Double Star Measurements for 2011 Part 2

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Abstract: I report 65 measurements of binary systems from 2011.772 to 2011.774. The observations were conducted with the T11 robotic telescope located at the iTelescope Observatory, Mayhill, NM, USA . Discussion includes notes on a number of the observed doubles. Information about instrumentation and methodology and results are included.

Introduction and Instrumentation

I have been imaging double stars for a number of years using the equipment at iTelescopes remote observatory.

The program of measuring the visual doubles used the T11 telescope in Mayhill, NM. The instrument is a Planewave 20 in Dall-Kirkham Astrograph with a focal length of approximately 2280 mm. The CCD camera is a FLI ProLine PL11002M with 9um square pixels. The field of view is 36.2 X 54.3 arc-mins. The OTA is mounted on a Planewave Ascension 200HR.

The instrument is capable of quickly and accurately slewing to a selected double star. The system takes about one minute to cycle through an exposure and save the resulting image in a FITS format. Taking 5 to 6 exposures per double star allows 6 doubles to be imaged per hour. The relatively short focal length of this system restricts measurements of doubles to pairs > 10 arc-seconds in most cases.

Methods

Imaging was done by entering the coordinates of the double into the robotic telescope's web interface. A test exposure was done and checked for centering and proper exposure. If all was well, an exposure run of 5 to 7 images through a clear filter was done for each pair. Exposures typically ran about 10-15 seconds for 10-13 magnitude doubles. After the observing session was completed, the images were retrieved from an ftp site provided by the iTelescope observatory.

Each image in the exposure sequence was examined and any trailed or sub-par images were discarded. MOP Canopus (Warner, 2006) was used to reduce the images. Any image for which the software could not reach a plate solution was also discarded. Canopus produces an astrometric solution to the image based on the UCAC2.0 catalog (Zacharias et all.,2004) or the MSOSC catalog (USNO and Tycho data) in areas not covered by UCAC2.0. The software measures double stars using a subroutine built into Canopus. It also produces a great amount of information about the astrometric solution. All images were copied to archival CD -ROM material and are available by request from the author. Each starting and ending image was blinked—just in case.

Results

Table 1 shows the results for the 65 doubles measured.

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Table 1: Measures of Double Stars

WDS ID	Discoverer	PA	SEP	EPOCH	No.	PAsd	SEPsd	Notes
19293+0223	J 2176 AB	359.6	31.47	2011.772	4	0.07	0.03	
19297+2453	POU3860	75.9	10.21	2011.774	5	0.18	0.04	
19298+2123	LDS1023	268.4	227.64	2011.772	5	0.01	0.03	1
19298+0239	BAL1994	297.6	10.52	2011.772	4	0.49	0.08	
19299+2440	POU3862	171.6	16.20	2011.774	5	0.22	0.05	
19306+2450	POU3874	80.9	16.83	2011.774	5	0.14	0.02	
19314+2437	POU3876	185.0	15.57	2011.774	5	0.11	0.01	
19316+2441	POU3879	37.7	12.67	2011.774	5	0.15	0.03	
19317+2432	POU3880	137.0	15.92	2011.774	5	0.09	0.02	
19319+2420	POU3882	111.7	11.04	2011.774	5	0.10	0.05	
19321+2441	POU3885	208.4	9.64	2011.774	5	0.25	0.06	
19328+2444	POU3895	211.0	9.06	2011.774	5	0.49	0.08	
19329+2443	POU3897	312.7	16.54	2011.774	5	0.16	0.04	
19355+3019	SLE 639	11.0	11.36	2011.772	5	0.14	0.03	
19376+3030	LDS1026	138.3	17.91	2011.772	5	0.08	0.02	
19386+3026	SLE 653	338.3	11.49	2011.772	5	0.19	0.04	
19537+3442	SEI 716	110.2	23.18	2011.772	5	0.04	0.03	
19547+3453	SEI 723 AB	41.2	12.41	2011.772	5	0.04	0.01	
19547+3453	TOB 162 AC	253.4	24.17	2011.772	5	0.07	0.02	2
19557+3443	HLM 33 AB	76.7	11.73	2011.772	5	0.11	0.02	
19557+3443	HLM 33 AC	291.4	14.76	2011.772	5	0.11	0.02	
19537+3442	HLM 33 AD	129.7	13.36	2011.772	5	0.10	0.03	
19561+3457	HLM 34	12.6	9.80	2011.772	5	0.13	0.04	
19564+3448	SEI 737	67.5	25.77	2011.772	6	0.10	0.03	
20041+2347	POU4198	247.6	18.44	2011.774	5	0.09	0.01	
20057+2336	POU4208	169.3	19.18	2011.774	5	0.08	0.03	
20057+2336	POU4211	12.8	14.21	2011.774	4	0.18	0.02	
20065+2338	POU4216	300.8	13.30	2011.774	5	0.10	0.02	
20067+2358	POU4217	210.5	14.36	2011.774	5	0.21	0.02	
20120+2328	POU4264	353.0	16.47	2011.774	5	0.14	0.03	
20126+2326	POU4272 AB	31.8	13.56	2011.774	5	0.10	0.05	
20128+2331	POU4275	83.0	10.31	2011.774	4	0.25	0.06	
20130+2346	POU4278	15.7	11.42	2011.774	5	0.25	0.10	
20132+2342	POU4281	348.7	5.53	2011.774	5	0.76	0.40	
20133+2345	POU4283	173.1	9.90	2011.774	5	0.24	0.06	
20135+2325	POU4284	342.7	14.51	2011.774	6	0.19	0.03	
20136+2334	POU4287	63.3	15.41	2011.774	6	0.15	0.02	
20137+2333	POU4288	104.5	14.58	2011.774	3	0.06	0.01	
20138+2334	BKO 807 AB	170.9	9.91	2011.774	4	0.22	0.03	
20138+2340	POU4289	80.0	8.84	2011.774	6	0.25	0.08	3
20140+2335	POU4292	348.4	12.00	2011.774	4	0.13	0.06	
20142+2340	POU4294	155.1	13.11	2011.774	5	0.21	0.05	
20143+2328	POU4296	80.6	15.41	2011.774	5	0.10	0.03	

Table concludes on next page.

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Table 1 (conclusion): Measures of Double Stars

WDS ID	Discoverer	PA	SEP	EPOCH	No.	PAsd	SEPsd	Notes
20143+2343	POU4297	296.3	13.64	2011.774	5	0.13	0.01	
20309+2339	POU4545	254.0	11.81	2011.774	5	0.31	0.06	
20310+2323	POU4548	8.0	14.18	2011.774	5	0.11	0.04	
20313+2330	POU4556	335.3	7.10	2011.774	5	0.36	0.14	
20315+2336	POU4560	343.6	10.19	2011.774	5	0.28	0.06	
20326+2325	POU4594	214.8	18.97	2011.774	5	0.09	0.03	
20327+2327	POU4602	11.5	8.31	2011.774	5	0.24	0.12	
20322+2330	POU4622	349.4	8.52	2011.774	6	0.31	0.09	
20322+2335	POU4625	42.4	10.39	2011.774	5	0.21	0.04	
20333+2341	POU4633	177.4	11.56	2011.774	5	0.17	0.08	
20337+2316	POU4647	206.8	11.09	2011.774	5	0.30	0.04	
20338+2329	POU4651	226.9	22.30	2011.774	5	0.14	0.02	
20340+2330	POU4654	154.0	15.76	2011.774	5	0.11	0.04	
21586+0931	HJ 3077	36.0	35.63	2011.772	5	0.05	0.02	
22306+3706	HJ 1774 AB	53.0	15.94	2011.772	5	0.10	0.04	
22306+3706	HJ 1774 AB	322.0	29.15	2011.772	4	0.13	0.04	
22308+3708	ALI 456	212.2	14.66	2011.772	5	0.09	0.05	
22322+3659	LDS1057	353.8	57.83	2011.772	5	0.02	0.03	
22441+4029	LDS1064	270.8	18.84	2011.772	5	0.09	0.03	4

Table 1 Notes:

1. LDS 1023. This seems to be a cpm pair. “A” is TYC 1613 561, proper motion PA -64 dec -130. “B” is TYC 1613 520, proper motion PA -57 dec -128.
2. TOB 162 BC. This seems to be a cpm pair. “B” TYC 2677 967, proper motion, PA -62 dec -43. “C” is 4UC625-087839, proper motion PA -60.9 dec -39.8.
3. POU 4289. “B” star is much brighter in CCD image. POU stars are often reversed in visual and CCD brightness as the original plates were blue sensitive. “A” star is 2MASS 20134816+2340206 listed mag is 12.384. “B” star is 2MASS 20134881+2340221 listed mag is 10.262.
4. LDS 1064. This seems to be a cpm pair. “A” is TYC 3218 905 proper motion PA -75 dec -119. “B” is TYC 3218 907 proper motion RA -74 dec -121.

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

This research made use of the VizieR Catalog Access Tool, CDS, Strasbourg, France. The original description of the VizieR service was published in A&AS 143,2.

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