

Observations of Selected Northern Neglected Double Stars

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Abstract: Measurements of 21 neglected double stars from the United States Naval Observatory (USNO) Northern list. All observations and measurements were taken in the latter half of 2006 and early 2007 from my observatory located at 44.2° North latitude & 93.2° West longitude.

Introduction

The equipment I used for these observations was a 12" LX200 SCT f/10 telescope with a 12.5 mm Celestron MicroGuide eyepiece at 244x.

The double stars chosen in this report were taken from the Washington Double Star (WDS) list of neglected double stars [1]. I chose doubles that were brighter than magnitude 12 and those doubles that had no observations for quite some time. Historical measurement data were provided by the UNSO [2].

Four separate measurements of position angle and separation were taken each night for each double star observed. All nights were then averaged out for the final measurement.

Method

As described in reference [3], a calibration was done on August 2, 2006 by timing the transit of Altair using my 12" LX200 SCT. Transparency and seeing were very good. Eleven measurements were taken and averaged between 1:00 AM and 2:00 AM on August 2, 2007.

The declination of Altair is 09° 38' 34". The average time of eleven transits was 26.512 seconds. Using the formula $s = 15.0411t \cos(\delta)/D$, a calibration constant of 6.557 a.s. per division on the linear scale was obtained. Table 1 contains the calibration data.

The new calibration was then tested on 5 known pairs whose separation and position angle have changed little in the last 100 years. [4] Table 2 contains a comparison of my measurements of the test

pairs with the PA and separation from the WDS.

After the calibration, I measured 21 neglected doubles. The measurements are given in Table 3.

Acknowledgments

I wish to thank Brian Mason and his team on providing timely historical data to me.

References

- [1] Mason, Brian D. et al, US Naval Observatory. List of neglected double stars, Northern List. <http://ad.usno.navy.mil/wds/NEGLECTED/neglectednorth1.html>
- [2] Mason, Brian D. et al, US Naval Observatory. Observational List of historical observations, personal communication.
- [3] Bob Argyle, ed., *Observing And Measuring Visual Double Stars*, Springer, New York, 2004
- [4] Ronald Charles Tanguay, *The Double Star Observer's Handbook*, The Double Star Observer, 2003

26.38	26.72	26.31	26.37
26.43	26.59	26.28	26.97
26.50	26.53	26.56	

Table 1: Transit times in seconds. The average transit time is 26.512 s, giving a calibration constant of 6.557 as per division on the scale of the MicroGuide eyepiece.

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Test Pair	PA	sep	Measured PA	Measured sep	delta PA	delta sep
STF 39AB	150	45.9	150.5	45.89	0.5	0.01
STF 37AB-CD	174	210.5	174.5	213.10	0.5	2.60
STF 43Aa-B	54	34.4	53.0	34.42	1.0	0.02
STF 307AB	302	28.7	301.5	29.50	-0.5	0.80
STF 331	86	12.0	86.5	12.45	0.5	0.45

Table 2: Comparison of measurements of test double stars with PA and sep listed in WDS.

WDS Name	RA+Dec	Mag	PA (deg)	SEP (as)	Date	N	Notes
STF 60 AB	004906+574900	3.5, 7.2	317.28	12.58	2006.658	4	1
STF 162 Aa-C	014915+475349	5.8, 9.4	182.54	21.23	2006.780	3	4
STF 296 AB	024517+490324	4.2, 10.0	302.38	19.64	2006.783	3	8
STF 307 AC	025041+555344	3.9, 9.9	269.58	67.20	2006.950	3	1
STF 484 AG	040751+621948	6.9, 9.6	260.04	61.74	2006.930	3	5
STF 484 AE	040751+621948	6.9, 6.2	304.81	18.72	2007.230	2	1
STF 484 AI	040751+621948	6.9, 9.81	279.37	69.25	2007.230	2	1
STF 484 EG	040751+621948	7.0, 9.5	246.0	48.56	2007.230	2	1
STF 484 EI	040751+621948	7.0, 9.7	270.25	55.12	2007.230	2	1
STF 516 AC	041423+101523	6.0, 10.0	157.12	135.10	2006.930	3	3
STH 5 AD	190545+383105	9.5, 10.0	343.16	18.63	2006.811	3	2
GUI 22 AB	190830+551950	7.5, ??	33.94	6.56	2006.745	2	7
GUI 22 AD	190830+551950	7.5, 12.3	121.44	65.90	2006.745	2	6
STF 2692 AC	203128+263024	??, ??	302.3	26.22	2006.674	1	7
BU 697 AC	220508+621647	5.1, 10.8	274.19	56.14	2006.633	4	1
BU 697 AB	220508+621647	5.1, 11.2	93.29	19.67	2006.745	4	1
HJ 1741 AD	221110+504923	5.4, 9.9	270.5	73.99	2006.616	4	1
HJ 1741 AB	221110+504923	6.2, 10.0	285.5	36.00	2006.616	4	10
H 6 24 AB	232521+622150	5.1, 9.9	225.5	97.48	2006.690	4	1
H 6 24 AC	232521+622150	4.9, 8.7	258.03	218.02	2006.690	4	11
STT 511 AB	235304+604216	6.9, 10.6	30.84	10.95	2006.701	4	9

Table 3: Measurements of double stars.

Notes:

1. No significant measurable change in PA or Sep
2. Only one other measurement taken in 1886 where the PA was measured at 336.4 but no Sep was measured. My measures show a change in PA. I estimate the magnitude of the D star to be 10.

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3. A change in both PA & Sep has taken place since the initial measurements taken in 1912.
4. My PA measure shows a 4 degree change. 41 historical measures show no PA change. The PA should be rechecked.
5. PA has changed 2.5 degrees, sep has not changed.
6. PA has changed by about 2 degrees, sep remains the same as the measurements taken in 2000.
7. No measurement history available.
8. There have been 70 measurements taken and an orbit calculated. My measure seems to be off.
9. The PA has changed on this double by about 3.3 degrees.
10. The PA here has changed by 3 degrees.
11. The separation has changed by 3" since the last measurement in 1917. Because component C was so faint, it was tough getting a separation measure.

