

Jonckheere Double Star Photometry – Part VI: Auriga

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Abstract: If any double star discoverer is in urgent need of photometry then it is Jonckheere. There are over 3000 Jonckheere objects listed in the WDS catalog and a good part of them has magnitudes which are obviously far too bright. This report covers the Jonckheere objects in the constellation Auriga. Only one image per object was taken as despite the risk of random effects even a single instance visual magnitude measurement is better than the currently usually given estimation although the J-objects in this constellation seem with some exceptions better covered with observations as usual for Jonckheere doubles.

Introduction

The degree of contamination of the WDS catalog with wrong magnitude data is rather high – this might very well be a side effect of magnitudes considered being not as important as the basic double star parameters separation and position angle. Measurements of magnitudes without these basic parameters are not even counted as observations in the WDS catalog. As follow up to the report on J-objects so far I selected this time all J-objects in Auriga to be imaged for measurements with a remote telescope located in New Mexico. To counter the single image random effects especially for the astrometry results of rather close pairs I checked also catalogs like especially GAIA DR1 for recent precise position data with a surprisingly high number of objects with missing GAIA DR1 data. The single image random effects seem less significant for the measured magnitudes as a magnitude error of ~0.1 or even a bit larger seems negligible in comparison with the Jonckheere objects often given magnitude errors in the range of up to 2 magnitudes. The G-band magnitudes given in the GAIA DR1 data lines covering the white light range of about 330 to 1050 nm

(<http://www.cosmos.esa.int/web/gaia/science-performance>) are also a good indication for the visual magnitudes and there is even a relation available to convert Johnson V and Johnson-Cousins V-I_C to Gaia G:

$$G = V - 0.0257 - 0.0924(V - I_C) - 0.1623(V - I_C)^2 + 0.0090(V - I_C)^3$$

with an average fit error of 0.05 mag.

Results of Photometry and Catalog Checking

For each of the selected J-objects one single image was taken with iTelescope iT24 with V-filter and 3s exposure time, plate solved with Astrometrica using the URAT1 catalog with reference stars in the Vmag range of 8.5 to 14.5 giving not only RA/Dec coordinates but also photometry results for all reference stars used including an average dVmag error. The J-objects were then located in the center of the image and astrometry/photometry was then done by the rather comfortable Astrometrica procedure with point and click at the components delivering RA/Dec coordinates and Vmag measurements based on all reference stars used for plate solving. Weather was a bit difficult during the imaging sessions so I had to take additional images for several objects to get acceptable results.

The results are given in table 1 below with the following structure:

- The header line gives the WDS catalog data for each object per 08/2016 with RA/Dec in the HH:MM:SS/DD:MM:SS format and with Date giving the year of the last observation
- The following rows give the data for the object in existing catalogs (mostly GAIA DR1) as far as available with
 - ◊ RA/Dec in decimal degrees with the catalog reference given in the Source/Notes column
 - ◊ Sep gives separation in arcseconds in the data lines calculated (in radians) as

$$Sep = \sqrt{[(RA2 - RA1)\cos(Decl)]^2 + (Dec2 - Dec1)^2}$$

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- ◇ PA gives position angle in degrees in the data lines calculated as

$$PA = \arctan \left[(RA2 - RA1) \cos \left(\frac{Decl}{Dec2 - Dec1} \right) \right]$$

in radians depending on quadrant

- ◇ G-band M1 and M2
- ◇ If 2MASS and GAIA DR1 positions are available then also proper motion data is calculated according to the formulae used for Sep and PA (see above)
- ◇ Used Aperture and observation method code is given in the Ap and Me columns. As GAIA uses a rectangular aperture the value given in the Ap column is the calculated diameter for a corresponding circular surface
- ◇ CPM rating procedure according to Knapp and Nanson 2017 (see appendix for description)
- ◇ Date gives the Bessel observation epoch
- The last row per object gives then the measurements based on the iT24 images
 - ◇ RA/Dec in decimal degrees from plate solving
 - ◇ Sep gives separation in arcseconds in the data lines calculated (in radians) as

$$Sep = \sqrt{[(RA2 - RA1) \cos(Decl)]^2 + (Dec2 - Dec1)^2}$$

- ◇ PA gives position angle in degrees in the data lines calculated as

$$PA = \arctan \left[(RA2 - RA1) \cos \left(\frac{Decl}{Dec2 - Dec1} \right) \right]$$

in radians depending on quadrant

- ◇ Visual magnitudes M1 and M2 based on the plate solving results
- ◇ Measurement error estimations calculated on base of the average plate solving errors are given in a separate Table 2 in the appendix.

Summary

Table 1 shows with few exceptions significant differences for the magnitudes compared with the WDS data even if the J-objects in Auriga seem rather well researched in comparison with other northern constellations. Quite often also the WDS proper motion data seems quite off when compared with the values derived from comparing 2MASS to GAIA DR1 positions. Yet for a significant part of the objects calculation of proper motion values was not possible due to missing 2MASS data and for surprisingly many objects there is also no GAIA DR1 data for at least for one component availa-

ble. That means that the GAIA DR1 coverage is less complete than expected. Only a small part of the objects with calculated PM numbers qualify as potential CPM pairs based on calculations with the now available GAIA DR1 data but the proper motion speed is in most cases too slow to be significant. This means that most Jonckheere objects in Aur are optical pairs. Finally two objects (J 943 and J988) seem to be either bogus or misidentified but on the other side one object with WDS code X for bogus (J 2414) is obviously real.

Acknowledgements

The following tools and resources have been used for this research:

- 2MASS catalog
- 2MASS images
- AAVSO APASS
- AAVSO VPhot
- Aladin Sky Atlas v9.0
- Astrometrica v4.10.0.427
- AstroPlanner v2.2
- iTelescope iT24: 610mm CDK with 3962mm focal length. Resolution 0.625 arcsec/pixel. V-filter. No transformation coefficients available. Located in Auberry, California. Elevation 1405m
- GAIA DR1 catalog
- MaxIm DL6 v6.08
- POSS images
- SDSS DR9 and DR7 catalogs
- SDSS images
- SIMBAD
- UCAC4 catalog
- URAT1 catalog
- Vizier
- Washington Double Star Catalog

References

- Buchheim, Robert, 2008, "CCD Double-Star Measurements at Altamira Observatory in 2007", *Journal of Double Star Observations*, **4**, 27-31.
- Knapp, Wilfried; Nanson, John, 2017, "A New Concept for Counter-Checking of Assumed CPM Pairs", *Journal of Double Star Observations*, **13**, 31-51.

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Table 1. Jonckheere Objects in Auriga

J#	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	Ap	Me	Date	CPM	Source/Notes
11	04:54:36.46	+43:44:24.8	1.6	20.0	10.20	10.20	1	5							2003		WDS 04546+4345
	73.65163333	43.7397917	1.49	20.9	11.27	11.36							0.61	C	2016.239		it24 1x3s. Overlapping star disks Secondary neither in 2MASS nor GAIA DR1 available
12	05:00:15.19	+42:51:42.5	3.0	239.0	9.90	11.40	26	8							2002		WDS 05003+4252
	75.06331525	42.8617747	3.06	238.3	10.80	12.55							0.96	Hg	2015.000		GAIA DR1. M1 and M2 are G-band
	75.06332500	42.8617528	3.00	233.7	11.26	12.62							0.61	C	2016.239		it24 1x3s. Touching star disks No 2MASS object for B
13	05:04:07.73	+43:40:23.8	2.0	168.0	9.60	9.60	11	-20							2008		WDS 05042+4341
	76.03214134	43.6737354	2.14	166.9	10.90	10.85							0.96	Hg	2015.000		GAIA DR1. M1 and M2 are G-band
	76.03214583	43.6737722	2.14	176.5	10.81	10.82							0.61	C	2016.116		it24 1x3s. Touching star disks. Image quality questionable. SNR A and B <20 No 2MASS object for B
17	06:05:10.92	+43:02:18.2	2.9	154.0	10.15	10.59	-13	5		0	-11				2002		06052+4303
	91.29547059	43.0383207	2.90	154.0	9.94	10.23	-4.33	-6.78	0.49	-4.44	-5.91	0.71	0.96	Hg	2015	BBBB	GAIA DR1. Gmag and PM data from GAIA DR1 catalog. Might be a CPM pair. Plx similar but most probably no gravitational relation. Border case for a physical
	91.29550833	43.0382361	2.52	156.1	9.80	10.01							0.61	C	2016.171		it24 1x3s. Touching star disks No 2MASS object for B
31	04:57:29.66	+37:51:14.9	3.6	350.0	10.70	13.40	2	-10							2008		WDS04575+3751
	74.37358751	37.8541582	3.60	349.5	10.49	12.28	-1.84	0.48	5.68	-44.68	33.29	11.32	0.96	Hg	2015	CCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	74.37358750	37.8541389	3.58	349.7	10.72	12.45							0.61	C	2016.239		it24 1x3s. Touching star disks
32	05:01:09.64	+38:13:38.2	2.6	291.0	10.23	13.50	17	-5							2000		WDS05012+3813
	75.29013333	38.2272583	2.29	289.7	10.06	11.88							0.61	C	2016.239		it24 1x3s. Overlapping star disks Secondary neither in 2MASS nor GAIA DR1 available
J#	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	Ap	Me	Date	CPM	Source/Notes
240	05:02:46.08	+35:07:55.3	1.3	211.0	10.70	10.90	1	11							2008		WDS05027+3507
	75.69208096	35.1322564	1.32	210.2	10.71	10.83							0.96	Hg	2015		GAIA DR1. M1 and M2 values are G-band
	75.69200833	35.1322194	1.23	216.2	10.80	11.29							0.61	C	2016.239		it24 1x3s. Heavily overlapping star disks Despite a hint of elongation in the 2MASS images there is no 2MASS catalog object for B, the same goes for URAT1

Table 1 continues on next page.

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Table 1 (continued). Jonckheere Objects in Auriga

J#	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	Ap	Me	Date	CFM	Source/Notes
591 AB	06:16:45.22	+38:52:29.7	4.5	200.0	11.20	12.40	-3	-9							2007		WDS06167+3852
	94.18843080	38.8749072	4.42	199.7	11.21		1.80	-2.32	7.24	-6.44	1.38	7.18	0.20	Eu	2013.575		URAT1. PM data calculated from position comparison with 2MASS
	94.18845388	38.8749158	4.49	199.7	11.52	12.86	5.89	-0.05	6.53	-3.13	-0.69	6.53	0.96	Hg	2015	CCCC	GAIA DR1. PM data calculated from position comparison with 2MASS
	94.18843750	38.8748889	4.36	198.3	11.59	13.01							0.61	C	2016.902		it24 5x1s
GCB 18 AC	06:16:45.22	+38:52:29.7	5.5	321.0	11.20	12.80	-3	-9		38	-24				2007		WDS06167+3852
	94.18843080	38.8749072	5.47	321.6	11.21		1.80	-2.32	7.24	-2.25	3.94	7.17	0.20	Eu	2013.581		URAT1. PM data calculated from position comparison with 2MASS
	94.18845388	38.8749158	5.48	321.3	11.52	13.03	5.89	-0.05	6.53	0.28	5.07	6.53	0.96	Hg	2015	CCCC	GAIA DR1. PM data calculated from position comparison with 2MASS. WDS PM data for C probably wrong
	94.18843750	38.8748889	5.38	321.9	11.59	13.31							0.61	C	2016.902		it24 5x1s
593	06:18:41.15	+37:52:23.6	4.4	195.0	11.22	12.20	-3	-9		-13	-46				2004		WDS06187+3752
	94.67151065	37.8731627	4.43	194.4	10.98	12.25	5.37	-24.06	5.60	2.52	-24.73	5.60	0.96	Hg	2015.000	CACB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	94.67150417	37.8731389	4.42	194.1	11.14	12.47							0.61	C	2016.239		it24 1x3s
650	04:51:21.02	+49:03:11.9	4.1	38.0	11.13	12.20	-4	-8							2002		WDS04513+4901
	72.83760387	49.0533203	4.14	38.0	10.83	12.07	-1.27	-2.07	5.60	-2.19	-3.59	5.60	0.96	Hg	2015.000	ACCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	72.83763333	49.0533250	4.12	38.7	10.99	12.23							0.61	C	2016.239		it24 1x3s
651	05:01:41.20	+49:05:03.3	4.6	238.0	10.63	11.60	11	4							2002		WDS05017+4905
	75.42165942	49.0842541	4.63	238.3	10.57	11.68	0.73	1.54	5.97	-0.14	-4.56	5.97	0.96	Hg	2015.000	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	75.42164583	49.0842667	4.60	238.2	10.63	11.82							0.61	C	2016.239		it24 1x3s
652	05:20:43.39	+33:50:22.8	3.7	355.0	12.00	12.50	2	-26		0	-1				2008		WDS05207+3349
	80.18077667	33.8392027	3.75	355.5	12.03	12.50	-4.83	-9.00	6.69	-4.46	-9.71	6.69	0.96	Hg	2015.000	BACB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	80.18076250	33.8391889	3.69	355.5	12.09	12.57							0.61	C	2016.239		it24 1x3s
653	05:35:06.54	+35:18:20.6	5.7	172.0	11.37	12.90	0	-4		-8	-4				2001		WDS05351+3517
	83.77727208	35.3057459	5.77	172.0	11.24	12.56	-1.72	-7.69	5.45	-1.56	-7.65	5.45	0.96	Hg	2015	AACB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS - a bit slow but potential CPM
	83.77727083	35.3057722	5.98	172.5	11.30	12.74							0.61	C	2016.902		it24 5x2s
665	06:44:05.90	+38:22:33.0	7.4	69.0	10.22	10.40	-6	-10							2014		WDS06442+3822
	101.02458748	38.3757970	7.57	66.5	10.25	13.03	-3.96	-8.16	5.91	-2.80	-7.81	6.75	0.96	Hg	2015	CBCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	101.02452917	38.3757889	7.45	66.7	10.25	13.34							0.61	C	2016.902		it24 5x2s
693	06:35:03.99	+29:09:55.6	1.6	279.0	10.15	10.75									2009		WDS06351+2909
	98.76678750	29.1653611	1.75	279.2	9.86	10.84							0.61	C	2016.239		it24 1x3s. Heavily overlapping star disks
																	Secondary neither in 2MASS nor GAIA DR1 available
897	05:20:38.72	+44:52:41.9	3.3	236.0	10.60	12.60									2011		WDS05206+4452
	80.16137500	44.8783278	3.37	234.2	10.33	12.23							0.61	C	2016.239		it24 1x3s
																	Secondary neither in 2MASS nor GAIA DR1 available

Table 1 continues on next page.

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Table 1 (continued). Jonckheere Objects in Auriga

J#	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	Ap	Me	Date	CFM	Source/Notes
898	05:23:07.03	+33:58:14.3	3.7	153.0	10.00	10.50	-28	56							2003		WDS05231+3400
	80.77910934	33.9714456	3.94	150.1	12.18	12.63	-5.06	-10.09	5.45	4.81	-15.72	5.45	0.96	Hg	2015.000	CCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	80.77910417	33.9714222	3.94	149.9	12.54	12.97							0.61	C	2016.239		it24 1x3s
899	05:31:39.14	+32:24:43.9	1.8	335.0	9.70	10.30									2013		WDS05317+3225
	82.91330833	32.4118000	1.85	333.1	12.54	12.88							0.61	C	2016.239		it24 1x3s. Overlapping star disks
																	Secondary neither in 2MASS nor GAIA DR1 available
901	05:38:32.89	+32:01:22.8	2.9	145.0	12.80	12.80	-15	28		30	-49				2009		WDS05385+3201
	84.63679712	32.0234021	3.17	146.3	12.78	12.74	-23.09	25.78	9.20	53.45	-63.50	6.69	0.96	Hg	2015	CCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	84.63684167	32.0233889	3.12	150.4	13.01	13.01							0.61	C	2016.989		it24 10x3s. Touching star disks
902	05:47:19.02	+32:21:50.5	3.1	236.0	11.70	11.90									2002		WDS05473+3222
	86.83007700	32.3644777	3.07	236.4	11.47	12.03							0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band
	86.83010000	32.3644667	3.01	231.9	11.46	11.97							0.61	C	2016.171		it24 1x3s. Image quality questionable. SNR B <20
																	Secondary in 2MASS not available
903	05:49:12.46	+33:22:42.6	2.9	124.0	10.36	15.20									1959		WDS05493+3323. Code X for bogus
	87.30176667	33.3782528			10.19								0.61	C	2016.171		it24 1x3s. Image quality questionable. No resolution of B
																	Secondary in 2MASS not available nor in GAIA DR1
904	06:01:34.96	+39:36:29.3	4.0	197.0	12.80	13.10									2002		WDS06016+3938
	90.39558724	39.6078932	3.85	197.4	11.60	12.92							0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band
	90.39551250	39.6079111	3.78	198.0	12.22	12.99							0.61	C	2016.171		it24 1x3s. Image quality questionable. SNR B <20
																	Secondary in 2MASS not available
905	06:02:45.92	+39:39:06.1	4.6	44.0	11.60	12.40									2004		WDS06028+3939
	90.69135498	39.6516949	4.64	44.1	11.06	12.17	1.19	-9.35	5.69	2.23	-8.02	5.69	0.96	Hg	2015	CCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	90.69136667	39.6517194	4.28	42.2	11.11	12.45							0.61	C	2016.171		it24 1x3s. Image quality questionable. SNR B <20
906 AB	06:07:48.41	+38:36:58.4	4.9	293.0	11.87	12.70	-4	-11							2003		WDS06078+3837 catalog data
	91.95169152	38.6161986	4.98	296.4	11.45	12.52	9.45	-10.80	6.00	-25.75	30.94	6.00	0.96	Hg	2015	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	91.95168750	38.6161472	4.90	297.2	11.42	12.46							0.61	C	2016.902		it24 5x1s

Table 1 continues on next page.

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Table 1 (continued). Jonckheere Objects in Auriga

J#	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	Ap	Me	Date	CFM	Source/Notes
WSI 32 AC	06:07:48.41	+38:36:58.4	2.8	282.0	11.87	13.50	-4	-11							2003		WDS06078+3837 catalog data
	91.95169152	38.6161986	2.79	282.8	11.45	12.63	-2.47	-11.26	0.429				0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band. PM data from GAIA DR1
	91.95182500	38.6161306	2.66	281.0	11.56	12.20							0.61	C	2016.171		it24 1x3s. Touching star disks. Image quality questionable. SNR C <10 No 2MASS object for C
907	06:07:47.97	+35:30:50.6	2.5	236.0	11.30	11.30									2001		WDS06078+3532
	91.94988235	35.5140679	2.52	235.5	11.71	11.98							0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band
	91.94985417	35.5140583	2.27	234.4	11.68	11.83							0.61	C	2016.239		it24 1x3s. Touching star disks No 2MASS object for C
908	06:19:25.83	+40:59:05.3	1.2	95.0	10.93	11.06									2001		WDS06195+4100
	94.85760417	40.9846222			10.30								0.61	C	2016.171		it24 1x3s. No resolution. Combined magnitude rather confirms WDS data Secondary neither in 2MASS nor GAIA DR1 available
910 AB	06:28:27.54	+43:04:05.5	2.2	339.0	9.94	10.59	4	-30	4	-30					2011		WDS06285+4304
	97.11479479	43.0680555	1.75	330.1	9.64	10.20	6.20	-23.04					0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band. No GAIA DR1 PM data for B - WDS values suggest CPM
	97.11488333	43.0679500	1.77	326.9	9.82	10.00							0.61	C	2016.239		it24 1x3s. Overlapping star disks No 2MASS object for B
910 AC	06:28:27.54	+43:04:05.5	46.0	33.0	9.94	10.62	5	-29		33	-15				2011		WDS06285+4304
	97.11479479	43.0680555	45.60	32.7	9.64	10.49	6.20	-23.04	0.25	34.07	-14.27	2.92	0.96	Hg	2015	CCBC	GAIA DR1. M1 and M2 are G-band. PM data from GAIA DR1 catalog
	97.11488333	43.0679500	45.54	32.2	9.82	10.76							0.61	C	2016.239		it24 1x3s
935	05:02:26.29	+37:48:12.1	3.1	46.0	10.41	13.30									2011		WDS05025+3748
	75.60957254	37.8033096	3.24	46.1	10.41	12.62							0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band
	75.60957500	37.8033194	3.11	45.1	10.46	12.36							0.61	C	2016.239		it24 1x3s. Touching star disks No 2MASS object for B
939	05:42:43.98	+30:54:19.7	5.0	45.0	10.00	13.00	-1	1		19	12				2001		WDS05438+3056
	85.68329260	30.9054951	4.85	45.0	11.78	13.57	5.41	-0.40	5.02	2.04	-1.41	5.02	0.96	Hg	2015	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	85.68335833	30.9055111	5.00	47.9	12.10	14.49							0.61	C	2016.171		it24 1x3s. B barely resolved. SNR B <10
940	05:43:27.24	+30:55:24.6	4.8	359.0	10.80	12.00	0	-21		0	30				2015		WDS05445+3057
	85.86349960	30.9234751	4.79	358.8	12.60	13.39	-1.72	-6.58	5.02	-2.13	-8.42	5.02	0.96	Hg	2015	ACCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	85.86350833	30.9235389	4.25	359.1	12.79	13.82							0.61	C	2016.171		it24 1x3s. SNR A <20 und B <10
941 AB	05:45:25.31	+30:44:28.9	3.6	176.0	9.60	9.60	-14	63		1	-48				2003		WDS05453+3045
	86.35541343	30.7412264	3.68	174.8	11.86	11.63	-8.52	-26.33	5.45	-7.55	-25.74	5.45	0.96	Hg	2015	AACB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS. Solid CPM candidate
	86.35542083	30.7411861	3.35	176.0	12.02	11.79							0.61	C	2016.171		it24 1x3s

Table 1 continues on next page.

Jonckheere Double Star Photometry – Part VI: Auriga

Table 1 (continued). Jonckheere Objects in Auriga

J#	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	Ap	Me	Date	CPM	Source/Notes
941 AC	86.35541343	30.7412264	3.57	80.4	11.86	15.33							0.96	Hg	2015		Data for a third component to be found only in GAIA DR1. M1 and M2 are G-band
942	05:49:57.53	+31:33:33.6	3.5	187.0	10.50	12.50	10	9							2015		WDS05496+3133
	87.48972270	31.5593532	3.91	199.6	11.88	15.27	2.04	-0.40	5.27	0.51	-11.21	14.49	0.96	Hg	2015	CCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	87.48973333	31.5593528			12.48								0.61	C	2016.976		iT24 5x3s. A is 2mag fainter than WDS listed. No resolution of B, has to be fainter than 14.5mag
943	05:50:06.72	+31:34:31.4	2.7	209.0	10.88	12.20									1928		WDS05502+3135. Bo-gus or mis-identification?
	87.52803022	31.5753936	5.28	254.3	9.92	16.01							0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band. Data bad match with WDS values
	87.52801250	31.5754250			10.50								0.61	C	2016.171		iT24 1x3s. No resolution. Combined magnitude seems to rather confirm WDS data but overall this observation record seems inconsistent
																	No object for B in 2MASS, SDSS, GAIA DR1
	87.48972270	31.5593532	3.91	199.6	11.88	15.27							0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band. Alternative object nearby better match with first measurement according to WDS?
947	05:52:54.87	+31:45:42.9	5.3	323.0	10.00	11.00	11	-8		-8	-2				2001		WDS05529+3146
	88.22823750	31.7623994	3.00	322.0	11.76		-93.53	132.65	6.36	3.27	-3.66	6.16	0.20	Eu	2013.781	CCCB	URAT1. PM data calculated from position comparison with 2MASS. Bad match with WDS data but there is something completely odd with the URAT1 data for A (see PM values!)
	88.22865833	31.7618167	5.52	324.7	12.26	12.94							0.61	C	2016.171		iT24 1x3s
																	No GAIA DR1 object for B
949	05:53:21.23	+31:29:14.9	3.4	241.0	10.10	10.70	15	4							2003		WDS05534+3129
	88.33843516	31.4874696	3.41	241.5	9.91	10.62	13.54	6.71	5.74	-26.89	-30.22	6.70	0.96	Hg	2015	CCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	88.33843333	31.4873528	3.21	244.2	9.88	10.52							0.61	C	2016.171		iT24 1x3s
950	05:54:11.17	+44:35:57.0	4.6	60.0	9.20	10.30	-9	-24		43	6				2002		WDS05542+4435
	88.54647906	44.5990677	4.67	60.4	10.98	12.43	-9.99	-20.34	5.25	-8.98	-23.77	5.25	0.96	Hg	2015	BCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	88.54651667	44.5990250	4.60	59.2	11.13	12.74							0.61	C	2016.239		iT24 1x3s
951	05:53:40.27	+32:53:08.6	4.9	56.0	10.90	11.90	-11	-4		57	33				2004		WDS05537+3252. Last 2010 observation with 4.0" separation seems to be in error
	88.41787980	32.8857423	4.92	56.3	10.68	11.88	3.64	-5.54	5.74	3.62	-5.77	5.74	0.96	Hg	2015	AACC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS - too small to be significant
	88.41786250	32.8857500	4.93	56.7	10.56	12.10							0.61	C	2016.171		iT24 1x3s

Table 1 continues on next page.

Jonckheere Double Star Photometry – Part VI: Auriga

Table 1 (continued). Jonckheere Objects in Auriga

J#	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	Ap	Me	Date	CFM	Source/Notes
952	05:54:31.15	+33:32:29.6	3.7	232.0	11.70	11.80	58	33		10	-8				2002		WDS05545+3331
	88.63035151	33.5417594	3.76	232.0	11.45	11.71	8.43	-15.01	5.74	6.01	-11.63	5.74	0.96	Hg	2015	ACCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	88.63037917	33.5417250	3.70	233.3	11.65	11.93							0.61	C	2016.239		iT24 1x3s
953	05:55:55.05	+28:47:06.3	4.9	269.0	10.30	11.00	5	-2		-78	-39				2003		WDS05559+2847
	88.97934007	28.7851082	5.03	269.4	10.03	11.31	-4.06	-0.81	4.98	-0.49	-0.24	4.98	0.96	Hg	2015	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	88.97933333	28.7851167	5.02	269.3	10.01	11.34							0.61	C	2016.239		iT24 1x3s
960	06:00:53.60	+30:53:28.5	6.2	196.0	10.58	13.80	5	-5		0	38				2015		WDS06009+3053
	90.22335990	30.8912597	5.77	198.4	10.55		0.44	-1.71	6.38	21.28	-10.88	6.38	0.20	Eu	2013.536	CCCC	URAT1. PM data calculated from position comparison with 2MASS
	90.22331250	30.8912111	5.57	194.9	10.57	13.59							0.61	C	2016.171		iT24 1x3s. SNR B <10. Some PM of B
																	No GAIA DR1 object for A
961	06:06:26.08	+28:49:12.7	4.0	149.0	11.50	12.40									2001		WDS06063+2849
	91.60836705	28.8204546	4.09	148.9	11.45	12.27	2.98	-12.82	5.43	4.81	-14.76	5.43	0.96	Hg	2015	BCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	91.60833333	28.8204944	4.17	147.2	11.64	12.43							0.61	C	2016.989		iT24 5x3s. Touching star disks
962	06:06:44.90	+33:37:05.4	5.4	358.0	10.00	10.80	-6	-18		-9	0				2001		WDS06067+3337
	91.68689024	33.6174938	5.47	356.9	12.20	13.02	-5.74	-9.87	5.64	-5.92	-9.20	5.64	0.96	Hg	2015	AACB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS - too small to be significant
	91.68685000	33.6174639	5.54	357.2	12.36	13.48							0.61	C	2016.171		iT24 1x3s. SNR B <20
963	06:06:59.09	+33:37:31.6	5.9	351.0	11.80	12.70	-2	-36		-1	-10				2001		WDS06069+3336
	91.74619006	33.6246270	6.25	350.7	11.62	12.53	1.41	-25.39	5.64	0.98	-6.34	5.64	0.96	Hg	2015	BCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	91.74620000	33.6246167	6.28	350.5	11.83	12.77							0.61	C	2016.171		iT24 1x3s
965	06:09:14.20	+33:59:47.2	5.4	239.0	10.94	12.60	-9	-9		-21	-9				2001		WDS06092+3359
	92.30912071	33.9964458	5.37	238.5	11.00	12.73	-6.73	-5.42	5.75	-11.93	-3.47	5.75	0.96	Hg	2015	CCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	92.30911250	33.9964000	5.10	235.3	11.25	13.22							0.61	C	2016.171		iT24 1x3s. SNR B <20
966	06:10:47.43	+34:59:44.8	6.7	35.0	10.91	13.10	2	-6		7	9				2005		WDS06108+3500
	92.69765383	34.9957932	6.65	35.3	10.22	12.59	-4.22	0.90	5.03	5.35	-3.49	7.54	0.96	Hg	2015	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	92.69764583	34.9958194	6.57	34.8	10.55	12.93							0.61	C	2016.171		iT24 1x3s. SNR B <20
983 AB	06:35:11.08	+29:02:47.2	5.4	235.0	10.92	13.00	3	-5		-9	-5				2001		WDS06351+2902
	98.79619296	29.0464620	5.37	235.7	10.76	12.94	0.36	-2.33	5.00	-4.46	-3.00	5.00	0.96	Hg	2015	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	98.79618750	29.0464583	5.35	236.2	10.86	13.04							0.61	C	2016.239		iT24 1x3s

Table 1 continues on next page.

Jonckheere Double Star Photometry – Part VI: Auriga

Table 1 (continued). Jonckheere Objects in Auriga

J#	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	Ap	Me	Date	CPM	Source/Notes
983 AC	06:35:11.08	+29:02:47.2	9.2	19.0	10.92	14.00	3	-5		-6	14				2001		WDS06351+2902
	98.79619296	29.0464620	9.22	18.8	10.76	12.56	0.36	-2.33	5.00	-1.26	-1.47	5.00	0.96	Hg	2015	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	98.79618750	29.0464583	9.20	18.9	10.86	12.97							0.61	C	2016.239		iT24 1x3s
988?	06:39:46.42	+30:27:34.2	4.7	173.0	10.87	11.90	6	-8							2006		WDS06397+3027. The given position seems to be a mis-identification of J988 - see below
	99.94344583	30.4594750	3.26	214.0	10.56	13.84							0.61	C	2016		iT24 1x3s. Touching star disks
																	No object for B in 2MASS, URAT1 and GAIA DR1
988?	06:39:42.55	+30:27:39.7	4.7	173.0	10.87	11.90	6	-8							2006		WDS06397+3027. This nearby object seems a better match for the given WDS data
	99.92729720	30.4610243	4.63	172.4	12.02	12.41	-8.25	-2.84	5.72	-10.80	-2.42	5.72	0.96	Hg	2015	CCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	99.92728750	30.4610194	4.62	172.3	12.26	12.70							0.61	C	2016.239		iT24 1x3s
1249	05:07:37.84	+43:43:13.4	2.2	18.0	10.00	10.00	-1	-3							2002		WDS05077+4342
	76.90752780	43.7200571	2.12	18.4	11.67	11.56							0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band
	76.90754167	43.7200861	1.92	18.8	11.66	11.51							0.61	C	2016.239		iT24 1x3s. Touching star disks
																	No object for B in 2MASS
1250	05:14:50.21	+31:45:28.8	2.6	300.0	11.28	12.66	12	-5		-21	8				2001		WDS05148+3145
	78.70934452	31.7579893	2.58	299.0	11.19	11.73							0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band
	78.70935833	31.7579361	2.61	296.6	11.21	11.75							0.61	C	2016.239		iT24 1x3s. Touching star disks
																	No object for B in 2MASS
1253	05:12:22.51	+42:48:08.2	3.0	256.0	12.00	12.20	9	-10							2005		WDS05124+4248
	78.09423499	42.8023100	2.99	256.3	11.77	11.99							0.96	Hg	2015		GAIA DR1. M1 and M2 are G-band
	78.09432083	42.8022833	3.04	256.5	12.00	12.17							0.61	C	2016.239		iT24 1x3s. Touching star disks
																	No object for B in 2MASS
1904	05:38:12.92	+30:04:47.3	9.3	318.0	12.40	13.80	1	-6		-22	-7				2001		WDS05386+2957
	84.55383830	30.0797592	9.30	317.3	12.38		-0.95	-16.93	5.48	-3.56	-15.26	5.47	0.20	Eu	2013.580	CBCB	URAT1. PM data calculated from position comparison with 2MASS
	84.55383750	30.0797583	9.22	317.4	12.51	14.09							0.61	C	2016.239		iT24 1x3s
2392	05:20:43.68	+39:46:48.5	7.1	124.0	11.40	12.30	-152	95		3	-4				2014		WDS05207+3946. PM data for A seems completely off
	80.18201163	39.7801111	7.09	125.0	10.97	11.57	4.97	-7.99	5.72	6.91	-6.77	5.72	0.96	Hg	2015	CACC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	80.18201250	39.7801278	7.12	125.3	11.83	12.37							0.61	C	2016.979		iT24 5x3s
2393	05:22:11.87	+39:46:35.0	7.8	335.0	12.50	14.00	1	-4							2002		WDS05221+3945
	80.54948463	39.7763734	7.85	335.5	12.24	14.19	1.09	-1.20	6.43	1.78	2.10	6.43	0.96	Hg	2015	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	80.54947083	39.7763750	7.91	334.8	12.35	14.59							0.61	C	2016.239		iT24 1x3s

Table 1 concludes on next page.

Jonckheere Double Star Photometry – Part VI: Auriga

Table 1 (conclusion). Jonckheere Objects in Auriga

J#	RA	Dec	Sep	PA	M1	M2	pmRA1	pmDec1	e_pm1	pmRA2	pmDec2	e_pm2	Ap	Me	Date	CPM	Source/Notes
2414	05:25:33.54	+29:29:47.6	7.3	176.0	12.00	14.00	0	-3		15	1				2001		WDS05256+2929. Code X for bogus for unknown reason
	81.38975270	29.4965044	7.20	175.5	12.67	14.25	0.15	-15.35	5.97	1.15	-7.55	5.97	0.96	Hg	2015	CCCB	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	81.38977083	29.4964778	7.07	175.8	12.85	14.44							0.61	C	2016.239		iT24 1x3s
2415	05:25:37.18	+29:28:31.7	6.7	358.0	12.50	13.00	-2	-13		-6	112				2001		WDS05257+2928. PM values for B seem suspect
	81.40492135	29.4754449	6.76	358.5	13.42	13.68	-2.13	-7.64	5.97	3.15	-4.59	5.97	0.96	Hg	2015	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	81.40487500	29.4754222	6.89	359.8	13.74	14.19							0.61	C	2016.239		iT24 1x3s. SNR B <20
2428	06:30:03.89	+27:57:46.4	4.8	159.0	9.40	10.90	-4	9		23	-26				2015		WDS06301+2756
	97.51621438	27.9629274	4.95	157.2	11.29	12.58	-1.62	7.08	5.00	0.01	4.03	5.00	0.96	Hg	2015	CCCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	97.51625417	27.9629111	4.94	157.1	11.47	12.92							0.61	C	2016.239		iT24 1x3s
2431	06:32:43.72	+30:58:52.6	5.6	178.0	11.20	11.50	-8	12		2	-16				2001		WDS06328+3111
	98.18218564	30.9812657	5.66	177.7	13.08	13.61	-3.18	-4.12	5.03	0.33	-4.84	5.03	0.96	Hg	2015	CBCC	GAIA DR1. M1 and M2 are G-band. PM data calculated from position comparison with 2MASS
	98.18218750	30.9812500	5.59	178.2	13.27	13.88							0.61	C	2016.239		iT24 1x3s

Explanations Notes column:

- "iT24 1x3s" indicates the use of stacked telescope iT24 images with 3s exposure time and use of URAT1 for plate solving
- "Touching star disks" indicates that the rims of the star disks are touching and that the measurement results might be a bit less precise than with clearly separated star disks
- "Touching/Overlapping star disks" indicates that the star disks overlap to the degree of an elongation and that the measurement results is probably less precise than with clearly separated star disks
- "SNR <20" indicates that the measurement result might be a bit less precise than desired due to a low SNR value but this is already included in the calculation of the magnitude error range estimation
- "SNR <10" indicates that the measurement result is probably a bit less precise than desired due to a very low SNR value but this is already included in the calculation of the magnitude error range estimation
- "Image quality questionable" or similar indicates rather large average errors for the reference stars used for plate solving for different reasons (mostly atmospheric influences). But this is at least to some degree already included in the calculation of the error range estimation

Jonckheere Double Star Photometry – Part VI: Auriga

Appendix A

Below, Table 2 gives the plate solving errors for the iT24 images and error information derived therefrom for the measurements provided in Table 1 and also the measured positions for both components.

Table 2: Error estimations for the in Table 1 provided measurements for the given objects:

J#		RA	Dec	dRA	dDec	Err Sep	Err PA	Err Mag	SNR	dVmag
11	A	04 54 36.392	43 44 23.25	0.08	0.08	0.113	4.348	0.091	67.25	0.09
	B	04 54 36.441	43 44 24.64					0.091	65.80	
12	A	05 00 15.198	42 51 42.31	0.08	0.08	0.113	2.157	0.091	80.75	0.09
	B	05 00 14.978	42 51 40.53					0.093	47.04	
13	A	05 04 07.715	43 40 25.58	0.12	0.13	0.177	4.717	0.120	11.59	0.08
	B	05 04 07.727	43 40 23.44					0.099	18.19	
17	A	06 05 10.922	43 02 17.65	0.10	0.09	0.135	3.061	0.091	86.10	0.09
	B	06 05 11.015	43 02 15.35					0.091	74.77	
31	A	04 57 29.661	37 51 14.90	0.06	0.07	0.092	1.476	0.070	196.34	0.07
	B	04 57 29.607	37 51 18.42					0.071	76.65	
32	A	05 01 09.632	38 13 38.13	0.06	0.07	0.092	2.306	0.080	265.25	0.08
	B	05 01 09.449	38 13 38.90					0.081	89.99	
240	A	05 02 46.082	35 07 55.99	0.07	0.08	0.106	4.954	0.081	105.07	0.08
	B	05 02 46.023	35 07 55.00					0.081	115.00	
591	A	06 16 45.225	38 52 29.60	0.10	0.08	0.128	1.683	0.072	57.89	0.07
	B	06 16 45.108	38 52 25.46					0.079	28.97	
GCB 18	A	06 16 45.225	38 52 29.60	0.10	0.08	0.128	1.365	0.072	57.89	0.07
	C	06 16 44.941	38 52 33.83					0.083	23.64	
593	A	06 18 41.161	37 52 23.30	0.08	0.07	0.106	1.377	0.090	174.85	0.09
	B	06 18 41.070	37 52 19.01					0.091	80.69	
650	A	04 51 21.032	49 03 11.97	0.07	0.08	0.106	1.477	0.080	179.69	0.08
	B	04 51 21.294	49 03 15.19					0.081	84.74	
651	A	05 01 41.195	49 05 03.36	0.07	0.06	0.092	1.149	0.090	186.67	0.09
	B	05 01 40.797	49 05 00.94					0.091	102.97	
652	A	05 20 43.383	33 50 21.08	0.07	0.08	0.106	1.650	0.081	101.52	0.08
	B	05 20 43.360	33 50 24.76					0.081	80.98	
653	A	05 35 06.484	35 18 20.32	0.32	0.25	0.406	3.787	0.069	32.13	0.06
	B	05 35 06.519	35 18 14.20					0.115	10.54	
653	A	05 35 06.545	35 18 20.78	0.09	0.09	0.127	1.219	0.071	88.53	0.07
	B	05 35 06.609	35 18 14.85					0.074	45.27	
665	A	06 44 05.888	38 22 32.73	0.18	0.21	0.277	2.014	0.064	47.70	0.06
	B	06 44 06.493	38 22 36.08					0.227	4.47	
665	A	06 44 05.887	38 22 32.84	0.11	0.09	0.142	1.093	0.061	96.17	0.06
	B	06 44 06.469	38 22 35.79					0.078	21.35	
693	A	06 35 04.029	29 09 55.30	0.06	0.07	0.092	3.013	0.080	291.13	0.08
	B	06 35 03.897	29 09 55.58					0.080	173.60	
897	A	05 20 38.730	44 52 41.98	0.06	0.06	0.085	1.443	0.080	237.95	0.08
	B	05 20 38.473	44 52 40.01					0.081	82.96	
898	A	05 23 06.985	33 58 17.12	0.06	0.08	0.100	1.453	0.071	88.58	0.07
	B	05 23 07.144	33 58 13.71					0.072	69.09	
899	A	05 31 39.194	32 24 42.48	0.07	0.07	0.099	3.064	0.091	71.09	0.09
	B	05 31 39.128	32 24 44.13					0.095	35.60	
901	A	05 38 32.842	32 01 24.20	0.09	0.09	0.127	2.339	0.055	47.95	0.05
	B	05 38 32.963	32 01 21.49					0.054	53.15	
902	A	05 47 19.224	32 21 52.08	0.11	0.12	0.163	3.093	0.106	31.44	0.10
	B	05 47 19.037	32 21 50.22					0.120	15.91	
903	A	05 49 12.424	33 22 41,71	0.10	0.08			0.130	110.71	0.13
	B									
904	A	06 01 34.923	39 36 28.48	0.11	0.09	0.142	2.151	0.093	22.55	0.08
	B	06 01 34.822	39 36 24.88					0.105	15.61	

Table 2 continues on the next page.

Jonckheere Double Star Photometry – Part VI: Auriga

Table 2 (continued): Error estimations for the in Table 1 provided measurements for the given objects:

J#		RA	Dec	dRA	dDec	Err Sep	Err PA	Err Mag	SNR	dVmag																																																																																																																																																																																																																																																																																																																																																																																																																																										
905	A	06 02 45.928	39 39 06.19	0.11	0.10	0.149	1.989	0.095	33.95	0.09																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	06 02 46.177	39 39 09.36					0.135	10.25		906	A	06 07 48.405	38 36 58.13	0.10	0.12	0.156	1.825	0.095	33.59	0.09	B	06 07 48.033	38 37 00.37	0.104	20.17	WSI 32	A	06 07 48.438	38 36 58.07	0.11	0.09	0.142	3.055	0.119	24.09	0.11	C	06 07 48.215	38 36 58.58	0.153	9.71	907	A	06 07 47.965	35 30 50.61	0.06	0.07	0.092	2.328	0.081	117.95	0.08	B	06 07 47.814	35 30 49.29	0.081	114.39	908	A	06 19 25.825	40 59 04.64	0.11	0.08	0.136		0.131	61.60	0.13	B					910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	3.444	0.110	167.87	0.11	B	06 28 27.484	43 04 06.10	0.113	41.55	910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	0.134	0.110	167.87	0.11	C	06 28 29.789	43 04 43.14	0.110	160.73	935	A	05 02 26.298	37 48 11.95	0.08	0.07	0.106	1.955	0.100	155.34	0.10	B	05 02 26.484	37 48 14.15	0.103	43.46	939	A	05 42 43.982	30 54 19.58	0.11	0.11	0.156	1.887	0.063	56.93	0.06	B	05 42 44.254	30 54 22.75	0.080	19.75	940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08	B	05 43 27.237	30 55 28.99	0.191	5.76	941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49
906	A	06 07 48.405	38 36 58.13	0.10	0.12	0.156	1.825	0.095	33.59	0.09																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	06 07 48.033	38 37 00.37					0.104	20.17		WSI 32	A	06 07 48.438	38 36 58.07	0.11	0.09	0.142	3.055	0.119	24.09	0.11	C	06 07 48.215	38 36 58.58	0.153	9.71	907	A	06 07 47.965	35 30 50.61	0.06	0.07	0.092	2.328	0.081	117.95	0.08	B	06 07 47.814	35 30 49.29	0.081	114.39	908	A	06 19 25.825	40 59 04.64	0.11	0.08	0.136		0.131	61.60	0.13	B					910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	3.444	0.110	167.87	0.11	B	06 28 27.484	43 04 06.10	0.113	41.55	910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	0.134	0.110	167.87	0.11	C	06 28 29.789	43 04 43.14	0.110	160.73	935	A	05 02 26.298	37 48 11.95	0.08	0.07	0.106	1.955	0.100	155.34	0.10	B	05 02 26.484	37 48 14.15	0.103	43.46	939	A	05 42 43.982	30 54 19.58	0.11	0.11	0.156	1.887	0.063	56.93	0.06	B	05 42 44.254	30 54 22.75	0.080	19.75	940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08	B	05 43 27.237	30 55 28.99	0.191	5.76	941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30										
WSI 32	A	06 07 48.438	38 36 58.07	0.11	0.09	0.142	3.055	0.119	24.09	0.11																																																																																																																																																																																																																																																																																																																																																																																																																																										
	C	06 07 48.215	38 36 58.58					0.153	9.71		907	A	06 07 47.965	35 30 50.61	0.06	0.07	0.092	2.328	0.081	117.95	0.08	B	06 07 47.814	35 30 49.29	0.081	114.39	908	A	06 19 25.825	40 59 04.64	0.11	0.08	0.136		0.131	61.60	0.13	B					910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	3.444	0.110	167.87	0.11	B	06 28 27.484	43 04 06.10	0.113	41.55	910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	0.134	0.110	167.87	0.11	C	06 28 29.789	43 04 43.14	0.110	160.73	935	A	05 02 26.298	37 48 11.95	0.08	0.07	0.106	1.955	0.100	155.34	0.10	B	05 02 26.484	37 48 14.15	0.103	43.46	939	A	05 42 43.982	30 54 19.58	0.11	0.11	0.156	1.887	0.063	56.93	0.06	B	05 42 44.254	30 54 22.75	0.080	19.75	940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08	B	05 43 27.237	30 55 28.99	0.191	5.76	941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																										
907	A	06 07 47.965	35 30 50.61	0.06	0.07	0.092	2.328	0.081	117.95	0.08																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	06 07 47.814	35 30 49.29					0.081	114.39		908	A	06 19 25.825	40 59 04.64	0.11	0.08	0.136		0.131	61.60	0.13	B					910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	3.444	0.110	167.87	0.11	B	06 28 27.484	43 04 06.10	0.113	41.55	910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	0.134	0.110	167.87	0.11	C	06 28 29.789	43 04 43.14	0.110	160.73	935	A	05 02 26.298	37 48 11.95	0.08	0.07	0.106	1.955	0.100	155.34	0.10	B	05 02 26.484	37 48 14.15	0.103	43.46	939	A	05 42 43.982	30 54 19.58	0.11	0.11	0.156	1.887	0.063	56.93	0.06	B	05 42 44.254	30 54 22.75	0.080	19.75	940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08	B	05 43 27.237	30 55 28.99	0.191	5.76	941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																										
908	A	06 19 25.825	40 59 04.64	0.11	0.08	0.136		0.131	61.60	0.13																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B										910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	3.444	0.110	167.87	0.11	B	06 28 27.484	43 04 06.10	0.113	41.55	910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	0.134	0.110	167.87	0.11	C	06 28 29.789	43 04 43.14	0.110	160.73	935	A	05 02 26.298	37 48 11.95	0.08	0.07	0.106	1.955	0.100	155.34	0.10	B	05 02 26.484	37 48 14.15	0.103	43.46	939	A	05 42 43.982	30 54 19.58	0.11	0.11	0.156	1.887	0.063	56.93	0.06	B	05 42 44.254	30 54 22.75	0.080	19.75	940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08	B	05 43 27.237	30 55 28.99	0.191	5.76	941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																										
910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	3.444	0.110	167.87	0.11																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	06 28 27.484	43 04 06.10					0.113	41.55		910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	0.134	0.110	167.87	0.11	C	06 28 29.789	43 04 43.14	0.110	160.73	935	A	05 02 26.298	37 48 11.95	0.08	0.07	0.106	1.955	0.100	155.34	0.10	B	05 02 26.484	37 48 14.15	0.103	43.46	939	A	05 42 43.982	30 54 19.58	0.11	0.11	0.156	1.887	0.063	56.93	0.06	B	05 42 44.254	30 54 22.75	0.080	19.75	940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08	B	05 43 27.237	30 55 28.99	0.191	5.76	941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																										
910	A	06 28 27.572	43 04 04.62	0.07	0.08	0.106	0.134	0.110	167.87	0.11																																																																																																																																																																																																																																																																																																																																																																																																																																										
	C	06 28 29.789	43 04 43.14					0.110	160.73		935	A	05 02 26.298	37 48 11.95	0.08	0.07	0.106	1.955	0.100	155.34	0.10	B	05 02 26.484	37 48 14.15	0.103	43.46	939	A	05 42 43.982	30 54 19.58	0.11	0.11	0.156	1.887	0.063	56.93	0.06	B	05 42 44.254	30 54 22.75	0.080	19.75	940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08	B	05 43 27.237	30 55 28.99	0.191	5.76	941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																										
935	A	05 02 26.298	37 48 11.95	0.08	0.07	0.106	1.955	0.100	155.34	0.10																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 02 26.484	37 48 14.15					0.103	43.46		939	A	05 42 43.982	30 54 19.58	0.11	0.11	0.156	1.887	0.063	56.93	0.06	B	05 42 44.254	30 54 22.75	0.080	19.75	940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08	B	05 43 27.237	30 55 28.99	0.191	5.76	941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																										
939	A	05 42 43.982	30 54 19.58	0.11	0.11	0.156	1.887	0.063	56.93	0.06																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 42 44.254	30 54 22.75					0.080	19.75		940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08	B	05 43 27.237	30 55 28.99	0.191	5.76	941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																										
940	A	05 43 27.242	30 55 24.74	0.09	0.10	0.135	1.813	0.116	12.43	0.08																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 43 27.237	30 55 28.99					0.191	5.76		941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06	B	05 45 25.319	30 44 24.93	0.025	42.92	942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																										
941	A	05 45 25.301	30 44 28.27	0.10	0.10	0.141	2.419	0.026	40.96	0.06																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 45 25.319	30 44 24.93					0.025	42.92		942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09	B					943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																										
942	A	05 49 57.536	31 33 33.67	0.12	0.11	0.163		0.017	62.78	0.09																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B										943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07	B					947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																										
943	A	05 50 06.723	31 34 31.53	0.10	0.10	0.141		0.071	88.25	0.07																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B										947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10	B	05 52 54.628	31 45 47.04	0.112	20.87	949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																										
947	A	05 52 54.878	31 45 42.54	0.10	0.11	0.149	1.544	0.105	32.18	0.10																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 52 54.628	31 45 47.04					0.112	20.87		949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11	B	05 53 20.998	31 29 13.07	0.113	43.95	950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																																										
949	A	05 53 21.224	31 29 14.47	0.13	0.08	0.153	2.721	0.111	76.90	0.11																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 53 20.998	31 29 13.07					0.113	43.95		950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09	B	05 54 11.534	44 35 58.85	0.091	66.95	951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																																																										
950	A	05 54 11.164	44 35 56.49	0.07	0.08	0.106	1.323	0.090	156.81	0.09																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 54 11.534	44 35 58.85					0.091	66.95		951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11	B	05 53 40.614	32 53 11.41	0.122	20.49	952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																																																																										
951	A	05 53 40.287	32 53 08.70	0.09	0.10	0.135	1.563	0.113	45.53	0.11																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 53 40.614	32 53 11.41					0.122	20.49		952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08	B	05 54 31.054	33 32 28.00	0.081	95.52	953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																																																																																										
952	A	05 54 31.291	33 32 30.21	0.07	0.07	0.099	1.534	0.081	117.91	0.08																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 54 31.054	33 32 28.00					0.081	95.52		953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09	B	05 55 54.658	28 47 06.36	0.091	112.10	960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																																																																																																										
953	A	05 55 55.040	28 47 06.42	0.07	0.07	0.099	1.129	0.090	236.46	0.09																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	05 55 54.658	28 47 06.36					0.091	112.10		960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07	B	06 00 53.484	30 53 22.98	0.125	9.95	961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																																																																																																																										
960	A	06 00 53.595	30 53 28.36	0.10	0.09	0.135	1.385	0.071	79.02	0.07																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	06 00 53.484	30 53 22.98					0.125	9.95		961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06	B	06 06 26.172	28 49 10.27	0.065	44.09	962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																																																																																																																																										
961	A	06 06 26.000	28 49 13.78	0.10	0.10	0.141	1.940	0.062	78.22	0.06																																																																																																																																																																																																																																																																																																																																																																																																																																										
	B	06 06 26.172	28 49 10.27					0.065	44.09		962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10	B	06 06 44.822	33 37 08.40	0.133	11.94	963	A	06 06 59.088	33 37 28.62	0.08	0.07	0.106	0.970	0.082	55.98	0.08	B	06 06 59.005	33 37 34.81	0.086	34.45	965	A	06 09 14.187	33 59 47.04	0.11	0.12	0.163	1.829	0.072	63.35	0.07	B	06 09 13.850	33 59 44.14	0.096	15.93	966	A	06 10 47.435	34 59 44.95	0.09	0.11	0.142	1.239	0.081	76.22	0.08	B	06 10 47.740	34 59 50.35	0.099	17.88	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	1.060	0.080	182.42	0.08	B	06 35 10.746	29 02 44.27	0.083	47.71	983	A	06 35 11.085	29 02 47.25	0.07	0.07	0.099	0.616	0.080	182.42	0.08	C	06 35 11.312	29 02 55.96	0.082	67.34	988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																																																																																																																																																										
962	A	06 06 44.844	33 37 02.87	0.11	0.10	0.149	1.538	0.105	33.02	0.10																																																																																																																																																																																																																																																																																																																																																																																																																																										
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	C	06 35 11.312	29 02 55.96					0.082	67.34		988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09	B	06 39 46.286	30 27 31.41	0.101	23.30																																																																																																																																																																																																																																																																																																																																																																																																																										
988?	A	06 39 46.427	30 27 34.11	0.07	0.07	0.099	1.740	0.090	131.49	0.09																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Table 2 concludes on the next page.

Jonckheere Double Star Photometry – Part VI: Auriga

Table 2 (conclusion): Error estimations for the in Table 1 provided measurements for the given objects:

J#		RA	Dec	dRA	dDec	Err Sep	Err PA	Err Mag	SNR	dVmag
988?	A	06 39 42.549	30 27 39.67	0.07	0.07	0.099	1.227	0.091	73.65	0.09
	B	06 39 42.597	30 27 35.09					0.092	60.89	
1249	A	05 07 37.810	43 43 12.31	0.09	0.09	0.127	3.789	0.101	68.42	0.10
	B	05 07 37.867	43 43 14.13					0.101	79.09	
1250	A	05 14 50.246	31 45 28.57	0.09	0.07	0.114	2.501	0.111	74.20	0.11
	B	05 14 50.063	31 45 29.74					0.112	51.31	
1253	A	05 12 22.637	42 48 08.22	0.08	0.07	0.106	2.000	0.111	65.54	0.11
	B	05 12 22.368	42 48 07.51					0.112	57.25	
1904	A	05 38 12.921	30 04 47.13	0.06	0.06	0.085	0.527	0.071	86.59	0.07
	B	05 38 12.440	30 04 53.92					0.077	33.76	
2392	A	05 20 43.683	39 46 48.46	0.10	0.11	0.149	1.197	0.072	59.87	0.07
	B	05 20 44.187	39 46 44.35					0.073	48.31	
2393	A	05 22 11.873	39 46 34.95	0.08	0.07	0.106	0.770	0.091	94.04	0.09
	B	05 22 11.581	39 46 42.11					0.101	23.34	
2414	A	05 25 33.545	29 29 47.32	0.08	0.08	0.113	0.917	0.081	70.92	0.08
	B	05 25 33.585	29 29 40.27					0.090	25.79	
2415	A	05 25 37.170	29 28 31.52	0.09	0.08	0.120	1.001	0.109	25.18	0.10
	B	05 25 37.168	29 28 38.41					0.115	18.59	
2428	A	06 30 03.901	27 57 46.48	0.07	0.08	0.106	1.233	0.141	88.55	0.14
	B	06 30 04.046	27 57 41.93					0.144	29.97	
2431	A	06 32 43.725	30 58 52.50	0.07	0.07	0.099	1.014	0.082	56.98	0.08
	B	06 32 43.739	30 58 46.91					0.085	39.12	

Table 2 Notes

- dRA and dDec = average RA and Dec plate solving errors in arcseconds
- Err_Sep = separation error estimation in arcseconds calculated as $\text{SQRT}(\text{dRA}^2 + \text{dDec}^2)$
- Err_PA = position angle error estimation in degrees calculated as $\arctan(\text{Err_Sep}/\text{Sep})$ assuming the worst case that Err_Sep points perpendicular to the separation vector
- dVmag as average mag plate solving error (Vmag for images with made V-filter and I_{mag} for images made with I-filter)
- Err_Mag = magnitude error estimation calculated as $\text{SQRT}(\text{dVmag}^2 + (2.5 * \text{LOG}_{10}(1 + 1/\text{SNR}))^2)$
- SNR as signal to noise ratio for the given object

Jonckheere Double Star Photometry – Part VI: Auriga

Appendix B

CPM rating scheme according to Knapp/Nanson 2017 with extensions:

Four rating factors are used: Proper motion vector direction, proper motion vector length, size of position error in relation to proper motion vector length and relationship separation to average proper motion speed:

- Proper motion vector direction rating: “A” for within the error range identical direction, “B” for similar direction within the double error range and “C” for outside
- Proper motion vector length rating: “A” for within the error range identical length, “B” for similar length within the double error range and C for outside
- Error size rating: “A” for error size of less than 5% of the proper motion vector length, “B” for less than 10% and “C” for a larger error size
- Rating for relation separation to average proper motion speed: “A” for less than 100 years, “B” for 100 to 1000 years and “C” for above.

To compensate for (depending on the selected objects and available catalogs) excessively large position errors resulting an “A” rating despite rather high deviations absolute upper limits are applied regardless calculated error size:

- Proper motion vector direction: Max. 2.86° difference for an “A” and 5.72° for a “B”
- Proper motion vector length: Max. 5% difference for an “A” and 10% for a “B”

Modification for cases of very small position errors (when for example using SDSS9 instead of 2MASS) with the consequence that the requirements to get an A or even B CPM rating get unreasonable hard:

- The from the position error resulting error estimation for proper motion vector direction and length is in this case calculated as root mean square from both position errors (instead of so far only the larger 2MASS one)
- If the PM vector direction difference is larger than this calculated “allowed” error but still less than 0.5° then an “A” is given, a “B” is given for larger than 0.5 but less than 1 degree, and a “C” is given if above
- If the PM vector length difference is larger than this calculated “allowed” error but still less than 0.5% then an “A” is given, a “B” is given for larger than 0.5 but less than 1 percent, and a “C” is given if above.

