

# Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

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**Abstract:** This paper presents measurements of Theta ( $\theta$ ) and Rho ( $\rho$ ) for 628 double stars listed in the Washington Double Star Catalog (WDS). The measurements were made between November of 2017 and December of 2018.

## 1. Introduction

This paper presents measurements of 628 double star systems studied between November 2017 and December 2018 at Brilliant Sky Observatory located in Cave Creek, Arizona (a northern suburb of Phoenix, Arizona). The observatory and methodology used in these measurements are well-covered elsewhere in the pages of this journal (for example, references [1] - [3]) Harshaw 2018, Harshaw 2017A, and Harshaw 2017B).

## 2. Methodology

There are two major types of observation reported: S and CV.

S measurements are done with speckle interferometry. Speckle requires two major conditions: (1) the stars are no farther apart than 5 arc seconds, and (b) the stars are bright enough to both register on the camera in 40 milliseconds or less.

CV measurements were done on stars that did not meet the speckle criteria—that is, they were farther apart than 5 milliarcseconds, or needed more than 40 milliseconds to record both stars on the camera's CCD chip (or both). The CV code is a relatively new code, and it signifies that speckle reduction software was used to analyze the data of a pair that does not fit true speckle criteria. The experience of this author is that using speckle reduction software to analyze double star images is more precise than using traditional CCD image measuring software.

The results will be presented in two tables. Table 1 will report the measurements of 32 pairs with known orbits or rectilinear solutions. Such pairs have published ephemerides which allow the observer to check his or her accuracy and to make residual calculations.

Table 2 will present measurements of 596 pairs which have not yet been classified as having orbits or rectilinear solutions.

At the end of each table is a summary line under the "Change per Year" column. The first row is the sum of all the annual changes while the second row is the mean change. One would expect that for any large collection of double star measurements, changes in theta and rho would tend to lie about a normal distribution, meaning that the cumulative total of the changes for both theta and rho should approach zero. The smaller the mean values are for the annual change in theta and rho, the better the overall accuracy of the measurements being reported. Ideally, both means should be zero, but that will rarely, if ever, be achieved in practice.

## 3. Acknowledgements

This research has made use of the Washington Double Star Catalog maintained at the U.S. Naval Observatory.

## 4. References

- [1] Harshaw, Richard W. "Measurements of 427 Double Stars With Speckle Interferometry: The Winter/Spring 2017 Observing Program at Brilliant Sky Observatory, Part 1", *JDSO*, **14** (2), 284-330, 2018.
- [2] Harshaw, Ricard W., "The Autumn 2016 Observing Program of Brilliant Sky Observatory", *JDSO*, **13** (4), 511-528, 2017.
- [3] Harshaw, Richard W., "The Speckle Toolbox: A Powerful Data Reduction Tool for CCD Astrometry", *JDSO*, **13** (1), 52-67, 2017.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 1: Measures of 32 Pairs with Known Orbits or Rectilinear Solutions, with Residuals

Double Star Measures, 2017-2018																	
Date	WDS Number	Discoverer	Observations	Method	Year	Last Reported			Measured			Changes from Last			Change per Year		
						θ	ρ	θ	θ	ρ	θ	θ	ρ	θ	ρ	θ	ρ
2017.9041	00424+0410	STT 18 AB	5	S	2014	210.2	2.05	211.42 ± 0.0	2.065 ± 0.002	1.22	0.015	0.312	0.004	0.004	0.004	0.004	0.004
			Type:	ORB (4)	Solution:	HRT 2001	Ephem:	209.4	2.038				Residuals:	-2.020	-0.027		
2018.0356	01030+4723	STT 21	5	S	2015	175.0	1.30	175.2 ± 0.1	1.300 ± 0.002	0.20	0.000	0.066	0.000	0.000	0.000	0.000	0.000
			Type:	ORB (5)	Solution:	HEI	Ephem:	175.7	1.143				Residuals:	-0.500	0.157		
2018.0329	01055+2107	AG 14	5	S	2010	314.7	0.76	309.0 ± 0.3	0.822 ± 0.004	-5.70	0.062	-0.710	0.008	0.008	0.008	0.008	0.008
			Type:	ORB (4)	Solution:	FMR 2014	Ephem:	309.3	0.851				Residuals:	0.300	-0.029		
2018.0329	01213+1132	BU 4 AB	5	S	2015	117.0	0.50	113.8 ± 2.3	0.639 ± 0.021	-3.20	0.139	-1.055	0.046	0.046	0.046	0.046	0.046
			Type:	ORB (4)	Solution:	SCA 2001	Ephem:	105.8	0.554				Residuals:	8.000	0.085		
2017.9945	01424-0645	A 1	5	S	2014	253.9	0.85	254.1 ± 0.0	0.785 ± 0.000	0.20	-0.065	0.050	-0.016	-0.016	-0.016	-0.016	-0.016
			Type:	ORB	Solution:	TOK 2015	Ephem:	253.5	0.868				Residuals:	0.600	-0.083		
2018.0110	01437+0934	BU 509	5	S	2015	44.0	0.80	41.8 ± 0.1	0.782 ± 0.002	-2.20	-0.018	-0.731	-0.006	-0.006	-0.006	-0.006	-0.006
			Type:	ORB (3)	Solution:	HRT 2010	Ephem:	45.1	0.767				Residuals:	-3.300	0.015		
2018.0356	01467+3310	STF 158 AB	5	S	2013	269.0	2.20	271.3 ± 0.0	2.237 ± 0.001	2.30	0.037	0.457	0.007	0.007	0.007	0.007	0.007
			Type:	ORB (5)	Solution:	HRT 2011	Ephem:	272.7	2.032				Residuals:	-1.400	0.205		
2018.0329	01532+1526	BU 260	5	S	2015	259.0	1.10	260.7 ± 0.1	1.110 ± 0.001	1.70	0.010	0.561	0.003	0.003	0.003	0.003	0.003
			Type:	ORB (5)	Solution:	CVE 2006	Ephem:	260.7	1.091				Residuals:	0.000	0.019		
2018.0110	01559+0151	STF 186	5	S	2015	71.0	0.70	71.3 ± 0.1	0.726 ± 0.001	0.30	0.026	0.100	0.009	0.009	0.009	0.009	0.009
			Type:	ORB (2)	Solution:	USN 2007	Ephem:	70	0.755				Residuals:	1.300	-0.029		
2018.0603	02140+4729	STF 228	5	S	2015	300.0	0.60	305.4 ± 0.3	0.636 ± 0.016	5.40	0.036	1.765	0.012	0.012	0.012	0.012	0.012
			Type:	ORB (2)	Solution:	SCA 2015	Ephem:	299.6	0.714				Residuals:	5.400	-0.078		
2018.0329	02280+0158	KUI 8	5	S	2008	38.8	0.51	38.4 ± 1.4	0.536 ± 0.016	-0.40	0.026	-0.040	0.003	0.003	0.003	0.003	0.003
			Type:	ORB (4)	Solution:	ZIR 2013	Ephem:	39.4	0.49				Residuals:	-1.000	0.046		

Table 1 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 1. (continued). Measures of 32 Pairs with Known Orbits or Rectilinear Solutions, with Residuals

Double Star Measures, 2017-2018															
Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year	
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	
2018.0466	02407+2637	STT 43	5	S	2015	338.0	0.60	342.5 ± 0.5	0.646 ± 0.017	4.50	0.046	1.477	0.015	0.015	
			Type:	ORB (4)	Solution:	SCA 2001	Ephem:	337.9	0.618		Residuals:	4.600	0.028		
2018.0110	02460-0457	BU 83	5	S	2015	13.2	0.98	11.8 ± 0.2	1.006 ± 0.002	-1.40	0.026	-0.465	0.009		
			Type:	ORB (5)	Solution:	HRT 2011	Ephem:	11.7	0.99		Residuals:	0.100	0.016		
2018.0658	02563+7253	STF 312 AB	5	S	2013	47.0	1.80	48.8 ± 0.1	1.800 ± 0.005	1.80	0.000	0.355	0.000		
			Type:	ORB (5)	Solution:	CVE 2006	Ephem:	46.9	1.745		Residuals:	1.900	0.055		
2018.0329	02572+0153	A 2413	5	S	2015	163.1	0.60	163.3 ± 0.7	0.564 ± 0.014	0.20	-0.036	0.066	-0.012		
			Type:	ORB (3)	Solution:	HRT 2010	Ephem:	163.5	0.581		Residuals:	-0.200	-0.017		
2018.0466	02589+2137	BU 525	5	S	2015	271.0	0.60	273.7 ± 0.9	0.585 ± 0.006	2.70	-0.015	0.886	-0.005		
			Type:	ORB (4)	Solution:	RBR 2018	Ephem:	275.6	0.489		Residuals:	-1.900	0.096		
2018.0959	03127+7133	STT 50 AB	10	S	2013	147.0	1.00	144.6 ± 0.0	1.015 ± 0.001	-2.40	0.015	-0.471	0.003		
			Type:	ORB (4)	Solution:	SCA 2012	Ephem:	145.4	0.915		Residuals:	-0.800	0.100		
2018.0877	03130+4417	STT 51	5	S	2014	340.0	0.70	346.2 ± 0.4	0.552 ± 0.002	6.20	-0.148	1.517	-0.036		
			Type:	ORB (5)	Solution:	LIN 2012	Ephem:	345.7	0.582		Residuals:	0.500	-0.030		
2018.0466	03140+0044	STF 367	5	S	2012	131.4	1.22	129.2 ± 0.0	1.293 ± 0.000	-2.20	0.073	-0.364	0.012		
			Type:	ORB (4)	Solution:	RAO 2014	Ephem:	127.8	1.154		Residuals:	1.400	0.139		
2018.0959	03196+6714	HU 1056	10	S	2012	80.7	1.09	79.5 ± 0.1	1.063 ± 0.001	-1.20	-0.027	-0.197	-0.004		
			Type:	ORB (5)	Solution:	ZIR 2015	Ephem:	79.8	1.056		Residuals:	-0.300	0.007		
2018.0466	03217+0845	STF 380	5	S	2015	6.0	0.90	4.0 ± 0.3	0.888 ± 0.012	-2.00	-0.012	-0.656	-0.004		
			Type:	ORB (5)	Solution:	POP 1996	Ephem:	4.4	0.889		Residuals:	-0.400	-0.001		
2018.0630	03344+2428	STF 412 AB	15	S	2015	352.0	0.80	352.6 ± 0.5	0.759 ± 0.002	0.60	-0.041	0.196	-0.013		
			Type:	ORB (3)	Solution:	SCA 2002	Ephem:	350.8	0.76		Residuals:	1.200	-0.001		
2018.0959	03350+6002	STF 400 AB	10	S	2015	267.0	1.60	268.8 ± 0.1	1.634 ± 0.002	1.80	0.034	0.581	0.011		
			Type:	ORB (3)	Solution:	USN 2006	Ephem:	268.4	1.612		Residuals:	0.400	0.022		
2018.0603	03520+0632	KUI 15 AB	15	S	2012	203.8	0.82	206.2 ± 0.3	0.824 ± 0.001	2.40	0.004	0.396	0.001		
			Type:	ORB	Solution:	ZIR 2015	Ephem:	206.6	0.799		Residuals:	-0.600	0.025		

Table 1 concludes on the next page.

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Table 1. (conclusion). Measures of 32 Pairs with Known Orbits or Rectilinear Solutions, with Residuals

Double Star Measures, 2017-2018																
Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	
2018.0877	04041+3931	STF 483	5	S	2015	53.0	1.60	52.6 ± 0.0	1.606 ± 0.001	-0.40	0.006	-0.130	0.002			
			Type:	ORB (4)	Solution:	USN 2006	Ephem:	53.7	1.533		Residuals:	-1.100	0.073			
2018.0630	04227+1503	STT 82 AB	5	S	2015	328.0	1.20	327.1 ± 0.2	1.222 ± 0.003	-0.90	0.022	-0.294	0.007			
			Type:	ORB (3)	Solution:	WSI 2004	Ephem:	328.9	1.19		Residuals:	-1.900	0.032			
2018.0630	04233+1123	STF 535	5	S	2013	271.3	1.13	266.9 ± 0.1	1.090 ± 0.001	-4.40	-0.040	-0.869	-0.008			
			Type:	ORB (5)	Solution:	HRT 2000	Ephem:	265	1.021		Residuals:	1.000	0.069			
2018.0877	04385+2656	STF 572 AB	5	S	2014	188.6	4.35	188.7 ± 0.1	4.393 ± 0.010	0.10	0.043	0.024	0.011			
			Type:	LIN	Solution:	HRT 2011	Ephem:	188.6	4.37		Residuals:	0.100	0.023			
2018.0877	04422+3731	STF 577	5	S	2014	329.0	0.70	325.7 ± 0.3	0.763 ± 0.002	-3.30	0.063	-0.807	0.015			
			Type:	ORB (4)	Solution:	RAO 2014	Ephem:	322.9	0.519		Residuals:	2.800	0.244			
2018.2384	08554+7048	STF1280 AB	5	S	2012	353.1	2.67	357.5 ± 0.2	3.419 ± 0.007	4.40	0.749	0.705	0.120			
			Type:	ORB (4)	Solution:	HEI 1997	Ephem:	355.8	2.962		Residuals:	1.700	0.457			
2018.9233	22226+3328	ES 390	5	CV	2010	267.4	8.50	268.45 ± 0.04	8.404 ± 0.013	1.05	-0.096	0.118	-0.011			
			Type:	LIN	Solution:	HRT 2011	Ephem:	268.6	8.241		Residuals:	0.150	-0.163			
2018.9233	23133+2205	STF2990 AB	5	S	2010	55.8	2.51	55.95 ± 0.05	2.625 ± 0.002	0.15	0.115	0.017	0.013			
			Type:	LIN	Solution:	HRT 2011	Ephem:	55.32	2.557		Residuals:	-0.630	-0.068			
											Cumulative:	15.400	1.387			
											Mean:	0.481	0.043			

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2: Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$
2017.9041	00028+0208	BU 281 AB	5	S	2014	160.3	1.59	159.4 ± 0.1	1.585 ± 0.006	-0.90	-0.005	-0.231	-0.001			
2017.9370	00029+2844	MLB 509	3	CV	2002	325.1	3.28	328.89 ± 0.2	3.268 ± 0.013	3.79	-0.012	0.238	-0.001			
2017.9205	00065+0155	HJ 1000	3	CV	2005	205.9	7.41	205.2 ± 0.0	7.259 ± 0.007	-0.70	-0.151	-0.054	-0.012			
2017.9370	00083+2029	BOW 3	3	CV	2011	47.5	3.28	47.99 ± 0.1	3.336 ± 0.015	0.49	0.056	0.071	0.008			
2017.9370	00084+1843	COU 246	3	CV	2008	252.3	1.63	251.63 ± 0.2	1.637 ± 0.007	-0.67	0.007	-0.067	0.001			
2017.9041	00137+0635	BU 998	5	S	2006	107.6	1.29	107.73 ± 0.1	1.275 ± 0.003	0.13	-0.015	0.011	-0.001			
2017.9205	00162-0359	ROE 115	3	CV	2010	303.0	5.50	301.98 ± 0.0	5.512 ± 0.003	-1.02	0.012	-0.129	0.002			
2017.9041	00174+0853	STF 22 AB-C	5	S	2012	235.0	4.00	234.52 ± 0.0	3.942 ± 0.001	-0.48	-0.058	-0.081	-0.010			
2017.9370	00174+1002	A 1804	3	CV	2005	27.4	1.34	27.32 ± 0.2	1.233 ± 0.003	-0.08	-0.107	-0.006	-0.008			
2017.9205	00199+0317	BAL1607	3	CV	2002	189.4	3.17	189.45 ± 0.5	3.127 ± 0.020	0.05	-0.043	0.003	-0.003			
2017.9370	00344+1844	COU 250	3	CV	2005	36.5	1.20	40.44 ± 0.2	1.267 ± 0.001	3.94	0.067	0.305	0.005			
2017.9370	00414+1439	KU 6	3	CV	2009	224.9	1.90	226.07 ± 0.2	1.850 ± 0.006	1.17	-0.050	0.131	-0.006			
2017.9370	00419+1751	A 2303	3	CV	2001	218.3	1.17	221.23 ± 0.9	1.073 ± 0.050	2.93	-0.097	0.173	-0.006			
2017.9205	00486-0146	HDO 35	3	CV	2010	34.1	7.26	34.06 ± 0.0	7.292 ± 0.007	-0.04	0.032	-0.005	0.004			
2018.0329	01004+1803	BRT1927	5	S	2013	172.0	2.00	169.6 ± 0.2	1.894 ± 0.005	-2.40	-0.106	-0.477	-0.021			
2018.0110	01007+0929	STF 82 AB	5	S	2008	304.0	1.80	304.2 ± 0.0	1.858 ± 0.002	0.20	0.058	0.020	0.006			
2018.0356	01070+3014	A 929 AB	5	S	2015	135.0	0.70	127.7 ± 0.2	0.645 ± 0.012	-7.30	-0.055	-2.405	-0.018			
2017.9945	01072-0144	STF 91	5	S	2012	314.0	4.30	314.41 ± 0.0	4.321 ± 0.003	0.41	0.021	0.068	0.004			
2018.0356	01089+4512	AC 13 AB	5	S	2015	266.0	0.70	264.8 ± 0.3	0.616 ± 0.021	-1.20	-0.084	-0.395	-0.028			
2018.0329	01097+2348	BU 303	5	S	2015	293.0	0.70	292.1 ± 0.4	0.551 ± 0.009	-0.90	-0.149	-0.297	-0.049			
2018.0466	01099+4011	AG 15	5	S	2012	70.0	2.80	70.0 ± 0.0	2.818 ± 0.001	0.00	0.018	0.000	0.003			
2018.0466	01121+4700	BU 236	5	S	2010	113.0	5.40	114.2 ± 0.1	5.362 ± 0.007	1.20	-0.038	0.149	-0.005			
2018.0356	01151+3416	HU 803	5	S	2013	209.0	0.90	215.7 ± 0.2	0.932 ± 0.004	6.70	0.032	1.331	0.006			
2017.9945	01163-0709	STF 106	5	S	2009	308.0	4.60	306.52 ± 0.0	4.620 ± 0.002	-1.48	0.020	-0.165	0.002			

Table 2 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$
2018.0466	01119+4748	BU 398	5	S	2008	44.0	1.74	43.6 ± 0.0	1.820 ± 0.000	-0.40	0.080	-0.040	0.008			
2017.9945	01198-0031	STF 113 A-BC	5	S	2015	22.0	1.60	20.94 ± 0.1	1.616 ± 0.002	-1.06	0.016	-0.354	0.005			
2018.0110	01205+0418	J 1807	3	CV	2008	249.9	3.10	248.6 ± 0.1	3.112 ± 0.008	-1.30	0.012	-0.130	0.001			
2018.0329	01208+1813	A 2212	5	S	2015	214.0	1.30	213.5 ± 0.1	1.331 ± 0.003	-0.50	0.031	-0.165	0.010			
2018.0329	01255+2832	HO 310	5	S	2013	357.0	1.60	355.9 ± 0.0	1.692 ± 0.008	-1.10	0.092	-0.219	0.018			
2018.0110	01291+0347	A 2317	5	S	2009	58.4	1.09	58.9 ± 0.2	1.031 ± 0.008	0.50	-0.059	0.055	-0.007			
2018.0329	01321+1218	AG 20	5	S	2015	247.0	2.50	249.1 ± 0.0	2.633 ± 0.010	2.10	0.133	0.692	0.044			
2018.0356	01355+3118	STF 137	5	S	2011	85.0	3.30	85.4 ± 0.2	3.385 ± 0.003	0.40	0.085	0.057	0.012			
2018.0356	01359+3304	HLD 6	5	S	2009	294.5	2.15	294.6 ± 0.0	2.140 ± 0.001	0.10	-0.010	0.011	-0.001			
2018.0110	01360+0739	STF 138 AB	5	S	2015	58.0	1.80	59.7 ± 0.0	1.736 ± 0.001	1.70	-0.064	0.565	-0.021			
2018.0329	01391+2656	BU 508 AB	5	S	2015	53.0	0.70	53.2 ± 1.0	0.668 ± 0.016	0.20	-0.032	0.066	-0.011			
2018.0356	01401+3858	STF 141	5	S	2013	303.0	1.70	303.2 ± 0.0	1.670 ± 0.002	0.20	-0.030	0.040	-0.006			
2018.0110	01443+0929	STF 155 AB	5	S	2012	325.0	5.00	324.7 ± 0.0	4.942 ± 0.001	-0.30	-0.058	-0.050	-0.010			
2018.0356	01445+3957	STF 149	5	S	2015	81.0	1.40	81.2 ± 0.1	1.436 ± 0.002	0.20	0.036	0.066	0.012			
2018.0110	01479-0057	BU 871	5	S	2008	349.1	1.93	346.6 ± 0.0	2.089 ± 0.002	-2.50	0.159	-0.250	0.016			
2018.0329	01492+2815	A 2009	5	S	2009	321.9	0.86	321.4 ± 0.0	0.893 ± 0.005	-0.50	0.033	-0.055	0.004			
2018.0329	01501+2217	STF 174	5	S	2015	163.0	2.80	163.9 ± 0.1	2.909 ± 0.003	0.90	0.109	0.297	0.036			
2018.0329	01520+1049	STF 178	5	S	2013	205.0	3.00	205.1 ± 0.1	3.049 ± 0.005	0.10	0.049	0.020	0.010			
2018.0356	01532+3719	STF 179	5	S	2007	160.0	3.50	160.4 ± 0.0	3.511 ± 0.003	0.40	0.011	0.036	0.001			
2018.0329	01551+2847	STF 183 AB-C	5	S	2011	162.6	5.64	161.8 ± 0.1	5.635 ± 0.002	-0.80	-0.005	-0.114	-0.001			
2018.0356	01557+3620	HU 1033	5	S	2015	215.0	1.30	216.2 ± 0.0	1.229 ± 0.001	1.20	-0.071	0.395	-0.023			
2018.0356	01579+3310	A 1920	5	S	2011	233.3	1.71	236.2 ± 0.3	1.776 ± 0.015	2.90	0.066	0.412	0.009			
2017.9945	01579-1158	HU 13	5	S	2001	111.4	1.00	114.06 ± 0.0	1.035 ± 0.003	2.66	0.035	0.157	0.002			
2018.0329	01593+2450	STF 194	5	S	2013	280.0	1.20	278.9 ± 0.0	1.295 ± 0.001	-1.10	0.095	-0.219	0.019			
2018.0603	02002+4427	STF 195	15	S	2008	194.3	3.02	194.6 ± 0.0	3.012 ± 0.001	0.30	-0.008	0.030	-0.001			
2018.0877	02045+4750	WFC 7	5	CV	2010	122.0	5.20	120.4 ± 0.0	5.318 ± 0.018	-1.60	0.118	-0.198	0.015			

Table 2 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$
2018.0110	02052-0058	BU 516	5	S	2015	316.0	0.60	317.4 ± 0.3	0.699 ± 0.004	1.40	0.099	0.465	0.033			
2018.0110	02070-0413	HDS 283	5	S	2010	267.8	0.91	263.5 ± 0.3	0.871 ± 0.025	-4.30	-0.039	-0.537	-0.005			
2018.0466	02140+3431	STF 229	5	S	2013	356.0	2.40	356.1 ± 0.0	2.490 ± 0.001	0.10	0.090	0.020	0.018			
2018.0356	02174+2353	STF 240	5	S	2013	53.0	4.80	52.1 ± 0.0	4.786 ± 0.001	-0.90	-0.014	-0.179	-0.003			
2018.0356	02176+2214	STF 244	5	S	2013	290.0	4.30	289.7 ± 0.0	4.415 ± 0.005	-0.30	0.115	-0.060	0.023			
2018.0356	02211+2956	A 962	5	S	2013	67.0	0.90	66.7 ± 0.0	0.876 ± 0.001	-0.30	-0.024	-0.060	-0.005			
2018.0466	02213+3726	STF 250	5	S	2009	136.0	3.20	136.4 ± 0.0	3.159 ± 0.002	0.40	-0.041	0.044	-0.005			
2018.0603	02213+4436	STF 249	5	S	2006	195.2	2.43	197.2 ± 0.0	2.429 ± 0.002	2.00	-0.001	0.166	0.000			
2018.0466	02217+3923	STF 251	5	S	2008	265.0	2.10	266.3 ± 0.1	2.217 ± 0.001	1.30	0.117	0.129	0.012			
2018.0466	02218+3830	STT 40	5	S	2014	53.0	0.80	46.0 ± 0.1	0.655 ± 0.009	-7.00	-0.145	-1.730	-0.036			
2018.0658	02231+5233	HU 536	10	S	2015	320.0	0.70	322.3 ± 0.7	0.627 ± 0.018	2.30	-0.073	0.750	-0.024			
2018.0603	02261+4914	HU 537	15	S	2010	21.2	2.15	21.7 ± 0.0	2.152 ± 0.001	0.50	0.002	0.062	0.000			
2018.0466	02270+3117	HO 216	5	S	2013	6.0	1.40	6.3 ± 0.0	1.431 ± 0.000	0.30	0.031	0.059	0.006			
2018.0356	02282+2952	STF 269	5	S	2012	345.0	1.70	345.0 ± 0.1	1.677 ± 0.002	0.00	-0.023	0.000	-0.004			
2018.0329	02284+1722	A 2330	5	S	2013	207.0	1.20	210.1 ± 0.3	1.211 ± 0.007	3.10	0.011	0.616	0.002			
2018.0658	02292+5352	HJ 2136	10	S	2010	38.0	4.70	36.1 ± 0.1	4.655 ± 0.009	-1.90	-0.045	-0.236	-0.006			
2018.0658	02292+5637	A 1275	5	S	2015	21.0	0.80	20.6 ± 0.8	0.856 ± 0.011	-0.40	0.056	-0.130	0.018			
2018.0658	02294+5532	STF 268	10	S	2012	129.7	2.80	131.2 ± 0.1	2.865 ± 0.007	1.50	0.065	0.247	0.011			
2018.0630	02313+4703	A 968	5	S	2009	26.2	1.69	27.1 ± 0.1	1.767 ± 0.004	0.90	0.077	0.099	0.008			
2018.0658	02333+5619	A 1276 AB	5	S	2015	203.0	0.90	201.6 ± 0.2	0.939 ± 0.005	-1.40	0.039	-0.457	0.013			
2018.0712	02343+4017	AG 42	5	CV	2010	144.0	6.20	143.9 ± 0.1	6.369 ± 0.008	-0.10	0.169	-0.012	0.021			
2018.0329	02344+1148	HLD 63	5	S	2013	292.0	1.30	292.3 ± 0.1	1.489 ± 0.011	0.30	0.189	0.060	0.038			
2018.0712	02348+4924	ES 458 AB	5	CV	2010	316.2	4.80	316.9 ± 0.4	5.072 ± 0.006	0.70	0.272	0.087	0.034			
2018.0712	02366+4921	ES 459	5	CV	2002	142.7	3.42	143.2 ± 0.1	3.441 ± 0.006	0.50	0.021	0.031	0.001			
2018.0110	02368-0334	BU 520	5	S	2004	188.3	0.87	189.7 ± 0.3	0.893 ± 0.022	1.40	0.023	0.100	0.002			
2018.0712	02376+4839	ES 460 AB	5	CV	2002	318.4	2.88	319.4 ± 0.5	2.910 ± 0.008	1.00	0.030	0.062	0.002			

Table 2 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$
2018.0603	02388+3325	STF 285	15	S	2012	163.0	1.70	161.5 ± 0.1	1.738 ± 0.004	1.70	163.0	-1.50	0.038	-0.248	0.006	
2018.0110	02389-0135	HO 315	5	S	2008	356.9	1.63	354.7 ± 0.2	1.748 ± 0.010	1.63	356.9	-2.20	0.118	-0.220	0.012	
2018.0329	02391+1430	BU 1315 AB	5	S	2006	131.3	1.72	129.6 ± 0.1	1.527 ± 0.005	1.72	131.3	-1.70	-0.193	-0.141	-0.016	
2018.0466	02393+2552	A 2023	5	S	2015	226.0	0.60	228.3 ± 1.0	0.563 ± 0.025	0.60	226.0	2.30	-0.037	0.755	-0.012	
2018.0712	02405+4535	ES 1308	5	CV	2010	276.1	6.93	276.0 ± 0.2	6.908 ± 0.026	6.93	276.1	-0.10	-0.022	-0.012	-0.003	
2018.0658	02405+6129	STF 283 AB	5	S	2007	208.8	1.79	210.3 ± 0.1	1.849 ± 0.006	1.79	208.8	1.50	0.059	0.136	0.005	
2018.0329	02409+0452	STT 45	5	S	2015	263.0	0.80	256.8 ± 0.5	0.829 ± 0.004	0.80	263.0	-6.20	0.029	-2.044	0.010	
2018.0712	02412+4241	HJ 2154	5	CV	2010	140.2	9.99	140.4 ± 0.0	9.980 ± 0.006	9.99	140.2	0.20	-0.010	0.025	-0.001	
2018.0466	02446+2928	STF 300	5	S	2012	314.3	3.09	316.1 ± 0.1	3.170 ± 0.005	3.09	314.3	1.80	0.080	0.298	0.013	
2018.0658	02470+5007	ARG 9	10	S	2006	149.9	2.60	151.0 ± 0.1	2.564 ± 0.002	2.60	149.9	1.10	-0.036	0.091	-0.003	
2018.0603	02478+3103	BU 262	5	S	2009	51.7	1.71	50.0 ± 0.0	1.722 ± 0.000	1.71	51.7	-1.70	0.012	-0.188	0.001	
2018.0712	02506+4904	ES 1135	5	CV	2004	41.5	4.48	41.2 ± 0.1	4.532 ± 0.015	4.48	41.5	-0.30	0.052	-0.021	0.004	
2018.0658	02511+6025	STF 306 AB	5	S	2008	92.6	2.15	92.9 ± 0.0	2.199 ± 0.001	2.15	92.6	0.30	0.049	0.030	0.005	
2018.0658	02529+5300	STF 314 AB-C	10	S	2015	317.0	1.60	315.8 ± 0.1	1.608 ± 0.004	1.60	317.0	-1.20	0.008	-0.391	0.003	
2018.0712	02548+4244	BRT 334	5	CV	2002	251.8	3.48	251.9 ± 0.7	3.637 ± 0.027	3.48	251.8	0.10	0.157	0.006	0.010	
2018.0658	02581+6912	STF 317	5	S	2012	84.0	4.07	83.4 ± 0.0	4.137 ± 0.008	4.07	84.0	-0.60	0.067	-0.099	0.011	
2018.0712	02593+4502	ES 1363	5	CV	2011	205.9	5.59	206.6 ± 0.0	5.834 ± 0.008	5.59	205.9	0.70	0.244	0.099	0.035	
2018.0329	02594+0639	STF 334	5	S	2015	307.0	1.10	307.3 ± 0.0	1.112 ± 0.000	1.10	307.0	0.30	0.012	0.099	0.004	
2018.0712	02595+4110	ES 1510	5	CV	2011	144.2	4.81	144.1 ± 0.2	4.897 ± 0.012	4.81	144.2	-0.10	0.087	-0.014	0.012	
2018.0959	03034+6051	KR 17	10	S	2011	219.2	3.09	219.3 ± 0.1	3.113 ± 0.002	3.09	219.2	0.10	0.023	0.014	0.003	
2018.0904	03061+5303	ARG 10	10	S	2015	265.0	3.90	264.2 ± 0.0	4.053 ± 0.003	3.90	265.0	-0.80	0.153	-0.259	0.050	
2018.0877	03072+4306	A 1702 AB	5	S	2011	230.6	4.28	230.5 ± 0.0	4.359 ± 0.003	4.28	230.6	-0.10	0.079	-0.014	0.011	
2018.0877	03150+3543	HO 502	5	S	2014	14.0	0.80	15.3 ± 0.9	0.843 ± 0.014	0.80	14.0	1.30	0.043	0.318	0.011	
2018.0904	03158+5057	HU 544	10	S	2008	102.2	1.60	102.5 ± 0.1	1.674 ± 0.002	1.60	102.2	0.30	0.074	0.030	0.007	
2018.0630	03163+1920	A 2244	5	S	2015	332.0	0.90	331.0 ± 0.1	0.790 ± 0.001	0.90	332.0	-1.00	-0.110	-0.326	-0.036	
2018.0877	03182+4915	HU 545	5	S	2009	81.3	3.52	81.7 ± 0.0	3.617 ± 0.001	3.52	81.3	0.40	0.097	0.044	0.011	

Table 2 continues on the next page.



Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$
2018.0630	03206+1911	STF 377 AB	5	S	2015	110.0	1.10	110.3 ± 0.2	1.119 ± 0.005	0.30	0.019	0.098	0.006			
2018.0959	03218+6830	STF 368 AB	10	S	2015	172.0	1.70	158.7 ± 0.0	2.042 ± 0.001	-13.30	0.342	-4.296	0.110			
2018.0630	03233+2058	STF 381	5	S	2015	108.0	1.00	108.7 ± 0.1	1.090 ± 0.002	0.70	0.090	0.229	0.029			
2018.0877	03250+4013	HU 1058	5	S	2015	111.0	0.80	114.1 ± 0.0	0.863 ± 0.001	3.10	0.063	1.004	0.020			
2018.0904	03260+4536	HO 322	10	S	2008	124.7	1.86	125.6 ± 0.1	1.887 ± 0.004	0.90	0.027	0.089	0.003			
2018.0630	03261+2015	A 2344 AB	5	S	2015	195.0	1.20	193.0 ± 0.3	1.166 ± 0.027	-2.00	-0.034	-0.653	-0.011			
2018.0959	03280+5511	STF 386	10	S	2011	59.0	2.67	59.3 ± 0.0	2.711 ± 0.003	0.30	0.041	0.042	0.006			
2018.0959	03285+5954	STF 384 AB	10	S	2012	272.0	2.00	272.5 ± 0.1	1.974 ± 0.005	0.50	-0.026	0.082	-0.004			
2018.0630	03286+2904	STF 395	5	S	2015	89.0	1.80	89.8 ± 0.0	1.790 ± 0.001	0.80	-0.010	0.261	-0.003			
2018.0959	03287+5026	STF 388	10	S	2007	213.5	2.76	214.3 ± 0.0	2.753 ± 0.002	0.80	-0.007	0.072	-0.001			
2018.0904	03293+4503	STF 391	10	S	2007	96.0	4.00	95.9 ± 0.0	3.944 ± 0.005	-0.10	-0.056	-0.009	-0.005			
2018.0959	03302+5922	STF 389 AB	10	S	2012	71.1	2.67	71.5 ± 0.0	2.625 ± 0.003	0.40	-0.045	0.066	-0.007			
2018.0904	03306+4947	HLD 8	10	S	2009	176.6	2.31	176.7 ± 0.1	2.356 ± 0.001	0.10	0.046	0.011	0.005			
2018.0466	03307+0416	STF 408	5	S	2008	322.9	1.18	319.0 ± 0.4	1.096 ± 0.000	-3.90	-0.084	-0.388	-0.008			
2018.0466	03318+0749	A 1931	5	S	2014	56.0	0.80	47.3 ± 1.3	0.801 ± 0.025	-8.70	0.001	-2.150	0.000			
2018.0630	03332+2817	HO 14	5	S	2009	25.9	2.15	25.8 ± 0.3	2.164 ± 0.019	-0.10	0.014	-0.011	0.002			
2018.0603	03355+0625	A 1933	15	S	2015	136.0	1.10	136.8 ± 0.0	1.255 ± 0.003	0.80	0.155	0.261	0.051			
2018.0603	03372+0121	A 2419	5	S	2015	99.0	0.80	98.4 ± 0.0	0.802 ± 0.001	-0.60	0.002	-0.196	0.001			
2018.0904	03377+4807	HLD 9 AB	10	S	2016	54.0	1.30	54.9 ± 0.0	1.329 ± 0.001	0.90	0.029	0.431	0.014			
2018.0466	03379+0739	BU 308	5	S	2006	323.9	1.82	324.3 ± 0.7	1.864 ± 0.012	0.40	0.044	0.033	0.004			
2018.0959	03427+6950	STF 419 AB	10	S	2010	72.2	2.99	73.1 ± 0.1	2.907 ± 0.002	0.90	-0.083	0.111	-0.010			
2018.0877	03435+2244	STF 438 AB	5	S	2012	242.5	1.74	241.9 ± 0.1	1.698 ± 0.004	-0.60	-0.042	-0.099	-0.007			
2018.0904	03454+4952	HU 103 AB	10	S	2014	202.0	1.10	201.6 ± 0.0	1.179 ± 0.001	-0.40	0.079	-0.098	0.019			
2018.0877	03466+2728	COU 694	5	S	2012	134.0	2.51	135.7 ± 0.1	2.539 ± 0.003	1.70	0.029	0.279	0.005			
2018.0630	03490+1459	HO 324	5	S	2013	330.0	1.20	328.2 ± 0.4	1.155 ± 0.019	-1.80	-0.045	-0.356	-0.009			
2018.0877	03491+3216	STT 516	5	S	2010	43.4	2.22	44.3 ± 0.1	2.205 ± 0.006	0.90	-0.015	0.111	-0.002			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$
2018.0877	03503+2241	STF 457 AB	5	S	2013	91.0	0.90	90.9 ± 0.2	0.722 ± 0.015	-0.10	-0.178	-0.020	-0.035			
2018.0959	03507+6007	STF 445	10	S	2010	258.5	3.05	259.2 ± 0.0	3.107 ± 0.001	0.70	0.057	0.086	0.007			
2018.0904	03521+4048	STT 66	10	S	2015	145.0	1.00	145.7 ± 0.2	1.012 ± 0.001	0.70	0.012	0.227	0.004			
2018.0959	03556+5216	BU 743	10	S	2014	261.0	1.10	261.0 ± 0.1	1.085 ± 0.001	0.00	-0.015	0.000	-0.004			
2018.0877	03565+3311	BU 263	5	S	2007	105.1	0.69	110.0 ± 0.2	0.706 ± 0.001	4.90	0.020	0.442	0.002			
2018.0904	04020+4151	STF 477	10	S	2012	211.3	3.07	212.0 ± 0.0	3.088 ± 0.004	0.70	0.018	0.115	0.003			
2018.0877	04038+2549	COU 562	5	S	2008	337.5	1.85	339.8 ± 0.7	1.881 ± 0.004	2.30	0.031	0.228	0.003			
2018.0904	04045+5544	STF 480	10	S	2012	326.5	3.29	327.0 ± 0.1	3.375 ± 0.003	0.50	0.085	0.082	0.014			
2018.0877	04089+2306	STF 494	5	S	2015	187.0	5.20	188.1 ± 0.0	5.289 ± 0.002	1.10	0.089	0.356	0.029			
2018.0904	04092+4010	STF3114	10	S	2013	158.0	3.10	157.1 ± 0.0	3.114 ± 0.001	-0.90	0.014	-0.177	0.003			
2018.0904	04115+4152	BU 546	10	S	2015	229.0	0.90	230.0 ± 0.1	0.980 ± 0.004	1.00	0.080	0.324	0.026			
2018.0904	04116+4016	STF 500	10	S	2011	79.4	3.84	78.7 ± 0.1	3.954 ± 0.001	-0.70	0.114	-0.099	0.016			
2018.0904	04158+4524	STF 512	10	S	2010	220.0	5.20	217.8 ± 0.0	5.294 ± 0.005	-2.20	0.094	-0.272	0.012			
2018.0877	04182+2248	STF 520	5	S	2015	81.0	0.70	80.9 ± 0.2	0.705 ± 0.001	-0.10	0.005	-0.032	0.002			
2018.0959	04315+6232	HU 1079	10	S	2006	160.3	0.64	160.2 ± 0.5	0.664 ± 0.003	-0.10	0.024	-0.008	0.002			
2018.0630	04335+1801	STF 559	15	S	2014	277.2	3.11	277.0 ± 0.1	3.103 ± 0.004	-0.20	-0.007	-0.049	-0.002			
2018.0630	04567+1930	STF 567	5	S	2015	344.0	2.10	344.9 ± 0.1	2.046 ± 0.008	0.90	-0.054	0.294	-0.018			
2018.0904	04381+4207	STF 565 AB	10	S	2016	166.0	1.30	166.7 ± 0.1	1.375 ± 0.003	0.70	0.075	0.335	0.036			
2018.0904	04401+4220	WEI 4	10	S	2009	111.0	2.59	110.2 ± 0.2	2.634 ± 0.005	-0.80	0.044	-0.088	0.005			
2018.0959	04551+6104	HU 1088	10	S	2003	157.7	2.62	158.4 ± 0.1	2.757 ± 0.001	0.70	0.137	0.046	0.009			
2018.0904	04567+3917	HU 1091	10	S	2015	36.0	0.80	37.6 ± 0.3	0.908 ± 0.001	1.60	0.108	0.518	0.035			
2018.0630	04583+1357	STF 620	15	S	2012	238.0	4.00	238.1 ± 0.1	4.413 ± 0.009	0.10	0.413	0.016	0.068			
2018.2685	07001+1200	HU 111	5	S	2013	16.8	2.94	17.9 ± 0.0	2.990 ± 0.002	1.10	0.050	0.209	0.009			
2018.2685	07018+1053	BU 573	5	S	1997	300.5	0.79	311.0 ± 0.7	0.820 ± 0.004	10.50	0.030	0.494	0.001			
2018.2685	07046+1131	STF1016	5	S	2003	149.2	5.35	150.0 ± 0.1	5.372 ± 0.004	0.80	0.022	0.052	0.001			
2018.2685	08001+0937	J 2862	3	CV	2000	58.9	2.54	61.1 ± 0.2	2.413 ± 0.006	2.20	-0.127	0.120	-0.007			

Table 2 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$
2018.2959	08049-0819	A 1582	5	S	2010	227.4	1.46	229.1 ± 0.2	1.474 ± 0.011	1.70	0.014	0.205	0.002			
2018.2959	08059-0146	AG 148	5	CV	2010	178.0	6.60	176.1 ± 0.0	6.839 ± 0.006	-1.90	0.239	-0.229	0.029			
2018.2959	08136-0159	HJ 1778	5	S	2002	138.2	4.84	138.8 ± 0.1	4.862 ± 0.008	0.60	0.022	0.037	0.001			
2018.2685	08174-1125	BRT2708	3	CV	2005	116.4	4.70	116.3 ± 0.3	4.606 ± 0.008	-0.10	-0.094	-0.008	-0.007			
2018.2685	08226-1041	HJ 784 AC	3	CV	2000	10.4	18.03	12.6 ± 0.0	17.862 ± 0.008	2.20	-0.168	0.120	-0.009			
2018.2685	08226-1041	HU 116 AB	3	CV	1991	170.1	1.94	167.9 ± 0.5	1.765 ± 0.049	-2.20	-0.175	-0.081	-0.006			
2018.2959	08244-0431	A 3059 AB	5	S	2005	137.2	3.57	136.7 ± 0.3	3.536 ± 0.007	-0.50	-0.034	-0.038	-0.003			
2018.3151	08255-0207	A 1336	5	CV	2010	211.0	5.40	206.5 ± 0.0	5.670 ± 0.000	-4.50	0.270	-0.541	0.032			
2018.3151	08287-0018	BAL1137	5	CV	2005	191.5	5.47	189.4 ± 0.0	5.720 ± 0.000	-2.10	0.250	-0.158	0.019			
2018.2685	08298-1015	HJ 789	3	CV	2004	47.9	10.20	47.7 ± 0.1	10.232 ± 0.004	-0.20	0.032	-0.014	0.002			
2018.3151	08423-0824	STF1264	5	CV	2004	269.0	6.41	268.7 ± 0.0	6.400 ± 0.010	-0.30	-0.010	-0.021	-0.001			
2018.2384	08514+5732	STF1275 AB	5	S	2012	197.9	1.87	198.6 ± 0.1	1.883 ± 0.002	0.70	0.013	0.112	0.002			
2018.2384	08519+6308	KR 32	5	S	2005	13.6	4.80	15.1 ± 0.0	4.945 ± 0.006	1.50	0.145	0.113	0.011			
2018.2384	08554+6414	STI 684	5	S	2003	214.2	8.00	214.5 ± 0.0	8.058 ± 0.011	0.30	0.058	0.020	0.004			
2018.2384	08590+6326	BU 408	5	S	2001	343.2	2.95	344.9 ± 0.1	2.777 ± 0.005	1.70	-0.173	0.099	-0.010			
2018.2959	09013+4843	ES 1083	5	CV	2010	335.0	6.20	336.4 ± 0.0	6.338 ± 0.003	1.40	0.138	0.169	0.017			
2018.2685	09015-0816	BRT 546	3	CV	2000	138.3	2.81	139.9 ± 0.1	2.683 ± 0.003	1.60	-0.127	0.088	-0.007			
2018.3205	09043+0511	ALD 85	5	CV	2009	37.7	2.58	36.2 ± 0.0	2.660 ± 0.001	-1.50	0.080	-0.161	0.009			
2018.3205	09057+3227	AG 161	5	CV	2009	224.0	4.40	224.6 ± 0.04	4.340 ± 0.002	0.60	-0.060	0.064	-0.006			
2018.2685	09072-0357	A 342	3	CV	2010	151.4	5.50	151.9 ± 0.0	5.603 ± 0.006	0.50	0.103	0.060	0.012			
2018.3205	09077+6459	STF1303	5	CV	2012	282.0	2.70	282.2 ± 0.0	2.800 ± 0.007	0.20	0.100	0.032	0.016			
2018.2685	09078-0013	SCJ 12	3	CV	2012	261.0	6.60	261.8 ± 0.0	6.610 ± 0.003	0.80	0.010	0.128	0.002			
2018.2959	09081+4510	HJ 1164 AB	5	CV	2010	174.0	6.20	173.1 ± 0.0	6.084 ± 0.003	-0.90	-0.116	-0.108	-0.014			
2018.3205	09082+2353	POU3029	5	CV	2009	316.0	7.90	315.4 ± 0.0	8.120 ± 0.002	-0.60	0.220	-0.064	0.024			
2018.3205	09129+2420	BRT 155 AB	5	CV	2011	269.8	4.37	269.8 ± 0.0	4.550 ± 0.003	0.00	0.180	0.000	0.025			
2018.3151	09136+4659	STF1318	5	S	2013	228.0	2.60	227.7 ± 0.2	2.440 ± 0.010	-0.30	-0.160	-0.056	-0.030			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$
2018.2685	09147-0212	BAL 517	3	CV	2007	51.0	5.03	50.4 ± 0.1	4.848 ± 0.010	-0.60	-0.182	-0.053	-0.016			
2018.2685	09167-0941	HDO 122	3	CV	2011	92.4	8.84	92.9 ± 0.1	8.913 ± 0.038	0.50	0.073	0.069	0.010			
2018.3151	09225+4933	STF1340 AB	5	CV	2012	321.0	6.30	319.0 ± 0.0	6.280 ± 0.010	-2.00	-0.020	-0.317	-0.003			
2018.3205	09229-0753	BRT 428	5	CV	2010	190.0	4.20	191.1 ± 0.0	4.340 ± 0.002	1.10	0.140	0.132	0.017			
2018.3205	09238+3825	AG 164	5	CV	2004	18.0	4.50	18.7 ± 0.0	4.610 ± 0.003	0.70	0.110	0.049	0.008			
2018.3205	09424-0750	BRT 547	5	CV	2009	222.1	3.94	223.9 ± 0.1	3.930 ± 0.003	1.80	-0.010	0.193	-0.001			
2018.3205	09505+0337	J 83	5	CV	2001	237.6	2.20	238.1 ± 0.1	2.140 ± 0.004	0.50	-0.060	0.029	-0.003			
2018.4027	09514+7436	STF1378	5	CV	2011	357.5	5.19	357.2 ± 0.0	5.249 ± 0.002	-0.30	0.059	-0.041	0.008			
2018.3205	09562+0328	J 426	5	CV	2012	208.0	3.41	207.3 ± 0.1	3.450 ± 0.002	-0.70	0.040	-0.111	0.006			
2018.3205	09564+1040	STF1396 AB	5	CV	2009	129.5	3.95	129.7 ± 0.1	3.890 ± 0.004	0.20	-0.060	0.021	-0.006			
2018.2959	10220+4354	STF1427	5	CV	2012	214.0	9.00	214.1 ± 0.0	9.355 ± 0.004	0.10	0.355	0.016	0.056			
2018.4027	10429+4641	STF1463	5	CV	2007	258.0	7.90	258.0 ± 0.0	7.943 ± 0.001	0.00	0.043	0.000	0.004			
2018.4027	10473+5815	MLB 167	5	CV	2011	322.0	5.60	322.0 ± 0.0	5.527 ± 0.006	0.00	-0.073	0.000	-0.010			
2018.4027	10545+4730	STF1483	5	S	2010	243.0	2.30	242.3 ± 0.0	2.345 ± 0.003	-0.70	0.045	-0.083	0.005			
2018.3918	11029-1001	RST3726	5	CV	2003	283.0	1.99	283.5 ± 0.5	2.023 ± 0.035	0.50	0.033	0.032	0.002			
2018.3918	11029-1001	RST3726	5	CV	2003	283.0	1.99	283.5 ± 0.5	2.023 ± 0.035	0.50	0.033	0.032	0.002			
2018.3918	11086-0442	J 1372	5	CV	2011	21.8	8.25	22.0 ± 0.1	8.242 ± 0.002	0.20	-0.008	0.027	-0.001			
2018.3918	11086-0442	J 1572	5	CV	2011	21.8	8.25	22.0 ± 0.1	8.242 ± 0.002	0.20	-0.008	0.027	-0.001			
2018.3918	11114-0921	STF3068	5	CV	2012	312.6	19.36	312.4 ± 0.0	19.426 ± 0.013	-0.20	0.060	-0.031	0.009			
2018.3918	11114-0921	STF3068	5	CV	2012	312.6	19.36	312.4 ± 0.0	19.426 ± 0.013	-0.20	0.066	-0.031	0.010			
2018.3918	11246-0156	BAL 536	5	CV	2011	146.8	11.84	145.6 ± 0.0	11.463 ± 0.004	-1.20	-0.380	-0.162	-0.051			
2018.3918	11246-0156	BAL 536	5	CV	2011	146.8	11.84	145.6 ± 0.0	11.463 ± 0.004	-1.20	-0.377	-0.162	-0.051			
2018.3918	12108+3953	STF1606	5	S	2015	151.0	0.60	143.7 ± 0.8	0.631 ± 0.005	-7.30	0.031	-2.152	0.009			
2018.3918	12108+3953	STF1606	5	S	2015	151.0	0.60	143.7 ± 0.8	0.631 ± 0.005	-7.30	0.031	-2.152	0.009			
2018.3918	12207+2255	STF1634	5	S	2014	147.0	5.10	147.1 ± 0.0	5.367 ± 0.005	0.10	0.267	0.023	0.061			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	
2018.3918	12207+2255	STF1634	5	S	2014	147.0	5.10	147.1 ± 0.0	5.367 ± 0.005	0.10	0.267	0.023	0.061			
2018.4027	14218+4229	A 1618	5	CV	2009	161.5	3.95	161.7 ± 0.0	3.810 ± 0.002	0.20	-0.140	0.021	-0.015			
2018.4027	14222+4832	BU 615	5	CV	2000	235.7	2.91	235.1 ± 0.1	2.969 ± 0.002	-0.60	0.059	-0.033	0.003			
2018.4027	14319+5758	A 1106	5	CV	2013	28.0	2.27	29.0 ± 0.3	2.224 ± 0.008	1.00	-0.046	0.185	-0.009			
2018.4027	14416+5124	STF1871	5	S	2012	312.0	1.80	312.7 ± 0.2	1.858 ± 0.008	0.70	0.058	0.109	0.009			
2018.4027	14539+5734	HJ 1261	5	CV	2009	17.0	8.89	16.7 ± 0.0	8.796 ± 0.010	-0.30	-0.094	-0.032	-0.010			
2018.4027	14565+5923	STF1898	5	CV	2006	217.9	2.78	217.8 ± 0.1	2.798 ± 0.012	-0.10	0.018	-0.008	0.001			
2018.4822	15019+1506	HU 1155	5	CV	2010	15.0	3.90	15.0 ± 0.0	3.964 ± 0.004	0.00	0.064	0.000	0.008			
2018.4822	15056+1138	STF1907	5	S	2015	349.0	0.90	347.5 ± 0.2	0.853 ± 0.003	-1.50	-0.047	-0.431	-0.013			
2018.4986	15076+5056	ES 774	5	CV	2006	230.5	3.29	230.4 ± 0.0	3.377 ± 0.002	-0.10	0.087	-0.008	0.007			
2018.4822	15077+1158	STF1911	5	CV	2015	291.0	2.00	291.5 ± 0.1	1.966 ± 0.004	0.50	-0.034	0.144	-0.010			
2018.4986	15187+5334	ES 740	5	CV	2011	39.0	3.42	38.3 ± 0.0	3.451 ± 0.001	-0.70	0.031	-0.093	0.004			
2018.4822	15190-0713	HJ 4758	5	CV	2009	78.8	8.93	78.6 ± 0.0	6.015 ± 0.003	-0.20	-2.915	-0.021	-0.307			
2018.4822	15227-1654	HU 307	5	CV	1999	2.7	2.94	3.20 ± 0.1	2.981 ± 0.003	0.50	0.041	0.026	0.002			
2018.4822	15252+0932	HEI 784	5	CV	2009	275.5	3.95	274.7 ± 0.0	3.923 ± 0.002	-0.80	-0.027	-0.084	-0.003			
2018.4986	15261+2128	STF1942	5	CV	2008	91.4	9.62	91.6 ± 0.0	9.737 ± 0.002	0.20	0.117	0.019	0.011			
2018.4986	15269+4610	KU 50	5	CV	2002	335.3	2.91	335.9 ± 0.0	2.948 ± 0.002	0.60	0.038	0.036	0.002			
2018.4986	15288+2038	HU 150	5	CV	2010	25.6	4.36	26.0 ± 0.0	4.542 ± 0.001	0.40	0.182	0.047	0.021			
2018.4986	15347+3446	STF1959	5	CV	2009	244.7	2.11	243.5 ± 0.0	2.155 ± 0.001	-1.20	0.045	-0.126	0.005			
2018.4822	15352+1456	LEO 33	5	CV	2015	258.0	1.60	260.7 ± 0.1	1.543 ± 0.005	2.70	-0.057	0.775	-0.016			
2018.4822	15370-0041	HJ 1276	5	CV	2009	258.6	5.43	258.1 ± 0.0	5.410 ± 0.004	-0.50	-0.020	-0.053	-0.002			
2018.4822	15379+3006	STF1963 AB	5	S	2010	298.0	5.10	298.3 ± 0.0	5.321 ± 0.006	0.30	0.221	0.035	0.026			
2018.4986	15448+3534	PRT 5	5	CV	2009	44.0	4.44	44.7 ± 0.0	4.533 ± 0.003	0.70	0.093	0.074	0.010			
2018.4822	15501-0311	STF3126 AB	5	CV	2013	278.6	2.29	278.5 ± 0.1	2.309 ± 0.001	-0.10	0.019	-0.018	0.003			
2018.4986	15513+2509	STF1981	5	CV	2010	3.5	12.01	3.90 ± 0.0	12.056 ± 0.001	0.40	0.046	0.047	0.005			
2018.4822	15521+0528	A 1128	5	CV	2005	349.7	1.57	349.5 ± 0.0	1.552 ± 0.003	-0.20	-0.018	-0.015	-0.001			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$
2018.4986	15568+1229	STF1988	5	CV	2011	249.0	1.90	249.3 ± 0.1	1.808 ± 0.003	0.30	-0.092	0.040	-0.012			
2018.4986	15578+1737	BRT2422	5	CV	2010	179.0	4.53	179.0 ± 0.0	4.554 ± 0.002	0.00	0.024	0.000	0.003			
2018.7288	17021+0713	STF2113	5	S	2010	116.6	4.88	115.56 ± 0.04	5.230 ± 0.009	-1.04	0.350	-0.119	0.040			
2018.7288	17057+0620	HEI 859	5	CV	2010	56.3	3.11	55.07 ± 0.05	3.190 ± 0.005	-1.23	0.080	-0.141	0.009			
2018.7288	18004+2112	A 1375	5	CV	2014	92.0	1.80	91.63 ± 0.05	1.817 ± 0.003	-0.37	0.017	-0.078	0.004			
2018.7288	18009+2633	STF2263	5	CV	2004	160.4	7.41	158.40 ± 0.03	7.707 ± 0.007	-2.00	0.297	-0.136	0.020			
2018.7260	18014+0406	BAL2910	5	CV	2002	111.3	3.72	112.36 ± 0.01	4.003 ± 0.001	1.06	0.283	0.063	0.017			
2018.7260	18030-0237	A 35	5	S	2005	300.9	1.37	297.23 ± 0.18	1.398 ± 0.006	-3.67	0.028	-0.267	0.002			
2018.7260	18033+0745	HEI 867	5	CV	2001	339.2	3.39	337.94 ± 0.03	3.495 ± 0.001	-1.26	0.105	-0.071	0.006			
2018.7288	18033+2751	ES 470	5	CV	2011	208.6	8.15	208.48 ± 0.04	8.270 ± 0.013	-0.12	0.120	-0.016	0.016			
2018.7233	18056+1242	J 1220	5	CV	2015	129.0	1.50	128.34 ± 0.04	1.548 ± 0.002	-0.66	0.048	-0.177	0.013			
2018.7233	18067+1359	AG 358 AB	5	CV	2009	330.2	3.45	330.16 ± 0.24	3.660 ± 0.012	-0.04	0.210	-0.004	0.022			
2018.7288	18069+2933	SLE 135	5	CV	2002	126.2	9.30	125.69 ± 0.03	9.676 ± 0.008	-0.51	0.376	-0.030	0.022			
2018.8301	18094+3144	A 237 AB	5	CV	2002	102.2	2.32	103.41 ± 0.22	2.214 ± 0.027	1.21	-0.106	0.072	-0.006			
2018.7233	18096+1801	BRT2441	5	CV	2003	27.7	4.66	26.37 ± 0.05	4.764 ± 0.015	-1.33	0.104	-0.085	0.007			
2018.7260	18146-1113	HLD 142	5	S	1991	253.4	1.17	252.99 ± 0.16	1.270 ± 0.002	-0.41	0.100	-0.015	0.004			
2018.7288	18204+2048	WFC 206	5	CV	2011	43.9	9.15	44.63 ± 0.01	9.422 ± 0.003	0.73	0.272	0.094	0.035			
2018.8301	18209+3220	ES 347	5	CV	2000	64.9	1.78	64.11 ± 0.20	1.754 ± 0.015	-0.79	-0.026	-0.042	-0.001			
2018.7288	18216+2030	HO 430	5	CV	2002	193.6	2.40	194.01 ± 0.02	2.498 ± 0.002	0.41	0.098	0.025	0.006			
2018.7342	18234+2327	STF2314	5	S	2013	330.0	2.58	331.03 ± 0.07	2.670 ± 0.008	1.03	0.090	0.180	0.016			
2018.7342	18273+2012	TDS 922	5	S	2002	205.4	2.32	206.04 ± 0.08	2.375 ± 0.009	0.64	0.055	0.038	0.003			
2018.7342	18276+2423	AG 223	5	S	2002	50.3	2.59	50.91 ± 0.07	2.637 ± 0.005	0.61	0.047	0.036	0.003			
2018.7342	18280+2708	ES 475	5	CV	2006	219.8	10.91	222.98 ± 0.02	10.654 ± 0.003	3.18	-0.256	0.250	-0.020			
2018.7342	18330+2420	POU3427	5	CV	2011	79.7	6.61	80.65 ± 0.04	6.783 ± 0.003	0.95	0.173	0.123	0.022			
2018.7342	18335+2102	COU 204	5	CV	2004	129.4	10.08	130.47 ± 0.04	11.872 ± 0.013	1.07	1.792	0.073	0.122			
2018.8301	18375+3112	A 250	5	CV	2003	114.3	2.52	113.81 ± 0.47	2.447 ± 0.053	-0.49	-0.073	-0.031	-0.005			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$
2018.7342	18386+2706	HJ 1333	5	S	2012	225.6	2.84	226.36 ± 0.15	2.910 ± 0.004	0.76	0.070	0.113	0.010			
2018.7342	18413+2506	SLE 502	5	CV	2010	93.2	5.82	94.48 ± 0.05	6.218 ± 0.007	1.28	0.398	0.147	0.046			
2018.7342	18422+2739	STF2371	5	CV	2010	55.0	9.30	55.53 ± 0.02	9.971 ± 0.005	0.53	0.671	0.061	0.077			
2018.7342	18425+2537	ROE 7	5	CV	2010	197.4	9.45	198.05 ± 0.04	9.835 ± 0.04	0.65	0.385	0.074	0.044			
2018.7342	18455+2815	STF2381	5	S	2008	122.1	8.50	122.45 ± 0.01	8.919 ± 0.005	0.35	0.419	0.033	0.039			
2018.7260	18459+1030	STF2373	5	S	2007	336.9	4.44	335.96 ± 0.03	4.259 ± 0.006	-0.94	-0.181	-0.080	-0.015			
2017.8383	18472+3125	STF2397	5	S	2011	265.8	3.87	269.28 ± 0.0	3.887 ± 0.001	3.48	0.017	0.509	0.002			
2017.8383	18487+3401	HU 936	5	S	2011	97.8	1.83	101.21 ± 0.0	1.844 ± 0.001	3.41	0.014	0.499	0.002			
2018.7342	18500+2043	HU 328	5	CV	2003	188.8	4.62	187.38 ± 2.32	4.772 ± 0.004	-1.42	0.152	-0.090	0.010			
2017.8383	18576+3209	A 260	5	S	2010	245.8	0.88	246.63 ± 0.6	0.912 ± 0.004	0.83	0.032	0.106	0.004			
2017.8383	18584+3625	STF2429	5	S	2006	285.2	5.43	288.63 ± 0.0	5.490 ± 0.003	3.43	0.060	0.290	0.005			
2018.7425	19015+2724	AG 370	5	S	2014	341.0	4.00	340.53 ± 0.08	4.114 ± 0.002	-0.47	0.114	-0.099	0.024			
2018.7425	19019+2718	ES 479	5	CV	2008	141.5	8.23	141.57 ± 0.01	8.345 ± 0.010	0.07	0.115	0.007	0.011			
2018.7370	19023+0652	A 359	5	CV	2002	272.5	2.17	273.73 ± 0.10	2.287 ± 0.003	1.23	0.117	0.073	0.007			
2018.7425	19025+2640	BRT 36 AB	5	CV	2011	45.7	4.75	46.77 ± 0.06	4.923 ± 0.008	1.07	0.173	0.138	0.022			
2018.7425	19031+2202	BRT2451	5	CV	2003	65.1	4.78	65.14 ± 0.04	4.896 ± 0.002	0.04	0.116	0.003	0.007			
2018.7397	19041+1106	AG 371	5	CV	2010	159.5	5.49	159.24 ± 0.03	5.637 ± 0.003	-0.26	0.147	-0.030	0.017			
2018.7233	19042+3245	BRD 4	5	S	2009	310.1	2.54	309.71 ± 0.08	2.600 ± 0.002	-0.39	0.060	-0.040	0.006			
2018.7753	19050+2904	AG 372 AB	5	CV	2006	184.4	6.14	181.80 ± 0.02	6.029 ± 0.002	-2.60	-0.111	-0.204	-0.009			
2018.7342	19077+0421	J 1639	5	CV	2010	337.3	6.58	334.76 ± 2.29	6.744 ± 0.007	-2.54	0.164	-0.291	0.019			
2018.7370	19078+0928	J 812	5	CV	2007	120.3	2.42	120.22 ± 0.08	2.436 ± 0.004	-0.08	0.016	-0.007	0.001			
2018.8301	19078+3040	STF2465	5	CV	2010	248.6	1.25	249.05 ± 0.33	1.195 ± 0.009	0.45	-0.055	0.051	-0.006			
2018.7397	19080+1945	STF2460	5	CV	2005	197.9	9.38	197.80 ± 0.04	9.488 ± 0.012	-0.10	0.108	-0.007	0.008			
2018.7397	19082+1448	ROE 1.25 AB	5	CV	2010	265.2	7.79	265.62 ± 0.03	7.949 ± 0.002	0.42	0.159	0.048	0.018			
2018.7370	19102+0841	STF2468	5	CV	2010	257.0	7.70	257.40 ± 0.07	7.765 ± 0.008	0.40	0.065	0.046	0.007			
2018.7397	19104+1744	STF2475	5	CV	2007	321.1	6.55	320.86 ± 0.04	6.790 ± 0.009	-0.24	0.240	-0.020	0.020			

Table 2 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$
2018.8301	19106+3701	A 152 AB	5	CV	2008	2.9	2.54	2.900 ± 0.01	2.594 ± 0.002	0.00	0.054	0.000	0.000	0.005		
2018.7425	19113+2705	AG 373	5	S	2013	327.0	2.80	327.61 ± 0.05	2.991 ± 0.007	0.61	0.191	0.106	0.106	0.033		
2018.7753	19118+2443	MRG 3	5	CV	2010	144.4	5.25	144.34 ± 0.02	5.428 ± 0.004	-0.06	0.178	-0.007	0.020			
2018.7753	19124+2435	HO 445	5	CV	2010	244.0	5.20	242.90 ± 0.02	5.283 ± 0.003	-1.10	0.083	-0.125	0.009			
2018.8301	19129+3100	HO 101	5	CV	1999	112.7	2.17	113.37 ± 0.03	2.162 ± 0.001	0.67	-0.008	0.034	0.000			
2018.7370	19144+0053	J 1035	5	S	2000	76.3	4.21	73.94 ± 0.32	4.112 ± 0.022	-2.36	-0.098	-0.126	-0.005			
2018.7397	19153+1522	J 483	5	CV	2002	216.8	2.67	217.55 ± 0.20	2.731 ± 0.006	0.75	0.061	0.045	0.004			
2018.7397	19162+1534	KU 57 AB	5	CV	2010	229.8	9.79	229.82 ± 0.05	10.230 ± 0.006	0.02	0.440	0.002	0.050			
2018.7342	19164-0925	A 99 AB	5	CV	2002	63.1	2.31	64.93 ± 0.13	2.397 ± 0.011	1.83	0.087	0.109	0.005			
2018.7342	19170-0713	BRT 492	5	CV	2010	188.4	5.43	188.96 ± 0.08	5.421 ± 0.018	0.56	-0.009	0.064	-0.001			
2018.7397	19172+1853	HU 336	5	CV	2008	190.7	1.50	191.43 ± 0.16	1.581 ± 0.008	0.73	0.081	0.068	0.008			
2018.7370	19184+0654	BRT2181	5	CV	2011	178.3	3.65	177.31 ± 0.13	3.826 ± 0.011	-0.99	0.176	-0.128	0.023			
2018.7753	19186+2038	WFC 219	5	CV	2010	70.0	8.60	70.71 ± 0.02	8.763 ± 0.001	0.71	0.163	0.081	0.019			
2018.7370	19188+0451	BAL2938	5	CV	2011	91.6	9.89	91.03 ± 0.02	9.892 ± 0.016	-0.57	0.002	-0.074	0.000			
2018.7397	19192+1540	A 1646	5	S	2003	205.5	4.31	205.40 ± 0.05	4.496 ± 0.006	-0.10	0.186	-0.006	0.012			
2018.7370	19203+0056	BAL1202	5	CV	2004	20.1	8.39	19.69 ± 0.08	8.478 ± 0.013	-0.41	0.088	-0.028	0.006			
2018.7370	19213+0404	BAL2509	5	CV	2000	212.7	9.57	212.60 ± 0.04	9.723 ± 0.017	-0.10	0.153	-0.005	0.008			
2018.7342	19215-0807	J 2265	5	CV	1999	279.6	3.27	278.44 ± 0.11	3.494 ± 0.015	-1.16	0.224	-0.059	0.011			
2018.7370	19217+0014	BAL1203	5	CV	2002	127.4	8.76	125.86 ± 0.04	9.365 ± 0.011	-1.54	0.605	-0.092	0.036			
2018.7342	19218-0122	J 116	5	CV	2013	142.0	5.70	143.22 ± 0.07	5.992 ± 0.002	1.22	0.292	0.213	0.051			
2018.7370	19233+0931	STF2510 A-BC	5	CV	2010	181.2	8.71	180.95 ± 0.04	8.978 ± 0.006	-0.25	0.268	-0.029	0.031			
2018.7233	19236-0424	A 103	5	S	2000	4.3	3.36	3.11 ± 0.06	3.489 ± 0.020	-1.19	0.129	-0.064	0.007			
2018.7753	19237+2746	AG 378	5	CV	2004	45.0	8.39	45.19 ± 0.05	8.776 ± 0.007	0.19	0.386	0.013	0.026			
2018.7233	19251+2150	STF3111	5	CV	2009	117.2	2.50	155.21 ± 0.04	2.560 ± 0.001	38.01	0.060	3.909	0.006			
2018.7397	19265+1839	BOW 7	5	CV	2008	250.6	9.38	250.63 ± 0.02	9.590 ± 0.007	0.03	0.210	0.003	0.020			
2018.8301	19267+3221	STF2528 AB	5	CV	2004	243.5	14.32	243.66 ± 0.05	14.677 ± 0.024	0.16	0.357	0.011	0.024			

Table 2 continues on the next page.



Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\theta$
2018.7397	19268+1252	STF2520 AB	5	S	2009	233.8	1.84	234.24 ± 0.10	1.856 ± 0.004	0.44	0.016	0.045	0.002			
2018.7260	19281+3521	HU 1194 AB	5	S	2009	37.3	0.95	36.02 ± 0.20	0.983 ± 0.002	-1.28	0.033	-0.132	0.003			
2018.7753	19282+2013	STF3132 AB	5	CV	2008	39.9	7.85	39.33 ± 0.06	7.975 ± 0.007	-0.57	0.125	-0.053	0.012			
2018.7425	19282+2942	AG 380	5	S	2009	228.4	2.46	225.51 ± 2.32	2.571 ± 0.006	-2.89	0.111	-0.297	0.011			
2018.7342	19282-0932	STF2519	5	CV	2003	124.5	11.85	123.74 ± 0.01	12.038 ± 0.010	-0.76	0.188	-0.048	0.012			
2018.7425	19284+2019	STF2530	5	S	2006	158.5	5.57	154.93 ± 0.16	5.641 ± 0.004	-3.57	0.071	-0.280	0.006			
2018.7370	19288+0939	J 2970	5	CV	2001	37.4	6.28	37.09 ± 0.08	6.510 ± 0.011	-0.31	0.230	-0.017	0.013			
2018.7370	19290+0343	HJ 872 AB	5	CV	2007	115.8	6.34	111.45 ± 0.02	9.809 ± 0.006	-4.35	3.469	-0.371	0.296			
2018.7233	19296+1800	AG 231	5	CV	2009	240.3	4.35	239.32 ± 0.04	4.490 ± 0.001	-0.98	0.140	-0.101	0.014			
2018.7425	19298+2522	DOO 75	5	CV	2002	238.3	2.92	239.58 ± 0.08	3.033 ± 0.006	1.28	0.113	0.076	0.007			
2018.7397	19299+1241	BRT1318	5	CV	2010	84.7	5.93	83.61 ± 0.04	6.035 ± 0.009	-1.09	0.105	-0.125	0.012			
2018.7397	19329+0831	A 1185	5	S	2009	193.2	3.38	193.27 ± 0.04	3.537 ± 0.005	0.07	0.157	0.007	0.016			
2018.7233	19333+2025	STF2540 AB	5	S	2005	146.1	5.05	145.47 ± 0.02	5.404 ± 0.008	-0.63	0.354	-0.046	0.026			
2018.7425	19340+2729	ES 488	5	S	2005	52.4	2.70	52.54 ± 0.12	2.784 ± 0.010	0.14	0.084	0.010	0.006			
2018.7233	19356+2944	AG 387	5	S	2010	119.6	3.53	118.81 ± 0.02	3.695 ± 0.002	-0.79	0.165	-0.091	0.019			
2018.7260	19356+3617	AG 234	5	S	2002	321.2	2.59	319.85 ± 0.03	2.679 ± 0.002	-1.35	0.089	-0.081	0.005			
2018.7425	19358+2334	A 2787	5	CV	2010	111.0	4.20	110.73 ± 0.09	3.937 ± 0.006	-0.27	-0.263	-0.031	-0.030			
2018.7425	19366+2700	BRT3345	5	CV	2002	12.3	3.33	11.79 ± 0.07	3.408 ± 0.005	-0.51	0.076	-0.030	0.005			
2018.7397	19370+1430	A 1655	5	S	2013	69.0	1.90	67.97 ± 0.16	2.027 ± 0.004	-1.03	0.127	-0.179	0.022			
2018.7397	19371+1723	HU 342	5	S	2011	254.3	4.44	255.14 ± 0.06	4.710 ± 0.007	0.84	0.270	0.109	0.035			
2018.7397	19373+1534	TDT1590	5	CV	2010	349.0	6.20	349.62 ± 0.06	6.344 ± 0.008	0.62	0.144	0.071	0.016			
2018.7425	19374+2249	STF2551	5	CV	2008	41.9	6.50	41.43 ± 0.04	6.889 ± 0.012	-0.47	0.389	-0.044	0.036			
2018.7397	19377+1422	BRT1321	5	CV	2003	157.1	4.43	156.78 ± 0.03	4.616 ± 0.006	-0.32	0.186	-0.020	0.012			
2018.7233	19379+1922	STF2552	5	S	2011	196.3	5.10	194.10 ± 0.01	5.393 ± 0.005	-2.20	0.293	-0.285	0.038			
2018.7397	19384+1153	BRT1323	5	CV	2001	157.1	3.95	157.29 ± 0.08	4.095 ± 0.006	0.19	0.145	0.011	0.008			
2018.7397	19392+1152	BRT1324	5	CV	2004	78.5	4.82	75.88 ± 0.09	5.064 ± 0.007	-2.62	0.244	-0.178	0.017			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$
2018.7342	19394-0118	J 120	5	CV	2002	93.6	1.71	94.01 ± 0.17	1.950 ± 0.003	0.41	0.240	0.025	0.014			
2018.7397	19402+1211	A 1190	5	CV	2010	198.0	5.00	199.94 ± 1.33	4.897 ± 0.101	1.94	-0.103	0.222	-0.012			
2018.7342	19413-0128	BAL 605	5	CV	2010	280.3	6.98	279.89 ± 0.07	7.158 ± 0.012	-0.41	0.178	-0.047	0.020			
2018.7233	19415+1838	HO 112	5	CV	2001	260.1	2.69	258.65 ± 0.02	2.785 ± 0.002	-1.45	0.095	-0.082	0.005			
2018.8301	19417+3103	A 371	5	CV	2008	18.6	1.90	19.16 ± 0.13	1.857 ± 0.016	0.56	-0.043	0.052	-0.004			
2018.7397	19429+0502	HWE 50	5	S	2001	16.3	2.61	15.69 ± 0.08	2.662 ± 0.003	-0.61	0.052	-0.034	0.003			
2018.7260	19435+3450	AG 236 AB	5	S	2008	148.6	4.44	147.01 ± 0.02	4.292 ± 0.003	-1.59	-0.148	-0.148	-0.014			
2018.7342	19436-0904	HO 579 AB	5	CV	2002	305.9	2.52	306.09 ± 0.05	2.817 ± 0.003	0.19	0.297	0.011	0.018			
2018.7397	19445+1418	BRT1953	5	CV	2010	197.0	6.40	194.55 ± 0.09	6.470 ± 0.004	-2.45	0.070	-0.280	0.008			
2018.7425	19451+2359	J 492 AB	5	CV	2008	296.4	4.83	296.39 ± 0.09	5.009 ± 0.010	-0.01	0.179	-0.001	0.017			
2018.7260	19453+3048	AG 237	5	S	2011	140.7	2.43	139.52 ± 0.04	2.491 ± 0.003	-1.18	0.061	-0.153	0.008			
2018.8301	19453+3656	POP 121	5	CV	1995	324.8	1.51	323.46 ± 0.04	1.675 ± 0.001	-1.34	0.165	-0.056	0.007			
2018.7425	19456+2512	AG 390	5	CV	2007	96.2	7.11	96.69 ± 0.09	7.263 ± 0.004	0.49	0.153	0.042	0.013			
2018.7397	19469+0610	BU 828	5	S	2002	10.4	2.96	14.56 ± 0.00	3.036 ± 0.004	4.16	0.076	0.249	0.005			
2018.7260	19471+3321	HU 758	5	S	2012	144.2	0.88	144.06 ± 0.20	0.920 ± 0.002	-0.14	0.040	-0.021	0.006			
2018.8301	19476+3557	ES 2182	5	CV	1996	48.1	1.88	43.52 ± 0.01	1.942 ± 0.003	-4.58	0.062	-0.201	0.003			
2018.7288	19483+3710	STT 386	5	S	2013	69.9	0.95	71.22 ± 0.04	0.964 ± 0.004	1.32	0.014	0.230	0.002			
2018.7397	19485+1958	J 1865	5	CV	2011	21.8	5.82	21.87 ± 0.05	6.252 ± 0.007	0.07	0.432	0.009	0.056			
2018.7288	19489+3202	A 375	5	S	2011	158.8	1.18	158.66 ± 0.06	1.213 ± 0.002	-0.14	0.033	-0.018	0.004			
2018.7753	19493+2726	MLB 603	5	CV	2005	28.0	7.75	27.70 ± 0.02	8.309 ± 0.004	-0.30	0.559	-0.022	0.041			
2018.7397	19496+0235	BAL2005	5	CV	2010	285.0	6.50	285.51 ± 0.02	6.537 ± 0.006	0.51	0.037	0.058	0.004			
2018.7397	19513+1430	HJ 1442	5	CV	2007	275.8	7.55	275.62 ± 0.04	7.751 ± 0.005	-0.18	0.201	-0.015	0.017			
2018.7397	19517+0738	A 376	5	CV	2012	129.3	2.21	128.99 ± 0.09	2.271 ± 0.003	-0.31	0.061	-0.046	0.009			
2018.7425	19518+2356	POU4122	5	CV	2008	74.6	6.89	73.73 ± 0.12	7.115 ± 0.011	-0.87	0.225	-0.081	0.021			
2018.7288	19530+3704	AG 242	5	S	2013	179.0	2.00	180.37 ± 0.03	2.061 ± 0.004	1.37	0.061	0.239	0.011			
2018.7425	19534+2923	J 25	5	S	1994	8.4	1.67	11.88 ± 0.05	1.666 ± 0.006	3.48	-0.004	0.141	0.000			

Table 2 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$
2018.7425	19537+2805	ES 494	5	CV	2009	198.0	3.78	198.12 ± 0.04	3.847 ± 0.008	0.12	0.067	0.012	0.007			
2018.7397	19542+1744	J 830	5	CV	2009	194.3	3.40	194.15 ± 0.03	3.502 ± 0.004	-0.15	0.102	-0.015	0.010			
2018.7425	19554+2449	J 1156 AB	5	CV	2006	226.7	3.25	225.89 ± 0.04	3.336 ± 0.005	-0.81	0.086	-0.064	0.007			
2018.7342	19567-0737	RST4646	5	CV	2010	195.8	4.35	195.49 ± 0.04	4.590 ± 0.005	-0.31	0.240	-0.035	0.027			
2018.7397	19568+0155	STF2601 AB-C	5	CV	2010	161.9	6.92	161.76 ± 0.02	7.119 ± 0.006	-0.14	0.199	-0.016	0.023			
2018.7397	19568+1935	J 3036 AB	5	CV	2004	257.9	6.81	256.41 ± 0.03	7.200 ± 0.002	-1.49	0.390	-0.101	0.026			
2018.7397	19570+0514	BAL2956	5	CV	2011	245.8	9.47	245.71 ± 0.04	9.975 ± 0.011	-0.09	0.505	-0.012	0.065			
2018.7342	19576-0608	BRT 496	5	CV	2010	339.1	3.57	339.65 ± 0.05	3.711 ± 0.004	0.55	0.141	0.063	0.016			
2018.7342	19583-0037	J 1386	5	CV	2010	319.2	3.73	318.96 ± 0.07	3.860 ± 0.005	-0.24	0.130	-0.027	0.015			
2018.7288	19586+3806	STF2609	5	S	2013	22.3	1.95	23.12 ± 0.05	1.977 ± 0.003	0.82	0.027	0.143	0.005			
2018.8219	20003+4621	A 719	5	CV	2003	108.5	2.93	108.62 ± 0.05	3.029 ± 0.004	0.12	0.099	0.008	0.006			
2017.8356	20004+5627	ES 1756	5	CV	1991	185.8	2.19	188.76 ± 0.9	2.141 ± 0.042	2.96	-0.049	0.110	-0.002			
2018.7342	20006-0911	BRT 554	5	CV	2002	26.0	2.56	25.28 ± 0.06	2.550 ± 0.002	-0.72	-0.010	-0.043	-0.001			
2018.7753	20010+2956	L 32	5	CV	2003	127.6	3.26	128.79 ± 0.08	3.347 ± 0.006	1.19	0.087	0.075	0.006			
2017.8356	20031+5921	ES 1757	3	CV	1997	212.0	1.89	209.31 ± 0.0	1.960 ± 0.002	-2.69	0.070	-0.129	0.003			
2018.8466	20034+1528	STF2618	5	CV	2005	114.9	5.43	114.73 ± 0.04	5.627 ± 0.003	-0.17	0.197	-0.012	0.014			
2018.8466	20041+1700	STF2622 AB	5	CV	2010	194.2	5.83	193.22 ± 0.02	6.033 ± 0.005	-0.98	0.203	-0.111	0.023			
2017.8383	20046+3641	A 1413	5	CV	1999	138.0	2.36	138.85 ± 0.0	2.393 ± 0.001	0.85	0.033	0.045	0.002			
2018.8493	20047+4938	KU 58 AB	5	CV	2011	190.3	2.72	186.38 ± 0.06	2.868 ± 0.004	-3.92	0.148	-0.499	0.019			
2018.8301	20066+0207	HJ 902	5	CV	2004	18.4	6.91	17.14 ± 0.03	7.119 ± 0.010	-1.26	0.209	-0.085	0.014			
2018.8466	20070+1220	BRT1336	5	CV	2011	292.5	5.12	292.09 ± 0.03	5.499 ± 0.001	-0.41	0.379	-0.052	0.048			
2017.8383	20083+3714	ES 2185	5	CV	2002	242.0	2.20	244.05 ± 0.0	2.195 ± 0.002	2.05	-0.005	0.129	0.000			
2018.8466	20099+1149	BRT1339	5	CV	2001	177.9	4.27	177.71 ± 0.16	4.382 ± 0.001	-0.19	0.112	-0.011	0.006			
2018.8137	20102+3644	ES 87	5	CV	2004	298.0	8.89	298.43 ± 0.03	8.793 ± 0.004	0.43	-0.097	0.029	-0.007			
2018.8493	20104+4949	STF2648	5	CV	2008	117.1	6.75	117.24 ± 0.04	6.862 ± 0.001	0.14	0.112	0.013	0.010			
2018.8493	20105+4923	ES 1099	5	CV	2006	183.8	6.58	185.98 ± 0.02	4.932 ± 0.005	2.18	-1.648	0.170	-0.128			

Table 2 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$
2017.8356	20111-1252	HO 119	5	S	2002	198.1	3.14	197.52 ± 0.0	3.120 ± 0.001	-0.58	-0.020	-0.037	-0.001			
2018.7753	20120+2554	DOO 14	5	S	2000	271.0	1.93	273.14 ± 0.27	1.909 ± 0.005	2.14	-0.021	0.114	-0.001			
2018.8466	20128+1210	A 722	5	CV	2009	162.8	2.65	162.43 ± 0.04	2.736 ± 0.001	-0.37	0.086	-0.038	0.009			
2018.7945	20129+2913	HJ 1492 A-BC	5	CV	2005	53.9	18.27	54.13 ± 0.01	18.740 ± 0.020	0.23	0.470	0.017	0.034			
2018.8137	20129+3429	AG 250	5	CV	2006	50.8	8.71	53.10 ± 0.01	8.889 ± 0.003	2.30	0.179	0.179	0.014			
2018.8493	20137+4050	DOO 13	5	CV	2009	258.4	2.91	258.28 ± 0.02	3.021 ± 0.002	-0.12	0.111	-0.012	0.011			
2018.8219	20142+4744	ES 799 AB	5	CV	2011	17.0	2.07	14.38 ± 0.04	2.199 ± 0.001	-2.62	0.129	-0.335	0.016			
2018.7753	20145+2808	BRT 47 AB	5	CV	2007	232.2	4.67	232.29 ± 0.07	4.773 ± 0.003	0.09	0.103	0.008	0.009			
2018.8219	20158+4233	ES 1567	5	CV	1991	183.6	2.19	181.86 ± 0.03	2.391 ± 0.001	-1.74	0.201	-0.063	0.007			
2017.8356	20160+2703	A 389	5	S	2013	211.0	1.70	212.74 ± 0.3	1.690 ± 0.007	1.74	-0.010	0.360	-0.002			
2017.8356	20164+5542	KR 49	5	CV	1997	114.7	1.68	113.56 ± 0.0	1.700 ± 0.000	-1.14	0.020	-0.055	0.001			
2018.8301	20166+0405	J 1641	5	CV	2002	215.7	7.19	215.27 ± 0.07	7.378 ± 0.003	-0.43	0.188	-0.026	0.011			
2018.8301	20186+1100	STF2662	5	CV	2007	37.2	1.80	42.44 ± 0.04	1.961 ± 0.004	5.24	0.161	0.443	0.014			
2018.8301	20186+1318	A 1671	5	CV	2005	231.6	2.17	229.02 ± 0.02	2.197 ± 0.005	-2.58	0.027	-0.187	0.002			
2017.8383	20192+3859	HO 126 AB	5	CV	2002	159.7	2.18	162.79 ± 0.0	2.184 ± 0.005	3.09	0.004	0.195	0.000			
2018.8137	20193+3635	AG 253 AB	5	CV	2008	118.9	9.49	117.64 ± 0.02	9.784 ± 0.002	-1.26	0.294	-0.117	0.027			
2018.8466	20209+1948	HJ 2954 AB	5	CV	2009	303.3	2.97	302.62 ± 0.02	3.075 ± 0.002	-0.68	0.105	-0.069	0.011			
2018.7753	20237+2710	TDS1067	5	S	2000	203.8	1.78	202.68 ± 0.35	1.797 ± 0.012	-1.12	0.017	-0.060	0.001			
2017.8383	20255+3553	A 47	5	CV	2000	176.2	1.56	175.95 ± 0.8	1.565 ± 0.002	-0.25	0.005	-0.014	0.000			
2018.8466	20260+1212	J 1704	5	CV	2009	202.0	6.03	202.05 ± 0.01	6.223 ± 0.005	0.05	0.193	0.005	0.020			
2018.8137	20263+3728	AG 255	5	CV	2008	286.0	4.94	286.68 ± 0.01	5.208 ± 0.001	0.68	0.268	0.063	0.025			
2018.7753	20278+2411	TDT2295	5	CV	2003	29.4	2.79	28.69 ± 0.04	2.796 ± 0.007	-0.71	0.006	-0.045	0.000			
2018.8301	20279+0958	AG 256 AB	5	CV	2011	351.3	4.97	351.41 ± 0.09	5.214 ± 0.007	0.11	0.244	0.014	0.031			
2018.8137	20282+3024	HJ 1517	5	CV	2002	104.8	12.74	104.78 ± 0.02	13.100 ± 0.002	-0.02	0.360	-0.001	0.021			
2018.8466	20284+1713	HJ 2969	5	CV	2004	169.4	5.79	169.57 ± 0.03	5.986 ± 0.002	0.17	0.196	0.011	0.013			
2018.8137	20288+3810	ES 206	5	CV	2008	124.4	3.95	124.15 ± 0.02	4.162 ± 0.002	-0.25	0.212	-0.023	0.020			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$
2018.7945	20291+2956	AG 406	5	CV	2011	332.6	8.30	332.79 ± 0.03	8.478 ± 0.005	0.19	0.178	0.024	0.023			
2018.8219	20300+4940	HU 589	5	CV	2005	201.6	1.54	203.56 ± 0.06	1.615 ± 0.001	1.96	0.075	0.142	0.005			
2018.8466	20306+1404	AG 408	5	CV	2003	284.8	4.87	285.05 ± 0.02	5.060 ± 0.001	0.25	0.190	0.016	0.012			
2018.8493	20308+1347	STF2688	5	CV	2011	175.0	7.66	174.88 ± 0.01	8.040 ± 0.004	-0.12	0.380	-0.015	0.048			
2018.7342	20312+0328	J 1395	5	CV	2011	298.0	5.62	297.82 ± 0.07	5.701 ± 0.014	-0.18	0.081	-0.023	0.010			
2018.8137	20319+3920	HJ 1531	5	CV	2010	317.7	6.37	317.89 ± 0.02	6.448 ± 0.002	0.19	0.078	0.022	0.009			
2018.8493	20329+1803	HJ 2977	5	CV	2004	317.4	19.75	316.64 ± 0.02	20.11 ± 0.002	-0.76	0.360	-0.051	0.024			
2018.7753	20338+2125	TDS1083	5	CV	2013	354.0	2.50	353.47 ± 0.04	2.616 ± 0.004	-0.53	0.116	-0.092	0.020			
2018.8137	20338+3336	HJ 1538	5	CV	2009	120.5	5.43	121.94 ± 0.01	5.542 ± 0.003	1.44	0.112	0.147	0.011			
2018.7945	20382+2224	HJ 1550	5	CV	2001	223.3	7.61	223.26 ± 0.04	7.912 ± 0.011	-0.04	0.302	-0.002	0.017			
2017.8356	20383+5023	HU 588 AB	5	CV	2008	245.2	2.08	244.64 ± 0.1	2.010 ± 0.001	-0.56	-0.070	-0.057	-0.007			
2018.7945	20410+2001	HJ 2987	5	CV	2007	115.7	10.78	115.73 ± 0.05	11.146 ± 0.011	0.03	0.366	0.003	0.031			
2018.7945	20411+2133	HJ 922	5	CV	2004	312.3	7.41	313.05 ± 0.02	7.752 ± 0.004	0.75	0.342	0.051	0.023			
2018.7342	20417+0424	BU 267	5	CV	2001	239.2	1.84	237.46 ± 0.07	1.935 ± 0.003	-1.74	0.095	-0.098	0.005			
2018.8301	20431+0253	AG 262	5	CV	2011	94.0	5.30	93.69 ± 0.02	5.678 ± 0.005	-0.31	0.378	-0.040	0.048			
2018.8137	20431+3411	ES 2310	5	CV	2002	33.2	4.61	33.08 ± 0.02	4.751 ± 0.003	-0.12	0.141	-0.007	0.008			
2018.8301	20444+1205	A 875	5	CV	2005	210.2	2.29	207.81 ± 0.01	2.529 ± 0.001	-2.39	0.239	-0.173	0.017			
2018.7945	20445+2856	MLB 710	5	CV	2011	180.0	7.36	180.37 ± 0.08	7.583 ± 0.006	0.37	0.223	0.047	0.029			
2018.7342	20447+0721	A 2999	5	CV	2001	222.0	2.04	221.44 ± 0.10	2.052 ± 0.008	-0.56	0.012	-0.032	0.001			
2018.7945	20448+2051	A 172	5	CV	2009	219.5	2.81	219.41 ± 0.05	2.889 ± 0.008	-0.09	0.079	-0.009	0.008			
2018.8219	20449+4332	ES 1448	5	CV	2000	141.9	1.95	142.38 ± 0.03	2.013 ± 0.001	0.48	0.063	0.026	0.003			
2018.7370	20456+0853	HDO 160	5	CV	2010	201.0	5.74	201.17 ± 0.13	5.844 ± 0.005	0.17	0.104	0.019	0.012			
2018.8137	20457+3647	AG 265	5	CV	2008	207.5	6.91	206.98 ± 0.03	6.843 ± 0.006	-0.52	-0.067	-0.048	-0.006			
2018.7945	20461+2638	BRT 217	5	CV	2006	79.9	4.14	80.06 ± 0.07	4.297 ± 0.006	0.16	0.157	0.013	0.012			
2018.8219	20480+4126	ES 1681	5	CV	2001	153.7	2.10	145.82 ± 0.02	2.134 ± 0.001	-7.88	0.034	-0.442	0.002			
2018.8301	20484+0426	AG 267	5	CV	2010	260.8	5.90	260.46 ± 0.05	6.066 ± 0.002	-0.34	0.166	-0.039	0.019			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$
2018.7945	20490+2932	BRT 51 AB	5	CV	2010	355.0	6.59	354.87 ± 0.03	6.916 ± 0.005	-0.13	0.326	-0.015	0.037			
2018.7945	20490+2932	BRT 51 AC	5	CV	2010	38.0	4.90	37.22 ± 0.05	5.053 ± 0.005	-0.78	0.153	-0.089	0.017			
2018.7945	20493+2026	HJ 926	5	CV	2009	190.1	5.73	189.67 ± 0.06	6.001 ± 0.005	-0.43	0.271	-0.044	0.028			
2018.7945	20497+2535	J 3112	5	CV	2009	75.2	5.57	75.10 ± 0.06	5.788 ± 0.005	-0.10	0.218	-0.010	0.022			
2018.8137	20505+3635	SEI1271 AB	5	CV	2002	27.2	14.52	27.03 ± 0.01	14.917 ± 0.003	-0.17	0.397	-0.010	0.024			
2018.8137	20505+3635	SEI1271 AC	5	CV	2002	184.7	19.81	184.77 ± 0.01	20.395 ± 0.002	0.07	0.585	0.004	0.035			
2017.8356	20506+3024	STT 415	5	S	2009	231.6	3.66	234.2 ± 0.0	3.740 ± 0.000	2.60	0.080	0.294	0.009			
2018.8301	20516+07341	A 612	5	CV	2000	9.2	2.01	6.95 ± 0.15	2.026 ± 0.014	-2.25	0.016	-0.119	0.001			
2018.7945	20523+2839	BRT 52	5	CV	2009	86.6	8.39	86.62 ± 0.04	8.830 ± 0.008	0.02	0.440	0.002	0.045			
2018.8137	20540+3124	ES 371	5	CV	2002	34.4	3.39	33.61 ± 0.03	3.477 ± 0.003	-0.79	0.087	-0.047	0.005			
2018.8301	20554+0653	BRT2188	5	CV	2010	45.6	4.06	45.92 ± 0.05	4.290 ± 0.006	0.32	0.230	0.036	0.026			
2017.8356	20559+5906	A 754	5	S	2008	2.4	0.93	6.29 ± 0.1	0.980 ± 0.002	3.89	0.050	0.396	0.005			
2017.8356	20559+5906	AG 258	5	S	2009	9.4	4.14	10.75 ± 0.0	4.160 ± 0.001	1.30	0.020	0.147	0.002			
2018.8466	20567+1300	STF2736	5	CV	2009	217.1	5.43	219.13 ± 0.02	5.251 ± 0.005	2.03	-0.179	0.206	-0.018			
2018.8219	20576+4058	A 400	5	CV	2011	68.1	1.42	69.41 ± 0.03	1.931 ± 0.001	1.31	0.511	0.167	0.065			
2017.8356	20577+5849	A 756 AB	5	S	2011	209.6	0.57	209.73 ± 0.2	0.580 ± 0.016	-0.60	0.010	-0.088	0.001			
2017.8356	20588+0921	BU 764	5	S	1991	357.9	0.71	1.46 ± 0.5	0.730 ± 0.015	3.56	0.020	0.133	0.001			
2018.8137	20596+3703	HJ 1601	5	CV	2008	143.2	6.42	140.76 ± 0.03	6.524 ± 0.005	-2.44	0.104	-0.226	0.010			
2017.8383	21001+3627	J 1219	5	CV	2007	171.4	3.62	172.12 ± 0.0	3.684 ± 0.003	0.72	0.064	0.066	0.006			
2017.8383	21020+3745	COU2223	5	CV	2009	178.6	1.93	180.33 ± 0.3	1.893 ± 0.013	1.73	-0.037	0.196	-0.004			
2017.8383	21020+3914	IV 9	5	CV	2009	193.0	2.33	194.93 ± 0.1	2.283 ± 0.006	1.93	-0.047	0.218	-0.005			
2018.8219	21022+4235	ES 1577	5	CV	2004	40.4	5.59	40.79 ± 0.01	5.783 ± 0.003	0.39	0.193	0.026	0.013			
2018.8219	21024+4236	ES 1578	5	CV	1997	233.1	2.68	233.12 ± 0.06	2.822 ± 0.001	0.02	0.142	0.001	0.007			
2017.8383	21029+3554	J 1078 AB	5	CV	2000	109.7	2.59	112.0 ± 0.0	2.659 ± 0.005	2.30	0.069	0.129	0.004			
2018.8466	21031+1434	A 1689	5	CV	2000	340.4	2.25	340.86 ± 0.05	2.430 ± 0.002	0.46	0.180	0.024	0.010			
2018.8219	21044+4057	ROE 44	5	CV	2008	43.2	7.07	42.84 ± 0.02	7.193 ± 0.001	-0.36	0.123	-0.033	0.011			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\theta$
2018.8301	21052-1004	AOT 104	5	CV	2008	172.8	7.33	173.63 ± 0.07	7.573 ± 0.005	0.83	0.243	0.077	0.022			
2018.8219	21055+4758	ES 816	5	CV	2003	35.5	2.52	35.63 ± 0.05	2.640 ± 0.002	0.13	0.120	0.008	0.008			
2018.8301	21066-0534	BRT 557	5	CV	2010	280.1	4.02	280.54 ± 0.11	4.301 ± 0.013	0.44	0.281	0.050	0.032			
2017.8383	21067+3715	SEI1406	5	CV	2002	172.8	3.18	174.61 ± 0.0	3.235 ± 0.003	1.81	0.055	0.114	0.003			
2018.8959	21074+2429	STF2761	5	CV	2009	112.1	5.49	111.44 ± 0.01	5.729 ± 0.003	-0.66	0.239	-0.067	0.024			
2018.8493	21076+3546	ES 2254	5	CV	2010	275.3	8.16	275.22 ± 0.03	8.579 ± 0.005	-0.08	0.419	-0.009	0.047			
2018.8137	21082+3449	ES 2255 AB	5	CV	2004	249.3	4.80	249.17 ± 0.01	4.951 ± 0.001	-0.13	0.151	-0.009	0.010			
2018.8219	21082+4055	AG 414	5	CV	2004	105.0	5.43	107.53 ± 0.02	5.267 ± 0.001	2.53	-0.163	0.171	-0.011			
2018.8301	21086-0427	BRT 514	5	CV	2003	135.0	4.49	136.06 ± 0.12	4.769 ± 0.006	1.06	0.279	0.067	0.018			
2018.8137	21088+3102	ES 375	5	CV	2003	41.3	4.42	41.80 ± 0.02	4.536 ± 0.003	0.50	0.116	0.032	0.007			
2018.8219	21100+4326	ES 1453	5	CV	2007	68.4	5.43	68.00 ± 0.02	5.463 ± 0.002	-0.40	0.033	-0.034	0.003			
2018.8466	21116+1251	ROE 102	5	CV	2010	127.4	6.45	128.18 ± 0.05	6.686 ± 0.004	0.78	0.236	0.088	0.027			
2018.8219	21119+4838	HJ 1624	5	CV	2004	189.4	5.94	189.69 ± 0.02	6.204 ± 0.002	0.29	0.264	0.020	0.018			
2018.8301	21127-0045	J 1403	5	CV	2011	343.9	3.77	343.85 ± 0.14	4.013 ± 0.007	-0.05	0.243	-0.006	0.031			
2018.8466	21130+1802	J 577	5	CV	2000	20.2	2.39	19.10 ± 0.11	2.434 ± 0.004	-1.10	0.044	-0.058	0.002			
2018.8959	21158+4719	ES 514	5	CV	2003	195.0	4.25	194.94 ± 0.03	4.392 ± 0.003	-0.06	0.142	-0.004	0.009			
2018.8466	21167+1459	HU 961	5	CV	1999	13.7	2.13	13.86 ± 0.08	2.156 ± 0.005	0.16	0.026	0.008	0.001			
2018.8493	21189+3909	AG 270	5	CV	2007	111.8	5.93	112.20 ± 0.01	5.791 ± 0.003	0.40	-0.139	0.034	-0.012			
2017.8383	21210+3304	J 1229	5	CV	2001	302.7	2.23	304.56 ± 0.0	2.215 ± 0.003	1.86	-0.015	0.110	-0.001			
2018.8959	21230+2858	STF2791	5	CV	2010	330.2	7.25	330.58 ± 0.02	7.412 ± 0.004	0.38	0.162	0.043	0.018			
2018.8466	21236+1030	BRT1356	5	CV	2004	63.2	5.48	62.70 ± 0.13	5.685 ± 0.018	-0.50	0.205	-0.034	0.014			
2018.8959	21240+2236	KU 60	5	CV	2011	227.6	7.08	227.86 ± 0.01	7.319 ± 0.002	0.26	0.239	0.033	0.030			
2018.8493	21278+3835	KU 61 AB	5	CV	2002	271.4	3.80	271.24 ± 0.04	3.919 ± 0.003	-0.16	0.119	-0.009	0.007			
2018.9041	21282+4713	ES 1171 AB	5	CV	2003	196.5	3.66	196.58 ± 0.03	3.772 ± 0.001	0.08	0.112	0.005	0.007			
2018.9041	21287+4952	STF2800	5	CV	2010	249.0	9.00	254.36 ± 0.01	9.337 ± 0.007	5.36	0.337	0.602	0.038			
2018.9041	21293+4512	ES 100 AB	5	CV	2011	157.0	4.33	156.64 ± 0.04	4.387 ± 0.002	-0.36	0.057	-0.046	0.007			

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Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$
2018.8466	21300-0637	BRT 517	5	CV	2001	206.7	4.27	204.57 ± 0.08	4.407 ± 0.007	-2.13	0.137	-0.119	0.008			
2018.8466	21309+1141	J 178	5	CV	2001	187.4	2.72	185.20 ± 0.16	2.938 ± 0.012	-2.20	0.218	-0.123	0.012			
2018.9041	21309+4228	TDT3004	5	CV	2002	173.3	5.97	163.76 ± 0.02	5.933 ± 0.003	-9.54	-0.037	-0.564	-0.002			
2018.9041	21317+4508	AG 272	5	CV	2011	183.4	4.10	183.70 ± 0.05	4.240 ± 0.002	0.30	0.140	0.038	0.018			
2018.8493	21322+3850	ES 259	5	CV	2009	318.3	3.77	318.98 ± 0.03	3.937 ± 0.004	0.68	0.167	0.069	0.017			
2018.9041	21324+4002	HO 162	5	CV	2009	330.0	3.42	329.97 ± 0.02	3.537 ± 0.001	-0.03	0.117	-0.003	0.012			
2018.8493	21327+3948	HO 604	5	CV	2011	316.1	4.94	316.06 ± 0.03	5.291 ± 0.003	-0.04	0.351	-0.005	0.045			
2018.8959	21374+2454	POU5440	5	CV	2003	305.0	4.16	304.67 ± 0.05	4.219 ± 0.005	-0.33	0.059	-0.021	0.004			
2018.8301	21385+0513	BAL2981	5	CV	2010	265.7	4.12	265.33 ± 0.01	4.284 ± 0.001	-0.37	0.164	-0.042	0.019			
2018.8466	21388-0121	BAL 624	5	CV	2003	331.1	3.43	330.85 ± 0.05	3.599 ± 0.004	-0.25	0.169	-0.016	0.011			
2018.8959	21389+3623	STF2814	5	CV	2004	159.9	7.93	159.85 ± 0.01	8.143 ± 0.004	-0.05	0.213	-0.003	0.014			
2018.8466	21399+1427	AG 419	5	CV	2009	222.5	3.64	222.58 ± 0.06	3.803 ± 0.005	0.08	0.163	0.008	0.017			
2018.8301	21403+0344	STT 446	5	CV	2004	173.9	6.58	173.33 ± 0.02	6.769 ± 0.003	-0.57	0.189	-0.038	0.013			
2018.8301	21423+0715	HU 279	5	CV	2009	355.5	2.42	356.08 ± 0.08	2.482 ± 0.002	0.58	0.062	0.059	0.006			
2018.8466	21456+0251	BAL2056	5	CV	2010	269.3	7.88	269.11 ± 0.03	8.128 ± 0.008	-0.19	0.248	-0.021	0.028			
2018.8959	21474+2834	A 300 AB	5	CV	2001	251.5	2.40	251.81 ± 0.13	2.312 ± 0.006	0.31	-0.088	0.017	-0.005			
2017.8383	21474+3453	HO 466	5	CV	2005	143.1	2.26	144.57 ± 0.0	2.291 ± 0.003	1.47	0.031	0.115	0.002			
2017.8383	21522+3252	ES 2321	5	CV	2005	277.3	2.04	279.03 ± 0.1	2.007 ± 0.008	1.73	-0.033	0.135	-0.003			
2018.8959	21551+2523	AG 421	5	CV	2010	198.9	6.36	199.05 ± 0.01	6.799 ± 0.006	0.15	0.439	0.017	0.049			
2018.8493	21557+3301	AG 278	5	CV	2010	158.4	3.40	158.69 ± 0.02	3.542 ± 0.003	0.29	0.142	0.033	0.016			
2018.8959	21561+2420	STT 454 AB	5	CV	2009	277.9	7.05	278.06 ± 0.01	7.429 ± 0.003	0.16	0.379	0.016	0.038			
2018.8493	21571+3858	SEL1545	5	CV	2004	324.5	5.60	324.49 ± 0.04	5.800 ± 0.002	-0.01	0.200	-0.001	0.013			
2018.8301	21591+0116	HJ 3078	5	CV	2003	182.7	4.39	180.78 ± 0.06	4.564 ± 0.011	-1.92	0.174	-0.121	0.011			
2018.8466	21595+0617	HJ 3079	5	CV	2010	74.3	9.78	74.24 ± 0.01	10.02 ± 0.002	-0.06	0.240	-0.007	0.027			
2018.9233	22002+4545	A 777	5	CV	2005	81.7	2.30	81.57 ± 0.03	2.322 ± 0.001	-0.13	0.022	-0.009	0.002			
2018.8493	22006+5411	STF2852	5	CV	2005	172.7	7.90	172.25 ± 0.02	7.862 ± 0.006	-0.45	-0.038	-0.032	-0.003			

Table 2 continues on the next page.



Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\theta$
2017.9205	22013+2751	ES 527	3	CV	2011	213.7	3.46	214.03 ± 0.0	3.494 ± 0.008	0.33	0.034	0.048	0.005			
2018.8493	22029+4717	A 781	5	CV	2001	199.6	2.85	199.64 ± 0.12	2.919 ± 0.005	0.04	0.069	0.002	0.004			
2017.9370	22040+3841	COU1341	3	CV	2005	272.2	1.57	272.64 ± 0.2	1.612 ± 0.002	0.44	0.042	0.034	0.003			
2017.9205	22044+2500	POU5269	3	CV	2004	235.9	5.38	235.23 ± 0.1	5.562 ± 0.012	-0.67	0.182	-0.048	0.013			
2017.9205	22058+2951	J 1225	3	CV	2002	114.3	3.19	115.2 ± 0.0	3.195 ± 0.002	0.90	0.005	0.057	0.000			
2017.9205	22060+2036	STF2859	3	CV	2013	344.0	3.70	343.92 ± 0.1	3.765 ± 0.010	-0.08	0.065	-0.016	0.013			
2017.9205	22061+2034	BRT2840	3	CV	2013	318.0	2.30	315.88 ± 0.2	2.350 ± 0.002	-2.12	0.050	-0.431	0.010			
2017.9205	22092+2346	TDS1160	3	CV	2003	115.5	1.38	116.78 ± 0.5	1.468 ± 0.003	1.28	0.088	0.086	0.006			
2017.9041	22104+1925	BRT2527	3	CV	2010	12.0	5.80	10.71 ± 0.0	5.613 ± 0.003	-1.29	-0.187	-0.163	-0.024			
2017.9342	22108+2151	J 2365	3	CV	2004	260.6	5.45	261.14 ± 0.0	5.508 ± 0.001	0.54	0.058	0.039	0.004			
2017.9041	22110+1543	J 1794	3	CV	2011	229.9	5.28	229.3 ± 0.0	5.209 ± 0.004	-0.60	-0.071	-0.087	-0.010			
2018.8959	22117+3149	A 1228	5	CV	2002	350.0	3.77	349.92 ± 0.02	3.830 ± 0.007	-0.08	0.060	-0.005	0.004			
2017.9205	22120+2546	MLB 723	3	CV	2006	337.9	2.33	338.8 ± 0.1	2.337 ± 0.011	0.90	0.007	0.076	0.001			
2018.8959	22126+3358	KU 63	5	CV	2003	241.1	4.16	240.97 ± 0.13	4.245 ± 0.005	-0.13	0.085	-0.008	0.005			
2017.9342	22132+2148	HJ 958	3	CV	2010	231.0	5.70	232.51 ± 0.2	5.839 ± 0.015	1.51	0.139	0.190	0.018			
2018.8301	22133+3207	ES 388	5	CV	2010	263.7	7.33	263.43 ± 0.11	7.855 ± 0.005	-0.27	0.525	-0.031	0.059			
2018.8301	22159+3125	BU 477	5	CV	2010	41.5	6.14	41.45 ± 0.07	6.559 ± 0.013	-0.05	0.419	-0.006	0.047			
2018.9041	22159+3125	BU 477	5	CV	2010	41.5	6.14	41.32 ± 0.07	6.572 ± 0.004	-0.18	0.432	-0.020	0.049			
2018.8301	22161+3037	ES 389	5	CV	2010	258.6	7.57	257.93 ± 0.02	7.640 ± 0.004	-0.67	0.070	-0.076	0.008			
2018.9233	22176+4503	ES 1343	5	CV	2000	76.0	1.72	73.97 ± 0.05	1.744 ± 0.003	-2.03	0.024	-0.107	0.001			
2017.9205	22221+2155	J 2578	3	CV	2000	351.4	2.09	351.18 ± 0.1	2.095 ± 0.002	-0.22	0.005	-0.012	0.000			
2017.9342	22242+2712	HJ 1760	3	CV	2007	335.9	6.93	336.17 ± 0.0	6.977 ± 0.023	0.27	0.047	0.025	0.004			
2017.9041	22254+1842	HJ 963	3	CV	2010	59.6	7.00	59.62 ± 0.0	7.170 ± 0.006	0.02	0.170	0.003	0.022			
2017.9041	22265+1925	HU 596	3	CV	2005	19.4	3.09	16.56 ± 0.0	1.111 ± 0.001	-2.84	-1.979	-0.220	-0.153			
2017.9342	22292+2621	J 3168 AB	3	CV	2006	149.4	7.91	149.46 ± 0.2	8.036 ± 0.43	0.06	0.126	0.005	0.011			
2017.9370	22293+3008	MLB 581 AB	3	CV	2006	236.2	2.24	235.74 ± 0.1	2.278 ± 0.016	-0.46	0.038	-0.039	0.003			

Table 2 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$
2017.9370	22297+3259	TDT3548	3	CV	2002	136.6	1.50	135.6 ± 0.2	1.498 ± 0.012	-1.00	-0.002	-0.063	0.000			
2018.9233	22314+4753	A 2397	5	CV	2010	267.4	8.50	271.46 ± 0.04	2.054 ± 0.004	4.06	-6.446	0.455	-0.722			
2017.9342	22318+2953	MLB 582	3	CV	2010	341.6	5.49	342.01 ± 0.2	5.406 ± 0.024	0.41	-0.084	0.052	-0.011			
2017.9342	22339+2635	HO 476	3	CV	2010	206.9	6.75	207.4 ± 0.0	6.921 ± 0.009	0.50	0.171	0.063	0.022			
2017.9370	22364+3007	MLB 624	3	CV	2009	298.6	1.93	298.45 ± 0.6	1.927 ± 0.038	-0.15	-0.003	-0.017	0.000			
2017.9041	22379+1131	J 165	3	CV	2001	137.3	1.96	137.29 ± 0.0	2.077 ± 0.002	-0.01	0.117	-0.001	0.007			
2018.9041	22395+3653	HJ 968	5	CV	2011	109.2	4.32	110.44 ± 0.02	4.415 ± 0.004	1.24	0.095	0.157	0.012			
2017.9041	22432+1913	TDT3676	3	CV	2002	348.4	2.03	348.89 ± 0.0	1.982 ± 0.003	0.49	-0.048	0.031	-0.003			
2018.9233	22439+3337	ES 265	5	CV	2011	5.2	8.65	5.250 ± 0.02	8.853 ± 0.003	0.05	0.203	0.006	0.026			
2017.9370	22445+3303	ES 2271	3	CV	1997	206.9	1.75	205.78 ± 0.2	1.730 ± 0.007	-1.12	-0.020	-0.053	-0.001			
2017.9370	22455+3359	HU 782	3	CV	2009	321.3	1.98	322.73 ± 0.0	1.966 ± 0.015	1.43	-0.014	0.160	-0.002			
2018.9233	22459+3358	HJ 969	5	CV	2009	26.3	5.86	26.19 ± 0.03	6.131 ± 0.005	-0.11	0.271	-0.011	0.027			
2017.9370	22492+3310	ES 2272	3	CV	2002	23.2	2.10	21.5 ± 0.7	2.020 ± 0.009	-1.70	-0.080	-0.107	-0.005			
2017.9205	22519+2219	COU 239	3	CV	2005	296.2	2.13	296.55 ± 0.0	2.105 ± 0.003	0.35	-0.025	0.027	-0.002			
2017.9205	22524+2819	TDT3763	3	CV	2009	13.4	1.56	12.59 ± 0.0	1.652 ± 0.000	-0.81	0.092	-0.091	0.010			
2017.9342	22546+2020	BU 847	3	CV	2010	35.6	6.92	36.17 ± 0.0	6.872 ± 0.002	0.57	-0.048	0.072	-0.006			
2018.9233	22550+3304	KU 66	5	CV	2009	2.5	3.46	2.610 ± 0.03	3.658 ± 0.004	0.11	0.198	0.011	0.020			
2017.9342	22580+2240	BRT2510	2	CV	2005	268.8	3.02	269.98 ± 0.0	3.056 ± 0.000	1.18	0.036	0.091	0.003			
2017.9205	23002+2409	TDT3834	3	CV	2009	16.3	2.45	15.91 ± 0.2	2.496 ± 0.034	-0.39	0.046	-0.044	0.005			
2017.9342	23042+2438	J 211	3	CV	2009	147.9	2.60	149.48 ± 0.5	2.426 ± 0.057	1.58	-0.174	0.177	-0.019			
2017.9041	23049+0122	J 622	3	CV	2010	320.1	4.06	320.18 ± 0.0	4.155 ± 0.006	0.08	0.095	0.010	0.012			
2017.9205	23055+0407	HO 485	3	CV	2010	46.9	5.38	47.2 ± 0.1	5.665 ± 0.013	0.30	0.285	0.038	0.036			
2018.9233	23134+4603	A 199	5	CV	2009	278.0	2.25	279.62 ± 0.16	2.206 ± 0.022	1.62	-0.044	0.163	-0.004			
2017.9370	23171+2045	BRT2512	3	CV	2010	350.4	3.64	351.4 ± 0.0	3.709 ± 0.011	1.00	0.069	0.126	0.009			
2017.9342	23180+1032	FOX 47	3	CV	2010	279.8	4.83	280.24 ± 0.5	4.736 ± 0.062	0.44	-0.094	0.055	-0.012			
2017.9370	23204+2915	FOX 101	3	CV	2009	45.7	2.38	47.22 ± 0.2	2.262 ± 0.021	1.52	-0.118	0.170	-0.013			

Table 2 continues on the next page.

Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory

Table 2 (continued). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$	$\rho$	$\theta$
2017.9370	23232+2439	TDT4012	3	CV	2009	36.6	2.30	40.04 ± 0.5	2.153 ± 0.039	3.44	-0.147	0.385	-0.016			
2017.9342	23279+1108	STF3014	3	CV	2011	277.0	8.10	278.52 ± 0.0	8.148 ± 0.031	1.52	0.048	0.219	0.007			
2017.9370	23280+1024	ROE 137	3	CV	2010	61.2	8.40	61.76 ± 0.1	8.464 ± 0.018	0.56	0.064	0.071	0.008			
2017.9205	23287+1157	A 1239	3	CV	2008	53.2	2.02	52.99 ± 0.0	2.074 ± 0.001	-0.21	0.054	-0.021	0.005			
2017.9370	23293+2949	ES 400	3	CV	2008	211.0	6.15	211.05 ± 0.0	6.046 ± 0.006	0.05	-0.104	0.005	-0.010			
2017.9205	23302+1359	HU 999	3	CV	2005	141.9	1.59	141.25 ± 0.1	1.608 ± 0.010	-0.65	0.018	-0.050	0.001			
2017.9205	23314+0317	BAL2068	3	CV	2010	74.7	7.14	74.45 ± 0.0	7.178 ± 0.001	-0.25	0.038	-0.032	0.005			
2017.9370	23345+2703	COU 440	2	CV	2009	235.6	1.78	236.31 ± 0.1	1.779 ± 0.011	0.71	-0.001	0.079	0.000			
2017.9342	23352+1133	HJ 3203	3	CV	2010	211.2	6.59	211.71 ± 0.1	6.621 ± 0.005	0.51	0.031	0.064	0.004			
2017.9205	23355+0850	BRT3372	3	CV	2010	120.0	5.20	119.66 ± 0.0	5.535 ± 0.006	-0.34	0.335	-0.043	0.042			
2017.9370	23356+2816	BRT 230	3	CV	2011	5.8	3.20	6.53 ± 0.2	3.190 ± 0.002	0.73	-0.010	0.105	-0.001			
2018.9233	23357+3830	AG 296	5	CV	2008	55.2	5.93	54.00 ± 0.02	5.727 ± 0.002	-1.20	-0.203	-0.110	-0.019			
2018.8301	23372+3439	HO 201	5	CV	2010	346.7	3.53	346.71 ± 0.06	3.637 ± 0.005	0.01	0.107	0.001	0.012			
2018.9233	23372+3439	HO 201	5	CV	2010	346.7	3.53	346.77 ± 0.05	3.640 ± 0.003	0.07	0.110	0.008	0.012			
2018.8301	23392+3535	HO 203	5	CV	2009	131.5	3.80	130.51 ± 0.02	3.879 ± 0.003	-0.99	0.079	-0.101	0.008			
2018.9233	23392+3535	HO 302	5	CV	2009	131.5	3.80	130.47 ± 0.05	3.886 ± 0.002	-1.03	0.086	-0.104	0.009			
2017.9342	23397+1403	HEI 298	3	CV	2009	315.3	3.15	315.39 ± 0.6	3.056 ± 0.024	0.09	-0.094	0.010	-0.011			
2018.8301	23415+3247	ES 2327	5	CV	2009	55.6	3.29	54.99 ± 0.08	3.435 ± 0.003	-0.61	0.145	-0.062	0.015			
2018.9233	23415+3247	ES 2327	5	CV	2009	55.6	3.29	55.08 ± 0.07	3.408 ± 0.005	-0.52	0.118	-0.052	0.012			
2018.8301	23417+3147	HJ 992	5	CV	2010	255.4	6.77	255.67 ± 0.03	6.930 ± 0.006	0.27	0.160	0.031	0.018			
2017.9342	23455+1223	AG 248	3	CV	2010	85.0	4.90	86.69 ± 0.2	4.592 ± 0.010	1.69	-0.308	0.213	-0.039			
2017.9370	23467+2521	TDT4186	3	CV	2009	230.3	1.84	231.17 ± 0.0	1.825 ± 0.008	0.87	-0.015	0.097	-0.002			
2018.9233	23472+3044	A 1244	5	CV	2009	270.7	2.62	272.02 ± 0.01	2.658 ± 0.002	1.32	0.038	0.133	0.004			
2017.9205	23474+0928	A 1245	3	CV	1999	30.0	2.04	30.3 ± 0.1	2.063 ± 0.003	0.30	0.023	0.016	0.001			
2018.9233	23512+4847	A 795	5	CV	2001	317.8	1.26	317.97 ± 0.17	1.239 ± 0.003	0.17	-0.021	0.009	-0.001			
2017.9370	23522+2835	HO 204	3	CV	2010	356.6	5.66	356.75 ± 0.0	5.930 ± 0.009	0.15	0.270	0.019	0.034			

Table 2 concludes on the next page.

**Measurements of 628 Pairs: The 2018 Observing Run at Brilliant Sky Observatory**

*Table 2 (conclusion). Measures of 596 Pairs Without Known Orbits or Rectilinear Solutions*

Date	WDS Number	Discoverer	Observations	Method	Last Reported			Measured			Changes from Last			Change per Year		
					Year	$\theta$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	$\rho$	$\theta$	$\rho$	
2018.9233	23544+3700	ES 2005	5	CV	2004	148.9	5.79	147.95 ± 0.06	6.071 ± 0.009	0.281	-0.95	0.281	-0.064	0.019		
2017.9370	23560+2815	A 425	3	CV	2009	160.9	1.85	161.23 ± 0.0	1.878 ± 0.001	0.028	0.33	0.028	0.037	0.003		
									Cumulative	42.03	29.55	42.03	-3.39	4.33		
									Mean	0.07	0.05	0.07	-0.01	0.01		