

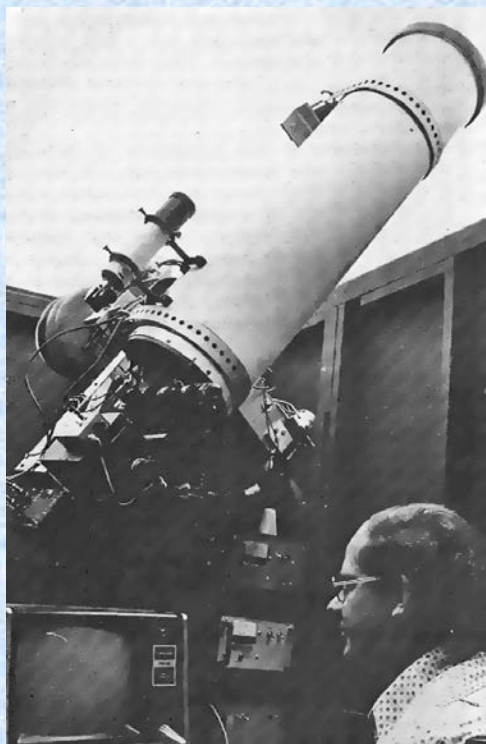
Student Double Star Speckle Interferometry Research Program

Russell Genet

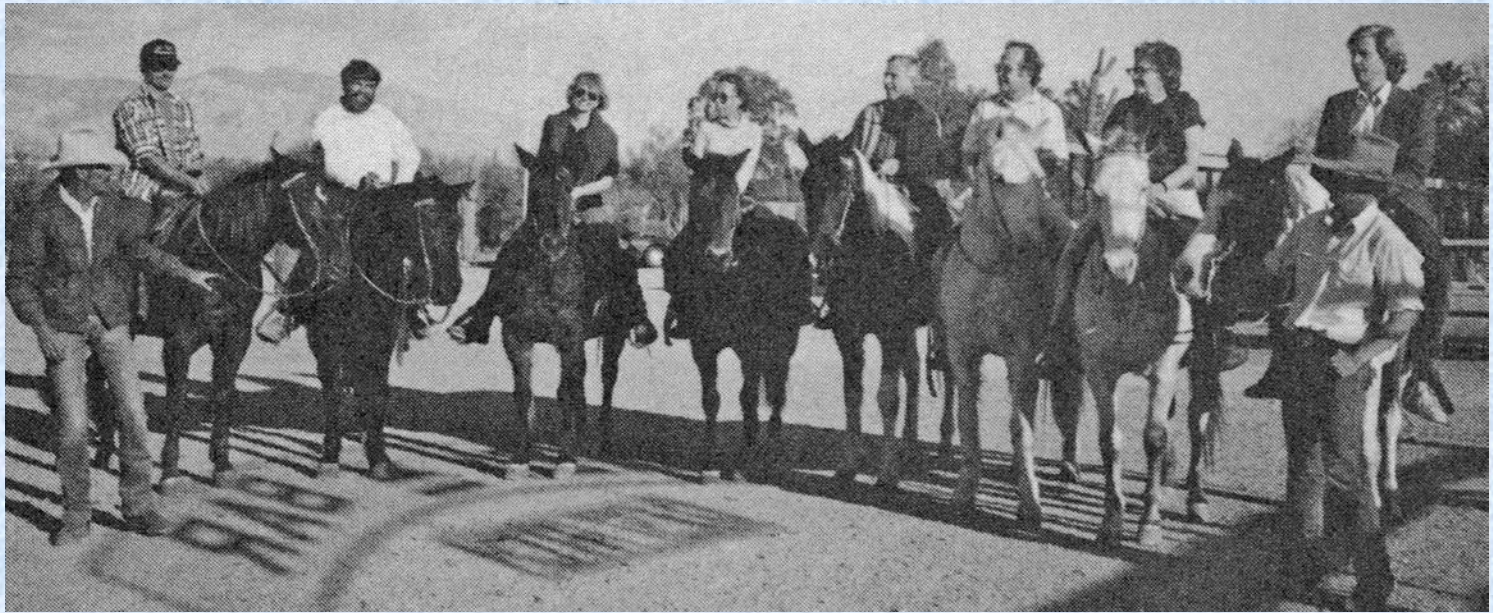
California Polytechnic State University

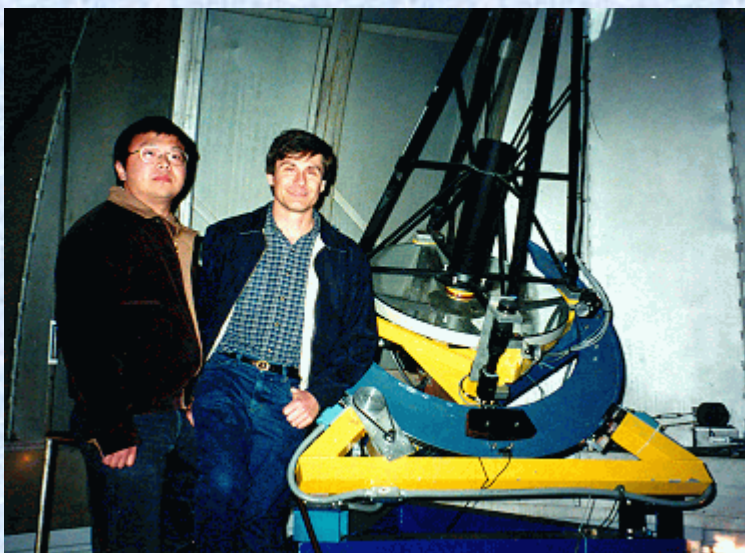
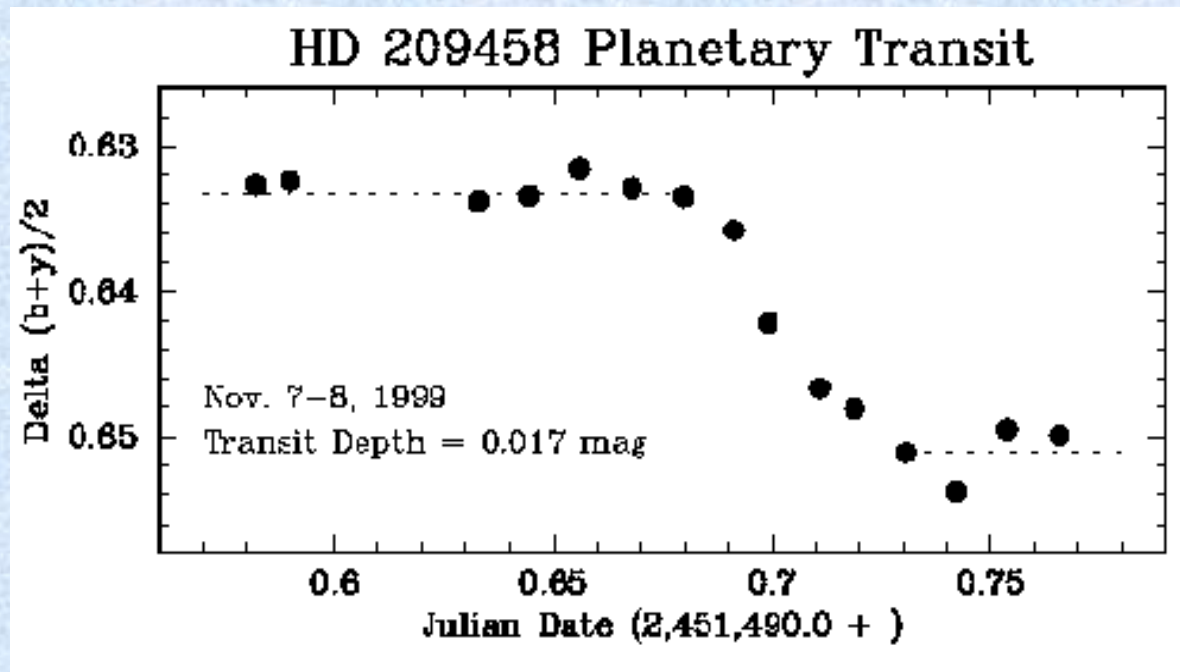
University of North Dakota

Cuesta College











small comment: Follow JDSO format EXACTLY!!!

Russ Genet

Measurements of the Double Star STFA 43AB

Mark A. Brewer
Cuesta College, San Luis Obispo, CA
Victor Valley Community College, Victorville, CA

Abstract

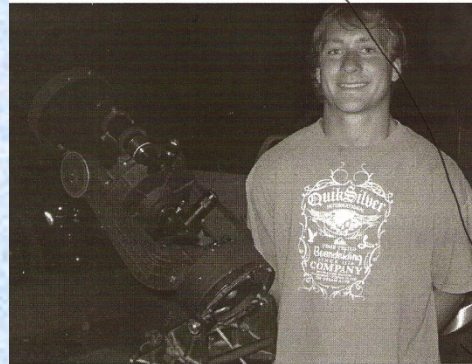
At my observatory in Phelan, CA, observations were made with an 8-inch Celestron telescope using a 12.5 mm Celestron Micro Guide astrometric eyepiece. A total of 10 drift times were observed to calibrate the scale constant. The double star STFA 43AB (Albireo), was observed to determine its position angle and separation. Results were compared to the last observation in 2006.

Introduction

Having the help from Central Coast Astronomical Society (CCAS), I was loaned as a member an 8-inch Celestron Telescope. Equipped with a tripod, wedge, two different eyepieces, and a power source cord that engaged the drive motors on and off. With the help of Dr. Russ Genet I was given a 12.5 mm Celestron Micro Guide astrometric eyepiece.

Identify
What was the position angle & separation?
Measurements were made using

How did they compare?



mainly.
I observed my observatory with a telescope graciously loaned to me by the Central Coast Astronomical Society. That was

Background (STFA 43AB)

Albireo is considered a double star. With the telescopes right ascension and declination set at 19hr30min43.29s, +27°57'34.9". Albireo is identified and the separation and spectral types will appear respectively. STFA 43AB was my first educational double

and declination

Page #?

Do a double star photo

Astrometric Measurements of the Double Star STFA 43AB

Mark A. Brewer

Cuesta College, San Luis Obispo, CA,
and
Victor Valley Community College, Victorville, CA

Abstract: At my observatory in Phelan, CA, observations were made of the visual double star STFA 43AB (Albireo) with an 8-inch Celestron telescope using a 12.5 mm Celestron Micro Guide astrometric eyepiece. A total of 10 drift times were observed to calibrate the scale constant. The last observations reported in WDS were made in 2009, at which time the position angle was 55° and separation 34.6 arc seconds. My 2010 results compared favorably with 2009 results.

Introduction

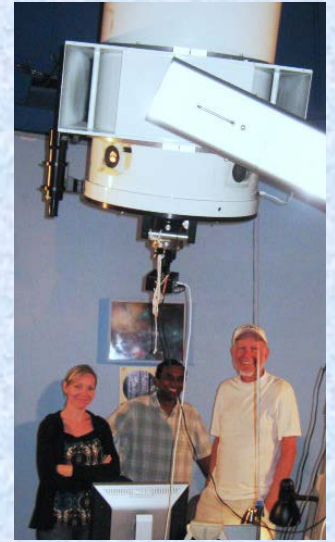
STFA 43AB (Albireo) is a double star at right ascension 19 hr 30 min 43.29 sec. and declination + 27° 57 min 34.9 sec. STFA 43AB was the first double star that I observed. STFA 43A is a red star with a catalog magnitude of 3.19, and STFA 43B is a beautiful blue color listed as a magnitude of 4.68 (Mason *et al.*, 2010).

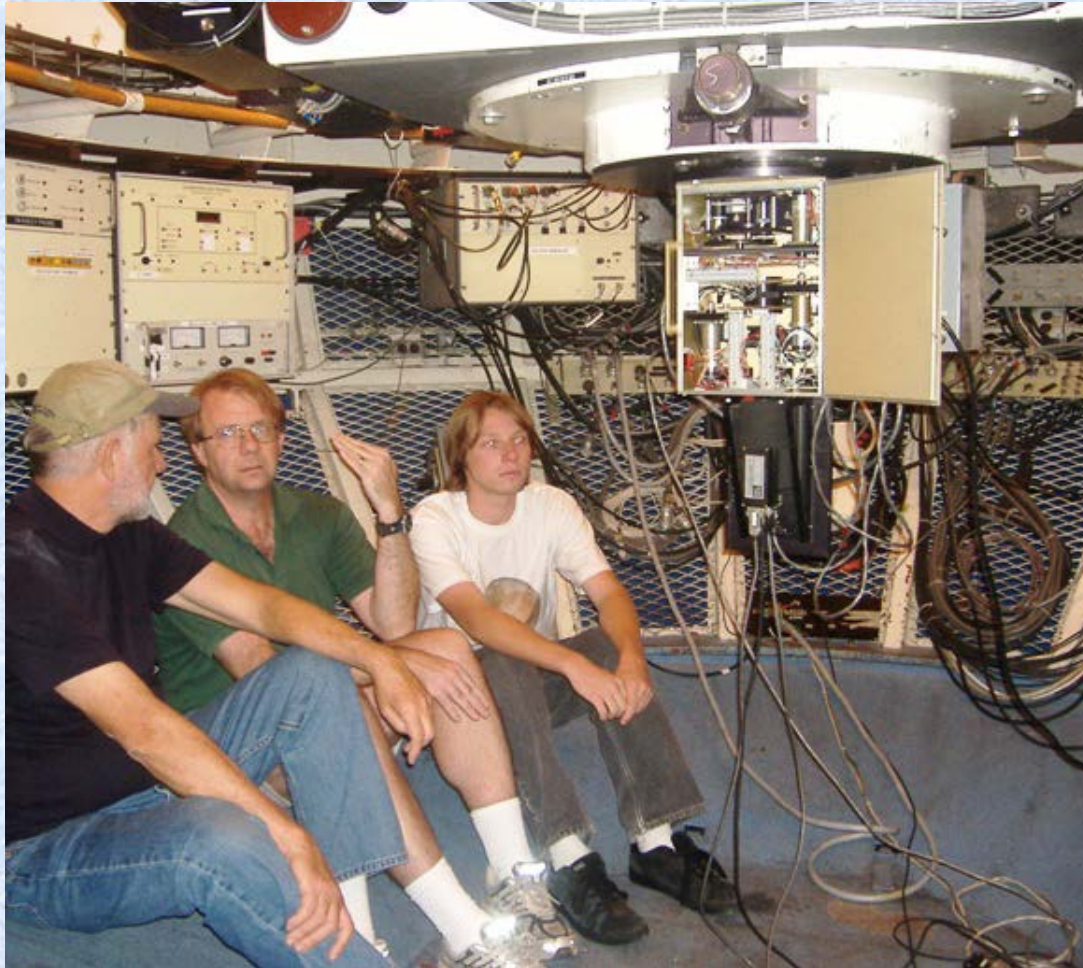
To this day professional and amateur astronomers still argue if STFA 43AB is a binary pair or not. The first observations published on STFA 43AB were made in 1755, by astronomer James Bradley (1693-1762). The position angle was reported to be 57.57 degrees and the separation was 34.20 arc seconds (WDS, Mason 2009). R.F. Griffin (1999) suggests that Albireo is a true double star. With twenty plus years observing STFA 43AB, Griffin defended its double star because his observations showed that Albireo's position angle has moved within one degree. Griffin's experience led him to suggest that nearly all double stars with close separations were likely to be a binary star.

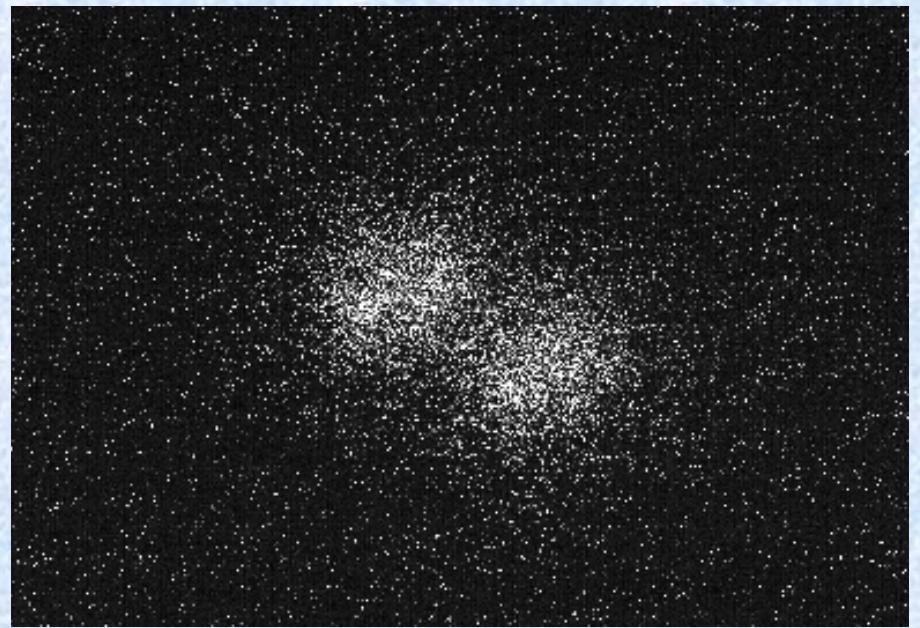
My observations of Albireo were made with a Celestron 8-inch Schmidt-Cassegrain telescope graciously loaned to me by the Central Coast Astronomical Society, and a 12.5 mm Celestron Micro Guide

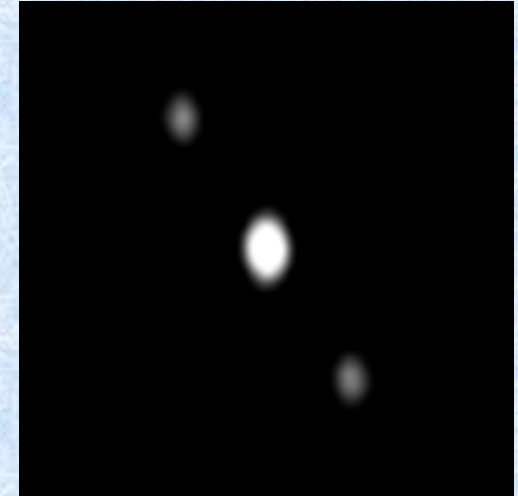


Figure 1: The author with the Celestron C-8 loaner telescope from the Central Coast Astronomical Society he used to make his first astrometric measurements of a visual double star.









Lucam Recorder Premium - DBx 21AF04A5 / Serial: 1302E59413

File Camera View Tools Settings Info

Image size: 640x440 Another: 328, 236
 Frame rate: 60 fps
 Exp (ms): 2,18 Auto
 Gain: 1,80
 Gamma: 1,00
 Contrast: 1,00
 Brightness: 0,00

Filter Wheel
 File Options
 Filter Control Setup
 Lumin
 Red
 Green
 Blue
 hAlpha
 IR742
 Neumann FR03 / COM4

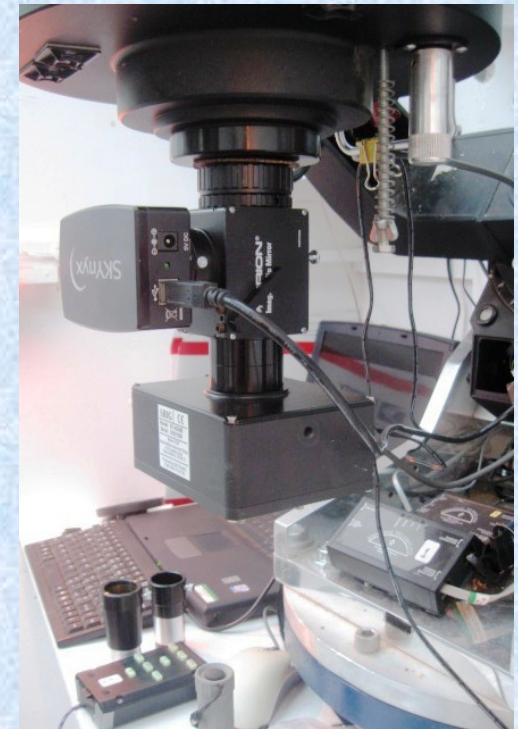
Rec Link Rate File Misc
 File format: Avi / B8V / Bayer
 Destination: Auto increment
 Sequence: 4 files
 Preview RAM Log Rate
 0 Frames 0.0 sec 0 fps

Colors and palettes
 RGB channels Palette Lin
 Grayscale linear Palette options
 Inverse palette Clip palette Save to image file
 black white

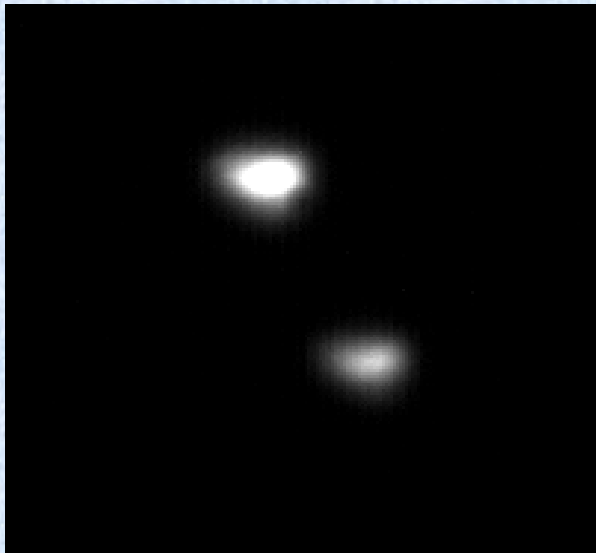
Image statistics
 Histogram Contrast
 Minimum: 5 Maximum: 205
 Median: 63 Deviation: 29,5

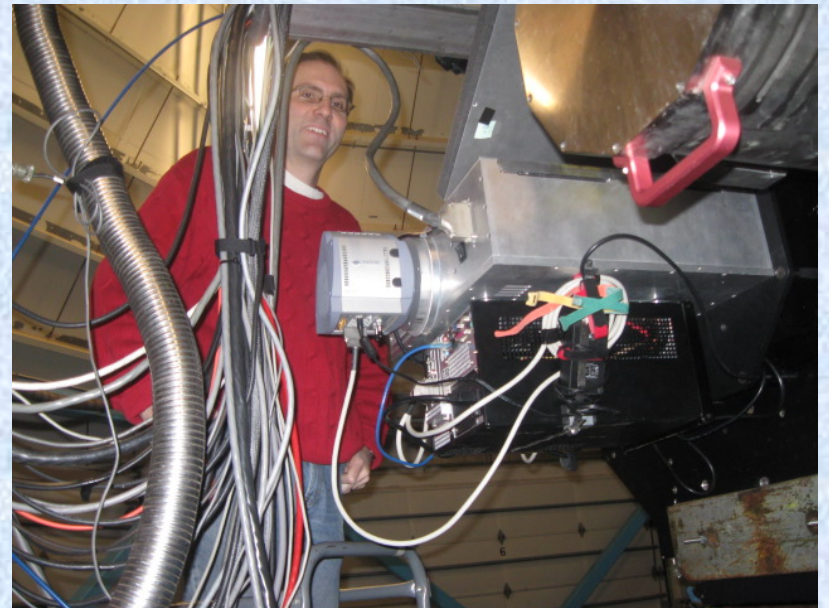
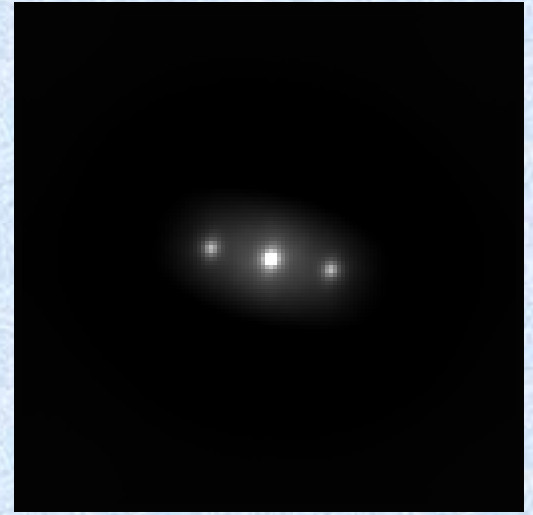
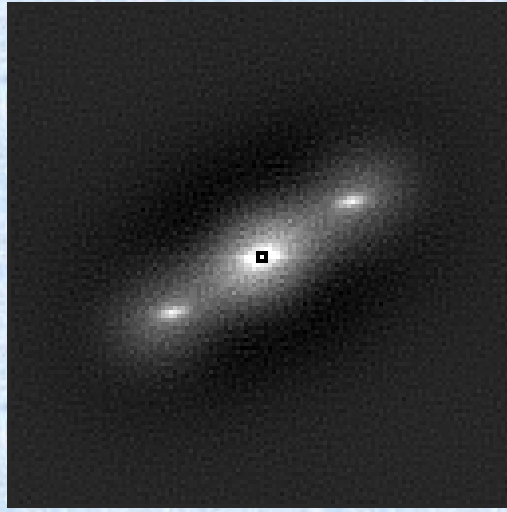
DiFilter

5,78" / 9,24" Field 406" x 249" Mevlon250 f/12 No Flip Zoom 100% STOP



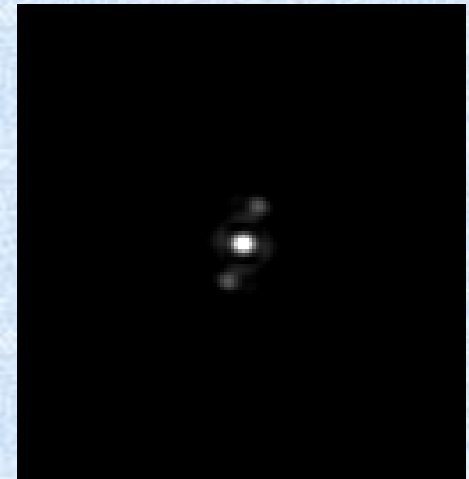
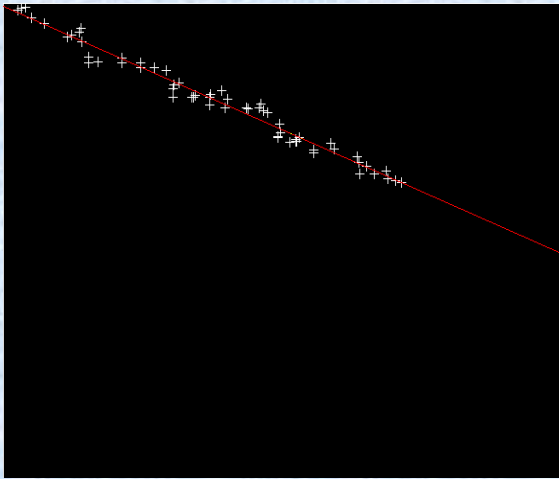








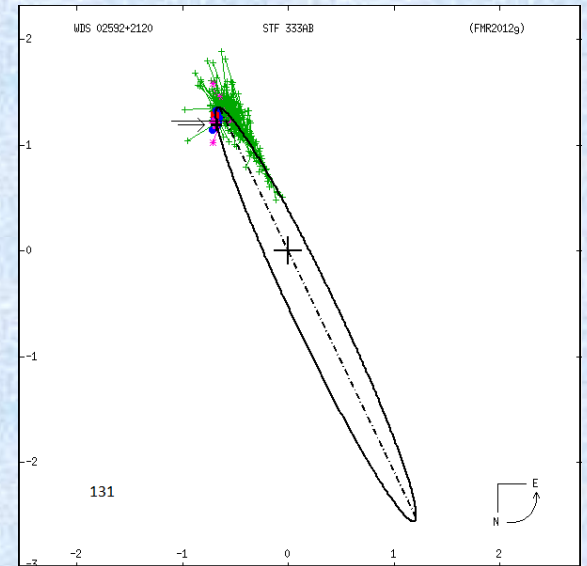
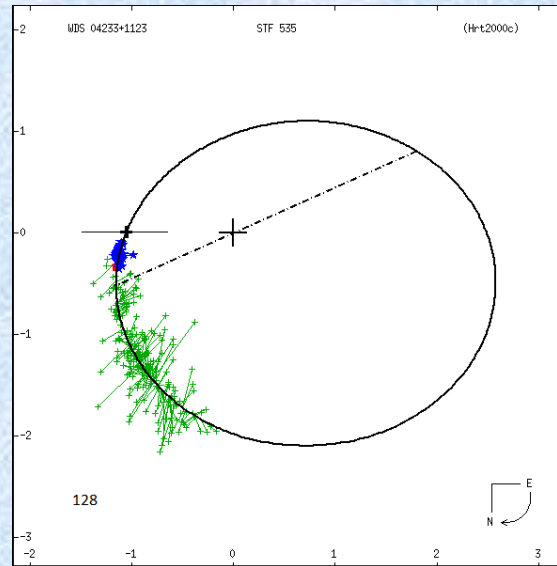
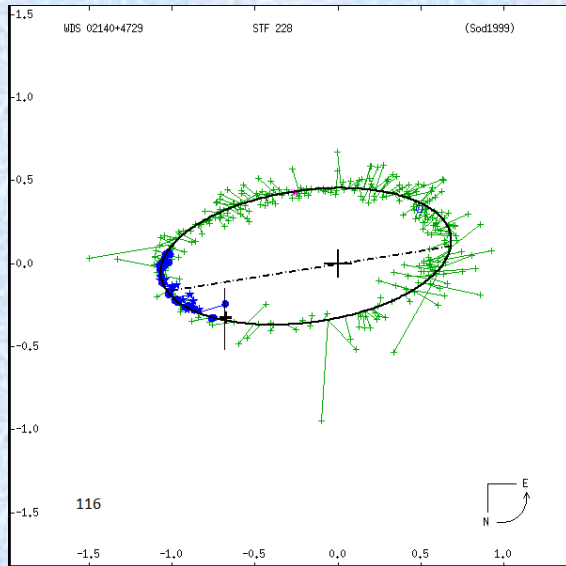
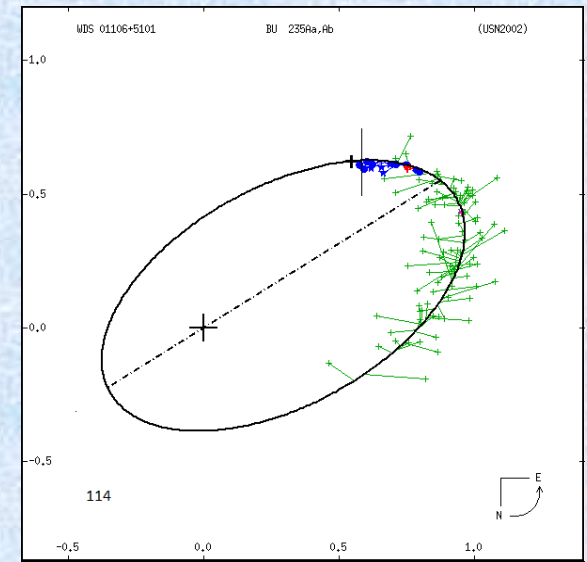
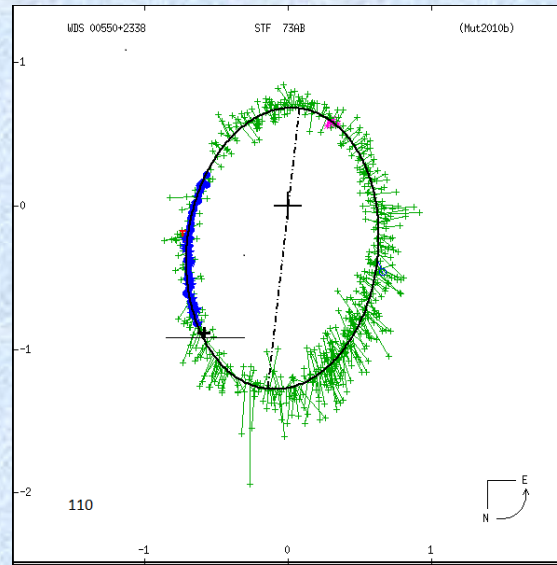
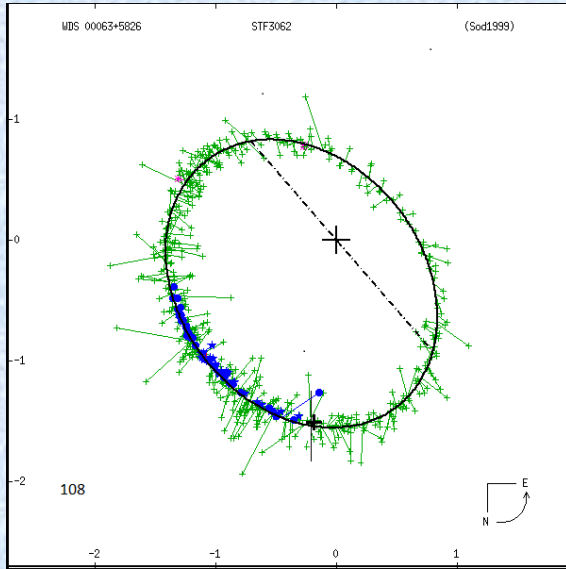
ID	Target	WDS	Gr	θ Calc	θ Avg	θ SEM	Tan	θ O-C	θ Tan	ρ Calc	ρ Avg	ρ SEM	ρ O-C
108	STF3062	00063+5826	2	352.18	352.85	0.04	1.05	0.62	16.4	1.55	1.52	3.34	-30.77
109	STT20	00546+1911	3	179.22	179.52	0.23	2.30	0.24	2.5	0.57	0.58	0.25	16.33
110	STF73	00550+2338	2	326.76	326.74	0.09	1.68	0.08	1.6	1.09	1.07	1.38	-23.75
111	STT515	01095+4715	4	118.17	118.23	0.37	3.36	0.15	1.3	0.52	0.50	4.25	-21.63
114	BU235	01106+5101	4	137.04	138.98	0.26	3.90	1.84	26.6	0.85	0.83	2.14	-28.06
116	STF228	02140+4729	2	296.64	295.65	0.19	2.48	-0.92	-12.0	0.76	0.75	2.08	-14.88
126	BU260	01532+1526	5	260.39	259.65	0.16	3.10	-0.70	-13.6	1.09	1.12	4.31	26.63
128	STF535	04233+1123	5	269.40	270.49	0.37	6.87	0.83	15.3	1.05	1.05	11.29	1.81
130	BU525	02589+2137	4	274.53	272.43	0.09	0.81	-2.11	-19.8	0.49	0.54	3.07	42.52
131	STF333	02592+2120	4	209.59	209.88	0.06	1.40	0.37	8.9	1.36	1.38	1.65	25.17
132	STF346	03054+2515	3	257.28	254.14	0.38	3.18	-3.23	-23.7	0.48	0.42	0.29	-54.81
135	STF412	03344+2428	3	352.33	353.09	0.17	2.26	0.80	10.4	0.74	0.74	0.00	0.46
139	STF535	04233+1123	5	269.40	271.41	0.23	4.15	2.29	43.6	1.05	1.09	3.52	39.81
140	A1710	04064+4325	3	310.57	311.90	0.23	2.53	1.47	15.8	0.62	0.62	3.61	-0.87
142	STF520	04182+2248	3	80.93	78.82	0.86	8.88	-2.54	-28.0	0.59	0.63	7.40	39.17
143	STT82	04227+1503	3	333.60	332.60	0.41	8.68	-1.19	-25.2	1.23	1.21	9.77	-16.56
154	HU612	04478+5318	5	0.75	0.32	0.40	4.73	-0.43	-5.3	0.67	0.70	1.85	29.73
155	STT95	05055+1948	4	296.92	296.43	0.13	2.13	-0.58	-9.4	0.96	0.93	1.47	-32.88

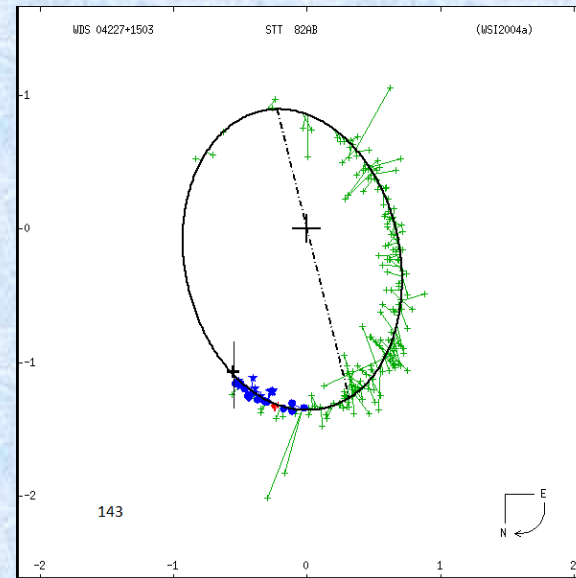
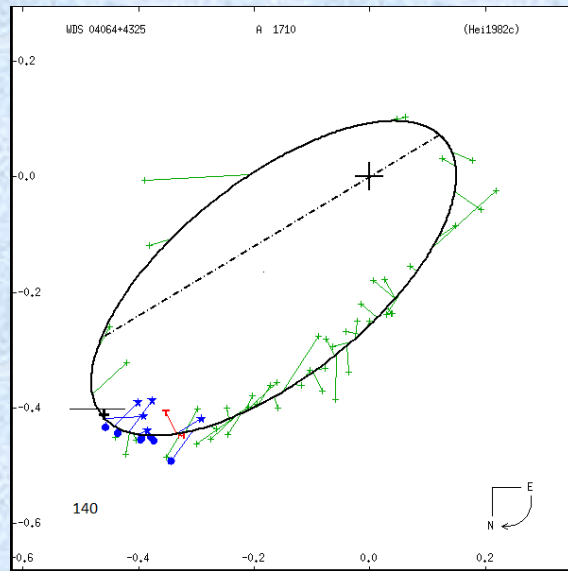
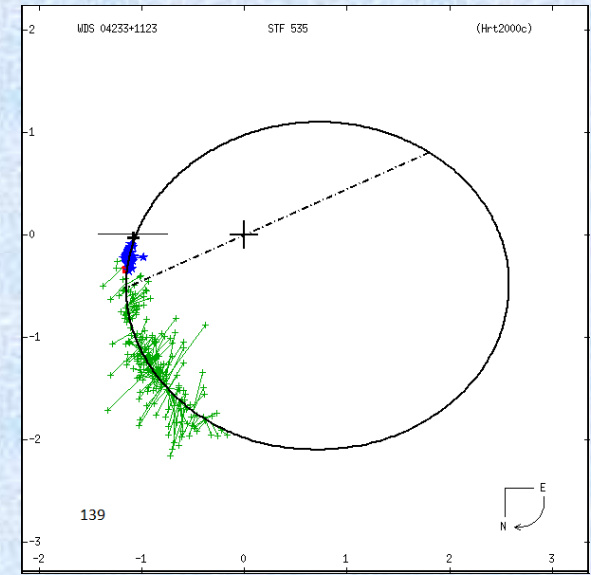
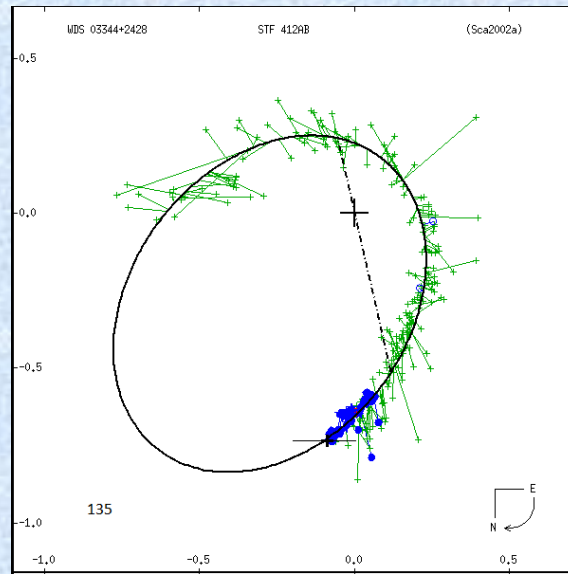
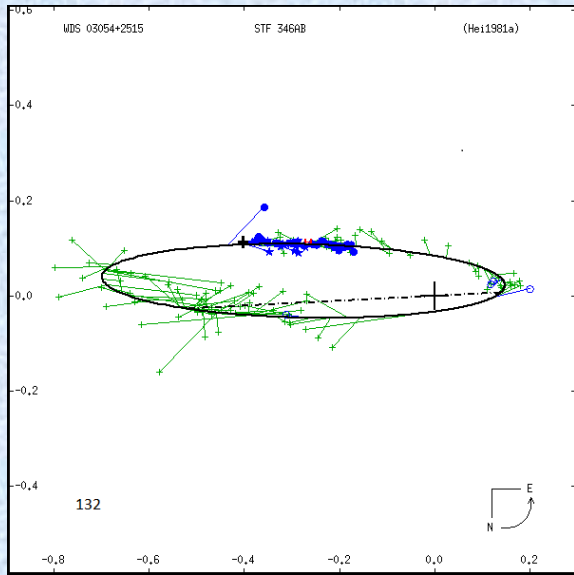


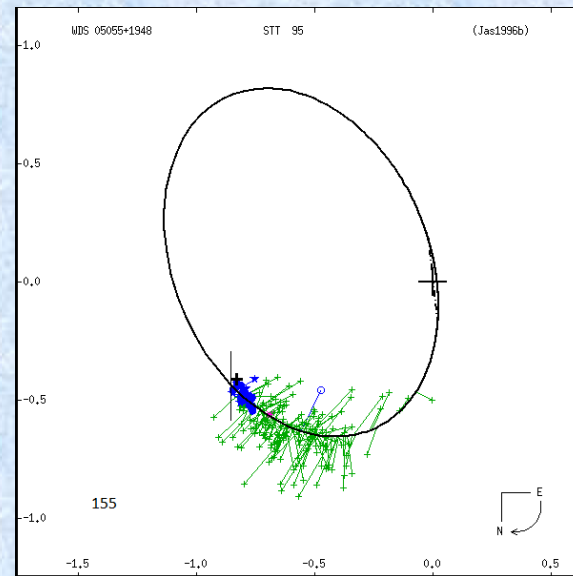
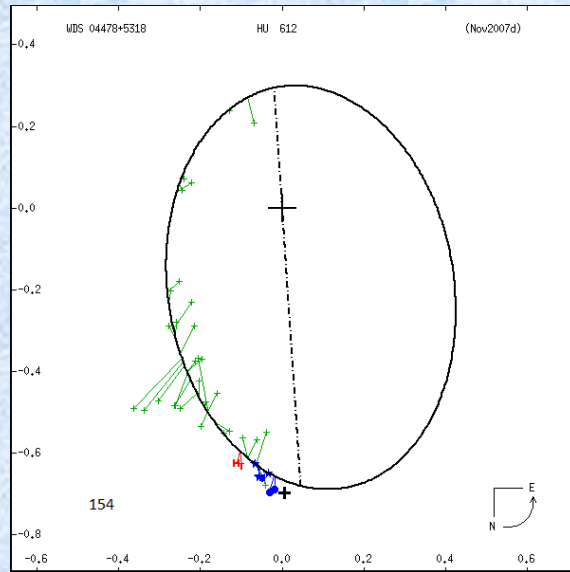
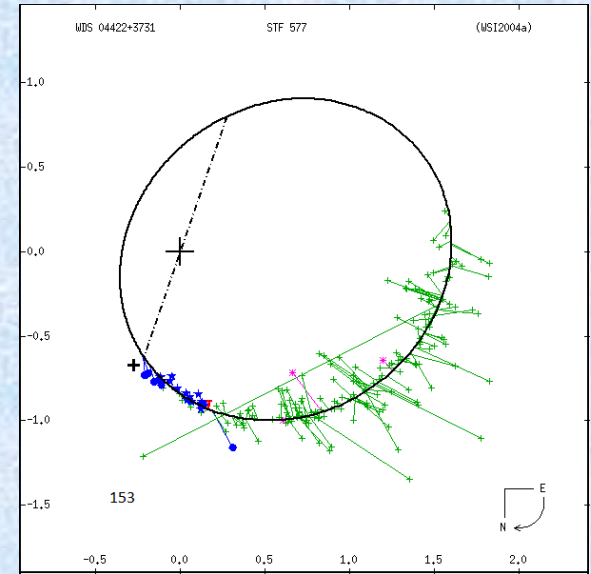
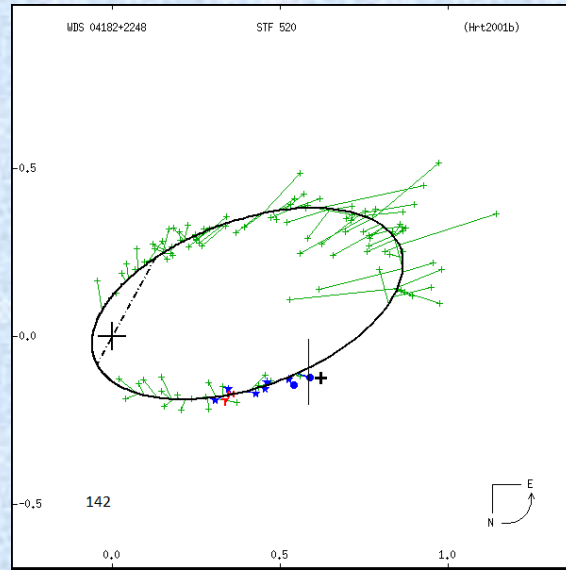
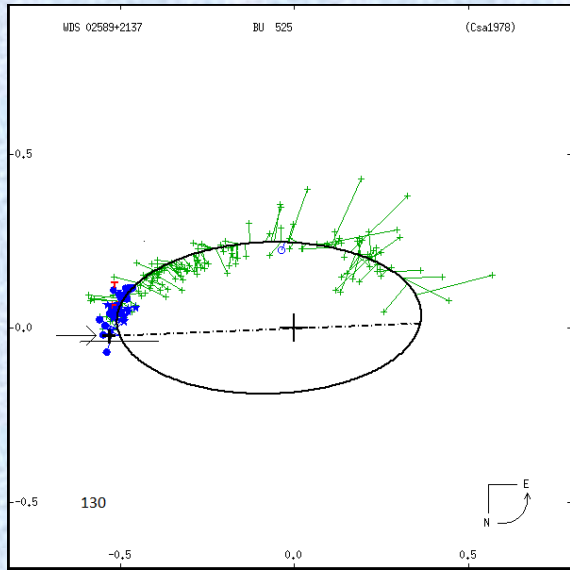
Camera Angle	58 And	psi Per
Mean	-23.13	-22.9
Standard Deviation	1.04	0.71
Standard Error of the Mean	0.47	0.35

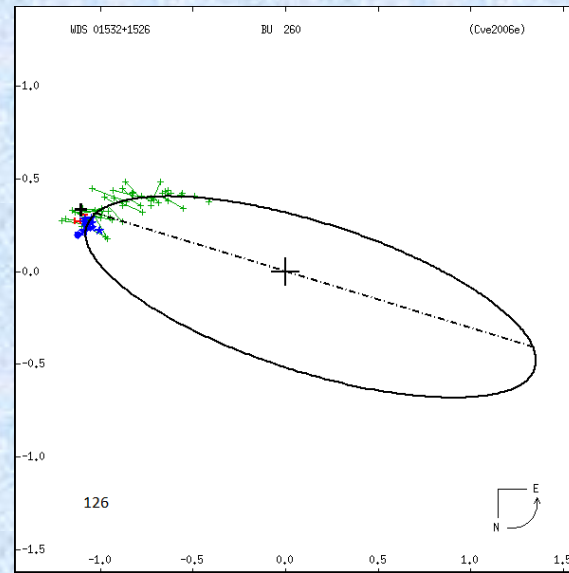
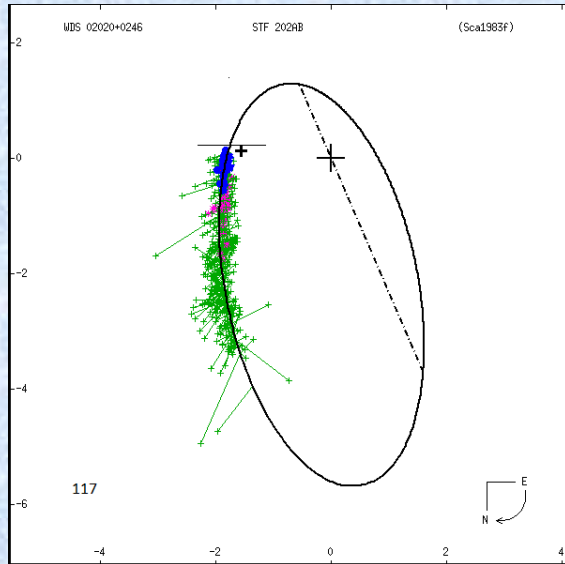
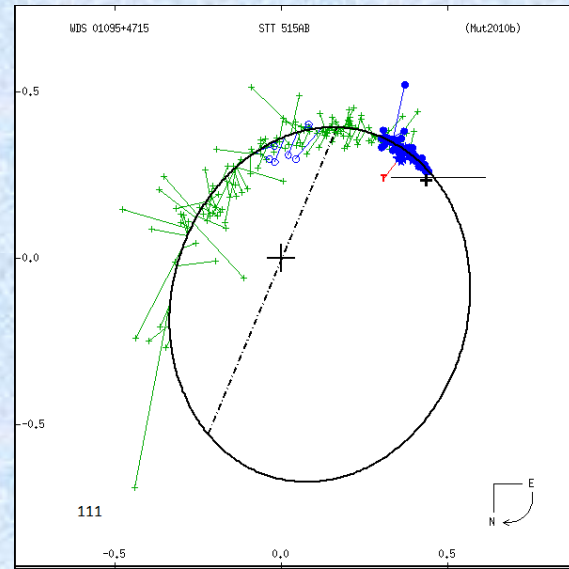
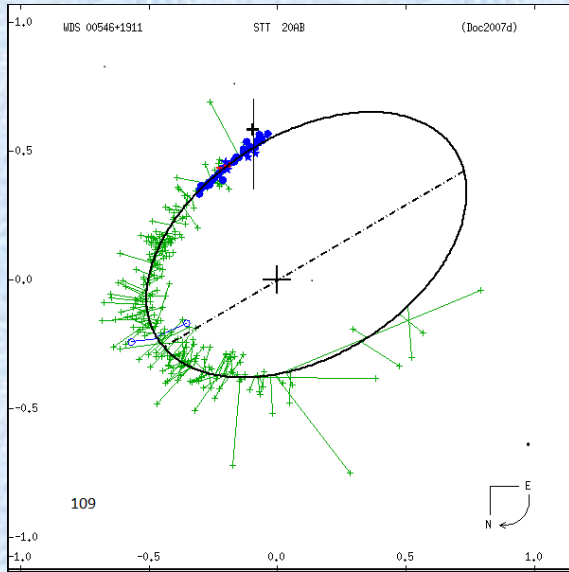
	Camera Angle [°]	Pixel Scale ^{''}
Mean	-22.46	0.0538
Standard Deviation	1.54	0.0020
Standard Error of the Mean	0.09	0.0005

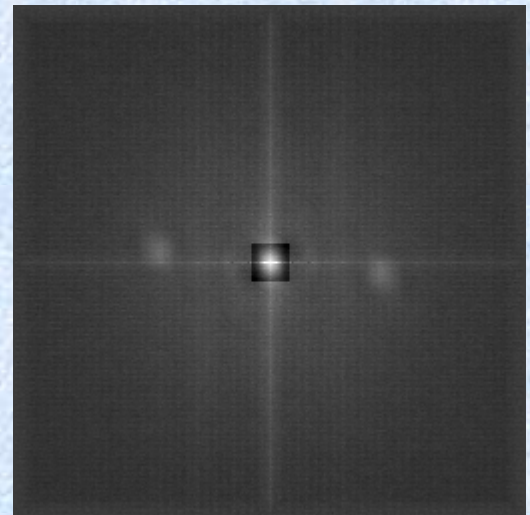
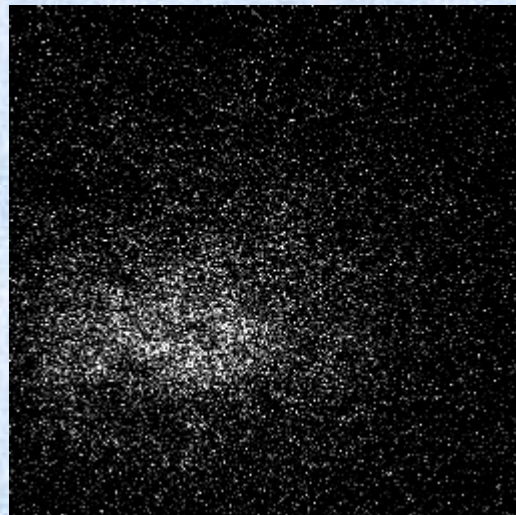
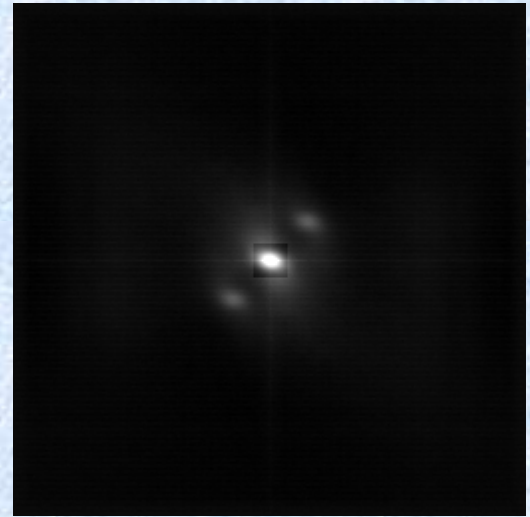
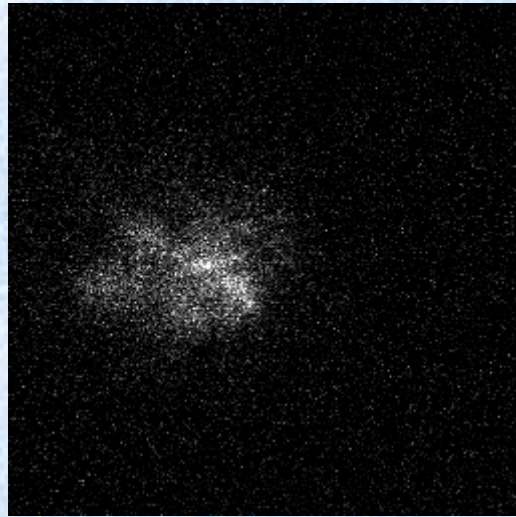
	Precision	Accuracy
θ	1.1	16.0
ρ	3.4	24.8
RSS	3.6	29.5



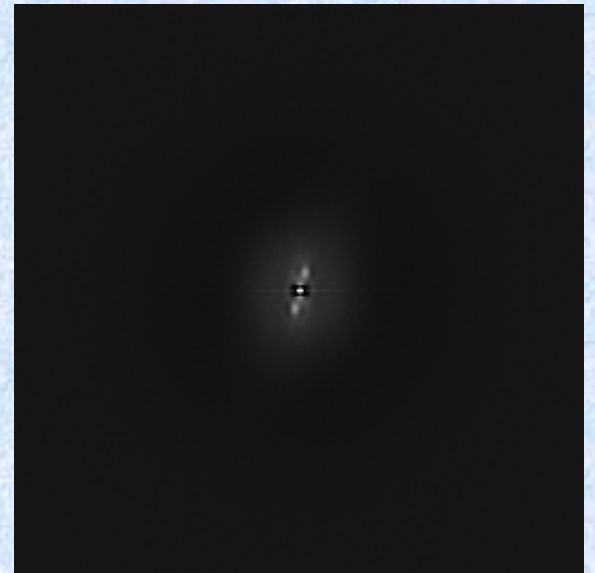
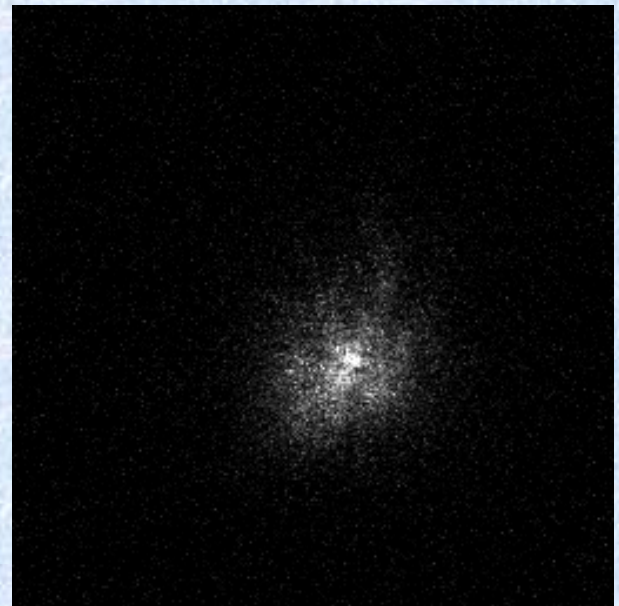
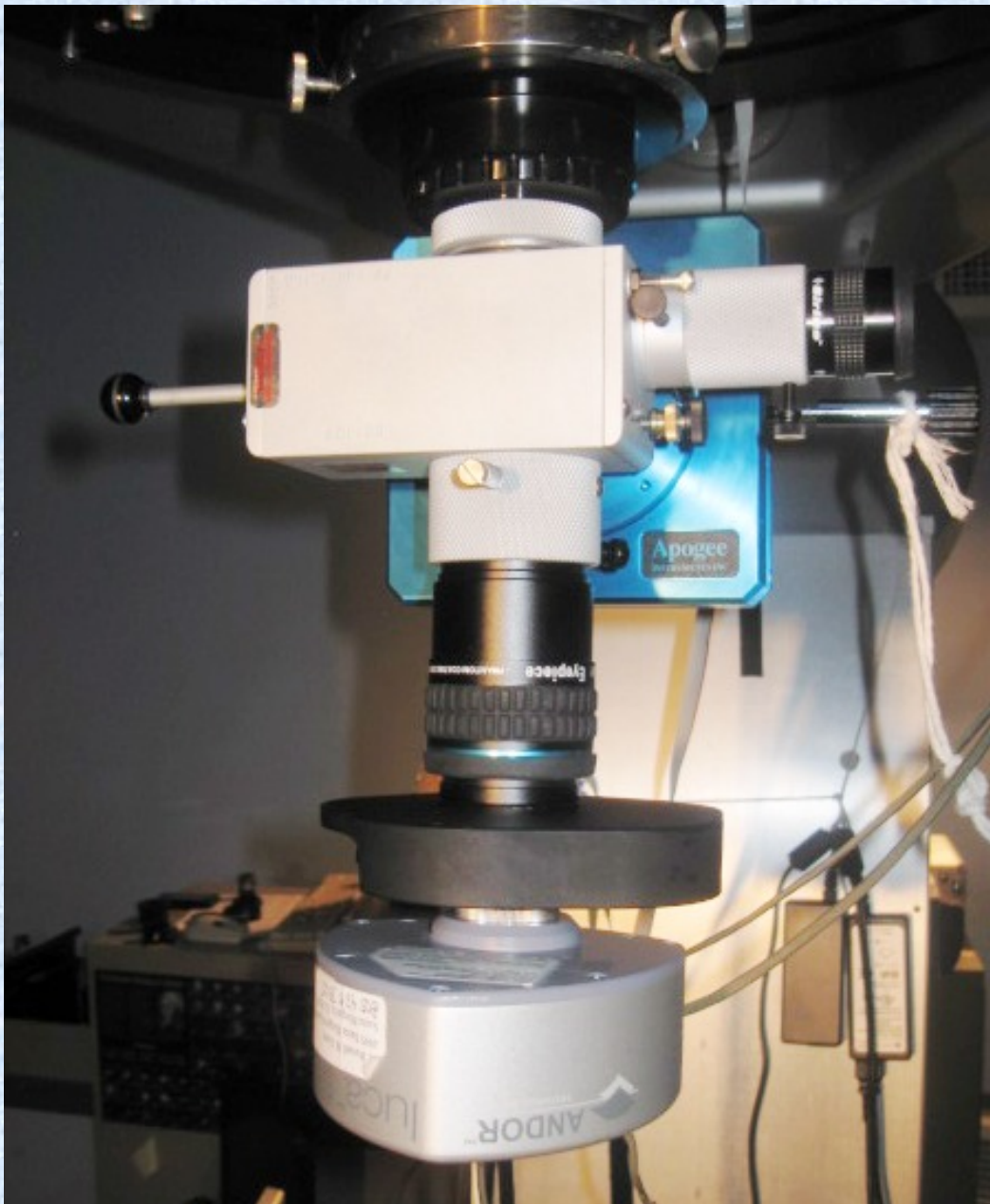








Configuration	Eff Fcl Lg	Airy # pix	arc sec/pix	# obs	filter	Comments
x4 Barlow	19 m	5	0.11	many	V, R, I	PVO good images, LCC oval?
x8 Barlow	38.3 m	10	0.054	many	V	Mainly excellent images
Minimal Hyp	57.6 m	15.2	0.036	none	N/A	Not tried yet, try next?
Hyp C1	90.0 m	23.8	0.029	one	clear	Okay image?
Hyp C2	158.7 m	41.9	0.012	one	clear	Terrible image, barely solve





Speckle interferometry at the Blanco and SOAR telescopes in 2008 and 2009

Andrei Tokovinin

Cerro Tololo Inter-American Observatory

Brian D. Mason, and William I. Hartkopf

U.S. Naval Observatory

Telescope	Location	Mtrs.	Inch.	Min"	Max"	Notes
Orion Obs.	California	0.25	10	0.54	6.9	Half hour drive, camping KoA
Pinto Valley Obs.	California	0.50	20	0.28	3.6	8 hour drive, camping at PVO
Leeward Com. Clg.	Hawaii	0.50	20	0.28	3.6	Students nearby, no camping
Evert Cooper Obs.	California	0.50	20	0.28	3.6	4 hour drive, small dome
LCOGT / BOS	California	0.81	32	0.17	2.1	2 hour drive, camping?
Pomona College	California	1.0	40	0.14	1.8	6 hour drive, camping
Kitt Peak, McMath	Arizona	1.6	63	0.086	1.1	Long way, limited number
Vatican Obs.	Arizona	1.8	71	0.077	1.0	Long way, quarters for 4
Kitt Peak, NOAO	Arizona	2.1	83	0.066	0.8	Long way, limited number
Kitt Peak, Steward	Arizona	2.3	90	0.062	0.8	Long way, limited number
Kitt Peak, WIYN	Arizona	3.5	138	0.039	0.5	Long way, limited number
Kitt Peak, NOAO	Arizona	4.0	157	0.035	0.4	Long way, limited number
CTIO, NOAO	Chile	4.0	157	0.035	0.4	Very long way! Very few
Keck	Hawaii	10.0	393	0.014	0.2	Not available, just to compare