   | -48:39:13.0  | A7 +         | 10.095              | 11.05               | 2.5897        | $15-38  \mathrm{d}^{-1}$     | oEA, detached                               | [317]             |
|                | HD 61199         | 07:38:17     | +04:56:34    | A3 + late F  | 7.97                | 8.18                | 3.57436       | 0.03959                      | triple system: multi-mode,MOST              | [183]             |
| 30             | V681 Car         | 07:39:03     | -60:37:08    | A5 II +      | 10.00               | 10.51               | 1.2209        | 0.21423                      | =CPD-60°871=ASAS J073904-6037.5, or BCEP    | [307, 347]        |
|                | Y Cam            | 07:41:11     | +76:04:26    | A7V + K1IV   | 10.50               | 10.88               | 3.3057        | 0.0665                       | oEA [45, 46                                 | 5, 228, 384, 385] |
|                | HD 62571         | 07:44:22     | -06:41:49    | F0V +        | 8.80                | 9.10                | 3.2086        | 0.11048                      | oEA, semi-detached, multiperiodic           | [307, 347]        |
|                | CL Lyn           | 07:55:12.5   | +54:09:45.6  | A5 +         | 9.77                | 10.05               | 1.58604       | 0.04338                      | oEA, [semi-]detached                        | [280]             |
|                | AW Vel           | 08:08:11.6   | -44:20:53.5  | A7 +         | J=9.789             | 11.5                | 1.9925        | $15-38 \mathrm{d}^{-1}$      | oEA, detached                               | [317]             |
|                | CQ Lyn           | 08:12:59     | +55:37:31    | Am F0 + G?   | 7.97                | 8.34                | 12.5074       | 0.11277                      | EB+SB2,Am DSCT and solar-like components    | [52]              |
|                | AI Hya           | 08:18:47     | +00:17:00    | F0 + F2      | 9.35                | _                   | 8.2897        | 0.1380                       | oEA, detached                               | [354]             |
|                | RS Cha           | 08:43:12     | -79:04:12    | A8V + A8V    | 6.02                | 6.28                | 1.6699        | 0.086                        | oEA   | [38, 67, 304]     |
|                | BF Vel           | 08:56:27.0   | -39:58:35.9  | A3 +         | J=10.246            | 11.4                | 0.704         | 0.02225                      | oEA, [semi-]detached                        | [280]             |
|                | XX Pyx           | 08:58:39     | -24:35:11    | A4V +        | 11.50               |                     | 1.15          | 0.02624                      | detached,multiperiodic,ellipsoidal var.     | [5, 14, 280]      |
| 40             | RX Hya           | 09:05:41     | -08:15:39    | A8 + K5IV    | 8.90                | 9.76                | 2.2817        | 0.0516                       | oEA, semi-detached                          | [229]             |
|                | WY Leo           | 09:31:01.1   | +16:39:25.2  | A2 +         | 10.89               | 11.28               | 4.98578       | 0.0655                       | oEA, [semi-]detached                        | [280]             |
|                | Y Leo            | 09:36:52     | +26:13:57    | A3V +        | 10.07               | 10.31               | 1.6861        | 0.029                        | oEA, semi-detached                          | [467, 280]        |
|                | VV UMa           | 09:38:06     | +56:01:07    | A2V + G1IV   | 10.13               | 10.42               | 0.6874        | 0.0195                       | oEA, semi-detached                          | [233]             |
|                | DG Leo           | 09:49:50     | +21:10:46    | A7IV +       | 6.08                | 6.32                | 4.14675       | 0.08337                      | SB: triple system [140, 14                  | 1, 258, 259, 280] |
|                | HD 86731         | 10:00:42     | +17:34:04    | F5 +         | 8.05                | 8.51                |               |                              | DSCT + ellipsoidal binary,=HIP 49061        | [244]             |

| Type of        | Binary or       | RA         | DEC         | Sp.(A+B)    | $\langle V \rangle$ | $\langle B \rangle$ | $P_{ m orb}$ | $P_{ m pul}$          | Comments  | References           |
|----------------|-----------------|------------|-------------|-------------|---------------------|---------------------|--------------|-----------------------|---|----------------------|
| Pulsators      | Multiple        | hh:mm:ss   | · : ' : "   | 21.()       | (mag)               | (mag)               | (day)        | (day)                 |   |                      |
|                |                 |            |             |             | (8)                 | (8/                 | (,)          | (==,)                 |   |                      |
| $\delta$ Scuti | HD 94529        | 10:53:59   | -49:19:51   | A0V +       | 8.77                | 8.81                |              |                       | double system   | [307]                |
| (DSCT)         | CPD-41°5106     | 11:06:15   | -42:24:36   | _           | 10.47               |                     | 2.1369       | 0.1215                | =ASAS J110615-4224.6, maybe BCEP                      | [307, 347]           |
|                | HD 99612        | 11:27:33   | -24:50:08   | A7 II +     | 11.3                | 11.4                | 2.7787       | 0.06796               | =ASAS J112733-2450.2,detached                         | [307, 347]           |
|                | OO Dra          | 11:40:01.4 | +75:09:21.5 | A3V +       | 11.386              | 11.42               | 1.23837      | 0.02703               | oEA, [semi-]detached,=GSC 4550-1408                   | [92, 280, 505]       |
| 50             | Y UMa           | 12:40:21.3 | +55:50:47.6 | M7II +      | 7.70                | 9.66                | 3.3057       | 0.0586                | oEA, semi-regular pulsation                           | [504]                |
|                | IO UMa          | 13:14:54.4 | +59:17:44.3 | A3 +        | 8.21                | 8.44                | 5.5204       | 0.05275,0.04542       | oEA, semi-detached,=HD 115268                         | [280, 434]           |
|                | RU UMi          | 13:38:56   | +69:48:11   | A2 +        | 10.24               | 10.00               |              |                       | oEA   | [25]                 |
|                | $\psi$ Cen      | 14:20:33   | -37:53:07   | A0IV        | 4.05                | 4.02                |              |                       | double system   | [47]                 |
|                | EW Boo          | 15:02:46   | +37:54:36   | A0 +        | 10.27               | 10.45               | 0.9063       | 0.02083               | oEA   | [428, 431, 280]      |
|                | TW Dra          | 15:33:51   | +63:54:25   | A5V + K2III | 7.43                | 7.70                | 2.8069       | 0.0556                | oEA, semi-detached                                    | [229, 429]           |
|                | YY Boo          | 15:35:28   | +43:28:49   | A7III+F9IV  | 11.90               | 12.0                | 3.93307      | 0.06128               | oEA, mass-accreting                                   | [178]                |
|                | AO Ser          | 15:58:18   | +17:16:00   | A2V +       | 11.40               | 11.3                | 0.8793       | 0.0465                | oEA, semi-detached                                    | [231]                |
|                | CT Her          | 16:20:26   | +18:27:16   | A3V + G3IV  | 10.60               | 11.4                | 1.7864       | 0.01889               | oEA, semi-detached                                    | [230, 262, 263, 264] |
|                | WASP 1628+10    | 16:28:42   | +10:14:16   | A2V + B     |                     |                     | 0.72         | 0.025                 | EL CVn-type, pre-He-WD companion                      | [302]                |
| 60             | GK Dra          | 16:45:41   | +68:15:31   | G0 +        | 8.77                | 9.11                | 16.96        | 0.11376               | oEA, detached   | [75, 280]            |
|                | EF Her          | 16:55:26   | +17:17:48   | F0 + KIV    | 11.00               | 12.0                | 4.7292       | 0.1042                | oEA, semi-detached                                    | [230, 390]           |
|                | AI Dra          | 16:56:18   | +52:41:54   | A0V +       | 7.11                | 7.16                |              |                       | EA, pulsation unconfirmed:                            | [239, 322]           |
|                | V2365 Oph       | 17:08:45.8 | +09:11:10.1 | A2 +        | 8.86                | 9.14                | 4.8656       | 0.07                  | oEA, [semi-]detached                                  | [280]                |
|                | TU Her          | 17:13:35   | +30:42:36   | A5+         | 10.88               | 11.33               | 2.2669       | 0.0556                | oEA, semi-detached                                    | [257]                |
|                | V944 Her        | 17:17:34.6 | +28:54:47.8 | MIII +      | 6.89                | 8.54                | 2.08309      | 0.09467               |   | [280]                |
|                | GSC 3889-0202   | 17:46:30.4 | +53:11:57.9 |             | 10.39               | 10.60               | 2.71066      | 0.0441                | oEA, semi-detached                                    | [280]                |
|                | SX Dra          | 18:04:34   | +58:23:54   | A9V +       | 10.41               | 10.72               | 5.16919      | 0.04375               | oEA, semi-detached                                    | [95, 433]            |
|                | V577 Oph        | 18:16:45.8 | +06:54:18.2 | A +         | 10.98               | 11.4                | 6.0791       | 0.0695                | oEA, detached; Simbad: RR Lyr type                    | [138, 506]           |
|                | TZ Dra          | 18:22:11   | +47:34:08   | A7V + K2IV  | 9.60                | 9.54                | 0.8660       | 0.01973               | oEA, semi-detached                                    | [276]                |
| 70             | MX Pav          | 18:24:11   | -63:56:55   | A5 + K3 IV  | 11.45               | 10.0                | 5.7308       | 0.0756                | oEA, =ASAS J182411-6356.9, semi-detached              | [307, 347]           |
|                | V994 Her        | 18:27:45   | +24:41:50   | B9 +        | 7.00                | 7.01                | 2.08309      | 0.09467               | oEA   | [74, 504]            |
|                | HL Dra          | 18:34:26.3 | +57:48:06.5 | A5 +        | 7.36                | 7.56                | 0.94428      | 0.03848               | oEA, semi-detached                                    | [280]                |
|                | HD 172189       | 18:38:37   | +05:27:55   | A2+         | 8.85                | 9.09                | 5.702        | 0.0510                | EB,detached, in open cluster IC 4756                  | [67]                 |
|                | BO Her          | 18:40:30   | +24:55:42   | A7 +        | 11.1                | 11.6                | 4.27283      | 0.07446               | oEA, semi-detached                                    | [439]                |
|                | CoRoT 105906206 | 18:43:17   | +05:58:00   |             | 12.21               | 12.68               | 3.6945       | $9.41\mathrm{d}^{-1}$ | oEA, detached,=TYC 459-892-1                          | [77]                 |
|                | HN Dra          | 18:44:53   | +57:05:17   | F2 +        | 8.11                | 8.43                | 1.80075      | 0.11686               | SB, detached, DSCT + Ell., =HD 173977                 | [56]                 |
|                | KIC 4544587     | 19:03:32.7 | +39:41:00.3 |             | 10.83               | 10.95               | 2.189        | 31 modes              | oEA, 14/17 $g/p$ modes, $e$ =0.28, detached           | [177]                |
|                | KIC 10661783    | 19:21:11.6 | +47:58:42.9 | A2 +        | 9.563               | 9.844               | 1.23136      | 0.03554               | oEA, semi-detached EB of $\beta$ Lyr type,68 puls. fr | eq. [423, 273]       |
|                | V377 Vul        | 19:22:51   | +26:15:44   | B6III +     | 5.19                | 5.07                | 367          |                       | SB1,unconfirmed,=3 Vul=HD 182255                      | [201]                |

| Type of        | Binary or        | RA DEC               | Sp.(A+B)       | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\rm orb}$ | $P_{ m pul}$                    | Comments   | References       |
|----------------|------------------|----------------------|----------------|---------------------|---------------------|---------------|---------------------------------|--|------------------|
| Pulsators      | Multiple         | hh:mm:ss °:′:        | //             | (mag)               | (mag)               | (day)         | (day)                           |  |                  |
| $\delta$ Scuti | GSC 4588-0883    | 19:27:54 +77:17:42   | 2 A9IV + K4III | 11.31               | 11.85               | 3.2582        | 0.0493                          | oEA, semi-detached                                     | [93, 280]        |
| (DSCT)         | HD 183648        | 19:28:33 +44:40:2    | 1 A5+          | 8.48                | 8.69                | 31.973        | 0.53                            | oEA, =KIC 8560861                                      | [39]             |
|                | KIC 9651065      | 19:30:25 +46:22:52   | 2 A+           | 10.98               | 11.31               |               | 13.62-36.15 d <sup>-1</sup>     |  | [321]            |
|                | KIC 4471379      | 19:34:07 +39:34:19   | 9 A+           | R=12.32             | KEP=12.344          | 961           | 12.41–21.95 d <sup>-1</sup>     | a binary/w 2 pulsating components (PB2)                | [321]            |
|                | KIC 3858884      | 19:34:46.9 +38:58:58 | 3.0 F5 + F?    | 9.28                | 9.72                | 25.95         | $6-15\mathrm{d}^{-1}$           | oEA, 2 components pulsating, highly eccentric (e=0.46) | [290, 266]       |
|                | HD 174884        | 19:36:08.0 +11:09:00 | ).6 B8 +       | 7.998               | 8.14                | 3.657         | multiples of $f_{orb}$          | eclipsing SB2, $e\sim$ 0.3, =HR 7445=CoRoT 7758        | [287]            |
|                | KIC 7618364      | 19:39:52 +43:16:38   | 3 A+           | R=13.05             | KEP=13.095          | 1479          | $17.35 - 26.14 \mathrm{d}^{-1}$ |  | [321]            |
|                | KIC 11771670     | 19:43:49 +49:57:13   | 3 A+           | R=12.82             | KEP=12.826          | 565           | 34.71-40.43 d <sup>-1</sup>     |  | [321]            |
|                | HZ Dra           | 19:46:02.5 +69:55:0  | 8.9 A0+        | 8.14                | 8.34                | 0.77294       | 0.01895                         | oEA, detached  | [280]            |
|                | V729 Aql         | 19:56:50 +13:17:50   | B - V = 0.16   | 13.75               | 14.2                | 1.282         | $28.034\mathrm{d}^{-1}$         | oEA  | [277]            |
| 90             | UCAC4 515-117553 | 19:57:31 +12:54:17   | B - V = 0.26   | 13.5                |                     | 3.015         | $18.7\mathrm{d}^{-1}$           | oEA,=USNO-A2.0 0975-17281677                           | [277]            |
|                | QY Aql           | 20:09:28 +15:18:44   | 4 F0+          |                     | 11.4                | 7.2296        | 0.09385                         | oEA, detached  | [280, 468]       |
|                | V469 Cyg         | 20:14:48 +34:44:22   | 2 A+           | 12.80               | 12.80               | 1.3125        | 0.0278                          | oEA, semi-detached                                     | [55]             |
|                | V346 Cyg         | 20:19:24 +36:20:24   | 4 A5 + G4IV    | 11.80               | 11.80               | 2.7433        | 0.0502                          | oEA, semi-detached                                     | [234]            |
|                | BW Del           | 20:21:06.5 +18:23:10 | ).9 F+         | 11.28               | 11.57               | 2.42313       | 0.03984                         | oEA, detached  | [504]            |
|                | UW Cyg           | 20:23:02.8 +43:14:32 | 2.4 A5 +       | 10.86               | 11.09               | 3.4508        | 0.03405                         | oEA, [semi-]detached,third & fourth bodies             | [280]            |
|                | TY Cap           | 20:24:30 -12:57:55   | 5 A5III +      | 10.3                | 10.48               | 1.42346       | 0.0413                          | oEA, third body  | [278, 280]       |
|                | IZ Tel           | 20:28:43 -56:20:43   | 3 —            | 12.06               | 13.00               | 4.8802        | 0.07376                         | oEA, =ASAS J202844-5620.8,semi-detached                | [307, 347]       |
|                | VY Mic           | 20:49:07 -33:43:54   | 4 A4III/V +    | 9.47                | 8.40                | 4.4364        | 0.08174                         | oEA, =ASAS J204907-3343.9,semi-detached                | [307, 347]       |
|                | RS Gru           | 21:43:04 -48:11:22   | 2 A9IV +       | 7.93                | _                   | 11.5          | 0.147                           | SB   | [20, 86, 280]    |
| 100            | δ Cap            | 21:47:02 -16:07:35   | 5 A8m + dK7    | 2.87                | 3.16                | 1.02          |                                 | oEA, p-& g-mode hybrid                                 | [175]            |
|                | HD 207651        | 21:50:08 +19:25:20   | 6 A5 +         | 7.21                | 7.42                | 1.4708        | 0.06479,0.051                   | SB, DSCT + Ell.,detached                               | [70]             |
|                | AU Lac           | 22:15:17.1 +48:43:10 | 6.9 A5 +       | 11.81               | 12.15               | 1.39243       | 0.01977                         | oEA, [semi-]detached                                   | [280]            |
|                | DY Aqr           | 22:19:04 -02:38:30   | ) A0+          | 10.23               | 10.30               | 2.1597        | 0.04275                         | oEA  | [431, 430, 9]    |
|                | BG Peg           | 22:52:47 +15:39:34   | 4 A2 +         | 10.50               | 10.50               | 1.9527        | 0.0391,0.047                    | oEA,detached,ℓ=2 non-radial modes [430                 | ), 432, 279, 400 |
|                | HD 218994        | 23:13:16 -60:35:02   | 2 Ap           | 8.55                | 8.8                 |               |                                 | Magnetic Ap star: multiple star                        | [251]            |
|                | CZ Aqr           | 23:22:20 -15:56:20   | ) A5+          | 11.1                | 11.1                | 0.08628       | 0.02849                         | oEA, detached, third body                              | [280, 468]       |
|                | HD 220687        | 23:25:47 -11:36:3    | 5 A2 III +     | 9.55                | 9.79                | 1.5942        | 0.03821                         | oEA, detached, multiperiodic, =ASAS J232548-1136.6     | [307, 347]       |
|                | HD 220392        | 23:33:54 -53:48:3    | l A4III        | 6.12                | 6.37                |               |                                 | =HR 8895=IRAS 23210-5405,visual binary                 | [255]            |
|                | XX Cep           | 23:38:20.2 +64:20:02 | 2.7 A7V +      | 9.18                | 9.47                | 2.3373        | 0.0317                          | oEA, detached  | [200]            |
| 110            | CPD-31°6830      | 23:45:20 -31:00:30   | ) —            | 10.95               |                     | 0.8834        | 0.18304                         | contact EB, =ASAS J234520-3100.5                       | [307, 347]       |
| 111            | GSC 4293-0432    | 23:45:42 +66:05:00   | 6 A7 + K3      | 10.58               | 10.79               | 4.3844        | 0.125                           | oEA, semi-detached,=BD+65 1939                         | [94]             |
| 112            | IV Cas           | 23:49:31 +53:08:04   | 4 A2 + G1IV    | 11.20               | 11.6                | 0.9985        | 0.0265                          | oEA, detached  | [236, 237]       |
|                | 15+stars         |                      |                |                     |                     |               |                                 | candidate oEA with a DSCT primary: OGLE-II             | [308]            |

Table 2—Continued

| Type of Pulsators | Binary or<br>Multiple   | RA<br>hh:mm:ss | DEC ° : ' : " | Sp.(A+B) | $\langle V \rangle$ (mag) | $\langle B \rangle$ (mag) | P <sub>orb</sub> (day) | P <sub>pul</sub> (day) | Comments                                     | References           |
|-------------------|-------------------------|----------------|---------------|----------|---------------------------|---------------------------|------------------------|------------------------|--|----------------------|
| δ Scuti           | 8+stars                 |                |               |          |                           |                           |                        |                        | candidate oscillating EW stars: OGLE-II      | [308]                |
| (DSCT)            | HD 719                  | 00:11:28 624   | -26:15:11.68  | A3mF0    | 9.377                     | 9.76                      |                        |                        | SB,SAO 166102: candidate                     | [411, 404, 374, 375] |
| (BBC1)            | HD 923                  |                | -29:34:32.49  | A6mF2    | 8.55                      | 8.74                      |                        |                        | SB, SAO 166128: candidate                    | [79, 303, 411]       |
|                   | AU Scl                  |                | -29:00:23.02  | A4mF4Sr  | 9.050                     | 9.48                      |                        |                        | SB,HD 1097=SAO 166146: candidate             | [79, 303, 411]       |
|                   | BB Phe                  | 00:30:27.826   |               | F2III    | 6.178                     | 6.478                     |                        |                        | SB,HD 2724=SAO 215120=HR 119: candidate      | [79, 303]            |
|                   | BG Cet                  | 00:36:06.857   |               | A5m      | 6.06                      | 6.35                      |                        |                        | SB,HD 3326=SAO 166400=HR 151: candidate      | [87, 79, 88, 303]    |
|                   | AI Scl                  |                | -37:51:23.32  | FOIII    | 5.946                     | 6.212                     |                        |                        | SB,HD 7312=SAO 192980=HR 359: candidate      | [79, 303]            |
|                   | TYC 5276-1653-1         | 01:18:01.569   | -13:23:06.39  | A6m      | 11.01                     | 11.35                     |                        |                        | SB: candidate                                | [411, 374, 375]      |
|                   | HD 8457                 | 01:23:34.252   | -13:02:34.03  | A1III    | 10.14                     | 10.45                     |                        |                        | SB,BD-13 252: candidate                      | [66, 411, 404]       |
|                   | WZ Scl                  | 01:28:43.491   | -33:45:50.30  | F0IV     | 6.595                     | 6.870                     |                        |                        | SB,HD 9065=SAO 193136=HIC 6888: candidate    | [79, 303]            |
|                   | XX Scl                  | 01:29:26.133   | -33:19:13.74  | A7       | 8.89                      | 9.12                      |                        |                        | SB: candidate                                |                      |
|                   | HD 9659                 | 01:34:26.155   | -17:43:53.22  | A6IV     | 10.32                     | 10.49                     |                        |                        | SB: candidate                                |                      |
|                   | HD 11490                | 01:52:09.745   | -36:14:29.51  | A5m      | 9.30                      | 9.51                      |                        |                        | SB: candidate                                |                      |
|                   | BK Cet                  | 01:52:52.114   | -16:55:45.29  | F0V      | 5.793                     | 6.028                     |                        |                        | SB: candidate                                |                      |
|                   | mu. Cet                 | 02:44:56.541   | +10:06:50.91  | A9IIIp   | 4.20                      | 4.58                      |                        |                        | SB: candidate                                |                      |
|                   | 60 Tau                  | 04:22:03.518   | +14:04:37.91  | A3m      | 5.720                     | 6.018                     |                        |                        | SB: candidate                                |                      |
|                   | 71 Tau                  | 04:26:20.741   | +15:37:05.77  | F0V      | 4.490                     | 4.727                     |                        |                        | SB: candidate                                |                      |
|                   | rho Tau                 | 04:33:50.918   | +14:50:39.92  | A8V      | 4.65                      | 4.90                      |                        |                        | SB: candidate                                |                      |
|                   | 14 Aur                  | 05:15:24.394   | +32:41:15.36  | A9V      | 5.000                     | 5.217                     |                        |                        | SB: candidate                                |                      |
|                   | 59 Ori                  | 05:58:24.443   | +01:50:13.59  | A5me     | 5.904                     | 6.114                     |                        |                        | SB: candidate                                |                      |
|                   | DD Lyn                  | 07:55:40.827   | +35:24:45.67  | A3p      | 6.233                     | 6.481                     |                        |                        | SB: candidate                                |                      |
|                   | SZ Lyn                  | 08:09:35.748   | +44:28:17.61  | F2       | 9.08                      | 9.73                      |                        |                        | SB,hybrid RR+DSCT,=HD 67390: candidate       | [59, 275, 79]        |
|                   | HH UMa                  | 11:04:48.151   | +35:36:26.62  | F8       | 10.39                     | 10.92                     |                        |                        | SB: candidate                                |                      |
|                   | d02 Vir                 | 12:45:37.058   | +07:40:23.97  | F0IIIm   | 5.217                     | 5.516                     |                        |                        | SB: candidate                                |                      |
|                   | 2MASS J13101839-4508550 | 13:10:18.39    | -45:08:55.0   | A7V      |                           | 16.9                      |                        |                        | EA: candidate                                |                      |
|                   | EL Boo                  | 14:48:03.405   | +13:56:41.19  | F8       | 9.37                      | 9.85                      |                        |                        | SB: candidate                                |                      |
|                   | TU UMi                  | 14:55:43.801   | +76:18:23.65  | F2       | 8.75                      | 9.17                      |                        |                        | SB: candidate                                |                      |
|                   | V644 Her                | 16:55:15.991   | +13:37:11.68  | F1V      | 6.352                     | 6.662                     |                        |                        | SB: candidate                                |                      |
|                   | V1003 Her               | 18:53:17.543   | +21:13:32.74  | A7       | 9.79                      | 10.20                     |                        |                        | SB: candidate                                |                      |
|                   | BD+38 3415              | 19:03:51.028   | +38:21:28.75  | A5       | 9.56                      | 9.73                      |                        |                        | SB: candidate                                |                      |
|                   | KIC 9210037             | 19:12:07.37    | +45:38:11.9   |          |                           |                           |                        |                        | EB: candidate                                | [410, 475]           |
|                   | V2363 Cyg               | 19:21:08.382   | +51:02:00.93  |          | 12.01                     | 12.81                     |                        |                        | Contradictory variability types,KIC 12305537 | [410, 359, 81]       |
|                   | TYC 3146-584-1          | 19:24:05.977   | +44:32:47.01  |          | 12.00                     | 12.40                     |                        |                        | EB, KIC 8493159, ASAS J192406+4432.8         | [81, 359, 410, 349]  |
|                   | TYC 3142-717-1          | 19:27:25.346   | +42:00:31.04  |          | 11.24                     | 11.50                     |                        |                        | EB, KIC 6606229                              | [475, 359, 410]      |

Table 2—Continued

| Type of Pulsators | Binary or<br>Multiple  | RA<br>hh:mm:ss | DEC °: ': "  | Sp.(A+B)     | $\langle V \rangle$ (mag) | $\langle B  angle$ (mag) | $P_{ m orb}$ (day) | $P_{ m pul}$ (day)         | Comments                              | References                |
|-------------------|------------------------|----------------|--------------|--------------|---------------------------|--------------------------|--------------------|----------------------------|---------------------------------------|---------------------------|
| $\delta$ Scuti    | BD+37 3464             | 19:27:34.029   | +37:33:24.51 | F2           | 9.47                      | 9.90                     |                    |                            | EB, SAO 68345, KIC 2162283,           | [475, 359, 410]           |
| (DSCT)            | TYC 3142-957-1         | 19:29:59.685   | +41:37:44.87 |              | 12.22                     | 13.16                    |                    |                            | Contradictory var. types, KIC 6287172 | [64, 359, 410, 18]        |
|                   | KIC 5623923            | 19:32:01.50    | +40:51:16.8  |              |                           |                          |                    |                            | EB: candidate                         | [364]                     |
|                   | KIC 8758716            | 19:35:24.449   | +44:56:57.90 |              |                           |                          |                    |                            | Contradictory var. types              | [64, 359, 410, 81]        |
|                   | h01 Sgr                | 19:36:01.653   | -24:43:08.68 | A1mA2        | 5.647                     | 5.824                    |                    |                            | SB: candidate                         |                           |
|                   | BD+39 3858             | 19:36:09.032   | +39:37:42.98 | F1V          | 9.76                      | 10.11                    |                    |                            | Contradictory var. types,KIC 4570326  | [475, 359, 410, 54]       |
|                   | BOKS 33809             | 19:38:18.252   | +46:44:05.54 |              | g=15.82                   | r=15.22                  |                    |                            | Contradictory var. types,KIC 9897710  | [81, 359, 410, 130]       |
|                   | TYC 3140-782-1         | 19:42:52.228   | +39:41:29.39 |              | 11.95                     | 12.56                    |                    |                            | KIC 4577647: candidate                | [81, 359, 410]            |
|                   | TYC 3565-1003-1        | 19:45:48.805   | +49:47:11.48 |              | 10.90                     | 11.27                    |                    |                            | Contradictory var. types,KIC 11671429 | [475, 410]                |
|                   | HD 234999              | 19:46:42.589   | +50:21:01.35 | B8.5IV-V     | 9.09                      | 9.27                     |                    |                            | SB: candidate                         |                           |
|                   | TYC 3148-1402-1        | 19:46:55.498   | +43:50:27.81 |              | 10.69                     | 11.20                    |                    |                            | EA,Contradictory var. types,KIC 80439 | 61[64, 365, 81, 475, 410] |
|                   | KIC 7300184            | 19:47:08.587   | +42:48:12.00 |              | R=15.98                   |                          |                    |                            | EB, hybrid DSCT+SXPhe                 | [21, 81, 359, 410]        |
|                   | KIC 5724811            | 19:47:39.257   | +40:54:46.72 |              |                           |                          |                    |                            | Contradictory variability types       | [81, 359, 410]            |
|                   | TYC 3562-805-1         | 19:53:42.391   | +47:58:27.21 |              | 11.19                     | 11.42                    |                    |                            | Contradictory var. types,KIC 10684673 | [475, 410, 349]           |
|                   | KIC 9306095            | 20:00:41.911   | +45:47:59.34 |              | 12.450                    |                          |                    |                            | EW: candidate                         |                           |
|                   | KIC 8330092            | 20:03:34.930   | +44:14:50.06 |              | 13.523                    | 13.966                   |                    |                            | EW,Contradictory var. types           | [64, 460, 81, 475, 359]   |
|                   | IK Peg                 | 21:26:26.662   | +19:22:32.30 | kA6hA9mF0+DA | 6.078                     | 6.294                    |                    |                            | SB: hybrid DSCT+WD: candidate         |                           |
|                   | HR 8437                | 22:08:42.644   | -33:07:32.49 | A2III/IV     | 6.383                     | 6.565                    |                    |                            | SB: candidate                         |                           |
|                   | GX Peg                 | 22:31:34.352   | +29:32:33.93 | A5m          | 6.330                     | 6.520                    |                    |                            | SB: candidate                         |                           |
|                   | HD 223676              | 23:51:43.195   | -37:05:46.38 | A2mA8        | 9.46                      | 9.72                     |                    |                            | SB: candidate                         |                           |
| Solar-like        | NSVS 06507557          | 01:58:24       | +25:21:12    | K9 + M3      | 13.4                      | _                        | 0.515              |                            | EB, SB2,low mass                      | [50]                      |
| oscillators       | $\alpha$ CMi (Procyon) | 07:39:18       | +05:13:30    | F5IV-V       | 0.34                      | 0.74                     |                    |                            | SPB, visual Binary                    | [101]                     |
| (oscillating RGB) | $\beta$ Gem            | 07:45:19       | +28:01:34    | K0IIIb +     | 1.15                      | 2.15                     | 545                | 0.1332                     | planet-hosting,2.6M <sub>Jup</sub>    | [179, 190, 191]           |
|                   | α Cen A                | 14:39:36       | -60:50:08    | G2V + K1V    | -0.1                      | 0.4                      | 79 yr              |                            | Visual Binary,28 modes                | [40, 51, 101]             |
|                   | 70 Oph                 | 18:05:27       | +02:30:00    | K0V          | 4.03                      | 4.89                     |                    |                            | SPB,visual Binary                     | [53, 101]                 |
|                   | KIC 8210370            | 18:43:05.3     | +44:11:19.4  |              | J= 9.522                  | H=9.001                  | 153.5              | $44.1 \mu \mathrm{Hz}$     | oscillating RGB heartbeat star        | [24]                      |
|                   | KIC 7799540            | 18:44:46.0     | +43:31:29.8  |              | J=11.021                  | H=10.571                 | 71.8               | $347.2 \mu \text{Hz}$      | oscillating RGB heartbeat star        | [24]                      |
|                   | KIC 8144355            | 18:47:30.4     | +44:01:47.7  |              | J=12.084                  | H=11.534                 | 80.6               | $179.0 \mu Hz$             | oscillating RGB heartbeat star        | [24]                      |
|                   | KIC 8410637            | 18:48:38.1     | +44:29:09.8  | K2III + F    | 11.33                     | $12.18, K_p = 10.77$     | 408.32             | $30\text{-}60\mu\text{Hz}$ | EB,detached, oscillating red-giant    | [194, 139, 147, 145]      |
| 10                | KIC 8803882            | 18:59:11.2     | +45:05:56.7  | <u> </u>     | J=11.489                  | H=11.013                 | 89.7               | $347.0 \mu \mathrm{Hz}$    | oscillating RGB heartbeat star        | [24]                      |
|                   | KIC 6762188            | 19:06:12.2     | +42:14:05.2  |              | KEP=13.672                | J=11.989,H=11.434        | 7.155              |                            | Detached, triple                      | [145]                     |
|                   | KIC 4732015            | 19:07:18.0     | +39:48:09.0  |              | 10.72                     | 12.19,KEP=10.147         |                    | 0.9388                     | EA,Detached, Triple                   | [145]                     |
|                   | KIC 10001167           | 19:07:49.3     | +46:56:11.8  |              | 10.39                     | 11.48                    | 120.39             |                            | oscillating red-giant(RG) EB,detached | [147, 145]                |
|                   | KIC 7879404            | 19:08:30.1     | +43:36:04.1  |              | KEP=11.835                |                          | 0.3927             |                            | EB of W UMa-type, overcontact,        | [145]                     |

| Type of           | Binary or    | RA         | DEC         | Sp.(A+B) | $\langle V \rangle$ | $\langle B \rangle$ | $P_{ m orb}$ | $P_{\mathrm{pul}}$      | Comments   | References |
|-------------------|--------------|------------|-------------|----------|---------------------|---------------------|--------------|-------------------------|--|------------|
| Pulsators         | Multiple     | hh:mm:ss   | °:′:″       | _        | (mag)               | (mag)               | (day)        | (day)                   |  |            |
| -                 |              |            |             |          |                     |                     |              |                         |  |            |
| Solar-like        | KIC 6509282  | 19:09:19.3 | +41:58:29.6 |          | KEP=13.560          | J=11.839,H=11.296   | 3.9890       |                         | Detached,  | [145]      |
| oscillators       | KIC 7431665  | 19:09:30.3 | +43:00:34.1 |          | J=9.305             | H=8.783             | 281.4        | $54.0 \mu \mathrm{Hz}$  | oscillating RGB heartbeat star                     | [24]       |
| (oscillating RGB) | KIC 2697935  | 19:09:52.2 | +37:58:00.0 |          | 11.01               | 11.77               | 21.5         | $405.6 \mu \mathrm{Hz}$ | oscillating RGB heartbeat star                     | [24]       |
|                   | KIC 3532985  | 19:11:39.6 | +38:38:26.8 |          | 11.88               | 13.17,KEP=11.317    | 5.2885       |                         | EA,Detached, triple                                | [145]      |
|                   | KIC 4999260  | 19:12:04.7 | +40:07:37.4 |          | 9.61                | 10.49,KEP= 9.333    | 0.37837      |                         | EB of W UMa-type, overcontact,                     | [145]      |
| 20                | KIC 8747222  | 19:17:19.1 | +44:58:27.1 |          | KEP=12.882          | J=11.105,H=10.557   | 1.6674       |                         | Detached,  | [145]      |
|                   | KIC 5179609  | 19:18:26.7 | +40:20:09.0 |          | J=11.061            | H=10.564            | 43.93        | 181.70                  | oscillating red-giant(RG) EB, oEA, detached        | [147, 145] |
|                   | KIC 12645761 | 19:18:48.9 | +51:42:51.8 |          | KEP=13.368          | J=11.781,H=11.18    | 5.4192       |                         | EA,Detached,                                       | [145]      |
|                   | KIC 10007492 | 19:20:20.8 | +46:56:42.7 |          | KEP=12.375          | J=10.887,H=10.441   | 2.6456       |                         | EA,Detached,                                       | [145]      |
|                   | KIC 7955301  | 19:20:44.7 | +43:43:25.8 |          | KEP=12.672          | J=10.992,H=10.487   | 15.326       |                         | Detached, RG/EB, detached, Triple                  | [145]      |
|                   | KIC 5786154  | 19:21:01.4 | +41:01:04.9 |          | J=11.816            | R=13.488            | 197.92       |                         | oscillating red-giant(RG) EB, oEA, detached        | [147, 145] |
|                   | KIC 5006817  | 19:21:49.4 | +40:08:44.6 |          | 11.15               | 12.39               | 94.8         | $145.9 \mu \mathrm{Hz}$ | oscillating RGB heartbeat star                     | [24]       |
|                   | KIC 9151763  | 19:22:44.4 | +45:34:06.0 |          | J=9.717             | H=9.034             | 437.5        | $13.8 \mu Hz$           | oscillating RGB heartbeat star                     | [24]       |
|                   | KIC 8095275  | 19:23:52.9 | +43:58:14.9 |          | J=11.819            | H=11.248            | 23.01        | 69.3μHz                 | oscillating RGB heartbeat star,                    | [24, 145]  |
|                   |              |            |             |          |                     | non-El              | B, photometr | ric variability         | is due to tidally induced distortions/oscillations |            |
|                   | KIC 2711123  | 19:24:03.7 | +37:58:03.9 |          | KEP=12.529          | J=10.805,H=10.226   | 0.7147       |                         | Detached,  | [145]      |
| 30                | KIC 11135978 | 19:24:09.9 | +48:43:04.9 |          | KEP=12.331          |                     | 0.2921       |                         | overcontact, ellipsoidal variation, Triple         | [145]      |
|                   | KIC 7031714  | 19:24:44.0 | +42:32:00.8 |          | KEP=12.126          | J=10.514,H=9.985    | 0.8141       |                         | EB of $\beta$ Lyr-type,semi-detached,Triple        | [145]      |
|                   | KIC 8430105  | 19:26:14.1 | +44:29:17.5 |          | 10.61               | 11.44               | 63.33        | 121.6                   | oscillating red-giant(RG) EB,detached              | [147, 145] |
|                   | KIC 2444348  | 19:26:40.4 | +37:42:14.6 |          | 10.74               | 11.90               | 103.5        | $30.5 \mu \mathrm{Hz}$  | oscillating RGB heartbeat star                     | [24]       |
|                   | KIC 7037405  | 19:31:54.2 | +42:32:51.6 |          | J=10.156            | H=9.554             | 207.11       |                         | oscillating red-giant(RG) EB,detached              | [147, 145] |
|                   | KIC 2720096  | 19:31:54.9 | +37:54:39.3 |          | J=11.337            | H=10.776            | 26.7         | $110.1 \mu \mathrm{Hz}$ | oscillating RGB heartbeat star                     | [24]       |
|                   | KIC 2997455  | 19:32:31.3 | +38:07:40.1 |          | KEP=13.800          | J=12.028,H=11.501   | 1.1298       |                         | EA,Detached,                                       | [145]      |
|                   | KIC 9408183  | 19:33:58.3 | +45:59:15.3 |          | J=11.533            | H=10.998            | 49.7         | $164.8 \mu \mathrm{Hz}$ | oscillating RGB heartbeat star                     | [24]       |
|                   | KIC 10735519 | 19:34:13.7 | +48:02:30.3 |          | KEP=11.780          | J=10.035,H=9.552    | 0.9070       |                         | EA,Detached,                                       | [145]      |
|                   | KIC 4663185  | 19:36:19.0 | +39:43:46.7 |          | KEP=11.356          | J=9.602,H=8.998     | 56.699       |                         | RG/EB,detached,                                    | [145]      |
|                   |              |            |             |          |                     |                     |              |                         | quadruple:(RG+RG)+(RG+ $\delta$ Sct companion)     |            |
| 40                | KIC 4570555  | 19:36:23.1 | +39:38:49.5 |          | 11.74               | 12.74,KEP=11.540    | 4.7503       |                         | Detached,  | [145]      |
|                   | KIC 4663623  | 19:36:47.7 | +39:45:28.8 |          | J=11.110            | H=10.593            | 358.08       |                         | oscillating red-giant(RG) EB                       | [147]      |
|                   | KIC 11968514 | 19:37:26.8 | +50:18:27.4 |          | KEP=11.449          | J=9.910,H=9.403     | 1.0366       |                         | EA,Detached,                                       | [145]      |
|                   | KIC 7690843  | 19:38:06.4 | +43:23:47.2 | 11       | .322,KEP=11.083     | J=9.481,H=8.961     | 0.7862       |                         | EW, contact/semi-detached, Triple                  | [145]      |
|                   | KIC 9163796  | 19:41:20.9 | +45:30:17.2 |          | 9.82                | 10.67               | 121.3        | 153.2μHz                | oscillating RGB heartbeat star                     | [24]       |
|                   | KIC 6791033  | 19:42:08.9 | +42:15:06.3 |          | KEP=12.385          | J=10.782,H=10.188   | 0.7582       |                         | ellipsoidal variable                               | [145]      |
|                   | KIC 4576968  | 19:42:18.9 | +39:41:53.2 | 12       | 370,KEP=12.537      | J=10.847,H=10.296   | 0.37842      |                         | overcontact,                                       | [145]      |

Table 2—Continued

| Type of           | Binary or    | RA           | DEC          | Sp.(A+B)    | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\mathrm{orb}}$ | $P_{\mathrm{pul}}$    | Comments                              | References     |
|-------------------|--------------|--------------|--------------|-------------|---------------------|---------------------|--------------------|-----------------------|---------------------------------------|----------------|
| Pulsators         | Multiple     | hh:mm:ss     | °:′:″        |             | (mag)               | (mag)               | (day)              | (day)                 |                                       |                |
| Solar-like        | KIC 7377422  | 19:43:43.3   | +42:57:04.3  |             |                     |                     | 107.62             | 54.6                  | oEA,oscillating RG,detached           | [147]          |
| oscillators       | KIC 11147460 | 19:44:49.2   | +48:46:00.5  |             | KEP=13.912          | J=12.234,H=11.67    | 4.1077             |                       | EA, Detached (D),                     | [145]          |
| (oscillating RGB) | KIC 10809677 | 19:45:54.8   | +48:08:46.2  |             | KEP=13.942          | J=12.320,H=11.764   | 7.042              |                       | EA,Detached,                          | [145]          |
| 50                | KIC 8702921  | 19:46:39.6   | +44:51:11.1  |             | J=10.326            | H=9.839             | 19.385             | 97.8                  | oscillating RG,detached EB            | [147, 145]     |
|                   | KIC 7769072  | 19:47:21.5   | +43:24:28.9  |             | KEP=13.886          | J=12.237,H=11.672   | 0.6088             |                       | EA,Detached,                          | [145]          |
|                   | KIC 10614012 | 19:47:42.9   | +47:52:58.8  |             | 9.98                | 11.04               | 132.1              | $70.2 \mu \text{Hz}$  | oscillating RGB heartbeat *,eclipsing | [24]           |
|                   | KIC 9540226  | 19:48:08.1   | +46:11:54.5  |             | 12.44               | 12.75               | 175.46             | 27.4μHz               | oscillating RGB heartbeat *, oEA, D   | [24, 147, 145] |
|                   | KIC 5640750  | 19:48:48.4   | +40:53:32.8  |             | 12.03               | 13.23               | 987.40/1324.26     |                       | oscillating RG,detached EB            | [147, 145]     |
|                   | KIC 11044668 | 19:51:46.7   | +48:33:28.0  |             | J=10.736            | H=10.246            | 139.5              | 50.2μHz               | oscillating RGB heartbeat star        | [24]           |
|                   | KIC 5039392  | 19:53:36.2   | +40:10:19.7  |             | J=9.291             | H=8.491             | 236.7              | $6.2 \mu \mathrm{Hz}$ | oscillating RGB heartbeat star        | [24]           |
|                   | KIC 8255058  | 19:53:43.4   | +44:11:32.8  |             | KEP=13.285          | J=11.628,H=11.106   | 6.2799             |                       | EA,Detached,triple                    | [145]          |
|                   | KIC 10991989 | 19:54:06.5   | +48:25:06.9  |             | 10.60               | 11.50,KEP=10.282    | 0.9744             |                       | EA,Detached, Triple                   | [145]          |
|                   | KIC 9970396  | 19:54:50.3   | +46:49:58.9  |             | J=9.742             | H=9.19              | 235.30             |                       | oscillating RG,detached EB            | [147, 145]     |
| 60                | KIC 8453324  | 19:55:18.8   | +44:29:20.9  |             | KEP=11.516          | J=9.795,H=9.26      | 2.5245             |                       | EA,Detached,                          | [145]          |
|                   | KIC 5218014  | 19:55:59.5   | +40:18:53.1  |             | KEP=12.923          | J=11.153,H=10.619   | 10.845             |                       | EA,Detached,                          | [145]          |
|                   | KIC 5650420  | 19:56:45.8   | +40:49:21.5  |             | KEP=12.387          | J=10.555,H=9.97     | 2.0988             |                       | Detached,                             | [145]          |
|                   | KIC 8054233  | 19:56:58.4   | +43:48:51.7  |             | J=10.036            | H=9.46              | 1058.23            |                       | oscillating red-giant(RG) EB          | [147]          |
|                   | KIC 5652071  | 19:58:02.2   | +40:48:31.8  |             | KEP=13.299          | J=11.412,H=10.790   | 1.0205             |                       | overcontact,                          | [145]          |
|                   | KIC 5308778  | 19:58:18.5   | +40:27:30.5  |             | J=10.046            | H=9.532             | 40.567             | 38.9                  | oscillating RG, detached EB           | [147, 145]     |
|                   | KIC 5308777  | 19:58:18.5   | +40:29:54.6  |             | KEP=13.199          | J=11.368,H=10.746   | 0.9447             |                       | Detached,                             | [145]          |
|                   | KIC 8912308  | 20:00:16.4   | +45:06:05.8  |             | J=9.73              | H=9.21              | 20.2               | $350.2 \mu Hz$        | oscillating RGB heartbeat star        | [24]           |
|                   | KIC 9181877  | 20:02:09.5   | +45:30:25.9  |             | 11.80               | 13.13,KEP=11.698    | 0.32101            |                       | overcontact,ellipsoidal,Triple        | [145]          |
|                   | KIC 8718273  | 20:03:04.4   | +44:49:50.3  |             | 10.83,KEP=10.565    | 12.16               | 6.959              |                       | EA,Detached,                          | [145]          |
| 70                | KIC 9246715  | 20:03:48.3   | +45:36:14.8  | K2 +        | 9.65                | 10.74               | 171.28             | 93.30                 | EB,detached,oscillating double RG     | [147, 145]     |
| 71                | KIC 8848288  | 20:04:11.3   | +45:05:15.3  | K2 +        | 10.22               | 11.22,KEP= 9.837    | 2.7831             |                       | Detached,                             | [145]          |
| sdBV              | WD 0048-202  | 00:51:04     | -19:59:59    | sdB + WD    | 15.4                | 15.1                | 7.4436             |                       | DA,=GD 656                            | [149]          |
| & sdOV            | Ton S 183    | 01:01:17     | -33:42:45    | sdB + WD    | 12.57               | 12.39               | 0.8277             |                       | may be NS/BH companion,HIP 4769       | [149]          |
|                   | PG 0101+039  | 01:04:21.677 | +04:13:37.06 | sdB + WD    | 12.06               | 11.82               | 0.6                |                       | SB*,WD*,blu,=HIP 5023                 | [367]          |
|                   | WD 0107-342  | 01:10:19     | -34:00:00    | sdB + WD    | 13.93               | 14.7                | 0.375              |                       | WD companion,=GD 687                  | [149]          |
|                   | FBS 0117+396 | 01:20:22.9   | +39:50:59.3  | sdB + dM    | R=15.7              | 14.5                | 0.252              | 337–379 s             | 8 more modes 45 m–2.5 h               | [331]          |
|                   | HE 0230-4323 | 02:32:54     | -43:10:27    | sdB + WD    | 13.78               | 13.9                | 0.443              |                       | may be late MS companion              | [149]          |
|                   | IQ Cam       | 04:26:06.87  | +54:28:17.0  | sdB + WD    | 14.66               | 14.86               |                    |                       | EB,=KPD 0422+5421                     | [245, 327]     |
|                   | AA Dor       | 05:31:40     | -69:53:02    | sdO + dM    | 11.14               | 10.84               |                    |                       | EA+SB,=LB 3459                        | [223, 242]     |
|                   | HE 0532-4503 | 05:33:40     | -45:01:35    | sdB + NS/BH | 16.06               | 16fm20              | 0.2656             | Neutron Sta           | r (NS)or Black Hole (BH) companion    | [149]          |

| Type of   | Binary or       | RA DEC                        | Sp.(A+B)    | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\rm orb}$ | $P_{ m pul}$          | Comments  | References           |
|-----------|-----------------|-------------------------------|-------------|---------------------|---------------------|---------------|-----------------------|---|----------------------|
| Pulsators | Multiple        | hh:mm:ss $\circ$ : $'$ : $''$ |             | (mag)               | (mag)               | (day)         | (day)                 |   |                      |
| sdBV      | V470 Cam        | 07:10:42.07 +66:55:43.6       | sdB + dM    |                     | 14.100              |               |                       | EA,=HS 0705+6700=GSC 04123-00265                            | [98, 360]            |
|           | GSC 00196-00617 | 08:20:53 +00:08:43            | sdB + dM    | 15.17               | 15.03               | 0.096         |                       | EB with a Brown Dwarf Companion                             | [151]                |
|           |                 |                               |             |                     |                     |               |                       | =SDSS J082053.53+000843.4, MUCHFUSS project                 |                      |
|           | HE 0929-0424    | 09:32:02 -04:37:37            | sdB + WD    |                     | 15.4                | 0.440         |                       | may be NS/BH companion                                      | [149]                |
|           | PG 0941+280     | 09:43:54 +27:46:59            | sdB + WD    | 13.24               | 12.95               |               |                       |   | [150]                |
|           | XY Sex          | 10:20:14 -08 53 46            | sdB + dM    | 14.43               | 14.46               |               |                       | =PG 1017-086  | [300]                |
|           | HE 1047-0436    | 10:50:27 -04:52:36            | sdB + WD    |                     | 14.68               | 1.2133        |                       | may be late MS companion                                    | [149]                |
|           | KL UMa          | 11:47:14 +61:15:32            | sdB + WD    | 1328                | 1312                | 0.376         |                       | =Feige 48   | [333, 369, 476]      |
|           | PG 1232-136     | 12:35:19 -13:55:09            | sdB + NS/BH | 13.27               | 13.06               | 0.3630        |                       |   | [149]                |
|           | HW Vir          | 12:44:20 -08:40:17            | sdB + dM    | 10.9                | 10.53               |               |                       | oEA,post-CE binary  | [267, 497]           |
|           | PG 1329+159     | 13:31:53 +15:41:18            | sdB + dM    | 13.53               | 13.24               |               |                       | =GSC 01459-01061  | [169]                |
| 20        | NY Vir          | 13:38:48 -02:01:49            | sdB + dM    | 13.30               | 13.6                |               |                       | oEA,=PG 1336-018,HW Vir-type EB                             | [224, 225, 483, 484] |
|           | HE 1421-1206    | 14:24:09 -12:20:21            | sdB + WD    |                     | 15.1                | 1.188         |                       | may be late MS companion                                    | [149]                |
|           | PG 1438-029     | 14:40:53 -03:08:56            | sdB + dM    |                     | 13.82               |               |                       |   | [170]                |
|           | HE 1448-0510    | 14:51:13 -05:23:17            | sdB +       |                     | 14.96               | 7.1588        |                       |   | [149]                |
|           | NSVS 7826147    | 15:33:49 +37:59:28            | sdB + dM    |                     | 12.6                | 0.1617        |                       | EB,=2MASS J15334944+3759282                                 | [136, 137]           |
|           | KIC 11179657    | 19:02:22 +48:50:52            | sdBV + dM   | $K_p = 17.06$       |                     |               |                       | =SDSS J19023+4850,double stars                              | [330]                |
|           | KIC 7668647     | 19:05:06.39 +43:18:31.1       | sdB +       | 15.48               | 15.08               |               |                       | sdBV +  | [457, 305, 332]      |
|           | KIC 2438324     | 19:21:12.9 +37:45:51.3        | sdBV + dM   | 17.873              | 17.69               | 0.3985        | 2384–7640 s           | EB sdB in NGC 6791,non-EB or ellipsoidal variations?        | [314, 85, 334]       |
|           | KIC 1868650     | 19:26:09.44 +37:20:08.18      | sdB + dM    | $K_p = 13.45$       | 13.60               | 0.2923        |                       | EB?, CV*, =NAME KBS 13                                      | [135, 330]           |
|           | KIC 2991403     | 19:27:16 +38:08:08            | sdBV + dM   | $K_p = 17.14$       |                     |               |                       | =SDSS J192715.88+380808.2                                   | [330]                |
| 30        | V2214 Cyg       | 19:32:15 +27:58:35            | sdB + WD    | 13.82               | 13.75               | 0.1           |                       | SB,=KPD 1930+2752   | [148, 370, 371]      |
|           | KIC 6614501     | 19:36:50.013 +42:01:43.60     | sdB+WD      |                     |                     |               | 0.1575                | SB,low mass,beta Cep type,=2MASS J19365001+4201436          | [406]                |
|           | KIC 9472174     | 19:38:32 +46:03:59            | sdBV + dM   | 12.69               | 12.17               |               | Е                     | B of beta Lyr,=TYC 3556-3568-1=2M1938+4603,multimode        | [329]                |
|           | KPD 1946+4340   | 19:47:43 +43:47:31            | sdOB + WD   | 14.23               | 14.06               |               |                       | EB,2MASS J19474288+4347306,Kepler                           | [34]                 |
|           | GSC 09331-00373 | 21:36:01 -72:48:27            | sdB +       | 12.40               | 12.18               |               | 0.75                  | SB, =JL 82, PG 1716-class                                   | [243]                |
|           | HE 2135-3749    | 21:38:44 -37:36:15            | sdB + WD    | 13.94               | 13.68               | 0.924         |                       | may be late MS companion                                    | [149]                |
|           | HE 2150-0238    | 21:52:36 -02:24:37            | sdB +       |                     | 15.8                | 1.3209        |                       |   | [149]                |
|           | V391 Peg        | 22:01:12 +26:25:08            | sdBV + dM   | 14.3                | 13.6                | 1168          | 349 <sup>s</sup> .5   | planetary companion of M dwarf                              | [286, 395, 405]      |
|           |                 |                               |             |                     |                     |               |                       | =HS 2201+2610, planet-hosting sdBV, both $p$ - & $g$ -modes |                      |
|           | HS 2231+2441    | 22:33:24 +24:56:00            | sdB + dM    |                     |                     |               |                       | M-dwarf secondary   | [328]                |
|           | EQ Psc          | 23:34:34 -01:19:37            | sdB + dM    | 13.06               |                     | 0.8014        | $8-46\mathrm{d}^{-1}$ | 19h periodic variation by orbital reflection                | [211]                |
| 40        | HS 2333+3927    | 23:35:42 +39:44:27            | sdB + dM    |                     |                     |               |                       | multiple  | [193]                |
| 41        | PG 2345+318     | 23:48:07 +32:04:46            | sdB + WD    |                     | 14.37               |               |                       | EB+SB,=SBC9 2129  | [150]                |

| Type of   | Binary or                | RA DEC                    | Sp.(A+B) | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\mathrm{orb}}$ | $P_{\mathrm{pul}}$ | Comments  | References     |
|-----------|--------------------------|---------------------------|----------|---------------------|---------------------|--------------------|--------------------|---|----------------|
| Pulsators | Multiple                 | hh:mm:ss °: ': "          |          | (mag)               | (mag)               | (day)              | (day)              |   |                |
| sdBV      | GD 1289                  | 00:03:24.43 -16:21:06.3   | sdB      | 12.7                | 12.6                |                    |                    | SB*,WD*: candidate  |                |
|           | HE 0004-2737             | 00:06:46.26 -27:20:53.4   | sdB      | 13.97               | 13.68               |                    |                    | SB*,blu: candidate  |                |
|           | GD 605                   | 00:21:58.73 -24:25:20.9   | sdB      | 14.48               | 14.10               |                    |                    | SB*,WD*,blu: candidate  |                |
|           | 2MASS J00232400-0029530  | 00:23:24.01 -00:29:53.1   | sdB      | 15.7                | 15.26               |                    |                    | SB*,WD*: candidate  |                |
|           | TYC 6425-1982-1          | 01:12:11.650 -26:13:27.69 | sdB      | 13.15               | 12.953              |                    |                    | SB*,WD*,blu: candidate  |                |
|           | TYC 6433-1540-1          | 02:22:19.833 -23:24:55.88 | sdB      | 12.01               | 11.79               |                    |                    | SB*,double stars: candidate   |                |
|           | TYC 3315-1807-1          | 03:21:39.630 +47:27:18.83 | sdB      | 11.73               | 11.54               |                    |                    | EB*,CV*,double stars: candidate   |                |
|           | GSC 00231-01572          | 09:21:28.214 +02:46:02.31 | sdBw+    | 13.327              | 13.056              |                    |                    | SB*,WD*: candidate  |                |
|           | EC 10246-2707            | 10:26:56.6 -27:22:59      | sdB+dM   | 14.38               | 14.22               |                    |                    | EB*: candidate  |                |
|           | 2MASS J11384069-0035317  | 11:38:40.70 -00:35:31.8   | sdB      | 14.0                | 13.75               |                    |                    | SB*,Pe*,WD*: candidate  |                |
|           | SBC9 2128                | 14:35:19.20 +15:40:14.0   | sdBw+    |                     | 13.63               |                    |                    | SB*,WD*: candidate  |                |
|           | PG 1502+113              | 15:05:13.524 +11:08:36.63 | sdB      | 15.33               | 15.08               |                    |                    | SB*,WD*: candidate  |                |
|           | 2MASS J15461169+4838373  | 15:46:11.69 +48:38:37.3   | sdB+sdB  |                     | 12.80               |                    |                    | SB*: candidate  |                |
|           | V1093 Her                | 17:18:03.86 +42:34:12.7   | sdB      | 13.97               | 13.69               |                    |                    | SB*,WD*: candidate  |                |
|           | OGLE BUL-SC16 335        | 18:09:48.226 -26:41:49.46 | sdB+dM   | J=12.868            | H-12.072            |                    |                    | EB*: candidate  |                |
|           | V2214 Cyg                | 19:32:14.81 +27:58:35.5   | sdBV     | 13.82               | 13.75               |                    |                    | SB*,sdBV: candidate   |                |
|           | 2MASS J19530839+4743002  | 19:53:08.391 +47:43:00.22 | sdB      | J=15.45             | H=15.54             |                    |                    | SB*,bC*+HB*: candidate  |                |
|           | SDSS J204613.40-045418.7 | 20:46:13.402 -04:54:18.75 | sdB      | u=15.80             | g=15.98             |                    |                    | SB*,WD*: candidate  |                |
|           | 2MASS J22342148+2456573  | 22:34:21.481 +24:56:57.39 | sdB+dM   | J=14.67             | H=14.73             |                    |                    | EB*: candidate  |                |
|           | FBS 2347+385             | 23:49:47.642 +38:44:41.55 | sdB      | 11.73               | 11.65               |                    |                    | EB*,double stars: candidate   |                |
| CV        | GALEX J003535.7+462353   | 00:35:36 +46:23:52        | WD+      |                     |                     | 0.1722             |                    | eclipsing dwarf nova  | [493]          |
|           | 2MASS J01074282+4845188  | 01:07:43 +48:45:19        | WD+      |                     |                     | 0.1935             |                    | nova-like CV  | [91]           |
|           | PHL 1445                 | 02:42:43 -11:46:48        | WD+      | 18.6                | 18.37               | 0.0529             |                    | eclipsing CV,=PB 9151   | [493]          |
|           | XZ Eri                   | 04:11:25 -15:23:24        | WD+      |                     | 14.6                |                    |                    | eclipsing CV,dwarf nova   | [389]          |
|           | HS 0417+7445             | 04:23:33 +74:52:50        | WD+      | R=17.2              | 18.4                | 0.0753             |                    | SU UMa-type dwarf nova  | [402]          |
|           | KR Aur                   | 06:15:44 +28:35:08        | WD+      | 11.0                | 11.3                |                    |                    | nova-like star  | [248]          |
|           | BG CMi                   | 07:31:29 +09:56:23        | WD+      | 14.5                | 14.5                |                    |                    | =3A 0729+103:DG Her type CV   | [238]          |
|           | SDSS J081610.84+453010.2 | 08:16:10.8 +45:30:10.2    | WD + dM  |                     |                     |                    | 0.2096             | eclipsing dwarf nova  | [401]          |
|           | SDSS J090350.73+330036.1 | 09:03:50.7 +33:00:36.1    | WD+      | u=18.856            | g=18.826            | 85.066 m           |                    | =SDSS J0903+3300,eclipsing CV   | [389]          |
| 10        | SDSS J092638.71+362402.4 | 09:26:38 +36:24:02        | WD+      |                     |                     | 28m                | shoi               | test period EB, first eclipsing AM CVn-type<br>SDSS J0926+3624 – short nomemclature | [65]           |
|           | DV UMa                   | 09:46:36 +44:46:45        | WD+      | J=16.89             | 19.0                |                    |                    | eclipsing CV,dwarf nova   | [389]          |
|           | SDSS J103533.03+055158.4 | 10:35:33.0 +05:51:58.4    | WD+      | 18.80               | 18.57               | 82.089 m           |                    | =SDSS J1035+0551, eclipsing CV  | 389, 281, 282] |
|           | DP Leo                   | 11:17:16 +17:57:41        | WD+      | 17.5                | 18.5                | 89.9 m             |                    | post-CE binary, AM Her-type,planet triple   | [31, 361]      |

| Type of   | Binary or                | RA           | DEC          | Sp.(A+B)   | $\langle V \rangle$ | $\langle B \rangle$ | $P_{ m orb}$ | $P_{\mathrm{pul}}$ | Comments                                  | References      |
|-----------|--------------------------|--------------|--------------|------------|---------------------|---------------------|--------------|--------------------|---|-----------------|
| Pulsators | Multiple                 | hh:mm:ss     | °:′:″        |            | (mag)               | (mag)               | (day)        | (day)              |   |                 |
|           |                          |              |              |            |                     |                     |              |                    |   |                 |
| CV        | SDSS J122740.83+513925.0 |              | +51:39:25.0  | WD +       | 19.08               | 18.89               |              |                    | =SDSS J1227+5139, eclipsing CV            | [389]           |
|           | SDSS J115207.00+404947.8 |              | +40:49:48    | WD +       |                     |                     | 0.06772      |                    | eclipsing CV                              | [389]           |
|           | CTCV J1300-3052          |              | -30:52:57.1  | WD +       | 15.4                | 18.40               | 0.0889       |                    | eclipsing CV, dwarf nova                  | [389]           |
|           | QS Vir                   |              | -13:13:37.5  | DA + dMe   | U=14.27             | 16.17               | 0.15         |                    | detached oEA, eclipsing post-CE binary    | [338]           |
|           | SDSS J143317.78+101123.3 |              | +10:11:23.5  | WD +       | u=18.533            | g=18.555            | 78.1066 m    |                    | =SDSS J1433+1011, eclipsing CV            | [389]           |
|           | OU Vir                   | 14:35:00.2   | -00:46:06.3  | WD +       | 14.5                | 18.5                |              |                    | eclipsing CV,dwarf nova                   | [389]           |
| 20        | SDSS J150137.22+550123.3 | 15:01:37.2   | +55:01:23.3  | WD +       |                     |                     | 0.0568       |                    | =SDSS J1501+5501, eclipsing CV            | [389]           |
|           | SDSS J150240.98+333423.9 | 15:02:40.9   | +33:34:23.9  | WD +       | 13.7                | 17.3                | 84.829 m     |                    | =SDSS J1502+3334=NZ Boo,eclipsing CV      | [389]           |
|           | SDSS J150722.30+523039.8 | 15:07:22.3   | +52:30:39.8  | DAe +      | g=18.32             | 18.7                | 66.61 m      |                    | eclipsing CV,subdwarf donor,=SDSS 1507+52 | [389, 474, 282] |
|           |                          |              |              |            |                     |                     |              |                    | =SDSS J150722.30+523039.8, d=250 pc       |                 |
|           | GSC 04560-02157          | 15:43:36.71  | +75:15:40.5  |            | 15.7                |                     | 0.2653       |                    | eclipsing CV,                             | [222]           |
|           | SDSS 154453.60+255348.9  | 15:44:53     | +25:53:49    | WD + dM    |                     |                     | 0.2513       |                    | eclipsing CV, d=800 pc                    | [409]           |
|           | NN Ser                   | 15:52:56     | +12:54:45    | DAO +M4    | 16.67               | 16fm0               |              |                    | nova-like                                 | [30]            |
|           | V386 Ser                 | 16:10:33     | -01:02:23    |            | 18.9                | _                   |              |                    | =SDSS J161033.64-010223.3, nova-like star |                 |
|           | SDSS J170213.26+322954.1 | 17:02:13     | +32:29:54    | WD + M1.5e | u=18.166            | g=17.928            |              |                    | eclipsing CV,=SDSS J170213.26+322954.1    | [389, 281]      |
|           | LSQ172554.8-643839       | 17:25:54     | -64:38:39    | DA + M8    |                     |                     | 94.657m      |                    | eclipse depths >5.7 mag                   | [363]           |
|           | 1RXS J180834.7+101041    | 18:08:36     | +10:10:30    | WD +       | R=16.2              | 16.2                |              |                    | accretion disc eclipsed,SU UMa-subtype    | [422]           |
| 30        | WZ Sge                   | 20:07:36     | +17:42:15    | WD +       | 15.2                | 15.3                |              |                    | eclipsing dwarf nova                      |                 |
| 31        | HU Aqr                   | 21:07:58     | -05:17:40    | WD+ Am     | 15.0                |                     | 0.0868       |                    | with unconfirmed planet,AM Her-type       | [398, 397]      |
| 32        | CTCV J2354-4700          | 23:54:20     | -47:00:20    | WD +       | g=19.25             | r=19.15             |              | 0.0655             | eclipsing CV                              | [389]           |
|           | 2MASS J00274999-0010234  | 00:27:50.00  | -00:10:23.4  | WD:+dM     |                     | 18                  |              |                    | SB*: candidate                            |                 |
|           | TW Tri                   | 01:36:37.01  | +32:00:39.9  |            |                     | 16.000              |              |                    | SB,CV*: candidate                         |                 |
|           | TT Ari                   | 02:06:53.084 | +15:17:41.81 | Bep:       | 10.20               | 10.73               |              |                    | SB,Nova: candidate                        |                 |
|           | PY Per                   | 02:50:00.15  | +37:39:22.2  |            |                     | 13.8                |              |                    | SB,CV*: candidate                         |                 |
|           | TYC 3315-1807-1          | 03:21:39.630 | +47:27:18.83 | sdB+       | 11.73               | 11.54               | 0.266        |                    | EB, detached: candidate                   | [331, 152]      |
|           | GK Per                   | 03:31:12.012 | +43:54:15.48 | Be+K2sdI*  | 14.0                | 10.2                |              |                    | SB,nova: candidate                        |                 |
|           | EGB 4                    | 06:29:33.96  | +71:04:36.3  |            |                     | 14.1                |              |                    | SB+PN: candidate                          |                 |
|           | Z Cam                    | 08:25:13.201 | +73:06:39.23 |            | 10.00               | 11.85               |              |                    | SB+DN*: candidate                         |                 |
|           | 2MASS J08375098+3830124  | 08:37:50.99  | +38:30:12.4  | WD+M       |                     | 18.400              |              |                    | SB*: candidate                            |                 |
|           | EG Cnc                   |              | +27:51:49.66 |            | 11.9                | 11.9                |              |                    | SB+DN*: candidate                         |                 |
|           | SDSS J092219.55+421256.7 |              | +42:12:56.8  | WD+M:      | u=19.83             | g=19.84             |              |                    | SB,CV*: candidate                         |                 |
|           | V436 Cen                 |              | -37:40:47.8  |            |                     | 11.5                |              |                    | SB+DN*: candidate                         |                 |
|           | BE UMa                   |              | +48:56:18.5  | CV         |                     | 14.8                |              |                    | EA+SB*: candidate                         |                 |
|           | 4 Dra                    | 12:30:06.660 | +69:12:04.06 | M4III      | 4.95                | 6.57                |              |                    | SB: candidate                             |                 |

Table 2—Continued

| Type of        | Binary or                | RA           | DEC          | Sp.(A+B)      | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\mathrm{orb}}$ | $P_{ m pul}$             | Comments   | References           |
|----------------|--------------------------|--------------|--------------|---------------|---------------------|---------------------|--------------------|--------------------------|--|----------------------|
| Pulsators      | Multiple                 | hh:mm:ss     | °:′:″        |               | (mag)               | (mag)               | (day)              | (day)                    |  |                      |
| CV             | 2MASS J12495974+0357265  | 12:49:59 74  | +03:57:26.5  | DA+M          |                     | 14.55               |                    |                          | SB,WD*: candidate                                    |                      |
| 0.             | 2MASS J13023621+0601483  | 13:02:36.21  | +06:01:48.3  | M6            | J=14.623            | H=14.026            |                    |                          | SB,FI*: candidate                                    |                      |
|                | 2MASS J13231264-0254559  | 13:23:12.65  |              | DC:+dM        | J=14.254            | H=13.719            |                    |                          | SB*: candidate                                       |                      |
|                | NGC 5139 BPB 341736      | 13:26:38.439 | -47:19:59.71 |               | 14.737              | 15.390              |                    |                          | EB: candidate  | [488]                |
|                | SDSS J140453.98-102702.1 |              | -10:27:02.32 |               | u=20.01             | g=19.738            |                    |                          | EB,dwarf nova,CRTS CSS080623 J140454-102702          | [96, 498]            |
|                | 2MASS J14394762-0106068  | 14:39:47.63  |              | DA+dM:e       |                     | 15.700              |                    |                          | SB*: candidate                                       | . , ,                |
|                | 2MASS J14460066+3328502  |              | +33:28:50.29 | DA1.8         |                     | 16                  |                    |                          | SB*: candidate                                       |                      |
|                | AP CrB                   | 15:54:12.35  | +27:21:52.4  | M3            |                     |                     |                    |                          | SB,AM*: candidate                                    |                      |
|                | SDSS J155904.62+035623.4 | 15:59:04.623 | +03:56:23.45 | DA+M          | u=18.240            | g=18.392            |                    |                          | SB,CV*: candidate                                    |                      |
|                | NAME KBS 13              | 19:26:09.444 | +37:20:08.18 | sdB+dM        | 13.63               | 13.60               |                    |                          | Contradictory variability types, KIC 1868650         | [211, 391]           |
|                | V1504 Cyg                | 19:28:56.47  | +43:05:37.1  |               |                     | 13.5                |                    |                          | SB,DN*: candidate                                    |                      |
|                | 2MASS J20482791+0050089  | 20:48:27.92  | +00:50:09.0  | M4            | 19.04               | 19.45               |                    |                          | SB,double stars: candidate                           |                      |
|                | V2069 Cyg                | 21:23:44.82  | +42:18:01.7  |               | 15.70               | 16.100              |                    |                          | SB,Nova: candidate                                   |                      |
|                | 2MASS J21435459+1244577  | 21:43:54.59  | +12:44:57.8  | DA+M          |                     | 15.700              |                    |                          | SB,CV*: candidate                                    |                      |
| $\beta$ Cephei | $\gamma$ Peg             | 00:13:14     | +15:11:00    | B2IV +        | 2.83                | 2.60                | 370.5              | 0.15175                  | hybrid BCEP/SPB star: p & g-modes                    | [57, 181]            |
| (BCEP)         | $\gamma$ Cas             | 00:56:42     | +60:43:00    | B0.5IVpe +    | 2.47                | 2.29                | 200                |                          | Be binarity; unconfirmed                             | [184, 285, 413, 414] |
|                | $\varepsilon$ Per        | 03:57:51     | +40:00:37    | B0.5V +       | 2.901               | 2.733               | 14.07              |                          |  | [162, 455]           |
|                | SZ Cam                   | 04:07:49.3   | +62:19:58.6  | O9IV + B0.5 V | 6.93                | 7.26                | 2.7                | 0.3326                   | quadruple EB/SB2 of $\beta$ Lyr type, semi-detached  | [454]                |
|                | $\eta$ Ori               | 05:24:28.6   | -02:23:50.0  | B0.5Vea + B3V |                     |                     |                    |                          | EA + BCEP  | GCVS                 |
|                | Ψ Ori                    | 05:26:50     | +03:05:44    | B1II + B2V    | 4.595               | 4.393               | 2.5                |                          | =HR 1811,acoustic high-degree modes                  | [440, 456]           |
|                | HD 50230                 | 06:52:19.8   | -00:40:38.9  | B3V +         | 8.95                | 8.93                |                    | rich                     | SB2,CoRoT target, $g + p$ -modes                     | [84]                 |
|                | V467 Vel                 | 08:43:49.8   | -46:07:08.8  | O6.5V + B1 V  | 10.56               | 11.2                | 2.7532             | 0.4327                   | oEA, O-type SB2, =CPD-45 2920                        | [307, 347]           |
|                |                          |              |              |               |                     | =ALS                | S 1135 = ASA       | AS J084350-46            | 507.2,detached/semidetached/contact, may not pulsate |                      |
|                | V381 Car                 | 10:43:49     | -58:13:04    | B1III         | 9.03                | 8.99                |                    |                          | =HD 92024,in NGC 3293                                | [197]                |
| 10             | V916 Cen                 | 11:42:25     | -62:28:37    | B0.5+         | 8.73                | 8.72                |                    |                          | =HD 101794, EB, in Stock 14                          | [105]                |
|                | HD 101838                | 11:42:49     | -62:33:55    | B0.5+         | 8.41                | 8.44                |                    |                          | in Stock 14  | [105]                |
|                | $\beta$ Cru              | 12:47:43     | -59:41:19    | B0.5IV        | 1.30                | 1.15                |                    |                          | hot star + pre-MS companion                          | [4, 63, 72]          |
|                | $\alpha$ Vir=Spica       | 13:25:12     | -11:09:41    | B1III-IV +    | 1.04                | 0.91                | 4.01               |                          | EB,=67 Vir=HR 5056,acoustic oscill.                  | [89, 412]            |
|                | u Cen                    | 13:49:30     | -41:41:16    | B2IV +        | 3.39                | 3.19                | 2.6                |                          | Ellipsoidal variable                                 | [394, 440]           |
|                | $\beta$ Cen              | 14:03:49     | -60:22:23    | B1III +       | 0.60                | 0.38                | 357.02             |                          | line-profile variation, no phot.var.                 | [16]                 |
|                | $\delta$ Sco             | 16:00:20     | -22:37:18    | B0.2IVe       | 2.29                | 2.21                | 10.74              |                          | Be binary star,=HR 5953                              | [451]                |
|                | V393 Sco                 | 17:48:47.6   | -35:03:25.6  | B3III +       | 7.59                | 7.71                | 7.7122             | 253.4                    | oEA, detached, ASAS data                             | [350]                |
|                | V539 Ara                 | 17:50:28     | -53:36:44    | B3V + B4V     | 5.71                | 5.61                | 3.17               | 0.74                     | oEA,multiperiods: 0.56,0.93                          | [60]                 |
|                | V4386 Sgr                | 18:14:42.1   | -33:08:27.2  | B1II +        | 8.46                | 8.34                | 10.79824           | $6.771  \mathrm{d}^{-1}$ | EB, =HD $167003;7.023,7.351 d^{-1}EB$                | [106]                |

| Type of          | Binary or               | RA           | DEC          | Sp.(A+B)        | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\mathrm{orb}}$ | $P_{ m pul}$   | Comments  | References                    |
|------------------|-------------------------|--------------|--------------|-----------------|---------------------|---------------------|--------------------|----------------|---|-------------------------------|
| Pulsators        | Multiple                | hh:mm:ss     | °:′:″        |                 | (mag)               | (mag)               | (day)              | (day)          |   |                               |
| $\beta$ Cephei   | V1135 Her               | 18:32:13.0   | +12:17:04.3  |                 | 12.65               | 14.10               |                    |                | EB, semi-detached, =NSV 10993                   | [220]                         |
| (BCEP)           | KIC 6362430=HD 179506   | 19:10:57.7   | +41:46:33.4  | B7V + F2.5V     | 7.907               | 7.859               | 26.551             | 1.3616         | SB2:multiple,1175 frequencies,g-mode SPB        | [336]                         |
|                  | KIC 11558725            | 19:26:34.1   | +49:30:29.6  | sdB + WD        | J=15.38             | H=15.35             | 10.05              | 160+ freq.     | β Cep-type                                      | [458]                         |
|                  | KIC 4931738             | 19:36:00.8   | +40:05:55.2  | B6V + B8.5V     | 11.317              | 11.543              | 14.197             | 0.7488         | SB2,1082 frequencies, tidally excited $g$ modes | [336]                         |
|                  | V2107 Cyg               | 20:08:45.7   | +37:14:13.3  | B1III + B8      | 8.63                | 8.73                |                    |                | $EB(\beta)$ , semi-detached                     | [17]                          |
|                  | $\beta$ Cep             | 21:28:40     | +70:33:38    | B2III + B5Ve    | 3.22                | 3.02                | 90 yr              |                | close Be star companion, prototype of BCEP      | [490, 196]                    |
| 26               | EN Lac                  | 22:56:23     | +41:36:14    | B2IV            | 5.58                | 5.44                |                    |                | eclipsing SB, =16 Lac,                          | [144, 213, 461]               |
|                  | 8+stars                 |              |              |                 |                     |                     | candidate /        | 3 Cep eclipsin | g systems, might be DSCT as primary: OGLE-II    | [308]                         |
|                  | HD 16429                | 02:40:44.944 | +61:16:56.06 | O9.5III+F4V     | 7.67                | 8.29                |                    |                | bC*,SB, double stars                            | bC*=Variable of β Cep type    |
|                  | tet02 Cru               | 12:04:19.215 | -63:09:56.55 | B2IV            | 4.718               | 4.626               |                    |                | bC*,SB: candidate                               |                               |
|                  | eps Lup                 | 15:22:40.868 | -44:41:22.61 | B2IV-V          | 3.367               | 3.198               |                    |                | bC*,SB, double stars                            |                               |
|                  | sig Sco                 | 16:21:11.316 | -25:35:34.05 | B1III           | 2.89                | 3.02                |                    |                | bC*,SB, double stars                            |                               |
|                  | iot Her                 | 17:39:27.886 | +46:00:22.80 | B3IV            | 3.800               | 3.630               |                    |                | bC*,SB: candidate                               |                               |
|                  | TYC 3135-115-1          | 19:31:06.729 | +38:19:41.71 | B2V             | 10.15               | 10.07               |                    |                | bC*,SB: candidate                               |                               |
|                  | TYC 3135-619-1          | 19:35:05.808 | +38:52:50.11 | B5IV-V          | 10.00               | 9.95                |                    |                | bC*,SB: candidate                               |                               |
|                  | 2MASS J19530839+4743002 | 19:53:08.391 | +47:43:00.22 | sdB             |                     |                     |                    |                | bC*,SB*,HB*                                     | HB*=Horizonal Branch star     |
|                  | TYC 3562-2361-1         | 19:54:12.421 | +46:56:12.71 |                 | 11.45               | 11.86               |                    |                | bC*,EB*,El*                                     | El*=Ellipsoidal variable star |
| SPB              | au 08 Eri               | 03:53:43     | -24:36:44    | B5V +           | 4.60                | 4.51                | 459                | 0.8642         | SB1,=33 Eri,Rotationally variable Star          | [82]                          |
|                  | V1133 Tau               | 04:03:44.6   | +05:26:08.2  | B5V +           | 5.33                | 5.25                | $\sim$ 8.9 yr      | 1.532          | =HD 25558 SB2 (SPB+SPB)                         | [415]                         |
|                  | GSC 00138-00095         | 06:04:12     | +05:30:31    | B9 +            | 10.29               | 10.52               | 1.4329             | 1.7655c/d      | =ASAS J060412+0530.5                            | [348, 307]                    |
|                  | NO Vel                  | 08:13:36     | -46:59:30    | B2.5IV + K5V    | 5.10                | 4.99                | 4.82               |                | SB1,EB, visual,ellipsoidal variable             | [82]                          |
|                  | HY Vel                  | 08:42:25     | -53:06:50    | B3IV +          | 4.86                | 4.66                | 8.378              | 1.5511         | SB1,=HR 3467=HD 74560                           | [82]                          |
|                  | V514 Car                | 10:38:03     | -57:15:23    | B3IV +          | 5.91                | 5.75                | 2.9                | 4.6555         | SB1,=HR 4173=HD 92287                           | [82]                          |
|                  | Y Cir                   | 13:39:09     | -65:02:11    | A2 + K0IV       | 11.21               | 10.80               | 3.1699             | 1.1089         | oEA, SPB? =ASAS 133910-6502.2                   | [307, 347, 348]               |
|                  | V869 Cen                | 14:09:35     | -51:30:17    | B9IV +          | 5.94                | 5.92                | 26                 | 1.4592         | SB2,=HR 5296,visual 4+ modes                    | [83, 225]                     |
|                  | PT Ser                  | 15:46:06     | -01:48:15    | B8III +         | 5.39                | 5.37                | 38.9               | 0.8683         | SB2,=HR 5863=HD 140873                          | [82]                          |
| 10               | HD 314884               | 17:56:37     | -27:11:46    | B5V +           | 10.04               | 10.05               | 1.365              | 0.889          | SPB, + G or WD companion                        | [216]                         |
|                  | FR Sct                  | 18:23:22     | -12:40:51    | M3 Iaep + O9.5V | 10.15               | 11.6                | 3.5339             |                | =ASAS 182323-1240.9,triple,VV Cep star          | [348, 307]                    |
|                  | V4396 Sgr               | 18:30:02     | -33:29:43    | B8 V +          | 7.66                | 7.71                | 1.745              | 0.9087c/d      | =oEA, =ASAS 183002-3329.7                       | [348, 307]                    |
|                  | HD 169978               | 18:31:22     | -62:16:42    | B7.5III +       | 4.64                | 4.50                | 1.71               |                | SB1,=HR 6916=NSV 10889                          | [82]                          |
|                  | V4198 Sgr               | 19:07:08     | -18:44:17    | B8V +           | 6.29                | 6.24                | 11.91              | 1.1896         | SB1,=HR 7241,forced oscillation                 | [82, 182, 440, 492]           |
| 15               | V746 Cas                | 00:24:15.6   | +52:01:11.7  | B5IV +          | 5.575               | 5.467               |                    |                | =HD 1976, triple: SB2 binary + SB1,magnetic     | [324]                         |
|                  | 4+stars                 |              |              |                 |                     |                     |                    |                | binary candidates with a SPB primary: OGLE-II   | [308]                         |
| $\gamma$ Doradus | AS Cam                  | 05:29:47     | +69:29:45    | A0 +            | 8.60                | 8.59                | 3.43               | 0.913          | oEA, triple                                     | [249, 250]                    |

Table 2—Continued

| Type of          | Binary or          | RA           | DEC          | Sp.(A+B)         | $\langle V \rangle$ | $\langle B \rangle$ | $P_{ m orb}$ | $P_{ m pul}$                    | Comments                              | References               |
|------------------|--------------------|--------------|--------------|------------------|---------------------|---------------------|--------------|---------------------------------|---------------------------------------|--------------------------|
| Pulsators        | Multiple           | hh:mm:ss     | °:′:″        |                  | (mag)               | (mag)               | (day)        | (day)                           |                                       |                          |
| $\gamma$ Doradus | V432 Aur           | 05:37:32     | +37:05:12    | G0               | 8.07                | 8.58                |              |                                 | EB                                    | [408]                    |
|                  | CoRoT 102918586    | 06:48:54.3   | -00:52:22.8  | F0V/F3III + A5IV | 12.43               |                     | 4.39138      | 1.22                            | EB, SB2, 35 frequencies               | [290, 42, 289, 463, 288] |
|                  | CoRoT 102931335    | 06:49:09     | -01:26:52    | G3V + F2         |                     |                     | 3.979        | 0.6-0.8                         | EB                                    | [76]                     |
| 05               | CoRoT 102980178    | 06:50:12     | -02:41:22    |                  |                     |                     | 5.05         | 2.75c/d                         | oEA, multimode                        | [416]                    |
|                  | VZ CVn             | 13:32:03     | +28:35:05    | F2V + F8V        | 9.35                | 9.68                | 0.842        | 1.0688                          | =HD 117777, double-lined close EB     | [206]                    |
|                  | ASAS 172738-3808.6 | 17:27:38     | -38:08:48    |                  | 11.56               |                     | 0.3786       | 0.4233                          | may be a contact secondary            | [350]                    |
|                  | V2502 Oph          | 18:17:04     | +01:00:20    | F2V              | 6.61                | 6.91                |              |                                 | =HR 6844                              | [129]                    |
|                  | KIC 11285625       | 19:00:51.8   | +49:05:22.0  | F0 +             | 10.143              | 10.51               | 10.79        | $0.557 - 1.684 \mathrm{d}^{-1}$ | SP2-EB,                               | [80]                     |
| 10               | V404 Lyr           | 19:19:05.9   | +38:22:00.5  |                  | 11.77               | 12.03               | 649          | 1.85-2.11 d <sup>-1</sup>       | EB of $\beta$ Lyr type, semi-detached | [268]                    |
| 11               | KIC 10486425       | 19:49:54.4   | +47:39:32.3  |                  | R=12.505            | 13.235              |              | 1.3189                          | oEA, detached                         | [10]                     |
| 12               | CK Ind             | 20:04:38     | -64:43:42    | A9/F0V           | 7.33                | 7.55                | 3.1          | 3.0303                          | =HD 209295, $p-$ and $g-$ modes       | [182]                    |
|                  | CD-22 422          | 01:13:32.647 | -22:01:13.62 | A6m              | 12.16               | 12.14               |              |                                 | SB: candidate                         | _                        |
|                  | KU Eri             | 02:46:33.962 | -06:42:06.81 | F0               | 7.78                | 8.14                |              |                                 | SB: candidate                         |                          |
|                  | 9 Aur              | 05:06:40.630 | +51:35:51.80 | F2V              | 4.980               | 5.280               |              |                                 | SB: candidate                         |                          |
|                  | DO Lyn             | 07:45:42.337 | +39:32:49.00 | F0               | 7.13                | 7.45                |              |                                 | SB: candidate                         |                          |
|                  | LS UMa             | 08:27:40.087 | +67:58:26.78 | F0               | 8.11                | 8.42                |              |                                 | SB: candidate                         |                          |
|                  | LU UMa             | 09:24:03.260 | +61:46:22.85 | F0V              | 8.46                | 8.78                |              |                                 | SB: candidate                         |                          |
|                  | HN Leo             | 09:58:26.039 | +27:45:32.40 | F3V              | 6.460               | 6.800               |              |                                 | SB: candidate                         |                          |
|                  | NY UMa             | 11:32:12.881 | +38:55:32.99 | Am               | 7.99                | 8.28                |              |                                 | SB: candidate                         |                          |
|                  | HD 120054          | 13:47:49.253 | -33:25:20.41 | A2mA8            | 9.372               | 9.665               |              |                                 | SB: candidate                         |                          |
|                  | iot TrA            | 16:27:57.345 | -64:03:28.60 | F4IV             | 5.27                | 5.63                |              |                                 | SB: candidate                         |                          |
|                  | V2502 Oph          | 18:17:04.841 | +01:00:20.63 | F2V              | 6.61                | 6.91                |              |                                 | SB: candidate                         |                          |
|                  | KIC 10711646       | 18:49:44.633 | +48:05:51.91 |                  | J=13.926            | H=13.253            |              |                                 | EA,Contradictory var. types           | [460, 81, 68, 359]       |
|                  | TYC 3120-328-1     | 19:07:22.878 | +37:48:57.23 |                  | 11.63               | 12.11               |              |                                 | EA,KIC 2557430                        | [460, 475, 359, 410]     |
|                  | HD 180099          | 19:13:27.170 | +40:14:31.92 | F5               | 8.70                | 9.07                |              |                                 | Contradictory var. types              | [464, 475, 359]          |
|                  | KIC 11134079       | 19:20:03.362 | +48:42:06.58 |                  | J=13.502            | H=13.04             |              |                                 | EA,Contradictory var. types           | [460, 81, 68, 359]       |
|                  | HD 181850          | 19:20:27.025 | +38:23:59.46 | A                | 8.94                | 9.11                |              |                                 | EA,KIC 3230227,SAO 68163              | [462, 460, 475, 359]     |
|                  | V850 Cyg           | 19:24:58.822 | +47:14:57.35 | B1               | 11.27               | 11.93               |              |                                 | EA,Contradictory var. types           | [161, 475, 359, 410]     |
|                  | TYC 2666-352-1     | 19:25:29.233 | +37:05:56.86 |                  | 11.15               | 11.44               |              |                                 | EB,KIC 1432149                        | [475, 189]               |
|                  | TYC 3547-2237-1    | 19:27:44.720 | +47:18:34.91 |                  | 11.54               | 12.26               |              |                                 | EA,Contradictory var. types           | [460, 475, 359, 410]     |
|                  | KIC 7286410        | 19:32:40.848 | +42:48:26.57 |                  |                     |                     |              |                                 | EB,Contradictory variability types    | [145, 81, 410]           |
|                  | KIC 4936334        | 19:40:35.669 | +40:01:59.09 |                  |                     |                     |              |                                 | EA,Contradictory variability types    | [81, 359, 410]           |
|                  | KIC 10417135       | 19:45:54.689 | +47:33:17.02 |                  |                     |                     |              |                                 | EB+gD*+El*,Contradictory types        | [81, 359, 410]           |
|                  | KIC 6302592        | 19:46:38.460 | +41:36:51.81 |                  |                     |                     |              |                                 | EB, Contradictory variability types   | [64, 81, 359, 410]       |

Table 2—Continued

| Type of                      | Binary or                | RA           | DEC          | Sp.(A+B)        | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\mathrm{orb}}$ | $P_{\mathrm{pul}}$    | Comments   | References          |
|------------------------------|--------------------------|--------------|--------------|-----------------|---------------------|---------------------|--------------------|-----------------------|--|---------------------|
| Pulsators                    | Multiple                 | hh:mm:ss     | °:':"        |                 | (mag)               | (mag)               | (day)              | (day)                 |  |                     |
| $\gamma$ Doradus             | TYC 3145-171-1           | 19:50:57.860 | +42:59:46.04 |                 | 11.44               | 12.04               |                    |                       | EA,KIC 7385478, Contradictory var. types                   | [64, 460, 81, 359]  |
|                              | TYC 3558-637-1           | 19:58:20.770 | +46:45:55.97 |                 | 10.82               | 11.20               |                    |                       | EA,KIC 9913481, Contradictory var. types                   | [460, 81, 475, 359] |
|                              | KIC 8264534              | 20:03:54.19  | +44:06:46.2  |                 | 12.6435             | 12.8711             |                    |                       | EB,Contradictory variability types                         | [19, 359, 410]      |
|                              | BD+43 3473s              | 20:04:09.305 | +44:04:15.98 | F2              | 10.66               | 11.02               |                    |                       | EB,KIC 8197761,Contradictory var. types                    | [460, 475, 359]     |
|                              | V418 Peg                 | 23:35:37.528 | +14:35:37.17 | A3m             | 7.444               | 7.72                |                    |                       | SB,HD 221866,HIP 116434                                    |                     |
|                              | BD+44 4512               | 23:53:10.921 | +45:02:25.93 | A2mF5           | 10.16               | 10.46               |                    |                       | SB: candidate  |                     |
| Be/X-ray binary              | DZ Tuc                   | 00:50:45     | -73:16:05    | B0-0.5 V D +    | 15.44               | 15.40               |                    | 0.71                  | Galactic,nonradial,high-mass,                              | [61, 393]           |
|                              |                          |              |              |                 | =SXP 32             | 23=AX J0051         | -733=RX J0         | 050.7–731             | 5=MACHO 212.16019.30, wide orbit, MACHO                    |                     |
|                              | XTE J0052-725            | 00:52:09     | -72:38:03    | B1-3 III-V D    | 15.02               | 15.16               |                    |                       | in SMC,wide orbit,nonradial,MACHO                          | [393]               |
|                              | RX J0055.2-7238          | 00:55:17.7   | -72:38:53    |                 |                     |                     | =X                 | KMMU J00              | 5517.7–723853,wide orbit,nonradial,MACHO                   | [393]               |
|                              | MACHO 207.16313.35       | 00:55:17.9   | -72:38:53    | O9.5V D +       | 15.87               | 16.02               |                    | 6 <sup>h</sup> 833    | p <sub>2</sub> =15 <sup>h</sup> :586, =SC7 129062 (in SMC) | [128]               |
|                              | V635 Cas                 | 01:18:31     | +63:44:24    | B0.2 Ve +       | 15.19               | 16.64               |                    | 3.3                   | Galactic,nonradial,high-mass                               | [176]               |
|                              |                          |              |              |                 |                     |                     |                    |                       | =4U0115+63=1XRS 01152+634                                  |                     |
|                              | V831 Cas                 | 01:47:00     | +61:21:23    | B1 III +        | 11.34               | 12.22               |                    | 25.;8 <sup>s</sup> .7 | =LS I+61° 235=RX J0146.9+6121                              | [388]               |
|                              |                          |              |              |                 |                     |                     |                    |                       | Galactic, high-mass  |                     |
|                              | GRO J2058+42             | 20:59:00     | +41:43:00    | O9.5-B0 IV-Ve + | 14.92               | 16.04               |                    |                       | Galactic Be/X-ray binary                                   | [241]               |
|                              | SAX J2103.5+4545         | 21:03:35     | +45:45:05    | B0 Ve +         | 14.25               | 15.36               |                    | 2.23                  | Galactic,nonradial,high-mass                               | [176]               |
|                              | IGR J21343+4738          | 21:34:20     | +47:38:00    | B1IVe +         | 14.1                | 14.9                | 200-300            | 320 s                 | X-ray pulsations in Be/X-ray binary                        | [373]               |
| 10                           | 4U 2206+54               | 22:07:56     | +54:31:06    | O0.95IIIe       | 9.93                | 10.14               |                    |                       | high-mass, X-ray pulsation                                 | [372]               |
| Pulsating White Dwarf        | J0247-25                 | 02:47:43.3   | -25:15:49.2  |                 |                     |                     | 0.6678             |                       | EB, multi-periodic around $2500\mu$ Hz,                    | [301]               |
|                              |                          |              |              |                 | =15                 | SWASP J0247         | 43.37-25154        | 49.2; stripp          | ed red giant,low-mass WD precursor + SXPhe                 |                     |
|                              | LP 413-40                | 03:45:17     | +17:48:09    | WD + WD         | 16.66               | 17.10               | 5.64h              |                       | EB, detached, =NLTT 11748                                  | [436]               |
|                              | V471 Tau                 | 03:50:25     | +17:14:47    | K2V + DA        | 9.48                | 10.24               |                    |                       | EA+SB:   | [205]               |
|                              | CSS 41177                | 10:05:59     | +22:49:32    | WD + WD         | g=17.27             | r=17.61             | 0.116              |                       | EB,detached, =SDSS J100559.10+224932.2                     | [337]               |
|                              |                          |              |              |                 |                     |                     |                    |                       | =SDSS J100559.10+224932.2                                  |                     |
|                              | SDSS J143547.87          | 14:35:47     | +37:33:38    | _               | g=17.12             | r=17.22             |                    |                       | =SDSS J143547.87+373338.5                                  | [248]               |
| 6                            | HIP 96515                | 19:37:08     | -51:34:00    | M1Ve            | 12.29               | 13.38               |                    |                       | triple system  | [204]               |
|                              | BD+08 102                | 00:44:01.319 | +09:32:57.85 | K2V+DA2.1       | 10.219              | 10.94               |                    |                       | SB*,WD*,flare star: candidate                              |                     |
|                              | PTF1 J004546.00+415030.0 | 00:45:46.00  | +41:50:30.0  | M3              |                     |                     |                    |                       | EB*,WD*: candidate   |                     |
|                              | GD 659                   | 00:53:17.44  | -32:59:56.6  | DA1.4           | 13.36               | 13.14               |                    |                       | SB*,WD*: candidate   |                     |
|                              | 2MASS J01100908+1326166  | 01:10:09.08  | +13:26:16.7  | DA+dMe          | J=16.362            | H=15.927            |                    |                       | EB+SB,WD,double stars: candidate                           |                     |
|                              | TYC 6425-1982-1          | 01:12:11.650 | -26:13:27.69 | sdB             | 13.15               | 12.953              |                    |                       | SB*,WD*,sdB: candidate                                     |                     |
| <b>Pulsating White Dwarf</b> | 39 Cet                   | 01:16:36.289 | -02:30:01.32 | G5III+DA2.8     | 5.432               | 6.298               |                    |                       | SB*,WD,double stars,RS*: candidate                         |                     |

Table 2—Continued

| Type of Pulsators | Binary or<br>Multiple    |                | DEC ° : ' : " | Sp.(A+B)          | $\langle V \rangle$ (mag) | $\langle B \rangle$ (mag) | P <sub>orb</sub> (day) | $P_{ m pul}$ (day) | Comments                          | References                  |
|-------------------|--------------------------|----------------|---------------|-------------------|---------------------------|---------------------------|------------------------|--------------------|-----------------------------------|-----------------------------|
|                   |                          |                |               |                   | (8)                       | (8)                       | (,)                    | (,)                |                                   |                             |
|                   | PTF1 J015256.60+384413.4 | 01:52:56.60    | +38:44:13.4   | M3                |                           |                           |                        |                    | EB*,WD*: candidate                |                             |
|                   | PTF1 J015524.70+373153.8 | 01:55:24.70    | +37:31:53.8   | M3                |                           |                           |                        |                    | EB*,WD*: candidate                |                             |
|                   | ksi01 Cet                | 02:12:59.995 + | +08:50:48.16  | G6II/III-Ba0.3+DA | 4.35                      | 5.23                      |                        |                    | EB+SB,WD,double stars: candidate  |                             |
|                   | FS Cet                   | 02:35:07.594 + | +03:43:56.80  | DA.8              | 12.412                    | 12.209                    |                        |                    | SB*,WD*: candidate                |                             |
|                   | HD 18131                 | 02:54:38.827 - | -05:19:50.93  | K0IV+DA:          | 7.31                      | 8.32                      |                        |                    | SB*,WD*,BY*: candidate            |                             |
|                   | SDSS J030308.35+005444.1 | 03:03:08.362 + | +00:54:43.92  | WD+dM             | 18.06                     | 18.9                      |                        |                    | EB+SB, WD,double stars: candidate |                             |
|                   | CL Oct                   | 03:17:15.81    | -85:32:25.5   | DA                | 14.72                     |                           |                        |                    | ZZ*, double stars,blu: candidate  | ZZ*=pulsating WD*           |
|                   | WD 0316+003              | 03:18:47.088 + | +00:30:29.61  | DA                | 17.94                     | 18.10                     |                        |                    | ZZ*,double stars: candidate       |                             |
|                   | V471 Tau                 | 03:50:24.968 + | +17:14:47.42  | K2V+DA            | 9.373                     | 10.24                     |                        |                    | EA+SB,WD*: candidate              |                             |
|                   | V1092 Tau                | 03:57:05.816 + | +28:37:51.38  | K2V+DA1.5         | 11.51                     | 12.61                     |                        |                    | SB*,WD*,BY*: candidate            | BY*=Variable of BY Dra type |
|                   | RR Cae                   | 04:21:05.563 - | -48:39:07.02  | DA7.8             | 14.40                     | 14.92                     |                        |                    | EA*,WD*: candidate                |                             |
|                   | HS 0507+0434B            | 05:10:13.512 + | +04:38:55.10  | DA2.3             | 15.31                     | 15.52                     |                        |                    | ZZ*,double stars: candidate       |                             |
|                   | V1396 Ori                | 05:10:13.9     | +04:38:44     | DA+               | 15.36                     |                           |                        |                    | ZZ*,double stars: candidate       |                             |
|                   | IN CMa                   | 07:20:47.909 - | -31:47:02.73  | DA.9              | 14.64                     | 14.900                    |                        |                    | SB*,Nova,WD*: candidate           |                             |
|                   | WD J0751-0141            | 07:51:41.179 - | -01:41:20.90  |                   | u=17.911                  | g=17.453                  |                        |                    | EB*,WD*: candidate                |                             |
|                   | RY LMi                   | 09:24:15.27    | +35:16:51.3   | DA4.0             | 15.54                     | 15.72                     |                        |                    | ZZ*, double stars: candidate      |                             |
|                   | SDSS J100559.10+224932.2 | 10:05:59.116 + | +22:49:32.32  | DA                | u=17.33                   | g=17.27                   |                        |                    | EB*,WD?: candidate                |                             |
|                   | WD J1007+5245            | 10:07:18.263 + | +52:45:19.83  | DA                | u=19.27                   | g=18.86                   |                        |                    | ZZ*, double stars: candidate      |                             |
|                   | WD 1013-050              | 10:16:28.677 - | -05:20:32.06  | DAO.9             | 13.21                     | 13.3                      |                        |                    | SB*,WD*: candidate                |                             |
|                   | RW Sex                   | 10:19:56.623 - | -08:41:56.09  | DAe               | 10.7                      | 10.65                     |                        |                    | SB*,WD*,Nova: candidate           |                             |
|                   | HD 90052                 | 10:24:05.900 + | +26:21:03.72  | F0V+DA1.4         | 9.26                      | 9.57                      |                        |                    | SB*,WD*: candidate                |                             |
|                   | RX J1027.1+3223          | 10:27:12.013 + | +32:23:29.71  | G5V+DA1.4         | 13.38                     | 14.00                     |                        |                    | SB*,WD*: candidate                |                             |
|                   | V727 Car                 | 10:44:10.231 - | -69:18:18.03  | DA2.2             | 13.09                     | 13.05                     |                        |                    | SB*,WD*: candidate                |                             |
|                   | 2MASS J12101023+3347239  | 12:10:10.232 + | +33:47:23.99  | WD+M              | 16.3                      | 16.9                      |                        |                    | EB+SB, WD,double stars: candidate |                             |
|                   | V379 Vir                 | 12:12:09.308 + | +01:36:27.74  | DAH+dL8           | 17.85                     | 17.21                     |                        |                    | SB*,WD?,Nova: candidate           |                             |
|                   | 2MASS J12125824-0123101  | 12:12:58.25    | -01:23:10.2   | DA+M              | J=14.830                  | H=14.347                  |                        |                    | EB+SB, WD,double stars: candidate |                             |
|                   | LM Com                   | 12:26:30.895 + | +30:38:52.72  | DA1.7             | 16.15                     | 16.099                    |                        |                    | SB*,WD,double stars: candidate    |                             |
|                   | V886 Cen                 | 12:38:49.82    | -49:48:00.2   | DA4.2             | 13.96                     | 14.14                     |                        |                    | ZZ*, double stars: candidate      |                             |
|                   | PN LoTr 5                | 12:55:33.747 + | +25:53:30.61  | G5III-IV          | 8.88                      | 9.72                      |                        |                    | SB*,PN,WD*: candidate             |                             |
|                   | QS Vir                   | 13:49:51.95    | -13:13:37.5   | DA+M2-4           |                           | 16.17                     |                        |                    | EA+SB,WD*: candidate              |                             |
|                   | GK Vir                   | 14:15:36.411 + | +01:17:18.23  | DAO1.1            | 17.01                     | 17.0                      |                        |                    | EA+SB,WD,double stars: candidate  |                             |
|                   | GD 165                   | 14:24:39.144 + | +09:17:13.98  | DA4.1             | 14.32                     | 14.46                     |                        |                    | ZZ*, double stars: candidate      |                             |
|                   | 2MASS J14354787+3733386  | 14:35:47.88    | +37:33:38.7   | DA+dM             | J=15.421                  | H=15.045                  |                        |                    | EB+SB, WD,double stars: candidate |                             |
| Pulsating         | SDSS J145634.29+161137.7 | 14:56:34.298 + | +16:11:37.72  | D+M6.0            | u=17.866                  | g=17.703                  |                        |                    | EB*,WD*: candidate                |                             |
|                   |                          |                |               |                   |                           |                           |                        |                    | •                                 |                             |

Table 2—Continued

| Type of Pulsators | Binary or<br>Multiple      | RA DEC hh:mm:ss °: ': "   | Sp.(A+B)        | $\langle V \rangle$ (mag) | $\langle B \rangle$ (mag) | P <sub>orb</sub> (day) | $P_{ m pul}$ (day)         | Comments   | References     |
|-------------------|----------------------------|---------------------------|-----------------|---------------------------|---------------------------|------------------------|----------------------------|--|----------------|
| White Dwarf       | 2MASS J15484603+4057291    | 15:48:46.04 +40:57:29.1   | DA+M            |                           | 18.700                    |                        |                            | EB+SB, WD,double stars: candidate                |                |
| Winte Dwarf       | V1093 Her                  | 17:18:03.86 +42:34:12.7   | sdB             | 13.97                     | 13.69                     |                        |                            | SB*,WD*: candidate                               |                |
|                   | DR Dra =29 Dra             | 17:32:41.208 +74:13:38.47 | K0+DA1.5        | 6.635                     | 7.673                     |                        |                            | SB*,WD*,RS*,=HD 160538=WD 1734+74                | 12             |
|                   | WD J1741+6526              | 17:41:40.490 +65:26:38.74 | 110   12/11.5   | u=19.34                   | g=18.411                  |                        |                            | EB*,WD*: candidate                               |                |
|                   | HD 165141                  | 18:07:00.249 -48:14:50.23 | K0II/IIIBa1+DA: | 7.10                      | 8.10                      |                        |                            | SB*,WD*,RS* — RS*=Variable of RS CV              | n type         |
|                   | 2MASS J19135987+4759472    | 19:13:59.874 +47:59:47.28 | Ron/mbar Dr.    | J=13.056                  | H=13.04                   |                        |                            | EA*,WD*: candidate                               | n type         |
|                   | V3885 Sgr                  | 19:47:40.527 -42:00:26.39 | DB:p            | 10.33                     | 10.32                     |                        |                            | SB*,WD*,Dwarf Nova: candidate                    |                |
|                   | WZ Sge                     | 20:07:36.50 +17:42:14.8   | DAepv           | 15.20                     | 15.30                     |                        |                            | SB*,WD*,Dwarf Nova: candidate                    |                |
|                   | V1412 Aql                  | 20:13:55.67 +06:42:44.7   | DC              | 15.751                    | 16.176                    |                        |                            | EB*,WD,double stars: candidate                   |                |
|                   | IK Peg                     | 21:26:26.662 +19:22:32.30 | kA6hA9mF0 + DA  | 6.078                     | 6.294                     |                        |                            | SB*,hybrid WD+DSCT: candidate                    |                |
|                   | zet Cap                    | 21:26:40.026 -22:24:40.80 | G8IIIp+DA2.2    | 3.74                      | 4.75                      |                        |                            | SB*,WD,double stars; candidate                   |                |
|                   | RX J2130.6+4710            | 21:30:18.46 +47:10:07.4   | Me              | J=11.193                  | H=10.547                  |                        |                            | EB*,XB*,WD*: candidate                           |                |
|                   | 56 Peg                     | 23:07:06.739 +25:28:05.73 | K1IV(e)+DA1     | 4.74                      | 6.06                      |                        |                            | SB*,WD*: candidate                               |                |
|                   | VY Scl                     | 23:29:00.48 -29:46:45.9   | 0               | 4.74                      | 12.5                      |                        |                            | SB*,WD*,Nova-like: candidate                     |                |
|                   | SBC9 2129                  | 23:48:07.30 +32:04:46.0   | sdBw+           |                           | 14.37                     |                        |                            | EB+SB,WD*: candidate                             |                |
|                   | V409 Peg                   | 23:49:53.45 +13:06:12.8   | DA4.4           | 16.13                     | 15.9                      |                        |                            | ZZ*,double stars; candidate                      |                |
|                   | SB 911                     | 23:55:30.201 -25:16:13.06 | sdB             | 13.90                     | 13.88                     |                        |                            | SB*,WD*: candidate                               |                |
|                   |                            |                           | 500             |                           | 13.00                     | 2442                   | 4522447-1                  | <u> </u>   |                |
| SX Phoenicis      | KIC 11754974               | 19:08:15 +49:57:15        |                 | 12.48                     | - 150                     | 344.2                  | $16.3-21.4\mathrm{d}^{-1}$ | or DSCT-type                                     | [320, 321]     |
|                   | QU Sge                     | 19:53:49.34 +18:45:43.4   | _               | 15.2                      | 15.2                      |                        |                            | EB, in M71                                       | [212]          |
|                   | KIC 12643589               | 19:13:17.131 +51:43:35.59 |                 | J=12.90                   | H=12.65                   |                        |                            | EB, 2MASS J19131715+5143357                      | [21, 410]      |
|                   | KIC 7300184                | 19:47:08.587 +42:48:12.00 |                 | R=15.98                   |                           |                        |                            | hybrid DSCT+SXPhe                                | [21, 359, 410] |
|                   | KIC 10989032               | 19:49:34.459 +48:24:38.88 |                 | J=13.354                  | H=13.32                   |                        |                            | EA,detached,2MASS J19493443+4824386              | [21, 359, 410] |
|                   | [SS2011] W9                | 13:12:59.00 +18:10:22.0   |                 | 19.34                     | R=19.369                  |                        |                            | EB not confimed,NGC 5024 SAW V104                | [13, 41]       |
|                   | BQ Phe                     | 00:25:24.142 -46:55:27.06 | F4V             | 10.98                     | 10.41                     |                        |                            | SB*: candidate                                   |                |
|                   | BX Scl                     | 23:43:54.454 -28:18:34.50 | A               | 13.82                     | 13.56                     |                        |                            | SB*,SX*+cC* hybrid: candidate                    |                |
|                   | BY Scl                     | 23:51:32.250 -25:45:46.53 | A0              | 14.05                     | 13.85                     |                        |                            | SB*,SX*+cC* hybrid: candidate                    |                |
| RR Lyrae          | * RW Ari                   | 02:16:03 +17:31:59        | B8              | 12.12                     | 12.10                     |                        |                            | EB unconfirmed                                   | [496, 494, 73] |
|                   | * OGLE J052218.07-692827.4 | 05:22:18 -69:28:27        |                 | 18.6                      | 18.87                     | 8.923                  | 0.5649                     | disproved not pulsating EB                       | [174, 358]     |
|                   | * TU UMa                   | 11:29:48 +30:04:02        | F2 +            | 9.3–10.2                  |                           | 23 yr                  | 0.558                      | RRab, probably binary                            | [485]          |
|                   | OGLE-BLG-RRLYR-02792       | 17:47:38 -35:31:07        | _               | I=15.734                  |                           | 15.2447                | 0.6275                     | first RR Lyr in EB+SB2,detached;0.26M $_{\odot}$ | [421, 345]     |
|                   | WW Scl                     | 00:06:01.948 -36:54:15.14 | A0              | 13.2                      | 13.9                      |                        |                            | SB*,RR* – candidate                              |                |
|                   | CD Scl                     | 00:06:20.828 -35:17:12.59 | A0              | 13.73                     | 14.13                     |                        |                            | SB*,RR* - candidate                              |                |
|                   | RX Cet                     | 00:33:38.282 -15:29:14.79 | A7              | 11.2                      | 11.7                      |                        |                            | SB*,RR* - candidate                              |                |
| RR Lyrae          | 2MASS J00445307-2442392    | 00:44:53.08 -24:42:39.3   | A               | 13.67                     | 13.5                      |                        |                            | SB*,RR* – candidate                              |                |

Table 2—Continued

| Type of   | Binary or                | RA           | DEC          | Sp.(A+B) | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\rm orb}$ | $P_{\mathrm{pul}}$ | Comments                       | Reference |
|-----------|--------------------------|--------------|--------------|----------|---------------------|---------------------|---------------|--------------------|--------------------------------|-----------|
| Pulsators | Multiple                 | hh:mm:ss     | °:′:″        |          | (mag)               | (mag)               | (day)         | (day)              |                                |           |
|           | WX Scl                   | 00:49:29.098 | -27:23:14.19 | A3       | 13.1                | 13.8                |               |                    | SB*,RR* – candidate            |           |
|           | UV Scl                   | 00:55:58.59  | -26:22:59.5  |          | 13.50               | 13.80               |               |                    | SB*,RR* – candidate            |           |
|           | WY Scl                   | 01:00:27.77  | -28:12:20.5  | A        | 12.4                | 13.500              |               |                    | SB*,RR* – candidate            |           |
|           | RU Cet                   | 01:00:40.303 | -15:57:27.64 | A5       | 11.90               | 12.02               |               |                    | SB*,RR* – candidate            |           |
|           | AE Scl                   | 01:07:25.813 | -32:18:35.08 | sd?F0    | 12.44               | 12.86               |               |                    | SB*,RR* – candidate            |           |
|           | VX Scl                   | 01:35:23.663 | -35:07:42.59 | A2       | 12.01               | 12.22               |               |                    | SB*,RR* – candidate            |           |
|           | CU Scl                   | 01:42:26.369 | -30:27:36.74 | A0       | 12.28               | 12.29               |               |                    | SB*,RR* – candidate            |           |
|           | SV Scl                   | 01:44:59.662 | -30:03:33.39 | A0       | 11.6                | 11.6                |               |                    | SB*,RR* – candidate            |           |
|           | OGLE LMC-RRLYR-2863      | 04:59:36.06  | -70:35:40.9  |          | 18.97               |                     |               |                    | EB*,RR* – candidate            |           |
|           | OGLE LMC-RRLYR-11576     | 05:19:48.66  | -68:06:54.0  |          | 19.22               |                     |               |                    | EB*,RR* – candidate            |           |
|           | OGLE J052144.42-705729.8 | 05:21:44.30  | -70:57:29.5  |          | 19.48               | 19.82               |               |                    | EB*,RR* – candidate            |           |
|           | OGLE LMC-RRLYR-13574     | 05:23:11.17  | -68:28:44.7  |          | 19.14               |                     |               |                    | EB*,RR* – candidate            |           |
|           | UU Dor                   | 05:45:07.683 | -69:52:15.29 |          | 14.25               | 14.2                |               |                    | EB*,RR* – candidate            |           |
|           | SZ Lyn                   | 08:09:35.748 | +44:28:17.61 | F2       | 9.08                | 9.73                |               |                    | SB*,RR+DSCT hybrid – candidate |           |
|           | AG Cnc                   | 08:51:25.305 | +12:02:56.35 |          |                     | 14.2                |               |                    | SB*,RS*,RR* – candidate        |           |
|           | FT UMa                   | 08:54:30.328 | +51:14:40.35 | F0       | 9.20                | 9.64                |               |                    | EB+SB,RR* – candidate          |           |
|           | RR LMi                   | 11:00:15.121 | +29:19:14.52 | A        |                     | 13.5                |               |                    | EB*,RR* – candidate            |           |
|           | GL Mus                   | 11:38:58.87  | -74:28:08.4  |          |                     | 15.1                |               |                    | EB*,RR* – candidate            |           |
|           | DE Cha                   | 11:46:35.63  | -76:35:14.8  |          |                     | 14.5                |               |                    | EB*,RR* – candidate            |           |
|           | 2MASS J13244044-4745225  | 13:24:40.44  | -47:45:22.5  |          | 17.45               | 17.700              |               |                    | EB*,RR* – candidate            |           |
|           | NGC 5139 WSB V155        | 13:26:13.17  | -47:24:04.5  |          | 16.10               |                     |               |                    | EB*,RR* – candidate            |           |
|           | V814 Cen                 | 13:27:44.02  | -47:26:09.8  | K2.5     | 14.295              | 14.271              |               |                    | SB*,RR* – candidate            |           |
|           | NGC 5139 WSB V53         | 13:28:54.73  | -47:30:21.1  |          | 19.41               |                     |               |                    | EB*,RR* – candidate            |           |
|           | NN Vir                   | 14:19:37.741 | +05:53:46.65 | F2       | 7.63                | 8.02                |               |                    | EW*,SB*,RR* – candidate        |           |
|           | DD Boo                   | 14:51:20.07  | +23:32:30.0  |          | 12.8                |                     |               |                    | EB*,RR* – candidate            |           |
|           | TYC 2576-1282-1          | 16:00:58.471 | +34:18:54.32 |          | 13.16               | 13.12               |               |                    | EB*,RR*,double – candidate     |           |
|           | BX Dra                   | 16:06:17.370 | +62:45:46.10 | A3       | 10.62               | 11.00               |               |                    | SB*,RR* – candidate            |           |
|           | LQ Nor                   | 16:33:39.31  | -56:12:29.6  |          |                     | 12.9                |               |                    | EB*,RR* – candidate            |           |
|           | V719 Her                 | 17:09:52.584 | +42:56:07.98 |          | 12.344              | 12.5                |               |                    | EB*,RR*,double - candidate     |           |
|           | V1844 Oph                | 17:19:03.12  |              |          |                     | 16.4                |               |                    | EB*,RR* – candidate            |           |
|           | OGLE BLG-RRLYR-2792      | 17:47:38.21  | -35:31:07.1  |          | 17.079              |                     |               |                    | EB*,RR* – candidate            |           |
|           | V4584 Sgr                | 18:08:55.24  | -32:30:46.3  |          | 16.254              | 16.8                |               |                    | EW*,RR* – candidate            |           |
|           | [BB97c] E2               | 18:10:15.68  | -31:46:41.7  |          |                     |                     |               |                    | EB*,RR* – candidate            |           |
| RR Lyrae  | V4623 Sgr                | 18:11:39.34  |              |          |                     | 15.9                |               |                    | EA*,RR* – candidate            |           |

Table 2—Continued

| Type of          | Binary or               | RA           | DEC          | Sp.(A+B)              | $\langle V \rangle$ | $\langle B \rangle$ | $P_{\mathrm{orb}}$ | $P_{\mathrm{pul}}$ | Comments                            | References                |
|------------------|-------------------------|--------------|--------------|-----------------------|---------------------|---------------------|--------------------|--------------------|-------------------------------------|---------------------------|
| Pulsators        | Multiple                | hh:mm:ss     | °:′:″        |                       | (mag)               | (mag)               | (day)              | (day)              |                                     |                           |
|                  | HI Dra                  | 18:33:24.361 | +58:42:23.36 | F8                    | 9.01                | 9.30                |                    |                    | SB*,RR*,double – candidate          |                           |
|                  | HN Dra                  | 18:44:53.133 | +57:05:17.16 | F2                    | 8.07                | 8.45                |                    |                    | SB*,RR* – candidate                 |                           |
|                  | 2MASS J18451772+4240120 | 18:45:17.727 | +42:40:12.05 |                       | 13.213              |                     |                    |                    | EB*,RR* – candidate                 |                           |
|                  | 2MASS J19100386+5033239 | 19:10:03.870 | +50:33:23.91 |                       | 13.664              |                     |                    |                    | EW*,RR* - candidate                 |                           |
|                  | KIC 3104113             | 19:12:09.521 | +38:17:38.86 |                       |                     |                     |                    |                    | EW*,RR* – candidate                 |                           |
|                  | V400 Lyr                | 19:13:52.65  | +38:06:54.7  |                       |                     | 13.5                |                    |                    | EB*,RR* – candidate                 |                           |
|                  | V894 Cyg                | 19:33:00.910 | +46:14:22.93 |                       | 12.794              | 11.9                |                    |                    | EB*,RR*-candidate                   |                           |
|                  | V1269 Aq1               | 19:36:40.122 | +00:53:38.11 |                       | 11.87               | 12.56               |                    |                    | EB*,RR* – candidate                 |                           |
|                  | KIC 9350889             | 19:40:22.025 | +45:50:34.15 |                       |                     |                     |                    |                    | EW*,RR* - candidate                 |                           |
|                  | 2MASS J19471339+4323077 | 19:47:13.397 | +43:23:07.71 |                       | J=14.151            | H=13.89             |                    |                    | EW*,RR* – candidate                 |                           |
|                  | V997 Cyg                | 19:48:05.077 | +52:51:16.25 |                       |                     | 14.265              |                    |                    | EW*,RR* - candidate                 |                           |
|                  | V1464 Aql               | 19:50:15.473 | -08:36:06.26 | A2                    | 8.68                | 8.94                |                    |                    | SB*,RR*-candidate                   |                           |
|                  | 2MASS J19560480+4713138 | 19:56:04.802 | +47:13:13.86 |                       | 11.987              |                     |                    |                    | EW*,RR* – candidate                 |                           |
|                  | KIC 8265951             | 20:05:23.67  | +44:11:16.1  |                       | 12.515              | 12.91               |                    |                    | EW*,RR* - candidate                 |                           |
|                  | DE Oct                  | 20:19:19.162 | -76:07:35.54 | A9IV                  | 9.13                | 9.48                |                    |                    | SB*,RR*,double-candidate            |                           |
|                  | SU Equ                  | 21:25:36.972 | +09:41:35.78 | A8                    |                     | 16.1                |                    |                    | EW*,RR* - candidate                 |                           |
|                  | BO Gru                  | 23:06:58.63  | -43:54:38.5  |                       | 12.66               | 12.1                |                    |                    | EB*,RR* - candidate                 |                           |
|                  | V351 Peg                | 23:25:25.188 | +15:41:19.14 | A9III                 | 8.04                | 8.33                |                    |                    | EW+SB*,RR*-candidate                |                           |
|                  | CN Scl                  | 23:40:22.913 | -38:18:58.09 | A7:                   | 13.2                | 13.7                |                    |                    | SB*,RR*-candidate                   |                           |
|                  | TW Scl                  | 23:54:41.65  | -33:28:52.5  | A7                    | 12.5                | 13.5                |                    |                    | SB*,RR* – candidate                 |                           |
|                  | TX Scl                  | 23:55:22.257 | -26:18:07.15 | F0                    | 12.14               | 12.89               |                    |                    | SB*,RR* – candidate                 |                           |
| Wolf-Rayet stars | HD 5980                 | 00:59:26     | -72:09:54    | WN3 + OB              | 11.5                | 11.28               |                    |                    | triple, 3rd object is also a binary | [133]                     |
| SMC WR/LBV       | WR 104                  | 18:02:04     | -23:37:41    | WCv + OB              | 13.54               |                     | 220                |                    | WR + OB binary                      | [466]                     |
|                  | MWC 314                 | 19:21:34     | +14:52:57    | B3Ibe +               | 9.89                | 11.3                |                    |                    | =IRAS 19192+1447,WR + OB binary     | [495]                     |
| HADS             | UNSW-V-500              | 13:10:18     | -45:09:13    | $\sim$ A6 + $\sim$ K6 | ~12.2               |                     | 5.35048            | 0.0734             | oEA, semi-detached, first overtone  | [58]                      |
|                  |                         |              |              |                       |                     |                     |                    |                    | =ASAS 131018-4509.2                 |                           |
|                  | GSC 01374-01131         | 07:47:22.45  | +22:04:13.9  |                       | 14.04               |                     |                    |                    |                                     | [221]                     |
| BY Draconis      | SV Cam                  | 06:41:19     | +82:16:02    | G5V                   | 9.37                | 10.02               |                    |                    | RS CVn-type EB: polar spots         | [199, 209, 269]           |
| non-classified   | WDS 12483-6708          | 12:48:17     | -67:07:52    | _                     |                     |                     |                    |                    |                                     | [407]                     |
|                  | HD 187091               | 19:46:15.5   | +43:56:51.3  | A0 +                  | 8.38                | 8.51                | 41.805             | 0.4645             | KOI-54,tidally-excited pulsations   | [489, 143]                |
|                  | TYC 5887-1085-1         | 03:52:21.955 | -21:51:20.09 |                       | 11.65               | 12.62               |                    |                    | EA*,Pu*: candidate                  | Pu*=pulsating variable st |
|                  | TYC 7243-1211-1         | 12:00:20.526 | -36:53:54.92 |                       | 13.08               | 12.83               |                    |                    | EA*,Pu*: candidate                  |                           |
|                  | V1289 Cen               | 13:49:09.215 | -47:46:33.73 | F5                    | 10.54               | 10.87               |                    |                    | EA*,Pu*: candidate                  |                           |
| non-classified   | V1119 Her               | 16:40:22.415 | +06:07:29.71 | G0                    | 10.070              | 10.36               |                    |                    | $EB(\beta)$ ,Pu*: candidate         |                           |

Table 2—Continued

| Type of<br>Pulsators | Binary or<br>Multiple   | RA<br>hh:mm:ss | DEC °: ': "  | Sp.(A+B) | $\langle V \rangle$ (mag) | $\langle B \rangle$ (mag) | P <sub>orb</sub> (day) | $P_{ m pul}$ (day) | Comments                    | References |
|----------------------|-------------------------|----------------|--------------|----------|---------------------------|---------------------------|------------------------|--------------------|-----------------------------|------------|
|                      | 2MASS J16580027-5951065 | 16:58:00.28    | -59:51:06.6  |          |                           | 17.5                      |                        |                    | EW*,Pu*: candidate          |            |
|                      | 2MASS J17050043-5930427 | 17:05:00.44    | -59:30:42.8  |          |                           | 13.7                      |                        |                    | EW*,Pu*: candidate          |            |
|                      | V817 Ara                | 17:09:26.003   | -57:44:41.50 |          |                           | 14.9                      |                        |                    | $EB(\beta)$ ,Pu*: candidate |            |
|                      | V938 Oph                | 17:52:46.54    | +02:48:50.2  |          |                           | 14.5                      |                        |                    | EW*,Pu*: candidate          |            |
|                      | V866 Aql                | 18:49:25.0     | -01:06:20    |          |                           | 14.6                      |                        |                    | EA*,Pu*: candidate          |            |
|                      | TYC 3139-1857-1         | 19:39:43.167   | +40:08:49.28 |          | 11.71                     | 12.02                     |                        |                    | EW*,Pu*: candidate          |            |
|                      | TYC 3140-582-1          | 19:49:04.758   | +40:24:36.60 | F4.5IV   | 12.50                     | 12.55                     |                        |                    | EW*,Pu*: candidate          |            |

<sup>&</sup>lt;sup>a</sup>Candidates are extracted from Simbad database without literature check. There are no lines between candidates entries.

<sup>&</sup>lt;sup>b</sup>References numbers are accordingly linked to their entries in the list of references at the end of the paper.

<sup>&</sup>lt;sup>c</sup>Check updates of this table on-line at: http://www.chjaa.org/COB/. You are welcome to reporting any mistakes/typos as well as new members of this category of oscillating binaries to the author at aiying@nao.cas.cn.

Table A.2 435 Identified Algol-type Eclipsing Binaries (web version: http://www.chjaa.org/COB/).

| No. | Stars            | Sp. Type | RA (2000)                | DEC(2000)   | $\langle V \rangle$ | Min.I <sub>HJD</sub>         | D . (d)              |
|-----|------------------|----------|--------------------------|-------------|---------------------|------------------------------|----------------------|
| 1   |                  |          |                          |             |                     |                              | P <sub>orb</sub> (d) |
|     | DM Peg<br>TW And | A8       | 00:00:07.5<br>00:03:18.2 | +18:44:17.1 | 10.80               | 2425853.4700                 | 2.5890               |
| 2   |                  | F0V:     |                          | +32:50:45.1 | 9.08                | 2443790.4490<br>2417983.4300 | 4.1228               |
| 3   | SX Cas           | G6       | 00:10:42.1               | +54:53:29.4 | 8.96                |                              | 36.5668              |
| 4   | GT Cas           | A0       | 00:13:29.4               | +58:16:58.0 | 11.90               | 2427341.4250                 | 2.9898               |
| 5   | TV Cas           | B9V      | 00:19:18.7               | +59:08:20.6 | 7.22                | 2443043.6265                 | 1.8126               |
| 6   | FS Cas           | F2       | 00:24:44.2               | +57:18:37.0 | 13.90               | 2428038.5400                 | 3.0809               |
| 7   | V380 Cas         | A0       | 00:31:27.2               | +73:43:27.0 | 10.40               | 2425645.5050                 | 1.3573               |
| 8   | UU And           | F5       | 00:43:45.1               | +30:56:20.0 | 11.20               | 2441650.3400                 | 1.4863               |
| 9   | Y Hyi            | A6V      | 00:45:50.7               | -78:49:16.8 | 10.40               | 2425481.5000                 | 3.5360               |
| 10  | OR Cas           | F3       | 00:48:00.7               | +60:51:39.0 | 11.40               | 2444210.3890                 | 1.2457               |
| 11  | V Tuc            | A0/A1IV  | 00:51:46.6               | -71:59:53.0 | 10.60               | 2436139.1420                 | 0.8709               |
| 12  | KR Cas           | A0       | 00:54:01.9               | +54:30:58.0 | 9.80                | 2415038.2290                 | 4.9043               |
| 13  | SX Psc           | F1       | 00:57:35.2               | +12:18:36.0 | 11.20               | 2445992.2890                 | 0.8259               |
| 14  | U Cep            | B8V      | 01:02:18.3               | +81:52:32.1 | 6.86                | 2444541.6031                 | 2.4930               |
| 15  | CO And           | F8       | 01:11:24.8               | +46:57:49.5 | 11.10               | 2426985.5100                 | 1.8277               |
| 16  | GG Cas           | B5       | 01:16:12.6               | +56:19:43.0 | 9.94                | 2441054.9335                 | 3.7587               |
| 17  | V Tri            | A2:      | 01:31:47.1               | +30:22:01.8 | 10.70               | 2424474.3050                 | 0.5852               |
| 18  | IZ Per           | B8       | 01:32:05.5               | +54:01:08.3 | 7.80                | 2444577.5874                 | 3.6877               |
| 19  | MN Cas           | A0V      | 01:42:02.9               | +54:57:37.0 | 10.10               | 2442326.4699                 | 1.9169               |
| 20  | V436 Per         | B1.5V    | 01:51:59.3               | +55:08:50.7 | 5.45                | 2443562.8530                 | 25.9359              |
| 21  | BZ Cas           | A0       | 01:53:42.8               | +62:57:33.0 | 11.40               | 2429497.3160                 | 2.1264               |
| 22  | TX Cet           | A2       | 01:56:07.2               | -00:42:56.0 | 10.43               | 2443082.6343                 | 0.7408               |
| 23  | XZ And           | A4IV     | 01:56:51.5               | +42:06:02.2 | 9.56                | 2423977.1915                 | 1.3573               |
| 24  | X Tri            | A7V      | 02:00:33.7               | +27:53:19.3 | 8.55                | 2442502.7210                 | 0.9715               |
| 25  | CP And           | A5       | 02:12:51.2               | +45:37:51.8 | 11.40               | 2427718.5180                 | 3.6089               |
| 26  | RV Tri           | A2:      | 02:13:18.2               | +37:01:01.7 | 11.50               | 2446033.3080                 | 0.7537               |
| 27  | RW Cet           | A5       | 02:15:21.6               | -12:12:34.0 | 10.43               | 2442229.3883                 | 0.9752               |
| 28  | SU For           | A2IV     | 02:21:36.5               | -37:12:46.0 | 9.84                | 2444891.6639                 | 2.4347               |
| 29  | DM Per           | B6V      | 02:25:58.0               | +56:06:10.0 | 7.96                | 2441920.4543                 | 2.7277               |
| 30  | AB Cas           | A3Vv     | 02:37:31.6               | +71:18:16.1 | 10.21               | 2442714.4600                 | 1.3669               |
| 31  | Z Per            | A0       | 02:40:03.2               | +42:11:57.6 | 9.67                | 2445659.2450                 | 3.0563               |
| 32  | DO Cas           | A2II     | 02:41:24.2               | +60:33:11.8 | 8.39                | 2433926.4580                 | 0.6847               |
| 33  | IT Per           | A1       | 02:43:20.0               | +43:43:24.0 | 9.90                | 2429382.9420                 | 1.5337               |
| 34  | RY Per           | B8V      | 02:45:42.1               | +48:08:37.9 | 8.49                | 2427070.7080                 | 6.8636               |
| 35  | TW Cas           | A0V      | 02:45:54.8               | +65:43:35.1 | 8.32                | 2442008.3873                 | 1.4283               |
| 36  | RS Ari           | F8IV     | 02:46:14.1               | +27:52:39.0 | 10.70               | 2452507.4400                 | 8.8032               |
| 37  | SS Cet           | A2       | 02:48:36.3               | +01:48:27.0 | 9.40                | 2442451.3290                 | 2.9740               |
| 38  | RZ Cas           | A3Vv     | 02:48:55.5               | +69:38:03.1 | 6.28                | 2443200.3100                 | 1.1952               |
| 39  | TU Cet           | K2       | 02:59:20.3               | +03:17:18.0 | 10.80               | 2428507.2700                 | 4.3912               |
| 40  | ST Per           | A3V      | 03:00:05.7               | +39:11:25.1 | 9.61                | 2442436.5880                 | 2.6483               |
| 41  | RX Cas           | G3III    | 03:07:45.7               | +67:34:38.6 | 8.64                | 2416250.9100                 | 32.3121              |
| 42  | $\beta$ Per      | B8V      | 03:08:10.1               | +40:57:20.3 | 2.08                | 2445641.5135                 | 2.8673               |
| 43  | AY Per           | B9       | 03:10:25.1               | +50:55:54.3 | 9.80                | 2427152.2500                 | 11.7766              |
| 44  | LX Per           | G5IV     | 03:13:22.3               | +48:06:31.9 | 8.10                | 2427033.1200                 | 8.0382               |
| 45  | RT Per           | F2V      | 03:23:40.4               | +46:34:35.6 | 10.60               | 2433376.0583                 | 0.8494               |
| 46  | AS Eri           | A1V      | 03:32:25.1               | -03:18:47.7 | 8.29                | 2428538.0660                 | 2.6642               |
| 47  | AB Per           | A5       | 03:37:45.2               | +40:45:49.3 | 9.66                | 2422987.2070                 | 7.1603               |
| 48  | WY Per           | A0       | 03:38:24.5               | +42:40:40.0 | 11.50               | 2446002.3600                 | 3.3272               |
| 49  | CD Eri           | A0       | 03:47:46.0               | -08:36:41.4 | 9.51                | 2429910.5670                 | 2.8767               |
| 50  | RY Eri           | G0       | 03:58:58.1               | -17:13:46.6 | 10.30               | 2425621.5800                 | 4.9793               |
|     | -                |          |                          |             |                     |                              |                      |

Table A.2 — Continued

|     | tinued       | ~         | D. J. (2000) |              | (* *)               | 3.6. 7               |                      |
|-----|--------------|-----------|--------------|--------------|---------------------|----------------------|----------------------|
| No. | Stars        | Sp. Type  | RA (2000)    | DEC(2000)    | $\langle V \rangle$ | Min.I <sub>HJD</sub> | P <sub>orb</sub> (d) |
| 51  | λ Tau        | B3V       | 04:00:40.8   | +12:29:25.0  | 3.34                | 2421506.8506         | 3.9529               |
| 52  | RW Tau       | B8Ve      | 04:03:54.3   | +28:07:34.0  | 8.00                | 2445684.2040         | 2.7688               |
| 53  | XZ Per       | G1        | 04:09:27.8   | +46:33:57.0  | 11.40               | 2443507.4774         | 1.1516               |
| 54  | RV Per       | A0        | 04:10:38.0   | +34:15:54.9  | 10.23               | 2442046.9210         | 1.9735               |
| 55  | BZ Eri       | F2        | 04:12:12.6   | -06:01:17.6  | 9.00                | 2425558.4450         | 0.6642               |
| 56  | VX Hyi       | F4        | 04:14:56.1   | -73:22:02.0  | 11.90               | 2425481.5000         | 3.5360               |
| 57  | BN Tau       | _         | 04:15:28.3   | +30:40:59.3  | 10.17               | 2445236.5840         | 4.2543               |
| 58  | RW Per       | A5Ve      | 04:20:16.8   | +42:18:51.9  | 9.77                | 2436701.0854         | 14.1989              |
| 59  | TZ Eri       | A5        | 04:21:40.3   | -06:01:09.4  | 9.80                | 2442414.2630         | 2.6061               |
| 60  | AO Eri       | A2        | 04:32:00.9   | -17:44:47.7  | 10.30               | 2429631.1500         | 9.2982               |
| 61  | AC Tau       | A8        | 04:37:06.4   | +01:40:23.0  | 10.30               | 2445636.5900         | 2.0434               |
| 62  | HU Tau       | B8V       | 04:38:15.8   | +20:41:05.1  | 5.86                | 2441275.3219         | 2.0563               |
| 63  | ET Ori       | G3        | 04:55:34.3   | +01:22:49.6  | 10.13               | 2426684.2830         | 0.9509               |
| 64  | AQ Tau       | A5        | 04:55:57.5   | +27:53:12.0  | 12.00               | 2429651.7740         | 1.2159               |
| 65  | AM Aur       | G5        | 04:56:37.0   | +32:12:11.0  | 9.72                | 2439732.6000         | 14.6172              |
| 66  | EQ Ori       | A0        | 04:57:13.6   | -03:35:59.0  | 10.20               | 2431438.7430         | 1.7461               |
| 67  | RV Pic       | A1V       | 04:57:29.7   | -52:08:45.7  | 9.43                | 2441286.7570         | 3.9718               |
| 68  | RS Cep       | A0V       | 05:06:03.2   | +80:14:52.3  | 10.20               | 2440862.6770         | 12.4201              |
| 69  | SX Aur       | B1:V:ne   | 05:11:42.9   | +42:09:55.3  | 8.39                | 2440162.3355         | 1.2101               |
| 70  | IM Aur       | B7V       | 05:15:29.8   | +46:24:21.5  | 7.96                | 2440515.5465         | 1.2473               |
| 71  | XZ Cam       | A0        | 05:17:12.7   | +75:50:05.3  | 11.40               | 2432468.5030         | 11.0146              |
| 72  | RY Aur       | B9        | 05:18:24.5   | +38:20:38.0  | 11.70               | 2438289.5630         | 2.7254               |
| 73  | X Pic        | A2        | 05:04:56.1   | -53:08:29.0  | 10.70               | 2429112.1690         | 0.8619               |
| 74  | FK Ori       | A2        | 05:05:33.3   | +09:20:01.0  | 11.80               | 2445680.5120         | 1.9475               |
| 75  | FL Ori       | A3V       | 05:07:44.5   | -02:44:56.0  | 11.40               | 2445347.4640         | 1.5510               |
| 76  | FM Ori       | A5        | 05:08:54.4   | +10:33:34.2  | 10.30               | 2425859.5880         | 22.1451              |
| 77  | Z Lep        | F0        | 05:10:09.3   | -14:52:18.0  | 11.00               | 2427424.3110         | 0.9937               |
| 78  | FH Ori       | A2        | 05:23:16.6   | +04:16:45.0  | 10.50               | 2425900.3870         | 2.1512               |
| 79  | FO Ori       | A3        | 05:28:09.7   | +03:37:23.4  | 9.50                | 2431820.6270         | 18.8006              |
| 80  | EY Ori       | A7V:      | 05:31:18.4   | -05:42:13.5  | 9.55                | 2443527.4660         | 16.7878              |
| 81  | FF Ori       | A1        | 05:35:11.3   | +02:56:54.6  | 10.20               | 2432216.3670         | 1.8105               |
| 82  | BM Ori       | B0V       | 05:35:16.4   | -05:23:06.0  | 7.90                | 2440265.3430         | 6.4705               |
| 83  | OS Ori       | A0        | 05:36:20.0   | +08:49:55.0  | 11.50               | 2445386.3490         | 2.3835               |
| 84  | ET Tau       | B8        | 05:37:40.8   | +27:16:16.4  | 8.68                | 2429362.4760         | 5.9969               |
| 85  | GQ Tau       | B9        | 05:41:35.1   | +26:00:21.0  | 11.20               | 2436493.5160         | 1.5318               |
| 86  | RZ Aur       | A0        | 05:49:21.9   | +31:42:11.0  | 11.90               | 2442447.5210         | 3.0106               |
| 87  | SV Tau       | В9        | 05:52:08.2   | +28:06:40.0  | 9.55                | 2434423.7491         | 2.1669               |
| 88  | AM Tau       | B3V       | 05:52:19.2   | +16:17:15.0  | 10.40               | 2445253.4170         | 2.0439               |
| 89  | Z Ori        | B4V       | 05:55:50.9   | +13:41:42.0  | 9.90                | 2425190.7200         | 5.2033               |
| 90  | RS Lep       | A0V       | 05:59:18.4   | -20:13:25.1  | 9.58                | 2436191.1480         | 1.2885               |
| 91  | DN Ori       | A2e       | 06:00:28.4   | +10:13:05.0  | 9.21                | 2435577.1848         | 12.9665              |
| 92  | SV Gem       | В3        | 06:00:41.0   | +24:28:26.0  | 8.34                | 2418662.4880         | 4.0061               |
| 93  | RW Gem       | B6V       | 06:01:28.1   | +23:08:28.0  | 9.61                | 2418302.6550         | 2.8655               |
| 94  | CP Ori       | G0        | 06:07:01.8   | +17:41:58.2  | 10.07               | 2436130.4410         | 5.3205               |
| 95  | $\delta$ Pic | B3III+O9V | 06:10:17.9   | -54:58:07.2  | 4.65                | 2441695.3360         | 1.6725               |
| 96  | RT CMa       | F8        | 06:13:13.5   | -17:39:16.0  | 11.40               | 2426625.5700         | 1.2938               |
| 97  | BO Gem       | A2        | 06:25:02.3   | +17:58:17.0  | 11.30               | 2437027.2690         | 4.0686               |
| 98  | AY Gem       | A0        | 06:31:56.2   | +19:40:12.0  | 10.80               | 2436631.3260         | 3.0536               |
| 99  | BD Gem       | A0        | 06:34:35.1   | +15:33:05.0  | 11.90               | 2427414.5320         | 1.6167               |
| 100 | RW Mon       | B8V+G5IV  | 06:34:45.9   | +08:49:32.2  | 9.29                | 2433680.4481         | 1.9061               |
| 100 | 20,7 171011  | 20110011  | 00.01.10.7   | 1 00.17.02.2 | J.=J                | 55000.7701           | 1.7001               |

Table A.2 — Continued

|     | unuea    | g         | D. I. (2000) | DEG(2000)                  | /T.T\               | 1.6° T               | D (1)             |
|-----|----------|-----------|--------------|----------------------------|---------------------|----------------------|-------------------|
| No. | Stars    | Sp. Type  | RA (2000)    | DEC(2000)                  | $\langle V \rangle$ | Min.I <sub>HJD</sub> | $P_{\rm orb}$ (d) |
| 101 | AK Aur   | A1        | 06:39:17.3   | +31:36:46.0                | 10.55               | 2428126.4810         | 2.3814            |
| 102 | AE Gem   | B9        | 06:47:36.9   | +28:55:16.0                | 10.50               | 2435893.2810         | 1.4568            |
| 103 | RX Gem   | A2        | 06:50:11.6   | +33:14:21.0                | 9.21                | 2440555.7820         | 12.2087           |
| 104 | AF Gem   | A0        | 06:50:39.7   | +21:21:56.0                | 10.54               | 2427162.3095         | 1.2435            |
| 105 | RU Mon   | B9pv      | 06:54:12.3   | -07:35:45.0                | 10.33               | 2441743.2900         | 3.5846            |
| 106 | AU Mon   | B5        | 06:54:54.7   | -01:22:32.9                | 8.17                | 2442801.3752         | 11.1130           |
| 107 | V745 Mon | B8        | 06:55:11.9   | -09:19:16.2                | 7.69                | 2448502.7700         | 3.9744            |
| 108 | AL Gem   | F6V       | 06:57:38.6   | +20:53:33.0                | 9.80                | 2426324.4467         | 1.3913            |
| 109 | HO Mon   | A5        | 07:10:17.2   | +00:25:26.0                | 11.40               | 2429999.3900         | 7.8945            |
| 110 | AQ Mon   | A0        | 07:14:17.7   | -07:13:45.1                | 9.79                | 2425620.3920         | 2.5456            |
| 111 | AG CMa   | F4        | 07:15:47.7   | -26:09:57.0                | 13.90               | 2428059.3550         | 2.6726            |
| 112 | SS Cam   | G1III:    | 07:16:24.7   | +73:19:57.1                | 10.14               | 2442855.6370         | 4.8242            |
| 113 | R CMa    | F2III/IV  | 07:19:28.1   | -16:23:42.0                | 5.78                | 2420213.1330         | 1.1359            |
| 114 | AR Mon   | K0II      | 07:20:48.4   | -05:15:35.7                | 8.75                | 2426606.4080         | 21.2091           |
| 115 | AS Mon   | A2:       | 07:22:25.0   | -08:51:41.0                | 10.70               | 2426721.5690         | 1.8365            |
| 116 | RY Gem   | A2Ve      | 07:27:24.2   | +15:39:35.0                | 8.71                | 2439732.6328         | 9.3006            |
| 117 | AV Mon   | A0        | 07:28:16.1   | -04:36:50.5                | 10.80               | 2426709.1720         | 6.9474            |
| 118 | YY Pup   | B8V       | 07:35:52.3   | -19:23:31.2                | 9.00                | 2424832.5400         | 27.9549           |
| 119 | TX Gem   | A2V       | 07:36:01.3   | +16:54:29.0                | 10.00               | 2419848.4120         | 2.8000            |
| 120 | AK CMi   | A0        | 07:40:15.9   | +03:57:12.0                | 10.10               | 2449396.7070         | 0.5659            |
| 121 | Y Cam    | A7V       | 07:41:11.0   | +76:04:26.1                | 10.54               | 2448502.2480         | 3.3055            |
| 122 | HY Mon   | F8        | 07:44:51.0   | -07:32:49.4                | 11.50               | 2425621.5170         | 7.2827            |
| 123 | RR Pup   | A0        | 07:46:53.1   | -41:22:27.0                | 10.34               | 2429115.5800         | 6.4296            |
| 124 | ZZ Pup   | A4III     | 07:48:26.0   | -19:17:33.9                | 9.07                | 2426783.1070         | 6.3381            |
| 125 | AW Mon   | A2        | 07:48:43.8   | -10:26:41.7                | 10.50               | 2435932.9000         | 20.8200           |
| 126 | V397 Pup | B9V       | 07:49:14.7   | -35:14:35.9                | 5.91                | 2448502.1900         | 3.0046            |
| 127 | TU Mon   | B2Vn      | 07:53:19.8   | -03:02:31.2                | 9.00                | 2434068.1230         | 5.0490            |
| 128 | ZZ Cnc   | A3        | 07:57:06.8   | +10:59:04.0                | 9.40                | 2426770.3500         | 25.5950           |
| 129 | FW Mon   | A2        | 07:57:38.4   | -07:11:22.0                | 9.40                | 2427562.2200         | 3.8736            |
| 130 | V Pup    | B2II/IIIn | 07:58:14.4   | -49:14:41.7                | 4.35                | 2445367.6063         | 1.4545            |
| 131 | BO Mon   | A2        | 07:59:49.2   | -03:28:15.0                | 10.00               | 2443507.5970         | 2.2252            |
| 132 | AA Pup   | F3IV/V    | 08:01:36.1   | -24:43:03.6                | 9.44                | 2425652.5900         | 7.0671            |
| 133 | V635 Mon | F5        | 08:01:44.5   |                            | 7.40                | 2429658.3750         | 1.8078            |
| 134 | XY Pup   | A3        | 08:09:34.7   | -11:59:08.5                | 9.10                | 2426417.8050         | 14.7783           |
| 135 | XZ Pup   | B9.5IV/V  | 08:13:31.1   | -23:57:11.4                | 7.80                | 2442412.1946         | 2.1924            |
| 136 | SX Lyn   | A2        | 08:13:58.1   | +57:15:54.0                | 10.00               | 2445439.4240         | 2.0225            |
| 137 | TY Lyn   | A0        | 08:18:23.6   | +46:16:07.0                | 10.00               | 2426024.3250         | 4.3317            |
| 138 | AI Hya   | F2        | 08:18:46.0   | +00:16:52.0                | 9.35                | 2441726.3872         | 8.2897            |
| 139 | SW Pup   | A0V       | 08:18:50.9   | -42:45:11.3                | 8.87                | 2419282.0680         | 2.7473            |
| 140 | DE Hya   | A2        | 08:27:47.1   | +05:38:38.0                | 11.00               | 2431149.1510         | 4.2277            |
| 141 | SY Hya   | A0:       | 08:29:51.7   | -09:23:57.5                | 10.70               | 2432216.3560         | 3.4029            |
| 142 | VW Hya   | B9III/IV  | 08:33:51.0   | -07.23.37.3<br>-14:40:07.0 | 10.70               | 2426421.4300         | 2.6964            |
| 143 | RU Cnc   | F9V:      | 08:37:30.1   | +23:33:41.6                | 10.14               | 2422650.7160         | 10.1729           |
| 143 | RZ Cnc   | K2III     | 08:39:08.5   | +23.33.41.6                | 8.67                | 2412880.4340         | 21.6431           |
| 144 | RY Cnc   | F2        | 08:39:55.3   | +31.47.44.0 +19:49:20.0    |                     | 2442458.5470         |                   |
| 143 | S Cnc    | B9V       | 08:43:56.2   | +19:49:20.0 +19:02:03.0    | 12.99<br>8.30       | 2442438.3470         | 1.0929            |
|     |          |           |              |                            |                     |                      | 9.4846            |
| 147 | TU Cnc   | A2        | 08:52:16.5   | +09:05:18.0                | 9.90                | 2442050.7344         | 5.5615            |
| 148 | AS Vel   | A6V       | 08:28:18.2   | -38:58:19.2                | 8.51                | 2426454.4400         | 1.5579            |
| 149 | EQ Vel   | B7        | 08:43:46.0   | -45:05:11.0                | 11.00               | 2426507.2858         | 1.0803            |
| 150 | AC UMa   | A2        | 08:55:54.0   | +64:58:12.0                | 10.30               | 2446072.4660         | 6.8549            |

Table A.2 — Continued

|     | Store           | Cn. Truns         | D.A. (2000)              | DEC(2000)   | /17\  | Min I                             | D (d)             |
|-----|-----------------|-------------------|--------------------------|-------------|-------|-----------------------------------|-------------------|
| No. | Stars<br>CW Vel | Sp. Type B5III/IV | RA (2000)                | DEC(2000)   | 9.04  | Min.I <sub>HJD</sub> 2444248.7584 | $P_{\rm orb}$ (d) |
| 151 |                 |                   | 09:02:21.3<br>09:05:41.2 | -52:50:28.9 |       |                                   | 2.3609            |
| 152 | RX Hya          | A2                |                          | -08:15:39.2 | 8.90  | 2443447.7000                      | 2.2816            |
| 153 | WW Cnc          | A8                | 09:09:46.5               | +30:26:46.0 | 10.50 | 2427133.4590                      | 1.1160            |
| 154 | DN Vel          | A0III/IV          | 09:19:37.7               | -45:40:47.8 | 9.38  | 2428450.6900                      | 12.8977           |
| 155 | VZ Leo          | A5                | 09:26:49.2               | +16:36:15.0 | 11.80 | 2431164.3160                      | 1.0899            |
| 156 | RX Vel          | A2                | 09:27:32.6               | -51:04:15.5 | 9.68  | 2429243.2720                      | 3.1118            |
| 157 | TY Hya          | A0                | 09:29:02.8               | +05:34:32.0 | 10.50 | 2434478.4640                      | 4.6611            |
| 158 | KQ Car          | B8III/IV          | 09:29:19.5               | -60:51:22.0 | 10.20 | 2430868.2250                      | 2.3184            |
| 159 | XZ UMa          | A5                | 09:31:24.5               | +49:28:03.0 | 10.10 | 2446168.4260                      | 1.2223            |
| 160 | S Vel           | A5m               | 09:33:13.2               | -45:12:31.0 | 7.79  | 2427612.3560                      | 5.9336            |
| 161 | FU Vel          | A0                | 09:33:50.6               | -55:55:06.1 | 9.80  | 2428655.2250                      | 2.4468            |
| 162 | Y Leo           | A3V               | 09:36:51.8               | +26:13:57.7 | 10.09 | 2445436.4510                      | 1.6861            |
| 163 | VV UMa          | A2V               | 09:38:06.7               | +56:01:07.2 | 10.13 | 2445818.3365                      | 0.6874            |
| 164 | RT Leo          | A0                | 09:45:22.3               | +19:54:21.0 | 10.30 | 2423844.0370                      | 7.4479            |
| 165 | UU Leo          | A2                | 09:47:50.2               | +12:59:09.0 | 11.40 | 2445397.4560                      | 1.6797            |
| 166 | T LMi           | A0                | 09:48:28.5               | +33:17:19.6 | 10.85 | 2445397.3680                      | 3.0199            |
| 167 | DX Vel          | A5                | 09:51:46.0               | -50:53:23.7 | 10.08 | 2429037.2690                      | 1.1173            |
| 168 | VY Hya          | A8/A9V            | 10:20:16.0               | -23:09:05.1 | 9.00  | 2423535.6010                      | 2.0012            |
| 169 | TT Vel          | A5                | 10:20:16.5               | -46:14:04.4 | 10.10 | 2428633.3670                      | 2.1084            |
| 170 | AF UMa          | A0                | 10:24:07.8               | +64:07:50.5 | 10.05 | 2426796.3600                      | 5.2576            |
| 171 | EX Car          | G0                | 10:24:59.6               | -63:38:11.0 | 11.14 | 2423997.6410                      | 1.3964            |
| 172 | SW Car          | A0                | 10:26:57.1               | -58:16:34.0 | 10.80 | 2428947.6430                      | 8.1659            |
| 173 | ZZ UMa          | F8                | 10:30:03.2               | +61:48:41.4 | 10.10 | 2435951.4840                      | 2.2993            |
| 174 | TX Leo          | A2V               | 10:35:02.2               | +08:39:01.6 | 5.66  | 2438844.3220                      | 2.4451            |
| 175 | ZZ Vel          | A0V               | 10:37:54.1               | -55:56:37.3 | 9.61  | 2423700.4200                      | 2.8762            |
| 176 | RW UMa          | F9V:              | 11:40:46.4               | +51:59:53.5 | 10.16 | 2445823.4120                      | 7.3282            |
| 177 | TX UMa          | B8V               | 10:45:20.5               | +45:33:58.7 | 6.95  | 2444998.1475                      | 3.0632            |
| 178 | CV Car          | A2                | 10:45:44.4               | -57:55:00.0 | 11.10 | 2425759.7300                      | 14.4149           |
| 179 | CX Car          | A0                | 10:57:35.2               | -58:33:13.0 | 10.00 | 2423909.9140                      | 3.3472            |
| 180 | FP Car          | B5III             | 11:04:35.9               | -62:34:21.0 | 10.10 | 2421725.0480                      | 176.0270          |
| 181 | DE Car          | A0                | 11:06:13.7               | -60:47:33.0 | 11.20 | 2423891.3430                      | 3.7131            |
| 182 | GU Car          | A2                | 11:06:52.3               | -57:14:03.0 | 11.10 | 2428692.4100                      | 3.4906            |
| 183 | TT Hya          | A1III             | 11:13:12.5               | -26:27:54.3 | 7.30  | 2443918.1060                      | 6.9534            |
| 184 | SU Cen          | F2V               | 11:11:09.3               | -47:50:37.3 | 8.98  | 2429253.8300                      | 5.3543            |
| 185 | MN Cen          | B2/B3V            | 11:28:03.0               | -61:24:41.2 | 8.60  | 2424918.5800                      | 3.4891            |
| 186 | BF Cen          | B8                | 11:36:17.0               | -61:28:01.3 | 8.42  | 2424262.2800                      | 3.6933            |
| 187 | V646 Cen        | B8IV              | 11:36:58.8               | -53:12:35.4 | 8.75  | 2443916.1946                      | 2.2466            |
| 188 | MQ Cen          | B5                | 11:44:15.6               | -61:42:59.1 | 9.70  | 2429113.3870                      | 3.6870            |
| 189 | Z Dra           | A5V               | 11:45:29.2               | +72:14:59.0 | 10.67 | 2443499.7360                      | 1.3575            |
| 190 | VZ Cen          | B2III/IV          | 11:52:28.8               | -61:31:26.9 | 8.34  | 2429125.5190                      | 4.9288            |
| 191 | UV Mus          | A2                | 11:54:07.4               | -66:12:19.2 | 9.94  | 2423943.3380                      | 2.0033            |
| 192 | AE Cru          | B7III             | 11:58:34.8               | -61:10:01.0 | 8.97  | 2430399.1140                      | 3.4781            |
| 193 | DZ Mus          | B8/B9IV/V         | 11:59:53.5               | -69:53:04.8 | 8.82  | 2418093.7280                      | 3.2476            |
| 194 | SW Cen          | B9V               | 12:17:47.4               | -49:44:04.1 | 9.83  | 2429236.5910                      | 5.2195            |
| 195 | LP Cen          | A9V               | 12:22:16.9               | -41:46:10.0 | 8.50  | 2424262.2800                      | 3.6933            |
| 196 | UY Vir          | A9IV              | 13:01:53.4               | -19:46:28.4 | 8.02  | 2430020.6670                      | 1.9945            |
| 197 | CT Cen          | A3                | 13:10:43.0               | -58:16:38.7 | 9.49  | 2425438.2060                      | 16.3940           |
| 198 | SS Cen          | B8V               | 13:13:38.5               | -64:09:04.0 | 9.34  | 2429552.4750                      | 2.4787            |
| 199 | UW Vir          | A8IV/V            | 13:15:20.8               | -17:28:16.7 | 8.84  | 2444345.4130                      | 1.8108            |
| 200 | V379 Cen        | B5Vn              | 13:25 21.3               | -59:46:53.3 | 8.82  | 2428402.2300                      | 1.8747            |
|     |                 |                   |                          |             |       |                                   |                   |

Table A.2 — Continued

|     | G                | C T         | D. J. (2000) | DEG(2000)                  | /T 7\               | 1.6: T               | D (1)                |
|-----|------------------|-------------|--------------|----------------------------|---------------------|----------------------|----------------------|
| No. | Stars            | Sp. Type    | RA (2000)    | DEC(2000)                  | $\langle V \rangle$ | Min.I <sub>HJD</sub> | P <sub>orb</sub> (d) |
| 201 | BD Vir           | A8V         | 13:26:40.6   | -16:06:16.4                | 9.96                | 2442538.4130         | 2.5485               |
| 202 | V380 Cen         | B4V         | 13:27:23.4   | -61:52:26.3                | 9.70                | 2427807.6010         | 1.0872               |
| 203 | V402 Cen         | A0          | 13:28:23.3   | -63:35:02.4                | 9.30                | 2428330.3830         | 3.7198               |
| 204 | RU UMi           | A2          | 13:38:56.6   | +69:48:12.0                | 10.00               | 2441596.3365         | 0.5249               |
| 205 | SY Cen           | A5          | 13:41:51.6   | -61:46:10.1                | 10.21               | 2427892.6234         | 6.6314               |
| 206 | T Cir            | B7II/III    | 13:43:24.0   | -65:28:31.8                | 9.69                | 2429095.5860         | 3.2984               |
| 207 | SX Hya           | A5IV/V      | 13:44:37.4   | -26:46:48.3                | 8.60                | 2444344.4510         | 2.8957               |
| 208 | SZ Cen           | A6III       | 13:50:35.1   | -58:29:57.0                | 8.30                | 2441386.7466         | 4.1080               |
| 209 | DL Vir           | A1V         | 13:52:38.8   | -18:42:32.5                | 7.07                | 2438796.5250         | 1.3155               |
| 210 | DM Vir           | F5          | 14:07:52.5   | -11:09:07.5                | 8.80                | 2443583.8810         | 4.6694               |
| 211 | V621 Cen         | B8/B9II/III | 14:02:49.5   | -62:43:23.3                | 9.80                | 2428992.8300         | 3.6836               |
| 212 | AT Cir           | A5IV/Vs     | 14:03:38.3   | -66:44:07.2                | 7.67                | 2415221.8170         | 3.2575               |
| 213 | UW Boo           | F2          | 14:20:59.2   | +47:06:43.0                | 10.40               | 2452500.0434         | 1.0047               |
| 214 | SU Boo           | A4V         | 14:29:21.3   | +32:08:10.0                | 11.96               | 2421071.3970         | 1.5612               |
| 215 | RV Lib           | G7IV        | 14:35:48.4   | -18:02:11.4                | 9.19                | 2430887.2360         | 10.7222              |
| 216 | DT Lup           | A0V         | 14:36:35.8   | -51:24:49.2                | 9.95                | 2427897.6290         | 1.4531               |
| 217 | BW Boo           | F0V         | 14:37:08.8   | +35:55:47.1                | 7.16                | 2448501.6200         | 3.3328               |
| 218 | BU Dra           | F5          | 14:58:40.1   | +56:45:07.0                | 10.40               | 2428656.5100         | 3.8284               |
| 219 | $\delta$ Lib     | B9.5V       | 15:00:58.4   | -08:31:08.2                | 4.92                | 2442960.6994         | 2.3274               |
| 220 | RR Nor           | B9V         | 15:12:31.8   | -55:18:50.0                | 9.60                | 2444433.5976         | 1.5138               |
| 221 | TY UMi           | F0          | 15:17:57.5   | +83:51:34.1                | 7.79                | 2448500.2764         | 1.7248               |
| 222 | U CrB            | B7Vv        | 15:18:11.4   | +31:38:49.5                | 7.81                | 2448501.3910         | 3.4525               |
| 223 | CX Ser           | F8          | 15:23:35.3   | +02:35:17.0                | 12.30               | 2431213.4900         | 0.9973               |
| 224 | TW Dra           | A5          | 15:33:51.0   | +63:54:26.0                | 7.41                | 2444136.2950         | 2.8068               |
| 225 | EI Lib           | A5          | 15:34:21.8   | -23:00:03.1                | 9.54                | 2430869.3100         | 1.9869               |
| 226 | RW CrB           | A8Vv        | 15:39:15.2   | +29:37:19.7                | 10.26               | 2448500.3490         | 0.7264               |
| 227 | HH Nor           | F0          | 15:43:30.1   | -51:50:48.4                | 9.70                | 2427114.2350         | 8.5831               |
| 228 | SS Lib           | A8/A9II     | 15:49:05.1   | -15:32:08.6                | 10.43               | 2441155.6600         | 1.4380               |
| 229 | AO Ser           | A2          | 15:58:18.4   | +17:16:09.9                | 10.34               | 2434133.4640         | 0.8793               |
| 230 | Z Nor            | B3IV        | 16:04:57.1   | -46:17:37.4                | 9.06                | 2443343.9897         | 2.5569               |
| 231 | W UMi            | A2V         | 16:08:27.4   | +86:11:59.4                | 8.65                | 2443392.4794         | 1.7012               |
| 232 | EQ TrA           | F3V         | 16:10:00.0   | -66:09:30.2                | 8.90                | 2441100.0060         | 2.7091               |
| 233 | SW Oph           | A0          |              | -06.07.30.2 $-06:58:43.8$  | 9.39                | 2438957.3550         | 2.4460               |
| 234 | CC Her           | A0<br>A2    | 16:17:38.9   | +08:56:02.8                | 9.65                | 2439668.3420         | 1.7340               |
| 235 | RR TrA           | B8          | 16:17:38.9   | -62:44:14.8                | 10.36               | 2435629.3693         | 0.7131               |
|     |                  |             | 16:20:26.6   | -02.44.14.8<br>+18:27:16.9 |                     | 2442522.9320         |                      |
| 236 | CT Her<br>FN Her | A0<br>A8    | 16:25:13.4   | +18.27.10.9                | 11.32<br>10.50      | 2428309.2940         | 1.7864               |
| 237 | SY Ara           |             |              | +11.18.00.0 $-54:45:09.0$  | 10.30               |                      | 2.6913               |
| 238 |                  | A0          | 16:35:21.4   |                            |                     | 2425631.3770         | 1.8566               |
| 239 | R Ara            | B9IV/V      | 16:39:44.7   | -56:59:39.8                | 6.56                | 2425818.0280         | 4.4251               |
| 240 | AL Sco           | F2          | 16:48:13.1   | -32:56:42.3                | 11.01               | 2425086.1350         | 1.5322               |
| 241 | μ Sco            | B1.5Vp      | 16:51:52.2   | -38:02:50.4<br>+52:41:54.0 | 2.89                | 2432001.0450         | 1.4463               |
| 242 | AI Dra           | A0V         | 16:56:18.2   | +52:41:54.0                | 7.08                | 2443291.6270         | 1.1988               |
| 243 | V359 Her         | F0          | 16:56:28.7   | +37:39:18.9                | 9.71                | 2443673.4320         | 1.7557               |
| 244 | UU Oph           | A1IV        | 16:57:22.7   | -25:47:58.5                | 10.00               | 2420750.4890         | 4.3968               |
| 245 | V594 Sco         | F0          | 17:00:24.6   | -41:42:39.2                | 10.60               | 2428720.4100         | 3.6329               |
| 246 | V735 Oph         | A0          | 17:07:49.0   | +09:33:09.2                | 10.30               | 2426894.5170         | 3.2052               |
| 247 | TU Her           | A5          | 17:13:35.4   | +30:42:36.0                | 10.38               | 2444061.4620         | 2.2670               |
| 248 | FV Sco           | B6V         | 17:13:45.0   | -32:51:09.2                | 7.97                | 2448504.3800         | 5.7279               |
| 249 | SZ Oph           | A5          | 17:15:02.8   | -08:03:27.5                | 10.70               | 2445485.4620         | 3.7085               |
| 250 | $\mu$ Her        | M7III       | 17:17:19.6   | +33:06:00.4                | 4.73                | 2405830.0326         | 2.0510               |

Table A.2 — Continued

|     | minued      |             |            |                            | 4                   |                      |                   |
|-----|-------------|-------------|------------|----------------------------|---------------------|----------------------|-------------------|
| No. | Stars       | Sp. Type    | RA (2000)  | DEC(2000)                  | $\langle V \rangle$ | $Min.I_{\mbox{HJD}}$ | $P_{\rm orb}$ (d) |
| 251 | V441 Oph    | A0          | 17:20:52.7 | -17:20:05.3                | 11.60               | 2435663.8210         | 3.0585            |
| 252 | DW Aps      | B6III       | 17:23:30.0 | -67:55:44.8                | 8.88                | 2439209.5020         | 2.3129            |
| 253 | V535 Oph    | A3          | 17:32:10.0 | -29:25:56.0                | 11.30               | 2427959.5050         | 6.0553            |
| 254 | RV Oph      | A3V         | 17:34:34.9 | +07:14:49.2                | 9.42                | 2423997.3833         | 3.6871            |
| 255 | RW Ara      | A1IV        | 17:34:49.2 | -57:08:50.6                | 8.67                | 2441861.8801         | 4.3672            |
| 256 | SZ Her      | F0Vv        | 17:39:36.8 | +32:56:46.6                | 9.95                | 2441864.3052         | 0.8181            |
| 257 | V806 Oph    | F8          | 17:40:56.0 | -16:57:35.0                | 11.60               | 2434216.6700         | 15.4065           |
| 258 | AK Ser      | A5          | 17:42:04.4 | -13:53:11.7                | 10.30               | 2446255.4620         | 1.9226            |
| 259 | V496 Sco    | F5          | 17:43:02.9 | -32:22:15.0                | 11.50               | 2427299.3400         | 2.1926            |
| 260 | BN Sgr      | F3V         | 17:47:05.4 | -28:08:59.6                | 9.11                | 2435370.4930         | 2.5197            |
| 261 | UW Ara      | A0V         | 17:47:34.5 | -48:44:51.0                | 9.20                | 2419760.4100         | 3.2971            |
| 262 | V393 Sco    | B3III       | 17:48:47.6 | -35:03:25.6                | 7.45                | 2448504.9700         | 7.7125            |
| 263 | MX Her      | F5          | 17:50:51.0 | +50:02:47.0                | 11.40               | 2431657.4110         | 2.3477            |
| 264 | V338 Her    | F2V         | 17:53:12.7 | +43:46:23.3                | 10.15               | 2443691.1230         | 1.3057            |
| 265 | UX Her      | A0V         | 17:54:07.9 | +16:56:37.7                | 8.96                | 2439672.3785         | 1.5488            |
| 266 | BS Sco      | F8          | 17:55:04.4 | -31:38:34.8                | 11.50               | 2439301.4680         | 7.6224            |
| 267 | V913 Oph    | A0          | 17:55:12.8 | +14:08:34.0                | 11.50               | 2445414.6200         | 1.9173            |
| 268 | V453 Sco    | B0Ia        | 17:56:16.1 | -32:28:30.0                | 6.36                | 2442218.7400         | 12.0060           |
| 269 | V391 Oph    | A1          | 17:58:09.2 | +04:39:46.0                | 11.50               | 2445518.5460         | 2.8956            |
| 270 | RW CrA      | B9III       | 17:59:20.3 | -37:52:52.6                | 9.41                | 2448501.4968         | 1.6836            |
| 271 | WX Sgr      | A2III/IV    | 17:59:24.2 | -17:23:55.0                | 9.13                | 2445518.5420         | 2.1293            |
| 272 | WY Sgr      | B4III       | 18:00:58.7 | -23:01:56.0                | 9.38                | 2428752.2200         | 4.6704            |
| 273 | W Ser       | G0/G1Iape   | 18:09:50.7 | -15:33:00.3                | 8.72                | 2426625.4930         | 14.1549           |
| 274 | XY Sgr      | A0          | 18:11:05.4 | -16:28:05.0                | 10.70               | 2419979.3730         | 2.0229            |
| 275 | RS Sgr      | B3V         | 18:17:36.3 | -34:06:26.0                | 6.00                | 2420586.3870         | 2.4157            |
| 276 | V501 Oph    | A5          | 18:18:35.6 | +14:13:42.8                | 10.90               | 2430911.3950         | 0.9680            |
| 277 | TZ CrA      | A1III/IV    | 18:18:48.3 | -43:21:37.2                | 9.60                | 2436080.0350         | 0.6867            |
| 278 | IS CrA      | A2          | 18:19:37.9 | -38:04:29.0                | 10.90               | 2431293.2140         | 3.2366            |
| 279 | XZ Sgr      | A2/A3IV:    | 18:22:06.8 | -25:14:23.7                | 8.92                | 2441890.6201         | 3.2756            |
| 280 | TZ Dra      | A7V:        | 18:22:11.6 | +47:34:08.0                | 9.60                | 2442966.4820         | 0.8660            |
| 281 | RZ Dra      | A6V         | 18:23:05.4 | +58:54:13.0                | 10.21               | 2444177.5555         | 0.5509            |
| 282 | RY Sct      | B1IIIpe     | 18:25:31.5 | -12:41:24.2                | 9.16                | 2443342.4200         | 11.1247           |
| 283 | RZ Sct      | B3Ib        | 18:26:33.5 | -09:12:06.0                |                     | 2419261.1025         | 15.1902           |
| 284 | EW Lyr      | F0          | 18:33:15.6 | +37:45:12.8                | 11.20               | 2426499.6970         | 1.9487            |
| 285 | V681 CrA    | B9V         | 18:37:39.6 | -42:57:19.7                | 7.63                | 2448500.7800         | 2.1639            |
| 286 | DV Sgr      | A0          | 18:39:36.3 | -22:40:43.5                | 10.14               | 2431281.2150         | 1.8628            |
| 287 | BO Her      | A0<br>A7    | 18:40:30.1 | -22.40.43.3<br>+24:55:42.8 | 10.14               | 2434193.4950         | 4.2728            |
| 288 | RR Dra      | A2          | 18:41:47.4 | +24.33.42.8<br>+62:40:35.0 | 10.00               | 2444483.3910         | 2.8313            |
| 289 | RV Tel      | A2/A3III/IV | 18:43:37.4 | -51:37:49.5                | 10.30               | 2418641.1876         | 8.3281            |
| 290 | RZ Oph      | F3Ibe       | 18:45:46.4 | +07:13:12.3                | 9.65                | 2442204.3900         | 261.9277          |
| 291 | AC Sct      | B9          |            |                            |                     |                      |                   |
|     |             |             | 18:46:01.6 | -10:14:57.0                | 10.00               | 2428817.1430         | 4.7976            |
| 292 | SX Sgr      | A9V         | 18:46:05.3 | -30:29:20.4                | 9.26                | 2444048.1610         | 4.1541            |
| 293 | CX Dra      | B2.5Ve      | 18:46:43.1 | +52:59:17.0                | 5.68                | -<br>2441997 4724    | 2 06/11           |
| 294 | KO Aql      | A0          | 18:47:10.7 | +10:45:49.4                | 8.30                | 2441887.4724         | 2.8641            |
| 295 | DH Her      | A5          | 18:47:34.6 | +22:50:45.8                | 10.01               | 2426575.4560         | 4.7792            |
| 296 | V356 Sgr    | B9III       | 18:47:52.3 | -20:16:28.2                | 6.90                | 2433900.8270         | 8.8961            |
| 297 | RS Sct      | G0          | 18:49:11.3 | -10:14:27.9                | 9.90                | 2444437.1658         | 0.6642            |
| 298 | ZZ Sgr      | A2III/IV    | 18:49:42.1 | -34:40:59.5                | 9.70                | 2443344.9859         | 3.0835            |
| 299 | AD Her      | G5          | 18:50:00.3 | +20:43:16.6                | 9.38                | 2439001.1348         | 9.7666            |
| 300 | $\beta$ Lyr | B7Ve        | 18:50:04.8 | +33:21:45.6                | 3.37                | 2441539.5500         | 12.9138           |

Table A.2 — Continued

| No.   Stars   Sp. Type   |     | itiliucu |          |            |             |                     |                      |                        |
|--|-----|----------|----------|------------|-------------|---------------------|----------------------|------------------------|
| BS   Ber   Belli   Bis   Bis   50.49.8   -24.43:12.0   8.50   2452856.3646   1.6374     303   BF Dra   F8   Bis   50.59.3   +60.52:57.0   9.82   244727.63948   11.2111     305   U Sct   A9   Bis   Bis   27.2   -12.36:35.4   9.88   2444468.6658   0.9550     306   CT Sct   B9   Bis   Bis   24.21.6   -06:00:16.8   10.02   2428727.3740   4.9536     307   KP Aql   A3   19:02:29.9   +15:48:01.1   9.70   2428727.3740   4.9536     308   FK Aql   B9   19:04:18.6   +02:46:47.1   11.10   2437786.0790   2.6509     309   BL Tel   FS   FS   19:06:38.1   -51:25:03.2   7.09   2434692.6000   778.6000     310   FL Lyr   GOV   19:12:04.9   +46:19:26.5   9.27   2438221.5525   2.1782     311   Y554 Sgr   F8   19:14:01.7   +49:05:42.0   11.30   2426631.1480   8.5793     312   V474 Cyg   F8   19:14:01.7   +49:05:42.0   11.30   2426631.1480   8.5793     313   BO Sgr   AlIII/IV   19:14:14.9   -36:14:39.8   9.21   2422224.3780   8.0195     314   EG Sgr   AO/A1IV:   19:14:23.8   -14:11:16.0   11.20   2427395.7710   2.4862     315   RV Lyr   A5:   19:16:17.6   +32:25:11.0   11.50   2445526.4310   3.5991     316   YZ Aql   A3   19:16:46.2   -00:36:17.1   10.50   2434222.6390   4.6723     317   V342 Aql   A3I   19:17:03.5   -00:20:38.5   9.50   2433280.8570   4.4777     319   V409 Aql   F5   19:17:58.5   -00:40:54.0   11.50   2425503.3850   2.0494     320   U Sge   B8III   19:18:48.4   +19:36:37.7   6.50   241710.4114   3.3806     321   UZ Lyr   A2   19:21:39.1   +25:34:29.5   7.28   2442947.4777   2.4549     322   Z Vul   B4V   19:21:39.1   +25:34:29.5   7.28   2442947.4777   2.4549     323   V753 Cyg   F8   19:26:47.9   +50:08:43.0   7.46   244380.02600   4.9336     326   TT Lyr   B2V   19:26:11.6   +20:59:12.0   10.20   243898.1530   0.9964     327   V2080 Cyg   F5   19:26:47.9   +50:08:43.0   7.46   2444981.3780   1.7072     328   V415 Aql   B9V   19:38:53.2   +28:16:44.0   9.30   244389.1980   0.9941     331   V343 Aql   B9V   19:38:53.2   +28:16:44.0   9.30   243499.13780   1.7072     329   V909 Cyg   A0   19:48:41.9   +31:30:20.8   | No. | Stars    | Sp. Type | RA (2000)  | DEC(2000)   | $\langle V \rangle$ | $Min.I_{\mbox{HJD}}$ | $P_{\mathrm{orb}}$ (d) |
| BF Dra   | 301 | BC Her   | A2       | 18:50:41.2 | +12:29:46.0 | 11.80               | 2436483.4240         | 3.0873                 |
| BS Sct   | 302 | HS Her   | B6III    | 18:50:49.8 | +24:43:12.0 | 8.50                | 2452856.3646         | 1.6374                 |
| 305         U Sct         A9         18:54:27.2         -12:36:35.4         9.88         2444468.6658         0.9550           306         CT Sct         B9         18:54:21.6         -06:00:16.8         10.02         2428727.3740         49:336           307         KPAql         B9         19:04:18.6         +02:46:47.1         11.10         2437786.0790         2.6509           309         BL Tel         FSlab/lb         19:06:38.1         -51:25:03.2         7.09         2434692.6000         778.6000           310         FL Lyr         GOV         19:12:04.9         +46:19:26.5         9.27         2438221.5525         2.1782           311         Y354 Sgr         F8         19:14:01.7         +49:05:42.0         11.30         2426631.1480         8.5793           312         V474 Cyg         F8         19:14:01.7         +49:05:42.0         11.30         2426631.1480         24:6588           313         BG Sgr         AlIIII/V         19:14:14.9         -36:14:39.8         9.21         24222243780         8.0195           314         EG Sgr         AlVAH         51:14:10.0         +10.50         2427395.7710         2.4862           317         V342 Aql         AlII         19:1   | 303 | BF Dra   | F8       | 18:50:59.3 | +69:52:57.0 | 9.82                | 2447276.3948         | 11.2111                |
| CT Sct   | 304 | BS Sct   | A7       | 18:52:05.8 | -06:14:37.0 | 11.00               | 2440148.6200         | 3.8210                 |
| 307         KP Aql         A3         19:02:29.9         +15:48:01.1         9.70         245:2500.5670         3.3675           308         FK Aql         B9         19:04:18.6         +02:46:47.1         11.10         2437786.0790         2.6509           310         FL Lyr         GOV         19:12:04.9         +46:19:26.5         9.27         24348221.5525         2.1782           311         V354 Sgr         F8         19:13:23.4         -18:29:00.1         10.70         2431281.3400         8.5793           312         V474 Cyg         F8         19:14:01.7         +49:05:42.0         11.30         2426631.1480         24.6588           313         BQ Sgr         A1III/V         19:14:14.9         -36:14:39.8         9.21         2422224.3780         8.0195           314         EG Sgr         A0/AIIV:         19:14:23.8         -14:11:16.0         11.20         2479395.7710         2.4862           315         RV Lyr         A5:         19:16:17.6         +32:25:11.0         11.50         2434222.6390         4.6723           316         YZ Aql         A3         19:17:03.5         +09:20:38.5         9.50         2439318.5810         3.3909           318         RS Vul  | 305 | U Sct    | A9       | 18:54:27.2 | -12:36:35.4 | 9.88                | 2444468.6658         | 0.9550                 |
| 308         FK AqI         B9         19:04:18.6         +02:46:47.1         11.10         2437786.0790         2.6509           309         BL Tel         F5lab/lb         19:06:38.1         -51:25:03.2         7.09         2434692.0000         778.6000           310         FL Lyr         GOV         19:12:04.9         +46:19:26.5         9.27         2438221.5525         2.1782           311         V354 Sgr         F8         19:13:23.4         -18:29:00.1         10.70         2431281.3400         8.5793           312         V474 Cyg         F8         19:14:01.7         +49:05:42.0         11.30         2426631.1480         24.6588           313         BQ Sgr         AIIII/IV         19:14:14.9         -36:14:39.8         9.21         2422224.3780         8.0195           315         RV Lyr         A5:         19:16:17.6         +32:25:11.0         11.50         243525.64310         3.5991           316         YZ Aql         A3         19:16:17.6         +32:25:11.0         11.50         2432226.390         4.6723           317         V342 Aql         A4III         19:17:03.5         +00:30:38.5         9.50         2439318.5810         3.3991           318         V409 Aql   | 306 | CT Sct   | B9       | 18:54:21.6 | -06:00:16.8 | 10.02               | 2428727.3740         | 4.9536                 |
| BL Tel   | 307 | KP Aql   | A3       | 19:02:29.9 | +15:48:01.1 | 9.70                | 2452500.5670         | 3.3675                 |
| STOCK   STOC | 308 | FK Aql   | B9       | 19:04:18.6 | +02:46:47.1 | 11.10               | 2437786.0790         | 2.6509                 |
| 311  | 309 | BL Tel   | F5Iab/Ib | 19:06:38.1 | -51:25:03.2 | 7.09                | 2434692.6000         | 778.6000               |
| 312  | 310 | FL Lyr   | G0V      | 19:12:04.9 | +46:19:26.5 | 9.27                | 2438221.5525         | 2.1782                 |
| 313         BQ Sgr         AIIII/IV         19:14:14.9         -36:14:39.8         9.21         2422224.3780         8.0195           314         EG Sgr         AO/AIIV:         19:14:23.8         -14:11:16.0         11:20         2427395.7710         2.4862           315         RV Lyr         A5:         19:16:17.6         +32:25:11.0         11.50         243522.6390         4.6723           316         YZ Aql         A3         19:16:46.2         -00:36:17.1         10.50         2434222.6390         4.6723           317         Y342 Aql         A4III         19:17:03.5         +09:20:38.5         9.50         2439318.5810         3.3909           318         RS Vul         B5V         19:17:58.5         -00:40:54.0         11.50         2425503.3850         2.0494           320         U Sge         B8III         19:18:48.4         +19:36:37.7         6.50         2417130.4114         3.3806           321         UZ Lyr         A2         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2454           322         Zvul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2454           322         Yvl         B4  | 311 | V354 Sgr | F8       | 19:13:23.4 | -18:29:00.1 | 10.70               | 2431281.3400         | 8.5793                 |
| 314         EG Sgr         A0/A1IV:         19:14:23.8         -14:11:16.0         11.20         2427395.7710         2.4862           315         RV Lyr         A5:         19:16:17.6         +32:25:11.0         11.50         244526.4310         3.5991           316         YZ Aql         A3         19:16:46.2         -00:36:17.1         10.50         2434222.6390         4.6723           317         V342 Aql         A4III         19:17:03.5         +09:20:38.5         9.50         2439318.5810         3.3909           318         RS Vul         B5V         19:17:58.5         -00:40:54.0         11.50         2425503.3850         2.0494           320         U Sge         B8III         19:18:48.4         +19:36:37.7         6.50         2417130.4114         3.3806           321         UZ Lyr         A2         19:21:89.9         +37:56:11.5         9.92         2443689.9415         1.8913           322         Z Vul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         24549           323         V763 Cyg         F8         19:22:47.1         +48:12:11.0         11.20         243804.4651         0.9524           324         V687 Cyg         A0 </td <td>312</td> <td>V474 Cyg</td> <td>F8</td> <td>19:14:01.7</td> <td>+49:05:42.0</td> <td>11.30</td> <td>2426631.1480</td> <td>24.6588</td>  | 312 | V474 Cyg | F8       | 19:14:01.7 | +49:05:42.0 | 11.30               | 2426631.1480         | 24.6588                |
| 315         RV Lyr         A5:         19:16:17.6         +32:25:11.0         11.50         2445526.4310         3.5991           316         YZ Aql         A3         19:16:46.2         -00:36:17.1         10.50         2434222.6390         4.6723           317         V342 Aql         A4III         19:17:30.5         +09:20:38.5         9.50         2439318.5810         3.909           318         RS Vul         B5V         19:17:40.0         +22:26:28.4         6.85         2432808.2570         4.4773           319         V409 Aql         F5         19:17:58.5         -00:40:54.0         11.50         2425503.3850         2.0494           320         USge         B8III         19:18:48.4         +10:36:37.7         6.50         2417130.4114         3.3806           321         UZ Lyr         A2         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2.4549           322         Zvul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2.4549           323         V687 Cyg         A0         19:26:41.6         +29:59:12.0         10.20         24448500.620         49:36           324         V687 Cyg         A0   | 313 | BQ Sgr   | A1III/IV | 19:14:14.9 | -36:14:39.8 | 9.21                | 2422224.3780         | 8.0195                 |
| 316         YZ Aql         A3         19:16:46.2         -00:36:17.1         10.50         2434222.6390         4.6723           317         V342 Aql         A4III         19:17:03.5         +09:20:38.5         9.50         2439318.5810         3.3909           318         RS Vul         B5V         19:17:40.0         +22:26:28.4         6.85         2432808.2570         4.4777           319         V409 Aql         F5         19:17:58.5         -00:40:54.0         11.50         2425503.3850         2.0494           320         U Sge         B8III         19:18:48.4         +19:36:37.7         6.50         2417130.4114         3.3806           321         UZ Lyr         A2         19:21:08.9         +37:56:11.5         9.92         2443689.9415         1.8913           322         Z Vul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2.4549           323         V753 Cyg         F8         19:22:47.1         +48:12:11.0         11.20         2433804.4651         0.9524           324         V687 Cyg         A0         19:26:41.6         +29:59:12.0         10.20         2444810.0         1.7072           325         V2080 Cyg         F5  | 314 | EG Sgr   | A0/A1IV: | 19:14:23.8 | -14:11:16.0 | 11.20               | 2427395.7710         | 2.4862                 |
| 317         V342 Aql         A4III         19:17:03.5         +09:20:38.5         9.50         2439318.5810         3.3909           318         RS Vul         B5V         19:17:40.0         +22:26:28.4         6.85         2432808.2570         4.4777           319         V409 Aql         F5         19:17:58.5         -00:40:54.0         11.50         2425503.3850         2.0494           320         U Sge         B8III         19:18:48.4         +19:36:37.7         6.50         2417130.4114         3.3806           321         UZ Lyr         A2         19:21:08.9         +37:56:11.5         9.92         2443689.9415         1.8913           322         Z Vul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         24549           323         V753 Cyg         F8         19:22:47.1         +48:12:11.0         11.20         2438804.4651         0.9524           324         V687 Cyg         A0         19:26:41.9         +50:08:43.0         7.46         2448500.6200         49:336           326         TT Lyr         B2V         19:27:36.3         +41:20:5.5         9.10         2438605.2644         52:437           327         XzVul         G0  | 315 | RV Lyr   | A5:      | 19:16:17.6 | +32:25:11.0 | 11.50               | 2445526.4310         | 3.5991                 |
| 318         RS Vul         B5V         19:17:40.0         +22:26:28.4         6.85         2432808.2570         4.4777           319         V409 Aql         F5         19:17:58.5         -00:40:54.0         11.50         2425503.3850         2.0494           320         U Sge         B8III         19:18:48.4         +19:36:37.7         6.50         2417130.4114         3.3806           321         UZ Lyr         A2         19:21:08.9         +37:56:11.5         9.92         2443689.9415         1.8913           322         Z Vul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2.4549           323         V753 Cyg         F8         19:22:47.1         +48:12:11.0         11.20         2433804.4651         0.9524           324         V687 Cyg         A0         19:26:47.9         +50:08:43.0         7.46         2448500.6200         4.9336           326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         2432792.5730         3.0896           328         V415 Aql         F2   | 316 | YZ Aql   | A3       | 19:16:46.2 | -00:36:17.1 | 10.50               | 2434222.6390         | 4.6723                 |
| 319         V409 Aql         F5         19:17:58.5         -00:40:54.0         11.50         2425503.3850         2.0494           320         U Sge         B8III         19:18:48.4         +19:36:37.7         6.50         2417130.4114         3.3806           321         UZ Lyr         A2         19:21:08.9         +37:56:11.5         9.92         2443689.9415         1.8913           322         Z Vul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2.4549           323         V753 Cyg         F8         19:22:47.1         +48:12:11.0         11.20         243804.4651         0.9524           324         V687 Cyg         A0         19:26:11.6         +29:59:12.0         10.20         2444913.2780         0.9524           325         V2080 Cyg         F5         19:26:47.9         +50:08:43.0         7.46         2448500.6200         4.9336           326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:35:53.2         +28:16:44.0         9.30         2445207.5320         2.4627           329         V909 Cyg         A0  | 317 | V342 Aql | A4III    | 19:17:03.5 | +09:20:38.5 | 9.50                | 2439318.5810         | 3.3909                 |
| 320         U Sge         B8III         19:18:48.4         +19:36:37.7         6.50         2417130.4114         3.3806           321         UZ Lyr         A2         19:21:08.9         +37:56:11.5         9.92         2443689.9415         1.8913           322         Z Vul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2.4549           323         V753 Cyg         F8         19:22:47.1         +48:12:11.0         11.20         2433804.4651         0.9524           324         V687 Cyg         A0         19:26:47.9         +50:08:43.0         7.46         2448500.6200         4.9336           326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         243792.5730         3.0896           328         V415 Aql         F2         19:30:43.7         +13:40:20.8         11.10         2428670.5320         2.4627           329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2   | 318 | -        | B5V      | 19:17:40.0 | +22:26:28.4 | 6.85                | 2432808.2570         | 4.4777                 |
| 320         U Sge         B8III         19:18:48.4         +19:36:37.7         6.50         2417130.4114         3.3806           321         UZ Lyr         A2         19:21:08.9         +37:56:11.5         9.92         2443689.9415         1.8913           322         Z Vul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2.4549           323         V753 Cyg         F8         19:22:47.1         +48:12:11.0         11.20         2433804.4651         0.9524           324         V687 Cyg         A0         19:26:47.9         +50:08:43.0         7.46         2448500.6200         4.9336           326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         243792.5730         3.0896           328         V415 Aql         F2         19:30:43.7         +13:40:20.8         11.10         2428670.5320         2.4627           329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2   | 319 | V409 Aql | F5       | 19:17:58.5 | -00:40:54.0 | 11.50               | 2425503.3850         | 2.0494                 |
| 322         Z Vul         B4V         19:21:39.1         +25:34:29.5         7.28         2442947.4777         2.4549           323         V753 Cyg         F8         19:22:47.1         +48:12:11.0         11.20         2433804.4651         0.9524           324         V687 Cyg         A0         19:26:11.6         +29:59:12.0         10.20         2444913.2780         1.7072           325         V2080 Cyg         F5         19:26:47.9         +50:08:43.0         7.46         2448500.6200         4.9336           326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         2432792.5730         3.0896           328         V415 Aql         F2         19:30:43.7         +13:40:20.8         11.10         2428670.5320         2.4627           329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2         19:36:24.8         +26:45:56.6         9.91         2434981.3980         0.9419           331         V343 Aql         B9V <td>320</td> <td>U Sge</td> <td>B8III</td> <td>19:18:48.4</td> <td>+19:36:37.7</td> <td>6.50</td> <td>2417130.4114</td> <td>3.3806</td>   | 320 | U Sge    | B8III    | 19:18:48.4 | +19:36:37.7 | 6.50                | 2417130.4114         | 3.3806                 |
| 323         V753 Cyg         F8         19:22:47.1         +48:12:11.0         11.20         2433804.4651         0.9524           324         V687 Cyg         A0         19:26:11.6         +29:59:12.0         10.20         2444913.2780         1.7072           325         V2080 Cyg         F5         19:26:47.9         +50:08:43.0         7.46         2448500.6200         4.9336           326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         2432792.5730         3.0896           328         V415 Aql         F2         19:30:43.7         +13:40:20.8         11.10         2428670.5320         2.4627           329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2         19:36:24.8         +26:45:56.6         9.91         2434981.3980         0.9419           331         V343 Aql         B9V         19:38:35.2         +12:45:27.2         10.60         2428443.4170         1.8466           332         BR Cyg         A3V </td <td>321</td> <td>UZ Lyr</td> <td>A2</td> <td>19:21:08.9</td> <td>+37:56:11.5</td> <td>9.92</td> <td>2443689.9415</td> <td>1.8913</td>  | 321 | UZ Lyr   | A2       | 19:21:08.9 | +37:56:11.5 | 9.92                | 2443689.9415         | 1.8913                 |
| 324         V687 Cyg         A0         19:26:11.6         +29:59:12.0         10.20         2444913.2780         1.7072           325         V2080 Cyg         F5         19:26:47.9         +50:08:43.0         7.46         2448500.6200         4.9336           326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         2432792.5730         3.0896           328         V415 Aql         F2         19:30:43.7         +13:40:20.8         11.10         2428670.5320         2.4627           329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2         19:36:24.8         +26:45:56.6         9.91         2434981.3980         0.9419           331         V343 Aql         B9V         19:38:35.2         +12:45:27.2         10.60         2428443.4170         1.8446           332         BR Cyg         A3V         19:40:54.8         +46:70:60.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V <td>322</td> <td>Z Vul</td> <td>B4V</td> <td>19:21:39.1</td> <td>+25:34:29.5</td> <td>7.28</td> <td>2442947.4777</td> <td>2.4549</td>   | 322 | Z Vul    | B4V      | 19:21:39.1 | +25:34:29.5 | 7.28                | 2442947.4777         | 2.4549                 |
| 324         V687 Cyg         A0         19:26:11.6         +29:59:12.0         10.20         2444913.2780         1.7072           325         V2080 Cyg         F5         19:26:47.9         +50:08:43.0         7.46         2448500.6200         4.9336           326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         2432792.5730         3.0896           328         V415 Aql         F2         19:30:43.7         +13:40:20.8         11.10         2428670.5320         2.4627           329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2         19:36:24.8         +26:45:56.6         9.91         2434981.3980         0.9419           331         V343 Aql         B9V         19:38:35.2         +12:45:27.2         10.60         2428443.4170         1.8446           332         BR Cyg         A3V         19:40:54.8         +46:70:60.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V <td>323</td> <td>V753 Cyg</td> <td>F8</td> <td>19:22:47.1</td> <td>+48:12:11.0</td> <td>11.20</td> <td>2433804.4651</td> <td>0.9524</td>  | 323 | V753 Cyg | F8       | 19:22:47.1 | +48:12:11.0 | 11.20               | 2433804.4651         | 0.9524                 |
| 325         V2080 Cyg         F5         19:26:47.9         +50:08:43.0         7.46         2448500.6200         4.9336           326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         2432792.5730         3.0896           328         V415 Aql         F2         19:30:43.7         +13:40:20.8         11.10         2428670.5320         2.4627           329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2         19:36:24.8         +26:45:56.6         9.91         2434981.3980         0.9419           331         V343 Aql         B9V         19:38:35.2         +12:45:27.2         10.60         2428443.4170         1.8446           332         BR Cyg         A3V         19:40:54.8         +46:47:06.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V         19:41:05.5         +13:48:56.5         5.93         2440443.4798         2.5133           334         V463 Cyg         A1V <td>324</td> <td></td> <td>A0</td> <td>19:26:11.6</td> <td>+29:59:12.0</td> <td>10.20</td> <td>2444913.2780</td> <td>1.7072</td>  | 324 |          | A0       | 19:26:11.6 | +29:59:12.0 | 10.20               | 2444913.2780         | 1.7072                 |
| 326         TT Lyr         B2V         19:27:36.3         +41:42:05.5         9.10         2438605.2644         5.2437           327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         2432792.5730         3.0896           328         V415 Aql         F2         19:30:43.7         +13:40:20.8         11.10         2428670.5320         2.4627           329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2         19:36:24.8         +26:45:56.6         9.91         2434981.3980         0.9419           331         V343 Aql         B9V         19:38:35.2         +12:45:27.2         10.60         2428443.4170         1.8446           332         BR Cyg         A3V         19:40:54.8         +46:47:06.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V         19:41:05.5         +13:48:56.5         5.93         2440443.4798         2.5133           334         V463 Cyg         A1V         19:42:13.9         +31:18:02.0         10.55         2444081.5080         2.1176           335         V370 Cyg         A5: <td>325</td> <td></td> <td>F5</td> <td>19:26:47.9</td> <td>+50:08:43.0</td> <td>7.46</td> <td>2448500.6200</td> <td>4.9336</td>  | 325 |          | F5       | 19:26:47.9 | +50:08:43.0 | 7.46                | 2448500.6200         | 4.9336                 |
| 327         XZ Vul         G0         19:29:24.3         +27:26:04.6         11.30         2432792.5730         3.0896           328         V415 Aql         F2         19:30:43.7         +13:40:20.8         11.10         2428670.5320         2.4627           329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2         19:36:24.8         +26:45:56.6         9.91         2434981.3980         0.9419           331         V343 Aql         B9V         19:38:35.2         +12:45:27.2         10.60         2428443.4170         1.8446           332         BR Cyg         A3V         19:40:54.8         +46:47:06.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V         19:41:05.5         +13:48:56.5         5.93         2440443.4798         2.5133           334         V463 Cyg         A1V         19:42:13.9         +31:18:02.0         10.55         2444081.5080         2.1176           335         V370 Cyg         A0         19:43:38.0         +32:47:38.0         11.80         2434629.4620         0.7745           336         V959 Cyg         A5:<   |     |          | B2V      | 19:27:36.3 | +41:42:05.5 | 9.10                | 2438605.2644         | 5.2437                 |
| 329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2         19:36:24.8         +26:45:56.6         9.91         2434981.3980         0.9419           331         V343 Aql         B9V         19:38:35.2         +12:45:27.2         10.60         2428443.4170         1.8446           332         BR Cyg         A3V         19:40:54.8         +46:47:06.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V         19:41:05.5         +13:48:56.5         5.93         2440443.4798         2.5133           334         V463 Cyg         A1V         19:42:13.9         +31:18:02.0         10.55         2444081.5080         2.1176           335         V370 Cyg         A0         19:43:38.0         +32:47:38.0         11.80         2434629.4620         0.7745           336         V959 Cyg         A5:         19:43:53.9         +30:19:35.0         11.30         2433922.4120         1.8398           337         SY Cyg         A3v         19:46:34.3         +32:42:19.0         10.70         2420001.5370         6.0055           338         V995 Cyg         B8   |     | -        | G0       | 19:29:24.3 | +27:26:04.6 |                     | 2432792.5730         | 3.0896                 |
| 329         V909 Cyg         A0         19:35:53.2         +28:16:44.0         9.30         2445202.3731         2.8054           330         FR Vul         A2         19:36:24.8         +26:45:56.6         9.91         2434981.3980         0.9419           331         V343 Aql         B9V         19:38:35.2         +12:45:27.2         10.60         2428443.4170         1.8446           332         BR Cyg         A3V         19:40:54.8         +46:47:06.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V         19:41:05.5         +13:48:56.5         5.93         2440443.4798         2.5133           334         V463 Cyg         A1V         19:42:13.9         +31:18:02.0         10.55         2444081.5080         2.1176           335         V370 Cyg         A0         19:43:38.0         +32:47:38.0         11.80         2434629.4620         0.7745           336         V959 Cyg         A5:         19:43:53.9         +30:19:35.0         11.30         2433922.4120         1.8398           337         SY Cyg         A3v         19:46:34.3         +32:42:19.0         10.70         2420001.5370         6.0055           338         V995 Cyg         B8   | 328 | V415 Aql | F2       | 19:30:43.7 | +13:40:20.8 | 11.10               | 2428670.5320         | 2.4627                 |
| 331         V343 Aql         B9V         19:38:35.2         +12:45:27.2         10.60         2428443.4170         1.8446           332         BR Cyg         A3V         19:40:54.8         +46:47:06.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V         19:41:05.5         +13:48:56.5         5.93         2440443.4798         2.5133           334         V463 Cyg         A1V         19:42:13.9         +31:18:02.0         10.55         2444081.5080         2.1176           335         V370 Cyg         A0         19:43:38.0         +32:47:38.0         11.80         2434629.4620         0.7745           336         V959 Cyg         A5:         19:43:53.9         +30:19:35.0         11.30         2433922.4120         1.8398           337         SY Cyg         A3v         19:46:34.3         +32:42:19.0         10.70         2420001.5370         6.0055           338         V995 Cyg         B8         19:48:34.6         +46:13:40.0         11.30         2426352.2500         3.5563           339         V688 Cyg         A0         19:48:41.9         +37:36:16.0         13.80         2432344.1702         6.3034           340         V505 Sgr <t< td=""><td>329</td><td></td><td>A0</td><td>19:35:53.2</td><td>+28:16:44.0</td><td>9.30</td><td>2445202.3731</td><td>2.8054</td></t<>  | 329 |          | A0       | 19:35:53.2 | +28:16:44.0 | 9.30                | 2445202.3731         | 2.8054                 |
| 332         BR Cyg         A3V         19:40:54.8         +46:47:06.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V         19:41:05.5         +13:48:56.5         5.93         2440443.4798         2.5133           334         V463 Cyg         A1V         19:42:13.9         +31:18:02.0         10.55         2444081.5080         2.1176           335         V370 Cyg         A0         19:43:53.9         +30:19:35.0         11.80         2434629.4620         0.7745           336         V959 Cyg         A5:         19:43:53.9         +30:19:35.0         11.30         2433922.4120         1.8398           337         SY Cyg         A3v         19:46:34.3         +32:42:19.0         10.70         2420001.5370         6.0055           338         V995 Cyg         B8         19:48:34.6         +46:13:40.0         11.30         2426352.2500         3.5563           339         V688 Cyg         A0         19:48:41.9         +37:36:16.0         13.80         2432344.1702         6.3034           340         V505 Sgr         A1V         19:53:06.4         -14:36:11.1         6.51         2444461.5907         1.1829           341         V524 Sgr <td< td=""><td>330</td><td>FR Vul</td><td>A2</td><td>19:36:24.8</td><td>+26:45:56.6</td><td>9.91</td><td>2434981.3980</td><td>0.9419</td></td<>   | 330 | FR Vul   | A2       | 19:36:24.8 | +26:45:56.6 | 9.91                | 2434981.3980         | 0.9419                 |
| 332         BR Cyg         A3V         19:40:54.8         +46:47:06.0         9.40         2441539.4654         1.3326           333         QS Aql         B5V         19:41:05.5         +13:48:56.5         5.93         2440443.4798         2.5133           334         V463 Cyg         A1V         19:42:13.9         +31:18:02.0         10.55         2444081.5080         2.1176           335         V370 Cyg         A0         19:43:53.9         +30:19:35.0         11.80         2434629.4620         0.7745           336         V959 Cyg         A5:         19:43:53.9         +30:19:35.0         11.30         2433922.4120         1.8398           337         SY Cyg         A3v         19:46:34.3         +32:42:19.0         10.70         2420001.5370         6.0055           338         V995 Cyg         B8         19:48:34.6         +46:13:40.0         11.30         2426352.2500         3.5563           339         V688 Cyg         A0         19:48:41.9         +37:36:16.0         13.80         2432344.1702         6.3034           340         V505 Sgr         A1V         19:53:06.4         -14:36:11.1         6.51         2444461.5907         1.1829           341         V524 Sgr <td< td=""><td>331</td><td>V343 Aql</td><td>B9V</td><td>19:38:35.2</td><td>+12:45:27.2</td><td>10.60</td><td>2428443.4170</td><td>1.8446</td></td<>   | 331 | V343 Aql | B9V      | 19:38:35.2 | +12:45:27.2 | 10.60               | 2428443.4170         | 1.8446                 |
| 333 QS Aql B5V 19:41:05.5 +13:48:56.5 5.93 2440443.4798 2.5133 334 V463 Cyg A1V 19:42:13.9 +31:18:02.0 10.55 2444081.5080 2.1176 335 V370 Cyg A0 19:43:38.0 +32:47:38.0 11.80 2434629.4620 0.7745 336 V959 Cyg A5: 19:43:53.9 +30:19:35.0 11.30 2433922.4120 1.8398 337 SY Cyg A3v 19:46:34.3 +32:42:19.0 10.70 2420001.5370 6.0055 338 V995 Cyg B8 19:48:34.6 +46:13:40.0 11.30 2426352.2500 3.5563 339 V688 Cyg A0 19:48:41.9 +37:36:16.0 13.80 2432344.1702 6.3034 340 V505 Sgr A1V 19:53:06.4 -14:36:11.1 6.51 2444461.5907 1.1829 341 V524 Sgr F8 19:53:14.5 -14:55:04.0 9.96 2429236.0770 4.1162 342 AB Vul A8 19:53:47.2 +28:56:59.0 12.40 2425145.4670 1.4613 343 V1011 Cyg A0 19:55:14.9 +34:12:29.0 12.20 2433922.3330 3.2394 344 BO Vul F0 19:56:29.1 +23:54:45.0 9.71 2435989.4310 1.9459 345 V548 Cyg A1V 19:56:58.3 +54:47:58.0 8.54 2444456.4958 1.8052 346 WW Cyg B8V 20:04:02.7 +41:35:17.0 10.02 2440377.8860 3.3178 347 GM Cyg B9 20:04:15.8 +38:07:45.0 9.24 2441867.8173 4.5731 349 DE Sge A2 20:07:12.1 +20:49:32.0 11.90 2428717.4450 2.8721  |     | -        | A3V      | 19:40:54.8 | +46:47:06.0 | 9.40                | 2441539.4654         | 1.3326                 |
| 334         V463 Cyg         A1V         19:42:13.9         +31:18:02.0         10.55         2444081.5080         2.1176           335         V370 Cyg         A0         19:43:38.0         +32:47:38.0         11.80         2434629.4620         0.7745           336         V959 Cyg         A5:         19:43:53.9         +30:19:35.0         11.30         2433922.4120         1.8398           337         SY Cyg         A3v         19:46:34.3         +32:42:19.0         10.70         2420001.5370         6.0055           338         V995 Cyg         B8         19:48:34.6         +46:13:40.0         11.30         2426352.2500         3.5563           339         V688 Cyg         A0         19:48:41.9         +37:36:16.0         13.80         2432344.1702         6.3034           340         V505 Sgr         A1V         19:53:06.4         -14:36:11.1         6.51         2444461.5907         1.1829           341         V524 Sgr         F8         19:53:14.5         -14:55:04.0         9.96         2429236.0770         4.1162           342         AB Vul         A8         19:53:47.2         +28:56:59.0         12.40         2425145.4670         1.4613           343         V1011 Cyg         <   | 333 |          | B5V      | 19:41:05.5 | +13:48:56.5 | 5.93                | 2440443.4798         | 2.5133                 |
| 335         V370 Cyg         A0         19:43:38.0         +32:47:38.0         11.80         2434629.4620         0.7745           336         V959 Cyg         A5:         19:43:53.9         +30:19:35.0         11.30         2433922.4120         1.8398           337         SY Cyg         A3v         19:46:34.3         +32:42:19.0         10.70         2420001.5370         6.0055           338         V995 Cyg         B8         19:48:34.6         +46:13:40.0         11.30         2426352.2500         3.5563           339         V688 Cyg         A0         19:48:41.9         +37:36:16.0         13.80         2432344.1702         6.3034           340         V505 Sgr         A1V         19:53:06.4         -14:36:11.1         6.51         2444461.5907         1.1829           341         V524 Sgr         F8         19:53:14.5         -14:55:04.0         9.96         2429236.0770         4.1162           342         AB Vul         A8         19:53:47.2         +28:56:59.0         12.40         2425145.4670         1.4613           343         V1011 Cyg         A0         19:55:14.9         +34:12:29.0         12.20         2433922.3330         3.2394           345         V548 Cyg <t< td=""><td>334</td><td></td><td>A1V</td><td>19:42:13.9</td><td>+31:18:02.0</td><td>10.55</td><td>2444081.5080</td><td>2.1176</td></t<>  | 334 |          | A1V      | 19:42:13.9 | +31:18:02.0 | 10.55               | 2444081.5080         | 2.1176                 |
| 336         V959 Cyg         A5:         19:43:53.9         +30:19:35.0         11.30         2433922.4120         1.8398           337         SY Cyg         A3v         19:46:34.3         +32:42:19.0         10.70         2420001.5370         6.0055           338         V995 Cyg         B8         19:48:34.6         +46:13:40.0         11.30         2426352.2500         3.5563           339         V688 Cyg         A0         19:48:41.9         +37:36:16.0         13.80         2432344.1702         6.3034           340         V505 Sgr         A1V         19:53:06.4         -14:36:11.1         6.51         2444461.5907         1.1829           341         V524 Sgr         F8         19:53:14.5         -14:55:04.0         9.96         2429236.0770         4.1162           342         AB Vul         A8         19:53:47.2         +28:56:59.0         12.40         2425145.4670         1.4613           343         V1011 Cyg         A0         19:55:14.9         +34:12:29.0         12.20         2433922.3330         3.2394           344         BO Vul         F0         19:56:29.1         +23:54:45.0         9.71         2435989.4310         1.9459           345         V548 Cyg         A   |     |          |          |            |             |                     | 2434629.4620         |                        |
| 337         SY Cyg         A3v         19:46:34.3         +32:42:19.0         10.70         2420001.5370         6.0055           338         V995 Cyg         B8         19:48:34.6         +46:13:40.0         11.30         2426352.2500         3.5563           339         V688 Cyg         A0         19:48:41.9         +37:36:16.0         13.80         2432344.1702         6.3034           340         V505 Sgr         A1V         19:53:06.4         -14:36:11.1         6.51         2444461.5907         1.1829           341         V524 Sgr         F8         19:53:14.5         -14:55:04.0         9.96         2429236.0770         4.1162           342         AB Vul         A8         19:53:14.2         +28:56:59.0         12.40         2425145.4670         1.4613           343         V1011 Cyg         A0         19:55:14.9         +34:12:29.0         12.20         2433922.3330         3.2394           344         BO Vul         F0         19:56:29.1         +23:54:45.0         9.71         2435989.4310         1.9459           345         V548 Cyg         A1V         19:56:58.3         +54:47:58.0         8.54         2444456.4958         1.8052           346         WW Cyg         B8V<   |     | V959 Cyg |          | 19:43:53.9 | +30:19:35.0 |                     | 2433922.4120         | 1.8398                 |
| 338         V995 Cyg         B8         19:48:34.6         +46:13:40.0         11.30         2426352.2500         3.5563           339         V688 Cyg         A0         19:48:41.9         +37:36:16.0         13.80         2432344.1702         6.3034           340         V505 Sgr         A1V         19:53:06.4         -14:36:11.1         6.51         2444461.5907         1.1829           341         V524 Sgr         F8         19:53:14.5         -14:55:04.0         9.96         2429236.0770         4.1162           342         AB Vul         A8         19:53:47.2         +28:56:59.0         12.40         2425145.4670         1.4613           343         V1011 Cyg         A0         19:55:14.9         +34:12:29.0         12.20         2433922.3330         3.2394           344         BO Vul         F0         19:56:29.1         +23:54:45.0         9.71         2435989.4310         1.9459           345         V548 Cyg         A1V         19:56:58.3         +54:47:58.0         8.54         2444456.4958         1.8052           346         WW Cyg         B8V         20:04:02.7         +41:35:17.0         10.02         2440377.8860         3.3178           347         GM Cyg         B9 </td <td></td> <td></td> <td>A3v</td> <td>19:46:34.3</td> <td>+32:42:19.0</td> <td></td> <td>2420001.5370</td> <td>6.0055</td>  |     |          | A3v      | 19:46:34.3 | +32:42:19.0 |                     | 2420001.5370         | 6.0055                 |
| 339         V688 Cyg         A0         19:48:41.9         +37:36:16.0         13.80         2432344.1702         6.3034           340         V505 Sgr         A1V         19:53:06.4         -14:36:11.1         6.51         2444461.5907         1.1829           341         V524 Sgr         F8         19:53:14.5         -14:55:04.0         9.96         2429236.0770         4.1162           342         AB Vul         A8         19:53:47.2         +28:56:59.0         12.40         2425145.4670         1.4613           343         V1011 Cyg         A0         19:55:14.9         +34:12:29.0         12.20         2433922.3330         3.2394           344         BO Vul         F0         19:56:29.1         +23:54:45.0         9.71         2435989.4310         1.9459           345         V548 Cyg         A1V         19:56:58.3         +54:47:58.0         8.54         2444456.4958         1.8052           346         WW Cyg         B8V         20:04:02.7         +41:35:17.0         10.02         2440377.8860         3.3178           347         GM Cyg         B9         20:04:15.8         +38:07:45.0         12.00         2432408.5350         4.7457           348         SW Cyg         A2 <td></td> <td></td> <td></td> <td>19:48:34.6</td> <td>+46:13:40.0</td> <td></td> <td>2426352.2500</td> <td></td>  |     |          |          | 19:48:34.6 | +46:13:40.0 |                     | 2426352.2500         |                        |
| 340         V505 Sgr         A1V         19:53:06.4         -14:36:11.1         6.51         2444461.5907         1.1829           341         V524 Sgr         F8         19:53:14.5         -14:55:04.0         9.96         2429236.0770         4.1162           342         AB Vul         A8         19:53:47.2         +28:56:59.0         12.40         2425145.4670         1.4613           343         V1011 Cyg         A0         19:55:14.9         +34:12:29.0         12.20         2433922.3330         3.2394           344         BO Vul         F0         19:56:29.1         +23:54:45.0         9.71         2435989.4310         1.9459           345         V548 Cyg         A1V         19:56:58.3         +54:47:58.0         8.54         2444456.4958         1.8052           346         WW Cyg         B8V         20:04:02.7         +41:35:17.0         10.02         2440377.8860         3.3178           347         GM Cyg         B9         20:04:15.8         +38:07:45.0         12.00         2432408.5350         4.7457           348         SW Cyg         A2         20:06:57.9         +46:17:58.0         9.24         2441867.8173         4.5731           349         DE Sge         A2  |     |          |          | 19:48:41.9 | +37:36:16.0 |                     | 2432344.1702         |                        |
| 341         V524 Sgr         F8         19:53:14.5         -14:55:04.0         9.96         2429236.0770         4.1162           342         AB Vul         A8         19:53:47.2         +28:56:59.0         12.40         2425145.4670         1.4613           343         V1011 Cyg         A0         19:55:14.9         +34:12:29.0         12.20         2433922.3330         3.2394           344         BO Vul         F0         19:56:29.1         +23:54:45.0         9.71         2435989.4310         1.9459           345         V548 Cyg         A1V         19:56:58.3         +54:47:58.0         8.54         2444456.4958         1.8052           346         WW Cyg         B8V         20:04:02.7         +41:35:17.0         10.02         2440377.8860         3.3178           347         GM Cyg         B9         20:04:15.8         +38:07:45.0         12.00         2432408.5350         4.7457           348         SW Cyg         A2         20:06:57.9         +46:17:58.0         9.24         2441867.8173         4.5731           349         DE Sge         A2         20:07:12.1         +20:49:32.0         11.90         2428717.4450         2.8721  |     |          |          | 19:53:06.4 | -14:36:11.1 |                     | 2444461.5907         |                        |
| 342       AB Vul       A8       19:53:47.2       +28:56:59.0       12.40       2425145.4670       1.4613         343       V1011 Cyg       A0       19:55:14.9       +34:12:29.0       12.20       2433922.3330       3.2394         344       BO Vul       F0       19:56:29.1       +23:54:45.0       9.71       2435989.4310       1.9459         345       V548 Cyg       A1V       19:56:58.3       +54:47:58.0       8.54       2444456.4958       1.8052         346       WW Cyg       B8V       20:04:02.7       +41:35:17.0       10.02       2440377.8860       3.3178         347       GM Cyg       B9       20:04:15.8       +38:07:45.0       12.00       2432408.5350       4.7457         348       SW Cyg       A2       20:06:57.9       +46:17:58.0       9.24       2441867.8173       4.5731         349       DE Sge       A2       20:07:12.1       +20:49:32.0       11.90       2428717.4450       2.8721  | 341 | _        |          | 19:53:14.5 | -14:55:04.0 | 9.96                | 2429236.0770         | 4.1162                 |
| 343         V1011 Cyg         A0         19:55:14.9         +34:12:29.0         12.20         2433922.3330         3.2394           344         BO Vul         F0         19:56:29.1         +23:54:45.0         9.71         2435989.4310         1.9459           345         V548 Cyg         A1V         19:56:58.3         +54:47:58.0         8.54         2444456.4958         1.8052           346         WW Cyg         B8V         20:04:02.7         +41:35:17.0         10.02         2440377.8860         3.3178           347         GM Cyg         B9         20:04:15.8         +38:07:45.0         12.00         2432408.5350         4.7457           348         SW Cyg         A2         20:06:57.9         +46:17:58.0         9.24         2441867.8173         4.5731           349         DE Sge         A2         20:07:12.1         +20:49:32.0         11.90         2428717.4450         2.8721   |     | _        |          |            |             |                     | 2425145.4670         |                        |
| 344       BO Vul       F0       19:56:29.1       +23:54:45.0       9.71       2435989.4310       1.9459         345       V548 Cyg       A1V       19:56:58.3       +54:47:58.0       8.54       2444456.4958       1.8052         346       WW Cyg       B8V       20:04:02.7       +41:35:17.0       10.02       2440377.8860       3.3178         347       GM Cyg       B9       20:04:15.8       +38:07:45.0       12.00       2432408.5350       4.7457         348       SW Cyg       A2       20:06:57.9       +46:17:58.0       9.24       2441867.8173       4.5731         349       DE Sge       A2       20:07:12.1       +20:49:32.0       11.90       2428717.4450       2.8721   |     |          |          |            |             |                     |                      |                        |
| 345         V548 Cyg         A1V         19:56:58.3         +54:47:58.0         8.54         2444456.4958         1.8052           346         WW Cyg         B8V         20:04:02.7         +41:35:17.0         10.02         2440377.8860         3.3178           347         GM Cyg         B9         20:04:15.8         +38:07:45.0         12.00         2432408.5350         4.7457           348         SW Cyg         A2         20:06:57.9         +46:17:58.0         9.24         2441867.8173         4.5731           349         DE Sge         A2         20:07:12.1         +20:49:32.0         11.90         2428717.4450         2.8721   |     |          |          |            | •           |                     |                      |                        |
| 346       WW Cyg       B8V       20:04:02.7       +41:35:17.0       10.02       2440377.8860       3.3178         347       GM Cyg       B9       20:04:15.8       +38:07:45.0       12.00       2432408.5350       4.7457         348       SW Cyg       A2       20:06:57.9       +46:17:58.0       9.24       2441867.8173       4.5731         349       DE Sge       A2       20:07:12.1       +20:49:32.0       11.90       2428717.4450       2.8721  |     |          |          |            |             |                     |                      |                        |
| 347 GM Cyg     B9     20:04:15.8     +38:07:45.0     12.00     2432408.5350     4.7457       348 SW Cyg     A2     20:06:57.9     +46:17:58.0     9.24     2441867.8173     4.5731       349 DE Sge     A2     20:07:12.1     +20:49:32.0     11.90     2428717.4450     2.8721  |     |          |          |            |             |                     |                      |                        |
| 348 SW Cyg A2 20:06:57.9 +46:17:58.0 9.24 2441867.8173 4.5731 349 DE Sge A2 20:07:12.1 +20:49:32.0 11.90 2428717.4450 2.8721   |     |          |          |            |             |                     |                      |                        |
| 349 DE Sge A2 20:07:12.1 +20:49:32.0 11.90 2428717.4450 2.8721   |     |          |          |            |             |                     |                      |                        |
|  |     |          |          |            |             |                     |                      |                        |
|  |     |          |          |            |             |                     |                      |                        |

Table A.2 — Continued

| — Continued |           |          |            |             |                     |                      |                      |  |  |
|-------------|-----------|----------|------------|-------------|---------------------|----------------------|----------------------|--|--|
| No.         | Stars     | Sp. Type | RA (2000)  | DEC(2000)   | $\langle V \rangle$ | Min.I <sub>HJD</sub> | P <sub>orb</sub> (d) |  |  |
| 351         | QY Aql    | F0       | 20:09:28.8 | +15:18:44.7 | 11.40               | 2448507.1600         | 7.2296               |  |  |
| 352         | V346 Aql  | A0V      | 20:09:59.6 | +10:20:59.1 | 9.00                | 2441918.3840         | 1.1064               |  |  |
| 353         | V345 Cyg  | A1       | 20:10:10.5 | +30:28:55.0 | 11.30               | 2428635.5680         | 2.0755               |  |  |
| 354         | UZ Sge    | A0       | 20:12:16.0 | +19:20:56.0 | 11.40               | 2445861.4140         | 2.2157               |  |  |
| 355         | KU Cyg    | F0Iab:   | 20:12:45.1 | +47:23:41.0 | 10.73               | 2433884.8400         | 38.4393              |  |  |
| 356         | V695 Cyg  | K2II     | 20:13:37.9 | +46:44:29.0 | 3.73                | 2441470.0000         | 3784.3000            |  |  |
| 357         | VW Cyg    | A3       | 20:15:12.3 | +34:30:48.0 | 10.25               | 2441116.8678         | 8.4303               |  |  |
| 358         | RW Cap    | A1III/IV | 20:17:56.1 | -17:40:23.7 | 9.80                | 2440113.3280         | 3.3924               |  |  |
| 359         | V346 Cyg  | A5       | 20:19:24.7 | +36:20:24.0 | 11.80               | 2435686.7500         | 2.7433               |  |  |
| 360         | MY Cyg    | A0mv     | 20:20:03.4 | +33:56:35.0 | 8.30                | 2433847.6070         | 4.0052               |  |  |
| 361         | XZ Aql    | A2       | 20:22:13.4 | -07:21:03.4 | 10.10               | 2441903.4610         | 2.1392               |  |  |
| 362         | UW Cyg    | A5       | 20:23:02.8 | +43:14:32.0 | 10.70               | 2443690.0550         | 3.4508               |  |  |
| 363         | ZZ Cyg    | F7:      | 20:23:52.9 | +46:55:15.0 | 10.61               | 2445000.3570         | 0.6286               |  |  |
| 364         | TY Cap    | A5III    | 20:24:29.7 | -12:57:55.0 | 10.50               | 2444793.4520         | 1.4234               |  |  |
| 365         | BP Vul    | A7       | 20:25:33.3 | +21:02:17.9 | 9.71                | 2446003.2480         | 1.9403               |  |  |
| 366         | BE Vul    | A0       | 20:25:33.6 | +27:22:08.9 | 9.50                | 2440111.3810         | 1.5520               |  |  |
| 367         | V728 Cyg  | A0       | 20:26:40.1 | +58:46:48.0 | 10.60               | 2444806.4150         | 2.0602               |  |  |
| 368         | V788 Cyg  | F8       | 20:27:34.1 | +31:51:25.0 | 10.00               | 2426620.5400         | 47.8487              |  |  |
| 369         | BI Del    | G0       | 20:27:38.6 | +14:20:09.0 | 11.40               | 2428366.2900         | 7.2524               |  |  |
| 370         | V442 Cyg  | F4       | 20:27:52.3 | +30:47:28.0 | 10.00               | 2428745.2490         | 2.3859               |  |  |
| 371         | AW Vul    | F0       | 20:29:00.1 | +24:48:02.0 | 10.80               | 2446285.4650         | 0.8065               |  |  |
| 372         | V729 Cyg  | O7e      | 20:32:22.4 | +41:18:19.0 | 9.05                | 2440413.7960         | 6.5979               |  |  |
| 373         | AX Vul    | A2       | 20:33:10.3 | +24:51:55.6 | 10.34               | 2444853.3900         | 2.0248               |  |  |
| 374         | AY Vul    | F0       | 20:35:38.9 | +22:37:27.1 | 10.61               | 2442685.3770         | 2.4124               |  |  |
| 375         | TT Del    | A1       | 20:36:03.0 | +08:26:56.0 | 10.60               | 2445232.4190         | 2.8711               |  |  |
| 376         | W Del     | F0       | 20:37:40.1 | +18:17:04.0 | 9.69                | 2443328.5495         | 4.8061               |  |  |
| 377         | V748 Cyg  | A0       | 20:41:45.6 | +50:41:35.0 | 11.70               | 2430145.5450         | 10.4902              |  |  |
| 378         | RR Del    | F2       | 20:43:33.9 | +13:56:41.0 | 10.20               | 2418183.4220         | 4.5995               |  |  |
| 379         | V512 Cyg  | A0       | 20:44:40.5 | +49:37:57.0 | 11.40               | 2434730.3970         | 2.4246               |  |  |
| 380         | AV Del    | F8       | 20:45:30.8 | +11:10:22.0 | 10.70               | 2443689.5150         | 3.8534               |  |  |
| 381         | VY Mic    | A4III/IV | 20:49:07.1 | -33:43:54.4 | 9.39                | 2438295.2650         | 4.4358               |  |  |
| 382         | BT Pav    | F6       | 20:51:00.5 | -63:41:31.7 | 10.07               | 2428045.3150         | 2.5440               |  |  |
| 383         | DW Cep    | B8       | 20:51:39.7 | +62:48:50.4 | 10.25               | 2426980.2970         | 2.5169               |  |  |
| 384         | FZ Del    | F5:      | 20:53:32.8 | +04:38:48.0 | 10.20               | 2431324.3290         | 0.7832               |  |  |
| 385         | RR Vul    | A2       | 20:54:47.6 | +27:55:05.6 | 9.63                | 2435035.4370         | 5.0507               |  |  |
| 386         | S Equ     | B8V      | 20:57:12.8 | +05:04:49.0 | 8.09                | 2442596.7435         | 3.4361               |  |  |
| 387         | CG Cyg    | G9       | 20:58:13.5 | +35:10:30.0 | 9.73                | 2439425.1221         | 0.6311               |  |  |
| 388         | V1898 Cyg | B1IV:p   | 21:03:53.8 | +46:19:50.0 | 7.71                | 2445960.6758         | 1.5131               |  |  |
| 389         | TY Del    | A0       | 21:04:22.0 | +13:12:54.0 | 9.70                | 2442959.4450         | 1.1911               |  |  |
| 390         | AE Cyg    | A5       | 21:13:14.3 | +30:44:27.0 | 11.80               | 2444586.2290         | 0.9619               |  |  |
| 391         | RY Aqr    | A3       | 21:20:16.0 | -10:48:08.4 | 8.80                | 2443392.7981         | 1.9666               |  |  |
| 392         | BN Peg    | F5       | 21:28:02.1 | +05:00:12.0 | 10.30               | 2433896.3660         | 0.7133               |  |  |
| 393         | U Gru     | A5       | 21:31:48.5 | -45:02:44.0 | 11.00               | 2411202.7540         | 1.8805               |  |  |
| 394         | AQ Peg    | A2       | 21:37:20.9 | +13:28:28.5 | 10.37               | 2441222.7048         | 5.5485               |  |  |
| 395         | GP Cep    | O8-B0III | 21:41:21.5 | +69:41:34.1 | 8.96                | 2431256.6020         | 6.6883               |  |  |
| 396         | V Gru     | F2V      | 21:51:53.4 | -42:22:24.0 | 9.50                | 2444463.8040         | 0.4834               |  |  |
| 397         | AW Peg    | A4Vv     | 21:52:20.7 | +24:00:44.5 | 7.63                | 2447735.4967         | 10.6226              |  |  |
| 398         | DF Peg    | F5       | 21:54:43.4 | +14:33:28.1 | 9.17                | 2433505.6200         | 14.6987              |  |  |
| 399         | MR Cyg    | B3V      | 21:58:56.6 | +47:59:00.0 | 8.75                | 2433396.4069         | 1.6770               |  |  |
| 400         | UZ Cyg    | A3       | 21:59:14.3 | +44:21:35.0 | 10.23               | 2441226.6585         | 31.3058              |  |  |
|             |           |          |            |             |                     |                      |                      |  |  |

Table A.2 — Continued

| No. | Stars    | Sp. Type | RA (2000)  | DEC(2000)   | $\langle V \rangle$ | $Min.I_{ m HJD}$ | P <sub>orb</sub> (d) |
|-----|----------|----------|------------|-------------|---------------------|------------------|----------------------|
| 401 | RT Lac   | G5       | 22:01:30.7 | +43:53:26.0 | 9.00                | 2444873.3648     | 5.0739               |
| 402 | DO Peg   | B8       | 22:07:31.3 | +06:09:23.0 | 10.60               | 2445211.5100     | 2.6139               |
| 403 | CY Lac   | B5       | 22:13:08.3 | +54:33:35.0 | 11.50               | 2428746.2190     | 2.7869               |
| 404 | AT Peg   | A3/5V    | 22:13:23.5 | +08:25:30.8 | 8.97                | 2445219.8562     | 1.1461               |
| 405 | AU Lac   | A5:      | 22:15:09.6 | +48:42:55.0 | 12.00               | 2434195.4410     | 1.3924               |
| 406 | EK Cep   | A1V      | 22:18:45.6 | +56:07:33.9 | 7.88                | 2439002.7240     | 4.4278               |
| 407 | UW Lac   | A5:      | 22:20:39.8 | +42:24:29.0 | 11.40               | 2437188.3350     | 5.2902               |
| 408 | UX Peg   | A2       | 22:28:36.2 | +18:01:33.0 | 10.70               | 2440425.4790     | 1.5446               |
| 409 | DG Lac   | A5       | 22:28:50.2 | +53:46:16.0 | 10.80               | 2444509.3870     | 2.2065               |
| 410 | TW Lac   | A2       | 22:30:24.1 | +54:37:55.0 | 12.02               | 2441500.5340     | 3.0374               |
| 411 | EH Peg   | G0       | 22:34:03.7 | +13:41:06.0 | 10.20               | 2428408.4540     | 2.3744               |
| 412 | CX Aqr   | F2pv     | 22:35:43.9 | -00:41:32.4 | 10.55               | 2452500.4293     | 0.5560               |
| 413 | VX Lac   | F0       | 22:41:00.6 | +38:19:20.0 | 10.90               | 2445258.4660     | 1.0745               |
| 414 | AH Cep   | B0.5V    | 22:47:52.9 | +65:03:43.8 | 6.87                | 2434989.4026     | 1.7747               |
| 415 | BG Peg   | A2       | 22:52:47.2 | +15:39:09.0 | 10.50               | 2445532.5180     | 1.9527               |
| 416 | GT Cep   | B8       | 22:57:47.3 | +68:24:26.0 | 8.11                | 2425628.2500     | 4.9088               |
| 417 | BO And   | B8       | 22:58:38.0 | +45:31:52.0 | 13.40               | 2428021.3070     | 5.7973               |
| 418 | AA And   | B9V      | 23:05:22.9 | +47:40:34.8 | 10.87               | 2447804.6739     | 0.9351               |
| 419 | ER Peg   | A7       | 23:05:46.8 | +33:29:07.0 | 11.00               | 2445526.5540     | 2.2747               |
| 420 | TT And   | A0:      | 23:13:22.7 | +46:08:51.0 | 11.50               | 2434237.4130     | 2.7651               |
| 421 | SZ Psc   | K1IV-V   | 23:13:23.8 | +02:40:31.4 | 7.18                | 2443498.5020     | 3.9657               |
| 422 | AN And   | A7m      | 23:18:23.3 | +41:46:25.3 | 6.00                | 2436095.7260     | 3.2196               |
| 423 | X Gru    | A1V      | 23:19:42.4 | -55:36:42.0 | 10.64               | 2441858.8235     | 2.1236               |
| 424 | CZ Aqr   | A5       | 23:22:21.0 | -15:56:20.3 | 10.98               | 2443371.4690     | 0.8628               |
| 425 | IS Cas   | A2       | 23:28:29.0 | +60:33:56.0 | 12.10               | 2428776.2630     | 1.8415               |
| 426 | TY Peg   | F0V      | 23:29:57.0 | +13:32:31.4 | 10.28               | 2440451.7840     | 3.0922               |
| 427 | AN Tuc   | A5IIIm   | 23:30:22.2 | -58:25:34.6 | 10.20               | 2434305.6500     | 5.4609               |
| 428 | DI Peg   | F0IVn    | 23:32:14.7 | +14:58:08.8 | 9.54                | 2445196.4880     | 0.7118               |
| 429 | Y Psc    | A3V      | 23:34:25.4 | +07:55:28.6 | 9.40                | 2445635.2410     | 3.7658               |
| 430 | XX Cep   | A7V      | 23:38:20.3 | +64:20:02.8 | 9.25                | 2444839.8022     | 2.3373               |
| 431 | DK Peg   | A5       | 23:41:33.5 | +10:12:57.1 | 9.92                | 2445530.4660     | 1.6318               |
| 432 | WW And   | A5       | 23:44:53.5 | +45:41:11.5 | 10.93               | 2434618.1850     | 23.2852              |
| 433 | IV Cas   | A2       | 23:49:31.5 | +53:08:04.7 | 12.10               | 2440854.6480     | 0.9985               |
| 434 | XY Cep   | B8       | 23:52:32.9 | +68:56:01.7 | 10.03               | 2443791.3160     | 2.7745               |
| 435 | V354 Aur |          | 05:36:49.6 | +41:27:57.5 | 15.0                |                  |                      |

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