Version of Record: https://www.sciencedirect.com/science/article/pii/S1384107621001007
Manuscript_001c6a1eb13ff6c952f392dedf6ddff2

Catalog of W UMa Type Binary Systems with Additional Components Based on Eclipsing Time Variations

İ. Bulut[a,c], G. Aşkın[b,c]

[a] *Department of Space Sciences and Technologies, Faculty of Arts and Sciences, Çanakkale Onsekiz Mart University, Terzioğlu Kampüsü, TR-17020, Çanakkale, Turkey*
[b] *Department of Physics, Faculty of Arts and Sciences, Çanakkale Onsekiz Mart University, Terzioğlu Kampüsü, TR-17020, Çanakkale, Turkey*
[c] *Çanakkale Onsekiz Mart University, Astrophysics Research Centre and Ulupınar Observatory, TR-17020, Çanakkale, Turkey*

Abstract

A catalog of W UMa type eclipsing binary systems with tertiary components based on eclipse timing diagrams is presented listing the physical and orbital parameters (including third body parameters) of 150 W UMa type eclipsing binaries. In this study, the (O–C) diagrams of nine sample W UMa type eclipsing binary systems, based on the most reliable timings of minima in the literature, are analyzed to obtain the third-body parameters and significant statistical results are presented from the data in the catalog.

Keywords: Stars: binaries: eclipsing — binaries: catalogs

Email address: `ibulut@comu.edu.tr` (İ. Bulut)

1. Introduction

A considerable number of eclipsing binaries are known to belong to multiple star systems (e.g. Chambliss, 1992), acting as important laboratories for astrophysics. Studies on eclipsing binary systems have shown that the frequency of third components around W UMa type binary stars is very high (Frieboes-Conde and Herczeg, 1973; Kreiner, 1977; Chambliss, 1992; Borkovits and Hegedus, 1996). The occurrence of tertiary companions was found dependent on the orbital period of central binary systems by Tokovinin et al. (2006) in which the frequency of occurrence increases from a level of 34% for 12d $< P <$ 30d to 50% at P = 9d, and even 100% at P = 1d (Tokovinin et al., 2006). For a sample of contact binaries brighter than V = 10 mag, the incidence of triple systems was found by Rucinski et al. (2007) to be 61% for northern contact binaries. These results suggest that all contact binary stars may exist in multiple systems. General information on triple and multiple systems can be found in the updated Multiple Star Catalog by Tokovinin (2018).

Different methods have been developed to determine whether there is a third body in eclipsing binary systems. The light timeeffect (LITE) in the (O–C) diagrams of minima timings is the most used of these methods. LITE is caused by a third body in binary stars and shows itself as periodic changes in the (O–C) diagram. However, these variations might be also attributed to the magnetic activity cycles of binary systems (see Applegate, 1992; Lanza et al., 1998).

As the binary star moves around the barycenter of the triple system, its relative distance changes. This effect manifests itself as a sinus-like shape in the (O–C) diagrams of the eclipsing binaries. The analytical formulae of LITE as a function of the orbital parameters of the third body was given by Irwin (1959) as follows:

$$\tau = \frac{A}{\sqrt{1-e_3^2\cos^2\omega_3}}\left[\frac{(1-e_3^2)\cdot\sin(\nu+\omega_3)}{1+e_3\cos\nu}+e_3\sin\omega_3\right] \tag{1}$$

where τ is the light-travel time delay or advance caused by a perturbing third body. A is the semi-amplitude of the light-time curve (in days), and e_3 and ω_3 are the eccentricity, and longitude of the periastron of the third-body orbit, respectively. ν is the true anomaly of the position of the eclipsing pair's mass center on the relative orbit.

Eclipsing binary systems with additional components have attracted the attention of many researchers since the mass and orbital parameters of the additional components can be determined directly from the (O–C) diagrams. The LITE interpretation for contact binaries was introduced as early as the 1990s (see e.g. Demircan et al., 1992; Demircan, 1994).

W UMa type binaries are eclipsing binaries with a short orbital period ($P < 1$

day) and continuous light variation during a cycle. They consist of two solar-type component stars; whereby the eclipses have equal depths, indicating that both components have similar effective temperatures. Binnendijk (1970) classified the W UMa systems into two categories, A-type and W-type, according to spectral type groups A9-F8 and F7-M5, respectively. It is clear that there is no certain limit between the two sub-groups. A recent catalog of field contact binaries compiled by Pribulla et al. (2003) is a good source for their physical parameters. The presence and properties of tertiary companions to very close binaries with short periods have been assessed in a series of papers by Pribulla and Rucinski (2006), D'Angelo et al. (2006) and Rucinski et al. (2007).

The orbital period changes in W UMa type systems may be more complex due to their evolutionary status. We should expect the effects of angular momentum, mass loss and transfer, and magnetic activity in these systems. In addition, the LITE due to an unseen component in the system may be detected, which causes a periodic variation in their orbital periods.

In this paper, we present a catalog with all the known W UMa type eclipsing binaries including those with a tertiary component. This catalog can be used for statistical studies and is a valuable source for planning observations of W UMa type systems with additional components.

2. Selection Criteria and Data Collection

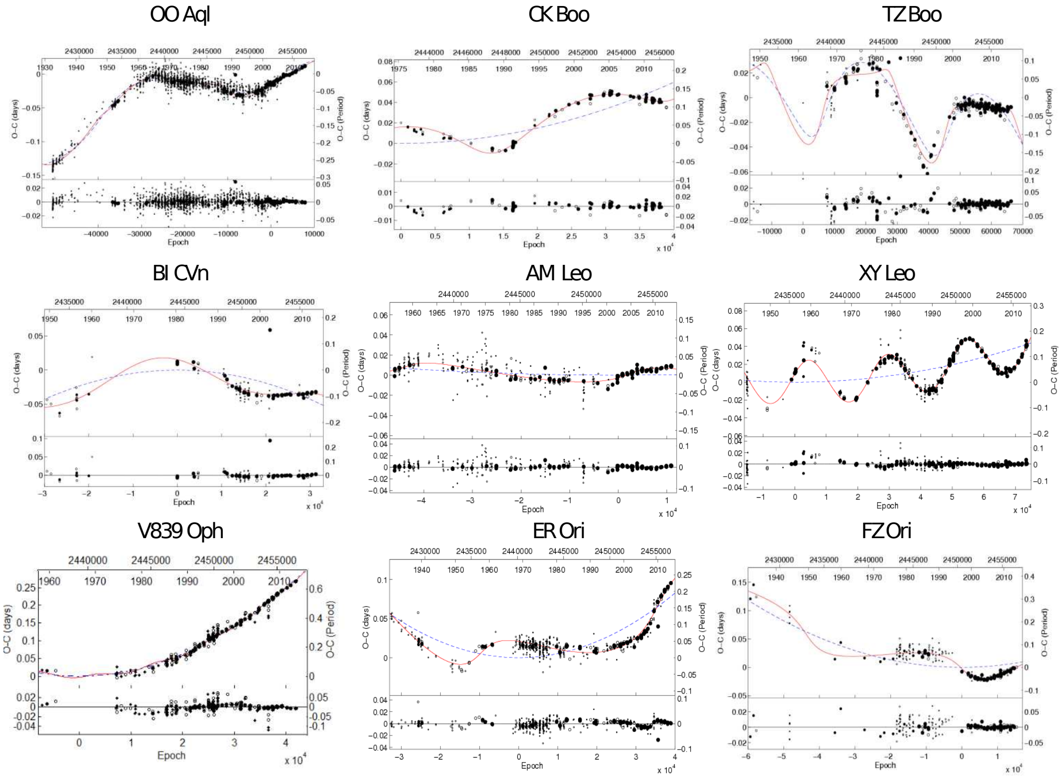
In this catalog, we compiled from the literature the W UMa type eclipsing binary systems having additional components. The physical and absolute parameters of the systems were obtained from various sources in the literature. Information on 150 multiple systems was collected, which forms an exhaustive catalog of W UMa type eclipsing binary stars with additional components. Seventeen of these are quadruple systems.

The catalog includes three tables that present the physical parameters of 150 W UMa type eclipsing binaries. Table 1 aims at identification of the binaries. These values are mostly taken from the SIMBAD Astronomical Database. Table 2 lists the absolute parameters calculated by a combined analysis of the light and radial velocity curves. Table 3 presents the orbital parameters of additional components around the binary systems obtained by (O–C) analysis.

If the value of a parameter is given by two or more different articles in the literature, the value in the most recent publication has been taken. The references in the SAO/NASA Astrophysics Data System (ADS) format are given in the last column of each table. Errors in the last digits are given in parentheses after the value. The stars are sorted in alphabetical order of the constellation listing (as in the General Catalog of Variable Stars (GCVS) of Kholopov et al. (1998)). The literature was scanned until January 2020.

Moreover, we re-analyzed the (O–C) diagrams of a sample of nine close binary systems: OO Aql, CK Boo, TZ Boo, BI CVn, AM Leo, XY Leo, V839 Oph, ER Ori and FZ Ori. All of these are well-known W UMa systems with a third body and have been observed for a long of period of time. The minima times taken from the (O–C) Database Gateway were used in the (O–C) analysis of the W UMa systems chosen. In the analysis, all minima times were used with different weights (visual = 1, photographic = 5, photometric/CCD = 10). For the (O–C) analysis, the software program of Zasche et al. (2009) was used. The (O–C) values were calculated with the linear ephemeris given by Kreiner et al. (2001). The corresponding (O–C) diagrams are shown in the upper panels of Figure 1. In the (O–C) curves of all systems, cyclical changes were seen in addition to parabolic behaviors.

The (O–C) data of the target binaries were analyzed under the assumption of mass transfer between the component stars and/or mass loss from the systems and an unseen component around the eclipsing binary, represented by parabolic variations and tilted sinusoidal changes in their (O–C) diagrams, respectively. The final parameters of LITE are given in Table 3 and the (O–C) values and residuals from


OO Aql

CK Boo

TZ Boo

BI CVn

AM Leo

XY Leo

V839 Oph

ER Ori

FZ Ori

Figure 1: (O–C) diagrams for selected nine systems showing third body effect. Full dots indicate photoelectric/CCD data and other symbols represent earlier visual and photographic observations. Best fit curves are also shown among the observational data.

the best fit are displayed in the upper and lower panels of Figure 1, respectively.

The catalog is arranged as follows:

Table I: Identification

(1) No: Catalog sequence number.

(2) Name: Name of star in GCVS.

(3) HD: Henry Draper Catalog number.

(4) HIP: Hipparcos Catalog (Zasche et al., 2009) number.

(5) α(2000): Right Ascension J2000.

(6) δ(2000): Declination J2000.

(7) $m_{\max}$: Apparent magnitude at maximum brightness

(8) λ: Photometric system for magnitudes. The basic codes are *V* (Johnson's *V*) and *B* (Johnson's *B*).

(9) Sp: Spectral type of components and their luminosity class.

(10) Type: Subclass of W UMa. A-subtype and W-subtype.

(11) Reference.

Table II: Absolute Parameters

(1) No: Catalog sequence number.

(2) Name: Name of star in GCVS.

(3) M_1: Mass of primary component.

(4) M_2: Mass of secondary component.

(5) R_1: Radius of primary component.

(6) R_2: Radius of secondary component.

(7) T_1: Effective temperature of primary component.

(8) T_2: Effective temperature of secondary component.

(9) g_1: Surface gravity of primary component.

(10) g_2: Surface gravity of secondary component.

(11) Reference.

Table III: Third Body Parameters

(1) No: Catalog sequence number.

(2) Name: Name of star in GCVS.

(3) T_0: Reference epoch for primary minimum (Heliocentric Julian Date (HJD)).

(4) P_{12}: Orbital period of binary system in days.

(5) $a_3 \sin i_3$: (a_3) is orbital semi-major axis and (i_3) is inclination of binary system's orbit relative to center of mass of triple system in AU.

(6) e_3: Eccentricity of third body orbit.

(7) ω_3: Longitude of periastron of third body orbit.

(8) T_3: HJD epoch of passage at periastron.

(9) P_3: Period of orbital rotation of third body in years.

(10) A: Amplitude of minimum of sinusoidal variation.

(11) $f(M_3)$: Mass function of hypothetical third body around binary system.

(12) M_3: Mass of third body.

(13) Reference.

3. Results

In this study, we present a new catalog of W UMa type eclipsing binary systems with tertiary components based on eclipse timing diagrams. The catalog contains the physical parameters of 150 W UMa type eclipsing binary systems, including their LITE parameters. Some results from the catalog are as follows:

1. The frequency distributions of the orbital period of the central binary for the systems in the catalog is given in Figure 2. In this figure, A-type and W-type systems are shown in different histograms. As can be seen in Figure 2, the possible presence of a third body is higher in systems with orbital periods shorter than P_{12} = 0.5 days. This ratio decreases with an increasing period. The frequency of the third body is approximately 43% in systems with orbital periods of 0.3-0.4 days.

Short period binary systems often have high levels of magnetic activity (Pribulla et al., 2003; Pi et al., 2014; Hall, 1996). Therefore, it should not be overlooked that the cyclic oscillations of these systems in the (O–C) diagrams might be caused by magnetic activity cycles. Long-term spectroscopic and photometric observations of the stellar activity of W UMa type eclipsing binaries are necessary. In such systems, further observational evidence for the existence of a third body needs to be investigated. A third body can manifest itself in a photometric light curve solution or a third spectrum in the overall spectrum.

2. The distance of the third body from the central system are in the range of 0.28 to 15.8 AU. The frequency distribution for this is given in Figure 4. This figure shows an approximate Gaussian distribution. The maximum of this curve is approximately $a_3 \sin i_3 = 4$ AU.

3. The frequency distribution for the mass of the third body is also presented in Figure 4. This shows an exponentially decreasing trend with increasing mass. It is seen that the mass of the third body is under 1 $M_\odot$ in the majority. EY Cas has the largest third body mass of 9.8 $M_\odot$, while ER Vul has the smallest third body mass of 0.0048 $M_\odot$. (in other words, the systems with the largest and smallest mass of the third body are EY Cas and ER Vul, respectively.)

4. The total number of W UMa-type binary stars in the General Catalog of Variable Stars (GCVS) is about 2918 which is 23% of the total number of eclipsing binaries in GCVS. Considering those W UMa-type binary stars brighter than $V = 10$ mag in our catalog and GSVS, the frequency of occurrence of tertiary

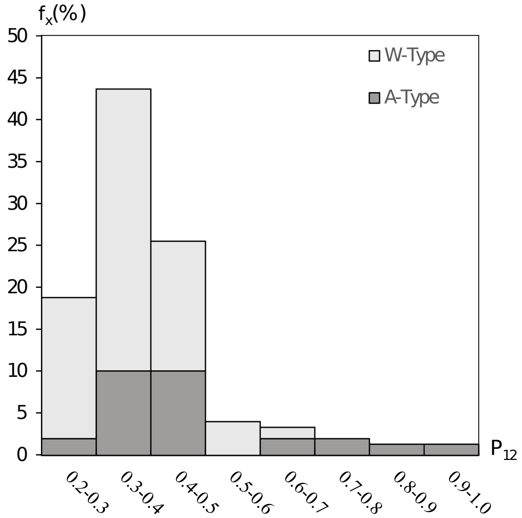


Figure 2: Frequency distribution of orbital periods of central binary.

companions in W UMa systems was found to be about 21%.

4. Acknowledgements

This work has been supported by Research Fund of Canakkale Onsekiz Mart University (BAP) under the research project no. FHD-2018-2461. This research has made use of the SIMBAD database, operated at CDS, Strasbourg, France and NASA's Astrophysics Data Systems.

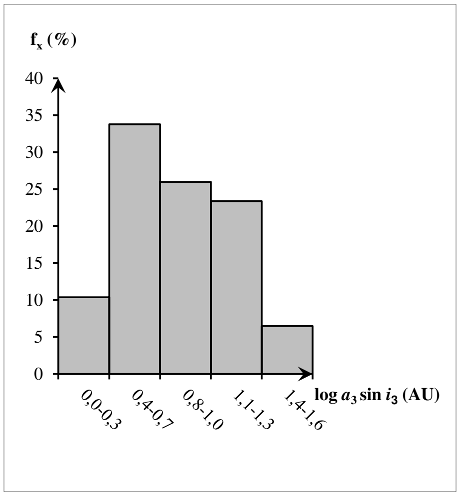


Figure 3: Frequency distribution of distances of third body from central system.

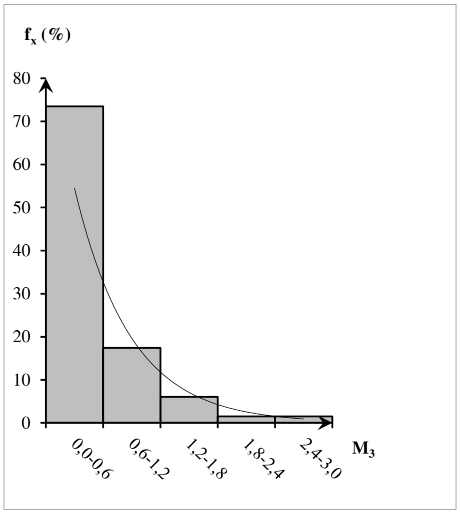


Figure 4: Frequency distribution for masses of third body.

References

Applegate, J.H., 1992. A mechanism for orbital period modulation in close binaries. Astrophys. J. 385, 621.

Binnendijk, L., 1970. The orbital elements of W Ursae Majoris systems. Vistas Astron 12, 217.

Borkovits, T., Hegedus, T., 1996. On the invisible components of some eclipsing binaries. Astron. Astrophys. Supp. 120, 63.

Chambliss, C. R., 1992. Eclipsing Binaries in Multiple Star Systems. Publications of the Astronomical Society of the Pacific. 104, 663.

D'Angelo, C., van Kerkwijk, M. H., Rucinski, S. M., 2006. Contact Binaries with Additional Components. II. A Spectroscopic Search for Faint Tertiaries. AJ, 132, 650

Demircan, O., Derman, E., Muyesseroğlu, Z., 1992. A period study of AW UMa. Astron. Astrophys. 263, 165.

Demircan, O., 1994. in The Impact of Long-Term Monitoring on Variable Star Research: As- trophysics, Instrumentation, Data Handling, Archiving, Proceedings of the NATO Ad- vanced Research Workshop, held in Ghent, Belgium, November 15-18, 1993, Dor- drecht: Kluwer, 1994, edited by Christiaan Sterken and Mart De Groot. NATO ASI.

ESA 1997. The Hipparcos and Tycho Catalogues, Noordwijk.

Frieboes-Conde, H., Herczeg, T., 1973. Period variations of fourteen eclipsing binaries with possible light-time effect. Astron. Astrophys. Supp. 12, 1.

Hall, J. C., 2008, Stellar Chromospheric Activity. Living Reviews in Solar Physics 5, 1.

Irwin, J. B., 1959. Standard light-time curves. Astron. J. 64, 149.

Kholopov, P. N. et al. 1998. The Combined General Catalogue of Variable Stars, 4th edn. Sternberg Astronomical Institute, Moscow, http://vizier.ustrasbg.fr/II/214A.

Kreiner, J. M., 1977. in Kippenhahn, ed., Proc. IAU Colloq. 42, The Interaction of Variable Stars with Their Environment. Bamderg, p. 393.

Kreiner, M. J., Kim, C.-H., Nha, I.-S., 2001. An Atlas of OC Diagrams of Eclipsing Binaries (Cracow: WNAP), 1520.

Lanza, A.F., Rodono, M., Rosner, R., 1198. Orbital period modulation and magnetic cycles in close binaries. Mon. Not.R. Astron. Soc. 1998, 893.

Rucinski, S. M., Pribulla, T., van Kerkwijk M. H., 2007. Contact Binaries with Additional Components. III. A Search Using Adaptive Optics. Astron. J. 134, 2353.

Tokovinin, A., Thomas, S., Sterzik, M., Udry, S., 2006. Tertiary companions to close spectroscopic binaries. Astron. Astrophys. 450, 681.

Tokovinin, A., 2018. The updated multiple star catalogue. Astrophys. J., Suppl. Ser. 235, 6.

Paschke, A., Brat, L., 2006. O-C Gateway, a Collection of Minima Timings. Open European Journal on Variable Stars. 23, 13.

Pi, Q.-f., Zhang, L.-Y., Li, Z.-M., Zhang, X. L., 2014. Magnetic Activity and Orbital Period Variation of the Short-period Eclipsing Binary DV Psc. Astron. J. 147, 50.

Pribulla, T., Kreiner, J. M., Tremko, J. 2003. Catalogue of the field contact binary stars. CoSka, 33, 38.

Pribulla, T., Rucinski, S. M. 2006. Contact Binaries with Additional Components. I. The Extant Data . AJ, 131, 2986.

Zasche, P., Liakos, A., Niarchos, P., Wolf, M., Manimanis, V., Gazeas, K., 2009.

Period changes in six contact binaries: WZ And, V803 Aql, DF Hya, PY Lyr, FZ Ori, and AH Tau. New Astronomy. 14, 121.

Table 1: Identification.

No	Name	HD	HIP	$\alpha(2000)$	$\delta(2000)$	$m_{\max}$ [mag]	λ	Sp	Type
1	AB And	–	114508	23 11 32.08	+36 53 35.11	9.5	*V*	G5+G5V	W
2	EP And	–	–	01 42 29.32	+44 45 42.36	11.4	*V*	F8V	W
3	GZ And	–	10270	02 12 14.28	+44 39 39.6	10.83	*V*	G5V	–
4	LO And	–	–	23 27 06.67	+45 33 22.00	11.25	*V*	–	–
5	HV Aqr	–	–	21 21 24.80	−03 09 36.88	9.99	*V*	F5V	–
6	OO Aql	187183	–	19 48 12.65	+09 18 32.37	9.49	*V*	G5V	–
7	V417 Aql	–	96349	19 35 24.12	+05 50 17.65	10.63	*V*	G0V+F9V	W
8	V802 Aql	–	–	18 58 54.83	−03 01 11.6	13.4	*B*	–	W
9	V803 Aql	–	–	19 00 44.19	−07 28 54.0	14	*B*	–	W
10	BO Ari	–	–	02 12 08.77	+27 08 18.24	10.02	*V*	–	A
11	SS Ari	–	–	02 04 18.40	+24 00 02.23	10.15	*V*	G0	W
12	V410 Aur	280332	23337	05 01 10.83	+34 30 23.58	10.34	*V*	G0	–
13	V599 Aur	–	–	05 08 46.79	+32 02 08.54	12	*V*	–	W
14	AC Boo	–	73103	14 56 28.33	+46 21 44.14	10.23	*V*	F8Vn	W
15	AR Boo	–	–	13 48 10.39	+24 55 26.80	12.75	*V*	G9+K1	W
16	CK Boo	128141	71319	14 35 03.75	+09 06 49.37	9.02	*V*	F7/8V	A
17	FI Boo	234224	75203	15 22 05.96	+51 10 55.29	9.49	*V*	G5	W
18	GN Boo	–	–	14 50 07.76	+29 38 58.50	11.12	*V*	–	W
19	HH Boo	–	–	14 21 44.06	+46 41 59.37	11.2	*V*	G5III	W
20	TU Boo	–	–	14 04 58.042	+30 00 01.54	11.61	*V*	G3	A
21	TY Boo	–	–	15 00 46.93	+35 07 54.78	11.39	*V*	G3+G7	W
22	TZ Boo	–	74061	15 08 09.13	+39 58 12.86	10.41	*V*	G2V	A
23	44i Boo	133640	73695	15 03 47.29	+47 39 14.62	4.76	*V*	G0Vn	W
24	AO Cam	–	–	04 28 13.64	+53 02 44.60	10.52	*V*	G0V	W
25	LR Cam	–	–	05 43 05.15	+68 40 07.04	10.61	*V*	–	–
26	AD Cnc	–	–	08 46 20.10	+10 20 07.2	13.1	*V*	K0V	W
27	AH Cnc	–	–	08 51 37.84	+11 50 57.11	13.41	*V*	F7V	A
28	EH Cnc	–	–	08 26 18.35	+20 52 49.74	11.9	*V*	F	–
29	TX Cnc	–	–	08 40 01.70	+18 59 59.45	9.97	*V*	G0–G1V	W
30	BI CVn	–	63701	13 03 16.40	+36 37 00.59	10.31	*V*	F9V	W
31	DF CVn	–	–	12 43 37.23	+38 44 15.65	11.2	*V*	–	W
32	FV CVn			13 53 13.67	+32 22 46.72	12	*B*		–
33	RV CVn	–	–	13 40 18.16	+28 18 21.53	14.03	*V*	F8	–
34	UZ CMi	–	–	07 50 51.76	+03 39 03.60	11.18	*V*	F8	–
35	BS Cas	–	–	01 21 38.57	+59 10 27.05	11.84	*V*	A–F	W

Table 1: Continued.

No	Name	HD	HIP	α(2000)	δ(2000)	$m_{\max}$ [mag]	λ	Sp	Type
36	AL Cas	–	–	02 13 44.65	+70 08 42.9	12.3	*B*	B	–
37	CW Cas	–	–	00 45 52.69	+63 05 08.40	11.08	*V*	G8V	W
38	EY Cas	–	–	00 03 22.77	+57 44 53.1	13.9	*V*	–	–
39	V366 Cas	–	–	01 08 25.60	+58 44 16.6	12	*B*	G1..	–
40	V776 Cas	–	8821	01 53 23.43	+70 02 33.44	9.42	*B*	F0	A
41	V523 Cas	–	–	00 40 06.26	+50 14 15.53	10.87	*V*	K4V	–
42	V1107 Cas	–	–	01 23 14.59	+61 34 52.9	12.88	*V*	–	W
43	V1139 Cas	–	–	01 35 44.48	+55 41 13.1	13.2	*V*	–	–
44	RR Cen	124689	69779	14 16 57.22	−57 51 15.65	7.7	*V*	A9/F0V	–
45	V752 Cen	101799	57129	11 42 48.08	−35 48 57.51	9.3	*V*	F7/G0(V)	W
46	BE Cep	–	–	22 41 20.80	+58 36 30.82	12.05	*V*	–	–
47	GK Cep	205372	106226	21 30 59.15	+70 49 23.57	7	*V*	A0V	–
48	GW Cep	–	–	01 45 58.58	+80 04 55.32	11.21	*V*	G3	W
49	VW Cep	197433	101750	20 37 21.54	+75 36 01.46	7.38	*V*	G8V+K0V	–
50	WZ Cep	–	–	23 22 24.21	+72 54 56.70	11.22	*V*	F5	–
51	TW Cet	–	8447	01 48 54.14	−20 53 34.60	10.7	*V*	G5+G8	–
52	VY Cet	–	–	01 49 33.69	−19 37 29.29	11.15	*V*	–	–
53	AQ Com	–	–	12 42 42.69	+21 52 17.5	15.2	*B*	–	–
54	CC Com	–	–	12 12 06.02	+22 31 58.69	11.42	*V*	K4/5V	–
55	KR Com	115955	65069	13 20 15.77	+17 45 56.98	7.2	*V*	F5	–
56	MR Com	–	–	13 14 24.18	+27 11 32.33	12.36	*V*	–	W
57	RW Com	–	61243	12 33 00.28	+26 42 58.37	11.25	*V*	G8e	W
58	RZ Com	–	61414	12 35 05.05	+23 20 14.02	10.57	*V*	G0Vn	A
59	CV Cyg	–	–	19 54 20.90	+38 02 49.99	10.99	*V*	F8III	–
60	DK Cyg	–	106574	21 35 02.66	+34 35 45.40	10.56	*V*	A6V	W
61	V401 Cyg	–	95816	19 29 20.27	+30 24 28.50	10.7	*V*	F0	–
62	V700 Cyg	–	–	20 31 05.25	+38 47 00.64	11.01	*V*	G2V	W
63	V1918 Cyg	–	–	19 26 08.65	+52 26 47.46	10.76	*V*	–	A
64	V2540 Cyg	–	–	20 23 37.87	+46 55 51.74	12.07	*V*	–	–
65	BV Dra	135421	74370	15 11 50.35	+61 51 25.24	8.04	*V*	F9V+F8V	–
66	BX Dra	–	78891	16 06 17.37	+62 45 46.10	10.62	*V*	A3	A
67	EF Dra	–	–	18 05 30.48	+69 45 15.70	10.81	*V*	F8/9V	A
68	FU Dra	–	76272	15 34 45.20	+62 16 44.27	10.48	*V*	F8V	W
69	BL Eri	–	–	04 11 48.18	−11 47 26.52	11.42	*V*	B5	–
70	CT Eri	–	20943	04 29 27.79	−33 34 34.33	10.28	*V*	F0	–

Table 1: Continued.

No	Name	HD	HIP	$\alpha(2000)$	$\delta(2000)$	$m_{\rm max}$ [mag]	λ	Sp	Type
71	UX Eri		14699	03 09 52.74	$-$06 53 33.56	10.63	*V*	F9V	W
72	YY Eri	26609	19610	04 12 08.84	$-$10 28 09.96	8.41	*V*	G3/K0+(F/G)	–
73	KV Gem	–	–	06 50 07.71	+24 35 12.7	14	*B*	–	–
74	AK Her	155937	84293	17 13 57.82	+16 21 00.60	9.04	*B*	F8Vv	A
75	V502 Her			17 35 49.35	+32 20 54.47	13.12	*V*	F5	–
76	V728 Her	–	–	17 18 04.30	+41 50 38.72	10.61	*V*	F3	W
77	V829 Her	–	–	16 55 47.87	+35 10 57.59	10.27	*V*	G2V	W
78	V842 Her	–	–	16 06 02.21	+50 11 13.09	9.97	*V*	G2	W
79	V899 Her	149684	81191	16 35 01.95	+33 12 47.76	7.88	*V*	F8	–
80	V1104 Her	–	–	18 09 47.63	+49 02 54.96	13.51	*V*	–	W
81	V1062 Her			17 34 54.27	+44 11 52.56	13.5	*V*	K2	–
82	DF Hya	–	–	08 55 02.24	+06 05 37.68	10.8	*V*	G0	–
83	EZ Hya	–	–	09 26 41.05	$-$13 45 06.40	10.56	*V*	G2	W
84	FG Hya	–	41437	08 27 03.94	+03 30 52.33	10.04	*V*	G0	–
85	FO Hya	–	–	09 59 43.28	$-$19 07 56.21	11.05	*V*	–	–
86	WY Hya	–	–	08 14 10.93	+00 29 43.52	10.61	*V*	A6	–
87	LU Lac	–	–	22 21 41.8	+51 22 03	14.6	*B*	–	W
88	PP Lac	–	–	22 42 38.66	+53 25 02.77	11.85	*V*	–	W
89	SW Lac	216598	113052	22 53 41.65	+37 56 18.63	8.51	*V*	K0Vv	–
90	AM Leo	–	53937	11 02 10.88	+09 53 42.67	9.33	*V*	F8Vn	W
91	AP Leo	–	54188	11 05 05.02	+05 09 06.41	9.57	*V*	F8V	–
92	CE Leo	–	–	11 44 24.23	+23 21 22.86	11.9	*V*	K	W
93	ET Leo	91386	51677	10 33 25.78	+17 34 27.41	9.55	*V*	G5	–
94	XY Leo	–	49136	10 01 40.42	+17 24 32.71	9.68	*V*	K0V	W
95	RT LMi	–	–	09 49 48.32	+34 27 15.44	11.35	*V*	F7V	–
96	VW LMi	95660	54003	11 02 51.90	+30 24 54.70	8.06	*V*	F5V	A
97	VZ Lib	–	76050	15 31 51.75	$-$15 41 10.18	10.27	*V*	F5	–
98	NY Lyr	–	–	19 16 36.87	+34 23 40.30	12.02	*V*	–	–
99	PY Lyr	–	–	19 20 25.99	+28 56 43.8	12.5	*B*	–	–
100	V574 Lyr			18 27 12.19	+36 14 36.25	12.29	*V*	K4	–
101	V649 Lyr	–	–	18 24 26.94	+45 39 01.30	14.51	*V*	K:	W
102	DD Mon	292319	–	06 45 57.83	$-$00 17 31.94	10.69	*V*	F6V	–
103	V396 Mon	–	–	06 38 36.48	+03 36 17.1	12.6	*B*	–	W
104	V524 Mon	–	–	06 59 01.19	+02 12 51.5	14.4	*B*	–	W
105	V753 Mon	54975	34684	07 10 57.85	$-$03 52 43.18	8.27	*V*	A8V	–

Table 1: Continued.

No	Name	HD	HIP	α(2000)	δ(2000)	$m_{\max}$ [mag]	λ	Sp	Type
106	TV Mus	–	310730	11 39 57.76	-64 48 59.29	10.75	*V*	F2	W
107	V502 Oph	150484	81703	16 41 20.86	+00 30 27.37	8.5	*V*	G2V+F9V	W
108	V508 Oph	–	88028	17 58 48.61	+13 29 46.27	10.65	*V*	G5	–
109	V566 Oph	163611	87860	17 56 52.41	+04 59 15.32	7.58	*V*	F5V	–
110	V839 Oph	166231	88946	18 09 21.26	+09 09 03.62	9.03	*V*	F8V	–
111	V2388 Oph	163151	87655	17 54 14.16	+11 07 50.00	6.26	*V*	F5Vn	A
112	ER Ori	–	24156	05 11 14.50	-08 33 24.69	9.46	*V*	G1V	W
113	FZ Ori	288166	–	05 41 21.00	+02 36 22.97	10.53	*V*	G0	W
114	BB Peg	–	110493	22 22 56.88	+16 19 27.83	11.17	*V*	F8V	–
115	BX Peg	–	–	21 38 49.39	+26 41 34.23	10.89	*V*	G4.5	W
116	U Peg	–	118149	23 57 58.47	+15 57 10.07	9.63	*V*	G2V	W
117	V432 Per	–	–	03 06 51.69	+42 40 48.5	11.19	*V*	–	–
118	V873 Per	–	–	02 47 08.20	+41 22 31.92	11.04	*V*	G0	W
119	AQ Psc	8152	6307	01 21 03.56	+07 36 21.62	8.69	*V*	F8	–
120	DZ Psc	–	–	00 36 27.94	+21 32 14.44	11.08	*V*	F7V	A
121	EM Psc	–	–	01 18 48.51	+13 21 07.7	13.33	*V*	–	–
122	VZ Psc	115819	–	23 27 48.39	+04 51 23.97	10.27	*V*	K4/5V	–
123	V701 Sco	85985	317844	17 34 24.51	-32 30 15.98	8.97	*V*	B5	–
124	V1055 Sco	148121	80603	16 27 26.18	-37 28 37.28	8.63	*V*	G2V	–
125	AU Ser	–	–	15 56 49.47	+22 16 01.59	11.04	*V*	G4V	–
126	V384 Ser	–	–	16 01 53.57	+24 52 17.53	11.88	*V*	–	–
127	Y Sex	87079	49217	10 02 47.95	+01 05 40.33	9.95	*V*	F3/5V	A
128	AH Tau	–	–	03 47 11.96	+25 06 59.39	11.07	*V*	G1p	A
129	EQ Tau	–	–	03 48 13.43	+22 18 50.93	11.18	*V*	G1	–
130	RZ Tau	285892	21467	04 36 37.66	+18 45 17.79	10.19	*V*	F5	A
131	V781 Tau	248087	27562	05 50 13.12	+26 57 43.36	8.67	*V*	G0	W
132	V1128 Tau	–	17878	03 49 27.77	+12 54 43.83	9.64	*V*	G0	W
133	AA UMa	–	–	09 46 59.29	+45 45 56.3	10.88	*V*	G0	W
134	AW UMa	99946	56109	11 30 04.31	+29 57 52.68	6.92	*V*	F0	–
135	BM UMa	–	–	11 11 20.48	+46 25 47.4	13.8	*B*	K0V	W
136	II UMa	1092247	61237	12 32 54.84	+54 47 42.90	8.3	*V*	F2	A
137	LP UMa	–	–	10 33 57.79	+58 52 15.55	11.39	*J*	–	–
138	PZ UMa	–	–	09 29 07.08	+49 51 23.03	12.71	*V*	–	W
139	TY UMa	–	–	12 09 02.49	+56 01 54.04	11.59	*V*	F8+F0	–
140	UY UMa	–	–	13 44 36.83	+55 13 18.35	12.9	*V*	–	A

Table 1: Continued.

No	Name	HD	HIP	α(2000)	δ(2000)	$m_{\max}$ [mag]	λ	Sp	Type
141	W UMa	83950	47727	09 43 45.46	+55 57 09.07	7.75	*V*	F8V	–
142	AG Vir	104350	58605	12 01 03.50	+13 00 30.01	8.52	*V*	A7V	–
143	AH Vir	106400	59683	12 14 20.99	+11 49 09.38	9.33	*V*	G8V	–
144	GR Vir	129903	72138	14 45 20.26	-06 44 04.12	8	*V*	G2/3V	–
145	HT Vir	119931	67186	13 46 06.76	+05 06 56.16	7.16	*V*	G0	A
146	PY Vir	–	–	13 10 32.22	-04 09 32.58	9.84	*V*	K2V	W
147	BI Vul	–	–	21 22 48.03	+27 01 39.9	14.15	*B*	–	W
148	ER Vul	200391	103833	21 02 25.90	+27 48 26.43	7.37	*V*	G0V+G5V	–
149	NO Vul	–	–	19 34 37.99	+20 37 14.28	12.83	*V*	–	–
150	NSVS 1461538	–	–	23 10 21.48	+58 59 17.11	11.76	*J*	–	W

Table 2: Absolute parameters.

No	Name	M_1	M_2	R_1	R_2	T_1	T_2	logg_1	logg_2	Ref.
		[M$_\odot$]	[M$_\odot$]	[R$_\odot$]	[R$_\odot$]	[K]	[K]	[cgs]	[cgs]	
1	AB And	0.579(13)	1.034(24)	0.822(23)	1.151(30)	–	–	–	–	2014NewA...30...64L
2	EP And	0.5	1.3	0.89	1.35	6387(2)	6360	4.24	4.29	2013AJ....145..100L
3	GZ And	1.25(4)	0.65(1)	1.06(1)	0.78(1)	5021(3)	5260	–	–	2003A&A...401..631Y
4	LO And	1.468(48)	0.447(22)	1.40(84)	0.84(1)	6650(200)	6690(200)	4.32(1)	4.24(1)	2015IBVS.6134....1N
5	HV Aqr	1.355	0.197	1.448	0.648	6460	6669	–	–	2013NewA...21...46L
6	OO Aql	1.05(2)	0.89(2)	1.38(2)	1.28(2)	5700	5472(55)	–	–	2013AJ....145..127I
7	V417 Aql	0.53	1.45	0.84	1.31	6111	5900	4.32	4.36	2004JASS...21...73L
8	V802 Aql	0.92	0.13	–	–	5000	5128(49)	–	–	2008PASJ...60..803Y
9	V803 Aql	0.79	0.79	0.77	0.77	4594	4600	–	–	1996A&A...311..523M
10	BO Ari	0.995(36)	0.189(7)	1.090(13)	0.515(10)	5940	5908(6.3)	4.361(19)	4.291(23)	2015NewA...39....9G
11	SS Ari	1.21(2)	0.40(1)	1.34(1)	0.81(1)	5900(200)	6350(200)	4.26(1)	4.23(2)	1992MNRAS.254..568R
12	V410 Aur	1.14	0.18	1.33	0.62	5942	5952(13)	–	–	2007ASPC..362...82O
13	V599 Aur	0.6	1			5860	5360	–	–	2010PASJ...62...81L
14	AC Boo	0.36(3)	1.20(5)	0.69(1)	1.19(1)	6250	6241(6)	4.32(4)	4.36(4)	2010IBVS.5951....1N
15	AR Boo	0.35	0.9	0.65	1	5398(14)	5100	4.36	4,39	2009AJ....138..478L
16	CK Boo	1.42	0.15	1.48	0.59	6200	6291	–	–	2005ApJ...629.1055Y
17	FI Boo	0.40(5)	1.07(5)	0.85(7)	1.28(7)	5746(33)	5420(56)	–	–	2013AJ....146..157C
18	GN Boo	1.065	0.32	1.056	0.631	6250	5628(6)	–	–	2015NewA...39....1B
19	HH Boo	0.627(27)	1.068(45)	0.782(11)	0.997(20)	5680	5386(4.3)	4.449(22)	4.469(25)	2015NewA...41...26G
20	TU Boo	0.97	0.48	1.05	0.78	5800	5737(4)	–	–	2007PASP..119.1099L
21	TY Boo	0.53(2)	1.19(5)	0.73(3)	1.06(4)	5732	5483(2)	–	–	2015RAA....15..501E
22	TZ Boo	0.99(3)	0.21(1)	1.08(5)	0.56(2)	5890	5873(10)	–	–	2011AJ....142...99C
23	44i Boo	0.861(8)	0.419(11)	–	–	5174(10)	–	–	–	2001OAP....14...74P
24	AO Cam	1.119(7)	0.486(5)	1.092(5)	0.732(4)	5900	5887(4)	–	–	2010AJ....139..195Y
25	LR Cam	0.9	0.27	1.27	0.73	5500	5198(4)	–	–	2010PASJ...62.1045Y
26	AD Cnc	0.9	0.24	0.96	0.55	5164	4609(11)	–	–	2002ChJAA...2..369Y
27	AH Cnc	1.22(7)	0.20(2)	1.37(7)	0.66(3)	6300	6330(20)	4.25	4.09	2006ASPC..349..375Y
28	EH Cnc	–	1.44	–	–	6820	6666(5)	–	–	2011PASP..123.1138.
29	TX Cnc	1.35(2)	0.61(1)	1.27(4)	1.26(7)	6537(9)	6250	–	–	2009AJ....138..680Z
30	BI CVn	0.66(1)	1.61(1)	0.96(1)	1.40(1)	6170(5)	6093	4.300(2)	4.350(2)	2014NewA...29...57N
31	DF CVn	0.91	0.32	1.03	0.64	5337	4902(2)	–	–	2005AN....326..338A
32	FV CVn	0.94(9)	1.01(10)	0.91(5)	0.94(4)	5470	5148(24)	–	–	2019RAA....19...99M
33	RV CVn	–	–	–	–	6100	5564(75)	–	–	2014AJ....147..130Z
34	UZ CMi	1.2	0.54	–	–	6250	6168(5)	–	–	2013AJ....145...91Q
35	AL Cas	1.33	0.81	–	–	6400	6316(32)	–	–	2014AJ....148...79Q

Table 2: Continued.

No	Name	M_1 [$M_\odot$]	M_2 [$M_\odot$]	R_1 [$R_\odot$]	R_2 [$R_\odot$]	T_1 [K]	T_2 [K]	logg_1 [cgs]	logg_2 [cgs]	Ref.
36	BS Cas	–	–	–	–	5637(12)	6100	–	–	2008AJ....136..594Y
37	CW Cas	–	1.22	–	–	5309	4950(5)	4.5	4.5	2014AJ....148...95W
38	EY Cas	–	–	–	–	–	6700	–	–	2008IBVS.5812....1Z
39	V366 Cas	1.19	0.5	–	–	5860	5907(6)	–	–	2013NewA...19...27Y
40	V523 Cas	0.74(1)	0.38(1)	0.77(1)	0.59(1)	5726	4125	–	–	2016NewA...44...78M
41	V776 Cas	1.71	0.25	1.77	0.81	7047	7004(39)	3.848	3.845	2007ASPC..362...82O
42	V1107 Cas	–	–	–	–	5721(9)	5270	–	–	2016PASP..128d4201Y
43	V1139 Cas	–	–	0,76	0,94	6250	5933(4)	–	–	2015NewA...34..217L
44	RR Cen	1.82(26)	0.38(6)	2.10(1)	1.05(3)	6912	6891(13)	–	–	2005PASJ...57..983Y
45	V752 Cen	0.4	1.302	0.754	1.28	6221(81)	5955(77)	–	–	1993ApJ...407..237B
46	BE Cep	0.86	0.37	–	–	5310	–	–	–	2012NewA...17..347D
47	GK Cep	2.7	2.5	–	–	–	–	–	–	2014arXiv1404.3124L
48	GW Cep	1.06	0.39	1.05	0.67	5800	6113	–	–	1996A&A...311..523M
49	VW Cep	0.838	0.28	0.93	0.58	4970	4650	4.43	4.36	2014arXiv1402.2933E
50	WZ Cep	1.33(8)	0.43(3)	1.29(1)	0.77(1)	–	–	–	–	2011JASS...28..163J
51	TW Cet	0.68	1.28	0.357	0.256	–	–	–	–	1959ApJ...130..774A
52	VY Cet	1.02	0.68	–	–	–	–	–	–	2014arXiv1404.3124L
53	AQ Com	–	0.85	–	–	5300	4911(15)	–	–	2014NewA...32...31L
54	CC Com	0.717(14)	0.377(8)	0.708(12)	0.530(10)	4300	4200(60)	4.59	4.57	2011AN....332..626K
55	KR Com	1.42	0.129	–	–	5549(244)	6072(270)	–	–	2010A&A...519A..78Z
56	MR Com	0.36	1.4	–	–	–	6457(10)	–	–	2013AJ....146...38Q
57	RW Com	0.38(2)	0.80(2)	0.30(1)	0.42(1)	4900	4720(20)	4.54(3)	4.57(3)	2011A&A...525A..66D
58	RZ Com	1.108	0.45	1.122	0.71	5500	5564	–	–	2000A&A...361..226L
59	CV Cyg	–	–	–	–	–	–	–	–	
60	DK Cyg	1.82(7)	0.56(2)	1.74(3)	1.05(2)	7500(200)	7011(200)	4.22(2)	4.14(2)	2015AJ....149..194L
61	V401 Cyg	1.68	0.49	–	–	–	–	–	–	2013AJ....146...28Z
62	V700 Cyg	0.6	0.92	0.86	1.04	5770	5396(9)	–	–	1997A&AS..124..291N
63	V1918 Cyg	1.52	0.4	1.52	0.87	7060	6924(5)	–	–	2013AJ....145...60Y
64	V2540 Cyg	1.024	0.478	1.06	–	5865	4369(46)	–	–	2010NewA...15..653Z
65	BV Dra	1.04(2)	0.43(1)	1.12(1)	0.76(1)	–	–	–	–	2009AJ....137..236Y
66	BX Dra	2.08(10)	0.60(4)	2.13(5)	1.28(3)	6980	6979(2)	4.10(3)	4.00(3)	2013PASJ...65....1P
67	EF Dra	1.815(32)	0.290(26)	1.702(2)	0.777(2)	6250	6186(7)	–	–	2012RAA....12..419Y
68	FU Dra	0.28	1.117	0.6	1.104	6100	5823	–	–	2012PASJ...64...48L
69	BL Eri	0.61(11)	0.33(10)	1.03(9)	0.75(7)	–	–	–	–	2009SASS...28....5S
70	CT Eri	–	–	–	–	–	–	–	–	

Table 2: Continued.

No	Name	M_1 [M$_\odot$]	M_2 [M$_\odot$]	R_1 [R$_\odot$]	R_2 [R$_\odot$]	T_1 [K]	T_2 [K]	logg_1 [cgs]	logg_2 [cgs]	Ref.
71	UX Eri	0.54(17)	1.45(44)	0.91(11)	1.45(18)	6100	5984(26)	–	–	2007AJ....134.1769Q
72	YY Eri	0.62	1.54	0.77	1.2	5600	5362	–	–	1986A&A...159..142N
73	KV Gem	0.98	2.74	–	–	6000	5672	–	–	2014NewA...27...81Z
74	AK Her	1.86(1)	0.48(1)	1.66(1)	0.96(1)	6358.0(40.4)	5848.0(9.6)	–	–	2010NewA...15..339S
75	V502 Her	1.23	0.38			6180	6143(4)	–	–	2018PASP..130d4201Z
76	V728 Her	1.8(1)	0.28(8)	1.87(4)	0.82(6)	6600	6743(27)	–	–	2016NewA...46...73E
77	V829 Her	1.31(3)	0.57(3)	1.21(1)	0.84(1)	5900	5758(15)	4.39(1)	4.35(2)	2007ASPC..370..237O
78	V842 Her	0.38(1)	1.45(1)	0.81(1)	1.47(1)	6020	5723(10)	4.20(1)	4.26(1)	2009NewA...14..321E
79	V899 Her	2.10(15)	1.19(8)	1.57(14)	1.22(14)	5700	5677	4.371(13)	4.342(18)	2002A&A...387..240O
80	V1104 Her	0.46	0.74	–	–	4050	3902	–	–	2015AJ....149..148L
81	V1062 Her	0.74(5)	1.83(12)			5121(130)	4712(13)			2019MNRAS.487.5520L
82	DF Hya	0.49	1.22	0.74	1.14	5980	5676(5)	–	–	1990AcASn..31..237L
83	EZ Hya	1.37(12)	0.35(3)	1.54(32)	0.85(18)	5721(9)	6100	–	–	2004PASP..116..826Y
84	FG Hya	1.444(25)	0.161(7)	1.405(9)	0.591(8)	5900	6012(13)	–	–	2005MNRAS.356..765Q
85	FO Hya	1.31(7)	0.31(11)	1.62(3)	0.91(2)	7000	5213.1(0.2)	4.14(7)	4.01(1.25)	2013NewA...20...52P
86	WY Hya	1.92	1.86	–	–	8000	7994(5)	–	–	2011NewA...16..265Y
87	LU Lac	–	–	–	–	5310	4899(7)	–	–	2014NewA...31...65L
88	PP Lac	1.18	0.51	–	–	5480	5202(3)	–	–	2005NewA...11...52Q
89	SW Lac	1.22	0.978	1.12	1.02	5379(7.048)	5521(6.960)	–	–	2014arXiv1402.2929E
90	AM Leo	0.54(7)	1.23(8)	0.85(7)	1.22(9)	6273(70)	5942(80)	–	–	2016AstBu..71...64G
91	AP Leo	1.460(42)	0.434(17)	1.477(45)	0.817(25)	6150	6250(25)	–	–	2003A&A...412..465K
92	CE Leo	0.94	0.47	0.94	0.68	–	–	–	–	2002A&A...384..908Q
93	ET Leo	–	–	–	–	6500	6107(86.62)	–	–	2004ASPC..318..189T
94	XY Leo	0.82(2)	0.50(1)	0.85(2)	0.68(2)	4850	4524(14)	–	–	2003A&A...401.1095Y
95	RT LMi	1.29(17)	0.49(6)	1.28(5)	0.84(3)	6400	6513(10)	–	–	2008PASJ...60...77Q
96	VW LMi	1.67(2)	0.70(2)	1.709(7)	1.208(6)	6700	6792(8)	–	–	2007Ap&SS.312..151S
97	VZ Lib	1.480(68)	0.378(34)	1.335(22)	0.692(12)	5920	6030(21)	–	–	2004AcA....54..299Z
98	NY Lyr	–	–	–	–	–	–	–	–	
99	PY Lyr	–	–	–	–	6980	7042	–	–	2009NewA...14..121Z
100	V574 Lyr	0.69(2)	0.65(2)	–	–	4929(149)	4690(44)	–	–	2019MNRAS.487.5520L
101	V649 Lyr	0.28	0.8	–	–	4830	4581(5)	–	–	2012AJ....144..178L
102	DD Mon	1.94(9)	1.12(6)	1.62(3)	1.37(3)	6250	5202(4)	–	–	2010ASPC..435..351G
103	V396 Mon	1.2	0.47	1.17	0.75	5922(14)	6210	–	–	2001AJ....122..425Y
104	V524 Mon	0.5	1.1	1.25	1.35	–	–	–	–	2005A&A...429..625D
105	V753 Mon	1.528(20)	1.482(20)	1.592(6)	1.738(7)	7500	7620(20)	–	–	2004AcA....54..299Z

Table 2: Continued.

No	Name	M_1 [$M_\odot$]	M_2 [$M_\odot$]	R_1 [$R_\odot$]	R_2 [$R_\odot$]	T_1 [K]	T_2 [K]	logg_1 [cgs]	logg_2 [cgs]	Ref.
106	TV Mus	1.35	0.22	1.7	0.83	5980	5808(40)	–	–	2005AJ....130..224Q
107	V502 Oph	1.448(70)	0.485(36)	0.915(191)	1.495(180)	5861	5769(56)	4.2	4.25	(Selam ve ark., 2009)
108	V508 Oph	1.01	0.52	1.07	0.8	6000	5830	–	–	2005ApJ...629.1055Y
109	V566 Oph	1.41(18)	0.34(8)	1.45(7)	0.77(4)	7000(100)	6902(100)	4.26(10)	4.19(10)	2006IBVS.5726....1D
110	V839 Oph	1.572(31)	0.462(17)	1.528(10)	0.874(06)	6250	6349(25)	–	–	2006AcA....56..127G
111	V2388 Oph	1.80(2)	0.34(1)	2.60(2)	1.30(1)	6900	6349(23)	0.0386	0.0374	2004A&A...417..725Y
112	ER Ori	1.53	0.98	1.39	1.14	6200	6314(66)	–	–	1994A&A...289..827G
113	FZ Ori	1.17	1	1.16	1.08	5940	5983(16)	–	–	2014Ap&SS.353..575P
114	BB Peg	1.42(4)	0.53(2)	1.29(2)	0.83(2)	6250	5905(45)	4.37	4.33	2007AJ....134..642K
115	BX Peg	0.96(59)	0.356(22)	0.9466(41)	0.6081(14)	5520	5978(18)	–	–	2013JAVSO..41..227A
116	U Peg	1.149(9)	0.379(2)	1.224(3)	0.744(2)	5860	5785(7)	0,0432	0,0427	2002CoSka..32...79P
117	V432 Per	1.12	0.42	1.22	0.78	6692(6)	5800	4.31	4.28	2008AJ....135.1523L
118	V873 Per	–	–	–	–	5150	4965(19)	–	–	2015NewA...41...42B
119	AQ Psc	1.26	0.28	1.22	1.18	6445	6247(10)	–	–	2020MNRAS.491.6065Z
120	DZ Psc	1.352(57)	0.183(24)	1.469(21)	0.617(9)	6210	6187(12)	–	–	2005AcA....55..123G
121	EM Psc	–	–	–	–	5300	4987(13)	–	–	2008AJ....136.1940Q
122	VZ Psc	0.81(5)	0.65(4)	0.78(2)	0.70(2)		4840(120)	–	–	1995ApJ...455..300H
123	V701 Sco	–	–	–	–	–	–	–	–	
124	V1055 Sco	–	–	–	–	5850	5632(26)	–	–	2015AcA....65..151Z
125	AU Ser	0.895	0.635	1.1	0.94	5495	5153(90)	4.31	4.29	2005NewA...10..653G
126	V384 Ser	0.79	2.5	0.85	0.798	5108	4811(7)	–	–	2020MNRAS.491.6065Z
127	Y Sex	1.21	0.22	1.5	0.75	6210	6093(18)	–	–	2003NewA....8..465Y
128	AH Tau	1.04	0.52	1.05	0.77	5900	5887(4)	–	–	2010AJ....139..195Y
129	EQ Tau	1.22(3)	0.54(2)	1.14(1)	0.79(1)	5860(10)	5851(10)	–	–	2013MNRAS.430.2029Y
130	RZ Tau	1.57	0.58	1.51	1	–	–	–	–	2001MNRAS.328..914Q
131	V781 Tau	0.71(7)	1.57(11)	0.89(5)	1.26(8)	6000	5525(10)	–	–	2016Ap&SS.361...63L
132	V1128 Tau	1.10(6)	0.58(4)	1.01(2)	0.76(2)	6200	6400(10)	–	–	2014AJ....148..126C
133	AA UMa	0.89(2)	1.61(3)	1.17(2)	1.53(2)	5964(9)	–	–	–	2011PASP..123...34L
134	AW UMa	1.60(3)	0.12(1)	1.79(1)	0.74(1)	7175	7035(9)	–	–	2014Ap&SS.352..673E
135	BM UMa	0.92	0.5	–	–	–	–	–	–	2009PASJ...61...13Y
136	II UMa	2.14	0.37	2.91	1.42	6412	6334(16)	3.807	3.802	2007ASPC..362...82O
137	LP UMa	0.92	0.3	–	–	5500	5302(32)	–	–	2016NewA...44...29G
138	PZ UMa	0.14(1)	0.77(2)	0.43(1)	0.92(1)	5430	5137(49)	–	–	2019PASJ...71...39Z
139	TY UMa	1.06	0.43	1.13	0.72	–	–	–	–	1996A&A...311..523M
140	UY UMa	1.151(53)	0.237(11)	1.342(21)	0.696(11)	5900	5882(4)	4.244(24)	4.126(24)	2019JASS...36..265K

Table 2: Continued.

No	Name	M_1 [M$_\odot$]	M_2 [M$_\odot$]	R_1 [R$_\odot$]	R_2 [R$_\odot$]	T_1 [K]	T_2 [K]	logg_1 [cgs]	logg_2 [cgs]	Ref.
141	W UMa	1.35(9)	0.69(5)	1.17(3)	0.85(2)	6026(278)	6310(291)	–	–	2013MNRAS.430.2029Y
142	AG Vir	1.61	0.51	2.07	1.27	–	–	–	–	2001MNRAS.328..914Q
143	AH Vir	–	–	–	–	–	–	–	–	
144	GR Vir	1.37(16)	0.17(6)	1.42(7)	0.61(4)	6300	6163(9)	–	–	2004AJ....128.2430Q
145	HT Vir	1.046(13)	1.284(15)	1.107(4)	1.223(5)	6100	6010(10)	–	–	2005AcA....55..389Z
146	PY Vir	0.95(1)	0.74(1)	0.923(2)	0.819(2)	4830	4702(7)	–	–	2013AJ....145...39Z
147	BI Vul	–	–	–	–	4600	4474(4)	–	–	2013ApJS..209...13Q
148	ER Vul	1.12	1.072	1.166(51)	1.185(142)	6000	5883(52)	4.27	4.3	1993A&A...269..310I
149	NO Vul	–	–	–	–	–	–	–	–	
150	NSVS 1461538	0.31(1)	1.09(3)	0.76(6)	1.31(11)	5740(10)	5340	4.17(9)	4.24(10)	2016JASS...33..185K

Table 3: Third body parameters.

No	Name	T_0 [HJD]	P_{12} [d]	$a_3 \sin i_3$ [AU]	e_3	ω_3 [deg]	T_3 [HJD]	P_3 [yr]	A [d]	$f(M_3)$ [M$_\odot$]	M_3 [M$_\odot$]	Ref.
1	AB And	2451534.2505	0.33189106	15.8(5.5)	0.41(15)	289.7(3.6)	2434950.6(246.8)	98.3	0.121(65)	0.00095(54)	2.54(87)	2014NewA...30...64L
2	EP And	2442638.52506(23)	0.4041087955(8)	13.92()	0.48(63)	170.7(1.5)	2438864(45)	44.62(13)	0.00997(36)	0.00378(14)	0.25	2013AJ....145..100L
	EP And	2442638.52506(23)	0.4041087955(8)	1.577	0.32(1)	40.8(5.2)	2443534(9)	1.834(15)	0.00386(22)	0.0972(8)	0.9	2013AJ....145..100L
3	GZ And	2441976.6948	0.305018323	–	–	–	–	–	–	–	0.42	2006AJ....132..650D
4	LO And	2445071.059	0.38043556	1.31	0.262	80.4	2446431	29.6	0.0075	0.00256	0.22	2015IBVS.6134....1N
5	HV Aqr	2448835.77422	0.374457	–	–	–	–	–	–	–	0.59	2006AJ....132..650D
6	OO Aql	2452500.2762(16)	0.50678967(7)	–	0.29(2)	0(3.3)	2432703(269)	59.71(44)	0.0261(2)	0.0296	0.57	This study
	OO Aql	2452500.2762(16)	0.50678967(7)	–	0.527(115)	173.84(9.36)	2454163(225)	19.31(25)	0.004(2)	0.0014	0.22	This study
7	V417 Aql	2449546.5096(12)	0.37031273(19)	2.25(23)	–	–	–	42.4	0.013(13)	0.0064(19)	0.31(6)	2003A&A...400..649Q
8	V802 Aql	2453614.0973(31)	0.2677087(8)	2.27	–	0.312	–	8.43(34)	0.0196(28)	–	1.6	2008PASJ...60..803Y
9	V803 Aql	2447684.785(3)	0.2634232(1)	–	0(11)	–	–	74.6(3.1)	0.0336(23)	0.0353(4)	0.52(2)	2009NewA...14..121Z
10	BO Ari	2455877.1405(6)	0.3181932(2)	–	0.24(6)	43(3.7)	2456373.2(78.6)	5.54(27)	0.0011	–	–	2016NewA...44...12K
11	SS Ari	2444469.4999(16)	0.40598942(2)	1.93	–	–	–	37.75	0.0112(12)	0.0051172	0.271	2009Ap&SS.321...19L
	SS Ari	2444469.4999(16)	0.40598942(2)	–	–	–	–	88.2	–	–	2.38	2009Ap&SS.321...19L
12	V410 Aur	2448500.176	0.3663565	–	–	–	–	–	–	–	0.97	2006AJ....132..650D
13	V599 Aur	2453686.4428(4)	0.31653708(61)	2(2)	–	–	–	1.92	0.003(13)	0.0381	0.562(7)	2010PASJ...62...81L
14	AC Boo	2445117.781(1)	0.3524321(2)	–	0.35(5)	348(11)	2453710(2154)	72.4(2.5)	0.047(4)	0.1(2)	–	2015IBVS.6142....1N
15	AR Boo	2450182.47724(28)	0.344874257(32)	–	0.59(28)	280(18)	2446142(97)	7.573(99)	0.00149(38)	0.000304(79)	0.081	2009AJ....138..478L
16	CK Boo	2452537.5904(49)	0.35515269(2)	2.82(11)	0.27(7)	295.3(15.05)	2447200(391)	25.6(8)	0.0016(6)	0.034	0.53	This study
17	FI Boo	2451718.3963817(2141)	0.38999741(25)	–	0.797(4)	267.4(142.2)	2444926.17(1030.76)	5.83(65)	0.003(1)	0.0054(3)	0.25	2013AJ....146..157C
18	GN Boo	2451996.4156(2)	0.3016022(3)	–	–	–	–	9.89(17)	0.0042(8)	0.0039(8)	0.19(1)	2013AJ....145...60Y
19	HH Boo	2456091.387	0.318666208	0	–	–	243122.9288	7.3921971	0.002227	0.00111121	0.18	2015NewA...41...26G
20	TU Boo	2445055.5971(3)	0.324284125(8)	–	0.48(27)	149(16)	2447562(743)	54.5(7.9)	0.0177	0.0126	0.34	2007PASP..119.1099L
21	TY Boo	2437378.4099(21)	0.31714863(23)	–	0.22(95)	158.5(14.4)	2435934(589)	58.9(4.4)	0.0254(49)	0.0263(1)	0.52	2012AJ....144..149C
	TZ Boo	2437378.4186(17)	0.29716088(4)	–	0.417(132)	308.9(18.8)	2450428(563)	31.61	0.0315(1)	0.1823(2)	0.79	This study
22	TZ Boo	2437378.4186(17)	0.29716088(4)	–	0.43(13)	80.03(22.54)	2439649(284)	15.87(14)	0.0097(13)	0.0191	0.43	This study
23	44i Boo	2450945.491(5)	0.26781565(3)	–	0.55	45	–	206(2)	–	–	1.42(16)	2001OAP....14...74P
24	AO Cam	2445745.6394	0.329905519	4.32(1.21)	–	–	–	7.63(7)	0.0019(3)	0.000653(281)	0.125(17)	2010AJ....139..195Y
25	LR Cam	2452500.0426(1)	0.43414003(3)	2.78(14)	0.5599(286)	326(25)	–	5.34(2)	0.0039(1)	0.0108(7)	0.28(1)	2010PASJ...62.1045Y

Table 3: Continued.

No	Name	T_0 [HJD]	P_{12} [d]	$a_3 \sin i_3$ [AU]	e_3	ω_3 [deg]	T_3 [HJD]	P_3 [yr]	A [d]	$f(M_3)$ [$M_\odot$]	M_3 [$M_\odot$]	Ref.
26	AD Cnc	2452313.2592(82)	0.2827291(57)	4.3(1.1)	–	–	–	6.6	0.0051(6)	0.016(6)	0.41(9)	2007ApJ...671..811Q
27	AH Cnc	2451939.1411	0.3604412	4.6(1.9)	–	–	–	7.75	0.0035(7)	0.0037(22)	0.2(7)	2006AJ....131.3028Q
28	EH Cnc	2452500.2668(6)	0.4180366(5)	–	–	–	–	16.6(4)	0.0032(3)	0.000619(173)	0.2	2011PASP..123.1138.
29	TX Cnc	2434426.474(1)	0.38288113(1)	0.48(1)	0	–	–	26.6	0.0028(6)	0.000156(9)	0.086(18)	2007PASJ...59..607L
30	BI CVn	2444365.241(114)	0.384209854(28)	3.22	0	4.67	245489	43.06(6.49)	0.01863(22)	0.01811(8)	0.49(1.15)	This study
31	DF CVn	2450571.1994	0.3268956	–	–	–	–	17.2(9)	0.007(8)	0.000816(262)	0.23(2)	2011NewA...16..173D
32	RV CVn	2444374.6415(16)	0.26956736(3)	–	0.413(14)	131.5(31.9)	2453523.1(892)	53.1(2.3)	0.0074(9)	0.001(1)	0.17(7)	2014AJ....147..130Z
33	FV CVn	2453045.476	0.31537	5.05(1.2)	0.41(16)	9.2(24.5)	2422843.1(100244.6)	10.28(42)	0.0069(8)	0.00162(56)	0.411(86)	2019RAA....19...99M
34	UZ CMi	2455943.20203(76)	0.55136313(9)	–	0	–	–	21.1(1.6)	0.0026(4)	0.00021(9)	–	2013AJ....145...91Q
35	AL Cas	2425303.55676(29)	0.50055604(8)	3.14(2.6)	0	0.0057	–	86.6(1.5)	0.0181(28)	0.0041(8)	0.29(5)	2014AJ....148...79Q
36	BS Cas	2427984.7395	0.44047629	–	–	0.032(1)	2431354	13.24(57)	0.0023(14)	0.000176	0.11	2008AJ....136..594Y
37	CW Cas	2455827.316	0.31886304	5.5(5)	0.571(67)	221.8(5.7)	2456205.7(456.3)	69.9(3.2)	0.03196(288)	0.0345	0.5708	2014AJ....148...95W
39	V366 Cas	2435075.3756(9)	0.72927177(6)	7.6(7)	0.324(27)	280(12)	2438920(137)	16.7(4)	0.0079(3)	0.00917(138)	0.42(2)	2013NewA...19...27Y
40	V523 Cas	2456178.2363(58)	0.23369221(6)	–	0.3(3)	-37.24(1.14)	–	80.58(68)	0.0241(4)	–	0.287(8)	2016NewA...44...78M
	V523 Cas	2456178.2363(58)	0.23369221(6)	9.2(1.4)	0.05(6)	-45.83(2.29)	–	29.35(81)	0.0054(4)	–	0.11(2)	2016NewA...44...78M
41	V776 Cas	2456894.42694(75)	0.440414(3)	5.09(1.52)	0	0	–	8.3(8)	0.0013(2)	–	0.08(1)	2017NewA...56....5N
42	V1107 Cas	2453225.4431(4)	0.27341193(5)	–	0.226(72)	4.285(443)	2453496.1(51.9)	7.23(14)	0.0023(2)	–	–	2016PASP..128d4201Y
43	V1139 Cas	24518767.342(8)	0.2971033(3)	6.7(8)	–	–	–	12.8	0.0064(4)	0.00832(156)	0.35(4)	2015NewA...34..217L
44	RR Cen	2448216.484(7)	0.60569079(5)	2.14(14)	0	–	–	60,1(4)	0.0124(7)	0.00232	0.24	2005PASJ...57..983Y
45	V752 Cen	2444243.695	0.3702276	–	–	–	–	0.014	–	–	–	2009ASPC..404..199S
46	BE Cep	2428751.3157	0.42439453	–	–	–	–	59.26(0,52)	0.0067(1)	0.000444(199)	0.09	2012NewA...17..347D
47	GK Cep	2438694.69719(159)	0.9361642(2)	–	0.45(6)	181.4(6.5)	2455140.816(155.377)	19.91(19)	0.0117(4)	0.02994(1)	1.0641(3)	2014arXiv1404.3124L
48	GW Cep	2451799.49465(23)	0.318831533(22)	–	0.361(35)	164.1(3.1)	2449298(50)	46.24(55)	0.00951(32)	0.00524(14)	0.26	2010JASS...27...89K
49	VW Cep	2437001.4327(25)	0.278315349(12)	–	0.633(7)	239.28(2.88)	2450390.6(37.3)	29.79(8)	0.0131(4)	0.0154(16)	0.74(7)	2007AN....328..928Z
	VW Cep	2437001.4327(25)	0.278315349(12)	–	0.543(7)	283.42(2.3)	2453857.4(13.6)	77.46(4)	0.1(2)	–	–	2007AN....328..928Z
50	WZ Cep	2449890.3371(3)	0.41744325(4)	–	0.544(25)	143.8(2.6)	2452780(142)	41.3(64)	0.0054	0.0061(11)	0.295(2)	2011JASS...28..163J
	WZ Cep	2449890.3371(3)	0.41744325(4)	–	–	–	–	41.3()	0.0178	0.0238(29)	0.494(6)	2011JASS...28..163J

Table 3: Continued.

No	Name	T_0 [HJD]	P_{12} [d]	$a_3 \sin i_3$ [AU]	e_3	ω_3 [deg]	T_3 [HJD]	P_3 [yr]	A [d]	$f(M_3)$ [M$_\odot$]	M_3 [M$_\odot$]	Ref.
51	TW Cet	2442373.375	0.316851713	–	–	–	–	–	–	–	0.5	2009KPCB...25..115Z
52	VY Cet	2440282.148(132)	0.3408091(1)	–	39(13)	219,0(18.5)	2430113.271(186.074)	7.07(6)	0.0082(5)	0.0649(1)	0.725(9)	2014arXiv1404.3124L
53	AQ Com	2456357.1567(22)	0.28133036(4)	0.28(6)	0	–	–	8.5(6)	0.00161(35)	0(0)	–	2014NewA...32...31L
54	CC Com	2442467.8313	0.22068597	0.49(4)	–	–	–	23.6(4)	0.0028(3)	0.000214(68)	0.066	2009AJ....137..236Y
55	KR Com	2453058.464(21)	0.40797003(239)	3.563(1.027)	0.934(239)	301.8(3.8)	2442055.1(118)	10.98(27)	0.0171(19)	0.3262(896)	1.598(423)	2010A&A...519A..78Z
56	MR Com	2452308.6719(3)	0.41274633(2)	5.3(1)	0	–	–	10.1(7)	0.0031(4)	0.0015(6)	–	2013AJ....146...38Q
57	RW Com	2419127.229(33)	0.2373499(1)	–	–	–	2438000	13.3	0.0035(13)	–	0.133()	2002A&A...384..908Q
58	RZ Com	2443967.944(5)	0.33850673(3)	1(9)	0	–	–	44.8(7)	0.0058(5)	0.00051(13)	0.11(2)	2005PASJ...57..977Q
59	CV Cyg	2424454.331	0.9834308	–	–	–	–	–	–	–	0.3	2001aocd.book.....K
60	DK Cyg	2437999.58039(25)	0.470690696(18)	0.65(46)	0.509(49)	259(7)	2422961(1640)	78.1(3.6)	0.00374(26)	0.0000451(38)	0.065	2015AJ....149..194L
61	V401 Cyg	2443835.2587(25)	0.58272304(5)	2.4(5)	0.22(14)	111.2(40.7)	2454499.5(138.9)	3.43(2)	0.00454(35)	0.041(8)	0.64	2013AJ....146...28Z
62	V700 Cyg	2445207.5039(39)	0.2906307(15)	–	0.934(95)	15(11)	2446478(8)	20.3(2)	0.0037(3)	0.0076(21)	0.293	2012JASS...29..151K
	V700 Cyg	2445207.5039(39)	0.2906307(15)	–	0.068(28)	33(16)	2445974(91)	62.8(2.4)	0.0258	0.0227(59)	0.495(11)	2012JASS...29..151K
63	V1918 Cyg	2452500.266(2)	0.4131769(2)	–	–	–	–	27.6(2)	0.013(8)	1.51(28)	0.45(3)	2013AJ....145...60Y
64	V2540 Cyg	2452795.8754(7)	0.4050051(4)	–	–	–	–	4.3	0.0038	0.016(1)	0.38	2010NewA...15..653Z
65	BV Dra	2453634.5196(5)	0.35006684(4)	0.5(9)	–	–	–	23.8(6)	0.0029(3)	0.000224(76)	0.084	2009AJ....137..236Y
66	BX Dra	2449810.58844(36)	0.579024741(46)	–	0.35(94)	61.8(3.8)	2450417(140)	30.2(1.2)	0.00615(74)	0.00138(17)	0.23	2013PASJ...65....1P
67	EF Dra	2452500.3086(2)	0.42402945(3)	–	0.49(2)	80.58(1.19)	24501665(65)	17.2(18)	0.0039(2)	0.00104(16)	–	2012RAA....12..419Y
68	FU Dra	2455327.1808(6)	0.30671838(19)	4.54	–	–	–	7.8	0.0024(4)	–	0.143	2012PASJ...64...48L
69	BL Eri	2444606.5849	0.41691599	–	–	–	–	20.8	0.0045	–	$\geq$0.11	2005ASPC..335..245L
70	CT Eri	2444555.6744	0.63419538	–	–	–	–	–	–	–	1.3	2009KPCB...25..115Z
71	UX Eri	2438700.7228	0.44528226	2.69(28)	0.72(2)	61.3(16.2)	2441269(693)	–	–	0.0094(29)	0.38	2007AJ....134.1769Q
72	YY Eri	241581.6194(34)	0.3215	–	–	–	–	18.176	–	–	0.094	2013SASS...32..179S
73	KV Gem	2452273.4188(2)	0.3585224(1)	–	0.38(3)	162.72(4.58)	2454613.3(53.9)	10.3(2)	0.0029(2)	0.0015(3)	0.29	2014NewA...27...81Z
74	AK Her	2422977.254	0.421152207	–	–	–	–	62.61	0.045	0.0015	0.204	2010NewA...15..339S
75	V502 Her	2430938.4980(16)	0.36927596(11)	10.6(4.3)				26.8	0.0032(9)	0.00024	0.098(29)	2018PASP..130d4201Z

Table 3: Continued.

No	Name	T_0	P_{12}	$a_3 \sin i_3$	e_3	ω_3	T_3	P_3	A	$f(M_3)$	M_3	Ref.
		[HJD]	[d]	[AU]		[deg]	[HJD]	[yr]	[d]	[M$_\odot$]	[M$_\odot$]	
76	V728 Her	2446949.845(2)	0.4712889(1)	–	–	–	–	–	0.02(1)	0.01(4)	0.4	2016NewA...46...73E
77	V829 Her	2450585.4879(3)	0.35815016(1)	0.99(3)	0.3(0,01)	102(9)	2453428(92)	12.61(1)	0.0057(2)	0.006(6)	0.31	2007ASPC..370..237O
78	V842 Her	2450177.4902(6)	0.4190346(2)	1.86(9)	0.5(6)	199(7)	2453854(76)	14.3(3)	0.011(1)	0.032(5)	0.57(3)	2009NewA...14..321E
79	V899 Her	2448500.1354(13)	0.42117138(14)	2(2)	–	–	–	3.7	0.0117(12)	0.61(19)	2.84(0,71)	2006NewA...12...33Q
80	V1104 Her	2452526.4289(1)	0.22787618(2)	5(1.1)	0	–	–	8.28	0.0125	0.00015	0.062(12)	2015AJ....149..148L
	V1104 Her	2452526.4289(1)	0.22787618(2)	–	–	–	–	1.82	–	0.019(1)	0.15(12)	2015AJ....149..148L
81	V1062 Her	2457906.6500(7)	0.251435 77(5)	0.7965	0.538(9)	9.586(14)	2461826.0668	14.3768(3)	0.0046(2)	0.002445(10)	0.0475	2019MNRAS.487.5520L
82	DF Hya	2445021.531(4)	0.3306022(3)	–	0.162(96)	165(104)	2430920(8000)	86.3(14.2)	0.054(9)	0.114(3)	0.84(2)	2009NewA...14..121Z
83	EZ Hya	2453055.2413(19)	0.44974752(21)	0	–	–	–	30.9(6)	0.0185(12)	0,0342(66)	56(3)	2004PASP..116..826Y
84	FG Hya	2436968.7067	0.32783433	–	–	–	–	36.4	0.0289	0.095(44)	0.82(28)	2005MNRAS.356..765Q
85	FO Hya	2455259.32959(64)	0.469556(3)	–	–	–	–	42.3	0.004	0.0002	0.1()	2013NewA...20...52P
86	WY Hya	2440570.979	0.716007	–	–	–	–	95.4(4.2)	0.0087(3)	0,0168(55)	0.18	2011NewA...16..265Y
87	LU Lac	2456162.13749(43)	0.29880186(1)	2.17(7)	0	–	–	51.92	0.0125(4)	0.00377(36)	0.192(7)	2014NewA...31...65L
88	PP Lac	2445595.4293(11)	0.40116138(13)	9.5	–	–	–	19.7	0.0058(16)	0.0026	0.21	2005NewA...11...52Q
89	SW Lac	2438708.3234	0.3207183	2.84(1)	0.329(2)	206.9(4)	2412529(29)	27.01(2)	–	–	–	2014MNRAS.439..878Y
	SW Lac	2438708.3234	0.3207183	12.91	0.649(1)	10.5(1)	2439235(5)	82.61(29)	–	–	–	2014MNRAS.439..878Y
90	AM Leo	2452397.3567(15)	0.365797612(38)	1.376(662)	0.54(25)	22(31)	2436637(1381)	46.48(4.84)	0.0068(33)	0.0012	0.177	This study
91	AP Leo	2439536.5441(1)	0.43035823(6)	0.85(9)	-()	–	–	22.4	0.0049(5)	0.0012(4)	0.17(3)	2007AJ....133..357Q
92	CE Leo	2447679.683(7)	0.30342695(3)	2.87(7)	0.372(26)	280(12)	2446590(110)	39.7(9)	0,0166(4)	0.0151(11)	0.37(1)	2013NewA...19...27Y
93	ET Leo	2448499.957	0.346505()	–	–	–	–	–	–	–	0.58	2006AJ....132..650D
94	XY Leo	235484.0238(22)	0.284410242(5)	4.24(11)	0.07(5)	53.43(40.75)	2471777(832)	19.55(9)	0.0244(6)	0.199864(86)	1.03	This study
95	RT LMi	2452249.387(4)	0.37491782(3)	–	–	–	–	46.7(6)	0.0049(4)	0.00028(9)	0.1(2)	2008PASJ...60...77Q
96	VW LMi	2452500.1497(2)	0.47755106(3)	1.785(11)	0.035(3)	108.86(5.15)	2452274.54(11)	0.02171	–	–	1.11	2008MNRAS.390..798P
	VW LMi	2452500.1497(2)	0.47755106(3)	3.32(1)	0.097(11)	126.05(6.87)	2453046(6)	0.02171(46)	–	–	1.09	2008MNRAS.390..798P
97	VZ Lib	2444788.595(6)	0.35825797(5)	–	–	–	–	17.1	0.02	0.142(23)	1.09(13)	2008NewA...13...98Q
98	NY Lyr	2445196.4136(1)	0.44079759(24)	–	–	–	–	82.1	0.0247	–	–	2009PASA...26....7Q
	NY Lyr	2445196.4136(1)	0.44079759(24)	–	–	–	–	19.4	0.0053	–	–	2009PASA...26....7Q
99	PY Lyr	2451663.563(5)	0.3857645(2)	–	0.138(115)	0(34)	2451360(1780)	52.5(9)	0.0395(23)	0.119(4)	1.17(4)	2009NewA...14..121Z
100	V574 Lyr	2457960.8201(6)	0.273126 33(2)	0.7099	0.205(14)	6.429(54)	2465338.5449	12.373(6)	0.0041(1)	0.002337(6)	0.0286	2019MNRAS.487.5520L

Table 3: Continued.

No	Name	T_0 [HJD]	P_{12} [d]	$a_3 \sin i_3$ [AU]	e_3	ω_3 [deg]	T_3 [HJD]	P_3 [yr]	A [d]	$f(M_3)$ [$M_\odot$]	M_3 [$M_\odot$]	Ref.
101	V649 Lyr	2454014.317(99)	0.29225601(9)	2.93(82)	–	–	–	7.39	0.00896(153)	0.069(35)	0.57(13)	2012AJ....144..178L
102	DD Mon	2450100.2938(4)	0.56801845(1)	7.7(1.7)	–	–	–	18.8(7)	0.0039(6)	0.00087(21)	0.13(2)	2009PASJ...61..333Q
103	V396 Mon	2455153.3763(53)	0.39634132(38)	–	–	–	–	42.4	0.016	–	0.31	2011AJ....141...44L
104	V524 Mon	2452641.74451(85)	0.283616121(54)	1.42(16)	0.77(13)	1.47(36)	2455343(176)	23.93(32)	0.0082(9)	0.005(16)	0.26	2012PASJ...64...85H
105	V753 Mon	2448500.2205(11)	0.67704303(34)	0.4(9)	–	–	–	13.5(6)	0.0023(5)	0.00035(7)	0.16(4)	2013ApJS..207...22Q
106	TV Mus	2445089.3997(12)	0.44567549(3)	–	–	–	–	29.1	0.024(22)	0.085	0.8	2005AJ....130..224Q
107	V502 Oph	2439639.9487(4)	0.4533928(12)	–	0.12(5)	283.1(3.6)	2448781(52)	23	0.00365(4)	0.00048	0.12	2006ChJAA...6..331L
108	V508 Oph	2455383.1889(8)	0.34479141(5)	–	–	–	–	24.27(34)	0.0036(4)	–	0.1	2015AJ....149...62X
109	V566 Oph	2442911.183(5)	0.409646(1)	–	0.6(2)	2(14)	–	62.3(3)	0.013(3)	–	0.29(5)	2010ASPC..424..204L
110	V839 Oph	2439313.4377(117)	0.408995833(43)	0.72(17)	0.07(5)	56.95(135.67)	2453930(1597)	12.28(75)	0.0041(9)	0.00257	0.24	This study
111	V2388 Oph	2452500.3842(4)	0.80229787(69)	4.6(1.02)	0.329(4)	208.4(3.3)	2454197.2(27)	8.975(60)	0.00102(6)	0.000078(14)	0.54(6)	2014AcA....64..125Z
112	ER Ori	2440127.5672(17)	0.423399556(7)	4.35(24)	0.49(7)	0(7)	2435961(473)	52.48(1.28)	0.0021(12)	0.029	0.63	This study
113	FZ Ori	450479.403(12)	0.39998594(16)	4.35(33)	0.524(146)	198(11)	2450835(596)	48.14(1.94)	0.0218(17)	0.0356(1)	0.64	This study
114	BB Peg	24430285.7655(36)	0.3615006(1)	–	0.56(3)	69(9)	2438540(793)	27.9(2)	–	0.001(5)	0.16	2007AJ....134..642K
115	BX Peg	24481784.533(3)	0.280422(44)	–	0.79(6)	127.2(7.4)	2425716.8(1226.1)	57.8(3.4)	0.0152(12)	0.0055(13)	0.25(4)	2015NewA...41...17L
	BX Peg	2448174.52786(19)	0.280419354(1)	–	0.723(104)	139.7(7.5)	243967(83)	15.88(5)	0.00201(26)	0.000289(38)	–	2009PASP..121.1366L
116	U Peg	2436511.6698(5)	0.3747809(5)	–	0.38(5)	112(9)	2445935(569)	0.085	–	0.00105(20)	0.14	2005A&A...441.1087B
117	V432 Per	2448601.3757(2)	0.38330916(13)	–	0.459(141)	180.9(17.7)	2439151.2(781.3)	52.36(2.54)	0.0324(22)	0.092(1)	0.81(1)	2014AJ....147..130Z
	V432 Per	2448601.3757(2)	0.38330916(13)	–	0.014(8)	127.3(10.4)	2451167.5(182.7)	9.55(41)	0.0038(15)	0.003(1)	0.28(1)	2014AJ....147..130Z
118	V873 Per	2455892.9201(7)	0.2949025(2)	–	0.19(9)	58.2(4.3)	2455730.6(107.3)	4.04(31)	0.001(2)	–	–	2015NewA...36...50K
119	AQ Psc	2457988.8606(37)	0.47560744(33)	2.439(3)	0.2108(9)			23.9(1)	0.0141(1)	0.0255(1)	0.5025	2020MNRAS.491.6065Z
120	DZ Psc	2452500.0905(19)	0.36613159(31)	5.3(9)	–	–	–	11.89(19)	0.0064(6)	0.00979(26)	0.33(3)	2013AJ....146...35Y
121	EM Psc	2452679.315(24)	0.34395922(93)	–	–	–	–	3.3	0.011(18)	0.634	1.79	2008AJ....136.1940Q
122	VZ Psc	2444556.5264(4)	0.26125912(3)	0.52(7)	–	–	–	25	0.003(4)	0.00022(9)	0.081(19)	2004AN....325..714Q
123	V701 Sco	2446199.5041	0.76187371	2.74(5)	–	–	–	41.2	0.0158(3)	0.121(7)	1.82(6)	2006NewA...12..117Q
124	V1055 Sco	2452050.7441(43)	0.3636835(38)	–	0	–	–	36.7(12.5)	0.031(9)	0.118(37)	–	2015AcA....65..151Z
125	AU Ser	2444722.46828(142)	0.386499241707(11)	–	0.52(12)	133.7(14.9)	2448219.4(507.6)	42.87(3.16)	0.0197(16)	0.02662(13)	0.475(1)	2015JKAS...48....1A

Table 3: Continued.

No	Name	T_0 [HJD]	P_{12} [d]	$a_3 \sin i_3$ [AU]	e_3	ω_3 [deg]	T_3 [HJD]	P_3 [yr]	A [d]	$f(M_3)$ [$M_\odot$]	M_3 [$M_\odot$]	Ref.
126	V384 Ser	2457169.2537(3)	0.26872872(4)	0.787(22)	0.229(16)			2.84(1)	0.0045(1)	0.0602(53)	1.04	2020MNRAS.491.6065Z
127	Y Sex	2454164.3027(33)	0.41981483(14)	3.37(43)	–	–	–	51.22	0.0218(42)	0.0205(1)	0.11(2)	2007PASJ...59.1115H
	Y Sex	2454164.3027(33)	0.41981483(14)	58.9(6.7)	–	–	–	32.1	0.01(11)	0.00504(1)	0.042(6)	2007PASJ...59.1115H
128	AH Tau	2431822.3653	0.33267368	2.95(9)	–	–	–	45.8(1.1)	0.0171(5)	0.0123(12)	0.36(1)	2010AJ....139..195Y
129	EQ Tau	2440213.325	0.3413478	10.7(1.1)	0.47(6)	87.9(9.5)	2447445.5(182.9)	22.7(2)	0.0058(3)	0.00096(3)	0.2(2)	2014AJ....147...98L
130	RZ Tau	2437676.5732(18)	0.41567365(3)	0.71	–	–	–	28.5	0.0041	0.000441	0.132	2001MNRAS.328..914Q
131	V781 Tau	2452500.072	0.34490986	–	0.55(22)	294.4(38.6)	2437588.2(2510.9)	44.8(5.7)	0.0064(11)	0.000679(35)	0.16(5)	2016Ap&SS.361...63L
132	V1128 Tau	2454842.347(1)	0.305371(1)	–	0.3(2)	56(14)	2456290(50)	12.6(3)	0.003(2)	0.0009(2)	0.15(1)	2014AJ....148..126C
133	AA UMa	2446885.11379(87)	0.468126612(66)	–	0.22(19)	154(10)	2445788(311)	28.2(1.6)	0.0066(12)	0.00196(38)	0.25	2011PASP..123...34L
134	AW UMa	2444664.80057(49)	0.43873	–	–	–	–	18.572	–	–	0.46	2013SASS...32..179S
135	BM UMa	2444292.3496	0.27122009	–	–	–	–	30.8(2)	0.0101(4)	–	0.25(1)	2009PASJ...61...13Y
136	II UMa	2448500.073	0.825224	–	–	–	–	–	–	–	1.34	2016AJ....151...67Z
137	LP UMa	2450495.51937(6)	0.30989168(1)	6.7(2.3)				14.84	0.0031	0.54(10)	0.14(4)	2016NewA...44...29G
138	PZ UMa	2451337.6950(4)	0.26267489(2)	3.43				13.22	0.0198(2)	0.23	0.88	2019PASJ...71...39Z
139	TY UMa	2439532.4951(26)	0.35453954(12)	3.6	–	–	–	57.4	0.0206(49)	–	1.7	2002MNRAS.331..707K
140	UY UMa	2451247.3414(17)	0.37602060(18)	0.45(18)	0.45/(12)	86(12)	2453586(192)	12.02(1.54)	0.0026(9)		0.11(1)	2016NewA...44...29G
	UY UMa	2451247.3414(17)	0.37602060(18)	1.45(56)	0.45(36)	111(12)	2448183(155)	46.3(7.37)	0.0083(29)		0.16(1)	2016NewA...44...29G
141	W UMa	2435918.417	0.33363747	–	0.092(27)	87(11)	2410271(1905)	95(3)	0.02902(38)	0.01389	0.389	2015ASPC..496..114D
	W UMa	2435918.4229(13)	0.33363661(4)	–	0.21(12)	0(27)	2457143(506)	17.91(21)	0.0019(11)	0.00011	0.0806	2015ASPC..496..114D
142	AG Vir	2439946.7463(11)	0.6426043(5)	0.55	–	–	–	40.9	0.0032	0.000102	0.079	2001MNRAS.328..914Q
143	AH Vir	2449821.822	0.4075231	–	0.89(5)	–	–	41.1	0.0219	0.042(24)	0.65	1998Ap&SS.260..375H
144	GR Vir	2452782.428	0.3469788	2.43	–	–	–	19.3	0.014	0.0383(66)	0.55(6)	2004AJ....128.2430Q
145	HT Vir	2444044.5117(3)	0.40767243(2)	1.14(5)	–	–	–	30.5	0.0066(3)	0.00161(22)	0.22(1)	2010PASJ...62..521L
146	PY Vir	2455956.29945	0.311248	2.8	–	–	–	5.22(5)	0.0075(4)	0.0804	0.79	2013AJ....145...39Z
147	BI Vul	2456161.0708(2)	0.25182528(18)	4.9(1.1)	0	–	–	10.8(5)	0.0057(5)	0.0083(2)	0.30	2013ApJS..209...13Q
148	ER Vul	2440182.262	0.69809409	–	–	–	–	30.6	0.0000032	0.00000188	0.0048	1997Ap&SS.257....1Q
149	NO Vul	2446346.3017	0.37076721	–	0.408	128	–	63.53	–	0.0063	0.36	2008arXiv0801.4258Z
150	NSVS 1461538	2455866.0968(44)	0.3913025(27)	15.8	–	–	–	5.61(3.49)	0.0079(38)	–	0.71	2016JASS...33..185K