

Improving the WDS Catalog: Identifications for same double stars

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Abstract: The Double Star Section of LIADA (*Liga Iberoamericana de Astronomía*) reports identifications for same neglected double stars studied by us in 2003. Accurate astrometry and proper motions are listed. Comments about a double star with possibly two WDS-identifications are included.

Introduction

Administrators of the Washington Double Star catalog (Mason, *et al.*, 2003, hereafter WDS) have changed its format in the last year. Now the WDS lists precise coordinates for the systems and subsystems and secondary proper motions.

Coordinates which are several times more precise than the WDS identifier are now provided for the majority of WDS systems. Coordinates are obtained from several astrometric catalogs such as Hipparcos (ESA 1997), Tycho-2 (Hog E. *et al.* 2000), Two Micron All Sky Survey (Cutri 2000, hereafter 2MASS), UCAC-2 (Zacharias *et al.*, 2004) or through manual inspection. The ten-digit WDS identifier is retained and will con-

tinue to be the same for all components in hierarchical systems. However, the precise coordinate will be for the primary of the subsystem. Nowadays, more than 92% of the systems have arcsecond precise coordinates. But there are many neglected or unconfirmed pairs without this precise coordinate. Systems with precise coordinates will be automatically updated by WDS administrators using future astrometric catalogs. This is why double star identification is an important contribution by an amateur, which improves the data of “our” WDS catalog.

Double Star Identification

Recently, LIADA reported on measurements made by its double star group (Rica Romero, 2006). Table I

(Continued on page 144)

(1) DOUBLE	(2) AR_2000	(3) DEC_2000	(4) PM_AR	(5) PM_DEC	(6) Source PM	(7) Note
LDS9084 B			-106	- 60	[USNO-B1.0]	
HJ 331 A	03 08 32.11	+31 00 43.9	- 4.2	- 28.8	[TYCHO-2]	
HJ 331 B			+ 11.2	- 3.1	[UCAC-2]	
HJ 28 A	04 51 20.46	-06 13 46.8	+ 3.3	+ 0.8	[UCAC-2]	
HJ 28 B			- 4.2	- 10.7	[UCAC-2]	
HJ 3306 A	08 00 14.97	+01 26 41.8	- 1.3	+ 4.7	[TYCHO-2]	
HJ 3306 B			- 1.8	- 20.7	[UCAC-2]	
B 2164 C	08 03 48.06	-31 32 55.7	- 1.8	+ 3.3	[TYCHO-2]	1)
HJ 82 A	08 11 13.64	+10 47 37.3	- 7.4	- 9.1	[UCAC-2]	
HJ 82 B			- 3.2	- 4.2	[TYCHO-2]	
HJ 84 A	08 12 32.75	+04 29 49.2				
BVD 2 A	08 12 32.75	+04 29 49.2				

Table I: Double star identifications and proper motions (continued on next page).

Improving the WDS Catalog: Identifications for Same Double Stars

(1) DOUBLE	(2) RA_2000	(3) DEC_2000	(4) PM_AR	(5) PM_DEC	(6) Source PM	(7) Note
HJ 83 A	08 12 31.13	+04 26 58.0	- 40.4	- 33.9	[UCAC-2]	
HJ 83 B			- 19.6	- 0.9	[UCAC-2]	
HJ 88 A	08 19 35.67	-00 47 21.3	- 0.7	- 20.9	[TYCHO-2]	
HJ 88 B			- 0.2	- 8.3	[UCAC-2]	
HJ 91 A	08 22 40.38	+12 04 24.2	- 7.5	- 4.2	[TYCHO-2]	2)
HJ 91 B			- 7.2	- 5.7	[TYCHO-2]	
HJ 192 A	11 51 59.06	-02 59 15.2	+ 2.2	- 53.1	[TYCHO-2]	
HJ 192 B			- 14.4	- 9.9	[UCAC-2]	
LDS 624 A	18 09 02.60	-61 54 14.6				1)
HJ 1345 A	18 46 13.83	+31 16 28.1				
HJ 2841 A	18 47 55.56	+23 35 30.8	+ 1.1	- 2.1	[TYCHO-2]	
HJ 2841 B			- 5.5	- 2.5	[UCAC-2]	
HJ 880 A	19 16 15.74	+04 39 49.1				
HJ 2864 A	19 19 10.94	+04 00 55.8	+ 4.6	- 2.9	[TYCHO-2]	
HJ 2864 B			+ 1.7	+ 4.8	[UCAC-2]	
HJ 1389 A	19 21 55.32	+30 50 00.2	- 3.9	- 6.2	[UCAC-2]	
HJ 1389 B			- 0.6	+ 13.7	[TYCHO-2]	
HJ 1637 A	21 22 33.22	+31 57 39.0	+ 10.9	- 37.9	[TYCHO-2]	
HJ 1637 B			+ 14.9	- 40.1	[UCAC-2]	
HJ 1646 A	21 27 00.86	+43 13 50.9	- 22.5	- 16.2	[TYCHO-2]	
HJ 1646 B			- 3.5	- 5.5	[UCAC-2]	
HJ 283 A	21 27 56.41	-10 48 19.5	+ 2.1	- 9.1	[UCAC-2]	
HJ 3036 A	21 33 43.21	-14 43 27.1				
HJ 5518 A	21 35 47.71	-10 23 29.8	- 0.4	- 1.7	[TYCHO-2]	
HJ 5518 B			- 70.5	-134.9	[TYCHO-2]	
HJ 3049 A	21 41 47.52	+01 44 21.8	- 0.6	- 6.6	[TYCHO-2]	
HJ 3049 B			+ 84.0	+ 17.9	[TYCHO-2]	

Table I: Double star identifications and proper motions (continued from previous page).

Notes:

1) bad WDS coordinate

2) HJ 91 is located at 08h 22m 40s387 and +12d 04' 24"19, six arcminutes West of the WDS coordinate.

ID. WDS	Designation	Epoch	N	Theta [°]	Rho [']	Mag.
18462+3116	SLE 121	1982	1	350	13.7	11.6, 11.7
18464+3116	HJ 1345	1828	1	171	8.	13, 13

Table II: Visual double star with multiple identifications in the WDS.

Improving the WDS Catalog: Identifications for Some Double Stars

(Continued from page 142)

shows some of those double stars identified with their precise coordinates and gives their proper motions. Discoverer codes for the double stars are listed in column 1; precise coordinates from the 2MASS catalog are listed in columns 2 and 3. Columns 4 and 5 give individual proper motion expressed in mas/yr. The sources for proper motion are listed in column 6 and they came from Tycho-2 (Hog E. et al. 2000), UCAC-2 (Zacharias et al., 2004) and USNO-B1.0 (Monet D.G., Levine S.E., Casian B., et al., 2003) catalogs. Column 7 gives some notes.

Double Star With Two Identifications

We argue that HJ 1345 is the same double star as SLE 121. In the WDS both entries are separated by 2.6 arcminutes (see Figure 1 and Table II). In addition to a pair of stars located near the WDS position for SLE 121, there is no other pair similar to HJ 1345. Position angles for both entries are nearly equal if a quadrant correction is performed for HJ 1345. Magnitude differences in each entry are equal within a margin of error. SLE 121 is wider than HJ 1345. According to LIADA Double Star Section's results, the angular separation of unconfirmed double stars discovered by John Herschel have a large error and usually are closer by several arcseconds than the modern values.

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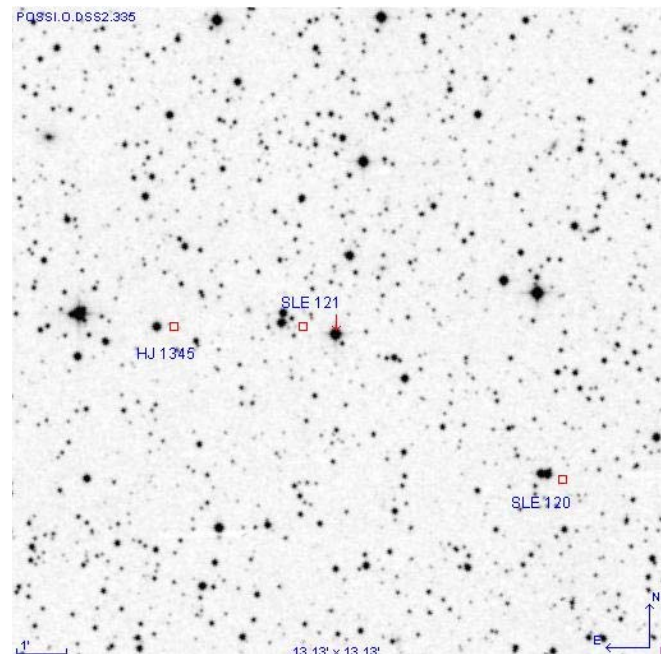


Figure 1. Part of the photographic plate from Digitized Sky Survey (POSS-I blue) taken on July 6, 1951. The field of view is of 13.1' x 13.1'. North is up and East is left. In this region are showed three WDS double stars (HJ 1345, SLE 121 and SLE 120) marked with empty red square.