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Measurements of visual binaries with EMCCD cameras and the Nice 76-cm refractor in 2009-2010

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We present relative astrometric and photometric measurements of visual binaries made in 2009-2010, with the 76-cm refractor of Côte d’Azur Observatory and a pair of sensitive EMCCD ANDOR cameras. Our observing list consists of optical pairs and binaries whose orbital motion is still uncertain. Three different techniques were used for obtaining measurements: Lucky Imaging, Speckle Interferometry and the Direct Vector Autocorrelation method. From the 2050 observations of double stars that we performed, we obtained 1652 new measurements of the relative position of 1792 objects, with angular separations in the range $0''.1$ — $14''.1$. The average accuracy is estimated at $0''.02$ for the angular separations and $0''.6$ for the position angles. We managed to observe faint systems ($m_V \approx 12$) with large magnitude difference (up to $\Delta m_V \approx 5$). We have thus been able to measure many systems containing red dwarf stars that had been poorly monitored since their discovery. We also measured the difference of magnitude of the two components of 1143 objects with an estimated error of 0.2 mag.

[†]Deceased in October 2018

1 Introduction

This paper presents the observations of binary stars made in 2009-2010 with the 76-cm refractor telescope “*Grande Lunette*” of “Observatoire de la Côte d’Azur”, OCA observatory (i.e., French Riviera Observatory). This work is the continuation of the program described in Gili & Prieur (2012), that will be referred hereafter as Paper I. This program aims at obtaining high angular resolution measurements of binary stars with sensitive detectors, by using the good image quality of the site and the optics of the large Nice refractor, that often provides diffraction-limited images.

The observations presented here were first done with the ANDOR iXon DV885 EMCCD detector (see AN-

DOR, 2020), that was acquired by René Gili (1951-2018) in July 2008 (see Paper I) and later in 2009, with an ANDOR iXon DV897 EMCCD (SPICA) that was kindly lent to our team by Farrokh Vakili, the former Director of OCA. The DV897 detector is a thin back illuminated CCD chip with a higher quantum efficiency than that of the DV885 thick front-illuminated CCD chip (see Fig. 1). Furthermore, the DV897 camera has a higher reading frequency, and a more elaborated cooling system than the DV885 camera (see Table 1). As a result, our observations substantially gained in sensitivity and productivity through the year 2009.

Concerning the data reduction of the observations, the Lucky imaging method (basically a shift-and-add method applied to a selection of the best images) that was mainly used in 2007 (Gili & Agati, 2009) and in 2008 (Paper I) was progressively replaced in 2009 by other methods based on speckle interferometry, which

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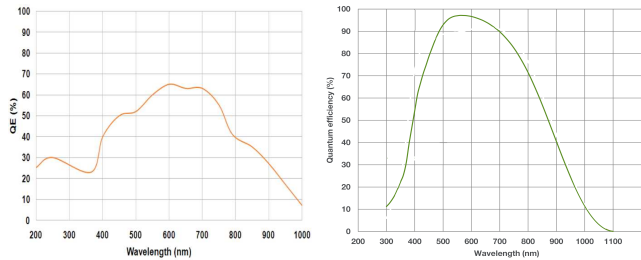


Fig. 1 Quantum efficiency of the Andor DV885 EMCCD chip on the left and of the DV897 on the right (from www.andor.com).

lead to higher accuracy measurements and are less sensitive to atmospheric turbulence.

In this paper, we describe our observations and our instrumentation setup in Sect. 2. The procedure we followed for determining the scale and position angle calibration is detailed in Sect. 3 and the data reduction procedure is described in Sect. 4. Then we present and discuss our relative astrometric and photometric measurements in Sect. 5.

2 Instrumentation and observations

2.1 Observing list

Our list of targets basically includes all the visual binaries of the “Washington Double Star Catalogue” (Mason et al., 2020, hereafter: WDS) for which new measurements are needed to improve their orbits and that are accessible with our instrumentation. Among those, we particularly favoured the objects discovered by Paul Couteau (see Couteau, 1999 and Le Contel et al., 2001), as they have been neglected by other observers due to faint magnitudes and small separations. Indeed they are particularly well suited to the 76-cm refractor and its site, since most of them were discovered in Nice.

The distribution of the apparent magnitudes m_V of the primary components of the binaries observed in 2009-2010 is presented in Fig. 2a and the difference of magnitudes Δm_V between the two components in Fig. 2b. These data were retrieved from the WDS catalog. The telescope aperture and detector sensitivity led to a limiting magnitude of $m_V \approx 14$ for the faintest companions, which corresponded to about $m_V \approx 12$ for the binary systems (see Fig. 2a).

2.2 Description of the ANDOR DV885 and DV897 cameras

The observations presented here were carried with two EMCCD (Electron Multiplying CCD) detectors of ANDOR Technology: an iXon DV885 and an iXon DV897. From 2008, the DV885 detector was used at the focus of the great refractor, with the instrumental setup presented in Paper I and in Gili et al. (2014). An additional

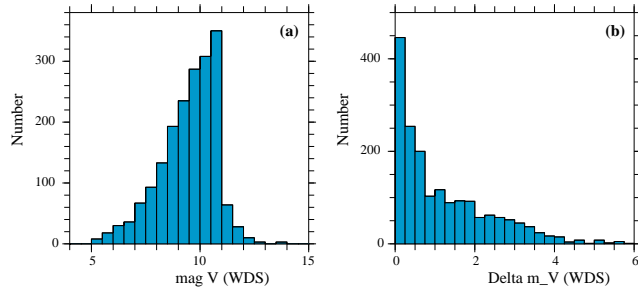


Fig. 2 Distribution of the WDS visual magnitudes of the binary systems observed in 2009-2010 (a) and distribution of the WDS magnitude differences Δm_V between the two components (b).

LUCA detector was mounted at the direct focus of the finder scope of the great refractor, with a resulting field of view of $12''.3 \times 9''.3$, and two webcams were installed in front of the graduated right-ascension and declination circles. This allowed a single person to operate the telescope, and the pointing of stars as faint as $m_V \approx 14$ could be interactively controlled from the screen of a computer transformed into a dashboard. This permitted us to observe typically twenty binaries per hour. During autumn 2009, the DV885 was replaced by the DV897 detector, that was kindly lent to us by F. Vakili.

The main characteristics of the EMCCD detectors that we used for our observations in 2009-2010 are given in Table 1. The peak quantum efficiency values in Col. 6 are those given by the manufacturer of the chip for wavelengths in the range 550–720 nm, but they are unfortunately much smaller for the whole system. The mention “interleaved” (Col. 8) means that the pixel electronic charges were transferred from the sensitive matrix of the CCD to a masked interleaved matrix available on the same CCD chip. The mention “non-interleaved” is reported in Col. 8 in the absence of a masked CCD. A USB (Universal Serial Bus) cable was used with the LUCA to communicate with the camera and transfer the images from it to the computer (Col. 9), whereas a dedicated Andor board running the ‘Camera Link’ serial protocol was installed on the Peripheral Component Interconnect Bus (PCI bus) of the computer for the other cameras.

For the LUCA detector, the read-out noise is about 25 electrons in conventional mode and less than one electron in electron-multiplying (EM) mode. It works in interleaved mode and the images are transferred to the computer through a USB link.

For the iXon DV885 and the iXon DV897, the image transfer is made with a dedicated link between the detector and a CCI-22 controller board installed on a PCI slot of the computer. Such a dedicated board allows a high reading frequency and an acquisition rate of 27 and 35 full-size images per second, for the DV885

Table 1 Main characteristics of the ANDOR EMCCD cameras used for our observations: full format in pixels (Col. 2), pixel size in μm (Col. 3), digitization depth in bits/pixel of the encoded output values (Col. 4), read-out frequency rate (Col. 5), Peak Quantum Efficiency (P.Q.E.) of the detector (Col. 6), cooling temperature used during our observations (Col. 7), frame transfer mode, i.e. pattern method used for reading the data (Col. 8) and hardware used for the data link (Col. 9).

Name	Format (pixels)	Pixel size (μm)	Digit. (bits/pixel)	Read freq. (MHz)	P.Q.E. (%)	Cool. temp. ($^{\circ}\text{C}$)	Frame transfer	Data link
LUCA	658×496	10×10	14	12.5	50	-20	Interleaved	USB
DV885	1004×1002	8×8	14	27	65	-70	Non-interleaved	PCI board
DV897	512×512	16×16	16	10	92	-80	Non-interleaved	PCI board

and DV897, respectively. In fact, to reduce the noise in the images, we used a lower value of about 5 MHz for this reading frequency. Like the LUCA, the DV885 and DV897 detectors were used in EM mode, which reduced the read-out-noise of the output register to less than one electron in both cases.

Compared to the LUCA, the main advantage of the DV885 and DV897 for our observations was a lower noise level due to better cooling performances. Indeed those cameras were endowed with a three-stage Peltier device that allowed to cooling the detector down to -70° for the DV885 and even -80° for the DV897, without external heat-exchanger, whereas the LUCA detector could be cooled down to -20° only.

Most of the observations presented here have been obtained and reduced with the method presented in Paper I which used the ANDOR SOLIS data acquisition software. The images were recorded as three-dimensional cubes in the proprietary SIF-format in 32 bits and converted to 16-bit FITS individual files using SOLIS too. Final processing of those images in the frequency or spatial domain was done with the REDUC program (Losse, 2020).

Another acquisition program was progressively implemented during that period, with the development of a dedicated real time processing program `BuildSpeck1` by Jean-Louis Prieur. This program was derived from the `vcrb` program used in Merate (Brera Observatory, Italy) for the real time processing of the video analog signal produced by an ICCD camera (see Prieur et al., 2001). It also allowed a full control of all the available options of the ANDOR cameras and could be used for the LUCA, DV885 and DV897 cameras. This program was written in C++ language with the Borland C++ (version 5.02) library. This program was widely used for data acquisition after mid-2009 but was only marginally used for data processing until the end of 2010.

2.3 Optical setup and observing procedure

The observations reported here were thus made with the “Grande Lunette” of OCA Observatory. It is a 19th century 76-cm refractor, with a free aperture diameter of $D = 74$ cm. The limit of diffraction $\rho_D = \lambda/D$ is

$0''.16$ with $\lambda = 570$ nm, which corresponds to the average central wavelength of the filters we used. The “Journal of the observations” is presented in Table 2.

For most of our observations, we used the optical setup presented in Paper I, and magnified the images with a negative achromatic double lens (“Barlow”) of -113 mm focal length. Switching from one camera to another was easy and did not change the field size since the mechanical structure of the cameras was the same and since the sensitive areas of the DV885 and DV897 cameras had the same size. Indeed the product of the number of the pixels by the pixel size was almost the same for both (see Table 1). We changed this setup in November 2010 when we installed PISCO2 on the refractor. This instrument is described detail in Gili et al (2014).

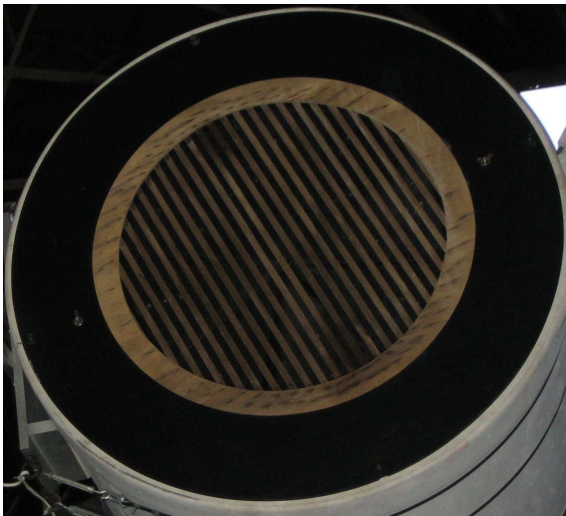
Exposure times of elementary frames were set in the range 20–30 msec for all objects, independently of their magnitudes. The standard format of the acquisition window was 128×128 pixels which corresponded to a field of view of $8'' \times 8''$. For faint objects or wide pairs, a wider field of 256×256 pixels on the detector was used with a binning factor of 2×2 which thus amounted to 128×128 pixels for the elementary frames. To avoid saturation with bright objects, the EM gain was reduced and sometimes even put to “off”, which corresponded to observing in conventional CCD mode.

For each object, we recorded SIF cubes of 1000 elementary images. In average $1''.2$ seeing conditions, the typical limiting V magnitude was close to 14–15 with a binning mode of 1×1 .

As described in Paper I, the AF filter (anti-fringe or V-block) was mounted on the front window of the DV885 or DV897 detectors. This filter is bandpass 450–650 nm which considerably reduces the secondary spectrum of the 76-cm refractor, with no significant loss of energy in the V band. When combined with the transmission of the lenses and the quantum efficiency response of the detector, the resulting transmission curve is close to a standard V filter with a maximum transmission at around 570 nm.

Table 2 Journal of the observations of double stars made in 2009-2010.

Month	Nobs.	Nobs. night distribution	Nights	Comments
2009-01	70	=70	1	DV885
2009-03	45	=18+27	2	DV885
2009-08	569	=37+61+54+41+69+78+59+71+23+38+38	11	DV885
2009-09	127	=21+68+38	3	DV885
2009-10	176	=24+14+24+36+29+49	6	From 15/10, DV897
2009-11	279	=7+41+59+31+8+84+49	7	DV897
2009-12	50	=50	1	DV897
Total in 2009	1216		31	
2010-03	7	=2+5	2	DV897
2010-04	205	=40+43+34+5+56+27	6	DV885
2010-05	145	=26+22+35+62	4	DV885
2010-06				Flap dome breakdown
2010-07	118	=15+19+6+43+35	5	DV897
2010-08	179	=47+57+40+35	4	DV897
2010-09	103	=60+28+15	3	DV897
2010-10	77	=6+23+48	3	PISCO2 + DV897
2010-11	74	=61+13	2	PISCO2 + DV897
Total in 2010	834		29	

**Fig. 3** Calibration grating mask on top of the 76-cm refractor

3 Scale and position angle calibration

The astrometric calibration was first done using wide well-known couples with a separation of about $5''$, and then, after 2010, with a calibration grating mask (see Fig. 3). This mask was initially designed for the 50 cm refractor of the OCA Observatory, but could also be used on the 76 cm refractor. Its free entrance diameter is 50.5 cm with 23 occulting bands that are uniformly distributed with an average step of $a = 22.43 \pm 0.10$ mm. This grating mask simulates the observation of a double star whose separation is (see Scardia et al. 2007):

$$\theta = \lambda/a$$

where λ is the wavelength of the incident light, and θ is in radians. To obtain θ in arcseconds, we should multiply it by $3600 \times 180/\pi = 206265$. Hence

$$\theta_{\text{arcsec}} = 206265 \times \lambda/a$$

For $\lambda = 570$ nm, we obtain $\theta = 5''.2409 \pm 0''.0241$ for our grating mask.

Without the Barlow lens, the focal length was found to be 17.89 ± 0.005 m at the primary focus. With Barlow, the equivalent focal length was 26.93 ± 0.2 m and the scale was $0.0613''/\text{pixel}$ for the DV885 and DV897 cameras. The sampling of both detectors in the Barlow configuration is thus less than $\rho_D/2$ for $\lambda = 570$ nm. It then satisfies the Nyquist-Shannon theorem and allows measurements down to the telescope diffraction limit.

The calibration of the origin of the position angles was done recording star trails caused by the diurnal motion. We used the largest available field for this purpose, which was $53'' \times 40''$ with the DV897.

4 Data reduction procedure

A basic pre-processing of the elementary frames consisted in subtracting the mean offset corresponding to the same detector setup. For this purpose, series of 1000 offset frames (i.e. short-exposure dark frames) were recorded each night to SIF cubes until mid-2009 or later to FITS cubes.

The pioneering work of Labeyrie (1970) showed that high resolution information could be extracted from short-exposures by computing the average power spectrum of those exposures. This technique is known as

“speckle interferometry”, and has become the “standard” way of processing our data since 2008. Our processing method is described in Paper I. Conventional speckle interferometry, is based on the computation of the mean autocorrelation function of short exposures. This function is symmetric relative to the origin and does not contain any information about the location of the companion of the binaries (see Fig.4). As a consequence, the speckle measurements of the position angles of binaries have an ambiguity of 180° . To solve this problem, we also computed the direct vector autocorrelation (DVA), as proposed by Bagnuolo et al (1992), that is the “oriented” autocorrelation function and takes into account the brightness level of the vector ends. The DVA allows the quadrant determination and the measurement of Δm_F when the contrast is not too large (e.g. $\Delta m_F < 2$). As explained in Paper I, those determinations were done with the REDUC software (Losse, 2020), which was kindly specially adapted to our application by Florent Losse.

In the case of good seeing conditions, we obtained high resolution images with the Lucky Imaging method that was described in Paper I, and consisted in shift-and-add processing a subset of selected good images (see Fig.4). We experimentally found that a selection of about 3–10% of the best images of our 1000-frame cubes often led to very nice shift-and-add images, with clear Airy rings and a final resolution close to the diffraction limit of the 76-cm refractor. When the “Lucky images” were very noisy, we filtered them with wavelets or with an “over-sampling Spline-method” by a factor of three using the IRIS software (Buil, 2020). The final images were then processed with the REDUC software (Losse, 2020) that provided the θ , ρ and Δm_F measurements. We could measure couples with very large differences of brightness, up to 4–5 magnitudes (see Sect. 5). Compared to the speckle interferometry, the main advantage of “Lucky imaging” is to provide a full image which is convenient for the determination of the quadrants (where lie the companions) and of the difference of magnitudes between the two components.

5 Relative astrometric and photometric measurements

The relative astrometric and photometric measurements that we obtained in 2009-2010 are displayed in Table 5 (beginning only). The full version (Table 6) is available in the on-line version of the paper).

The position angle θ of the companion in degrees (Col. 8) was measured from the North and positive to the East. In Col. 12, we reported the O-C residuals of our θ and ρ measurements with a computed orbit if any was available (see Sect. 5.1). When the stars were not resolved by our observations and when an orbit was known, we indicate the ephemerides in square

brackets. In that column, we also added in parentheses some complementary comments that could not fit in Col. 11.

In Col. 11, the note ‘i’, ‘dva’, or ‘ly’ was added when the ρ , θ measurements were obtained with speckle interferometry, the DVA method (Direct vector Autocorrelation) or with the Lucky imaging method respectively (see Sect. 4 and Paper I). The letter ‘b’ indicates that the measurements were obtained in the binning mode with bins of 2×2 pixels (see Sect. 2.2). The location of the companion in a given quadrant relative to the North-East orientation could be done with the Lucky imaging or the DVA methods. The quadrants are noted 1Q, 2Q, 3Q and 4Q for the first (North-East), second (South-East), third (South-West) and fourth (North-West) quadrant, respectively. They are indicated in Col. 11 or Col. 12.

In those columns, we also give some other information:

- ‘S’ for Single star (i.e., not seen as double),
- ‘NR’ for Non-Resolved, although seen as double, and in some cases an estimate of the upper limit for the separation in arcseconds (e.g. < 0.16 for 00122+4647).
- ‘ND’ for New Double.
- A colon ‘:’ following one measurement indicates that measurement has a large uncertainty.
- An exclamation mark ‘!’ was added to some comments to underline those comments (i.e., the observations clearly showed them).

The difference of magnitudes Δm_F of the two components was obtained either from the Lucky Imaging or the DVA method. This is indicated with ‘ly’ or ‘DVA’ in Col. 11, and concerns 1143 objects (see Fig. 5b). The average errors are estimated at 0.2 mag. In Fig. 5c we have plotted our measurements Δm_F versus the WDS values (Δm_V). There is a fair correlation between the two. The big scatter shows that the relative photometry of many systems is still poorly known in the literature and that photometric observations are really needed.

The distribution of the 1652 angular separations measured in this paper is displayed in Fig. 5a and shows a maximum for $\rho \approx 0''.65$. The largest separation of $\rho = 14''.056$ was obtained for GII30 AB,C. The smallest separation was measured for A1798 with $\rho = 0''.103$. This is below the diffraction limit of $\rho_D = \lambda/D$ is $0''.16$ with our V filter (i.e. $\lambda = 570$ nm) and the refractor whose free aperture is $D = 0.74$ m. Some other objects could be measured under this limit. The closest separations, less than $0''.16$, that we obtained in 2009-2010 are listed in Table 3. This table shows that the residuals in angular separation are compatible with our measurements. The position angles have a larger orbit residual, which was expected since those measurements were obtained at the limit of our instrumentation. We could also check that our measurements

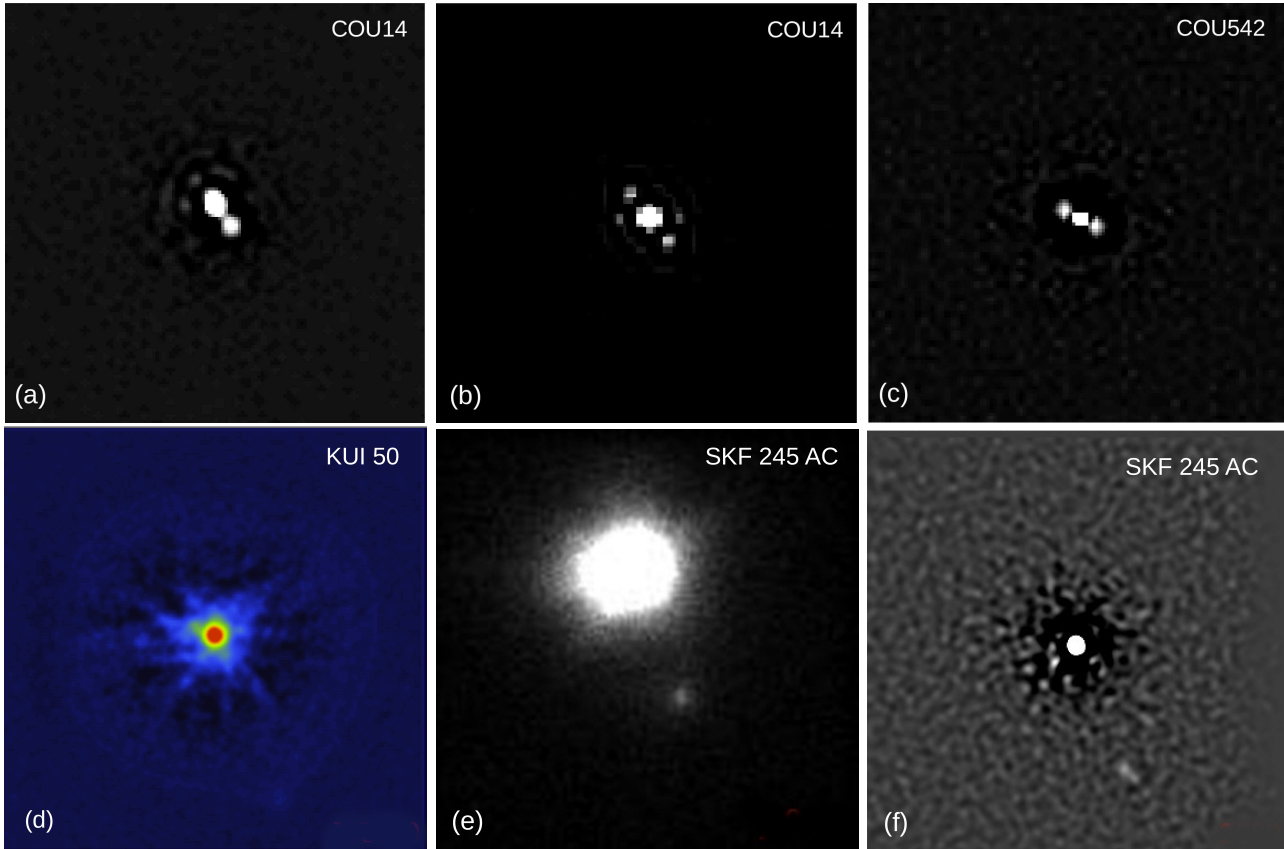


Fig. 4 Examples of "Lucky imaging" (LI) and "autocorrelation" (AC) images with the (θ, ρ) measurements that we obtained in 2009-2010. (a) LI of COU 14 in 2009., (b) AC of COU 14 in 2010, (c) AC of COU 542 in 2010, (d) LI of KUI 50 in 2009, (e) LI of SKF 245 AC in 2010 (f) wavelets filtered LI of SKF 245 AC in 2009. The position angle and angular separation were measured as $(33.3^\circ, 0.''30)$ for COU 14 in 2009.60, $(38.4^\circ, 0.''32)$ for COU 14 in 2010.64, $(63.2^\circ, 0.''19)$ for COU 542 in 2010.64, and $(20.7^\circ, 3.''26)$ for SKF 245 AC, whereas KUI 50 was not resolved. North is to the bottom and East to the right.

are in good agreement with other observations reported in the "Fourth Catalogue of Interferometric Measurements of Binary Stars" (Hartkopf et al., 2020, hereafter IC4).

From our 2050 observations of double stars, we were able to derive 1652 position measurements. There were 223 cases of unresolved objects that clearly appeared as single (S in Col. 11) or that appeared as an elongated spot although it was not possible to resolve this spot (NR in Col. 11). Some observations could not be used due to technical problems.

The average errors are estimated at $0''.02$ and $0^\circ.6$ for ρ and θ respectively (those values were determined from multiple measurements of the same objects). When the measurements had a large uncertainty, we added '}' after the corresponding values.

5.1 Comparison with published ephemerides

The $(O - C)$ (Observed minus Computed) residuals of the measurements for the systems with a known orbit in Table 5 are displayed in Cols. 11 and 12 for the po-

sition angle θ , and separation ρ , respectively. A Q was added to θ residuals when the quadrants of the measurements were not in agreement with those used for the orbits. The orbital elements used for computing the ephemerides were retrieved from the "Sixth Catalogue of Orbits of Visual Binary Stars" (Hartkopf & Mason, 2020, hereafter OC6). The corresponding authors are given in Col. 13, using the style of the OC6 references.

The 252 residuals from Table 5 are plotted in Fig. 6. The residuals are well centered around the origin, with a rather large scatter that can be explained by the poor quality of many orbits due to a lack of observations. The mean values computed with the residuals of Table 5 are $\langle \Delta\rho_{O-C} \rangle = 0''.01 \pm 0''.05$ and $\langle \Delta\theta_{O-C} \rangle = 0^\circ.3 \pm 4^\circ.9$. In both cases, the offsets are much smaller than the standard deviations which provides a validation of our calibration (see Sect. 2.3).

The largest residuals in angular position are reported in Table 4 and give an indication of the orbits that can be revised in the future.

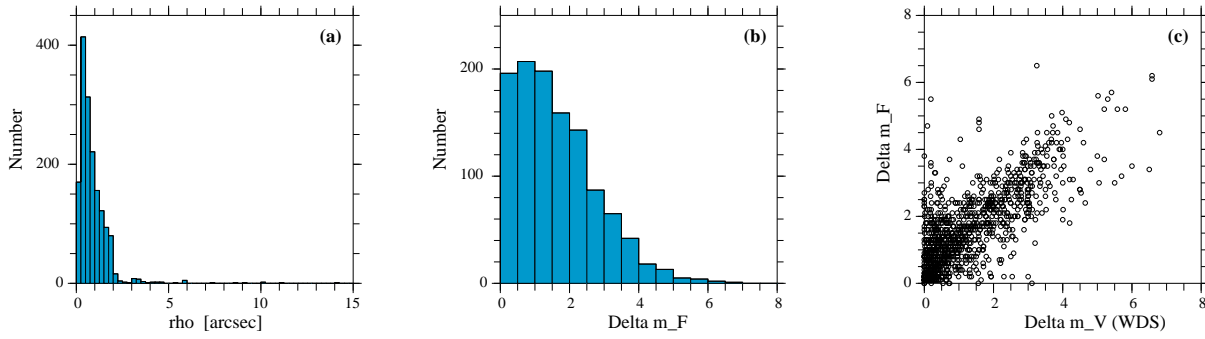


Fig. 5 Distribution of the angular separations of the 1652 measurements of Table 5 (a), and of the differences of magnitude Δm_F actually measured (b). At right (c), plot of Δm_F versus Δm_V , that was reported in the WDS.

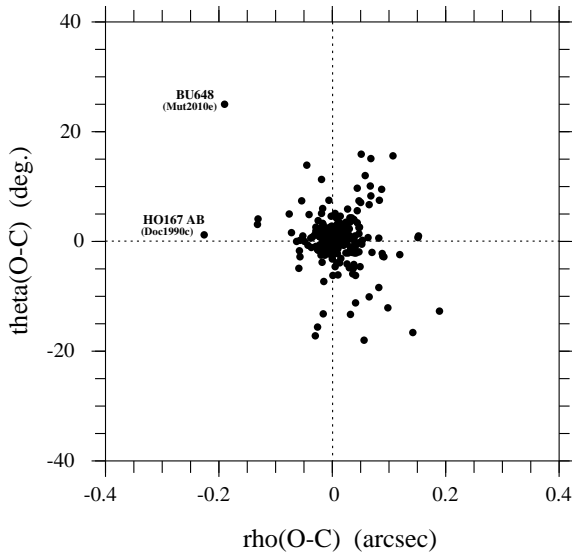


Fig. 6 Residuals of the position measurements of Table 5 relative to the published orbits.

6 Conclusion

In this paper, we have presented the numerous measurements that we obtained in 2009-2010, and constituted a significant harvest of results. This validated the technical and data processing investment that we have made in the preceding years. In 2009, we began to use a new EMCCD detector, an ANDOR iXon DV897, whose good sensitivity allowed us to take full advantage of speckle techniques.

In 2009-2010, we obtained 1652 new position measurements of 1569 visual binaries with the 76-cm refractor in Nice. The average accuracy is estimated at $0''.02$ for the angular separation and $0^\circ.6$ for the position angles. We observed faint systems ($m_V \approx 12$) with large magnitude difference (up to $\Delta m_V = 5$). We were thus

able to measure red dwarf stars that had been poorly monitored. We also measured the difference of magnitude of the two components for 1143 objects with an estimated error of 0.2 mag. This work is thus a good contribution to the continuing monitoring of long period visual binary systems, which is important for refining systemic stellar masses. We should also underline that this work is a good illustration of a fruitful collaboration between amateur and professional astronomers.

At the end of 2010, the new speckle camera PISCO2 began operation with a filter wheel, and a remote focusing system. It is a simplified version of PISCO that was first developed in 1993 for the 2-meter Bernard Lyot telescope (Pic du Midi Observatory, France) and had been in operation on a dedicated 1-meter telescope in Merate (Brera Observatory, Italy) between 2004 and 2015 (Priour et al., 1998, Scardia et al., 2011).

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We also thank W. Fresquet and J.-M. Laurent from the Andor company for providing us the figures of the quantum efficiency of the DV885 and DV897 detectors. This work has made use of the “Fourth Catalogue of Interferometric Measurements of Binary Stars”

(<http://www.astro.gsu.edu/wds/int4.html>), the “Sixth Catalogue of Orbits of Visual Binary Stars”

(<http://www.astro.gsu.edu/wds/orb6.html>), the Washington Double Star Catalogue maintained at the U.S. Naval Observatory, (<http://www.astro.gsu.edu/wds>), the SIDONIE (Site Informatique des étoiles DOubles de Nice)

<http://sidonie.obs-nice.fr> and the SIMBAD data base (<http://simbad.u-strasbg.fr/simbad>) operated by the *Centre de Données Astronomiques de Strasbourg* (France).

Table 3 Closest binaries measured in 2009-2010 with $\rho < 0''.16$ (i.e. smaller than the diffraction limit).

WDS	Name	ρ (")	$\Delta\theta_{(O-C)}$ ($^{\circ}$)	$\Delta\rho_{(O-C)}$ (")	Orbit ref.
00085+3456	HDS17	0.139	4.3	0.031	Cve2010c
00321+5000	COU2151	0.137:			
01325+7001	HDS199	0.149			
02277+7147	MLR305 Aa	0.153			
02377+6520	HU1041 AB	0.148			
03058+4818	COU2016	0.151:			
04461+4308	A1717	0.147:			
09498+5254	MLR677	0.131:			
11056+5448	A1591	0.135:	3.8	-0.025	Hei1976
14267+1625	A2069	0.144:	-3.9	0.013	Sca2001g
16079+1425	A1798	0.103:	7.4	-0.054	USN2002
17080+3556	HU1176 AB	0.154:	2.6 ^Q	0.017	Mut2010b
17313+1901	COU499	0.141:	-6.2	0.041	Tok2017c
17398+4619	COU1780	0.156:			
17542+1108	FIN381	0.136:	-11.2	0.041	Doc2013d
18007+1736	COU810	0.150:			
18126+1224	HDS2570	0.104:			
18149+0859	HU196	0.147:			
18170+1204	HDS2582	0.154:			
18411+4416	HDS2647	0.143:			
18549+0830	HU259	0.155:			
18558+0327	A2192	0.141:	0.1	0.002	Doc1988c
19073+2432	A262	0.145:	4.4 ^Q	-0.049	Zir2012b
19089+3404	COU1462	0.155	-7.3	-0.05	Doc2003e
19296+1224	A1653	0.130:	-4.9	-0.059	Pru2014
19490+4423	A718 BC	0.136:			
19496+1241	A1659	0.138:			
19539+3257	COU1626	0.125:			
20266+5106	HDS2923	0.152			
20470+4901	HDS2962	0.127:			
20489+4537	HDS2965	0.131:			
20530+4258	COU2542	0.111:			
20535+4523	HDS2975	0.151:			
21107+1334	HEI186	0.150			
21171+4001	A1441 AB	0.147:			
21251+0923	BU164 AB	0.139:			
21331+4512	COU2308	0.139:			
21365+4304	COU2233	0.121:			
21510+2911	A889	0.148:	13.9	-0.045	Baz1984b
22587+2611	COU543	0.154			
23137+3931	A1481	0.116:			
23498+2741	A424	0.158	2.8	-0.001	Sca2002b

Table 4 Measurements made in 2009-2010 with the largest θ residuals (ordered sequence of $|\Delta\theta_{O-C}| > 10^{\circ}$).

Name	$\Delta\theta_{(O-C)}$ ($^{\circ}$)	$\Delta\rho_{(O-C)}$ (")	Orbit ref.
BU648 AB	25.00	-0.190	Mut2010e
COU1394	-18.00	0.056	Cou1999b
COU812	-17.20	-0.030	Cou1999b
A1563	-16.60	0.142	Cou1986b
COU2197	15.90	0.051	Doc2016g
A578 Aa,Ab	15.60	0.107	Ole2001
A1400	-15.60	-0.026	USN2002
COU439 AB	15.10	0.068	Doc2017e
A889	13.90	-0.045	Baz1984b
KUI102	-13.30	0.032	Hrt2014b
A2414	-12.70	0.189	Hei1997
BU367 AB	-12.10	0.098	Sca2003e
A578 Aa,Ab	12.00	0.058	Ole2001
A700	-11.30	0.410	Hei1998
COU542 Aa,Ab	11.30	-0.019	Doc2001b
FIN381	-11.20	0.041	Doc2013d
A893	10.10	0.067	FMR2014a
A1088	-10.10	0.065	USN2002

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Table 5 Table of speckle measurements and O-C residuals with published orbits (begin. only). For each object we give its WDS old and new indices (Col. 1 and 2), the name of the discoverer and the components of the system (Col. 3), the magnitudes of the primary (m_{VA}) (Col. 4) and of the secondary m_{VB} (Col. 5) as given by the WDS data base, the BD (Bonner Durchmusterung) entry (Col. 6) from the BD star catalogue of Argelander et al. (1863), the epoch of observation in Besselian years (Col. 7), the position angle θ of the companion (Col. 8), and the angular separation ρ between the two components (Col. 9), the measured difference of magnitudes Δm_F between the two components (Col. 10), some notes in Col. 11 (see text in Sect. 5), and the O-C residuals of our θ and ρ measurements with a computed orbit in Col. 12. **The full table is available in the on-line version.**

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
00013+3351	0001157+335113	TDS1248	10.79	10.89		2009.638				S		
00014+3937	0001236+393638	HLD60	9.09	9.77	+38 5112	2009.827	169.5	1.304	0.9	ly	0.2 0.025	Hrt2011a
00015+3044	0001292+304409	HO208	8.20	9.81	+29 5046	2009.827	189.7	1.089	1.6	ly		
00022+2705	0002101+270455	BU733 AB	5.83	8.9	+26 4734	2009.811	270.0	0.874			-1.7 0.033	Sod1999
00022+3829	0002155+382918	COU945	9.86	11.94	+37 4922	2009.838	103.8	2.318	2.0:	ly		
00023+3257	0002193+325724	HO209 AB	9.07	10.54	+32 4755	2009.838	346.7	1.396	1.3	ly		
00023+3257	0002193+325724	HO209 AB	9.07	10.54	+32 4755	2009.844	346.8	1.402		b 4Q-ly		
00024+1047	0002253+104635	A1249 AB	9.37	9.91	+09 5314	2009.830				S	[76.2 0.140	Zir2003]
00024+5030	0002220+502959	COU2350	7.68	9.19	+49 4314	2009.630	116.5	0.444	1.8	2Q-ly		
00024+5030	0002220+502959	COU2350	7.68	9.19	+49 4314	2010.674	117.5	0.448	2.0	ly		
00026+1841	0002334+184100	HDS2 Aa,Ab	8.49	10.62	+17 5027	2009.860				NR		
00031+5228	0003058+522754	HDS3	8.41	11.12	+51 3769	2009.630				NR!		
00037+5329	0003425+532857	WOR30	9.62	10.36	+52 3591	2009.630	182.6	0.833	1.8	ly		
00037+5329	0003425+532857	WOR30	9.62	10.36	+52 3591	2009.630	181.7	0.828				
00047+3416	0004400+341554	STF3056 AB	7.72	8.08	+33 4827	2009.827	142.6	0.732	0.1	ly	0.4 0.020	Zir2015a
00048+3810	0004468+381025	BU862	10.02	10.18	+37 4930	2010.674	25.0	0.835	0.8	ly	-1.1 0.033	Cou1986b
00049+3005	0004519+300509	A1250 AB	8.22	9.65	+29 5057	2009.638	42.5	0.807	2.3	dv		
00055+3406	0005290+340620	HU1201 AB	8.20	9.76	+33 4832	2009.819	307.1	0.246:		4Q-ly	-0.2 0.048	Zir2003
00055+3406	0005290+340620	HU1201 AB	8.20	9.76	+33 4832	2010.674	310.4:	0.219:		4Q-ly	3.2 0.026	Zir2003
00061+0943	0006080+094253	HDS7	8.47	8.88	+08 5172	2009.860	357.2:	0.199:			2.7 ^Q 0.026	Cve2017b
00063+5826	0006155+582612	STF3062	6.42	7.32	+57 2865	2009.888	347.4	1.524	1.0	ly	0.8 -0.021	Sod1999
00065+5213	0006286+521333	A1252	10.54	10.52	+51 3782	2009.630	187.9	0.586	1.7	3Q-ly		
00068+0427	0006494+042727	BU1155	9.88	10.34	+03 4933	2009.860	75.7	0.638	0.8	ly		
00073+0742	0007183+074212	HDS13	8.04	9.08	+06 5243	2009.860	141.3	0.382	<.1	2Q-ly:		
00073+2058	0007181+205756	HDS12	9.22	11.53	+20 5430	2009.638	16.4	1.150	2.2	1Q-ly		
00074+2029	0007282+202935	KU3	10.32	10.40	+19 2	2009.827	74.7	0.945	0.1	ly		
00075+3308	0007278+330747	TDS1303	10.79	10.98		2009.827				S		
00075+3308	0007278+330747	TDS1303	10.79	10.98		2009.827				S		
00077+3711	0007431+371108	A1501	7.59	10.63	+36 1	2009.811	56.7	0.943				
00085+3456	0008283+345604	HDS17	8.27	8.31	+34 3	2009.638	99.3	0.139		2Q-dv	4.3 0.031	Cve2010c
00086+3228	0008350+322829	COU647	9.6	9.6	+31 2	2009.638	32.4	0.260		1Q-dv		
00089+0042	0008522+004132	HDS18	7.67	9.31	+00 6	2009.860				NR		
00094+5840	0009232+583957	HDS20	8.53	9.89	+57 9	2009.888	155.8	0.318	0.8	ly		
00095+1907	0009279+190656	COU247	8.29	9.98	+18 3	2009.830	255.2	0.347			3.9 0.038	Doc2012i
00098+3731	0009465+373148	COU847 AB	9.73	13.0	+36 7	2009.778	0.1	1.689	3.6	1Q-ly		
00100+0835	0009574+083437	A1801	9.5	9.5	+07 10	2009.830	191.0:	0.296:		3Q-ly		
00100+0835	0009574+083437	A1801	9.5	9.5	+07 10	2009.830	194.9	0.268				
00103+4920	0010190+491931	COU1851	10.42	10.91	+48 22	2009.630	171.2	0.669	1.3	ly		
00103+4920	0010190+491931	COU1851	10.42	10.91	+48 22	2009.630	171.3	0.664				
00110+1024	0011017+102349	TDS1333	10.86	11.08		2009.904				S		
00115+1940	0011308+193937	COU248	9.78	12.8	+18 9	2009.830	318.2	1.927	3.1	ly		
00115+3556	0011294+355551	HDS24	9.56	12.98	+35 18	2009.827	351.2	0.539				
00116-0210	0011383-020905	RST4141	10.71	10.86	-02 15	2009.860	186.6	0.847	0.1	dv		
00121+3328	001205 +332806	COU649 AB	11.25	10.9	+32 14	2009.638	353.5	0.559	0.2	4Q-dv		

Table 6 Table of speckle measurements and O-C residuals with published orbits (begin. of the full table)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ$, $''$)	$\Delta\rho$ (O-C)
00013+3351	0001157+335113	TDS1248	10.79	10.89		2009.638				S		
00014+3937	0001236+393638	HLD60	9.09	9.77	+38 5112	2009.827	169.5	1.304	0.9	ly	0.2 0.025	Hrt2011a
00015+3044	0001292+304409	HO208	8.20	9.81	+29 5046	2009.827	189.7	1.089	1.6	ly		
00022+2705	0002101+270455	BU733 AB	5.83	8.9	+26 4734	2009.811	270.0	0.874			-1.7 0.033	Sod1999
00022+3829	0002155+382918	COU945	9.86	11.94	+37 4922	2009.838	103.8	2.318	2.0:	ly		
00023+3257	0002193+325724	HO209 AB	9.07	10.54	+32 4755	2009.838	346.7	1.396	1.3	ly		
00023+3257	0002193+325724	HO209 AB	9.07	10.54	+32 4755	2009.844	346.8	1.402		b 4Q-ly		
00024+1047	0002253+104635	A1249 AB	9.37	9.91	+09 5314	2009.830				S	[76.2 0.140	Zir2003]
00024+5030	0002220+502959	COU2350	7.68	9.19	+49 4314	2009.630	116.5	0.444	1.8	2Q-ly		
00024+5030	0002220+502959	COU2350	7.68	9.19	+49 4314	2010.674	117.5	0.448	2.0	ly		
00026+1841	0002334+184100	HDS2 Aa,Ab	8.49	10.62	+17 5027	2009.860				NR		
00031+5228	0003058+522754	HDS3	8.41	11.12	+51 3769	2009.630				NR!		
00037+5329	0003425+532857	WOR30	9.62	10.36	+52 3591	2009.630	182.6	0.833	1.8	ly		
00037+5329	0003425+532857	WOR30	9.62	10.36	+52 3591	2009.630	181.7	0.828				
00047+3416	0004400+341554	STF3056 AB	7.72	8.08	+33 4827	2009.827	142.6	0.732	0.1	ly	0.4 0.020	Zir2015a
00048+3810	0004468+381025	BU862	10.02	10.18	+37 4930	2010.674	25.0	0.835	0.8	ly	-1.1 0.033	Cou1986b
00049+3005	0004519+300509	A1250 AB	8.22	9.65	+29 5057	2009.638	42.5	0.807	2.3	dv		
00055+3406	0005290+340620	HU1201 AB	8.20	9.76	+33 4832	2009.819	307.1	0.246:		4Q-ly	-0.2 0.048	Zir2003
00055+3406	0005290+340620	HU1201 AB	8.20	9.76	+33 4832	2010.674	310.4:	0.219:		4Q-ly	3.2 0.026	Zir2003
00061+0943	0006080+094253	HDS7	8.47	8.88	+08 5172	2009.860	357.2:	0.199:			2.7 ^Q 0.026	Cve2017b
00063+5826	0006155+582612	STF3062	6.42	7.32	+57 2865	2009.888	347.4	1.524	1.0	ly	0.8 -0.021	Sod1999
00065+5213	0006286+521333	A1252	10.54	10.52	+51 3782	2009.630	187.9	0.586	1.7	3Q-ly		
00068+0427	0006494+042727	BU1155	9.88	10.34	+03 4933	2009.860	75.7	0.638	0.8	ly		
00073+0742	0007183+074212	HDS13	8.04	9.08	+06 5243	2009.860	141.3	0.382	<.1	2Q-ly:		
00073+2058	0007181+205756	HDS12	9.22	11.53	+20 5430	2009.638	16.4	1.150	2.2	1Q-ly		
00074+2029	0007282+202935	KU3	10.32	10.40	+19 2	2009.827	74.7	0.945	0.1	ly		
00075+3308	0007278+330747	TDS1303	10.79	10.98		2009.827				S		
00075+3308	0007278+330747	TDS1303	10.79	10.98		2009.827				S		
00077+3711	0007431+371108	A1501	7.59	10.63	+36 1	2009.811	56.7	0.943				
00085+3456	0008283+345604	HDS17	8.27	8.31	+34 3	2009.638	99.3	0.139		2Q-dv	4.3 0.031	Cve2010c
00086+3228	0008350+322829	COU647	9.6	9.6	+31 2	2009.638	32.4	0.260		1Q-dv		
00089+0042	0008522+004132	HDS18	7.67	9.31	+00 6	2009.860				NR		
00094+5840	0009232+583957	HDS20	8.53	9.89	+57 9	2009.888	155.8	0.318	0.8	ly		
00095+1907	0009279+190656	COU247	8.29	9.98	+18 3	2009.830	255.2	0.347			3.9 0.038	Doc2012i
00098+3731	0009465+373148	COU847 AB	9.73	13.0	+36 7	2009.778	0.1	1.689	3.6	1Q-ly		
00100+0835	0009574+083437	A1801	9.5	9.5	+07 10	2009.830	191.0:	0.296:		3Q-ly		
00100+0835	0009574+083437	A1801	9.5	9.5	+07 10	2009.830	194.9	0.268				
00103+4920	0010190+491931	COU1851	10.42	10.91	+48 22	2009.630	171.2	0.669	1.3	ly		
00103+4920	0010190+491931	COU1851	10.42	10.91	+48 22	2009.630	171.3	0.664				
00110+1024	0011017+102349	TDS1333	10.86	11.08		2009.904				S		
00115+1940	0011308+193937	COU248	9.78	12.8	+18 9	2009.830	318.2	1.927	3.1	ly		
00115+3556	0011294+355551	HDS24	9.56	12.98	+35 18	2009.827	351.2	0.539				
00116-0210	0011383-020905	RST4141	10.71	10.86	-02 15	2009.860	186.6	0.847	0.1	dv		
00121+3328	001205 +332806	COU649 AB	11.25	10.9	+32 14	2009.638	353.5	0.559	0.2	4Q-dv		
00130+0257	0013004+025658	A2001	9.30	9.70	+02 16	2009.904	161.5	0.219		3Q-ly		
00132+1144	0013117+114334	HDS30	10.48	11.68	+10 16	2009.860	265.8:	0.348:		3Q-ly		
00134+2659	0013239+265915	STT2 AB	6.77	7.67	+26 13	2009.819	160.1	0.435	1.3	2Q-ly	0.3 0.038	Hrt2008
00137+0635	0013404+063449	BU998	9.30	9.54	+05 18	2009.904	108.0	1.268	1.2	ly		
00141+1207	0014068+120720	A1802	10.5	13.2	+11 19	2009.860	148.0	1.989	2.0	ly		
00148+2432	0014472+243216	TDS1356	10.68	10.81		2009.827				S		
00149+5315	0014523+531502	A903	9.45	10.09	+52 28	2009.630	134.5	0.909	1.9	2Q-ly		
00150+6607	0015010+660650	HDS34	8.66	9.49	+65 25	2009.888				NR		
00166+0814	0016340+081424	HDS37	6.32	9.92	+07 27	2009.860	219.6	0.587	4.2	ly		
00168+1202	0016505+120216	HEI300	12.9	12.9		2009.904	176.8	1.453	0.2	dv-b		
00174+0853	0017245+085234	STF22 AB,C	7.13	7.66	+08 24	2009.904	234.5	3.941	0.3	ly		
00178+3035	0017487+303535	MLB632	10.0	11.0		2009.838	268.0	1.512	1.6	ly		
00179+3435	0017569+343432	HDS41	8.62	11.54	+33 24	2009.819	284.2	0.549	3.1	4Q-ly		
00185+5945	0018286+594433	A905	9.72	10.52	+58 26	2009.630	288.0	0.908	1.9	4Q-ly		
00193+0314	0019207+031425	HEI420	10.8	11.0		2009.904	347.3	1.396	0.1	dv-b		
00193+0314	0019207+031425	HEI420	10.8	11.0		2009.904	345.3	1.312	0.3	dv		
00195+5030	0019297+503018	HU1005	10.10	10.31	+49 46	2009.630	192.6	0.659	1.6	3Q-ly		
00198+6752	0019498+675153	MLR285	9.95	14.2	+67 22	2009.888	189.5	1.305	2.5	ly		
00203+4650	0020239+465030	COU1852	11.9	12.2		2009.630	270.8	0.710	1.4	4Q-ly b		
00205+4531	0020329+453032	A647	7.17	9.56	+44 62	2009.630	99.8	0.686	2.1	ly	-0.4 0.012	Pru2008
00205+4531	0020329+453032	A647	7.17	9.56	+44 62	2009.630	100.3	0.684		2Q-ly	0.1 0.010	Pru2008
00206+1219	0020382+121839	BU1015	8.39	9.67	+11 41	2009.860	104.5	0.485	1.7	dv	0.8 0.002	Hrt2010a
00218+4357	0021505+435716	COU1352	9.68	11.3	+43 61	2009.792	63.1	1.442				
00238+3145	0023507+314436	COU546	9.59	13.6	+30 51	2009.819	292.5	1.869	3.8	4Q-ly		
00244+3629	0024192+362926	HO491	10.96	11.60	+35 64	2009.827	206.6	1.227	1.6	ly		
00258+1025	0025497+102524	HDS57	9.71	10.71	+09 41	2009.904				NR	[88.5 0.111	Tok2017]
00260+1905	0025575+190432	HDS59	8.99	11.71	+18 42	2009.830	263.7	0.826	2.8	ly		
00261+2359	0026054+235900	HU407	9.12	11.80	+23 54	2009.827	333.5	1.086				
00264+6246	0026232+624539	HDS60	9.82	11.87	+61 77	2009.633	41.3	0.373	2.4	1Q-ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ, ''$)	$\Delta\rho$ (O-C)
00266-0003	0026373-000258	HDS61	6.47	8.91	+00 63	2009.904	273.5	0.468	2.6	ly		
00272+2115	0027111+211529	BU1225	8.12	10.89	+20 44	2009.827	190.0	1.409	2.3	ly		
00274+3054	0027234+305336	HDS62	8.55	10.46	+30 60	2009.827	79.9	0.427				
00276+5120	0027239+513010	COU2252	10.25	12.23	+50 74	2009.630				S!		
00294+0206	0029269+020533	RST5181	10.38	12.4	+01 70	2009.830	187.4	1.982		3Q-ly		
00298+4915	0029484+491503	HU508	9.72	11.33	+48 146	2009.844	351.7	1.687		ly b		
00303+5959	0030199+595839	BU1094 AB	6.07	8.45	+59 68	2009.888	284.6:	0.343:				
00307+1339	0030429+133911	HDS66	9.73	12.76	+12 45	2009.904	266.7	0.994	2.4:	ly		
00310+6126	0030595+612619	HDS67	8.89	9.95	+60 63	2009.633				NR		
00312+3325	0031130+332521	HU1009	10.94	11.08	+32 78	2009.778	241.3	1.888	1.0:	3Q-ly		
00317+1929	0031434+192855	HDS70	7.84	9.37	+18 66	2009.904	66.5	0.374	3.2:	ly		
00318+5431	0031463+543120	STT12	5.33	5.62	+53 82	2009.888	208.1	0.269			-1.4 0.006	Dru2014
00321+5000	0032049+500012	COU2151	9.52	10.56	+49 116	2009.630	278.3:	0.137:				
00324+0657	0032237+065719	MCA1 Aa,Ab	5.84	7.99	+06 64	2009.830				S	[272.6 0.200	Jte2018]
00329+3551	0032518+355128	HO211	7.95	11.70	+35 90	2009.778	18.7	1.555	3.5	1Q-ly		
00342+3139	0034105+313844	HDS75	8.28	9.13	+30 77	2009.827				S		
00345-0433	0034297-043247	D2 AB	7.63	8.04	-05 83	2009.860				S	[40.7 0.065	Hrt2010a]
00352-0336	0035148-033534	HO212 AB	5.61	6.90	-04 62	2009.860				NR	[234.4 0.243	Msn2005]
00353+6944	0035185+694414	HDS77	8.83	11.00	+68 35	2009.633				NR		
00354+6152	0035219+615152	HDS79 Aa,Ab	8.35	10.56	+61 125	2009.633	27.5	0.325	2.4	1Q-ly		
00355+1150	0035298+115135	A806 CD	10.90	13.9		2009.830	235.8	1.309	2.0	ly		
00365+5831	0036364+583057	BU1096 AB	9.5	9.5	+57 111	2009.888				NR		
00366+5609	0036334+560832	A914	8.42	9.29	+55 117	2009.630	24.8	0.457			1.7 0.024	Lin2007c
00367+3814	0036407+381413	A1506	9.37	10.99	+37 102	2009.778	21.2	1.280	2.9	1Q-ly		
00374+0900	0037228+090006	A808	9.4	10.7	+08 81	2009.860	177.1	0.386		2Q-ly		
00380+0234	0038009+023414	A2302	10.19	10.28	+01 107	2009.860	153.0	0.737	0.7	ly		
00394+3446	0039255+344606	COU657	10.2	10.8	+33 91	2009.778	40.6	1.150	0.8	ly		
00402+4715	0040130+471521	BU257	8.06	9.11	+46 131	2009.844	250.8	0.679	0.4	ly b		
00407+5202	0040324+520244	COU2352	10.0	10.0	+51 123	2009.630	221.1	0.795		3Q-ly		
00423+2919	0042165+291927	COU658	10.39	10.42	+28 110	2009.827	128.3	0.658	1.0	ly		
00424+0410	0042232+041000	STT18 AB	7.86	9.71	+03 93	2009.860	208.9	1.960	1.8	ly	1.2 -0.026	Hrt2001b
00433+0634	0043163+063411	HDS96	8.93	10.49	+05 95	2009.830				!!		
00442+6501	0044111+650056	HU1015	10.35	10.64	+64 74	2009.633	315.3	0.656	1.6	4Q-ly		
00455+4324	0045283+432403	BU865 AB	8.69	9.17	+42 161	2009.844	192.3	1.231	0.6	ly b		
00457+0654	0045446+065359	A2002	9.7	9.8	+06 99	2009.830					(not single, 2Q)	
00458+2137	0045496+213701	TDS1603	10.84	11.01	+20 99	2009.819				NR		
00466-0207	0046379-020720	A2601	9.7	9.9	-02 105	2009.860	281.3	0.202				
00475+1237	0047309+123634	HEI303 Aa,Ab	11.4	11.4	+11 97	2009.860	161.7	0.340			(TDS1613AB is S)	
00481+2533	0048067+253254	HO306	9.57	9.88	+24 118	2009.827	159.2	1.468	0.7	ly		
00493+3508	0049223+350753	COU1208	10.87	11.54	+34 119	2009.827	252.5	1.112	0.6	ly		
00504+5038	0050251+503749	BU232 AB	8.46	8.79	+49 215	2009.630	252.3	0.883	0.5	3Q-ly	0.2 0.027	Sca2008a
00507+3357	0050422+335648	HO4	10.69	10.72	+33 114	2009.827	17.4	1.986	0.9:	ly		
00523-0022	0052172-002152	A1901	9.4	10.8	-01 110	2009.904	287.0	0.690		b		
00530+4935	0053011+493451	COU2155	11.00	11.40	+48 268	2009.630	26.5	0.770	1.4	ly		
00530+4935	0053011+493451	COU2155	11.00	11.40	+48 268	2009.630	26.3	0.777				
00533+0405	0053195+040510	A2307	7.55	8.79	+03 120	2009.830				S	[207.5 0.108	Tok2015c]
00536+4156	0053346+415308	ES1606	11.2	13.0	+41 155	2009.844				ly b NR		
00541+6626	0054061+662608	HDS117 AB	7.10	10.91	+65 106	2009.633	109.0	0.855	3.2	2Q-ly		
00549+4924	0054538+492418	HU802	7.81	10.01	+48 288	2009.630	220.1	0.347	0.6	3Q-ly		
00550+2338	0054538+492418	STF73 AB	6.12	6.54	+22 146	2009.819	323.6	1.047		4Q-ly	0.6 -0.001	Mut2010b
00550+2338	0054538+492418	STF73 AB	6.12	6.54	+22 146	2009.819	323.9	1.034	0.5	ly	0.9 -0.014	Mut2010b
00554+4023	0055264+402257	A1511	6.9	11.4	+39 210	2009.844	40.0	1.251		ly b		
00561+5406	0056067+540624	A1259	9.3	9.4	+53 179	2009.630				S		
00564+5903	0056229+590301	HDS125	8.43	10.59	+58 136	2009.630				S		
00568+6828	0056467+682816	MLR290	10.5	10.5	+67 80	2009.633				NR!		
00576+5424	0057357+542344	HLD4	9.0	9.5	+53 184	2009.630	41.2	0.344	0.8	1Q-ly	-0.3 0.008	Mnt2001c
00579+4054	0057521+405612	COU2004	11.0	11.0	+40 193	2009.945	158.1	0.230				
00582+1442	0058094+144114	HEI203	11.4	11.4	+13 135	2009.904	82.2	1.245	1.3	ly-b		
00586+4153	0058365+415240	TDS1697 AB	10.58	10.59	+41 177	2009.844	84.9	1.126		ly b		
00586+4352	0058416+435239	ES1491	10.60	10.79	+43 188	2009.945	134.9	1.919		2Q-dv-b		
00587+6726	0058399+672624	HU1019	8.59	10.38	+66 79	2009.633	192.9	1.039	2.0	3Q-ly		
00593-0040	0059204-004028	A1902	8.11	9.17	-01 124	2009.830	207.0	0.397	1.4:	ly	-2.1 0.039	Doc2014a
00596-0111	0059350-011130	A1903 AB	9.28	9.94	-01 125	2009.860	11.0	0.449		1Q-dv	-4.6 0.049	Hrt2010a
01007+1659	0100411+165820	HEI96	10.9	11.0	+16 100	2009.904	68.5	0.379		1Q-dv		
01015+6922	0101301+692130	A2901	7.12	7.84	+68 64	2009.633	61.4	0.426	0.2	1Q-ly	-0.7 0.020	Nov2007d
01024+0504	0102245+050341	HDS135 AB	8.49	10.07	+04 158	2009.860	92.7	0.614	1.0	ly	0.1 -0.016	PzT2015
01028+0214	0102452+021341	A2308	9.87	11.73	+01 194	2009.830	292.9	0.378	0.7	ly	1.2 0.022	Tok2015c
01030+4723	0103015+472234	STT21	6.76	8.07	+46 243	2009.844	176.2	1.194	1.5	ly b	0.6 0.082	Hei1966
01036+0313	0103337+031233	A2309	10.4	13.1	+02 150	2009.830	60.6	1.691	2.2	ly		
01036+6341	0103371+634116	MLR87 AB	8.68	9.51	+62 191	2009.633	24.6	0.289	0.9	1Q-ly	8.3 0.068	USN2007b

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ, ''$)	$\Delta\rho$ (O-C)
01046+2558	0104380+255802	COU253	10.79	10.99	+25 163	2009.827	97.9	0.976	0.9	ly		
01047+0029	0104439+002854	RST4744	10.23	10.88	-00 166	2009.860	105.3	0.426	0.8	ly		
01048+0135	0104482+013516	A2310	9.49	10.36	+00 179	2009.830	316.7	0.364		4Q-ly	0.1 0.024 Doc2017e	
01055+2107	0105324+210714	AG14	10.01	10.06	+20 154	2009.827	316.8	0.761			0.7 0.006 FMR2014f	
01055+2107	0105324+210714	AG14	10.01	10.06	+20 154	2009.827	318.2		0.7	ly		
01058+1319	0105489+131851	BU1228	10.36	10.43	+12 133	2009.904	258.4	0.511	1.8:	ly		
01063+3306	0106187+330602	TDS1767	10.78	11.04		2009.827	0.2	0.946		1Q-ly		
01066+6833	0106376+683255	HDS142	9.42	12.78	+67 95	2009.633	23.1	0.357	3.0	ly		
01078+0425	0107464+042452	BU1292	9.87	10.61	+03 161	2009.860				NR	[237.9 0.245 FMR2013a]	
01081+4012	0108089+401152	COU1056	10.2	12.5	+39 262	2009.844	90.2	0.580		ly b		
01081+6141		DOO2	9.5	10.5		2009.633				S		
01094+4454	0109233+445341	A932	9.53	10.61	+44 250	2009.844	333.5	0.857	0.8	ly b		
01103+1636	0110204+163530	HU1209 AB	10.16	12.9	+15 170	2009.904	208.1	0.580	3.3	ly (i NR)		
01106+4917	0110362+491707	COU2156	8.38	9.40	+48 352	2009.945	163.1	0.497		2Q-dv		
01115+4903	0111307+490246	COU2157	10.9	11.5	+48 356	2009.945	188.6	0.625				
01119+4748	0111524+474754	BU398	9.31	9.38	+47 333	2009.844	45.2	1.813		b 1Q-ly		
01142+0130	0114104+012952	HDS162	9.80	10.44	+00 204	2009.904	109.6:	0.301:				
01151+3416	0115033+341602	HU803	9.12	10.02	+33 193	2009.844	217.2	0.903		b 3Q-ly		
01155+0216	0115273+021614	CHR 195	9.3	9.9	+01 234	2009.860	151.9	0.206		2Q-ly		
01157+3712	0115428+371129	A1519 AB	10.31	11.48	+36 213	2009.945	73.0	1.635	1.7	ly-b		
01158+0947	0115467+094705	A2102	7.36	9.89	+09 142	2009.830	116.4	0.344	1.4:	ly	-1.1 0.040 RAO2015	
01158+0947	0115467+094705	A2102	7.36	9.89	+09 142	2009.830					(not single, 2Q!)	
01158+4306	0115446+430515	COU1506	10.80	11.00	+42 267	2009.945	90.5	0.538	1.9	ly-b		
01162+6608	0116124+660749	HDS168	9.03	10.06	+65 145	2009.633	41.8	0.380	1.1	1Q-ly		
01178+4153	0117474+415234	COU1357 AB	10.64	10.30	+41 239	2009.945	302.7	0.780	2.0	ly-b		
01184+6333	0118229+633242	HDS171	8.48	11.94	+62 235	2009.633	88.6	0.934	3.5	1Q-ly		
01194+0731	0119218+073039	HEI834	10.55	10.76		2009.904	275.9	1.049	0.5	ly-b		
01198+6856	0119459+685618	MLR293	9.3	9.3	+68 90	2009.633				S	[37.6 0.130 Msn2010c]	
01198-0031	0119483-003031	FIN337 BC	7.4	7.6	-01 171	2009.860				S:	[37.6 0.130 Msn2010c]	
01198-0031	0119483-003031	STF113 A,BC	6.45	6.99	-01 171	2009.860	18.7	1.619	0.0	2.1	-0.7 -0.012 Zir2015a	
01202+0304	0120121+030356	A2313	10.0	10.9	+02 192	2009.860	281.3:	0.297:				
01210+3042	0120586+304144	MLB678	10.0	11.7		2009.844				ly b NR		
01255+0225	0125304+022515	A2315	10.8	10.8	+01 260	2009.860	133.0	0.311		2Q-ly		
01257+3621	0125432+362126	A1907	7.8	13.4	+35 270	2009.844	216.2:	2.179:		ly b		
01275+4915	0127294+491432	HU525	8.82	10.91	+48 436	2009.844	320.6	1.145		ly b		
01280+6733	0128002+673238	HU1028	10.69	11.01	+66 117	2009.633	264.3	0.590	1.4	3Q-ly		
01281+6317	0128031+631657	HDS192 Aa,Ab	8.90	11.59	+62 254	2009.633	28.5	0.630	2.8	1Q-ly		
01286+4509	0128372+450907	A941 AB	8.66	11.52	+44 311	2009.844	246.2	1.578		ly b		
01306+5132	0130359+513227	COU2552	10.7	10.7		2009.888	207.6	0.569	0.1	dv		
01308+4734	0130506+473353	A815	8.84	11.3	+46 373	2009.844	132.3	1.291	1.6	ly b		
01321+4104	0132047+410352	BU1165	8.56	12.3	+40 309	2009.945	64.2	1.656	3.7	ly-b		
01325+6349	0132292+634917	HDS200	10.91	12.58		2009.633	37.7:	0.414:			(rings)	
01325+7001	0132325+700110	HDS199	7.29	8.44	+69 103	2009.633	201.5	0.149		3Q-ly		
01335+5745	0133326+574505	HDS206	10.24	10.62		2009.888				NR		
01345+6754	0134324+675401	MLR296	10.51	10.66	+67 138	2009.633	340.5	1.000	1.0	4Q-ly		
01352+5150	0135092+515015	A112	9.57	10.19	+51 337	2009.888	334.9	1.089	0.9	ly		
01365+4018	0136282+401736	COU1360	10.3	13.1	+39 362	2009.945	134.7	0.766	3.0	ly-b		
01367+5147	0136457+514633	COU2554	12.0	12.0	+51 340	2009.888	113.8	0.443	0.1	dv		
01376+5511	0137305+551116	A1265 CD	10.89	11.08	+54 332	2009.888	351.7	0.476	0.1:	ly		
01393+5436	0139173+543601	A1266	7.67	9.23	+53 354	2009.888				NR		
01394+3729	0139257+372838	COU1216	10.03	11.9	+36 297	2009.945	32.7	1.488	2.3	ly-b		
01396+1939	0139369+193911	COU255	12.0	12.5	+18 218	2009.860	194.1	1.291	0.8	ly		
01396+5030	0139331+502938	HU529	9.9	10.4	+49 427	2009.888				NR		
01398+3415	0139505+341606	COU667	10.58	12.2	+33 272	2009.945	212.1	1.955	3.1	ly-b		
01406+5457	0140351+545631	A1267 AB,C	7.94		+54 350	2009.888	2.0	1.777	4.1	ly ND	(not found in the WDS ?)	
01406+5457	0140351+545631	A1267	7.94	8.92	+54 350	2009.888	10.0	0.270		1Q-ly		
01409+0138	0140520+013741	A2404	9.3	9.3	+00 270	2009.860	187.7	0.216		3Q-ly	0.2 -0.003 Zir2010b	
01409+6410	0140527+641023	HDS221 AB	8.38	11.76	+63 218	2009.633	232.8	0.718	4.0	3Q-ly		
01410+4925	0140579+492516	COU2451	10.96	10.72	+48 502	2009.945	129.2	0.725		b		
01413+4650	0141205+465040	COU2006	10.6	14.6	+46 421	2009.945				b NR		
01416+5147	0141386+514640	COU2556	10.2	11.2	+51 371	2009.888	105.5	0.461	1.2	ly		
01416+7025	0141383+702509	A946	9.64	10.48	+69 110	2009.633	340.0	0.764	1.3	4Q-ly		
01424-0645	0142236-064517	A1	8.90	8.75	-07 282	2009.860	72.6	0.829	0.7	ly	0.8 -0.021 Sca2008c	
01425+5000	0142337+500032	HU1210 CD	10.0	10.0	+49 441	2009.888	247.6	0.180				
01425+5000	0142294+495959	B2550 AB	9.08	9.55	+49 440	2009.888	281.8	0.224		4Q-ly		
01432+0520	0143119+051931	A2008	9.2	10.2	+04 299	2009.860	359.2	0.374				
01437+0934	0143449+093407	BU509	9.48	9.19	+08 266	2009.860	47.5	0.708	0.2	ly	-2.4 -0.003 Hrt2010a	
01443+5732	0144179+573211	BU870 AB	6.29	8.68	+56 330	2009.888	332.3	0.574	1.3	ly	2.3 0.030 Hrt2009	
01444+5316	0144248+531545	MLR631	10.0	10.0	+52 425	2009.888	344.4	0.205				
01455+3452	0145280+345146	HU1031	9.00	10.94	+34 305	2009.038	338.0	1.109	>1.0	4Q-dv		
01475+5045	0147285+504503	HDS239	8.67	10.23	+50 357	2009.879	295.8	0.162		4Q-dv		
01479+5317	0147593+531631	A1269	10.2	10.7	+52 440	2009.888	241.6:	0.167:		3Q-ly		
01485+4308	0148305+430718	COU1662	10.45	12.9	+42 381	2009.945	303.3	1.466	2.5:	ly-b		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ, ''$)	$\Delta\rho$ (O-C)
01491+3441	0149074+344029	COU751	10.1	11.5	+33 304	2009.945	151.2	1.912	2.5	ly-b		
01491+6647	0149047+664706	HDS243	9.85	10.40	+66 159	2009.633				NR	(rings)	
01500+6209	0149593+620903	HDS246	8.43	10.31	+61 334	2009.633	308.3	0.340	2.5	4Q-ly		
01506+0658	0150362+065746	HEI836	10.69	11.36	+06 285	2009.904	119.1	0.987	1.8	ly-b		
01511+0644	0151085+064330	HDS250	9.16	11.80	+06 287	2009.904	17.2	0.565		b		
01511+1302	0151085+130154	HEI308	10.7	11.4	+12 243	2009.904	346.0	0.686	2.0	ly-b		
01511+4525	0151081+452448	COU1663	10.05	12.9	+44 378	2009.945	266.4	1.307	2.4	ly-b		
01517+0113	0151427+011308	A2406	10.0	12.8	+00 300	2009.904	53.5	0.884	2.7	ly-b		
01534+6411	0153247+641122	HDS257	9.57	12.00	+63 253	2009.633	259.8	0.395	2.0	3Q-ly		
01546+5956	0154388+595554	A953	9.07	9.17	+59 350	2009.879	64.2	0.826	0.3	dv		
01558+5420	0155474+541946	A1270	9.42	9.45	+53 420	2009.879				NR!	(WDS 2015 0 $^{\circ}$.7 - wrong star?)	
01564+4243	0156255+424246	A1525	9.61	11.31	+41 373	2009.844	28.8	1.178	0.6	ly b		
01573+4620	0157259+461932	COU1860	11.8	11.8		2009.945				NR b	(WDS 0 $^{\circ}$.7 - wrong star?)	
01579+3310	0157526+331019	A1920	9.47	10.05	+32 354	2009.844	235.5	1.749	0.7	ly b		
01579+4726	0157557+472605	COU2008	9.3	9.3	+46 484	2009.945	337.6:	0.258:			(WDS 0 $^{\circ}$.1 in 1986 - rapid motion: watch?)	
01584+5154	0158251+515337	COU2559	8.33	9.35	+51 452	2009.879	68.3	0.428	0.5	dv		
01584+5154	0158251+515337	COU2559	8.33	9.35	+51 452	2009.888	66.2	0.416				
01592+5234	0159125+523421	COU2560	10.91	10.84	+51 457	2009.888	343.0	0.621	0.1	ly		
01593+4146	0159166+414613	COU1509	9.51	11.41	+41 385	2009.844	299.6	1.257		b 4Q-ly		
02018+4040	0201490+404003	A1923	8.83	9.95	+39 454	2009.945	147.0	0.643		2Q-dv		
02018+4738	0201468+473754	A820	9.73	12.76	+46 495	2009.844	242.9	1.998	2.2:	ly b ND?		
02021+5318		A3106	9.4	12.0		2009.888				S	(WDS 54 $^{\circ}$ 0 $^{\circ}$.5 1933 - only 1 obs.)	
02038+7013	0203452+701253	MLR375	9.0	9.0	+69 129	2009.633	198.7	0.167		3Q-ly		
02063+4936	0206244+493533	COU2561	10.5	13.0	+48 602	2009.844	123.1	0.759		ly b		
02068+0354	0206465+035414	HDS281	9.06	9.67	+03 284	2009.904	170.3:	0.404:				
02089+0717	0208551+071704	HDS287	9.20	11.14	+06 330	2009.904				NR	(WDS 172 $^{\circ}$ 0 $^{\circ}$.2 1991)	
02089+7032	0208557+703136	MLR376	9.64	10.41	+69 138	2009.633	33.4	0.358	1.2	1Q-ly		
02097+0048	0209439+004748	A2325	9.3	9.9	+00 358	2009.904	114.3	0.354				
02108+3005	0210466+300441	COU456	8.71	10.83	+29 368	2009.038	71.4	0.458	>1.0	1Q-dv		
02108+6450	0210498+644945	HDS291	9.40	12.94	+64 302	2009.633	269.7	0.608	4.5	3Q-ly		
02114+6221	0211215+622052	STF216	8.1	9.0	+61 387	2009.633	307.7	0.206	0.5	4Q-ly	(WDS 354 $^{\circ}$ 0 $^{\circ}$.1 1990 - rapid motion: watch)	
02122+6132	0212120+613221	MLR30	9.7	9.7	+60 448	2009.633	65.4	0.249		1Q-ly		
02143+5029	0214201+502841	COU2452	12.1	12.6		2009.879				NR	(257 $^{\circ}$ 0 $^{\circ}$.3 1989 - only 1 obs)	
02143+5029	0214201+502841	COU2452	12.1	12.6		2009.888	69.0	0.566		1Q-dv		
02144+3946	0214263+394600	A205	9.07	10.74	+39 501	2009.844	309.6	1.733	1.7	ly b		
02145+3650	0214330+364911	COU1367	10.2	13.1	+36 442	2009.038	21.1	0.803	>1.0	1Q-dv	(only one obs.)	
02159+0638	0215534+063735	A2013	9.84	9.79	+05 307	2009.904				S	(WDS 0 $^{\circ}$.3 - wrong star?)	
02163+6337	0216181+633645	HDS300	9.50	11.49	+62 370	2009.888				NR	(WDS 27 $^{\circ}$ 0 $^{\circ}$.2 1991 - 1 obs: single?)	
02172+5048	0217154+504755	COU2563	10.75	10.83	+50 502	2009.888	274.0	0.847	0.9	ly		
02179+5112	0217502+511203	COU2564	10.4	10.4	+50 509	2009.888	4.6	0.314	0.8	ly		
02193+5338	0219202+533820	A1274	9.34	11.02	+52 564	2009.888	269.9	0.498	1.0	ly		
02196+3315	0219364+331433	HU808	9.95	10.03	+32 419	2009.038	213.3	0.472	1.8	3Q-dv		
02229+3445	0222558+344453	COU1069	10.3	12.2	+34 421	2009.038	300.4	0.374	0.3	4Q-dv		
02231+7021	0223047+702035	MLR377 AB	8.42	8.70	+69 144	2009.633	321.7	0.667	0.4	4Q-ly?	+1.8 -0.019 Msn2017e	
02249+3039	0224511+303849	HDS314 AB	8.39	10.97	+29 406	2009.038	269.6	0.386	0.9:	3Q-dv		
02257+6133	0225400+613258	STF257	7.51	8.16	+60 472	2009.633	74.1	0.425	0.4	1Q-ly	+1.1 -0.001 Doc2016b	
02275+5416	0227343+541511	MLR685	10.06	10.41		2009.888	137.5	0.396	0.2	dv		
02277+7147	0227406+714710	MLR305 Aa,Ab	9.5	10.2	+71 139	2009.633	258.1	0.153		3Q-ly		
02289+3442	0228544+344222	COU1070	10.8	10.8	+34 444	2009.038	137.0:	0.160:				
02292+6058	0229077+605601	HU1040	10.4	10.9	+60 484	2009.888				NR	(WDS 1982 0 $^{\circ}$.2 closing: single?)	
02307+4441	0230449+444040	COU1675	10.77	10.64	+44 517	2009.945	88.9	0.695				
02323+4630	0232455+463326	BRT 330	11.1	14.4		2009.945				NR!	(wrong star ?)	
02323+7146	0232171+714602	MLR306	10.77	11.42	+71 148	2009.633	231.8	1.006	3.1	3Q-ly		
02329+5053	0232538+505243	COU2565	10.9	14.4	+50 576	2009.888	304.9	1.199		4Q-dv		
02342+5035	0234121+503501	COU2355	11.0	12.5	+49 693	2009.888				ly b	(wrong star ?) [306.2 5.176 2.2 n]	
02363+4012	0236188+401217	BAZ2	7.65	9.68	+39 577	2009.945				NR	(WDS 68 $^{\circ}$ 0 $^{\circ}$.3 1995: single?)	
02371+6232	0237155+623237	MLR31	11.2	12.6		2009.633	268.4	1.647	3.0	3Q-ly	(double peaks : 0.2 1Q ?)	
02377+6520	0237395+652026	HU1041 AB	8.67	9.60	+64 337	2009.633	99.0	0.148		2Q-ly		
02386+0327	0238367+032635	KU19	6.35	10.38	+02 406	2009.904	329.9	0.784	3.5	ly		
02391+1430	0239063+143018	BU1315 AB	8.66	10.22	+13 422	2009.904	130.3	1.518	2.1	ly		
02394+5007	0239239+500710	COU2162	9.18	9.82	+49 730	2009.879	164.1	0.215				
02395+6740	0239304+674030	MLR382	9.4	10.2	+67 219	2009.633	5.3	0.170				
02395+7058	0239278+705750	MLR381	9.2	11.0	+70 195	2009.633	264.0	0.513	1.5	3Q-ly		
02396+6229	0239301+622912	MLR32 AB	12.19	12.5		2009.879	325.0	2.550				
02399+0009	0239517+000848	A1928	8.6	8.6	-00 407	2009.904				S	(WDS 238 $^{\circ}$ 0 $^{\circ}$.2: single?)	
02412+4734	0241131+473417	COU2260	8.5	8.5	+46 605	2009.945				NR	(WDS 55 $^{\circ}$ 0 $^{\circ}$.1 1985 1 obs: single?)	
02417+5529	0241427+552853	A1280	8.16	8.87	+54 596	2009.888	13.0	0.319	1.3	ly		
02418+5056	0241485+505634	COU2356	10.0	10.0	+50 607	2009.888	162.4	0.219		2Q-ly		
02418+5253	0241476+525254	HU538	10.0	11.3	+52 614	2009.888	132.2	0.257				
02454+5738	0245245+573825	A971	9.1	9.7	+57 630	2009.888				S!	(WDS 0 $^{\circ}$.1 1988: single?)	
02471+3927	0247055+392653	COU1221	10.52	12.9	+38 553	2009.038	130.8	1.478	2.0	2Q-dv		
02472+3634	0247113+363348	COU1072	8.57	10.88	+35 554	2009.038	41.9	0.689	>1.0	1Q-dv		
02478+5129	0247554+512755	COU2453	10.66	10.73	+50 629	2009.888	190.2	0.392	<0.1	3Q-ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ, ''$)	$\Delta\rho$ (O-C)
02488+6721	0248507+672126	MLR385	9.2	9.2	+66 232	2009.888				NR	(WDS gives 0 $^\circ$.2 in 1981: single?)	
02490+4941	0249024+494101	COU2261	11.4	11.4	+49 776	2009.945				NR	(AB,C 66.0 1.4 !)	
02502+6531	0250102+653115	MLR121	10.26	10.57	+64 350	2009.633	92.6	0.755	1.7	2Q-ly		
02505+4044	0250277+404259	COU1376	11.7	12.0	+40 611	2009.945	25.4	0.794		b		
02509-0026	0250564-002530	HEI98	11.6	11.8		2009.904	306.2	0.901	3.0	ly-b		
02513+0142	0251175+014209	VOU36	8.23	9.54	+01 502	2009.904	191.3	0.310	0.2	dv		
02513+0303	0251208+030324	HO218	8.8	8.8	+02 438	2009.904				NR	(WDS gives 0 $^\circ$.1 in 1953: single?)	
02513+1515	0251196+151348	HEI99	10.80	10.84	+14 479	2009.904	160.1	0.853	0.1	dv		
02537+3820	0253425+382015	BU524 AB	5.79	6.80	+37 655	2009.945	318.8:	0.225:			2.7 0.022 Mut2010b	
02551+3236	0255079+323550	COU678	10.00	10.10	+32 529	2009.945	321.8	1.274	0.1	dv		
02557+3028	0255390+302803	COU555	8.74	12.7	+29 500	2009.038	267.8	1.476	4.2	3Q-ly		
02557+3028	0255390+302803	GI2 AB,C	13.5	13.5	+29 500	2009.038	330.5	0.434				
03003+0125	0300202+012502	RST5196	10.24	10.51	+00 494	2009.904	50.2	0.617	0.1	dv		
03014+0615	0301226+061457	HDS385	9.54	9.78	+05 438	2009.904				NR	[220.9, 0.0081 Tok2019c]	
03014+4021	0301281+402111	COU1379	10.60	10.85		2009.038	76.5	0.736	>1.0	1Q-dv		
03023+1820	0302155+181945	A2414	10.54	10.41	+17 477	2009.904	68.2	0.553	0.2	dv	-12.7 0.189 Hei1997	
03025+6423	0302283+642258	HDS388	8.43	11.62	+63 380	2009.633	317.9:	0.382:	3.9	4Q-ly:		
03030+4250	0303006+424937	COU1512	9.92	12.7	+42 686	2009.038	109.0	1.786	>1.0	2Q-dv		
03036+4849	0303368+484827	HU541	10.53	11.71	+48 838	2009.945	159.5	0.642		2Q-dv-b		
03039+6831	0303520+683051	HU1052	9.4	11.9	+67 239	2009.633	147.1	1.268	2.0	3Q-ly		
03041+5040	0304140+503930	COU2567	11.1	11.4	+50 690	2009.888	70.5	0.397	1.0	ly		
03058+4342	0305464+434208	BU1175	7.23	8.80	+43 628	2009.038	274.8	0.674	>1.0	2Q-dv		
03058+4818	0305488+481942	COU2016	9.7	9.7	+47 766	2009.038	59.3:	0.151:				
03059+7036	0305547+703557	HDS394	10.67	10.63	+70 221	2009.633	89.4	0.551	2.2	1Q-ly		
03060+6135	0306003+613450	MLR34	9.2	11.5	+61 518	2009.633	352.0	0.355	2.1	4Q-ly		
03061+5144	0306107+514428	COU2454	9.9	9.9	+51 675	2009.888	208.3	0.353	0.2	ly		
03062+6146	0306123+614620	MLR35	9.7	12.0	+61 520	2009.633	157.0	0.252	0.2:	2Q-ly		
03081+4327	0308084+432642	COU1679	9.78	10.15	+42 706	2009.038	2.9	0.490	0.2	1Q-dv		
03096+0512	0309363+051210	A2030	8.58	9.20	+04 501	2009.904	7.5	0.261	0.1	dv	-1.8 -0.011 Sta1978b	
03098+5052	0309478+505153	COU2455	12.1	12.1	+50 708	2009.888	288.6	0.338	0.5	ly		
03100+5210	0309598+520955	COU2456 Aa,Ab	10.0	10.4	+51 685	2009.888	355.8	0.384	0.3	ly		
03100+5210	0309598+520955	ES767 AB	10.99	11.4	+51 685	2009.888	131.6	5.948	1.1	ly		
03114+1303	0311219+130252	CHR8	6.12		+12 452	2009.904				S	(Only 1 obs: single?)	
03119+6131	0311568+613112	HDS407	10.32	12.45	+60 637	2009.633	174.4	0.544	2.3	2Q-ly	+0.9 -0.025 Cve 2019	
03125+1857	0312329+185637	HDS408	9.14	9.45	+18 430	2009.904				S	(13 epochs at 0 $^\circ$.1: single?)	
03130+4417	0312570+441714	STT51	8.51	8.74	+43 653	2009.945	339.9	0.655	1.0	dv		
03148+6614	0314496+661340	HU1054	9.45	9.72	+65 330	2009.888	225.8	0.612	0.8	ly		
03175+6540	0317315+653930	STT52 AB	7.06	7.40	+65 338	2009.888	57.3	0.502	0.6	ly	+0.1 0.008 Msn2017e	
03176+4322	0317374+432223	COU1513	9.57	11.18	+42 735	2009.038	113.9	1.329	>1.0	2Q-dv		
03184-0056	0318222-005548	AC2 AB	5.60	7.97	-01 469	2009.904	258.8	1.210	2.7	ly	1.8 -0.010 Pop1997f	
03193+4519	0319197+451845	COU1680	10.47	11.60	+44 665	2009.945	132.2	1.453	2.2	ly-b		
03196+1841	0319360+184018	COU36 AB	10.43	10.53	+18 458	2009.904	143.0	0.977	0.2	ly		
03201+4811	0320027+481152	COU2019	10.7	11.1	+47 804	2009.038	257.7	0.269	1.3	3Q-ly		
03213+1038	0321181+103747	HEI449	9.19	9.43	+10 432	2009.904	69.3	0.238			+7.5 -0.006 Zir 2012	
03217+0845	0321438+084523	STT380	9.02	9.81	+08 500	2009.904	10.4	0.953	1.5	ly	2.6 0.048 Pop1996b	
03222+6856	0322175+685539	MLR389	9.7	13.2	+68 236	2009.888				NR	(WDS gives 0 $^\circ$.4: single?)	
03235+5209	0323301+520854	COU2569	9.13	10.33	+51 726	2009.888	152.2	0.311	0.7	ly		
03238+5436	0323525+543416	A1286 BC	11.2	11.2	+54 675	2009.888	55.0	0.667	0.8	ly		
03248+4159	0324509+415843	A1288	9.04	9.32	+41 675	2009.038	4.5	0.675	0.9	1Q-dv		
03250+4013	0324578+401323	HU1058	8.22	8.83	+39 778	2009.945	114.3	0.820	0.8	ly		
03251+5601	0325183+560523	MLR686	10.41	10.65		2009.888	92.2	0.630	<0.1	dv		
03259+4540	0325523+454029	COU1682	11.16	11.7	+45 762	2009.038	73.5	0.746	0.7	1Q-dv	(=TDS2544)	
03266+4415	0326332+441457	COU1684	10.65	11.07	+43 716	2009.038	61.2	0.660	0.1	1Q-dv		
03267+4420	0326397+442012	COU1685	10.9	11.4	+43 717	2009.038	330.9	0.508	0.2	4Q-dv		
03279+4551	0327551+455056	COU1687	10.23	10.03	+45 770	2009.038	111.9	0.786	1.7	2Q-dv		
03279+4614	0327532+461425	COU1686	10.57	11.83	+45 769	2009.945	83.9	0.479	2.6	ly		
03282+0409	0328149+040948	A2417 BC	10.38	10.39	+03 480	2009.904	133.9	0.888	0.3	dv		
03284+6015	0328235+601520	A980 AB	6.73	8.29	+59 657	2009.888	336.7	0.401	1.5	ly	-1.5 -0.032 Baz1994	
03298+5001	0329469+500105	COU2265 Aa,Ab	10.2	11.7	+49 946	2009.888				NR	(0 $^\circ$.6 in 1955 1 obs.)	
03303+1254	0330153+125406	HDS438	8.50	11.12	+12 485	2009.904	164.1	0.446	2.9	ly		
03321+4108	0332071+410729	COU1516	10.9	13.6	+40 775	2009.945	3.4	0.781		1Q-dv-b	(2 obs only.)	
03347+4241	0334381+424101	COU1689	10.32	11.16	+42 784	2009.945	295.7	1.096	1.7	ly-b		
03360+3839	0336033+383845	COU1386	10.59	11.4	+38 756	2009.945	113.5	1.556	2.1	ly-b		
03362+4220	0336093+422023	A1535	8.84	9.54	+41 714	2009.945	341.8	0.729	2.0:	dv	1.7 0.003 Hrt2008	
03364+0153	0336267+015237	A2418	10.57	10.61	+01 624	2009.904	65.1	0.761	0.1	dv		
03368+1338	0336472+133850	HEI213	11.4	11.8	+13 574	2009.904	211.7	0.393	0.4	dv		
03370+1632	0337017+163229	HEI29	10.06	10.31	+16 474	2009.904	78.2	0.768	1.3	ly-b		
03420+1812	0342018+181220	COU362	10.80	11.09	+17 610	2009.904	265.5	0.522		3Q-dv-b		
03438+4921	0343481+492126	COU2165	11.4	14.2	+48 982	2009.038	346.7	0.944	>1.0	4Q-dv-b		
03444+4153	0344211+415343	COU1519	11.57	12.4		2009.038	177.8	1.466	1.1	2Q-dv		
03473+4011	0347141+401107	COU1388	10.83	10.94	+39 860	2009.038	300.6	0.514	0.4	4Q-dv		
03477+5037	0347443+503646	COU2457	11.5	11.5	+50 822	2009.888	342.6:	0.216:				
03489+6445	0348565+644454	STT62	8.06	9.05	+64 408	2009.888	345.2	0.428	0.2	ly	1.2 0.014 Hrt2008	

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ, ''$)	$\Delta\rho$ (O-C)
03511+4940	0351050+493927	ES1137	11.0	11.1	+49 1038	2009.945	201.4	0.417		b	(rapid increase in θ : watch ?)	
03521+4121	0352065+412107	COU1520	10.85	11.2	+40 846	2009.945	265.3	1.619	1.6	ly-b		
03536+5006	0353384+500620	COU2166	10.7	11.4	+49 1051	2009.888	59.2	0.778	1.4	ly		
03566+4436	0356354+443641	COU1694	10.11	12.51	+44 817	2009.038	226.4	0.512	>1.0	3Q-dv		
03573+5051	0357199+505118	COU2357	10.27	10.63	+50 864	2009.888	96.3	0.882	1.5	dv		
04024+4600	0402272+460045	COU1697	10.03	12.04	+45 861	2009.945	135.2	1.185	2.2	ly-b		
04035+4211	0403312+421055	A1709 AB	8.06	10.04	+41 802	2009.945	221.0	1.058	3.0	ly-b		
04050+3734	0405031+373530	COU1393	10.22	12.3	+37 874	2009.945	148.8	2.168	2.9	ly-b		
04053+4535	0405143+453625	COU1698	10.53	11.42	+45 866	2009.945	243.9	1.489	1.4	ly-b		
04059+3438	0405521+343754	ES238	10.78	11.62	+34 809	2009.945	138.0	1.791	1.3	ly-b		
04060+4611	0406026+461114	COU1700	10.02	14.1	+45 869	2009.038	70.9	1.298	>1.0	1Q-dv-b		
04064+4325	0406255+432507	A1710	8.16	8.27	+43 892	2009.945	314.7	0.616	0.1	dv	2.5 -0.005 Hei1982c	
04070+3934	0407023+393424	COU1394	9.3	9.3	+39 930	2009.945	134.5	0.302			-18.0 0.056 Cou1999b	
04106+4406	0410371+440557	COU1703	8.7	11.5	+43 912	2009.038	71.3	0.646	>1.0	1Q-dv	(Second obs.)	
04289+4103	0428560+410325	A1712	10.22	10.24	+40 966	2009.038	40.1	0.432	>1.0	1Q-dv		
04294+4407	0429225+440715	A1713	10.11	10.11	+43 981	2009.038	204.6	0.440	0.8	3Q-dv		
04310+4333	0430577+433255	COU1864	11.46	13.4	+43 989	2009.038	231.3	1.536	2.5	3Q-dv-b		
04320+4715	0432017+471448	COU2169	10.45	11.8	+46 892	2009.038	170.9	1.202	>1.0	2Q-dv-b		
04340+4349	0433580+434857	COU1865	10.07	12.9	+43 1007	2009.038	209.8	1.718	>1.0	3Q-dv-b		
04344+4241	0434227+424036	A1714	9.1	9.4	+42 995	2009.038	255.0	0.382	0.6	3Q-dv		
04353+4141	0435195+414123	A1716	9.77	9.85	+41 905	2009.038	90.9	0.613	0.4	2Q-dv		
04380+4427	0438012+442723	A1011	9.46	10.19	+44 998	2009.038	27.1	0.829	0.0			
04380+4427	0438012+442723	A1011	9.46	10.19	+44 998	2009.038	29.5	0.715	0.8			
04461+4308	0446039+430744	A1717	10.4	10.6	+42 1041	2009.038	167.5:	0.147:				
04477+4014	0447431+401357	A1545 AB	8.98	10.54	+39 1065	2009.038	95.9	0.451	0.0	2Q-dv		
04493+4237	0449163+423701	COU2035	11.0	11.9	+42 1060	2009.038	260.8	0.408	0.4	3Q-dv		
04495+4116	0449273+411532	COU1709	11.3	11.7	+40 1059	2009.038	308.0	0.524	0.1	4Q-dv		
04497+4824	0449404+482332	COU2362	10.62	10.41	+48 1155	2009.038	348.5	0.466	0.6:	4Q-dv		
04584+4401	0458253+440200	COU2172	10.8	11.5	+43 1140	2009.038	181.3	0.337	0.5:	3Q-dv	(Second obs.)	
05018+4112	0501501+411211	A1552	10.27	10.42	+40 1135	2009.038	222.8	0.599	>1.0	3Q-dv		
05047+4458	0504441+445731	A1022 AB	10.08	9.83	+44 1086	2009.038	162.4	0.632	0.0			
05047+4458	0504441+445731	A1022 AC	10.08	13.15	+44 1086	2009.038	273.0	9.114	3.5	ly		
05047+4458	0504441+445731	A1022 AD	10.08	13.19	+44 1086	2009.038	318.8	11.082	3.3	ly		
05133+4940	0513186+494021	COU2578	9.3	10.1	+49 1325	2009.038	111.0	0.441	1.5	2Q-dv		
05152+4308	0515120+430735	COU2363	11.0	14.0	+42 1217	2009.038	21.8	1.019	>1.0	1Q-dv	(Second obs.)	
05163+4447	0516192+444700	COU2468	10.12	10.46	+44 1152	2009.038	327.9	0.668	1.3	4Q-dv		
05167+4012	0516282+401159	COU2173	10.9	11.1	+40 1228	2009.038	297.3	0.624	0.3	4Q-dv		
05210+4408	0521008+440824	COU2365	10.0	10.0	+43 1251	2009.038	199.3	0.325	0.0	1-3Q-dv		
05212+4148	0521126+414802	COU2174	10.83	10.78	+41 1160	2009.038	240.2	0.417	0.6	3Q-dv		
05226+4239	0522383+423834	A1718	9.2	10.7	+42 1264	2009.038	104.4	0.448	>1.0	2Q-dv		
05234+4233	0523235+423318	COU2366	10.49	10.63	+42 1269	2009.038	69.4	0.394	0.2	1Q-dv		
05273+4039	0527155+403940	COU2271	11.2	11.2	+40 1288	2009.038	11.1	0.299	<0.1:	1Q-dv		
05282+4253	0528102+425326	COU2367	9.0	10.0	+42 1292	2009.038	334.3	0.388	1.0	4Q-dv		
05294+4000	0529226+395924	COU2176	11.4	11.4	+39 1312	2009.038	287.9	0.326	<0.1:	4Q-dv		
05337+4103	0533412+410303	COU2272	10.8	13.5	+40 1327	2009.038	169.5	0.777	>1.0	2Q-dv		
05384+4301	0538256+430051	A1563	9.3	9.3	+42 1354	2009.038	285.8	0.220	0.0	4Q-dv	-16.6 0.142 Cou1986b	
05403+4421	0540207+442058	A1038	9.99	9.94	+44 1261	2009.038	192.7	0.599	0.0	3Q-dv		
05412+4615	0541156+461533	COU2588	10.88	11.15	+46 1037	2009.038	144.0	0.392	0.6	2Q-dv		
05459+4927	0545557+492707	COU2592	9.0	10.5	+49 1397	2009.038	331.9	0.318	0.8	4Q-dv		
05471+4018	0547057+401918	COU2368	11.5	12.5	+40 1409	2009.038	235.6	0.896	1.2	3Q-dv b		
07513+3849	0751190+384917	STF11445	8.73	10.39	+39 2017	2009.222	42.9	1.362	1.8	1Q-ly		
07590+3528	0759027+352723	COU1741	11.9	12.3	+35 1721	2009.222	93.9	0.786	1.6	2Q-ly		
07593+3817	0759167+381706	COU2076	10.71	10.80	+38 1845	2009.222	276.3	0.524	0.1			
08003+3953	0800148+395351	COU2381	10.72	12.2	+40 1975	2009.222	76.5	1.582	1.9	1Q-ly		
08041+3302	0804083+330150	STT187	6.94	8.50	+33 1636	2009.222	342.5	0.409	0.3	4Q-ly	1.9 -0.001 Msn1999a	
08076+3432	0807386+343137	COU1556	10.8	11.3	+34 1749	2009.222	327.9	0.924	1.6	4Q-ly		
08094+3734	0809227+373421	HU850	9.42	9.23	+37 1828	2009.222	347.8	0.520	0.8	4Q-ly		
08216+3356	0821370+335612	BU576	7.30	10.88	+34 1808	2009.222	134.6	1.532	3.0	2Q-ly		
08262+3528	0826154+352834	COU1891	10.72	11.42	+35 1824	2009.222	158.4	0.840	1.1	2Q-ly		
08311+3431	0831086+343124	HU627	10.30	10.62	+35 1833	2009.222	274.3	0.984	1.3	4Q-ly		
08350+3353	0834577+335301	TDS478	9.85	11.82	+34 1859	2009.222				S	(1 $^{\circ}$.5 in 1991 - only other obs.)	
08510+3124	0851026+312411	HO40 AB	10.55	10.70	+31 1891	2009.222	279.6	0.831	0.7	4Q-ly		
08580+3726	0858012+372545	HU860	10.33	10.51	+37 1931	2009.222	5.6	0.850	0.5	1Q-ly		
08587+3222	0858414+322211	DJU1	8.0	8.2	+32 1816	2009.222				S	(0 $^{\circ}$.3 in 1955 - only other obs.)	
09002+6323	0900168+632213	MLR134	10.5	10.5	+63 813	2010.262	241.1	0.290				
09007+3208	0900422+320810	COU1253	9.03	9.38	+32 1827	2009.222	12.1	0.732	1.6	1Q-ly		
09062+3314	0906137+331343	COU1560 AB	10.25	12.8	+33 1805	2009.222	297.5	1.234	1.6	4Q-ly		
09095+3250	0909308+324915	COU1561	10.23	11.57	+33 1814	2009.222	212.8	0.732	1.2			
09130+6939	0912595+693820	MLR417	10.24	10.90	+70 552	2010.262	95.7	0.890	1.6	ly		
09162+4540	0916109+454042	COU2688	11.2	11.2	+46 1486	2009.214	47.9	0.427				
09171+4040	0917036+404020	A1981	10.52	11.23	+41 1942	2009.214	165.7	0.273	0.0			
09179+2834	0917534+283342	STF3121 AB	7.9	8.0	+29 1883	2010.235	42.0	0.430	<0.1	3Q-dv	5.1 -0.019 Sod1999	
09210+3643	0920583+364309	STF1339	9.15	9.89	+37 1970	2010.235	65.9	1.456	0.3	1Q-dv		
09210+3811	0920594+381117	STF1338 AB	6.72	7.08	+38 2025	2010.235	301.9	1.099	<0.1	4Q-dv	-2.7 0.089 Sca2002b	
09222+3239	0922117+323901	HDS1347	9.07	12.78	+33 1850	2009.222	198.4	1.254	4.5	3Q-ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
09224+4616	0922273+461600	A1758	11.7	11.7	+46 1493	2009.214	309.9	0.653	0.0			
09267+3855	0926398+385438	COU1898	9.57	12.56	+39 2246	2009.222	158.5	1.644	2.4	2Q-ly		
09284+3955	0928231+395456	TDS6583	10.78	10.94		2009.222	92.3:	0.568:				
09336+6216	0933335+621623	HU228	9.84	9.95	+62 1077	2010.262	74.3	0.593	2.8:	ly		
09338+3634	0933480+363401	HU1127	10.1	11.1	+37 2000	2009.222	20.2	0.466				
09344+4704	0934218+470406	COU2500	10.25	10.89	+47 1682	2009.214	231.8	0.883	0.8	3Q-dv		
09354+3958	0935225+395747	COU2084 Aa,Ab	6.98	8.79	+40 2226	2010.235				NR	[48.7 0.070 Tok2019]	
09398+4135	0939473+413455	A2051	10.88	11.25	+42 2034	2009.214	230.2	0.356				
09429+5035	0942540+503518	HU629	8.47	9.27	+51 1537	2010.262	198.3	0.279		3Q-ly		
09444+4047	0944251+404704	A2053	9.40	10.62	+41 2000	2009.214	87.2	0.911	>1.0	1Q-dv		
09498+2111	0949501+211046	KUI144 AB	6.62	7.31	+21 2113	2010.235				S	[234.9 0.104 Tam 2006b]	
09498+5254	0949457+525327	MLR677	7.55	8.94	+53 1361	2010.262	313.2:	0.131:				
09499+3036	0949533+303554	COU1256	10.95	11.61	+31 2054	2009.222	152.6	1.198	0.4	2Q-ly		
09502+5706	0950158+570635	MLR568	10.70	10.60		2010.262	233.8	0.569	0.2	ly		
09523+3121	0952187+312048	TDS6867	10.79	10.83		2009.222	264.2:	1.219:	1.8	ly		
09531+3920	0953060+392000	A2140	10.13	10.71	+40 2270	2009.222	65.4	0.948	1.0	1Q-ly		
09580+6016	0958021+601623	MLR117	9.53	9.59	+60 1222	2010.262	309.2	0.433				
09591+5316	0959055+531549	A1346	8.84	9.66	+53 1375	2010.262	179.8	0.530	1.3	ly	-1.0 -0.010 Hrt2009	
10023+4940	1002152+493933	HU725	9.98	10.28	+50 1705	2009.214	154.9	0.656	1.0	2Q-dv		
10034+5732	1003262+573208	A1347	8.37	9.48	+58 1232	2010.262	38.3	0.358	1.6	ly		
10039+4027	1003554+402718	COU2385	10.65	12.4	+41 2046	2009.214	317.8	0.964	2.5	4Q-ly		
10054+5957	1005211+595631	MLR142	10.07	10.02	+60 1236	2010.262				NR		
10075+6952	1007276+695152	A1085	9.07	11.01	+70 596	2010.262	247.9	0.442	2.2	ly		
10104+5037	1010231+503649	TDS7078	10.93	11.02		2010.273	128.3	0.536				
10113+4554	1011241+455519	COU2620	11.6	11.6	+46 1595	2009.214	22.8	0.617	0.2	1Q-dv		
10126+6032	1012385+603159	HU1129	8.84	10.74	+61 1170	2010.262	259.3	0.386	2.2	ly		
10137+5654	1013426+565409	TDS7124	10.88	11.07		2010.273	50.8	0.846				
10151+6443	1015031+644301	HDS1478	8.74	11.57	+65 762	2010.287	63.5	0.789	3.6	ly		
10164+4003	1016245+400238	A2147	10.38	10.57	+40 2311	2009.214	273.6	0.940	1.2	4Q-dv		
10215+6333	1021307+633320	TDS7213	10.77	10.96		2010.273	66.3	0.764	1.8	ly		
10259+4628	1025521+462750	COU2504	10.2	10.2	+47 1770	2009.214	273.7	0.238	0.1	4Q-dv		
10261+5347	1026015+534505	MLR679	10.64	10.73		2010.262	83.0	1.080		1Q-ly:		
10262+6038	1026115+603827	HU1130	10.14	10.88	+61 1188	2010.273	135.4	1.038	1.2	ly		
10270+6051	1027003+605043	HU1131	9.97	10.62	+61 1190	2010.262	199.1	0.833	1.8	ly		
10270+6722	1027002+672212	A1086 AB	9.25	10.30	+68 606	2010.273	217.2	0.707	1.5	ly		
10281+4847	1028039+484706	KUI150	6.4	12.6	+49 1961	2009.214				NR	[21.6 4.024 Dru2014]	
10287+4558	1028438+455751	A1993	9.25	10.22	+46 1631	2009.214	189.1	0.272	0.5	3Q-dv	-6.2 0.001 Lin2017a	
10302+4419	1030103+441847	COU2090	10.89	11.16	+45 1835	2009.214	99.1	1.341	0.2	2Q-dv		
10303+5626	1030167+562545	TDS7303	10.95	11.39		2010.273	91.0	0.469	2.7	ly		
10340+4612	1033581+461219	A2054	9.5	9.5	+46 1639	2009.214				NR		
10341+5023	1034039+502234	COU2621	10.74	10.64	+51 1607	2010.262	175.9	1.019	2.3	ly		
10345+5103	1034321+510317	COU2622	10.27	11.61	+51 1609	2010.262	310.2	1.397	2.0	ly		
10365+4430	1036295+443023	A2055 AB	9.34	9.50	+45 1844	2009.214	177.3	0.327	0.3	2Q-ly		
10369+5042	1036547+504152	COU2624	10.51	10.56	+51 1612	2010.262	314.4	0.940	0.9	ly		
10369+5718	1036523+571823	HDS1519	8.55	11.06	+58 1265	2010.287	203.9	0.606	2.8	ly		
10399+5229	1039525+522837	TDS7404	10.83	10.86		2010.273	28.0	0.595	0.8	ly		
10416+6414	1041333+641411	HU1132	10.17	10.27	+64 806	2010.262	292.4	0.464	0.3	ly		
10440+5415	1044018+541425	MLB129	10.36	12.05	+54 1392	2010.262	145.8	1.735	2.2	ly		
10509+5810	1050518+581017	TDS7499	11.02	11.09		2010.273				NR		
10528+5502	1053026+550228	MLB130	10.92	11.82		2010.287	66.3	1.217	2.4	ly		
10530+5742	1053010+574207	A1352	9.42	11.48	+58 1286	2010.273	40.7	1.044	2.4	ly		
10555+6512	1055295+651152	TDS7556	10.63	10.66		2010.287				NR		
10560+5539	1056003+553837	TDS7561	10.84	11.04		2010.287	177.7	0.618	2.0	ly		
11035+5432	1103280+543132	A1590	8.95	9.64	+55 1439	2010.287	330.7	1.443	0.9	ly	-2.8 -0.057 Baz1985b	
11045+6405	1104304+640512	TDS7649	10.79	11.04		2010.287				NR		
11046+5058	1104358+505828	COU2505	10.86	10.88	+51 1647	2010.262	243.6	0.509	0.3	ly		
11056+5448	1105346+544828	A1591	8.98	9.52	+55 1440	2010.262	130.2:	0.135:		2Q-ly	3.8 -0.025 Hei1976	
11056+6024	1105352+602348	TDS7657	10.41	10.43		2010.273	200.6	0.547	2.1	ly		
11059+5049	1105514+504912	HU638	8.93	11.09	+51 1648	2010.314	329.0	1.869	3.4	ly		
11077+5303	1107404+530307	HDS1587	9.20	12.54	+53 1465	2010.273	214.9	0.733	2.9	ly		
11106+6954	1110377+695354	A1087	9.13	9.62	+70 651	2010.262	83.2	0.347	1.0	ly		
11107+6650	1110443+665023	TDS7715	10.95	11.22		2010.287				NR!		
11116+6607	1111385+660648	STF1514	9.49	10.64	+66 706	2010.273	342.3	1.249	1.5	ly		
11136+5525	1113347+552457	A1353	7.73	9.16	+56 1508	2010.262	211.9	0.552	0.8	ly	0.5 -0.012 Doc2015f	
11144+6732	1114261+673208	MLR144	10.9	10.9	+68 636	2010.262				NR		
11152+6731	1115097+673030	MLR145	10.34	10.46	+68 637	2010.262	240.5	0.976	1.2	dv		
11156+5947	1115367+594643	STF1519	9.03	9.95	+60 1316	2010.314	289.4	1.415	0.3	dv		
11161+5414	1116077+541423	TDS7771 Aa,Ab	10.44	10.87	+55 1451	2010.273	321.3	0.562	1.2	ly		
11190+1416	1118598+141608	STF1527	7.01	7.99	+15 2321	2010.375	186.7	0.337	1.1	ly	-0.1 0.006 Tok2012b	
11203+6541	1120157+654101	TDS7795	10.83	10.85		2010.287	224.8	0.561	1.1	ly		
11214+6213	1121252+621323	MLR146	10.78	11.04		2010.262	39.0	0.811	1.7	ly		
11226+6847	1122330+684639	HDS1619	9.62	12.85	+69 606	2010.273	55.2	1.736	3.7	ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ$, $''$)	$\Delta\rho$ (O-C)
11258+5527	1125463+552624	MLR601	10.06	10.81	+56 1516	2010.262	55.4	1.036	1.1	ly		
11267+6654	1126412+665344	HU1133	8.65	9.64	+67 699	2010.262	346.0	0.802	1.6	ly		
11272+5459	1127137+545747	MLR703	8.64		+55 1465	2010.262				NR		
11272+5513	1127136+551310	A1354	7.86	11.28	+56 1519	2010.287	124.8	1.212	3.9	ly		
11282+5540	1128114+554005	A1355	7.72	11.54	+56 1521	2010.287	359.1	1.365	4.2	ly		
11301+6808	1130054+680737	HDS1630	8.24	12.19	+68 645	2010.273	179.6	0.684	3.4	ly		
11311+6617	1131074+661715	HDS1632	9.17	9.42	+67 702	2010.273				NR		
11313+6749	1131203+674840	TDS7905	10.98	11.22		2010.287	10.4:	0.674:		:		
11321+1809	1132036+180918	HDS1635	8.28	9.49	+18 2506	2010.325				<0.2		
11330+0938	1133030+093738	A2576 AB	10.15	10.23	+10 2303	2010.325	257.1	0.543	0.8	dv	-1.8 -0.001	Sca2016a
11333+5748	1133188+574821	MLR551 Aa,Ab	10.3		+58 1324	2010.262	126.1	0.977	2.6	ly		
11354+6438	1135216+643827	MLR147	10.6	10.6	+65 837	2010.262	121.3:	0.223:		2Q-ly		
11361+6019	1136058+601922	TDS7946	10.98	11.15		2010.273				NR		
11366+0834	1136349+083402	HEI502	10.19	10.20	+09 2518	2010.325	330.4	0.989	0.2	dv		
11370+5700	1136596+565944	HDS1646	8.89	12.14	+57 1332	2010.273	67.0	0.606				
11390+6814	1138596+681332	TDS7975	10.84	12.13		2010.287				NR		
11394+0856	1139245+085626	A2577	9.6	9.7	+09 2526	2010.325	359.5:	0.235:				
11397+5036	1139391+503445	COU2101	11.3	11.8	+51 1681	2010.262	63.5	0.505	1.9	ly		
11406+6219	1140396+621758	MLR148	11.5	11.8		2010.262	157.9	0.437	0.6	ly		
11412+6250	1141135+625027	TDS7987	10.74	11.21		2010.287				NR		
11417+5627	1141431+562712	MLR552	9.43	11.27	+57 1334	2010.262	48.2	1.757	2.4	ly		
11437+3028	1143441+302747	TDS8009	10.69	10.73		2010.290				NR		
11447+5340	1144398+533949	HDS1657	8.85	12.39	+54 1459	2010.273	98.7	1.304	3.8	ly		
11460+0746	1145578+074554	A2778	8.4	11.4	+08 2540	2010.325	188.1	0.441	0.2	dv		
11486+1417	1148387+141703	BU603 AB	5.97	8.53	+15 2381	2010.325	334.4	1.043	1.4	dv	0.3 0.008	WSI2015
11500+1030	1150010+103013	HEI505	10.63	12.08	+11 2402	2010.325	355.2	1.306	1.8	ly-b		
11518+5032	1151263+503219	HU730	10.5	10.5	+51 1705	2010.262	116.6	0.189		2Q-ly:	5.9 0.027	USN2002
11551+6148	1155051+614819	TDS8110	10.91	11.07		2010.287				NR		
11563+3527	1156172+352653	STT241	6.82	8.74	+36 2225	2010.290	144.3	1.733	2.3	ly		
11579+6705	1157513+670445	HDS1683	8.66	11.40	+67 725	2010.273	347.4	0.467	3.1	ly		
11598+5104	1159488+510350	COU1906	9.61	11.38	+51 1718	2010.262	75.6	0.896	2.0	ly		
11598+5104	1159488+510350	COU1906	9.61	11.38	+51 1718	2010.273	76.1	0.903	2.3	ly		
12006+6911	1200375+691107	A1088	7.88	8.81	+69 636	2010.262	2.1	0.179		1Q-ly	-10.1 0.065	USN2002
12014+1119	1201214+111928	HU890	10.10	11.07	+12 2413	2010.325	70.1	1.500		b		
12048+5648	1204459+564806	A1358 AB	10.09	9.90	+57 1352	2010.273	48.3	0.554	0.6	dv		
12050+5113	1204563+511207	A1594	10.90	12.10	+52 1606	2010.287	129.3	1.582	2.3	ly		
12056+5659	1205355+565844	A1358 AB	10.09	9.90	+57 1354	2010.262				S!	(wrong object ?)	
12059+5017	1205562+501730	HDS1706	8.81	13.06	+51 1726	2010.273				NR		
12060+6842	1206014+684156	STF3123 AB	8.01	7.90	+69 644	2010.262	206.8	0.270	0.4	3Q-ly:	0.9 -0.009	Hrt1996a
12060+6842	1206014+684156	STF3123 AB	8.01	7.90	+69 644	2010.273	206.2	0.253		3Q-ly	-1.5 -0.026	Hrt1996a
12070+3421	1207018+342039	ES2224 AB	9.4	12.4	+35 2313	2010.290	21.6	1.710		1Q-ly		
12087+1147	1208440+114758	HEI508	10.61	11.17	+12 2427	2010.325	4.2	1.508		dv-b		
12094+5758	1209210+575821	TDS8247	10.80	10.88		2010.287				NR		
12119+5942	1211557+594150	HDS1723	9.14	11.92	+60 1382	2010.287	111.3	0.556	3.0	ly		
12121+6428	1212055+642749	HDS1725	7.73	11.45	+65 874	2010.287	358.6:	1.017:	4.7:	ly		
12154+5243	1215268+524302	MLR681 AB	8.2	8.2	+53 1535	2010.262				2-4Q: NR		
12160+0538	1215585+053825	STF1621	10.22	10.59	+06 2573	2010.325	41.7	1.464		b	0.0 -0.063	Sod1999
12175+0636	1217269+063604	BU796	8.38	9.46	+07 2529	2010.325				NR		
12182+6711	1218125+671111	HDS1732	8.93	12.15	+67 739	2010.273	6.7:	0.201:				
12191+6621	1219087+662048	MLR150	10.74	11.16	+67 741	2010.273	225.3	0.935	1.7	dv		
12197+0533	1219404+053243	A1597 AB	9.26	11.94	+06 2587	2010.325	274.9	0.641	3.4	ly		
12197+6229	1219399+622901	MLR151	10.88	10.81	+63 1010	2010.273	76.7	0.399	0.8	ly		
12223+6128	1222203+612818	HDS1743	8.69	10.28	+62 1229	2010.287	132.8	0.336	2.4	ly		
12228+6811	1222460+681045	A1089	10.65	11.04	+68 682	2010.273	288.3	0.896	1.6	ly		
12238+5410	1223508+540930	STT249 AB	8.21	9.18	+54 1522	2010.273	258.7	0.391	0.9	ly		
12244+2535	1224268+253456	STF1639 AB	6.74	7.83	+26 2345	2010.290	323.6	1.742	1.4	ly	0.0 -0.049	Ole2000b
12265+5229	1226311+522836	HDS1751	9.93	11.73	+53 1549	2010.287	316.4	0.417	3.1	ly		
12268-0011	1226458-001059	AGC4	7.95	10.04	+00 2944	2010.325	149.2	0.533		2Q-dv		
12281+0920	1227595+092107	A1090	9.86	11.25	+10 2428	2010.375	91.2	1.866		1Q-dv		
12306+0943	1230337+094257	STF1647	8.09	8.37	+10 2432	2010.325	246.1	1.281	0.3	DV	-4.1 0.026	Hop1970
12329+5448	1232548+544743	A1600	8.52	9.84	+55 1540	2010.287	8.1	0.884	2.1	ly		
12345+0558	1234327+055757	BU797 AB	9.10	9.39	+06 2630	2010.375	145.7	0.599	0.1	dv		
12368+2014	1236487+201415	AG180	7.81	9.79	+21 2434	2010.375	357.4	0.369	2.3	ly		
12376+6623	1237359+662241	MLR152	10.5	10.5	+67 756	2010.273				NR		
12409+0850	1240541+084945	STF1668	7.78	8.10	+09 2658	2010.389	185.9	1.115	0.5	ly		
12429+0516	1242554+051559	A1602	8.77	10.12	+06 2647	2010.325	27.0	0.557	0.7	dv	-0.9 0.001	Doc2015d
12440+0356	1243589+035557	A1603 AB	9.06	11.6	+04 2642	2010.325	121.1	0.858	0.2	dv		
12441+3546	1244088+354607	HO256	7.30	9.55	+36 2305	2010.290	118.0	0.545	2.5	ly		
12454+0128	1245223+012831	HEI770	10.8	11.2	+02 2575	2010.389	169.3	1.591	2.1	ly-b		
12473+5252	1247199+525142	HDS1794	8.08	9.48	+53 1568	2010.273				NR		
12490+6125	1248589+612523	TDS8536	10.91	11.05		2010.287				NR		
12494+1931	1249233+193115	TDS679	10.19	11.77		2010.389	171.4	1.013	2.5	ly-b		
12510+5959	1250583+595832	HU1140	9.58	9.93	+60 1422	2010.273	259.5	0.651	1.7	ly		
12533+2115	1253177+211442	STF1687 AB	5.15	7.08	+22 2519	2010.345	192.7	1.107	2.6	ly	-0.9 -0.029	Dru2014
12533+2115	1253177+211442	STF1687 AB	5.15	7.08	+22 2519	2010.395	192.1	1.120	2.4	ly	-1.5 -0.016	Dru2014

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ$, $''$)	$\Delta\rho$ (O-C)
12549+0919	1254510+091918	HEI514	9.85	11.00	+10 2484	2010.325	86.0	1.328	1.7	dv-b		
12554+6953	1255225+695314	A1092	9.73	9.88	+70 720	2010.273	0.2	0.293		1Q-ly	-8.4 0.082	Baz1959
12556+5706	1255370+570624	MLR553	9.73	10.16	+57 1400	2010.273	181.0	0.519	1.3	ly		
12560+5305	1255570+530432	TDS8595	10.12	10.31		2010.287				NR		
12572+0818	1257136+081737	FIN380	7.50	7.88	+09 2696	2010.325	158.8	0.254	0.3	dv	-2.5 -0.020	Doc2018I
12572+0818	1257136+081737	FIN380	7.50	7.88	+09 2696	2010.375	163.8	0.236	0.2	dv	2.4 -0.020	Doc2018I
12595+2814	1259333+281420	WS11	8.28	10.59	+29 2350	2010.395				NR		
13007+5622	1300435+562158	BU1082	5.02	7.88	+57 1408	2010.314	101.4	1.051		2Q-dv	-0.1 -0.060	Sca2012c
13018+6746	1301497+674538	MLR153	8.53	11.85	+68 705	2010.273	237.2	1.582	3.6			
13041+0511	1304048+051120	A1784	8.98	12.15	+05 2710	2010.345	314.5:	1.573:	3.7:	ly		
13041+5227	1304180+522710	MLR704 Aa,Ab	10.96	9.43	+53 1592	2010.273	32.5	0.416	1.6	ly		
13042+5615	1304092+561438	MLR554 Aa,Ab	10.71	10.72	+57 1415	2010.273	144.3	0.606	1.5	ly		
13047+0927	1304446+092659	HDS1829	8.34	11.37	+10 2509	2010.325				NR		
13053+6052	1305151+605137	MLR154 Aa,Ab	9.0	9.0	+61 1335	2010.273				S		
13053+6052	1305151+605137	MLR154 Aa,Ab	9.0	9.0	+61 1335	2010.287				S		
13053+6052	1305151+605137	GII26 AB	8.42	15.0	+61 1335	2010.273	214.9	3.105	6.1	ly	(ND)	
13053+6052	1305151+605137	GII26 AB	8.42	15.0	+61 1335	2010.287	214.9	3.032	6.2	ly		
13058+2614	1305510+261336	HO257	10.37	10.91	+27 2213	2010.395	154.0	1.979	1.1	ly		
13063+2044	1306154+204344	HU739	9.72	12.11	+21 2486	2010.375	201.5	1.380		3Q-dv	-1.6 -0.025	Hrt2014b
13069+1417	1306545+141721	HU1144	10.13	12.02	+15 2545	2010.389	7.0	1.546	2.4	ly-b		
13069+5200	1306540+520015	A1605	10.72	10.74	+52 1673	2010.287	348.5	1.066	0.3	ly		
13099+6521	1309543+652047	MLR156	10.93	11.48	+66 795	2010.314	105.2	1.720				
13103+6410	1310206+640948	MLR157 AB	10.2	10.7	+64 933	2010.273	18.7	0.182		1Q-ly		
13128+2356	1312490+235554	TDS8728	10.77	10.90		2010.395				S		
13128+6214	1312513+621408	MLR158	10.77	12.14	+63 1059	2010.287	40.4	1.024	2.4	ly		
13134+5252	1313238+525139	A1607	10.12	10.15	+53 1606	2010.287	191.2	0.468	0.2	ly		
13137+2949	1313419+294903	HO55 AB	7.39	11.6	+30 2383	2010.395				NR		
13157+5424	1315404+542410	HDS1858	7.96	9.62	+55 1587	2010.314	174.9	0.540		2Q-dv		
13160+6337	1316025+633712	HDS1860	9.01	9.65	+64 938	2010.314	208.4	0.269	0.1:	dv		
13161+5705	1316075+570527	HDS1861	8.40	11.59	+57 1432	2010.314	140.6	0.724				
13166+5034	1316372+503416	STT263	9.53	9.74	+51 1826	2010.314	136.3	1.738	0.4	dv		
13168+1015	1316489+101442	HEI519	10.80	11.94	+11 2551	2010.345	200.6	2.005	2.4	ly-b		
13177+5845	1317443+584502	A1360	8.27	10.81	+59 1500	2010.287	141.8	0.754	3.1	ly		
13196+0942	1319389+094135	A1787	7.93	11.2	+10 2536	2010.375	353.2	1.017	4.5	ly		
13207+0257	1320416+025632	STF1734	6.77	7.29	+03 2758	2010.389	174.9	1.090	0.6	ly		
13208+0701	1320466+070126	TDS8798 Aa,Ab	10.29	10.30		2010.395				S		
13216+1717	1321367+171545	COU56 AB	10.8	11.4	+18 2720	2010.345				NR!		
13223+2631	1322180+263109	A566	9.03	10.79	+27 2245	2010.395	64.5	1.946	2.2	lyb		
13229+6546	1322508+654536	MLR529	9.5	9.7	+66 805	2010.273				NR		
13235+2914	1323331+291412	HO260	9.60	9.94	+29 2405	2010.395	86.1	1.558	0.9	ly	0.5 -0.011	Zir2013a
13237+1257	1323425+125650	HDS1880	9.59	10.94	+13 2661	2010.395				NR <0.2	[348.7 0.115	Tok2018e]
13262+0345	1326121+034502	HEI773	10.41	10.82	+04 2746	2010.345	73.7	0.832		1Q-dv		
13268+5043	1326476+504242	COU2190	10.8	10.8	+51 1843	2010.287	213.1	0.469	0.7	ly ND?		
13272+2028	1327106+202743	AG187	10.49	10.71	+21 2531	2010.345	304.7	1.610				
13275+1055	1327275+105511	TDS8833	10.90	11.10		2010.395	9.7	0.726	2.9	ly		
13275+5601	1327302+560121	HDS1885 Aa,Ab	8.37	11.27	+56 1658	2010.314	335.3	0.366				
13283+0214	1328164+021409	A2490	7.50	10.03	+02 2680	2010.389	90.2	1.166		2Q-dv		
13284+3643	1328228+364252	COU1428	12.2	12.2	+37 2410	2010.325	55.8	0.227				
13285+0226	1328322+022551	TDS8839	10.85	12.09		2010.395				S		
13288+5956	1328499+595541	STF1752 AB	8.19	9.90	+60 1464	2010.314	107.9	0.987	1.1	dv		
13289+6423	1328539+642311	MLR160	10.87	11.00	+65 938	2010.287	208.9:	0.534:		3Q-ly		
13291+1128	1329062+112812	BU113 AB	8.73	10.66	+12 2597	2010.375	267.5	1.677	2.7	ly	0.8 -0.035	Hrt2013a
13305+0729	1330296+072910	A1789	9.14	9.39	+08 2721	2010.325	177.0	0.292	<0.1	dv	7.5 0.083	Hei1998
13315+5725	1331329+572459	MLR555	10.66	10.67		2010.314	169.9	0.543	<0.1	dv		
13326+6520	1332347+652020	MLR161	9.39	11.61	+66 810	2010.314	316.6	1.158		1Q-dv		
13334+5108	1333259+510737	COU2386	9.15	11.52	+51 1851	2010.314	198.8	1.105		3Q-dv		
13336+2944	1333338+294416	A1095	8.98	9.32	+30 2420	2010.395	280.9	0.361	1.0	ly	-0.8 0.002	Ole2002a
13336+6047	1333389+604714	HDS1903	8.65	9.70	+61 1365	2010.314	145.4	0.201		2Q-dv		
13340+0847	1334000+084654	A1792	8.43	9.55	+09 2777	2010.325	308.1	0.690	1.4	dv		
13359+1858	1335541+185822	COU300	10.36	12.96	+19 2689	2010.325	17.8	0.828				
13367+6947	1336418+694635	STF1771	8.77	9.37	+70 748	2010.314	81.0	1.773	1.1	dv		
13377+5028	1337393+502828	BU934	10.70	10.77	+51 1855	2010.314	263.4	1.245	0.3	dv		
13378+5103	1337497+510327	TDS8906	9.90	10.44	+51 1857	2010.314				NR		
13384+6758	1338215+675750	MLR163	11.1	11.1	+68 734	2010.314				NR		
13390+1141	1338575+114057	A1794	10.65	10.82	+12 2611	2010.345	28.6	0.509				
13390+6617	1339221+662047	MLR164	12.4	13.7		2010.314				NR		
13400+1235	1339595+123524	HDS1917	9.95	10.63	+13 2698	2010.395	92.2	0.249	2.0	ly		
13427+0235	1342435+023511	A2491	10.30	10.46	+03 2812	2010.389	124.8	0.764				
13437+1333	1343407+133316	HDS1930	9.61	12.80	+14 2655	2010.395				NR		
13453+0903	1345208+090328	BU115 AB	7.53	10.40	+09 2804	2010.375	257.2	1.575	3.6	ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(O-C)$ ($^\circ, ''$)	$\Delta\rho(O-C)$
13461+0507	1346068+050656	STF1781	7.89	8.10	+05 2794	2010.325	9.5	0.919	<0.1	dv	-1.1 ^Q	0.003 Alz2007
13478+0120	1347453+011929	A2492	10.88	10.67	+02 2725	2010.325	200.5	0.907				
13482+2248	1348092+224806	COU401	9.5	10.6	+23 2615	2010.345				NR		
13482+2248	1348092+224806	COU401	9.5	10.6	+23 2615	2010.395	167.5:	0.238:			13.0 ^Q	0.110 Doc2010h
13494+2418	1349228+241747	TDS8982	10.63	10.95		2010.389	14.0:	0.493:	3.3	ly ND?		
13553+5716	1355227+571513	MLR556	11.25	11.8		2010.314	338.7	1.319				
13563+0517	1356204+051723	STT273 AB	8.69	8.80	+05 2815	2010.375	112.5	0.958	0.5	dv		
13577+5200	1357400+515936	A1614	9.13	8.99	+52 1757	2010.314	301.5	1.391	0.5	dv	-0.4 -0.008	RAO2015
13583+0213	1358200+021314	A2167	9.27	9.64	+02 2752	2010.375	100.7	0.210			1.1	0.009 Hrt2010a
13584+1120	1358243+111943	HDS1959	10.87	11.05	+12 2646	2010.395	359.9	0.297	2.6	ly		
13587+1711	1358393+171048	COU58	10.27	11.64	+17 2688	2010.345	0.1	1.344	2.5	ly		
13590+1610	1359028+160856	HEI232	11.44	11.40	+16 2594	2010.345	64.9	1.817	3.4:	ly-b		
13598+1953	1359482+195258	STF1794	9.48	9.65	+20 2907	2010.345				dv NR		
14002+2826	1400134+282605	A687	10.49	10.50	+29 2482	2010.395	131.3	1.170	0.2	dv		
14009+0912	1429046+691646	HEI777	10.70	11.00		2010.345	216.7	1.790	3.3	ly-b		
14012+2522	1401115+252136	A569	10.14	10.31	+26 2517	2010.395	146.2	0.588	1.0	dv		
14020+5713	1402006+571328	A1097 AB	9.09	8.24	+57 1478	2010.314	252.5	0.429	0.3	dv	2.1 -0.006	Sca2000a
14025+6706	1402330+670555	HU1148	8.89	10.86	+67 820	2010.314	145.0	0.315				
14029+2434	1402520+243342	COU301	8.22	12.07	+25 2722	2010.345	121.2	0.866		:		
14037+0829	1403432+082913	BU1270	8.15	8.78	+09 2842	2010.375	335.8	0.253	0.3	dv	-2.2 -0.012	USN2006b
14055+6734	1405322+673344	MLR165	8.7	13.5	+68 759	2010.314	20.5	1.914	3.4	ly		
14063+0314	1406178+031408	A2170	10.52	12.92	+03 2855	2010.389	267.5	1.879	1.8	ly-b		
14063+2200	1406164+215956	HDS1978	9.86	13.54	+22 2662	2010.389	119.5	1.189	4.2	ly-b		
14068+5946	1406463+594616	HDS1980 Aa	9.76	11.45	+60 1511	2010.314	260.4	1.404		3Q-dv		
14073+2505	1407160+250529	A2384	10.82	11.53	+25 2731	2010.395	111.2	1.038	0.2	dv		
14077+0616	1407390+061617	TDS739	9.89	11.76	+06 2838	2010.389	230.5	1.945	2.4	ly-b		
14078+2443	1407506+244314	A346	10.31	10.49	+25 2732	2010.375	311.4	0.970	0.5	dv		
14092+1811	1409135+181042	COU2507	10.47	11.50	+18 2832	2010.389	136.8	1.510	1.5	ly-b		
14099+1152	1409516+115208	HDS1985	10.58	10.79	+12 2658	2010.395	289.6	0.253				
14106+0528	1410333+052820	HDS1987	9.83	12.32	+06 2844	2010.389	264.4	0.938		b		
14106+0528	1410333+052820	HDS1987	9.83	12.32	+06 2844	2010.395	267.4	0.905	2.4	ly		
14109+0424	1410557+042416	A1795	8.57	11.45	+05 2852	2010.389	183.4	1.310	3.1	ly-b		
14109+1513	1410558+151256	HDS1989 Aa,Ab	8.53	10.86	+15 2675	2010.389	354.8	0.470	2.5	ly		
14109+1513	1410558+151256	HDS1989 Aa,Ab	8.53	10.86	+15 2675	2010.395	355.3	0.427		4Q-ly b		
14110+0525	1411029+052447	TDS9122	10.48	10.51		2010.389				S-ly		
14135+1234	1413269+123426	BU224	8.94	9.35	+13 2762	2010.345	103.3	0.563	1.1	ly	0.9 -0.023	Lin1985c
14138+0859	1413506+08585	A1100	8.4	9.3	+09 2863	2010.345	174.4	0.235		2Q-ly		
14138+1720	1413492+172022	HDS1998 AB	10.11	12.74	+18 2846	2010.389	358.2	0.774	3.2	ly-b		
14146+2702	1414345+270130	COU481	11.39	13.7	+27 2350	2010.395	1.2	1.266	2.7	ly-b		
14148+1006	1414508+100603	KUI66	5.44	8.43	+10 2654	2010.375	107.9	0.988	3.5	ly		
14153+0308	1415195+030752	STF1819 AB	7.73	7.92	+03 2874	2010.375	177.7	0.882	0.4	dv	0.3 -0.012	Sca2012b
14164+2539	1416261+253909	HDS2006	9.19	12.06	+26 2546	2010.395	247.0	0.704	4.2:	ly-b		
14170+2412	1416583+241132	STF1828	10.40	10.75	+24 2712	2010.375	158.5	2.021	0.1	DV		
14179+6914	1417528+691403	A1102	9.33	8.65	+69 743	2010.314	264.2	0.488		3Q-dv	0.2 ^Q	0.026 Msn2017a
14185+0917	1418324+091727	HDS2015	9.48	11.95	+09 2875	2010.395	329.9:	0.235:		4Q-ly b		
14187+6409	1418424+640919	MLR168	10.	10.	+64 993	2010.314	91.2	0.250				
14188+5934	1418465+593419	HU1267	10.56	10.68	+60 1532	2010.314	187.2	0.756	0.2:	dv		
14189+0354	1418527+035333	STF1832 AB	9.37	9.69	+04 2848	2010.375	339.5	0.414	0.1	dv		
14220+1120	1422007+111949	TDS9173	10.28	10.41		2010.395				S		
14222+1350	1422135+135003	HDS2022	9.03	11.40	+14 2728	2010.395				NR		
14231+0729	1423055+072920	A1104	9.83	9.46	+08 2854	2010.389	245.0	0.455		S		
14235+1416	1423277+141554	TDS9182	10.43	10.52		2010.389				S		
14235+2649	1423273+264924	TDS9181	10.79	11.05		2010.395				S		
14236+2009	1423383+200837	COU184	10.84	10.85	+20 2973	2010.389	111.5	0.935	0.1:	dv-b		
14244+2526	1424217+252602	TDS9191	10.69	11.06		2010.395				S		
14267+1625	1426438+162451	A2069	8.78	9.36	+17 2737	2010.345	153.2:	0.144:			-3.9	0.013 Sca2001g
14277+2842	1427411+284150	TDS750	9.86	11.59		2010.395				S		
14291+6917	1429046+691646	MLR170	8.8	8.8	+69 751	2010.314				NR		
14317+0150	1431440+015018	AG195	10.36	10.22	+02 2834	2010.389	337.2	1.842	0.2	dv-b		
14325+0308	1432325+030808	A2226 AB	9.81	9.70	+03 2900	2010.389	263.8	0.476	0.1	ly		
14339+5514	1433524+551409	STF1860	7.99	8.97	+55 1695	2010.314	110.7	1.036	1.3	dv		
14354+1915	1435268+191519	HU574	9.0	9.3	+19 2827	2010.345	108.5	0.181				
14375+0217	1437284+021638	A2227 A,B	6.6	10.6	+02 2844	2010.389	123.8	1.282	4.0:	ly		
14378+1418	1437443+141804	HEI67	10.28	11.42	+14 2760	2010.389	109.4	0.911	1.9	ly-b		
14380+5135	1438007+513442	STF1863	7.71	7.80	+52 1816	2010.314	60.5	0.655	0.2	dv	-0.9	0.006 Zir2013a
14401+0504	1440061+050401	A1107	8.29	9.13	+05 2903	2010.345	88.5	0.351	1.9	ly		
14417+0932	1441446+093139	STF1866	8.65	8.48	+10 2725	2010.345	204.1	0.731	0.2	ly		
14417+1206	1441409+120539	TDS757	10.32	11.36		2010.389	338.9:	1.480:	4.3:	ly ND?		
14426+1929	1442338+192848	HU575 AB	9.77	10.05	+20 3010	2010.345	156.2	0.570	0.5	ly	0.0 -0.015	Sod1999
14428+0635	1442476+063526	A1109 AB	7.44	9.44	+07 2830	2010.389	85.1	1.820	2.3	ly	-2.4	0.119 WSI2006b
14430+6410	1443014+641024	HDS2073	9.12	11.83	+64 1023	2010.314	240.5	0.632				
14443+5420	1444158+541931	A1624	9.14	11.73	+54 1701	2010.314	183.1	1.045		3Q-dv		
14445+1221	1444325+122106	HEI534	11.8	11.9	+12 2732	2010.389	251.2	1.476	2.2	ly-b		
14456+1229	1445367+122901	HDS2078	10.52	10.52	+13 2837	2010.389	42.8	0.577	2.4	ly-b		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
14463+0939	1446155+093850	STF1879 AB	7.79	8.45	+10 2739	2010.395	82.9	1.680	0.9	ly	-1.1 -0.037	Msn1999a
14486+0451	1448352+045220	HEI889	11.6	11.7	+05 2926	2010.395	160.7	1.743	0.9	ly		
14489+0557	1448532+055716	STF1883	7.02	8.95	+06 2946	2010.389	278.3	0.935	0.2	dv	0.0 -0.012	USN2000c
14489+0557	1448532+055716	STF1883	7.02	8.95	+06 2946	2010.389	278.3	0.935	0.2	dv	-0.5 -0.017	WSI2015
14491+0756	1449053+075628	HDS2089	8.55	11.03	+08 2923	2010.395	345.6:	0.250:		4Q-ly		
14494+6733	1449229+673303	MLR173	10.7	11.0	+68 803	2010.314	338.8	0.308				
14522+0356	1452144+035619	HEI890	9.98	11.27	+04 2930	2010.395	195.3	1.594	1.3	ly		
14531+6534	1453086+653405	MLR175	9.84	10.18	+66 876	2010.314	186.3	0.287				
14534+1542	1453233+154218	STT288	6.89	7.55	+16 2705	2010.389	161.1	1.058	0.8	ly	-0.1 -0.015	Hei1998
14548+1535	1454469+153513	HEI234	11.67	12.3	+16 2710	2010.395	319.0	1.230	1.8	ly-b		
14562+1704	1456116+170327	COU187	10.3	10.9		2010.395	225.5	1.983	2.3	ly		
15054+1338	1505226+133820	HEI378	9.64	10.76	+14 2832	2010.395	349.5	1.579	1.3	ly		
15073+1827	1507203+182631	A2385 AB	6.8	6.8	+19 2924	2010.389				S	[75.1 0.079	Egg1946b]
15092+2809	1509098+280848	A690	10.0	10.5	+28 2403	2010.395				NR-b		
15118+1013	1511454+101422	DJU3	10.9	12.7		2010.395	248.0	1.905	1.3:	dv		
15127+6008	1512406+600804	HU1159	9.45	9.92	+60 1594	2010.314	353.6	0.283	0.1	dv	1.0 -0.007	Hrt2014b
15143+1959	1514146+195910	COU27 AB	8.84	9.3	+20 3083	2010.389	93.6	1.144	2.3	ly-b		
15157+6912	1515427+691139	A1118	10.44	11.03	+69 790	2010.314	55.9	0.810	0.3	dv		
15163+1706	1516208+170715	COU2509	10.82	10.82	+17 2842	2010.395	69.1	0.733	2.3	ly		
15173+0923	1517209+092247	A1117	8.83	9.88	+09 3016	2010.345	357.6	0.987	2.2	ly		
15202+5824	1520148+582440	MLR533	10.7	11.0		2010.314	320.0:	0.325:				
15206+1523	1520392+152250	HU1160	9.59	9.72	+15 2847	2010.395	115.2:	0.307:			-2.1 0.042	Hrt2009
15210+2104	1520596+210405	HU146	9.53	9.70	+21 2759	2010.345	123.9	0.701	2.1	ly	-0.6 -0.002	Zir2015a
15223+2455	1522191+245441	COU309	10.0	11.3		2010.395	340.8	1.760	2.5	ly-b		
15259+6032	1525562+603147	MLR346	10.	10.	+61 1505	2010.314				NR		
15262+1418	1526094+141642	HEI236	11.1	11.3	+14 2874	2010.395	105.4	0.242	1.3	ly		
15273+0942	1527180+094201	A1120	8.5	9.1	+10 2854	2010.395	330.2	0.295		4Q-ly	0.9 0.019	Msn2014b
15282+0251	1528129+025121	A2175	8.78	9.09	+03 3034	2010.395	206.9	0.208		3Q-ly	-0.7 -0.043	USN2006b
15370+6426	1537003+642623	HU1168	9.48	9.73	+64 1081	2010.314	114.9	0.528	0.3	dv	-0.6 ^Q 0.031	Doc2009g
15390+2545	1539026+254447	COU612	9.15	9.04	+26 2712	2010.395	354.9	0.302		4Q-ly	-0.3 ^Q 0.012	Doc2011h
15405+1840	1540284+184017	A2076	8.28	8.44	+19 3000	2010.545	4.5	0.720		ly	-0.3 ^Q -0.004	Zir2014a
15413+5959	1541166+595915	STF1969	9.14	9.50	+60 1629	2010.314	27.5	0.986	1.1	ly	-0.8 0.002	RAO2015
15424+6113	1542247+611304	MLR48	9.7	9.9	+61 1531	2010.314	102.3	0.297				
15442+5213	1544105+521233	TDS9608	10.78	11.25		2010.314	86.8	0.951	0.4	dv		
15447+1716	1544421+171753	CHR49	6.1		+17 2906	2010.545				S		
15456+1640	1545357+164038	COU2511	10.6	10.6	+17 2909	2010.395	3.6	0.173		1Q-ly		
15457+5040	1545407+504020	HU657	10.25	10.95	+51 2028	2010.314	179.7	0.434	0.3	dv	-0.1 0.000	Doc2012k
15458+2637	1545512+263607	COU615	10.5	10.5		2010.395	126.5	1.024	0.5:	dv-b		
15465+1957	1546324+195714	COU66	10.94	11.20		2010.545	96.6	0.556	0.8	ly	-0.7 -0.016	FMR1013e
15474+5929	1547260+592908	A1127	8.54	8.98	+59 1678	2010.314	291.0	0.330		4Q-dv		
15493+6032	1549157+603138	HU912	8.60	9.01	+60 1637	2010.314	132.1	0.325			0.1 0.005	Hei1996c
15536+5904	1553380+590402	MLR534	9.9	9.9		2010.314	354.0	0.259				
15540+1936	1554002+193549	COU67	10.99	11.07	+20 3164	2010.395	36.8	1.591	0.2:	dv		
15595+2555	1559302+255513	JEF2	10.39		+26 2765	2010.395	104.0:	0.655:	3.5:	ly		
16003+1140	1600162+114012	STF1992 AB,C	9.46	9.72	+12 2930	2010.395	325.7	5.810		b		
16003+1140	1600162+114012	STF1992 AB,C	9.46	9.72	+12 2930	2010.395	325.8	5.790	0.7			
16009+1316	1600541+131618	STT303 AB	7.69	8.06	+13 3047	2010.548	172.1	1.541	0.5	ly	-0.8 -0.019	Zir2015a
16019+2458	1601520+245825	COU411	10.61	11.43	+25 3015	2010.395	277.1	1.387	1.5	ly		
16038+1406	1603492+140629	HDS2265	9.34	12.23	+14 2988	2010.395				NR	[359.6 0.475	Tok2018e]
16048+2028	1604498+202745	COU194	9.6	13.5	+20 3201	2010.395	119.8	1.574	4.0	ly-b		
16064+1830	1606226+183006	COU195	10.33	12.92	+18 3119	2010.395	261.4	1.567	3.3	ly-b		
16079+1425	1607551+142522	A1798	8.88	10.20	+14 2999	2010.548	351.1:	0.103:		4Q-ly	7.4 -0.054	USN2002
16115+0943	1611297+094243	FIN354	7.19	7.52	+10 2971	2010.395				NR	[82.9 0.112	Doc2013b]
16162+6126	1616126+612614	MLR49	10.1	10.1	+61 1578	2010.314	82.1:	0.360:				
16186+1247	1618343+124710	HEI241	9.95	10.43	+13 3114	2010.548	58.1	0.742	2.6	ly		
16192+5736	1619142+573556	A1137	9.16	9.76	+57 1668	2010.314	201.5	0.558		3Q-dv		
16199+2341	1619525+234056	COU108	9.89	12.24	+24 2993	2010.548	253.1	0.648	2.9	ly		
16268+1203	1626468+120320	A1859	9.1	9.1	+12 3016	2010.548	222.1	0.201		3Q-ly		
16279+2559	1627546+255903	STF2049	7.33	8.10	+26 2845	2010.551	194.2	1.114	1.0	ly		
16280+2632	1627573+263223	BÜ813	9.39	9.59	+26 2846	2010.551	176.1	1.149	0.9	ly		
16416+2655	1641367+265501	CHR57	5.93		+27 2668	2010.551				S		
16468+0821	1646462+082231	A2784 AB	9.8	11.0	+08 3275	2010.551	164.8	0.335			0.2 -0.057	Sca2017d
16511+0924	1651074+092416	STF2106	7.07	8.20	+09 3287	2010.551	172.8	0.724	1.2	ly	0.6 -0.038	Sca2001g
16518+3151	1651506+315036	BÜ821	9.83	10.48	+32 2799	2010.551	322.3	1.258	1.4	ly		
16578+4344	1657473+434351	A1872	9.59	10.68	+43 2669	2010.570	116.0	1.052	1.7	ly-b		
16580+3101	1657584+310030	HDS2400	9.07	11.92	+31 2936	2010.551	84.8	1.262	3.8	ly		
16594+1419	1659244+141835	STT321	9.03	8.92	+14 3163	2010.551	13.5	0.567	0.6	ly		
16595+0942	1659295+094212	BÜ1298 AB	8.25	9.56	+09 3303	2010.551	131.6	0.424	0.4	ly		
17066+0039	1706361+003907	BÜ823 AB	8.73	9.81	+00 3633	2010.551	164.2	0.979	1.4	ly	-2.4 -0.015	Hrt2000c
17080+3556	1708020+355606	HU1176 AB	6.1	6.1	+36 2827	2010.570	295.9:	0.154:		4Q-ly	2.6 ^Q 0.017	Mut2010b
17083+5051	1708170+505032	CHR60 Aa,Ab	6.46		+51 2178	2010.584				S		
17088+0002	1708476+000203	A2237	9.54	10.57	+00 3641	2010.551	66.4	0.893	2.4	ly		
17096+0356	1709337+035556	HEI894	8.47	9.15	+04 3342	2010.545	20.6	0.516	0.7	ly		
17122+0946	1712141+094540	HU170	8.84	10.56	+09 3339	2010.545	268.7	1.805	2.2			
17130+0745	1712593+074457	STT325	7.15	8.94	+07 3321	2010.545	285.9	0.345	1.8	ly	-1.8 -0.002	FMR2012h
17173+2113	1717158+211244	HU668	8.9	15.4	+21 3084	2010.545	37.5	0.657	3.4	ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
17184+3240	1718222+323938	BU628	9.48	9.56	+32 2888	2010.551	265.9	0.544	1.3	ly	-0.4 0.005	FMR2012a
17184+6553	1718240+655301	MLR65	10.3	13.	+66 1011	2010.584	260.2	0.424	2.0	ly		
17215+2845	1721312+284529	KUI80 AB	6.58	9.57	+28 2728	2010.545	169.3	0.608	2.4	ly		
17221+2310	1722045+230940	COU415	8.75	9.83	+23 3092	2010.545	253.3	0.288	2.0	ly	4.0 0.038	Msn2011c
17222+2605	1722098+260512	HO414 AB	9.43	9.74	+26 3009	2010.551	102.4	0.764	0.9	ly		
17229+1628	1722527+162740	J1248 AB	9.0	9.0	+16 3167	2010.551				S		
17229+1628	1722527+162740	STF2157 AB,C	8.92	10.17	+16 3167	2010.551	208.0	3.267	2.0	ly		
17249+4701	1724552+470118	A2089	9.95	10.11	+47 2476	2010.570	149.4	0.701	0.2	ly		
17251+5312	1725048+531115	MLR604	10.99	11.18	+53 1944	2010.584	94.6	0.857	0.2	ly		
17268+2625	1726499+262516	COU1455	9.3	9.3	+26 3018	2010.545	179.0	0.282	<0.1	ly		
17280+2740	1728029+274009	HDS2467	8.17	11.01	+27 2819	2010.551	148.8	0.912	3.9	ly		
17293+0811	1729187+081103	HU176	9.6	9.8	+08 3425	2010.545	151.9	0.298	0.9	ly		
17293+2924	1729202+292333	A351 AB	9.70	9.95	+29 3029	2010.551	215.4	0.209			2.1 ^Q 0.003	Sod1999
17313+1901	1731174+190102	COU499	8.7	8.7	+19 3336	2010.545	350.8:	0.141:			-6.2 0.041	Tok2017c
17327+5924	1732473+592357	MLR355	10.52	11.00	+59 1826	2010.584	210.1	0.656	1.8	ly		
17335+5734	1733316+573331	MLR571	7.23	6.87	+57 1780	2010.584				NR	[167.8 0.079	Grf2013d]
17337+4942	1733438+494217	HU1282	9.9	10.9	+49 2661	2010.570	139.4	0.563		2Q-ly		
17344+4913	1734229+491251	HU923	9.49	9.90	+49 2662	2010.570	105.2	1.015	1.3	ly		
17354+1322	1735267+132142	A1879	8.36	10.20	+13 3404	2010.545	108.3	0.505	1.8	ly		
17365+4543	1736295+454313	COU1595	8.88	10.71	+45 2566	2010.570	265.9	0.480	1.8	ly		
17366+0723	1736346+072231	A1156	9.35	8.60	+07 3413	2010.545	351.5	0.299			4.3 0.034	Doc1991b
17366+4827	1736339+482729	COU1922	7.72	9.64	+48 2541	2010.570	99.4	0.343			-1.9 0.047	Doc2008f
17371+6707	1737046+670709	STF2207	8.37	9.16	+67 1027	2010.584	111.2	0.408	0.6	ly		
17377+3658	1737441+365759	HO420	10.99	11.26	+37 2912	2009.584	106.1	1.539	0.3	2Q-dv		
17398+4619	1739478+461911	COU1780	9.0	10.0	+46 2350	2010.570	349.1:	0.156:				
17400+5747	1740105+574725	MLR572	10.62	11.01		2010.584	39.5	0.691	0.6	ly		
17403+5047	1740173+504712	COU2114	10.88	11.12	+50 2444	2010.584	184.5	0.385		3Q-ly		
17449+6628	1744556+662752	HU924	9.5	9.7	+66 1047	2010.584	35.2	0.297	0.4	ly		
17471+1742	1747080+174149	STF2215	6.02	6.89	+17 3334	2009.605	254.5	0.488	1.0	3Q-ly	2.8 0.017	Cve2006e
17482+4944	1748106+494317	COU1923	10.5	10.9	+49 2693	2010.570	280.8	0.549	2.7	ly		
17490+3704	1748582+370343	COU1145	7.82	8.32	+37 2949	2010.600				NR	[143.0 0.098	Hrt1996a]
17496+2226	1749376+222530	COU502	9.71	11.54	+22 3219	2010.600	39.7	1.962	2.3	ly		
17506+0714	1750348+071357	STT337	8.18	8.98	+07 3481	2010.551	165.4	0.535	0.9	ly	-0.7 -0.013	Doc2015f
17506+1517	1750415+151615	FOX22	10.69	11.26	+15 3286	2009.605	340.3	0.966	1.1	4Q-ly		
17508+4824	1750471+482352	BU964	8.44	11.61	+48 2584	2010.570	153.0	1.030	3.5	ly		
17520+1520	1751584+151934	STT338 AB	7.38	7.21	+15 3292	2009.605	346.2	0.818	<0.1	4Q-ly:	0.7 ^Q -0.009	Pru2012
17533+3605	1753161+360525	STF2243	9.19	9.40	+36 2966	2009.584	40.3	1.124	0.4	1Q-dv		
17536+4234	1753322+423402	COU1600	10.57	10.83	+42 2946	2009.584	252.2	0.684	1.3	3Q-ly		
17542+1108	1754142+110751	FIN381	7.0	7.2	+11 3283	2009.605	157.5:	0.136:			-11.2 0.041	Doc2013d
17543+5357	1754183+535719	A1885	10.97	10.69	+53 2000	2010.584	260.7	0.401	0.4	ly		
17567+4837	1756422+483708	STF2258	9.40	9.66	+48 2602	2009.595	222.1	2.066	0.6	3Q-ly		
17590+4811	1759001+480954	COU1925	11.2	11.9	+48 2612	2009.595	213.5	0.216		3Q-ly		
17591+3228	1759046+322826	HU1185	9.81	10.48	+32 3024	2010.570	139.7	0.411	1.4	ly	-0.2 0.040	Doc2012i
17591+3404	1759057+340405	HO75	9.05	10.48	+34 3093	2009.597	215.9	1.331	1.7	3Q-ly		
18007+1736	1800435+173531	COU810	9.83	9.84	+17 3404	2009.605	110.6:	0.154:		ref		
18007+1736	1800435+173531	COU810	9.83	9.84	+17 3404	2009.605	101.9	0.147				
18007+1736	1800435+173531	COU810	9.83	9.84	+17 3404	2009.605	107.7	0.165				
18041+5053	1804070+505148	COU2391	12.8	14.8	+50 2516	2010.584	105.9	1.745	1.7	ly		
18043+4206	1804169+420545	COU1786	8.33	9.11	+42 2995	2010.570				NR	[339.8 0.159	Hrt2009]
18047+4650	1804409+465009	COU2115	10.2	13.0	+46 2420	2010.570				NR-ly		
18049+3015	1804515+301511	TDT 667	10.35	13.06		2009.627				S		
18054+5155	1805250+515509	COU2513	10.97	11.36		2010.584	56.7	0.913	1.1	ly		
18054+6216	1805213+621558	HU1290	9.29	9.73	+62 1595	2010.581	306.4	0.278		4Q-ly	-13.2 -0.016	Pop2000a
18058+2127	1805497+212645	STT341 AB	7.39	8.82	+21 3302	2009.597	92.3	0.488	0.5	2Q-ly	0.5 -0.002	Hei1982b
18061+5116	1806078+511654	COU2514	10.7	10.7	+51 2309	2010.584				NR		
18063+3824	1806163+382401	HU1186	9.12	9.34	+38 3077	2009.627	120.3	0.254			-2.0 0.070	USN2006b
18066+5001	1806372+500038	COU2276 Aa,Ab	9.77	10.00	+49 2730	2010.581	3.4	0.272	1.1	ly		
18067+1359	1806445+135926	AG358 AB	10.44	10.48		2009.605	329.8	3.578	1.3	4Q-ly		
18067+1359	1806445+135926	COU8 BC	10.48	10.7		2009.605	120.8	0.902	0.4	2Q-ly		
18092+3129	1809099+312910	COU812	10.77	10.85	+31 3186	2009.597	262.7	0.644	1.0	3Q-ly	-17.2 -0.030	Cou1999b
18095+3113	1809317+311241	TDS908	10.93	12.37	+31 3189	2009.627				S		
18097+5024	1809406+502407	HU674	7.68	8.63	+50 2531	2010.581	215.4	0.747	0.9	ly	-0.8 -0.003	Msn2017e
18101+6007	1810068+600637	MLR5	8.8	9.6	+60 1812	2010.584				S		
18103+1817	1810199+181633	HU316	10.03	11.02	+18 3578	2009.605	158.1	1.708	1.2	ly		
18104+5104	1810244+510439	COU2392	10.98	11.77	+51 2324	2010.584	145.5	0.626	1.0	ly		
18112+3906	1811130+390602	HDS2565	7.09	10.38	+39 3343	2009.584	340.2	0.628		4Q-ly		
18113+6022	1811244+602226	MLR501	10.9	11.1		2010.584				NR		
18116+5854	1811349+585405	MLR356	10.53	11.39	+58 1796	2010.584	149.0	1.402	1.2	ly		
18117+4758	1811389+475744	COU2116	11.16	13.0	+47 2597	2009.595	302.9	1.374	2.4	4Q-ly		
18118+3327	1811451+332649	HO82 AB,C	6.08	8.99	+33 3044	2009.597	221.7	0.708	1.9	3Q-ly		
18118+3327	1811451+332649	HO82 AB	6.0	6.0	+33 3044	2009.597				NR	[243.5 0.104	Hrt1989]
18119+4733	1811517+473241	COU2117	11.6	11.6	+47 2598	2009.595	295.2	0.423	0.5	4Q-ly		
18126+1224	1812356+122336	HDS2570	8.04	8.88	+12 3422	2009.605	162.3:	0.104:		ref	(to obs. later)	
18126+4123	1812388+412307	STF2298 AB	8.76	9.94	+41 3010	2009.595	175.8	1.851	1.4	2Q-ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
18127+5446	1812409+544606	MLR585	10.32	10.10	+54 1956	2010.584	335.4	0.442	1.2	ly		
18133+5242	1813160+524212	A1376	10.1	10.1	+52 2166	2010.584	24.4	0.344	0.1	ly		
18134+1643	1813233+164057	HEI170	10.9	11.0	+16 3407	2009.605	136.5	0.379		ref		
18134+1643	1813233+164057	HEI170	10.0	10.1	+16 3407	2009.605	135.4	0.345	0.2	2Q-ly		
18140+3223	1814010+322259	TDT 752	10.63	12.31		2009.627				S		
18144+3602	1814250+360216	HU1188	10.3	15.8	+35 3192	2009.627	119.2	1.864	3.0	2Q-ly		
18145+4737	1814304+473654	COU2119	10.0	12.6	+47 2601	2009.595	275.5	1.234	2.3	4Q-ly		
18149+0859	1814533+085843	HU196	9.4	9.6	+08 3621	2009.655	181.2:	0.147:			(to obs. later)	
18153+6012	1815194+601150	MLR6	10.2	12.6	+60 1817	2010.581				NR!		
18154+1001	1815225+100047	HEI800	10.9	10.9	+09 3626	2009.605	266.1	0.356	<0.1	3Q-ly		
18167+3623	1816417+362235	COU1304	9.3	10.6	+36 3078	2009.584	82.5	0.929	2.3	1Q-ly		
18170+1204	1816595+120403	HDS2582	7.88	8.40	+12 3446	2009.605	120.4:	0.154:				
18172+3703	1817145+370253	COU1305	10.55	12.48	+36 3080	2009.627	186.6	1.854	1.8	3Q-ly		
18178+4351	1817495+435032	A578 AB	9.13	12.24	+43 2938	2009.584	167.8	1.779	0.0	2Q-dv		
18178+4351	1817495+435032	A578 AB	9.13	12.24	+43 2938	2010.600	167.1	1.831	2.7	ly		
18178+4351	1817495+435032	A578 Aa,Ab	9.55	10.64	+43 2938	2009.584	248.3	0.288	0.4	3Q-dv	12.0 0.058	Ole2001
18178+4351	1817495+435032	A578 Aa,Ab	9.55	10.64	+43 2938	2010.600	248.7	0.334	1.1	ly	15.6 0.107	Ole2001
18182+5337	1818135+533657	MLR586	10.10	10.16	+53 2065	2010.581	200.5	0.590	1.0	ly		
18184+0358	1818258+035805	BAR45 AB	10.24	11.08	+03 3665	2009.655	257.5	1.092	1.4	3Q-ly		
18185+2749	1818283+274906	COU1008	10.37	11.39	+27 2996	2010.600	91.9	2.036	1.3	ly-b		
18208+3639	1820473+363840	COU1306	9.8	12.0	+36 3098	2009.584	38.7	0.424	1.3	1Q-ly		
18217+5740	1821435+574012	MLR536	10.30	10.76	+57 1866	2010.581	196.1	0.831	2.1	ly		
18218+2130	1821484+213028	BU641	7.03	8.66	+21 3400	2009.597	342.1	0.794	1.2	4Q-ly		
18220+1439	1822023+143927	HDS2598	8.33	11.85	+14 3499	2009.605	213.7	0.577	2.2	3Q-ly		
18224+0957	1822242+095659	HU238	9.34	9.65	+09 3680	2009.655	162.6	0.900	0.8	2Q-ly		
18224+4545	1822244+454437	A700	10.36	10.45	+45 2702	2009.595	127.8	0.601	0.3	2Q-dv	-11.3 0.410	Hei1998
18226+6347	1822369+634642	MLR55	10.91	10.98	+63 1423	2010.584	22.6	0.982	0.8	ly		
18230+3007	1822599+300718	HDS2599	9.00	11.13	+30 3190	2009.597	11.4	0.347	1.4	1Q-ly		
18231+4439	1823069+443919	COU1927	10.52	12.48	+44 2886	2009.584	26.5	1.075	1.5	1Q-ly		
18232+1044	1823132+104351	ARU 14	9.8		+10 3492	2009.605				NR		
18241+4054	1824053+405414	COU1603	9.5	10.1	+40 3360	2009.584	81.1	0.316	0.8	1Q-ly		
18241+4054	1824053+405414	COU1603	9.5	10.1	+40 3360	2009.595	80.4	0.316	0.8	1Q-ly		
18252+5659	1825117+565908	MLR537	9.60	9.75	+56 2095	2010.581	56.8	0.566	2.2	ly		
18253+2605	1825194+260446	STF2317 BC	12.5	12.7		2009.597	322.5	1.410	1.3	4Q-ly		
18253+4846	1825182+484542	HU66 AB	8.44	8.94	+48 2692	2009.595	219.2	0.187		ly	0.8 0.005	USN2002
18253+4846	1825182+484542	STT351 AC	7.90	8.25	+48 2692	2009.595	25.6	0.749	0.2	1Q-ly		
18261+0047	1826033+004649	BU1203	7.11	8.73	+00 3931	2009.655	155.4	0.476	>1	2Q-dv		
18264+4326	1826259+432601	HDS2606	9.77	13.14	+43 2976	2009.627	50.0	1.065	3.4	ly		
18268+4822	1826503+482150	COU2277	9.9	10.2	+48 2694	2009.595	320.1:	0.244:		2Q-ly:		
18287+6506	1828429+650614	HU931 AB	10.49	10.52	+65 1273	2010.584	262.2	0.477	0.2	ly		
18290+3029	1828597+302830	TDT 901	10.84	10.94		2009.597	223.7	0.562	0.2	3Q-ly		
18295+3259	1829316+325842	TDS925	10.11	11.38		2009.627	271.6:	1.775:				
18297+4400	1829444+435943	COU1789	11.4	11.4	+43 2990	2009.595	274.8	0.369	0.1	4Q-ly		
18298+3803	1829490+380310	HU1189	9.69	14.8	+37 3139	2009.627				S i-ly		
18300+1734	1829589+173347	TDT 914	10.64	10.86		2009.605				S		
18301+5805	1830031+580617	MLR357	11.2	11.4	+58 1820	2010.584	204.1	0.592	0.8	ly		
18304+1348	1830255+134735	HU583	10.26	10.48	+13 3662	2009.605	307.7	0.735	0.8	4Q-ly		
18309+3417	1830540+341630	COU1150 Aa,Ab	9.8	10.1	+34 3222	2009.597	282.1	0.243	0.5	4Q-ly		
18316+2030	1831356+203033	COU119	11.4	11.8		2009.597	228.9	0.677	1.3	3Q-ly		
18320+0647	1832017+064649	STT354	7.84	8.91	+06 3829	2009.655	211.7	0.571	1.0	3Q-ly	1.1 -0.022	Zir2013a
18335+6929	1833304+692914	MLR95	10.4	10.4	+69 992	2010.584				S		
18338+1400	1833456+135940	HEI395	9.93	10.05	+13 3685	2009.605	271.0	0.414	0.1	4Q-ly		
18338+1744	1833456+174355	STF2339 AB,CD	7.45	8.67	+17 3627	2009.605	277.4	1.577	1.6	4Q-ly		
18338+1744	1833456+174355	WAK 21 CD	9.30	9.56	+17 3627	2009.605	263.1	0.456	0.5	3Q-ly		
18338+1744	1833456+174355	HU322 AB	7.74	8.91	+17 3627	2009.605				S		
18339+5221	1833566+522112	A1377 AB	6.20	6.40	+52 2238	2010.581	127.5	0.280	0.2	ly	-4.9 0.037	Mut2010e
18339+7016	1833558+701622	MLR97	10.0	10.4	+70 1007	2010.641	117.9	0.205				
18347+5828	1834446+582753	MLR358	10.97	12.25		2010.584	161.6	1.424				
18351+0003	1835082+000234	RST5120	8.77	8.89	-00 3513	2009.655	22.6	0.248	0.1	1Q-dv		
18352+3427	1835135+342728	CHR75	6.12	9.47	+34 3245	2009.597				NR		
18363+2143	1836165+214307	COU206	9.6	9.9	+21 3492	2009.597				S	[275.6 0.049	Doc2013f]
18382+1426	1838129+142629	HU675	10.48	10.29	+14 3601	2009.605	52.1	0.267				
18384+0850	1838211+085002	HU198	8.5	8.6	+08 3780	2009.655	129.0	0.492	0.9	2Q-ly	-1.0 0.033	Nov2007d
18384+6708	1838238+670733	STF2384 AB	8.31	8.95	+67 1087	2010.581				NR		
18396+4056	1839330+405606	COU1607	6.47	7.99	+40 3446	2009.584				S		
18396+4056	1839330+405606	COU1607	6.47	7.99	+40 3446	2009.595				NR		
18402+6326	1840226+632748	MLR44	10.36	10.21	+63 1447	2010.581	116.1	0.392	1.5	ly		
18405+4906	1840300+490532	COU2394	10.0	11.3		2009.595	215.2	0.638	1.5	3Q-ly		
18411+4416	1841034+441616	HDS2647	7.58	9.41	+44 2963	2009.627	279.1:	0.143:		4Q-dv		
18412+2622	1841133+262111	COU642	12.0	12.6		2010.600	319.9	2.305	2.2	ly		
18413+3018	1841163+301740	STF2367 AB	7.70	8.03	+30 3271	2010.570				NR!	[74.4 0.401	Pbx2000b]
18421+2857	1842048+285729	HDS2648	9.46	9.65	+28 3059	2009.597	193.8:	0.319:	3.6	ly		
18436+0444	1843349+044406	A357	9.54	9.68	+04 3852	2009.655	70.0	0.558	0.3	1Q-ly		
18437+3141	1843435+314054	A253	9.71	10.29	+31 3347	2010.570	129.5	0.749	0.9	ly	-3.2 0.056	Baz1987d
18439-0013	1843535-001327	A859	8.60	9.13	-00 3540	2009.655	9.5	0.268				

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
18449+2234	1844567+223344	HDS2655	7.78	10.08	+22 3472	2009.597	200.2	0.310	1.1:	3Q-ly		
18450+7621	1844591+762110	MLR216 Aa,Ab	9.9	10.1	+76 704	2010.641	35.2	0.436	0.6:	ly		
18462+4408	1846122+440808	HDS2662 AB	8.19	11.28	+43 3066	2009.595	258.0	0.750	2.0	3Q-ly		
18466+5142	1846333+514142	HU756	9.77	11.10	+51 2424	2010.581	262.2	1.011	2.4	ly		
18473+3302	1847161+330229	TDS945	10.92	11.76		2009.627	319.8	1.503	1.4	4Q-ly		
18475+1537	1847286+153659	HU584 Aa,Ab	10.03	10.02	+15 3566	2009.605				S!		
18475+4926	1847295+492555	BU971 AB	7.37	10.16	+49 2871	2009.595	216.6	0.448	2.9	3Q-ly		
18477+0916	1847445+091547	HU252	9.2	9.7	+09 3873	2009.647	116.7	0.604		2Q-ly		
18477+4904	1847401+490429	HEI72	6.84	8.99	+48 2767	2010.674	235.6	0.614		ly-b		
18499+5516	1849539+551559	MLR574	10.59	10.83		2010.581	52.9	1.063	0.3	ly		
18507+3920	1850400+392024	HDS2672	8.07	8.29	+39 3551	2009.627				S		
18517+4323	1851443+432329	BU421 AB	9.80	9.89	+43 3104	2009.627	296.7	1.172	0.3	4Q-dv		
18521+2431	1852077+243058	COU510	8.9	8.9	+24 3555	2009.597	176.1:	0.180:		2Q-ly		
18526+4901	1852369+490122	A1384	10.80	10.86	+48 2784	2009.595	60.9	0.674	0.6	1Q-ly		
18527+5135	1852443+513531	COU2517	10.0	10.3		2010.570				b-NR		
18542+1304	1854102+130339	HDS2679	8.67	11.79	+12 3711	2009.605	317.3	0.462	2.2	2Q-ly!	(to obs. later)	
18548+4852	1854471+485134	BU1255 AB	5.80	12.6	+48 2793	2010.600	11.8:	0.708:	4.5	ly		
18549+0830	1854550+083008	HU259	9.8	10.0	+08 3896	2009.647				NR		
18549+0830	1854550+083008	HU259	9.8	10.0	+08 3896	2009.655	2.9:	0.155:				
18550+3053	1854599+305245	A258	8.86	9.88	+30 3345	2010.570	240.3	0.389	1.0	ly	-1.2 -0.007 Hrt2013c	
18551+3611	1855046+361108	TDT1125	10.93	11.05		2009.627	325.8:	0.419:			(faint)	
18555+4713	1855279+471342	COU2121	10.0	13.8	+47 2717	2009.595	336.2	1.157	2.5	4Q-ly		
18558+0327	1855486+032659	A2192	7.73	8.00	+03 3836	2009.655	15.8:	0.141:			0.1 0.002 Doc1988c	
18560+4414	1855571+441341	STT365 AB,C	7.2	8.3	+44 3017	2009.584	258.2	2.589	3.5	3Q-ly	(AB is S)	
18565+1020	1856278+102011	HEI565	10.86	11.21	+10 3737	2009.605	96.9	0.863	0.5	2Q-ly		
18570+3254	1857014+325405	BU648 AB	5.34	7.96	+32 3267	2010.570	254.7	1.075	2.6	ly	25.0 -0.19 Mut2010e	
18571+3451	1857075+345120	HDS2685	7.80	9.78	+34 3368	2009.597	198.1	0.490	1.6	3Q-ly	(rings)	
18572+2522	1857123+252234	COU512 AB	10.5	11.0		2010.600	190.0	1.685	2.0	ly		
18574+2129	1857261+212849	HU329	9.5	10.0	+21 3619	2009.597				NR		
18575+5814	1857284+581329	STF2438	7.01	7.44	+58 1849	2010.581	358.0	0.871	0.5	ly	-1.3 0.010 Jte2018	
18579+3020	1857528+301945	COU1017	10.8	12.4		2009.627	184.9	1.801	2.0	3Q-ly		
18579+4214	1857563+421508	COU1795	10.55	12.13	+42 3205	2009.595	305.0	0.430	1.0	4Q-ly		
18580+4407	1857559+440700	A587 BC	10.61	11.54	+43 3125	2009.627	188.6	1.803	0.9	3Q-ly		
18583+4423	1858157+442316	A702	10.1	10.3	+44 3027	2009.595	320.4	0.368	0.0	4Q-dv:		
18585+4215	1858283+421433	COU1797	10.14	11.83	+42 3207	2009.584	175.5	1.237	>1.0	2Q-dv		
18586+0237	1858358+023632	A2194	9.0	12.1	+02 3744	2009.655	326.3	1.407	3.3	4Q-ly		
18586+5210	1858322+521042	MLR638	9.0	9.6	+51 2471	2010.581	133.1	0.311	1.6	ly		
18597+2949	1859444+294844	COU1019	9.5	10.2	+29 3432	2009.597	352.3	0.326	0.8	4Q-ly		
19000+4100	1859596+410054	COU1798	11.5	11.8	+40 3552	2009.595	347.1	0.654	0.3	4Q-ly		
19005+1445	1900277+144454	HEI265	10.9	11.0	+14 3742	2009.605	224.7	0.320	0.2:	3Q-ly		
19006+3951	1900342+395041	COU1933	7.98	9.96	+39 3606	2009.584	198.4	0.539	>1.0	3Q-dv		
19011+3735	1901057+373512	TDT1181	10.85	12.23		2009.627	68.7	1.121	2.1	1Q-ly		
19022+0845	1902080+084533	HDS2698 Ba,Bb	9.60	10.93	+08 3949	2009.647				NR		
19023+1022	1902150+102009	OL90	11.0	11.7		2009.605	82.0	1.223	1.8	1Q-ly		
19023+3328	1902174+332721	COU1312	10.6	10.6	+33 3299	2010.570	36.5:	0.251:	0.3:	ly		
19023+3328	1902174+332721	COU1312	10.6	10.6	+33 3299	2010.600	233.5	0.252	0.2	ly		
19024+6927	1902226+692630	STF2478	9.43	9.52	+69 1022	2009.633	315.5	0.951	0.3	4Q-ly	(3 peaks in ly)	
19029+4930	1902513+492926	COU2626	10.0	12.4	+49 2921	2009.595	266.9	0.888	2.1	3Q-ly		
19030+5135	1902580+513521	STF2451	9.29	9.47	+51 2488	2009.630	83.4	1.955	0.6	1Q-ly		
19034+0718	1903234+071806	A360	10.21	10.26	+07 3944	2009.647	287.5	0.674	0.7	4Q-dv		
19035+0818	1903318+081737	HDS2700	7.90	9.29	+08 3956	2009.647				NR	[158.3 0.267 Hor2015]	
19042+3859	1904113+385847	COU1935	10.60	11.05	+38 3421	2009.627	42.1	1.139	0.6	1Q-dv		
19045+6248	1904326+624735	MLR8	9.5	12.	+62 1678	2009.633	16.4	0.632	3.9	1Q-ly		
19055+3352	1905308+335221	HU940	9.18	9.78	+33 3318	2009.627	194.2	0.464	1.5:	3Q-dv	3.0 -0.016 Hei2001	
19057+2717	1905391+271706	HO95	8.61	9.14	+27 3241	2010.696	147.4	0.227		2Q-ly		
19058+5918	1905500+591731	MLR217	8.5	8.5	+59 1947	2010.581				S		
19069+4137	1906562+413719	COU2197	9.1	9.1	+41 3236	2009.584	334.3	0.210			4.6 0.014 Doc2016g	
19069+4137	1906562+413719	COU2197	9.1	9.1	+41 3236	2010.570	338.6	0.240			15.9 0.051 Doc2016g	
19071+7204	1907063+720426	STT369	7.82	7.91	+71 932	2010.641	10.2	0.705	0.5	ly		
19073+2432	1907183+243133	A262	9.27	9.72	+24 3643	2009.597	272.5:	0.145:			4.4 ^Q -0.049 Zir2012b	
19074+0811	1907253+081059	A361	9.8	10.0	+07 3971	2009.647	247.9	0.290	0.1	3Q-dv		
19074+3601	1907248+360043	COU1615	10.5	10.5	+35 3486	2009.584	115.3	0.529				
19078+3040	1907460+304021	STF2465	9.04	10.43	+30 3427	2010.696	248.8	1.259	1.7	ly+i		
19079+4652	1907530+465205	A704	10.35	10.48	+46 2629	2009.595	280.7	1.119	0.1	4Q-dv		
19079+7252	1907532+725224	A1174	9.54	10.35	+72 878	2010.641	71.2	0.963	1.0	ly		
19083+2706	1908161+270539	HO98 AB	8.28	8.30	+26 3458	2010.600	242.1	0.202	0.2	ly	-2.4 0.002 Lin2012a	
19083+5520	1908202+551950	D19 AB	7.67	9.51	+55 2152	2009.630	348.4	0.503			1.9 -0.029 Hrt2013c	
19083+5520	1908202+551950	D19 AB	7.67	9.51	+55 2152	2009.630	349.1	0.503	1.9	ly	2.6 -0.029 Hrt2013c	
19087+5630	1908392+562943	MLR577	10.97	11.15		2009.630	276.2:	1.106:			(S in ly !)	
19089+3404	1908539+340343	COU1462	10.22	10.36	+33 3339	2009.597	194.1	0.155		3Q-ly	-7.3 -0.015 Doc2003e	
19094+1014	1909220+101428	CHR 140	7.10		+10 3801	2009.605				S		
19101+3252	1910053+325209	COU1313 AB	8.7	13.3	+32 3339	2010.696	247.8	1.850	4.2	ly+i		
19111+3847	1911080+384652	SE2 BC	8.65	9.40		2010.570				s		
19111+3847	1911080+384652	STF2481 A,B,C	8.39	8.31	+38 3466	2010.570	200.0	4.659	1.9	ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
19112+6952	1911109+695200	MLR92	9.6	9.6	+69 1035	2009.633	30.0	0.368	2.7	1Q-ly	(elongated central peak)	
19113+3732	1911178+373058	COU1800	10.0	13.0	+37 3366	2010.600	45.7	1.351	2.1	ly		
19114+0759	1911257+075841	HDS2718	8.65	9.23	+07 3988	2009.647				NR		
19122+3215	1912148+321509	HU941	7.45	11.01	+32 3354	2010.649	147.4	1.095	3.5	ly		
19123+2113	1912186+211329	COU320	8.92	9.19	+20 4076	2010.600	109.7	0.243	0.2	ly		
19126+1651	1912344+165047	BU139 AB	7.11	7.95	+16 3775	2009.605	136.9	0.626	0.7	2Q-ly	0.6 0.009 Zir2013a	
19129+3510	1912527+351012	HU942	9.30	11.55	+34 3461	2010.649	278.7	1.715	2.9	ly		
19131+2154	1913079+215427	A153	8.67	11.06	+21 3695	2009.597	267.8	0.709	1.7	3Q-ly		
19132+3420	1913116+341932	COU1616	11.6	11.6	+34 3464	2009.597				S	[:135.9 :0.329 Gii2012]	
19133+6647	1913154+664728	MLR98	10.0	10.4	+66 1176	2009.633	286.3	0.479	0.2	4Q-ly	(3 peaks in ly)	
19143+6230	1914198+622956	MLR10	10.52	10.85	+62 1699	2009.633	332.5	0.481	1.6	4Q-ly		
19164+7931	1916259+793051	MLR219	10.21	10.08	+79 625	2010.641	23.3	0.415	1.0	ly		
19165+5003	1916288+500241	COU2627	11.0	11.0	+49 2970	2010.581				NR (1Q:)	[21.2 0.237 Gii2012]	
19170+6808	1917012+680755	MLR88	10.38	10.34	+67 1137	2009.633	209.7	0.649	1.1	3Q-ly		
19173+3715	1917155+371430	HDS2728	8.72	11.98	+36 3487	2009.584	124.1	0.732		2Q-dv		
19178+0317	1917456+031719	A2268	9.35	9.78	+03 3966	2009.655	195.2	0.577	1.3	3Q-ly		
19180+2012	1917578+201133	COU321	8.92	8.92	+19 3972	2010.696				NR		
19185+0620	1918285+062004	BU1256	9.38	9.96	+06 4084	2009.647	43.5	1.599	1.3	1Q-dv		
19186+5358	1918358+535805	A1393	8.36	9.46	+53 2223	2010.581	253.8	0.698	1.3	ly		
19188+1736	1918489+173622	HU337	9.27	10.14	+17 3924	2009.605	92.5	0.200	0.5	2Q-ly		
19194-0136	1919265-013657	HDS2734 Aa,Ab	10.97	11.37		2009.655	225.8	0.425	0.2	3Q-dv	0.5 0.013 Tok2015c	
19195+4124		COU2397	10.5	11.5		2009.584	60.3	0.440		1Q-dv:		
19195+5729	1919341+573002	MLR539	9.4	9.4	+57 1983	2010.581	188.3:	0.272:		3Q-ly	(= HD 182030)	
19199+0413	1919537+041325	A2269	9.5	10.0	+03 3976	2009.655	5.9	0.230		1Q-ly		
19208+1717	1920468+171631	COU422	10.68	11.34	+17 3932	2009.605	209.0	0.837	1.5	3Q-ly		
19208+1717	1920468+171631	COU422	10.68	11.34	+17 3932	2009.605	219.3	0.963		ref		
19214+1948	1921235+194753	HO637	9.77	11.12	+19 3987	2010.674	27.3	1.238	1.7	ly		
19222+3849	1922097+384845	COU2281	11.72	12.7		2009.627	222.2	1.832	1.5	3Q-ly		
19232+1320	1923120+132018	HEI269	9.81	10.34	+13 4003	2009.605	10.8	0.704	1.4	1Q-ly		
19233+0931	1923178+093041	A1179 BC	9.11	10.02		2009.647	191.5	0.318		3Q-dv		
19237+4038	1923418+403820	TDS987	10.14	11.73		2009.627				S		
19246+0524	1924362+052358	HDS2755	9.23	12.66	+05 4135	2009.647	350.6	0.703	3.5	4Q-ly		
19247+5924	1924418+592359	MLR220	10.68	10.92	+59 2028	2009.630	336.4	0.775	1.0	4Q-ly b		
19250+3001	1925001+300043	HDS2758	9.27	10.80	+29 3588	2009.627	240.7	0.318	>1.0	3Q-dv		
19252+0227	1925112+022726	STF2513	8.57	9.47	+02 3877	2009.655	330.3	1.944	2.4	4Q-dv		
19262+3542	1926097+354221	COU1620	9.3	12.3	+35 3616	2009.584	297.6	1.395	2.6	4Q-ly		
19264+3529	1926244+352916	TDT1460	10.80	10.80		2009.627				S		
19266+3120	1926340+311953	HDS2762	8.45	10.78	+31 3592	2010.649	211.1	0.345	2.5	ly		
19268+5903	1926489+590258	A710	8.7	12.7	+58 1914	2010.581				NR		
19275+0910	1927329+091028	A1182	9.58	9.84	+08 4105	2009.647	293.0	0.705	1.0	4Q-dv		
19294+1950	1929254+194932	J3241 AB	10.43	11.61	+19 4040	2010.649	217.1	1.315	1.4	ly+i		
19296+1224	1929358+122415	A1653	8.18	9.50	+12 3929	2009.605	143.3	0.120:	0.3:	2Q-ly		
19296+1224	1929358+122415	A1653	8.18	9.50	+12 3929	2009.605	142.5	0.140:			-4.9 -0.059 Pru2014	
19302+5639	1930126+563840	A712	7.49	7.94	+56 2250	2009.630	80.2:	0.135:			3.5 0.031 USN2006b	
19303+2255	1930172+225522	COU515	10.4	13.8	+22 3716	2009.597	287.2	1.152	2.1	4Q-ly		
19303+6207	1930154+620649	HU947	9.6	11.8	+61 1870	2009.633	169.2	0.379		2Q-dv		
19305+3222	1930273+322255	COU1465	11.96	12.6	+32 3451	2009.627	174.7	1.565	1.1	2Q-dv		
19306+2817	1930338+281651	COU1161 Aa,Ab	8.1	8.9	+27 3409	2010.600				S		
19310+3227	1931018+322710	COU1466	10.55	13.1	+32 3453	2009.627	180.2	1.809	>1.0	3Q-dv		
19311+0824	1931031+082344	A1184	8.82	9.39	+08 4123	2009.647	112.7	0.882	0.8	2Q-dv		
19311+2233	1931016+223242	COU516	9.7	9.8	+22 3723	2010.600	148.5	1.845	0.1	ly		
19312+2201	1931096+220041	A161	9.5	10.0	+21 3807	2009.597				S:		
19312+2201	1931096+220041	A161	9.5	10.0	+21 3807	2010.649	261.9:	0.175:				
19314+6712	1931213+671147	TDT1519	10.77	11.06		2009.633				S		
19316+1747	1931378+174659	STF2536	8.40	11.38	+17 3992	2009.605	116.9	1.748	2.7	2Q-ly	-4.6 0.005 Sca2001e	
19316+2659	1931363+265911	HDS2774	7.41	10.31	+26 3574	2010.649	116.4	0.531	3.4	ly		
19320+1424	1931591+142405	A1654	10.55	15.6	+14 3950	2009.605	204.5	1.658	3.0	3Q-ly		
19321+3221	1932086+322106	HU945 AB	9.75	10.39	+32 3460	2010.570	23.3	1.241	1.8	ly		
19326+1203	1932372+120237	HEI574	8.75	9.22	+11 3882	2009.605	150.2	0.401	0.5	2Q-ly		
19329+4635	1932517+463447	COU2630	10.42	11.60	+46 2717	2009.630	226.8	1.175	2.2	3Q-ly		
19330+0546	1932585+054541	A367	8.75	9.87	+05 4184	2009.647	307.6	0.990	1.2	4Q-ly		
19334+6203	1933224+620311	STF2553	8.71	9.37	+61 1877	2010.581	130.2	0.986	1.0	ly		
19344+2535	1934249+253504	A270 Aa,Ab	8.8	12.3	+25 3879	2009.597	107.2	1.397	2.6	2Q-ly		
19347+2854	1934403+285427	COU1031 AB	8.94	12.19	+28 3398	2010.674	239.6	1.831	3.6	ly		
19347+2854	1934403+285427	COU1031 AB	8.94	12.19	+28 3398	2010.696	239.6	1.815				
19347+2854	1934403+285427	GII33Aa,Ab	8.9	10.7	+28 3398	2010.674	214.3	0.313	2.5	ly		
19347+2854	1934403+285427	GII33Aa,Ab	8.9	10.7	+28 3398	2010.696	210.2	0.316				
19347+2854	1934403+285427	GII33Ac	8.94	12.19	+28 3398	2010.696	61.4	5.346	6.5	ly		
19348+2750	1934530+275016	COU1032	10.66	11.15		2010.649	266.8	1.892	1.9	ly		
19350+2328	1935017+232827	A162	8.73	8.77	+23 3699	2010.696	278.5	0.193		4Q-ly	-2.0 0.035 Mdz2017	
19351+5038	1935045+503738	HU679	8.80	9.75	+50 2819	2010.570	263.8	0.369	1.6	ly	3.3 -0.017 Ana2005	
19356+4002	1935364+400139	A1400	8.20	9.90	+39 3831	2009.584	122.1	0.220	1.0	2Q-ly	-15.6 -0.026 USN2002	
19360+1416	1935575+141611	HEI272	9.9	10.1	+13 4070	2009.605	113.6	0.649		2Q-ly		
19364+1938	1936220+193821	COU210	9.7	12.0	+19 4077	2009.605	218.7	0.605	1.8	3Q-ly		
19364+1938	1936220+193821	COU210	9.7	12.0	+19 4077	2009.605	218.3	0.622		ref		
19365+2400	1936294+240011	COU1033	9.06	9.62	+23 3711	2010.696	181.8	0.220	0.7:	ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ, ''$)	$\Delta\rho$ (O-C)
19370+1927	1936588+192736	COU211	11.0	11.4		2009.605	304.9	0.744	0.4	4Q-ly		
19370+7725	1937005+772506	MLR223	10.78	10.65	+77 738	2010.641	54.2	0.630	<0.1	ly		
19371+4013	1937088+401250	WS15 AB	7.96		+39 3844	2009.584	210.3:	0.410:			(to obs. later)	
19375+3413	1937369+341450	COU1802	9.6	13.9	+33 3526	2009.597	298.4	2.099	3.1	4Q-ly	(to obs. later)	
19378+3227	1937471+322736	COU1803	9.82	13.8	+32 3499	2009.627	137.3	0.875	5.1	ly+i		
19388+1834	1938464+183412	COU212	9.9	12.7	+18 4172	2009.605	209.9	0.838	2.5	3Q-ly		
19389+3514	1938557+351412	HU953	8.8	9.2	+34 3645	2010.570	34.5	0.313	1.3	ly	-2.1 0.024	Msn2011c
19390+3559	1938553+355806	COU1943	11.1	11.6	+35 3728	2010.696	170.5	0.325	1.1	ly		
19391+7625	1939059+762518	MLR224	8.67	9.35	+76 750	2010.641				NR		
19393+3707	1939180+370648	ES2040	11.58	12.1		2010.584	112.8	1.623	1.8	ly		
19393+5802	1939194+580228	MLR540	10.0	12.4	+57 2044	2010.581	297.6:	0.707:	3.4	ly		
19395+2003	1939289+200318	COU214	10.4	12.5		2010.649	109.1	2.151	3.3	ly	(to obs. later)	
19399+7623	1939551+762321	MLR225	10.3	11.5	+76 753	2010.641	246.2	0.323	1.1	ly		
19402+2611	1940086+261132	A272 CD	10.45	15.1		2009.597	14.5	1.308	2.4	1Q-ly		
19411+1349	1941055+134856	KUI93	6.69	6.75	+13 4098	2009.605	313.7	0.207			-1.0 0.007	Zas2017
19412+5023	1941140+502242	HDS2792	7.94	10.87	+50 2844	2009.630	259.3:	0.365:			(rings on B comp.)	
19420+4015	1941576+401514	KUI94	6.5	7.8	+39 3878	2009.584	162.9	0.432	>1.0	2Q-dv	1.2 -0.001	Sod1999
19420+4015	1941576+401514	KUI94	6.5	7.8	+39 3878	2009.595	162.3	0.429	1.0	2Q-ly	0.6 -0.004	Sod1999
19420+4015	1941576+401514	KUI94	6.5	7.8	+39 3878	2010.570	161.9	0.423	0.7	ly	0.9 -0.018	Sod1999
19421+0545	1942042+054448	HEI876	9.81	10.24	+05 4245	2009.647	146.3	0.757	0.7	2Q-dv		
19429+5501	1942493+550137	MLR579	9.8	9.8	+54 2212	2009.630	34.3	0.365	2.5	1Q-ly		
19431+3341	1943058+334053	TDT1669	10.97	12.40		2010.674				?		
19432+6431	1943104+643129	TDT1672	10.91	11.23		2009.633				S		
19432+7143	1943094+714258	TDT1671	10.31	10.36		2009.633				S		
19439+2708	1943559+270807	BU658	6.72	7.92	+26 3654	2009.597	282.4	0.370	1.1	4Q-ly		
19446+0350	1944340+034947	A2389	9.0	11.3	+03 4133	2009.655	127.1	0.446		2Q-dv		
19449+1047	1944567+104630	STF2570 AB,C	7.62	9.81	+10 4036	2009.605	277.7	4.116	2.6	4Q-ly		
19449+1047	1944567+104630	AGC10 AB	8.43	8.42	+10 4036	2009.605	140.7	0.243				
19450+1551	1945025+155030	HDS2803	8.93	12.72	+15 3924	2010.674				NR		
19452+3829	1945157+382844	COU2408 AB	10.1	14.1	+38 3745	2009.627	146.9	0.994	1.9	2Q-ly		
19452+3829	1945157+382844	GI24 AB,C	10.0	15.2	+38 3745	2009.627	141.2	3.687	5.2	ly ND		
19457+3726	1945399+372557	COU2283	10.1	10.1	+37 3597	2010.674	161.2	0.188	0.8:	ly		
19458+2710	1945455+270728	KUI95 AB	13.6	14.6		2010.584	58.0	2.049	1.2	ly	4.1 -0.131	Sod1999
19458+2710	1945455+270728	KUI95 AB	13.6	14.6		2010.600	57.0	2.049	1.8	ly-b	3.1 -0.132	Sod1999
19458+4145	1945573+414456	A601 AB	10.4	11.4	+41 3480	2009.584	156.7	1.334	1.3	2Q-dv		
19462+2917	1946101+291714	TDT1721	10.25	10.91	+28 3470	2009.597				S	(No measures in IC4: single?)	
19463+7104	1946169+710347	TDT1724	10.88	11.07		2009.633	254.4	1.292	3.5	3Q-ly	(Second obs.)	
19468+4246	1946489+424616	A602 AB	9.31	11.02	+42 3455	2009.595	357.5	1.022	2.1	4Q-ly		
19473+4325	1947171+432509	TDT1748	10.08	11.99		2010.584				S		
19476+1917	1947354+191655	HU347	8.32	11.3	+18 4242	2010.600	324.9	1.505	2.5	ly		
19478+3833	1947465+383320	A1405	9.6	10.3	+38 3761	2010.584	190.2	0.337	0.6	ly		
19480+1541	1948026+154118	HEI75	10.51	10.75	+15 3948	2009.605	33.3	0.596	1.4	1Q-ly		
19483+1624	1948155+162404	HU348 AB	9.43	13.2	+16 4007	2010.674	111.1	1.403	2.7	ly	-0.1 -0.014	Doc2008c
19487+1504	1948396+150332	A1658	8.30	8.74	+14 4048	2010.674	102.1	0.270	0.4	ly	7.1 0.050	Doc2009g
19487+5118	1948440+511733	HEI907	10.6	11.2		2009.630	179.5	1.469	1.0	2Q-ly b		
19489+0545	1948560+054454	BU829	9.08	9.75	+05 4299	2009.647	315.5	0.778	0.4	4Q-dv		
19490+1909	1948586+190831	AGC11 AB	5.64	6.04	+18 4254	2010.600	174.3	0.230	0.4	ly	1.3 0.013	Mut2010b
19490+4423	1949009+442245	A718 BC	8.2	8.7		2009.584	34.0:	0.136:				
19490+7715	1948579+771515	MLR228	9.8	10.4	+76 758	2010.641	265.8	0.295	1.0	ly	(to obs. later)	
19492+4954	1949111+495401	HDS2820	9.34	13.43	+49 3113	2010.584	60.1:	0.564:	4.9:	ly		
19493+7309	1949153+730915	TDT1776	10.62	10.85		2010.641	130.6	0.760	1.8	ly		
19494+3147	1949213+314659	COU1467	9.47	13.1	+31 3796	2009.627	185.7	1.683	2.9	3Q-ly		
19496+1241	1949368+124058	A1659	10.2	10.2	+12 4095	2009.605	155.3:	0.138:				
19496+1707	1949366+170642	HU346	9.28	9.98	+16 4019	2010.600	190.4	0.559	1.2	ly		
19496+4255	1949371+425434	HDS2822	8.50	11.73	+42 3484	2009.595	141.4	1.249	2.6	3Q-ly		
19501+3158	1950019+315757	HDS2823 Aa,Ab	10.33	13.79	+31 3800	2010.584				NR		
19503+0713	1950155+071304	A2994 BC	10.2	10.2		2009.647	200.1	0.432	<0.1	3Q-dv		
19506+3715	1950333+371510	COU2285	11.21	12.5	+36 3726	2010.600	68.5	1.487	2.4	ly		
19506+3715	1950333+371510	COU2285	11.21	12.5	+36 3726	2010.600	67.5	1.507	1.8	ly-b		
19507+4851	1950429+485106	HU684	9.4	9.4	+48 2966	2009.595				NR		
19508+3906	1950513+390616	COU2528	11.5	11.5	+38 3783	2009.584	167.7	0.586	0.1	2Q-dv		
19509+3910	1950569+391011	A1406	9.86	12.5	+38 3784	2010.584	268.7	1.243	1.3:	ly		
19509+6852	1950561+685223	HDS2826	10.26	11.43	+68 1086	2009.633	39.2:	0.401:	2.6	1Q-ly		
19513+3830	1951223+383006	COU2529	10.30	11.43	+38 3788	2010.584	205.9	1.319	1.7	ly		
19515+2332	1951287+233146	BU978	9.56	9.67	+23 3807	2009.638	58.5	1.007	0.3	1Q-dv		
19516+3932	1951359+393209	HDS2830	8.35	11.25	+39 3934	2010.649	201.2	0.637	3.6	ly		
19517+4003	1951427+400318	COU2531 AB	9.6	9.6	+39 3935	2010.674				NR		
19521+3225	1952077+322500	COU1623	10.29	12.9	+32 3606	2010.584	215.8	1.677	3.0	ly		
19528+4045	1952457+404452	A603	8.95	10.20	+40 3922	2009.595	101.0	0.702	1.0	2Q-ly		
19533+2337	1953189+233659	A168	9.5	9.6	+23 3817	2009.597				S:	(artifact at 90-270 $^\circ$ 0 $''$.5 ?)	
19535+2117	1953325+211719	HDS2834	8.44	12.18	+20 4321	2010.696	199.5	0.704	3.7	ly		
19538+2237	1953459+223634	COU825 AB	9.61	12.36	+22 3847	2009.597	34.0	1.227	2.5	1Q-ly		
19539+3257	1953537+325649	COU1626	9.98	10.35	+32 3614	2009.597	116.6:	0.125:				
19549+2513	1954560+251314	A275 AB	9.8	10.0	+24 3926	2009.597	92.0	0.187			(to obs. later)	

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
19549+4339	1954530+434323	COU2692	11.9	11.9	+43 3407	2009.595	107.0	0.599				
19550+4152	1954584+415215	HO581	8.03	8.72	+41 3535	2010.600	191.3	0.244		3Q-ly	9.7 0.044 XXX2018c	
19553+3146	1955159+314604	COU1469	8.8	9.8	+31 3841	2010.674	210.2	0.239				
19556+4723	1955349+472241	BU831	9.60	10.36	+47 2955	2009.630	128.4	0.951	1.3	ly		
19556+4723	1955349+472241	BU831	9.60	10.36	+47 2955	2009.630	128.5	0.954	1.3	2Q-ly		
19561+3845	1956063+384512	A1407	9.76	10.02	+38 3818	2010.570	146.9	0.979	1.3	ly		
19562+6618	1956090+661801	HU1307	9.66	10.14	+65 1418	2010.581	25.1	1.018	1.2	ly		
19564+3750	1956248+374957	A1408	9.33	12.3	+37 3685	2010.584	184.4	1.522	2.4	ly-b		
19568+0155	1956506+015513	A2391 AB	9.1	9.4	+01 4145	2009.655	0.8	0.265	0.2	1Q-dv		
19568+2718	1956500+271737	COU1165	10.4	12.1	+26 3737	2010.584	76.7	0.906	3.0	ly		
19569+3706	1956561+370622	COU2409	10.34	10.42	+36 3778	2010.584	321.2	1.195				
19570+4441	1956585+444059	COU2701	10.2	13.2	+44 3294	2010.570	134.8	1.225	2.8	ly-b		
19572+3502	1957133+350153	HDS2840	7.40	11.18	+34 3806	2010.649				NR		
19573+0513	1957194+051245	A604	9.06	9.85	+04 4286	2009.647				NR	[16.9 0.107 Tok2015c]	
19579+2715	1957544+271507	AC16 AB	7.81	9.17	+26 3744	2010.600	233.5	0.383	0.2	ly		
19580+0456	1958027+045608	A606	9.52	9.33	+04 4292	2009.655	157.3	0.561	0.7	2Q-ly	-0.3 0.024 Sca2018e	
19586+3711	1958364+381132	COU2410	10.06	12.4	+37 3704	2010.570	172.8	1.679	2.8	ly-b		
19594+3029	1959241+302839	COU1471	10.89	11.38	+30 3842	2009.597	171.2	0.444	0.2:	2Q-ly		
20001+3423	2000085+342301	HU1308	9.55	9.86	+33 3683	2009.597	30.2	0.443	0.2	1Q-ly		
20002+1454	2000127+145410	HDS2847 Aa,Ab	8.83	11.11	+14 4125	2009.605	54.4	0.442	1.3	1Q-ly		
20003+2955	2000155+295514	BU1258	7.47	10.90	+29 3838	2009.729	144.4	1.415	3.2	2Q-ly		
20003+3522	2000190+352130	HDS2848	7.96	9.78	+34 3832	2010.649				NR		
20009+5801	2000535+580124	TDT1913	10.78	10.88		2009.630	208.4	0.706	1.0	3Q-ly b		
20012+0120	2001134+012014	A2275	9.8	10.4	+00 4385	2009.655	142.7	0.363				
20024+2105	2002230+210524	HDS2855	9.86	10.19	+20 4390	2009.729				NR		
20031+4118	2003060+411739	TDT1936	10.98	11.52		2010.674				S		
20035+6412	2003306+641154	TDT1939	10.76	11.76		2009.633				S		
20041+1700	2004089+165958	EGG3 Ba,Bb	10.2	10.2		2009.605	191.8	0.179		3Q-ly	-5.9 0.036 Hrt1996a	
20041+1700	2004089+170003	STF2622 AB	8.74	9.46	+16 4120	2009.605	194.3	5.794	1.4	3Q-ly		
20041+3957	2004035+395724	COU2534	10.6	10.6	+39 4022	2009.584	7.1	0.205				
20044+1715	2004223+171433	COU325 AB	9.36	10.9	+16 4123	2010.600	226.1	0.816	2.4	ly		
20045+4814	2004287+481346	CHR91	6.21	9.71	+47 3004	2009.595	213.6	0.398				
20048+7300	2004458+725946	A867	8.62	11.95	+72 933	2010.641	151.9	1.114	3.1	ly		
20049+6926	2004528+692536	HDS2863	10.11	12.77	+69 1092	2009.633	3.7	0.846	3.0	1Q-ly		
20051+3814	2005115+381504	COU2213	9.7	10.4	+37 3758	2009.584	154.2	1.391	2.4	2Q-ly		
20054+5807	2005223+580651	A866 Ba,Bb	10.9	11.3		2009.630	184.5:	0.542:		b		
20055+6834	2005310+683332	TDT1964	10.23	12.25		2010.581	340.0	1.993	3.1	ly		
20056+1838	2005372+183736	COU326	9.33	11.66	+18 4379	2010.600	255.4	1.758	3.1	ly		
20059+3247	2005552+324712	COU1807	10.0	10.0	+32 3700	2010.674	297.1	0.197	0.4	ly		
20065+6817	2006288+681641	TDT1984	10.66	12.35		2010.581				S		
20066+0928	2006334+092803	A1196	10.0	10.2	+09 4397	2009.647	241.7	0.346	0.9:	3Q-ly		
20067+2426	2006444+242623	A2995	8.5	13.0	+24 4002	2009.729	33.2	1.562	2.8	1Q-ly	(not obs. since 1930 ?)	
20071+0759	2007060+075914	A609	9.88	10.09	+07 4370	2009.647	306.7:	0.448:				
20071+0759	2007060+075914	A609	9.88	10.09	+07 4370	2009.655	309.9	0.441	0.7	4Q-ly		
20073+3534	2007162+353428	COU2125 Aa,Ab	9.9	9.9	+35 3969	2010.696				S		
20073+4811	2007183+481126	HDS2867	8.14	9.22	+47 3022	2009.595	123.8	0.359	0.6	2Q-ly		
20076+2139	2007346+213909	TDT2000	10.75	10.86		2010.649	73.3	0.655	2.0	ly		
20078+1325	2007452+132514	HDS2868	9.27	11.80	+12 4231	2009.605	215.0	0.721	1.9	3Q-ly		
20083+2950	2008196+294934	A1198	9.9	12.4	+29 3907	2009.597	230.7	1.488	2.4	3Q-ly		
20089+6205	2008568+620436	STF2652	7.29	7.78	+61 1975	2009.633	211.2	0.313	<0.1	3Q-ly	2.7 0.003 Zir2014a	
20092+1822	2009127+182148	HU354	8.7	12.9	+17 4233	2009.605	18.8	0.594	1.8	1Q-ly	(no motion since 1922 ?)	
20096+5034	2009388+503336	TDT2035	10.30	10.51		2009.630	93.8	0.758	2.4	2Q-ly		
20097+4130	2009442+412936	HDS2871	10.54	11.15	+41 3632	2010.674				NR		
20098+3629	2009462+362850	COU2413	10.25	10.41	+36 3911	2009.584	93.6	0.837	0.2	2Q-ly		
20102+4357	2010133+435643	STT400	7.60	9.83	+43 3513	2010.674	333.2	0.628	0.7	ly	-0.5 0.009 Hei1997	
20104+3356	2010238+335550	COU1629	9.6	9.9	+33 3777	2010.584	155.5	1.523	1.4	ly		
20105+2920	2010322+292149	HDS2874 Ca,Cb	7.61	11.49	+28 3646	2009.729	262.2	0.389				
20108+2029	2010451+202912	HDS2875	7.61	9.46	+20 4461	2009.729	230.4	0.300	2.3	3Q-ly		
20109+2237	2010562+223718	HDS2877	10.06	12.50	+22 3953	2009.729	196.5	0.492	3.0	3Q-ly		
20113+3338	2011146+333815	COU1630	10.9	10.9	+33 3789	2010.696	246.7	0.192		3Q-ly:		
20114+2217	2011243+221641	COU217 AB	10.4	11.4		2009.597	343.7	1.490	1.8	4Q-ly		
20118+3936	2011501+393628	COU2415 AB	9.8	10.2	+39 4074	2010.696	156.8	0.363	0.8	ly		
20119+2622	2011536+262215	BU982	9.61	10.55	+25 4146	2009.729	67.2	1.202	1.2	1Q-ly		
20119+2625	2011525+262449	HDS2879	9.59	11.04	+25 4145	2009.597	163.2	0.349	1.0	2Q-ly		
20124+0840	2012262+084003	HEI582	10.03	9.99	+08 4373	2009.647	220.6	0.634	0.8	3Q-dv		
20124+2908	2012232+290737	A1201	10.2	10.3	+28 3663	2009.729	157.5	0.326	1.2	2Q-ly		
20126+4729	2012356+472853	TDT2089	10.40	10.48		2009.630	3.0	0.319	1.6	1Q-ly		
20133+1047	2013198+104714	A1202	9.91	10.06	+10 4215	2009.605	124.9	0.778	0.9	2Q-ly		
20137+2732	2013398+273206	HDS2882	8.65	9.54	+27 3653	2009.729				NR		
20139+3545	2013548+354501	COU2215	9.86	10.38	+35 4028	2010.570	72.0	0.663	2.5	ly		
20143+0803	2014158+080316	HDS2884	8.78	12.04	+07 4410	2009.647				NR		
20144+4206	2014215+420615	STT403 AB	7.31	7.64	+41 3668	2010.584	170.7	0.948	0.5	ly		
20151+1143	2015054+114241	J604	10.23	10.44	+11 4188	2009.605	236.6	0.627	<0.1	3Q-ly		
20151+1143	2015054+114241	J604	10.23	10.44	+11 4188	2009.605	237.2	0.644		ref		
20151+3742	2015047+374145	COU2416	8.0	8.5	+37 3845	2010.570	119.2	0.285	0.7:	ly	-0.4 0.025 Doc2013g	

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ, ''$)	$\Delta\rho$ (O-C)
20157+4339	2015402+433859	A2095 AB	9.06	9.82	+43 3543	2010.570	334.7	0.288	0.8:	ly	-0.1 ^Q	0.018 Lin2012c
20157+4339	2015402+433859	STF2659 AB,C	8.61	10.82	+43 3543	2010.570	313.9	3.047	1.7	ly		
20158+4024	2015507+402352	TDS1055	10.94	12.12		2009.595				S		
20167+2729	2016420+272856	COU1168	10.6	10.6	+27 3671	2009.597	20.2	0.301	0.2	1Q-ly		
20176+2622	2017346+262212	BU984	8.22	9.39	+25 4184	2010.584				NR		
20178+1917	2017453+191700	TDT2146	10.42	10.96		2009.605	307.3:	0.721:			(Second obs.) (noisy)	
20185+5542	2018286+554134	BU1260	8.9	11.5	+55 2368	2009.603	4.7	0.183			(to obs. later)	
20187+5823	2018418+582313	TDT2157	10.83	10.83		2010.581	33.6	0.779	1.7	ly-b		
20187+6013	2018414+601326	A724	10.13	10.53	+59 2214	2009.603	126.5	1.212				
20188+3507	2018458+350642	A286 AB	9.4	9.4	+34 3968	2010.674	212.3	0.218		3Q-ly	(to obs. later)	
20188+3507	2018458+350642	BU986 AB,C	8.57	11.0	+34 3968	2010.674	239.3	4.506	3.5	ly+i		
20189+3325	2018574+332423	COU1948	10.5	10.5	+32 3782	2010.696	359.9	0.213				
20194+1422	2019213+142218	STF2665 A,BC	6.88	9.55	+13 4356	2009.605	13.5	3.253	2.7	1Q-ly	(A 1672 BC is S)	
20196+5132	2019367+513215	TDT2169	10.55	10.56		2009.630	51.7	0.894	2.0	1Q-ly		
20198+3203	2019474+320308	TDS1060	10.59	11.82	+31 4035	2010.584	230.4	0.996	2.1	ly		
20198+4522	2019496+452150	STT406	7.25	8.74	+44 3429	2009.595	102.1	0.353	0.6	2Q-ly	-1.7 -0.058	Hei1976
20199+3725	2019565+372437	COU2287	9.1	9.3	+36 4009	2010.696	297.4	0.201		3Q-ly		
20201+6010	2020057+600937	TDT2178	10.95	11.75		2010.581	135.0	1.548	1.5	ly		
20201+7605	2020046+760529	A869	9.68	10.25	+75 737	2010.641	269.9	2.029	0.8	ly		
20202+6236	2020098+623559	HU958	10.20	10.69	+62 1803	2009.603	352.6	0.885				
20203+3924	2020152+392411	A1427 AB	6.57	8.17	+38 4021	2010.674	125.2	0.322		2Q-ly	-2.8 0.091	Doc1987b
20203+3924	2020152+392411	STF2668 AB,C	6.34	8.49	+38 4021	2010.674	279.6	3.341	2.7	ly		
20207+1249	2020399+124904	HU1196 AC	9.87	14.4	+12 4297	2009.605	303.6	3.264	2.7	ly		
20207+1249	2020399+124904	HU1196 AB	9.87	10.14	+12 4297	2009.605	321.6	0.363	0.1	4Q-ly	(to obs. later)	
20208+1327	2020497+132713	HEI275	10.61	10.45	+12 4298	2009.605	273.4	0.454	0.2	4Q-ly		
20209+5511	2020568+551055	TDT2197	10.81	13.32		2009.630				b NR	(too faint)	
20211+4341	2021050+434030	A46 AB,C	9.26	11.15	+43 3573	2009.584	262.6	1.959	1.6	3Q-ly		
20211+4341	2021050+434030	A46 AB	9.0	9.2	+43 3573	2009.584	79.3	0.413	0.8	1Q-ly		
20213+0250	2021174+025022	HL158	9.71	9.78	+02 4139	2009.655	45.0	1.106	0.9	1Q-ly	0.4 -0.003	Msn2017c
20215+3035	2021195+303603	BU1259 Ba,Bb	9.06	9.60	+30 3994	2010.570				NR		
20216+1930	2021356+192940	COU327 AB,C	8.41	11.97	+19 4380	2010.674	131.6	4.076	4.0	ly		
20216+1930	2021356+192940	COU327 AB	9.1	9.1	+19 4380	2010.674	242.5	0.204			0.2 0.053	Doc2008a
20219+7347	2021532+734707	HDS2909	10.50	10.77	+73 906	2010.641	238.4	0.688	1.3	ly		
20222+3115	2022101+311511	A1208	9.69	9.20	+30 4003	2010.570	337.9	0.254		4Q-ly		
20231+2052	2023089+205151	A288	8.72	8.98	+20 4541	2010.696	288.1	0.224	0.2	ly	-4.8 0.030	Doc1994d
20238+4146	2023500+414630	COU2641	10.06	10.08	+41 3728	2009.584	280.3	0.953	<0.1	4Q-dv		
20239+3426	2023539+342647	COU1950	11.0	13.0	+33 3886	2010.649	265.9	1.050	2.6	ly		
20244+1213	2024266+121244	WOR33 Aa,Ab	8.6	9.3	+11 4250	2009.605	132.9	0.551	0.8	2Q-ly		
20244+1213	2024266+121244	A1209 AB	9.22	10.63	+11 4250	2009.605	325.1	1.861	1.6	4Q-ly		
20248+2511	2024466+251046	COU521	7.52	10.59	+24 4116	2010.584	280.4	0.522	2.9	ly		
20248+4009	2024487+400913	HO278	7.5	7.5	+39 4172	2009.584				S		
20248+5534	2024503+553343	TDS1071	9.98	11.33		2010.581	183.7	0.879	1.7	ly		
20250+3034	2025025+303405	HDS2921	8.10	11.04	+30 4023	2010.584	358.3	0.823	3.8	ly		
20251+3408	2025080+340751	COU1951	9.93	10.86	+33 3896	2010.570	178.7	1.317	1.5	ly		
20251+5936	2025050+593600	A730	6.94	7.63	+59 2228	2009.603	282.4	0.179			1.4 0.047	Pru2010
20256+2504	2025355+250321	A392	9.59	10.44	+24 4123	2010.649	294.0	0.917	1.4	ly		
20256+3350	2025405+335007	COU1952	10.39	11.52	+33 3898	2010.584	232.7	1.555	2.2	ly		
20256+4132	2025303+413330	COU2643	10.84	11.33	+41 3744	2009.584	292.9	0.529		4Q-dv		
20260+3512	2026000+351228	COU2129	9.7	9.7	+34 4016	2010.696	162.2	0.215		2Q-ly		
20260-0041	2026017-004054	A728	9.9	10.2	-01 3980	2009.655	348.2	0.325				
20265+3331	2026348+333012	COU1954	10.63	10.91	+33 3903	2009.597	349.5:	0.482:				
20265+3331	2026348+333012	COU1954	10.63	10.91	+33 3903	2010.674				NR!		
20266+4724	2026369+472414	HDS2924	9.97	11.63	+46 2937	2009.630	210.0	1.468	2.7	ly		
20266+4724	2026369+472414	HDS2924	9.97	11.63	+46 2937	2009.630	209.8	1.469				
20266+5106	2026377+510621	HDS2923	8.27	8.90	+50 3095	2009.630	196.4	0.152	0.2	3Q-ly		
20273+6846	2027200+684602	HDS2925	7.37	10.44	+68 1129	2010.641	92.5	0.675	3.6	ly		
20274+4727	2027260+472653	A732	9.65	9.81	+46 2940	2009.595	78.4	0.672	0.6	1Q-ly		
20275+1454	2027316+145334	A1674 AB	9.8	11.15	+14 4303	2009.605	15.5	1.025	2.0	1Q-ly		
20280+4829	2028000+482845	HU587	9.93	10.26	+48 3131	2009.595	337.1	0.628	1.0	4Q-ly		
20283+4005	2028169+400509	COU2538	10.40	10.42	+39 4203	2010.600	31.2	0.978	<0.1	ly		
20283+4038	2028154+403819	TDT2306	9.99	11.81	+40 4185	2010.674				S		
20287+3423	2028436+342317	COU1957	9.04	11.95	+33 3917	2010.570	83.3	1.142	3.4	ly		
20287+3423	2028436+342317	COU1957	9.04	11.95	+33 3917	2010.584	83.8	1.186	3.8	ly		
20288+3447	2028460+344652	COU2132	10.15	12.16	+34 4037	2010.584	107.7	1.224	3.2	ly		
20290+0710	2029025+070929	A610	9.52	9.91	+06 4543	2009.655	78.5	0.436	1.1	1Q-ly	3.2 0.009	Cot2002
20290+2658	2029021+265823	A394	9.72	10.14	+26 3908	2009.597	287.8	0.716	1.2	4Q-ly		
20291+4544	2029083+454405	BU1135	8.19	10.6	+45 3193	2009.595	334.8	1.529	2.8	4Q-ly		
20295+5604	2029271+560405	KU197	5.96	8.84	+55 2411	2010.581	128.5	0.801	1.6	ly		
20300+3222	2030029+322205	COU1960	10.19	10.63	+31 4110	2010.649	216.2	0.934	0.8	ly		
20301+5407	2030048+540644	TDS1077	10.81	11.82		2010.581				S		
20302+2651	2030106+265033	BUP213 AC	10.50	12.67	+26 3915	2009.729	310.3	10.014	3.7			
20302+2651	2030107+265034	WOR9 AB	10.50	10.63	+26 3915	2009.597	256.6	0.511	0.6	3Q-ly	3.5 0.024	Zir2003
20302+2651	2030107+265034	WOR9 AB	10.50	10.63	+26 3915	2009.729	255.0	0.533			2.5 0.047	Zir2003
20302+2651	2030107+265034	WOR9 AB	10.50	10.63	+26 3915	2010.600	252.0	0.528	0.7	ly	3.4 0.044	Zir2003
20304+7634	2030230+763334	TDT2327	10.95	11.04		2010.641	320.2:	0.622:	4.7:	ly	(Second obs.)	
20306+3525	2030315+352558	COU1961	10.76	10.90	+34 4053	2009.584	207.8	0.452	1.5	3Q-ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ$, $''$)	$\Delta\rho$ (O-C)
20307+3521	2030406+352053	HJ1526 A,BC	9.00	9.26	+34 4056	2010.570	148.9	8.504	1.8	ly-b		
20307+3521	2030411+352046	HU760 BC	9.8	10.4		2010.570	72.0	0.295	1.4	ly		
20310+5953	2031019+595233	HDS2933	8.75	12.09	+59 2251	2009.630	6.4	0.473	2.4:	1Q-ly		
20315+5520	2031281+551946	TDS1079	10.67	11.17		2010.581	122.5	0.839	1.4	ly		
20318+4933	2031465+493232	BU1136	7.75	9.19	+49 3305	2009.630	218.5	0.560	1.3	3Q-ly		
20320+2548	2031581+254818	STF2695	6.58	8.75	+25 4272	2009.597	253.2	0.370	0.7	3Q-ly	-0.7 -0.020	Alz2005a
20324+2731	2032269+273051	FOX93	8.23	11.73	+27 3780	2009.729	185.8	1.305	4.1	3Q-ly		
20329+1336	2032529+133560	BRT1346	10.	11.		2009.605	335.5	4.472	1.0	4Q-ly	(Wrong star?)	
20329+3056	2032537+305630	COU1326	9.9	10.1	+30 4068	2009.597	261.6	0.391	0.1	3Q-ly		
20333+2727	2033182+272726	HDS2935	9.13	11.38	+26 3930	2009.729	113.3	0.490	2.3	2Q-ly		
20333+4119	2033150+411850	HER4 Aa,Ab	8.98	14.	+40 4227	2010.600	245.1	0.203			(Second obs.)	
20333+4119	2033150+411850	HER4 Aa,Ac	8.98	14.	+40 4227	2010.600	340.0	3.117	5.6	ly		
20342+1333	2034064+133318	HEI277	10.78	11.07	+13 4443	2009.605	247.2	0.671	0.2	3Q-ly		
20353+4251	2035166+425047	A397	9.6	12.5	+42 3793	2010.600	183.9	1.265	1.9	ly		
20353+6437	2035193+643654	TDT2398	11.00	11.11		2009.633				S:		
20365+2342	2036296+234143	A2793	9.90	10.26	+23 4074	2009.811	210.5	0.888				
20375+1050	2037298+104943	HEI586	10.26	10.18	+10 4337	2009.605	220.9	0.536	0.7	3Q-ly		
20378+2943	2037489+294412	A742 BC	10.36	10.90		2009.729	132.7	1.161	0.6	2Q-dv		
20378+2943	2037489+294412	A742 BC	10.36	10.90		2009.729	132.9	1.167	0.2	2Q-ly		
20385+2945	2038313+294447	COU1172	10.98	10.88		2009.729	276.0	0.318	1.4	4Q-ly		
20386+2007	2038332+200704	COU225	9.7	10.0	+19 4472	2010.674	282.6	0.300	2.0	ly		
20396+0458	2039372+045818	KUI99 AB	8.28	9.63	+04 4510	2009.655	311.0	0.684	>1	4Q-dv	2.3 0.013	Mlg2007
20397+4734	2039422+473426	A747 AB	8.7	9.0	+47 3159	2009.595	103.8	0.303	0.5	2Q-ly		
20402+5427	2040134+542709	A1682	9.67	10.90	+53 2459	2009.603	48.5	1.360				
20411+3516	2041044+351629	COU1963 AB	9.3	9.3	+34 4117	2009.627	0.3:	0.179:		b		
20411+3516	2041044+351629	COU1963 AB,C	9.3	13.5	+34 4117	2009.627	45.8	1.708	3.1	1Q-ly		
20412+2703	2041097+270251	COU1038	9.77	10.23	+26 3958	2010.674	86.6	1.123	0.7	ly		
20416+3950	2041337+394950	COU2290	10.95	11.02	+39 4279	2009.584	41.8	0.506		1Q-ly		
20421+4125	2042043+412446	COU2420	9.85	10.26	+40 4283	2009.595	87.0	0.461	0.9	1Q-ly		
20427+3947	2042391+394702	TDT2491	10.15	12.19		2009.627				S		
20432+4431	2043099+443111	COU2422	10.4	13.2	+43 3696	2009.595	236.6	1.265	2.6	3Q-ly		
20433+2616	2043152+261546	COU1039	10.4	13.0	+25 4346	2009.597	236.0	1.009	2.0	3Q-ly		
20437+3243	2043446+324235	ES2376 AB	10.80	12.5	+32 3912	2009.627	127.1	7.344	2.8	ly		
20437+3243	2043446+324235	COU1633 Aa	10.80	12.26	+32 3912	2009.627	243.3	1.799	1.6	ly		
20437+3727	2043401+372700	COU2291	11.2	12.4		2009.627	229.4	0.985	1.3	3Q-ly		
20437+3727	2043401+372700	COU2291	11.2	12.4		2010.600	228.6	1.002				
20437+4733	2043445+473238	A749	9.58	9.81	+47 3177	2009.595	307.7	0.458	0.5	4Q-ly		
20445+3409	2044305+340907	HU690	9.53	9.76	+33 4011	2009.811	276.7	0.524				
20445+6136	2044270+613604	HDS2952	9.48	11.31	+61 2048	2009.633				NR	(rings)	
20447+2601	2044444+260046	HEI182	10.38	12.6		2009.729	207.2	0.904	2.5	3Q-ly		
20451+3529	2045057+352905	COU1809	9.5	12.0	+34 4141	2010.570	99.3	0.730	3.2	ly		
20453+4010	2045143+400937	COU2293	10.73	11.59	+39 4305	2009.595	201.2	1.146	1.4	3Q-ly		
20454+0023	2045267+002314	A876	10.12	10.00	-00 4086	2009.655	69.2	0.554	0.3	1Q-ly		
20455+0553	2045280+055253	HDS2954	7.59	11.41	+05 4600	2009.647	296.8	0.723		4Q-dv		
20455+4338	2045297+433808	A611	9.9	10.3	+43 3709	2009.595	175.9	0.276	0.5	2Q-ly		
20456+1714	2045361+171415	COU425	10.97	11.50	+16 4361	2009.605	325.8	0.659	1.5	4Q-ly		
20456+1714	2045361+171415	COU425	10.97	11.50	+16 4361	2009.605	326.0	0.656		ref		
20456+4014	2045356+401429	TDT2519	10.31	11.66		2010.649	347.3	1.283	2.3	ly+i		
20456+4621	2045352+462102	HDS2955	9.25	12.42	+45 3260	2009.630	288.9	0.387	3.1	ly		
20459+3852	2045526+385150	COU2294	10.9	13.1	+38 4226	2010.600	124.1	0.856	1.9	ly		
20466+4632	2046386+463154	KUI101	6.43	8.91	+45 3270	2009.595				NR		
20470+4901	2047009+490120	HDS2962	9.73	11.44	+48 3208	2009.630	221.5:	0.087:	0.5:	ly		
20470+4901	2047009+490120	HDS2962	9.73	11.44	+48 3208	2009.630	219.2:	0.127:				
20475+3016	2047299+301602	COU1176	11.6	11.6	+29 4179	2009.597	224.5	0.373	0.2	3Q-ly		
20477+3258	2047434+325828	COU1634	10.77	10.91	+32 3944	2009.597	57.4	0.386	1.1	1Q-ly	(fast rotation?)	
20477+4204	2047407+420406	BU268	7.75	9.29	+41 3889	2009.595	200.6	0.380	0.9	3Q-ly		
20482+2622	2048113+262130	COU827 Aa,Ab	11.2	11.6	+25 4377	2009.597	327.7	0.564	0.3	4Q-ly		
20482+2622	2048113+262130	COU827 Aa,Ab	11.2	11.6	+25 4377	2009.819	327.8	0.549	1.1	4Q-ly		
20489+4537	2048549+453727	HDS2965	9.02	10.08	+45 3290	2009.630	282.0:	0.131:				
20490+2540	2048597+254020	HDS2966	8.00	11.56	+25 4383	2010.649	225.3	0.558				
20490+2637	2048575+263717	COU828 AB	10.66	10.95	+26 4000	2009.819	189.3	0.906	0.8	3Q-ly		
20493+3113	2049190+311308	TDS1101	10.88	12.24		2010.649	231.3	1.213	1.4	ly+i		
20494+1124	2049235+112409	J194 AB	10.32	9.97	+10 4385	2009.605	329.1	0.593	0.2	4Q-ly	2.6 -0.004	Sod1999
20494+1124	2049235+112409	J194 AB	10.32	9.97	+10 4385	2009.605	329.1	0.602		ref	2.6 0.005	Sod1999
20511+5125	2051054+512501	BU155 AB	7.36	8.13	+50 3215	2010.570	39.1	0.735	0.8	ly	0.9 0.000	Izm2019
20519+0544	2051544+054429	A613	9.10	9.03	+05 4637	2009.647	144.0	0.672	<0.1	2Q-dv	0.8 ^Q	Sey2002
20519+4140	2051530+414018	COU2428	10.7	13.7	+41 3914	2009.627	113.5	0.716	2.6	2Q-ly		
20521+0205	2052085+020515	A2286 AB,C	9.14	10.09	+01 4383	2009.655	46.9	1.041	2.1:	1Q-dv		
20521+1014	2052076+101418	A1212	9.09	9.68	+09 4654	2009.605	13.5	0.541	0.6	1Q-ly		
20527+4607	2052449+460647	A750	9.11	10.26	+45 3310	2010.570				S	[211.8 0.148	Doc2013f]
20528+4551	2052499+455056	COU2647	9.9	11.1	+45 3311	2009.595	227.1	0.336	0.8	3Q-ly		
20530+4258	2052572+425825	COU2542	10.46	12.03	+42 3895	2009.595	143.1:	0.111:				

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
20535+0300	2053299+030007	HEI819	8.41	8.42	+02 4267	2009.655	119.7	0.273		2Q-dv		
20535+4523	2053321+452302	HDS2975	8.95	9.66	+44 3622	2009.630	191.1:	0.151:		3Q-ly:	(Second obs.)	
20536+3138	2053333+313734	HDS2976	7.02	9.64	+31 4254	2009.819				NR	(rings)	
20546-0042	2054368-004148	A877	9.74	9.90	-01 4072	2009.655	11.1	0.445	0.4	1Q-ly		
20550+2805	2055023+280526	BU367 AB	8.31	9.00	+27 3915	2010.600	153.8	0.298	0.6	ly	-12.1 0.098	Sca2003e
20556+4453	2055339+445251	COU2648	10.9	12.2		2009.627	20.5	1.302	1.2	1Q-dv		
20559+4345	2055549+434426	COU2543	10.85	11.16	+43 3764	2010.600	222.8	1.552	0.8	ly		
20562+4615	2056107+461456	A753 AB	9.69	10.07	+45 3335	2009.630	256.8	0.965	0.7	3Q-ly		
20567+6237	2056449+623653	HDS2983	9.95	12.35	+62 1874	2009.633	244.2	0.416	2.7	3Q-ly		
20571+7138	2057081+713731	TDT2652	10.72	10.90		2010.641	306.8	0.637	0.7	ly		
20573+4818	2057165+481744	HDS2987	8.47	10.70	+47 3237	2009.630	3.4	0.411	2.4:	1Q-ly		
20577+3943		COU2429	11.0	11.2		2010.674	207.9	0.767	1.3	ly		
20582+1942	2058098+194224	TDT2663	10.78	10.79		2010.649	35.3	0.853	0.5	ly		
20582+3510	2058134+351029	COU1813	10.20	12.03	+34 4217	2009.627	310.9	1.105	2.4:	4Q-dv		
20584+2619	2058250+261830	HDS2990	9.86	10.62	+25 4426	2009.729				NR		
20587+3657	2058427+365617	COU2296	10.33	11.29	+36 4349	2009.627	103.1	1.047	2.4	2Q-dv		
20593+1534	2059164+153421	STT424 AB	8.43	9.39	+15 4304	2009.605	307.2	0.498	0.8	4Q-ly		
20593+3155	2059179+315507	COU1178	10.91	11.50		2009.627	17.1	1.202	1.3	1Q-dv		
20599+4016	2059551+401529	COU2431 Aa,Ab	6.66	10.80	+39 4400	2010.600	208.7	2.123	4.3	ly		
21000+4004	2100048+400415	KUI103	10.49	12.40		2009.584	359.0	0.489	2.4	4Q-ly	-0.7 0.041	Gii2009b
21000+4004	2100048+400415	KUI103	10.49	12.40		2009.584	0.6	0.450	2.4	4Q-ly	0.9 0.002	Gii2009b
21000+4004	2100048+400415	KUI103	10.49	12.40		2009.595	0.8	0.438			0.9 -0.011	Gii2009b
21000+4004	2100048+400415	KUI103	10.49	12.40		2010.570	15.3	0.526	2.2	ly	-0.2 0.004	Gii2009b
21000+4004	2100048+400415	KUI103	10.49	12.40		2010.584	18.2:	0.503:	3.0:	ly	2.5 -0.020	Gii2009b
21000+4004	2100048+400415	KUI103	10.49	12.40		2010.600	15.8	0.520			-0.2 -0.005	Gii2009b
21001+0731	2100039+073058	KUI102	6.23	8.13	+06 4718	2009.647	312.2	0.228			-13.3 0.032	Hrt2014b
21010+1910	2101000+190932	COU523	10.3	10.3	+18 4677	2010.674				NR		
21019+4802	2101526+480219	COU2650	10.57	11.4	+47 3258	2010.600	256.0	1.951	1.7	ly		
21019+5704	2101550+570419	BU1139	6.69	12.5	+56 2523	2010.581	135.9	2.084	5.2	ly		
21020+3745	2102034+374404	COU2223	9.84	10.8	+37 4353	2009.627	180.1	1.858	>1.0	3Q-dv		
21023+2819	2102208+281912	COU524	10.89	11.01	+27 3950	2009.729	258.8	1.323	1.6	3Q-ly		
21027+7005	2102405+700449	TDT2710	10.11	10.24		2010.641	39.9	0.380	1.3	ly		
21028+4551	2102486+455056	KUI104 CD	7.82	13.4	+45 3374	2009.595	88.6	2.786	5.2	1Q-ly		
21045+0746	2104325+074536	BU269	8.34	10.07	+07 4617	2009.647	240.6	1.133		3Q-dv		
21047+3710	2104407+370947	HDS3003	8.92	12.18	+36 4390	2009.627	282.9	1.323	4.2	4Q-ly		
21048+4144	2104473+414350	KUI2434	10.83	11.09	+41 3992	2009.595	187.1	1.008	1.8	3Q-ly		
21050+1243	2105011+124323	A1690 BC	10.94	11.42		2009.605	117.8	0.360	1.0	2Q-ly		
21055+5340	2105308+534005	BU680 AB	8.70	9.38	+53 2546	2009.630	284.7	0.613	0.8	4Q-ly		
21058+4341	2105504+434054	BU679	11.5	11.9		2009.595	250.5	0.678	1.0	3Q-ly		
21060+5422	2106007+542155	A1691 Aa,Ab	9.2	13.2	+53 2549	2010.581	201.2	0.443	3.0	ly		
21061+4001	2106063+400037	COU2224	10.9	10.9	+39 4435	2009.595	60.0	0.348				
21061+4001	2106063+400037	COU2224	10.9	10.9	+39 4435	2010.600	61.1:	0.368:				
21065+4823	2106326+482312	BU836 AB	9.98	9.64	+47 3291	2009.630	354.0	0.792	0.7	ly		
21065+4823	2106326+482312	BU836 AB	9.98	9.64	+47 3291	2009.630	354.5	0.792	0.0			
21066+3309	2106331+330808	COU1329	11.0	11.0		2009.819	259.8	1.305	<0.1	3Q-ly		
21078+7123	2107469+712254	HDS3012	8.59	12.26	+70 1167	2009.633	190.0	0.873	4.3	3Q-ly		
21080+0509	2108006+050906	STT527	7.14	8.14	+04 4615	2009.647	115.0	0.366		2Q-dv	4.6 -0.002	Pop1995a
21089+1715	2108470+171438	HEI185	10.3	10.3		2009.605	80.1	0.173		ref		
21091+6623	2109057+662330	MLR68	10.72	10.83	+65 1551	2010.696	280.0	0.781	0.8	ly		
21092+5220	2109108+522023	COU2694	10.2	10.5	+51 3002	2009.630	248.6	1.132				
21092+5220	2109108+522023	COU2694	10.2	10.5	+51 3002	2009.630	248.5	1.128	1.7	ly		
21100+4745	2109591+474443	A761	9.35	10.70	+47 3316	2009.630	54.9	0.411	1.6	1Q-ly		
21105+4300	2110295+430028	VKI39	12.2	12.2		2009.627	237.9	1.304	0.8	3Q-dv		
21107+1334	2110409+133415	HEI186	10.5	11.4	+13 4632	2009.605	270.6	0.136				
21107+1334	2110409+133415	HEI186	10.5	11.4	+13 4632	2009.605	268.0	0.164		ref		
21112+3925	2111132+392445	COU1969	10.6	10.6	+38 4378	2009.819	216.0	0.296	0.9	3Q-ly		
21114+4551	2111265+455129	COU2435	10.04	11.65	+45 3439	2010.600	169.4	1.434	1.6	ly		
21115+2144	2111289+214401	COU227	10.05	11.77	+21 4489	2009.729	111.0	0.518			0.1 -0.001	FMR2012b
21115+2144	2111289+214401	COU227	10.05	11.77	+21 4489	2010.600	112.9	0.535	1.7	ly	0.5 0.016	FMR2012b
21115+7050	2111324+704931	HDS3019	7.71	10.25	+70 1171	2009.633				NR		
21120+2410	2111592+241004	STT430	8.27	10.34	+23 4264	2009.811	194.5	1.458	2.5	ly		
21120+2410	2111592+241004	STT430	8.27	10.34	+23 4264	2009.811	194.4	1.445				
21124+3810	2112208+381003	COU1971	10.0	13.0	+37 4221	2009.627	281.3	0.614	>1.0	4Q-dv		
21125+2821	2112311+282039	HO152	8.87	9.39	+27 4003	2009.729	138.9	0.197		2Q-ly	4.9 -0.041	Sca2012b
21135+0713	2113272+071304	BU270 AB	7.42	9.40	+06 4776	2009.647	347.8	0.572		4Q-dv	0.8 0.012	Msn2017a
21135+1559	2113287+155856	HU767	7.05	7.13	+15 4375	2010.674				S	[194.6 0.075	Hrt1996a]
21138+3711	2113487+371106	WSI37 AC	11.0	12.9	+36 4473	2010.600	336.6	10.042	1.7	ly-b		
21138+3711	2113487+371106	COU1816	10.98	12.30	+36 4473	2010.600	247.7	1.848	1.6	ly-b		
21139+4400	2113566+440017	COU2299	9.16	9.37	+43 3854	2009.595	34.3	0.354	0.5	1Q-ly		
21142+1231	2114141+123035	HEI406	11.5	11.7	+11 4512	2009.605	177.1	0.684	1.2	2Q-ly		
21145+4036	2114261+403633	COU2227	10.50	11.7	+40 4451	2010.600	192.7	1.153	2.0	ly	(3 peaks in ly ?)	
21145+4542	2114296+454146	COU2436	10.56	13.6	+45 3462	2009.630	257.7	1.167	2.3	ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
21148+4946	2114471+494537	COU2653	10.6	10.6	+49 3485	2009.595	245.9	0.315		3Q-ly:		
21151+2808	2115082+280816	J1154	9.78	11.69	+27 4018	2009.811	104.7	1.763				
21151+2808	2115082+280816	J1154	9.78	11.69	+27 4018	2009.811	104.8	1.798		b i		
21151+4257	2115050+425709	COU2300	8.93	9.52	+42 4024	2010.600	265.8	0.354	1.9	ly		
21152+4619	2115116+461911	HDS3023	9.93	12.69	+45 3466	2009.630	140.0	0.869	2.8	2Q-ly		
21157+4832	2115412+483153	HDS3024	9.05	10.93	+47 3349	2010.674	327.5	0.348	1.5	ly		
21161+4101	2116081+410109	COU2229	10.12	10.38	+40 4463	2009.627	278.6	0.766	>1.0	4Q-dv		
21165+4554	2116317+455427	HDS3027	10.30	12.79	+45 3479	2010.649	48.3	0.382	3.0	ly		
21169+2129	2116555+212837	TDS1122	10.76	11.21		2009.811	247.2	1.410		b i		
21171+4001	2117047+400124	A1441 AB	9.7	9.8	+39 4507	2009.595	104.5:	0.147:				
21171+4312	2117041+431136	A401	8.93	10.12	+42 4045	2009.627	321.2	0.411	0.3	4Q-dv		
21176+2915	2117363+291455	COU835 AB	9.5	9.5	+28 4044	2009.729	239.1	0.381	2.3:	3Q-ly		
21176+4350	2117384+434922	COU2301	11.4	11.4	+43 3873	2009.627	250.3	0.485	0.2	3Q-dv		
21177+3345	2117395+334530	HO153	8.50	9.55	+33 4219	2009.819	127.4	0.985	1.2	2Q-ly		
21182+4956	2118121+495554	HU692	8.55	9.79	+49 3494	2009.630	259.7	0.369	1.7	3Q-ly		
21183+4140	2118192+414006	COU2302	10.35	12.32	+41 4083	2010.600	63.3	1.290	2.5	ly		
21183+4140	2118192+414006	COU2302	10.35	12.32	+41 4083	2010.600	62.3	1.310	2.4	ly-b		
21183+4140	2118192+414006	GH30 AB,C	10.17	13.15	+41 4083	2010.600	187.7	14.056	2.8	ly-b		
21184+0518	2118220+051812	HDS3031	9.94	10.16	+04 4646	2009.647				NR		
21186+1134	2118348+113408	BU163 AB	7.37	8.94	+10 4514	2009.605	259.4	0.783	1.3	3Q-ly	0.6 -0.013 Fek1997	
21189+0252	2118515+025445	HEI407	10.5	11.0	+02 4337	2009.655	5.4	0.200	0.2	1Q-dv	(to obs. later, bad object ?)	
21189+4351	2118523+434941	COU2438	10.3	11.0	+43 3881	2010.649	254.8	1.401	1.4	ly		
21191+6152	2119073+615130	HDS3035 Aa,Ab	6.86	9.12	+61 2112	2010.581	299.7	0.323	1.8	ly		
21194+3814	2119221+381414	HO286	6.6	6.6	+37 4271	2009.819				NR		
21196+1421	2119350+142113	HU962	8.66	9.42	+13 4674	2009.605	61.1	0.593	1.6	1Q-ly		
21196+2543	2119369+254242	COU728	10.48	10.90	+25 4510	2009.729	50.9	1.537	1.2	1Q-ly		
21199+4307	2119513+430647	COU2439	9.61	9.97	+42 4056	2010.674	265.9	0.750	2.4	ly		
21199+5319	2119543+531919	A1695	8.50	9.28	+52 2915	2009.603	194.0	0.491				
21202+6038	2120140+603751	A763	7.60	10.88	+60 2223	2010.641	213.0	1.266				
21210+0022	2120589+002217	RST5162	9.88	9.92	-00 4202	2009.655	20.1	0.445	0.1	1Q-dv		
21210+0217	2120577+021727	HEI408AB	10.98	11.18		2009.655	258.1	2.262	0.4	3Q-dv		
21210+2233	2120579+223306	COU229	10.98	11.37	+21 4528	2009.729	117.1	0.495	2.8	2Q-ly		
21210+2233	2120579+223306	COU229	10.98	11.37	+21 4528	2009.819	120.4	0.555	2.4	2Q-ly		
21214+1020	2121215+101956	A617	7.5	7.5	+09 4786	2009.605				S	[49.5 0.051 Sod1999]	
21223+2906	2122195+290623	COU532	9.5	9.5	+28 4067	2010.674	51.2	0.367	1.6	ly		
21225+0827	2122286+082716	HU275	9.46	9.54	+07 4670	2009.647	236.1	0.351		3Q-dv		
21225+0827	2122286+082716	HU275	9.46	9.54	+07 4670	2009.863	238.8	0.367	0.1	ly		
21227+5214	2122437+521333	HU591	9.68	9.74	+51 3052	2009.603	128.4	0.730				
21232+4258	2123121+425754	COU2304 AB	11.0	11.6	+42 4073	2010.649	150.3	0.405	2.0	ly	(GH32 AB,C ok)	
21233+1520	2123208+152042	HEI189	11.4	11.6	+14 4603	2009.605	37.0	0.588	0.2	1Q-ly		
21238+4710	2123501+470952	A765 AB	9.02	7.33	+46 3294	2010.649	27.4	0.484	1.3	ly		
21243+0343	2124197+034300	A2288	9.97	10.27	+03 4562	2009.655	233.8	0.403	0.2	3Q-dv	1.1 0.024 Tok2015c	
21246+5033	2124331+503306	TDT2947	10.91	11.05		2010.581				NR		
21251+0923	2125056+092302	BU164 AB	8.17	8.30	+08 4671	2009.647	117.6:	0.139:				
21251+5229	2125069+522830	HU592	8.61	11.90	+51 3061	2009.603	134.6	0.492				
21254+1121	2125269+112046	A887 AB	8.7	9.7	+10 4542	2009.605				S		
21255+0203	2125307+020235	A2289 AB	7.82	9.27	+01 4477	2009.655				NR		
21267+0335	2126441+033511	VOU41	10.0	10.0	+02 4358	2009.863				NR		
21271+3419	2127039+341922	ES2262	10.75	11.48		2009.811	44.5	1.474	3.7	ly i b		
21274+5835	2127224+583519	MLR435	10.6	10.9		2009.603	242.6	0.231				
21277+1431	2127417+143103	HEI285	9.5	10.5	+13 4711	2009.863	98.2	0.905	1.3	ly		
21281+0440	2128034+044002	HDS3056	10.22	10.40	+04 4679	2009.863	199.4	0.209		3Q-ly		
21281+4110	2128050+411012	COU2231	9.6	9.6	+40 4535	2010.674	25.3	0.231	0.3	ly		
21287+1810	2128438+180947	HU490 AB	9.6	12.1	+17 4591	2009.605	308.3	0.360	0.8	4Q-ly		
21293+6703	2129206+670304	HU964	6.9	12.6	+66 1407	2010.641	270.7	1.343	3.2	ly		
21296+4307	2129370+430720	COU2232	10.27	12.24	+42 4114	2010.600	17.3	1.841	2.3	ly-b		
21297+1356	2129397+135539	HU963	8.90	10.48	+13 4721	2009.863	222.7	0.907	1.4	ly		
21297+1719	2129404+171846	COU535	10.60	10.56	+16 4539	2009.863	31.1	0.670	0.5	ly		
21301+3050	2130070+305021	COU941	8.75	10.26	+30 4455	2010.674				NR		
21302+4143	2130100+414405	COU1973	10.35	10.81	+41 4163	2010.649	196.8	0.806	1.1	ly		
21305+4620	2130312+461949	A768	10.33	10.51	+45 3565	2010.696	78.3	0.266	0.4	ly		
21306+0710	2130360+071025	HU277	7.92	10.85	+06 4842	2009.647	105.2	1.040	2.2	2Q-ly		
21322+1055	2132118+105439	HDS3061	7.44	9.08	+10 4570	2009.863	255.3	0.345				
21327+5459	2132412+545841	HDS3063	9.22	11.14	+54 2565	2009.603	3.2	0.494				
21327+5459	2132412+545841	HDS3063	9.22	11.14	+54 2565	2009.603	1.9	0.421				
21330+2408	2132572+240738	HDS3065 Aa,Ab	8.78	11.21	+23 4334	2009.729	231.0:	0.359:	3.3:	3Q-ly	-2.2 0.088 Tok2019c	
21331+4512	2133058+451132	COU2308	9.7	9.7	+44 3859	2009.595	175.3:	0.139:				
21336+1535	2133384+153456	HDS3067	9.04	12.30	+14 4627	2009.863	318.0	0.718				
21336+6020	2133383+602006	BU166	7.61	10.32	+59 2396	2010.641	262.4	1.097	2.6	ly		
21340+5100	2134008+510009	COU2546	9.94	10.18	+50 3364	2009.603	178.0	0.750				
21352+2124	2135119+212414	BU74	7.45	9.05	+20 4964	2010.641	336.8	1.001	1.7	ly		
21354+1344	2135251+134324	ROE127	10.81	11.25	+13 4742	2009.605	36.2	0.726	0.7	1Q-ly		
21355+2427	2135270+242707	HU371	6.83	7.27	+23 4346	2009.729	318.8	0.264	0.5	4Q-ly	0.6 -0.017 Wsi2006b	
21362+7115	2136093+711454	MLR249	10.65	10.95	+70 1188	2009.633	263.8	1.298	0.6	3Q-ly:	(dv for Q)	
21365+4304	2136328+430334	COU2233	9.5	9.5	+42 4155	2009.595	121.0:	0.121:				

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ$, $''$)	$\Delta\rho$ (O-C)
21370+4520	2137009+452024	COU2309	10.75	11.08	+44 3887	2010.600	50.9	0.669	0.9	ly		
21372+0054	2137115+005345	ARU22	9.31		+00 4754	2009.863				NR!		
21372+4527	2137127+452654	COU2310	10.4	10.4	+44 3888	2009.595	199.6	0.403	0.1	3Q-dv		
21372+5346	2137116+534535	MLR609	10.16	11.59	+53 2656	2009.603	38.6	1.008				
21379+2743	2138000+274325	HDS3080 Aa,Ab	10.17	11.75	+27 4120	2009.860				ly-b	S! [265.4 1.18 Sod1999]	
21379+2743	2138000+274325	HDS3080 Aa,Ab	10.17	11.75	+27 4120	2010.600				ly	S! [258.7 1.17 Sod1999]	
21379+2743	2138000+274325	SKF245 AC	10.17	11.75	+27 4120	2009.830	22.3	3.233	4.8	ly	(C comp. is not S !)	
21379+2743	2138000+274325	SKF245 AC	10.17	11.75	+27 4120	2009.863	21.0	3.224	4.6	ly		
21379+2743	2138001+274325	SKF245 AC	9.8	14.3	+27 4120	2009.860	20.7	3.244	4.6	ly-b		
21379+2743	2138000+274325	SKF245 AC	10.17	11.75	+27 4120	2010.600	20.7	3.263	4.9	ly		
21380+4153	2137583+415251	A402	9.12	10.54	+41 4213	2009.627	46.2	0.860	>1.0	1Q-dv		
21380+5037	2138029+503703	COU2443	9.78	10.12	+49 3574	2010.674	234.4	1.022	0.6	ly		
21392+4411	2139122+441104	BU1331	9.30	10.40	+43 3996	2009.627	340.4	0.936	>1.0	4Q-dv		
21395+3009	2139302+300922	A772	8.70	9.80	+29 4474	2010.696				S	[78.5 0.129 Doc2011b]	
21395-0003	2139313-000304	BU1212 AB	6.94	8.44	-00 4245	2009.863	288.1	0.475	0.4	ly	0.6 -0.015 Hei1994a	
21412+4117	2141120+411648	COU1977	8.4	13.6	+40 4608	2009.595	97.4	1.218	3.7	2Q-ly		
21420+1856	2141599+185620	LBU2 Aa,Ab	8.0	9.5	+18 4841	2009.863				NR!		
21421+4414	2142084+441334	A403	9.92	10.09	+43 4017	2009.627	78.1	0.506	>1.0	1Q-dv		
21423+0555	2142184+055443	HU280	8.33	8.50	+05 4851	2009.647	169.8	0.235			-10.6 $^\circ$ -0.134 USN2006a	
21424+1750	2142252+175009	HU373 AB	8.90	10.44	+17 4626	2009.863	298.7	0.951	1.7	ly		
21424+4105	2142229+410437	KUI108 AB	6.33	6.72	+40 4615	2009.627	50.7	0.164			1.9 -0.006 Hrt2000c	
21425+4832	2142292+483237	COU2313	11.2	11.2	+47 3530	2009.595	237.6	0.407	<0.1	3Q-ly		
21432+3801	2143163+380103	HDS3094 Aa,Ab	8.28	8.64	+37 4407	2009.819				NR		
21434+3817	2143256+381701	KUI109 Aa,Ab	5.69	11.1	+37 4408	2009.819	143.5	1.886	5.7	ly		
21439+0159	2143508+015930	A2097	10.7	10.8	+01 4531	2009.655	212.4	0.560		3Q-ly		
21445+3933	2144284+393152	A1447	10.2	10.2	+38 4595	2009.627	243.2	0.370	0.5	3Q-dv		
21447+0250	2144442+024952	BU1263	9.44	9.90	+02 4403	2009.655	198.4	0.560	>1	3Q-dv		
21448+4425	2144488+442403	COU2234	10.5	10.5	+43 4035	2009.627				S		
21451+3424	2145062+342222	COU1186	11.9	11.9	+33 4339	2009.627	46.7	0.353	0.1:	1Q-dv		
21455+2156	2145307+215624	AG276	9.62	9.99	+21 4611	2009.811	2.8	0.973		b i		
21460+3626	2145598+362554	HDS3100	9.15	11.25	+35 4629	2009.819	188.5	0.467	2.2	3Q-ly		
21461+2001	2146080+200127	HU376	8.87	11.65	+19 4780	2009.729	15.7	1.407	3.4	1Q-ly		
21461+2001	2146080+200127	HU376	8.87	11.65	+19 4780	2009.811	12.9	1.508	3.2	b i ly		
21461+2001	2146080+200127	HU376	8.87	11.65	+19 4780	2009.811	14.5	1.432		b i		
21462+4254	2146113+425409	COU1979	9.0	9.4	+42 4203	2010.674				NR		
21465+2210	2146288+221028	HDS3101 Aa,Ab	7.24	9.59	+21 4615	2009.729				NR		
21472+2409	2147098+240842	HDS3103	7.74	11.02	+23 4392	2009.729	115.0	0.613	3.9	2Q-ly		
21485+0331	2148306+303057	HEI289	10.71	10.87	+02 4418	2009.655	312.3	0.749	0.1	4Q-dv		
21493+3451	2149163+345104	COU1483	10.67	11.05	+34 4536	2009.597	132.0	0.679	1.2	2Q-ly		
21497+2039	2149403+203929	TDT3182	9.60	11.95	+19 4794	2009.811	210.0	1.852		b i		
21501+1717	2150086+171709	COU14	5.74	6.94	+16 4612	2009.605	33.3	0.299	1.3	1Q-ly	1.6 0.017 Mut2010b	
21501+1717	2150086+171709	COU14	5.74	6.94	+16 4612	2009.863	34.5	0.330	0.8:	ly	1.0 0.040 Mut2010b	
21501+1717	2150086+171709	COU14	5.74	6.94	+16 4612	2010.641	38.4	0.320	1.3	ly	-0.2 0.009 Mut2010b	
21502+5131	2150115+513021	COU2655	10.8	11.3	+50 3450	2009.603	249.7	0.289				
21502+6144	2150149+614404	TDT3186	10.93	11.44		2010.641	152.8	0.830	2.8	ly		
21510+2911	2151021+291033	A889	9.23	10.48	+28 4210	2009.729	82.6:	0.148:		1Q-ly	13.9 -0.045 Baz1984b	
21511+1022	2151074+102204	HEI599 AC	8.62	8.83	+09 4913	2009.830				S		
21511+1022	2151074+102204	COU2549 AB	8.8	8.83	+09 4913	2009.863				S		
21513+4456	2151180+445553	COU2318	10.1	12.3	+44 3967	2010.696	109.0	0.735	2.1	ly		
21517+3716	2152045+371430	COU1641	12.0	13.3		2009.819	308.2	2.057	2.3	4Q-ly		
21520+3857	2152025+385716	COU1823	7.69	11.54	+38 4625	2009.778	13.0	0.999	4.5	1Q-ly		
21526+4909	2152346+490949	COU2445	11.1	11.15	+48 3531	2010.600	18.9	1.414	0.4	ly		
21530+0518	2153018+051827	HU379	10.31	10.84	+04 4759	2009.830	252.8	1.431	1.0	ly		
21531+4826	2153022+482542	COU2319 AB	11.7	14.3	+47 3592	2010.600	59.6	0.845				
21538+4041	2153496+404038	COU1980	9.30	12.28	+40 4664	2010.600	247.6	1.506	3.0	ly		
21543+1333	2154113+133313	BU1213 BC	11.00	11.56		2009.830	309.6	0.974	1.4	ly		
21544+3206	2154216+320557	COU1042	10.5	12.2		2009.597	107.8	1.383	1.8	2Q-ly		
21553+1842	2155172+184311	HO173	10.34	10.63	+18 4888	2009.830	72.2	1.001	1.1	ly		
21556+3849	2155339+384859	A1449	9.6	9.6	+38 4638	2010.696	54.5	0.314	0.1	ly	5.1 0.005 Baz1993a	
21561+2846	2156074+284627	COU837 AB	11.1	11.6		2009.597	329.9	1.187	0.2	4Q-ly		
21565+0715	2156297+071432	STT453 AB	8.87	9.55	+06 4930	2009.830	268.5	0.717	0.6	ly		
21565+1940	2156309+194022	HU382	10.17	10.25	+18 4892	2009.830	219.0	0.321	0.6	3Q-ly		
21566+0633	2156332+063231	HU381	10.4	10.5	+05 4903	2009.647	229.2	0.189				
21572+1047	2157103+104722	A622	8.9	9.0	+10 4661	2009.863	284.0	0.160				
21579+3616	2157512+361613	COU1338	10.7	12.0		2009.627	111.2	1.169	1.0	2Q-dv	(double peak !)	
21586+3900	2158371+390031	COU1824	10.98	11.26	+38 4647	2009.627	301.4	0.608	1.1	4Q-dv		
21590+3422	2159022+342235	COU840	10.79	11.35	+33 4396	2009.778	67.3	1.127	1.9	1Q-ly		
21590+3839	2159064+383846	COU1339	10.56	12.7	+37 4464	2009.778	259.0	1.561	3.1	ly		
21590+4807	2158585+480655	COU2446	10.8	11.4	+47 3641	2009.595	58.8	0.395	1.0:	1Q-ly		
21593+0537	2159166+053644	HDS3123	9.88	10.55	+04 4779	2009.830	246.4	0.289		3Q-ly		
21593+3516	2159154+351535	COU1340	9.4	9.6	+34 4579	2010.696	1.8	0.206		1Q-ly:		
21593+4606	2159154+460531	COU2138	9.5	9.8	+45 3750	2010.649	342.7	0.219		4Q-ly	7.4 0.047 Doc2012c	

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
22002+4756	2200141+475547	A778 AB	10.1	10.9	+47 3650	2010.696	221.7	0.346	0.8	ly		
22007+4722	2200393+472153	COU2447	9.77	10.66	+46 3528	2010.600	124.9	0.319	1.2:	ly		
22007+6229	2200392+622916	KUI110	6.73	10.02	+61 2233	2009.603	222.1	0.991				
22012+2650	2201114+264949	A306	7.8	13.8	+26 4328	2009.819	309.5	1.449	3.5	4Q-ly	(first image with SPICA)	
22013+4515	2201245+451455	A780 CD	10.59	11.00	+44 4019	2010.696	110.1	1.095	1.8	ly		
22018+2334	2201489+233403	HO176	8.68	11.75	+22 4529	2009.819	180.5	1.155	3.0	3Q-ly		
22020+2651	2202007+265046	HO610 AB	10.07	10.25	+26 4333	2009.597	242.1	0.630	0.5	3Q-ly		
22020+3727	2201586+372644	A1452	9.98	13.0	+36 4741	2009.778	290.1	1.903	2.8	4Q-ly		
22023+3403	2202195+340205	COU733	10.71	13.4	+33 4414	2009.627	281.2	1.751	>1.0	4Q-dv		
22026+6816	2202274+681521	MLB310 BC	9.3	9.8		2009.888	197.8	3.489	1.3	b-ly		
22028+4839	2202500+483851	COU2322	10.32	11.35	+47 3672	2010.600	159.9	1.083	1.7	ly		
22037+0515	2203402+051501	HU491	10.63	10.93	+04 4792	2009.863	260.3	0.973	0.2	ly		
22039+5949	2203539+594852	HDS3132 Aa,Ab	6.82	9.87	+59 2456	2009.603	245.2	0.403				
22040+3841	2203574+384040	COU1341	10.12	11.70	+37 4478	2009.778	271.8	1.561	2.5	4Q-ly		
22041+3546	2204082+354534	HDS3133	9.55	11.53	+35 4699	2009.819	228.9	0.365	2.5	3Q-ly		
22052+2952	2205090+295203	A893	9.10	10.37	+29 4578	2009.729	255.2	0.269	1.6:	3Q-ly	10.1 0.067 FMR2014a	
22052+6335	2205138+633442	HDS3136	7.29	8.96	+62 2032	2009.603	155.2	0.409				
22059+4522	2205518+452217	A183	9.61	10.19	+44 4042	2010.696	245.4	0.739	1.0	ly		
22061+4159	2206042+415837	A407 AB	10.08	10.15	+41 4381	2009.627	203.9	0.653	<0.1	3Q-dv		
22063+3938	2206155+393742	COU1485	8.74	11.16	+38 4681	2009.627	68.1	0.528		1Q-dv		
22066+1416	2206495+141649	HEI293	11.07	11.15	+13 4848	2009.863	73.4	0.879	1.3	ly		
22070+3605	2207021+360537	STT462 AB	8.05	9.53	+35 4712	2009.778	318.0	1.065	1.7	4Q-ly		
22075+2538	2207291+253811	A308	8.83	9.38	+24 4536	2009.819	130.8	0.206		2Q-ly	0.6 0.022 Hrt2009	
22077+2622	2207402+262135	COU537	8.6	8.8	+25 4677	2010.600	139.5	0.264		2Q-ly	-1.6 ^Q 0.032 Doc2012q	
22077+2622	2207402+262135	COU537	8.6	8.8	+25 4677	2010.649	145.0	0.289		2Q-ly	-7.0 ^Q 0.057 Doc2012q	
22100+2308	2210022+230733	COU136	7.56	9.20	+22 4563	2010.600	24.0	0.466	0.1	ly	1.0 -0.052 Cou1999b	
22104+4619	2210246+461833	COU2237	10.2	12.2	+45 3821	2010.600				NR		
22108+1142	2210476+114159	HEI602	10.7	11.2		2009.863	153.0	0.875	0.6	ly		
22109+2717	2210538+271722	COU538	10.8	10.8	+26 4360	2010.649				S		
22113+4010	2211160+401008	STT464 AB	8.89	9.06	+39 4775	2010.674	183.1	0.343	0.3	ly	-4.2 0.038 Lin1999b	
22122+0828	2212133+082738	HDS3150	9.05	9.33	+07 4818	2009.830	305.7	0.263		4Q-ly		
22124+2712	2212215+271208	HDS3151	8.94	11.14	+26 4371	2010.649				NR		
22125+5243	2212283+524258	COU2661	11.00	10.66	+51 3288	2009.603	84.9	0.472				
22127+3837	2212414+383636	COU1487	10.5	12.5		2009.627	120.8	1.112		2Q-dv		
22128+0111	2212460+011104	A2292	9.15	9.54	+00 4836	2009.830	272.8	0.481	1.9	ly		
22128+1355	2212453+135436	HU978	9.12	9.58	+13 4869	2009.860	205.9	1.139	1.9:	dv		
22131+3653	2213042+365311	A1458	10.03	10.60	+36 4787	2009.778	341.9	0.800	2.9	4Q-ly		
22140+4733	2213565+473258	COU2324	10.42	13.04		2010.696	64.7	1.336	2.0	ly		
22141+0536	2214037+053623	HU286	10.11	14.6	+04 4824	2009.863	269.2	1.768	2.8	ly		
22146+2934	2214346+293421	STF2881	7.65	8.24	+28 4327	2009.778	77.2	1.267	0.9	1Q-ly		
22153+2354	2215163+235339	COU138	11.44	11.9	+23 4494	2010.641	37.9	1.511	1.5	ly		
22158+4354	2215486+435403	HO180 AB	7.92	8.73	+43 4165	2010.641	239.7	0.778	0.9	ly		
22166+5036	2216370+503606	COU2325	10.7	11.2	+49 3798	2009.603	138.1	0.549				
22171+0822	2217065+082227	HU287	7.73	11.24	+07 4836	2009.830	82.6	1.326				
22201+4625	2220069+462437	A185	10.20	10.31	+45 3885	2010.641	136.4	0.760	0.7	ly		
22202+2931	2220128+293108	BU1216	8.61	9.21	+28 4351	2009.778	278.9	0.889	1.1	4Q-ly		
22205+4817	2220316+481716	A186 AB	9.61	10.26	+47 3777	2010.649	11.2	0.984	1.5	ly		
22205+4817	2220316+481716	GHI31AB,C	9.61	10.26	+47 3777	2010.649	96.7	4.270	>7.0	ly		
22207+4615	2220442+461433	COU2141	10.90	11.08	+45 3892	2010.600	211.1	0.857	1.8	ly		
22210+0039	2220587+003737	RST5168	10.88	13.6	-00 4345	2009.830				NR		
22210+3119	2221018+311835	BU1217	7.91	9.48	+30 4685	2009.627	228.2	0.302	>1.0	3Q-dv	(rings)	
22210+6658	2220576+665754	STT470	7.37	9.77	+66 1501	2009.888	352.4	3.735	3.0	b-ly		
22212+1054	2221114+105341	A628	8.64	11.6	+10 4735	2009.830	226.3	1.280	2.1	ly		
22226+4738	2222385+473756	COU2327	10.27	12.00	+46 3676	2010.641	329.5	0.941	2.1	ly		
22237+2051	2223396+205053	STF2900 AB	6.28	9.18	+20 5139	2009.819	181.3	0.544	3.1	3Q-ly		
22241-0450	2224068-045013	BU172 AB	6.45	6.63	-05 5780	2009.863	39.9	0.420		1Q-ly	-1.4 0.006 Doc2007d	
22248+2841	2224488+284108	HDS3176	8.69	10.40	+27 4315	2010.649	332.4	0.388	1.1:	ly		
22256+4218	2225379+421852	COU1831	10.7	12.7	+41 4494	2009.627	38.5	0.987	2.1:	1Q-dv		
22271+1117	2227078+111658	A1231	8.5	13.8	+10 4754	2009.830	258.8	1.990	5.5	ly		
22277+0431	2227429+043125	BU291 AB	9.8	9.8	+03 4709	2009.830	232.4	0.330	1.2	ly		
22280+5132	2228015+513143	COU2695	10.5	12.5	+50 3727	2010.641	83.9	0.619	1.8	ly		
22281+1215	2228072+121455	BU701 AB	7.34	9.62	+11 4804	2009.830	182.4	1.007	1.8	ly	-0.5 0.052 Cve2005	
22281+2942	2228056+294208	BU1218	9.54	10.09	+28 4378	2009.778	54.6	1.498	1.2	1Q-ly		
22281+2942	2228056+294208	BU1218	9.54	10.09	+28 4378	2009.811	53.3	1.522		b i		
22282+0910	2228103+091006	COU5 AB	10.52	11.16	+08 4873	2009.860	251.1	0.931	1.2	ly		
22284+4729	2228254+472920	COU2328	10.92	11.33	+46 3712	2010.641	154.0	0.761	1.4	ly		
22289+4528	2228532+452737	COU2240	9.68	10.72	+44 4143	2010.641	79.1	0.349	1.6	ly		
22300+0426	2229579+042554	STF2912 AB	5.70	7.59	+03 4713	2009.860				NR		
22300+5122	2229596+512210	HU1318 AB	9.86	9.92	+50 3737	2010.674	13.4	0.775	<0.1	ly		
22300+5122	2229596+512210	GHI35 AB,C	9.37	12.2	+50 3737	2010.674	191.7	5.825	3.0	ly		
22302+2228	2230145+222800	HU388	8.48	9.10	+21 4770	2010.674	59.5	0.509	0.5	ly	-0.1 -0.014 Doc2008c	
22302+4655	2230127+465504	COU2329	11.7	12.0		2010.641	142.4	0.518	1.9	ly		
22305+2232	2230313+223214	VOU38	9.56	10.46	+21 4772	2009.819				NR:		
22307+1758	2230426+175828	COU234	9.68	9.13	+17 4759	2010.674	2.6	0.187		1Q-ly	-6.1 0.010 Doc2012c	
22307+3923	2230437+392258	A1466	10.87	11.01	+38 4785	2009.627	161.7	0.746	0.8	2Q-dv		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
22307+4856	2230427+485551	HU1319	10.38	10.43	+48 3750	2010.649	215.0	0.312	0.3:	ly		
22313+3820	2231156+381956	HDS3193	10.13	11.62	+37 4599	2010.649	278.8	0.270		4Q-ly		
22323+2319	2232184+231839	HDS3198	9.97	10.45	+22 4656	2010.649	96.9	0.181				
22327+3936	2232425+393545	COU1834 AB	10.73	12.8	+38 4794	2009.778	40.1	1.675	2.2	1Q-ly		
22327+3936	2232425+393545	COU1834 AB	10.73	12.8	+38 4794	2009.811	38.5	1.704		b 3Q-dv		
22327+3936	2232425+393545	COU1834 AB	10.73	12.8	+38 4794	2009.819	39.6	1.728	1.8	1Q-ly		
22327+3936	2232425+393545	GII16 AB,C	10.7	14.0	+38 4794	2009.819	238.6	3.490	3.6	3Q-ly		
22328+3324	2232506+332412	BU381	8.89	10.07	+32 4451	2009.844	225.7	1.464		ly b		
22330+4121	2233029+412102	COU1988	8.43	11.17	+40 4848	2009.844	350.7	1.949		ly b		
22334+3935	2233235+393431	COU1835 AB	8.2	13.2	+38 4797	2009.778	51.8	1.821	3.8	1Q-ly		
22334+3935	2233235+393431	COU1835 AB	8.2	13.2	+38 4797	2009.811	50.1	1.794		b i		
22341+3920	2234073+392008	BU707 AB	8.7	13.2	+38 4801	2009.778				NR		
22343+0345	2234193+034433	HDS3201	9.09	9.69	+02 4522	2009.830	358.2	0.114		4Q-ly-b		
22344+2623	2234229+262309	COU540	8.9	9.3	+25 4767	2010.674	318.1	0.343	1.2	ly	1.5 0.011 Mnt2004a	
22345+4046	2234302+404630	COU548 Aa,Ab	7.2	9.2	+40 4854	2009.844	167.0	1.152		ly b		
22352+1437	2235121+143638	HU982	7.81	9.40	+13 4944	2009.860	215.8	0.573		3Q-dv		
22358+1943	2235473+194260	HDS3209	7.28	10.54	+18 5009	2009.863	27.2	0.705	2.1	ly		
22360+4515	2236023+451454	COU2242	10.75	10.77	+44 4175	2010.641	276.1	0.832	0.3	ly		
22365+3831	2236301+383060	COU1193	10.98	11.83	+37 4635	2009.627	91.9	1.019	1.7	2Q-dv		
22375+1607	2237299+160645	HEI86 AB	9.9	9.9	+15 4683	2009.830	285.9	0.323				
22385+0218	2238292+021756	HO479	8.50	9.75	+01 4635	2009.830	58.1	0.355	0.8	ly	-0.6 0.016 Hrt2014b	
22389+1931	2238526+193121	KU1113	5.8	11.4	+18 5014	2009.830				S!		
22400+0113	2240005+011233	A2099	8.54	9.38	+00 4905	2009.860	164.5	0.769	0.8	ly	1.0 -0.010 Hrt2010a	
22400+4800	2240004+480026	COU2335	10.70	10.97	+47 3878	2010.641	345.8	0.986	0.8	ly		
22402+3732	2240137+373140	HO188	8.68	9.04	+36 4905	2010.649	224.5	0.369	0.5	ly	-1.3 0.033 USN2006b	
22406+0632	2240347+063142	HU494	9.95	9.94	+05 5054	2009.860	333.9	0.458		4Q-dv	2.3 -0.010 Hrt2010a	
22409+1433	2240527+143257	HO296 AB	6.14	7.22	+13 4971	2009.860	69.7	0.414		1Q-dv	-1.3 -0.005 Mut2010b	
22419+2126	2241517+212553	STF2934	8.64	9.55	+20 5208	2010.674	57.5	1.374	1.1	ly	1.0 0.152 Hei1981a	
22419+2126	2241517+212553	STF2934	8.64	9.55	+20 5208	2010.674	57.2	1.373			0.7 0.151 Hei1981a	
22424-0048	2242239-004730	A1233	10.00	10.49	-01 4339	2009.863	182.3	0.204		3Q-ly		
22426+4401	2242354+440057	A414 AB	9.84	9.78	+43 4276	2009.844	193.8	1.726	0.1	ly b		
22426+4550	2242337+454958	COU2336	10.62	10.90	+45 4028	2010.641	30.9	0.488				
22430+0637	2243024+063710	HU394	9.7	11.4	+05 5060	2009.860				NR		
22442-0057	2244119-005712	RST5487	9.70	9.95	-01 4340	2009.863				NR		
22451-0240	2245044-023923	A2696 BC	10.31	10.16		2009.860	79.5	0.591	0.9	ly	-3.9 0.008 Hei1973c	
22463+3319	2246186+331914	HDS3233 Aa,Ab	10.59	12.02	+32 4510	2009.627	303.5	0.328	2.6	2Q-ly		
22464+0030	2246245+002924	RST5170	10.4	11.6	-00 4417	2009.863	97.6	1.496	1.7	ly		
22466+6644		DJU8	10.5	10.9		2009.888				S!		
22470+4446	2246594+444623	A189 AB	8.99	9.16	+44 4232	2009.844	25.6	0.975	0.4	ly b		
22484+4906	2248257+490551	TDT3716	10.25	12.64		2010.674				S		
22485+3106	2248274+310602	BU1146	7.84	8.79	+30 4809	2010.641	75.4	0.270	0.9:	ly	-3.1 0.015 Cou1989c	
22487+1349	2248423+134929	HEI296	10.7	10.7	+13 4992	2009.830	341.7	0.656				
22502+1810	2250137+180948	HDS3243	9.46	12.67	+17 4817	2009.863	72.2	0.703	1.9:	ly		
22510+1330	2251022+132952	HEI297	10.10	12.06	+12 4895	2009.863	29.3	1.877	2.0	ly		
22514+2623	2251267+262328	HO482 AB	7.34	8.29	+25 4828	2009.638	18.1	0.500	0.7	1Q-dv	5.0 -0.076 Pru2014	
22518+3943	2251480+394252	HO298	8.8	12.1	+38 4884	2009.627				S		
22527+6759	2252421+675924	HDS3247 Aa,Ab	7.11	10.79	+67 1475	2009.888	301.6	0.844	5:	ly		
22527-0238	2252400-023733	HDS3248 Aa,Ab	7.96	11.00	-03 5521	2009.860	118.2	0.664		2Q-ly		
22536+5242	2253344+524154	HDS3252	8.46	11.41	+51 3499	2009.888	122.0	0.658	4.3	ly::		
22537+4445	2253401+444457	BU382 AB	5.97	7.79	+43 4331	2010.641	235.3	0.785	1.8	ly	1.2 -0.031 Sod1999	
22546+1054	2254371+105353	HDS3257	8.90	9.69	+10 4844	2009.863				NR		
22552-0459	2255110-045916	BU178	6.03	7.75	-05 5885	2009.860	324.8	0.609		4Q-ly	1.6 0.020 USN2007b	
22553+4028	2255189+402804	COU1840	9.7	10.2	+39 4971	2010.674	67.0	0.306				
22557+1547	2255434+154645	HU987	9.23	9.73	+15 4729	2009.860	76.9	1.115		1Q-dv	-2.1 0.028 USN2007a	
22569+3935	2256525+393418	COU1841 AB	9.7	11.7	+38 4902	2009.627	228.6	1.644	>1.0	3Q-dv	(elongated peak)	
22569+5941	2256523+594127	A634	8.1	11.6	+58 2515	2009.888	299.2	2.052	2.8	ly		
22570+2441	2257024+244056	COU542 Aa,Ab	9.29	9.93	+23 4640	2009.638	51.4	0.229	0.1:	1Q-dv	1.5 0.010 Doc2001b	
22570+2441	2257024+244056	COU542 Aa,Ab	9.29	9.93	+23 4640	2009.811	49.3	0.197			-0.6 -0.022 Doc2001b	
22570+2441	2257024+244056	COU542 Aa,Ab	9.29	9.93	+23 4640	2009.819	62.5	0.198			11.3 -0.019 Doc2001b	
22570+2441	2257024+244056	COU542 Aa,Ab	9.29	9.93	+23 4640	2010.641	63.2	0.190	0.5:	ly	6.0 -0.017 Doc2001b	
22578+2339	2257468+233905	HDS3265	8.23	12.16	+22 4744	2010.674	253.0	1.005	4.0	ly		
22578+4336	2257492+433622	COU2145	10.7	10.9	+42 4551	2010.696	237.2	0.322	2.2:	ly		
22578-4713	2257478+471328	A2399	10.0	13.2	+46 3890	2009.844	264.8	1.186	1.2:	ly b		
22579+1337	2257563+133642	HU989	7.67	9.52	+12 4919	2009.860	73.7	0.344		1Q-dv	5.6 0.044 Hei1998	
22579+3343	2257541+334314	HDS3266	9.21	10.01	+32 4552	2009.627				S		
22580+4954	2257600+495353	HDS3268	10.79	11.19	+49 3999	2010.641	244.0	0.782	1.0	ly		
22586+0921	2258351+092125	STT536 AB	7.0	7.3	+08 4973	2009.860	168.0	0.305			1.3 -0.021 Sod1999	
22586+6342	2258333+634224	HDS3270	7.65	9.53	+62 2146	2009.888				NR		
22587+0401	2258403+040033	A2296	9.5	10.5	+03 4804	2009.863	45.4	0.825	1.2	ly		
22587+2611	2258424+261120	COU543	9.5	9.5	+25 4852	2009.638	86.9	0.154				
22587+2611	2258424+261120	COU543	9.5	9.5	+25 4852	2010.641	82.4	0.194	0.6:	ly		
22592+1144	2259118+114344	STT483	6.11	7.27	+10 4859	2009.860	1.8	0.467		1Q-ly	-2.2 0.009 Alz2007	

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta$ (O-C) ($^\circ, ''$)	$\Delta\rho$ (O-C)
22597+4149	2259421+414925	HLD56	9.29	9.39	+41 4656	2009.844	93.9	1.198		ly b		
22597+6247	2259429+624638	HDS3273	9.31	11.10	+62 2152	2009.888	15.0	0.547	0.8	ly		
22598+3005	2259476+300439	HO192	8.65	10.57	+29 4830	2009.638	30.5	1.526		1Q-dv		
23001+2740	2300084+274018	TDS1198	10.49	12.36		2009.827	351.1:	0.821:			(Second obs.)	
23009+3522	2300557+352158	HU991	10.23	11.17	+34 4818	2010.674	299.7	0.861	1.0	ly	-0.5 0.022	Sca2017d
23014+4638	2301240+463818	A193	9.60	9.85	+45 4119	2009.792	175.7	1.528				
23014+4638	2301240+463818	A193	9.60	9.85	+45 4119	2009.792	176.0	1.527				
23018+4553	2301495+455309	HDS3278	10.45	10.64	+45 4121	2010.674	135.5:	0.636:	5.5:	ly:	(Second obs.)	
23022+1832	2302114+183206	HDS3279	8.46	11.78	+17 4852	2009.863	163.4	1.627	3.5	ly	(Second obs.)	
23027+5514	2302439+551411	HDS3280 Aa,Ab	6.51	10.52	+54 2900	2009.888	133.3	0.632	2.2:	ly		
23029+0738	2302523+073747	HDS3282	8.60	8.94	+06 5107	2009.863	308.4	0.197		3Q-ly		
23031+0456	2303071+045625	HDS3284	8.76	11.11	+04 4952	2009.863	251.3	0.708	1.5	ly		
23034+5834	2303213+583350	HDS3285	6.65	9.69	+57 2676	2009.888	132.1	0.411	3.7	ly		
23039+3510	2303553+351102	ES2134	11.19	13.4	+34 4828	2009.778	120.7	1.498	1.9	2Q-ly		
23039+3510	2303553+351102	ES2134	11.19	13.4	+34 4828	2009.811	116.1	1.504		b i		
23040+4835	2304028+483501	A195	8.99	10.75	+47 4027	2009.844	32.4	1.756	2.3	ly b		
23040+6324	2304022+632349	HDS3287 AB	7.84	10.19	+62 2163	2009.888	245.9	0.482	1.7	ly		
23043+0711	2304166+071229	HEI604	10.67	10.52	+06 5110	2009.863	4.8	0.450	1.0:	ly		
23043+3744	2304178+374415	COU1197	10.8	11.7	+36 4998	2010.674	163.6	0.417				
23074+4625	2307267+462448	COU2339 AB	10.90	11.14	+45 4148	2010.674	246.8	0.918	0.3	ly		
23078+1240	2307482+124024	BU1025 AB	7.77	9.75	+11 4940	2009.860	328.7	0.782	1.4	ly		
23080+4219	2307587+421942	COU1491	10.7	11.1	+41 4687	2010.674	356.1	0.215		4Q-ly		
23083+3028	2308204+302734	HO196	8.67	10.09	+29 4868	2009.778	297.4	1.880	1.8	4Q-ly		
23083+3028	2308204+302734	HO196	8.67	10.09	+29 4868	2009.811	295.1	1.872		b i		
23089+4705	2308536+470507	COU2340	9.8	11.4	+46 3949	2009.792	93.4	1.648	3.2	2Q-ly	(triple star ?)	
23089+4705	2308536+470507	COU2340	9.8	11.4	+46 3949	2009.792	95.5	1.507				
23101+5158	2310040+515820	HU1322	9.89	9.97	+51 3550	2009.888	123.0	0.485	0.9	ly		
23103+3229	2310172+322913	BU385 AB	7.44	8.23	+31 4859	2009.778	85.5	0.669	1.4	1Q-ly	-0.1 0.002	Lin2010c
23107+5900	2310429+590002	MLR364	10.0	10.0	+58 2555	2009.888				NR	(No measures in IC4: single?)	
23110+0637	2311019+063635	HEI829 AB	10.78	10.98	+05 5143	2009.860	87.2	1.020	1.5	ly		
23114+3813	2311258+381311	HO197 AB	8.47	9.16	+37 4785	2009.778	302.4:	0.204:	1.1	4Q-ly	1.2 -0.226	Doc1990c
23121+2656	2312066+265546	HDS3305AB	9.60	11.88	+26 4581	2009.638	170.4	1.274	2.3	2Q-ly		
23123+4449	2312150+444929	A197	9.13	9.59	+44 4350	2009.627	161.4	0.433		2Q-dv		
23137+3931	2313449+393111	A1481	9.9	10.0	+38 4957	2009.627	185.8:	0.116:				
23147+4116	2314398+411549	A200	8.7	9.2	+40 5025	2009.627	78.0	0.582		1Q-dv		
23149+4320	2314520+431953	MRZ2	10.17	12.22	+42 4611	2009.627	229.3	3.076	3.0	ly	(=HDS3309)	
23151+4319	2315043+431852	A201 AB	8.39	10.33	+42 4615	2009.627	24.0	0.522	2.6:	1Q-dv		
23155+4135	2315294+413505	HDS3310	10.58	11.58	+40 5031	2009.627	306.4	0.440	0.7	4Q-dv	(Second obs.)	
23176+1818	2317373+181817	HU400	7.01	8.80	+17 4891	2009.860				NR	[83.7 0.37	Sca2002d]
23176+3315	2317346+331456	HU790	8.59	11.24	+32 4618	2009.638	311.4	1.174		4Q-dv-q		
23189+0524	2318545+052420	BU80 AB	8.18	9.39	+04 4994	2009.860	230.4	0.530	0.6	ly	3.4 0.013	Hei1996c
23199+2844	2319516+284349	COU439 AB	9.24	9.94	+27 4530	2010.674	351.5:	0.202:			15.1 0.068	Doc2017e
23207+3855	2320420+385441	COU1494	10.94	12.4	+38 4981	2009.778	335.0	1.904	2.1	4Q-ly		
23207+3855	2320420+385441	COU1494	10.94	12.4	+38 4981	2009.811	333.0	1.808		b i		
23210+4926	2321003+492532	COU2700	9.8	10.8	+48 4004	2009.844	241.5	1.050		ly b		
23212+4219	2321098+421913	COU1647	9.3	10.3	+41 4755	2009.627	185.2	1.085	2.0	3Q-ly		
23215+4534	2321326+453427	COU2246	10.3	10.3	+44 4388	2010.674	97.4	0.323	2.5	ly		
23219+3149	2321549+314845	BU718 AB	5.44	7.76	+31 4897	2009.811	176.8	0.482				
23231+2445	2323036+244440	TDT4010	10.92	10.92	+23 4738	2009.638	273.2:	0.518:			(or S?) (Second obs.)	
23235+2059	2323316+205913	TDT4015	10.38	10.56	+20 5318	2009.638				S	(Not confirmed in IC4: single?)	
23236+0256	2323382+025557	HEI607	10.09	11.9	+02 4661	2009.860	32.2	1.294	1.7	ly		
23241+5732	2324079+573208	STT495	7.49	7.76	+56 2999	2009.888	122.0	0.376	0.3	ly	0.2 0.001	Alz2006
23257+2457	2325394+245714	HDS3335	7.06	11.25	+24 4773	2009.827	22.2	0.732	4.8:	ly		
23268+5434	2326485+543336	A1485	9.32	9.92	+53 3158	2009.888	209.0	0.567	0.6	ly		
23288+1512	2328507+151228	HU998	10.1	11.1	+14 4998	2009.830	179.4	0.372	0.4	ly		
23292+4042	2329121+404209	A1487	8.96	9.50	+39 5095	2009.844	159.1	1.070	0.6:	ly b		
23298+3142	2329459+314223	COU544	8.4	11.7	+30 4959	2009.638	264.6	1.070				
23301+6503	2330063+650311	BU1150	9.77	10.07	+64 1815	2009.888	64.6	0.681	1.0	ly		
23313+6206	2331188+620559	HU1000	8.06	9.31	+61 2466	2009.888	202.4	0.613	2.7	ly		
23322+0705	2332127+070506	HU298	7.46	7.92	+06 5168	2009.830	63.0	0.171			1.5 0.004	Hrt2000c
23322+0705	2332127+070506	HU298	7.46	7.92	+06 5168	2009.860	62.9	0.197			1.1 0.030	Hrt2000c
23333+4643	2333195+464356	COU2247	10.91	11.01	+45 4261	2010.674	72.6	0.917	0.7	ly		
23334+3215	2333220+321454	TDT4096	10.58	10.81	+31 4929	2009.827	103.9	0.449	0.2	ly		
23340+3120	2333572+311931	BU720	5.67	6.11	+30 4978	2009.819	101.0	0.563	0.3	2Q-ly	0.4 0.000	Mut2010e
23340+3120	2333572+311931	BU720	5.67	6.11	+30 4978	2009.827	100.5	0.563	0.5	ly	-0.1 0.000	Mut2010e
23347+1914	2334396+191401	COU341	10.3	13.0	+18 5172	2010.674	120.7	0.804	2.4	ly+i		
23357+4343	2335386+434308	COU2148	10.7	13.7	+42 4710	2009.844	260.2:	0.533:		ly b		
23375+4426	2337320+442545	STT500 AB	6.08	7.38	+43 4508	2010.674	10.3	0.461	1.0	ly	-4.7 0.037	Zul1981
23377+4457	2337399+445725	COU2249	10.31	10.56	+44 4459	2009.792	29.2	0.474				
23377+4741	2337334+474105	COU2248	10.2	10.8	+46 4102	2009.792	92.0	0.396				
23379+5806	2337538+580543	A642	8.86	10.16	+57 2766	2009.888	26.2	0.909	1.5	ly		

Table 6 Table of speckle measurements and O-C residuals with published orbits (cont.)

WDS	WDS(new)	Name	m_A (mag)	m_B (mag)	BD	Epoch	θ ($^\circ$)	ρ ($''$)	Δm_F (mag)	Notes	$\Delta\theta(\text{O-C})$ ($^\circ, ''$)	$\Delta\rho(\text{O-C})$
23392+5033	2339125+503242	COU2675	10.77	11.08	+49 4181	2009.888	17.6	0.618	1.6	ly		
23393+4543	2339208+454312	A643 AB	8.45	8.49	+44 4464	2009.792	133.9	0.252	0.2		0.4 0.012	Rbr2018
23393+4543	2339208+454312	A643 AB	8.45	8.49	+44 4464	2010.674	130.0	0.228	0.3	ly	-2.5 -0.013	Rbr2018
23401+1258	2340060+125805	HU1325	9.81	10.01	+12 5013	2009.830	29.4	0.841	1.3	ly	4.3 0.007	Sca2003a
23411+4328	2341103+432835	COU1997	10.63	12.09	+42 4734	2010.674	9.5	1.125	1.7	ly		
23420+1656	2341585+165547	HEI195	10.2	11.0	+16 4965	2009.860	338.7	1.502	2.5	ly		
23431+1150	2343061+115004	A1242	9.37	9.69	+11 5045	2009.830	337.9	1.020	0.5	ly	0.7 0.063	Lin2004c
23431+5214	2343045+521450	HU697	11.0	11.0	+51 3693	2009.888	99.2	0.534	<0.1	ly		
23432+4313	2343128+431338	POP172	10.0	10.2		2009.844	345.2	1.267:		ly b		
23436+0628	2343386+062828	HEI830	10.15	9.52	+05 5214	2009.830	303.0	0.404		4Q-ly		
23436+2506	2343339+250547	BU994	7.88	11.0	+24 4822	2009.638	315.7	1.402	2.9	4Q-ly		
23440+2922	2343595+292141	AGC14	5.07	8.10	+28 4627	2009.819	278.8	0.809	2.3	4Q-ly	1.6 -0.072	Pop1997f
23467+2521	2346397+252041	TDT4186	10.55	11.38		2009.827	230.3	1.854	1.0	ly		
23486+1622	2348381+162136	HEI91	10.1	11.9	+15 4888	2009.830	150.7	0.684	1.5	ly		
23498+2741	2349505+274051	A424	7.58	8.20	+26 4698	2009.638	162.3	0.158		3Q-dv	2.8 -0.001	Sca2002b
23502+1940	2350093+194000	COU344	10.04	10.42	+18 5226	2009.830	331.1	0.212	0.4:	ly	6.7 0.065	Msn2001a
23502+1940	2350093+194000	COU344	10.04	10.42	+18 5226	2010.674	330.0	0.231		4Q-ly	9.5 0.087	Msn2001a
23504+2620	2350212+261960	COU545	9.66	9.93	+25 5017	2009.638	317.1	0.751	1.5	4Q-ly		
23511+3147	2351073+314724	A1246	9.1	12.2	+30 5038	2009.638	94.1	0.938	>1.0	2Q-dv		
23515+5913	2351281+591324	MLR367	10.5	10.5	+58 2661	2009.888	147.2	0.693	3.8	ly		
23516+4205	2351330+420458	STT510 AB	7.86	8.43	+41 4881	2009.792	121.1	0.591			0.0 ^Q 0.005	Nov2006e
23522+4331	2352096+433032	BU728 AB	8.69	8.94	+42 4782	2009.844	11.0	1.224	0.5	ly b		
23523+0130	2352168+012955	A2198	8.18	12.03	+00 5064	2009.860	151.2	1.937		2Q-ly		
23527+6042	2352429+604104	BU1153 AB	9.7	9.9	+59 2784	2009.888	318.3	0.502	1.2	ly		
23536+3316	2353346+331625	TDT4258	10.76	10.87	+32 4726	2009.827				S	(Not confirmed in IC4: single ?)	
23560+2815	2356026+281438	A425	10.26	10.99	+27 4647	2009.811	160.6	1.816		b i		
23561+2520	2356076+252026	A426	9.26	9.92	+24 4862	2010.674	290.5	0.380	0.8	ly	-3.8 -0.018	Hrt2001b
23561+4648	2356031+464759	COU2000	9.21	12.7	+45 4365	2009.792	209.6	1.062				
23569+4235	2356515+423513	A2800	9.51	14.1	+41 4901	2009.844	101.2	1.887		b 2Q-ly		
23570+4637	2356590+463704	HDS3397	7.84	9.76	+45 4369	2009.630				NR	(Not confirmed in IC4: single ?)	
23572+3751	2357131+375046	AG297	9.70	10.04	+37 4908	2009.838	313.4	2.084	0.6	ly		
23576+6626	2357341+662554	HDS3400	10.73	11.92	+65 1970	2009.888	276.6	0.441	0.8	ly	(Not confirmed in IC4: single?)	
23585+4815	2358281+481529	COU2150	10.8	10.8	+47 4344	2010.674	293.2	0.192				
23588+4454	2358479+445346	HDS3405	9.04	12.66	+44 4532	2009.844	313.6	1.543		ly b	(Second obs.)	
23595+3343	2359293+334327	STF3050 AB	6.46	6.72	+32 4747	2009.838	336.6	2.254	0.7	ly	0.5 0.003	Hrt2011a
23595+5441	2359318+544119	A1498	9.16	8.12	+53 3267	2009.630	90.8	0.373	0.6	2Q-ly		