

Measurements of Neglected Double Stars: February 2015 Report

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Abstract: This article presents measurements of 44 double stars. The stars were selected from the Washington Double Star Catalog published by the United States Naval Observatory. The photographs were taken by remote telescopes. The measurements were done by the author.

Methodology

Photographs were taken using telescopes operated by the SLOOH observatories, which are part of the Institute of Astrophysics. One of the observatories is located in the Canary Islands near the west coast of Africa. That telescope is located at an elevation of 2,300 meters on the island of Tenerife. The instrument has a focal length of 3,910mm, an aperture of 356mm, and is a Celestron unit of Schmidt-Cassegrain design. The other observatory is located near Santiago, Chile. That telescope is the same model as the unit located in the Canary Islands. The methods used to calibrate the instruments of the SLOOH observatories are unknown to this author.

The camera used most frequently was a CCD SBIG 10XME, but some photographs were taken using a CCD SBIG 2000XM. The photographs were analyzed by the author using the programs CCD Soft v5 and SKY 6. The two programs are products of Software Bisque.

After accumulating the photographs, averages were calculated for the position angles and separations. All of the star patterns were compared with the data from ALADIN (part of the SIMBAD site), or with the SKY X program to insure correctness. After measuring each star and calculating the results, comparisons were made with the published data. The results are listed in the tables, which contain averages of measurements, or, in the case of a single measurement, the actual value. The statistical calculations were rounded to one decimal place in accord with significant figure rules.

Report

The following information was reported for each star: the WDS code with components, the discoverer code, the constellation, the position angle, the separation, the date of the first observation, and, under measures by the author, the results of other authors. The number of measurements, and the WDS values were taken from the WDS on the first observation date.

The column headings are: Washington Double Star identifier and components, DC = Discovery Code, PA = position angle, SD = standard deviation, SE = standard error of the mean, Sep = Separation, Mts = number of measurements, Con = Constellation, and the first observation date.

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Measurements of Neglected Double Stars: February 2015 Report

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WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
04307-5838 AB	LDS123	218.8	0.0	0.0	67.7	0.0	0.0	4	DOR	2014 12 08
WDS		225			65					1920
WDS		219			67.8			5		2010
04307-5838 AC	LDS123	157.3			111.3			4		2014 12 08
OAG (Tobal)		158			112.1					1983
WDS		158			111.7					1910
WDS		157			111.2			8		2010

Other identifiers: CCDM J04308-5838A, CD-58 942, CPC 201132, CPD-58 391, GSC 08515-00434, HD 29016, HIP 21048, IDS 04290-5850A, TYC 8515-434-1, WT 146

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
05210+3728 AB	SEI 203	252.1	0.1	0.1	21.5	0.1	0.1	4	AUR	2014 10 25
JDSO (Buchheim)		251.9			21.4					2008
WDS		251			21.9					1895
WDS		252			21.4			7		2008
05210+3728 AC	TOB 28	75.3	0.1	0.1	53.3	0.1	0.0	4	AUR	2014 10 25
WDS		75			53.6					1982
WDS		75			53.3			3		2008

Other identifiers: CCDM05230+3729A; IDS 05142+3722A

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
05231+3802 AB	SEI 225	87.6	0.3	0.2	26.3	0.2	0.1	3	AUR	2014 10 25
JDSO (Berkó)		87.4			26.3					2009
OAG (Tobal)		87.5			26.2					1982
WDS		88			25.6					1895
WDS		88			26.2			8		2009

Other identifiers: CCDM J05232+3802A; IDS 05163+3756A; 2MASS J05230898+3801383

Measurements of Neglected Double Stars: February 2015 Report

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
05284+3546 AB	SEI 277	187.1	0.2	0.1	24.9	0.1	0.0	4	AUR	2014 10 18
JDSO (Williams)		187.0			24.9					2010
WDS		186			25.1					1895
WDS		187			24.9			7		2009
05284+3546 AC	SEI 276	209.0	0.1	0.1	18.0	0.0	0.0	4	AUR	2014 10 18
WDS		207			17.8					1895
WDS		209			17.9			5		2009
05284+3546 BD	WSI 40	199.0	0.1	0.0	10.3	0.0	0.0	4	AUR	2014 10 18
WDS		199			10.3					1998
WDS		199			10.2			4		2009

Other identifiers: CCDM J05284+3546A; IDS 05217+3540A; 2MASS J0528679+3545310

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
05288+3547 AB	SEI 286	107.7	0.2	0.1	23.3	0.1	0.0	4	AUR	2014 10 18
WDS		106			23.6					1895
WDS		108			23.2			10		2009
05288+3547 AC	SEI 287	50.2	0.0	0.0	24.8	0.1	0.1	4	AUR	2014 10 18
WDS		50			24.7					1895
WDS		50			24.8			6		2009
05288+3547 BC	SEI 288	352.3	0.1	0.0	23.2	0.0	0.0	4	AUR	2014 10 18
WDS		352			22.7					1895
WDS		352			23.2			7		2009
05288+3547BD	BKO 257	132.9	0.1	0.0	16.2	0.1	0.1	4	AUR	2014 10 18
WDS		133			16.0					1895
WDS		134			15.9			4		2009

Other identifiers: GSC 02415-00080; IDS 05221+3543; TYC 2415-80-1; UCAC3 252-54307

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
05485-1322 A-BC	STF 801	326.0	1.8	0.8	27.4	0.7	0.3	7	LEP	2015 01 05
JDSO (Nugent))		327.5			26.8					2014
OAG (Comellas)		327.5			26.8					1980
OAG (Comellas)		325.4			25.6					1995
OAG (Comellas)		327.1			27.1					1997
WDS		326			26.9					1902
WDS		329			26.9			5		2013

Other identifiers: ADS 4410A; BD-13 1253; CCDM J05485-1322A; CSI-13 1253 1; GSC 05359-01776; HIP 27426; IDS 05439-1324A; PPM 216302; SAO 150823; SRS 6641; TYC 5359-1776-1

Measurements of Neglected Double Stars: February 2015 Report

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
05553+2023 AB	J 1914	256.9	0.8	0.4	7.6	0.2	0.1	5	ORI	2014 12 05
WDS		254			7.7					1893
WDS		256			7.8			10		2009

Other identifiers: TYC 1320-964-1

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06072-2216 AB	ARA 1638	179.0	2.1	0.7	13.4	0.0	0.0	8	LEP	2014 12 16
JDSO (Nugent)		182			12.4					2013
WDS		175			14					1920
WDS		182			12.4			9		2013
06072-2216 AD	ABH 37	48.0	0.7	0.2	35.3	0.5	0.2	8	LEP	2014 12 16
WDS		50			36.2					1987
WDS		49			35.4			3		1999
06072-2216 AE	ABH 37	294.7	0.4	0.1	45.3	0.6	0.2	8	LEP	2014 12 16
WDS		295			44.9					1987
WDS		295			44.8			3		1999

Other identifiers: ASAS J060712-2215.9; BD-22 1319; CCDM J06072-2216A; CD-22 2773; CPD-22 1067; GSC 05944-01053; HD 41974; IDS 06030-2215A; 2MASS J06071302-2215593; PPM 249872; SAO 171258; TYC 5944-1053-1; YZ 112 3251

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06219-0609 AC	HJ 36	208.2	0.2	0.1	22.6	0.1	0.0	4	MON	2014 12 17
OAG (Tobal)		229			23					1980
OAG (Tobal)		208.8			22.7					1983
WDS		215			30.0					1825
WDS		209			23.0			9		2007

Other identifiers: ADS 4821; CCDM J06128-0608AB; IDS 06080-0607AB

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06145-4521 AB	CPO 133	33.6	0.1	0.1	123.6	0.2	0.1	6	PUP	2014 12 16
OAG (Tobal)		33.6			122.4					1979
OAG (Tobal)		34.3			124.1					1991
WDS		35			140					1900
WDS		34			123.6			5		1999

Other identifiers: BD-45 2389; CCDM J06146-4520A; CF 2111; CPD-45 793; GSC 08102-01421; IDS 06117-4519A; PPM 310540; RAVE J061431.1-452044; TYC 8102-1421-1

Measurements of Neglected Double Stars: February 2015 Report

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06168-1359 AB	GAL 397	108.2	0.5	0.3	11.6	0.2	0.1	4	CMA	2015 01 05
WDS		93			11.3					1902
WDS		106			11.5			6		1999

Other identifiers: BD-13 1420; GSC 05375-01024; HD 43629; 2MASS J06163947-1359147; PPM 216946; TYC 5375-1024-1

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06234-0952 AB	GAL 400	176.0	0.4	0.2	17.9	0.1	0.0	4	MON	2014 12 17
WDS		176			18.3					1893
WDS		176			17.9			6		2010

Other identifiers: BD-09 1442; 2MASS J06232749-0952376; PPM 189210; SAO 133200; YZ 99 1944

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06259+0944 AC	OPI 11	110.3	0.2	0.1	252.4	0.1	0.0	4	MON	2014 12 25
WDS		110			257.3					1897
WDS		111.0			254.1			6		2000

Other identifiers: ADS 5055 AB; AG+09 708; BD+09 1235; CCDM J06259+0944AB; GSC 00736-01080; IDS 06204+0947 AB; PPM 150495; TYC 736-1080-1

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06273+0532 AB	SLE 285	74.3	0.1	0.0	18.4	0.1	0.0	4	MON	2014 12 25
WDS		74			18.2					1999
WDS		74.0			18.2			2		2000

Other identifiers: HD 257550; GSC 00141-00229; 2MASS J06272041+0531086; NGC 2244+05 86; TYC 141-229-1

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06345+0821 AB	FAL 16	271.1	0.5	0.2	11.0	0.7	0.3	4	MON	2014 12 25
WDS		271			11.1					1898
WDS		272.0			11.1			6		2012
06345+0821 AC	SLE 538	23.4	0.8	0.4	34.6	0.2	0.1	4	MON	2014 12 25
WDS		23.0			34.4					1999
WDS		23			34.4			12		2012

Other identifiers: ALS 14596; BD+08 1399; CI*NGC 2251 HOAG 1; GCRV 4235; GEN# +2.22510001; GSC 00733-01227; HD 259954; HILT 576; HIP 31365; 2MASS J06343615+0821076; NGC 2251 1; Renson 12460; TD1 31024; TYC 733-1227-1; UBV 6531; UBV M31801; UCAC2 34616664

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06360+0359 AB	BAL 2675	207.0	0.1	0.1	14.9	0.1	0.0	4	MON	2014 12 25
WDS		207			14.7					1999
WDS		207.0			14.9			8		2000

Other identifiers: CCDM J06359+0359A; IDS 06307+0404A; 2MASS J06355474+0358429

Measurements of Neglected Double Stars: February 2015 Report

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06382-0128 AB	BAL 326	125.1	0.1	0.0	19.5	0.1	0.0	4	MON	2014 12 25
WDS		126			18.9					1892
WDS		125			19.4			6		2000

Other identifiers: AG--01 782; BD-01 1306; GSC 04799-01398; IRAS 06355-0123; 2MASS J06380582-0126411; PPM 176356; SAO 133505; TYC 4799-1398-1; YZ 91 1764

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06421+0315 AB	HO 237	53.7	0.3	0.2	168.9	1.3	0.6	4	MON	2014 12 25
JDSO (Arnold)		55			168.9					2007
OAG (Ximenez)		54			165.9					1982
WDS		53			120					1999
WDS		55			168.9			8		2000

Other identifiers: AG+03 840; BD+03 1359; BDS 3560 AB; CSI+03 1359 1; GC 8752; GCRV 57922; GSC 00151-01121; HD 48157; HIP 32072; IDS 06368+0321 AB; 2MASS J06420468+0314538; PPM 151084; SOA 114297; SKY# 11735; TD1 7847; TYC 151-1121-1; YZ 3 2363

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06435-3147 AB	COO 42	97.9	1.6	0.8	19.5	0.4	0.2	5	CMA	2014 12 16
OAG (Tobal)		100.8			19.1					1998
WDS		87			15.7					1919
WDS		98			19.4			3		1999

Other identifiers: CD-31 3605; CCDM J06436-3147A; CPC 17 2940; CPD-31 1311; CSI-31 3605 21; GSC 07087-02711; IDS 06398-3140 A; 2MASS J06433274-3146337; PPM 283042; RAVE J064332.8-314636; SAO 197133; TYC 7087-2711-1

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06491+0151 AB	BAL 1342	159.4	0.2	0.1	13.5	0.0	0.0	4	MON	2014 12 25
WDS		159			15.7					1909
WDS		160			13.9			4		2007

Other identifiers: BD+02 1409; GSC 00148-00466; HD 289177; 2MASS J06490445+0152115; TYC 148-466-1

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
06502+0057 AB	BAL 1346	113.1	0.1	0.0	19.1	0.1	0.0	4	MON	2014 12 25
WDS		112			19					1910
WDS		113			19.1			4		2000

Other identifiers: CCDM J06501+0057A; HD 289224; IDS 06450+0104A; 2MASS J06500782+0056460; TYC 148-1018-1

Measurements of Neglected Double Stars: February 2015 Report

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
07260+1406 AC	STF 1088	237.9	0.1	0.1	112.4	0.6	0.3	5	GEM	2014 12 17
JDSO (Arnold)		238			112.6					2012
Tycho 2		238.1			112.8					1991
WDS		238			112.3					1829
WDS		239			112			27		2012
07260+1406 AD	STF 1088	243.3	1.2	0.5	90.9	1.4	0.6	5	GEM	2014 12 17
WDS		243			91.5					1997
WDS		243			91.6			2		2000
07260+1406 AE	STF 1088	225.6	0.4	0.2	123.0	1.0	0.1	5	GEM	2014 12 17
JDSO (Darling)		223			119.6					2012
WDS		238			112.8					1997
WDS		223			119.6			3		2011

Other identifiers: ADS 6068A; AG+14 801; BD+14 1665; CCDM J07260+1406A; GC 9917; GCRV 58745; GSC 00776-01373; HD 58383; HGAM 570; HIP 36078; 2MASS J07260241+1406107; PPM 124002; SAO 96892; SKY#13553; TD1 10055; TYC 776-1373-1; UBV 7179; YZ 14 2911

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
07487+1436 AB	WSI 25	67.7	0.1	0.0	13.2	0.0	0.0	4	GEM	2014 12 17
WDS AB		68			12.8					1906
WDS AB		68			13.1			6		2010
07487+1436 AC	HJ 3300	70.7	0.1	0.0	36.9	0.0	0.0	4	GEM	2014 12 17
WDS AC		71			37.8					1902
WDS AC		71			36.9			7		2010

Other identifiers: BDS 4268A; CCDM J07488+1436A; IDS 07431+1451A; 2MASS J07484713+1436221

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
07578-6048 AB	NBG 1	352.2	3.6	0.8	16.8	0.2	0.1	5	CAR	2014 12 16
OAG (Tobal)		351.9			16.2					1991
WDS		350			17.9					1924
WDS		352			16.8			5		2000

Other identifiers: BD-60 979; CD-60 1964; CPC 20.1 2006; NGC 2516 86; PPM 356389; SAO 250042; SKY# 14910; TYC 8911-1199-1; UBV M 33288

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
08260-4318 AB	DON 249	212.8	0.3	0.2	26.1	0.1	0.0	4	PUP	2014 12 17
OAG (Tobal)		212.2			26.5					1991
WDS		235			26.0					1929
WDS		212			25.6			4		1999

Other identifiers: CCDM J08260-4318A; CD-42 4240; CF 4286; CPD-42 2486; IDS 08226-4258A; 2MASS J08260022-4317385; PPM 755889; TYC 7673-2162-1

Measurements of Neglected Double Stars: February 2015 Report

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
09045-5620 AB,D	HJ 4177	294.6	0.9	0.3	32.0	1.1	0.4	8	VEL	2014 12 17
WDS		296			35.3					1892
WDS		294			33.6			7		2000
09045-5620 CD	HJ 4177	317.8	0.8	0.3	32.0	0.4	0.1	8	VEL	2014 12 17
WDS		295			10.0					1835
WDS		317			31.4			6		2000

Other identifiers: CCDM J09045-5620AB; CEL 3173; CPD-55 1924; CSI-55 1924 41; GC 12561; GCRV 60423; GEN# +1.00078190J; HD 78190; HIP 44545; IDS 09017-5556 AB; 2 MASS J09043283-5620277; PPM 337547; SAO 236568; SKY #17502; TD1 13533; TYC 8590-405-1; UBV M 15086

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
09059-3259 AC	RST 2602	337.0	0.4	0.2	13.1	0.0	0.0	6	PYX	2014 12 17
WDS		338			11.9					1909
WDS		337			12.8			7		1999

Other identifiers: CD-32 6047; CCDM J09059-3259A; IDS 09018-3235A; TYC 7155-233-

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
10044-6039 AB	JAW 11	47.0	0.1	0.1	13.6	0.0	0.0	5	CAR	2015 01 05
WDS		50			15.3					1924
WDS		47			13.9			5		2000

Other identifiers: BD-60 1627

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
11563-4546 AB	LDS 373	196.9	0.1	0.1	52.8	0.1	0.0	5	CEN	2015 01 05
OAG (Tobal)		197			53.2					1975
OAG (Tobal)		198.7			53.6					1991
WDS		225			53					1920
WDS		197			52.7			6		2000

Other identifiers: CD-45 7401; CCDM J11562-4547A; CF 9474; CPD-45 5694; GEN# -0.04507401; GSC 08216-01325; IDS 11512-4513A; 2MASS J11561429-4546230; PPM 758557; TYC 8216-1325-1

WDS number/Comp	D.C.	P.A.	SD	SM	SEP	SD	SM	Mts	Con	Date
23293+4152 AB	CHE 497	50.2	0.1	0.1	7.0	0.0	0.0	3	AND	2014 10 11
Webb (Berkó)		49.9			7.0					2008
WDS		52			6.9					1911
WDS		50			7.0			5		2008

There were no other identifiers.

Measurements of Neglected Double Stars: February 2015 Report

Notes:

05231+3802 AB: In the article written by Williams, it appears that the reported measurements were from B to A, as the values were 268 and 26.2.

05284+3546 AB: Based on the published data, it appears that the C and D components of this group are mislabeled in the article by Williams.

05485-1322 A-BC: Seven measurements were taken over a period of one month, due to the variations in the values. While the average is an acceptable 99.1% of the published value, the standard deviation is greater than is desired. The separation is 98.2% of the published value, and the standard deviation is an acceptable +/-0.7.

06346+0821 AD: Four photographs of this double star were taken over a period of one month, but this pair was not found in any of the photographs.

07260+1406 AB: Five measurements were made from 17 December 2014 to 19 January 2015. The position angle measurements yielded an average of only 190.7 with a standard deviation of 4.9. The WDS value was 197. The average separation was an acceptable 10.7 versus 11.0 as published in the WDS. More measurements will be necessary on the AB components. From the photographs I received, the AF and AR components could not be identified.

07578-6048 BC: This pair, with discover code TOB 356, was present in the photographs, but the closeness made measurements impossible with my equipment.

09045-5620 AB,C: Eight measurements were taken over two months (17 December 2014 to 4 February 2015) with mixed results. The position angle average was 216.0, less than the 225 given in the WDS, a difference of 4% with a standard deviation of 2.6. The separation was good at 12.9 versus 13.0.

