Report on the Observation of Binaries in 2013: Humacao University Observatory

D. Cotto, R.J. Muller, J.C. Cersosimo, R. Rodriguez, M. Diaz, M. Rosario, Y. Nieves, E. Franco, A. Lopez, B.S. Torres, N. Vergara, Y. Rodriguez-del Valle, G. Espinosa, M. Reyes, J. Martinez

Humacao University Observatory
Department of Physics and Electronics
The University of Puerto Rico at Humacao
Call Box 860, Humacao, Puerto Rico 00792
rjmullerporrata@gmail.com

Abstract: This is a report on observations of position angle and separation of binary stars of the year 2013 from the Humacao University Observatory. The stars analyzed totaled 62; they were imaged at the NURO 31 inch telescope in Flagstaff, Arizona in June 2013. The images were analyzed at the Humacao Observatory of the University of Puerto Rico.

Introduction

The objective of this paper is to continue reporting on measurements of position angle and separation of binary stars gathered from CCD images obtained at the National Undergraduate Research Observatory (NURO) telescope. The Humacao Campus of the University of Puerto Rico is a member of NURO, a consortium of primarily undergraduate institutions (www.nuro.nau.edu) with access to a 31 inch telescope owned by Lowell Observatory. This telescope, located at the Anderson Mesa facilities of the Lowell Observatory (located roughly 20 miles east of Flagstaff, Arizona at an altitude of 7200 feet) is equipped with a 2K X 2K CCD camera with 15 micron pixels. The camera is cooled to -110 C.

We present here our observations for the year 2013. A total of 62 images were considered fit for analysis. They were gathered at the prime focus of the NURO telescope during an observing run in June 16, 17 and 18 of 2013. We usually gather data in September or October but, for the first time in many years, we were rained and clouded out in our September visit. So we limit our report to the June data.

Procedure

Students pursuing undergraduate research projects at the Humacao Campus Observatory of the University of Puerto Rico analyzed the CCD images following a procedure detailed in a previous paper (Muller et.al, 2010). The 62 binaries are detailed here in Table I following standard JDSO ordering.

Acknowledgements

We made extensive use of the Washington Double Star Catalog of the U.S. Naval Observatory. We also looked into the Sixth Catalog of Orbits for information pertaining to binaries. We would like to acknowledge support for this project from the Puerto Rico Space Grant Consortium and the L.S. Alliance for Minority Participation of the University of Puerto Rico. We also want to thank Ed Anderson of NURO for his efforts on behalf of our students.

References

Muller, Rafael et al., 2010, "Observation Report 2008, Humacao University Observatory", *Journal of Double Star Observations*, **6**, 274-279.

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Table I.

Name	RA	DEC	Magnitudes		ρ	θ	Date 2013+
GRV 849	120253.16	+234550.8	12.03	12.35	28.1	232.32	0.457
STI 738	120317.64	+592405.8	12.24	13.1	6.59	40.82	0.457
STF1594AD	120328.56	+412415.5	10.09	14.4	27.21	74.32	0.457
BAL1450	120311.85	+004348.8	11.70	12.46	22.84	210.99	0.457
POU3120	120405.70	+231140.6	11.09	13.1	14.26	199.32	0.457
BU 458	120417.11	-210221.0	7.87	9.97	30.87	234.82	0.457
HJ 1206	120243.45	+042435.4	11.4	11.5	16.93	225.99	0.457
KZA 26	120507.86	+432246.7	13.0	13.6	16.88	110.82	0.457
HJ 4496	120612.76	-185327.9	10.05	10.98	12.50	30.65	0.457
COU2707	123004.89	+222216.5	11.77	14.1	14.20	346.15	0.457
HJ 519	123026.33	+360744.7	10.32	10.35	18.10	192.57	0.457
ES 726AC	123049.06	+535129.7	10.48	13.6	20.19	179.82	0.457
STF1650	123132.99	+243713.1	9.54	10.47	16.60	182.32	0.457
LDS4224	123213.27	+314719.6	10.4	13.5	11.05	311.62	0.457
HJ 211	123221,12	-015333.3	11.86	11.77	11.6	28132	0.457
HJ 2641	130855.13	+075958	12.1	12.8	12.9	249.32	0.460
HJ 542	141221.20	364612.6	12.9	12.5	12.20	57.32	0.460
STF1821AB	141329.00	+514723.8	4.53	6.62	12.15	259.32	0.460
SWI 1	140233.18	+462023.9	10.05	10.26	4.91	22.82	0.460
KZA 80	152042.06	+313315.1	12.13	12.82	23.6	54.82	0.460
KZA 87	152448.68	+293428.4	12	12.5	10.83	357.32	0.460
STF1999AB	160425.96	-112657.6	7.52	8.05	11.98	101.48	0.463
ARA 433	160635.80	-181911.6	11.6	14.1	9.94	58.92	0.463
ALI 370	160726.70	+354827.8	12.0	13.0	13.13	150.07	0.463
POU 3214	160748.84	+230529.9	11.1	13.3	12.58	86.32	0.463
STF2010AB	160804.55	+170249.2	5.10	6.21	28.31	15.82	0.463
BAL 564	161109.67	-020613.7	11.53	11.8	12.58	283.82	0.463
POU3216	161323.41	+242948.1	13.7	14.9	14.18	297.32	0.463
STF2032AB	161440.85	+335131.0	5.62	6.49	4.58	239.32	0.463
ES 627	161835.71	+511951.5	9.88	10.98	12.26	292.07	0.463
BAL2421	164056.30	+033806.0	8.51	11.1	9.21	230.32	0.463

Table 1 concludes on next page.

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Table 1.

Name	RA	DEC	Magnitudes		ρ	θ	Date 2013+
KZA 120	165322.06	+460130.9	10.5	10.5	10.55	82.62	0.463
BAL2429	165451.18	+031840.8	11.77	12.8	12.0	56.32	0.463
ES 1255	170100.54	+461626.8	8.19	11.7	7.30	49.32	0.463
HJ 2804AB	170433.42	+385927.3	11.00	13.3	7.23	238.07	0.463
WFC 186	170605.40	+432857.4	10.81	12.11	18.55	18.07	0.463
STF2123	170657.50	+064803.0	9.82	9.98	18.07	218.62	0.463
STF2127	170704.42	+310535.1	8.70	12.30	14.65	286.82	0.463
SLE 9	170706.29	+202921.7	10.49	12.30	20.3	177.07	0.463
ARA1121	170706.09	-201443.6	11.8	12.4	8.13	215.15	0.463
BEM 26	170836.72	+502245.2	11.06	13.34	14.78	199.32	0.463
STF2250AB	175918.09	-065121.2	8.79	9.24	8.26	346.82	0.463
STI2369	180729.23	+551431.1	12.3	12.6	14.78	191.32	0.463
SLE 85	180733.14	+031353.7	11.2	12.5	11.17	182.32	0.463
BAL1952	180734.41	+022407.8	11.52	12.8	13.06	155.32	0.463
STF2280AB	180749.56	+260604.4	5.81	5.84	13.93	181.32	0.463
SLE 138	180752.70	+304157.2	11.5	12.3	11.01	328.32	0.463
POU3338	175954.77	+233053.1	9.70	13.5	9.16	321.62	0.463
ES 183	180801.13	+364204.1	9.36	12.7	9.01	168.32	0.463
POU3351	180808.78	+232712.4	12.05	13.9	9.19	157.62	0.463
ARA 453	180852.23	-182655.1	10.69	12.5	9.0	57.82	0.463
SLE 111	180853.96	+272456.6	10.8	12.5	14.4	316.98	0.463
BEM 31	180941.21	+532931.5	9.90	12.3	12.63	311.57	0.463
STF2293	180953.83	+482405.7	8.08	10.34	13.73	85.82	0.463
BAL2483	181441.54	+034205.5	12.00	12.7	12.93	197.32	0.463
SLE 145	181458.39	+030343.6	11.2	11.9	11.92	30.62	0.463
ES 646	181509.43	+520924.8	8.72	14.1	9.48	204.32	0.463
POU3380	181722.66	+245636.2	12.4	13.3	12.84	74.82	0.463
HJ 1349	184848.77	+331912.1	8.29	10.7	29.41	97.32	0.463
STF2459	190722.01	+255823.9	9.12	10.07	14.21	234.92	0.463
AG 375	191413.48	+262628.4	9.89	10.92	18.43	302.82	0.463
SLE 959AB	201150.08	+372606.8	10.69	12.5	11.81	163.98	0.463