

# Double Star Measures for the Year 2006

James A. Daley  
Ludwig Schupmann Observatory  
New Ipswich, NH

E-mail: rigel@net1plus.com

**Abstract:** This yearly report contains 200 measures, four of which are new discoveries. The instrumentation has remained unchanged over nearly four years. A review of the system characteristics is included.

## Telescope

The telescope (see Figure 1) is a Schupmann medial of 9-inch clear aperture made by the writer. This form of refractor exhibits a longitudinal color residual only 1% that of the normal Fraunhofer doublet in the visual region and no refocusing is required over the wider spectral range of the CCD detector employed. The unamplified focal length is 100-inches. A high quality Barlow lens is employed to reach a focal length of 278.82-inches. The focal length stability is

very high, varying only a few mm over the seasonal temperature spread. Atmospheric dispersion is easily compensated (while visually observing a “bright” field star) with handy adjustments that decenter the pupil image on the Schupmann corrector, giving precisely opposing spectra. The telescope is mounted on a robust German equatorial fitted with a declination circle. Using Guide 8 sky chart printouts, the instrument is set in declination and hand pushed to center the double in the 3.2-inch finder then, again by hand, fine centered in the CCD port. The AC synchronous motor driven RA worm wheel is engaged via a clutch, and the writer retires to a heated computer room where the observations are comfortably performed. This old fashioned pointing method is fast and enjoyable, no go-to required!

## CCD Detector

The CCD is manufactured by SBIG Astronomical Instruments. It is their ST-7XE model and was purchased without the usual anti-blooming gate, thus increasing both the sensitivity and dynamic range significantly. The pixel size is 9x9 microns (0.26 x 0.26 arcseconds for measurements) arranged in a 765x510 array (KAF0401E chip). The CCD camera operates with a



**Figure 1:** Telescope used in making the measurements reported in this study. See text for description of the telescope. Photo by the author.

### Double Star Measures for the Year 2006

high grade mechanical shutter. Cooling is by a single stage TE cooler.

#### Photometric Filters

Photometry is performed in the standard BVRI-bands. The filter manufacturer is Schüler Astro Imaging (now Astrodon) and are made to Micheal Bessel's formula as described in CCD Astronomy (Fall 1995). Spectral characteristics in nanometers when used with the above CCD as follows:

Center wavelength: B= 433, V= 548, R= 639, I= 811

Half bandwidth: B=100, V=110, R=147, I=179

#### General Information

Data is presented in a fairly standard way; the top row gives (left to right) the discoverer designation,

WDS Epoch 2000 RA & Dec, WDS magnitudes (LSO mags bold-italicized), LSO measured position angle in degrees, LSO measured separation in arcseconds, Decimal date and number of nights object was observed. Lastly, a notes column where a variety of data is presented as well as the note numbers. In the notes section information on discoveries are also given. Delta m photometry results are shown as in the following example: V= 0.26 N9. This signify's that the difference in magnitude in V-band is 0.26 and 9 CCD frames were analyzed to obtain a mean value. Often included is the number of measures extant and time in years since the last measure as in this example: 2m105. Additional photometry data is included throughout the notes section. Astrometry values are the average obtained from at least 12 CCD frames.

Designation	RA & Dec	Mags	PA	Sep	Date	n	Notes
STF 60 AB	00491+5749	3.5 7.4	320.1	13.01	2006.022	1	Eta Cass
H 83 AC	01259+6808	4.7 9.2	124.4	20.78	2006.052	1	Psi Cass
BU 1101 AD	01259+6808	4.7 10.0	131.3	19.11	2006.052	1	
STF 117 CD	01259+6808	9.4 10.0	252.6	2.87	2006.052	1	31m23
STF 180 AB	01535+1918	4.5 4.6	1.0	7.46	2006.022	1	Gamma Ari
STF 262 Aa-B	02291+6724	4.6 6.9	230.6	2.66	2006.052	1	Iota Cass
STF 262 Aa-C	02291+6724	4.6 9.0	115.7	7.36	2006.052	1	
STF 262 BC	02291+6724	7.6 8.6	100.1	8.97	2006.052	1	
MLB 282 AB	02291+6207	10.4 11.9	145.8	3.82	2006.097	2	Trapezium-like
MLB 282 AC	02291+6207	10.7 11.2	42.5	4.69	2006.097	2	
ABH 12 AD	02291+6207	10.8 14.0	179.3	38.01	2006.090	1	
ABH 12 AE	02291+6207	10.8 14.9	156.4	47.58	2006.104	1	
ABH 12 AF	02291+6207	10.8 14.2	184.3	57.89	2006.090	1	
ABH 12 AG	02291+6207	10.8 14.9	92.9	37.70	2006.104	1	
ABH 12 AJ	02291+6207	10.8 13.6	267.0	67.52	2006.090	1	
DAL 29 AK	02291+6207	10.8 <b>13.6</b>	267.5	3.77	2006.097	2	new component
DAL 29 AL	02291+6207	10.8 <b>13.8</b>	158.7	2.77	2006.104	1	new component
HU 603 AB	02291+2252	9.4 11.3	230.9	5.85	2006.060	1	
HU 603 AC	02291+2252	8.8 ----	274.1	80.28	2006.060	1	2m90

Table continued on next page

**Double Star Measures for the Year 2006**

Designation	RA & Dec	Mags	PA	Sep	Date	n	Notes
STI1892	02292+5736	11.5 13.3	70.2	9.33	2006.074	1	
STI1893	02292+5700	11.6 13.3	166.3	10.56	2006.074	1	
STF 479 AB	04009+2312	6.9 7.8	127.2	7.43	2006.110	1	
STF 479 AC	04009+2312	6.9 9.4	242.5	57.56	2006.110	1	
STF 528	04226+2538	5.4 8.4	24.3	19.29	2006.126	1	Chi Tau
STF 534 AB	04240+2418	6.6 7.9	290.3	29.10	2006.126	1	
STF 534 BC	04240+2418	8.2 12.0	337.2	110.2	2006.126	1	
STI2051	04312+5858	11.4 12.1	62.0	9.41	2006.115	4	55 images measured
STF 716 AB	05293+2509	5.8 6.7	208.6	4.68	2006.129	1	
STF 748 Aa-B	05353-0523	6.5 7.5	31.1	8.84	2006.129	1	Trapezium
STF 748 Aa-C	05353-0523	6.5 5.1	131.6	12.80	2006.129	1	
STF 748 Aa-D	05353-0523	6.5 6.4	95.8	21.42	2006.129	1	
STF 748 Aa-E	05353-0523	6.8 11.1	349.7	4.47	2006.129	1	
STF 748 Ba-C	05353-0523	7.5 5.0	162.6	16.79	2006.129	1	
STF 748 Ba-D	05353-0523	7.5 7.2	120.1	19.37	2006.129	1	
STF 748 Ba-E	05353-0523	7.9 11.1	239.8	6.19	2006.129	1	
STF 748 Ba-F	05353-0523	7.9 11.5	154.1	20.31	2006.129	1	2m128
STF 748 Ca-D	05353-0523	5.6 6.4	61.6	13.32	2006.129	1	
STF 748 Ca-F	05353-0523	5.1 11.5	120.0	4.45	2006.129	1	
STF 982 AB	06546+1311	4.7 7.8	143.7	7.30	2006.192	1	38 Gem & a gem it is!
STI2200	08010+5615	12.1 12.7	244.8	3.17	2006.244	1	1m96, ~20-deg PA incr
STF1196 AC	08122+1739	5.3 5.8	70.2	6.45	2006.260	1	Zeta Cancri
STI2203	08136+5428	12.3 12.9	92.6	6.36	2006.241	1	fixed
STI2204	08140+5423	10.7 11.1	209.8	11.14	2006.241	1	
STI2206	08251+5603	10.9 11.9	-----	-----	2006.246	1	1m96, secondary not found
STI2208	08298+5631	11.3 11.9	271.5	7.00	2006.246	1	
STF1234	08331+5521	7.8 9.6	64.6	24.72	2006.252	1	
STI2209	08372+5557	11.6 11.6	65.7	12.08	2006.246	1	
STI2210	08379+5548	10.7 11.6	273.6	3.62	2006.246	1	
STI2211	08386+5830	11.1 12.3	328.9	7.15	2006.260	1	

*Table continued on next page*

**Double Star Measures for the Year 2006**

Designation	RA & Dec	Mags	PA	Sep	Date	n	Notes
STI2212	08395+5403	10.8 11.3	163.1	7.24	2006.260	1	note 1
STI2214	08495+5406	9.4 11.3	201.9	9.44	2006.271	1	
STI2215	08570+5527	11.6 13.2	256.9	13.21	2006.274	1	
STI2216	08595+5603	10.6 11.5	55.3	8.01	2006.277	1	little change
STI2217	09031+5704	11.5 11.5	127.4	9.03	2006.282	1	1m96, 39 deg PA incr
STI2218	09040+5656	11.5 12.1	298.8	4.48	2006.282	1	1m96, PA incr, opening
HJ 2478	09041+5541	10.7 11.4	199.7	18.07	2006.301	1	slow opening
LDS3852	09058+5532	8.0 15.5	51.9	56.82	2006.247	1	slight opening
STI2219	09063+5439	12.3 12.3	168.7	10.67	2006.247	1	
DAL 30	09065+5444	<b>9.4 11.5</b>	12.7	20.86	2006.247	1	discovery note
STI2221	09101+5513	11.1 12.3	192.6	11.01	2006.301	1	
STI2222	09102+5428	9.7 12.5	301.3	10.50	2006.301	1	
STI2223	09104+5441	9.8 11.9	33.5	11.52	2006.301	1	1m84, PA decr, opening ~2.6"
STI2224	09112+5631	12.1 12.1	106.7	5.34	2006.305	1	1m96, PA decr, opening
STI2225	09121+5357	11.9 11.9	159.9	5.37	2006.301	1	
STI2227	09188+5729	11.7 11.7	163.3	4.22	2006.305	1	
STI2229	09279+5824	11.3 12.5	206.4	7.93	2006.305	1	
STF1366	09357+5318	8.4 10.1	321.8	8.34	2006.305	1	slow binary, PA decr, opening
STF1368	09361+5318	8.9 10.4	220.7	21.59	2006.305	1	very slow binary
STI2231	09385+5404	12.0 12.0	28.3	11.70	2006.305	1	
STI2233	09403+5417	10.9 11.0	174.6	3.78	2006.305	1	
STI2235	09423+5543	11.1 12.6	153.8	8.68	2006.318	1	1m96, 37 <sup>0</sup> PA incr, 4" opening
STI2236	09485+5537	11.1 12.6	61.5	5.83	2006.318	1	Fixed
STI2237	09522+5537	11.9 11.9	115.6	9.18	2006.318	1	
STI2239	10016+5424	9.8 11.4	144.0	5.24	2006.323	1	opening
STI2240	10068+5648	11.2 11.4	12.4	4.11	2006.326	1	PA increasing
STI2241	10069+5427	10.8 11.8	247.5	7.62	2006.323	1	closing
STI2247	10213+5355	10.6 11.8	168.9	9.68	2006.348	1	
STF1487	10556+2445	4.5 6.3	111.9	6.54	2006.348	1	very slow binary
STI2278	12014+5600	10.5 12.0	297.8	4.84	2006.400	1	
STF1603	12081+5528	7.8 8.3	82.8	22.23	2006.400	1	

Table continued on next page

### Double Star Measures for the Year 2006

Designation	RA & Dec	Mags	PA	Sep	Date	n	Notes
WNC 4	12222+5805	9.7 10.2	76.3	53.15	2006.400	1	
STI2284	12308+5352	10.7 11.6	159.3	9.30	2006.400	1	
STI2285	12309+5453	11.7 11.2	336.7	9.45	2006.400	1	3m26, little motion
STI2286	12339+5522	11.6 12.2	82.3	10.84	2006.408	1	1m89, inexplicable motion
STI2287	12352+5617	11.3 12.3	80.1	16.04	2006.408	1	
STI2289	12385+5755	10.5 11.2	285.6	10.82	2006.408	1	cpm pair, slow closing
STI2290	12402+5503	9.8 12.8	245.9	13.55	2006.411	1	
STI2293	13008+5545	11.9 12.3	114.7	9.73	2006.457	1	cpm pair
WOR 23	13048+5555	11.2 12.2	159.3	1.86	2006.457	1	18m15, fast, under measured
STF1744 AB	13239+5456	2.2 3.9	152.5	14.31	2006.445	2	Mizar, 36 images measured
STI2304	13587+5628	10.3 11.5	228.7	6.54	2006.468	1	slow PA decrease
COU 59 AB	14008+1754	9.9 12.2	168.8	8.47	2006.468	1	PA decreasing,, opening
GRV 877 AC	14008+1754	10.5 11.5	229.9	35.50	2006.486	1	cpm pair
STF1800 AB-C	14020+5713	7.8 10.4	21.2	28.55	2006.486	1	AB is A 1097, sep ~0.4"
SWI 1	14024+4620	10.0 10.3	23.8	3.73	2006.408	1	V=0.26N9, I=0.11N8
STF1962	15387-0847	6.4 6.5	189.6	11.82	2006.512	1	
STI2326	15416+5613	12.6 12.6	156.6	14.05	2006.518	1	note 2
STI2327	15428+5530	11.4 12.8	235.8	8.61	2006.521	1	
BU 946	15476+5523	5.9 9.5	130.7	2.25	2006.521	1	challenging pair
STI2331	16081+5605	11.2 11.6	17.8	6.47	2006.562	1	
STF2010 AB	16081+1703	5.1 6.2	12.9	27.16	2006.512	1	Kappa Her
STI2334	16140+5844	10.5 12.0	111.4	8.98	2006.562	1	
STF2032 AB	16147+3352	5.6 6.5	237.3	7.05	2006.515	1	Sigma CrB, 28 images measrd
STI2335	16160+5718	11.7 11.9	150.5	9.43	2006.578	1	
STI2336	16178+5730	11.9 11.9	161.2	3.25	2006.578	1	
STI2338	16194+5606	12.0 12.0	48.5	3.45	2006.578	1	R=1.03N1
STI2339	16241+5835	10.0 11.5	75.3	13.05	2006.562	1	cpm pair
STI2340	16248+5649	12.0 12.3	151.3	4.35	2006.595	1	2m96, PA decr, opening
ARG 102	16289+5636	8.3 9.7	53.6	80.90	2006.595	1	
STI2342	16306+5521	11.5 12.1	339.9	11.41	2006.592	1	1m96, PA incr, closing
STI2343	16334+5524	11.4 11.4	44.9	7.71	2006.592	1	

*Table continued on next page*

### Double Star Measures for the Year 2006

Designation	RA & Dec	Mags	PA	Sep	Date	n	Notes
STI2345	16369+5618	12.2 12.2	75.3	4.25	2006.592	1	
STI2346	16490+5757	12.1 12.1	103.8	15.55	2006.595	1	
STI 820	17170+5932	11.0 12.2	65.8	12.02	2006.595	1	
SLE 81	17170+5612	10.3 11.8	15.8	17.54	2006.595	1	under measured cpm pair
STI2349	17173+5636	11.5 12.2	60.1	10.05	2006.595	1	
J 1033	17270+2243	9.5 10.5	248.8	6.27	2006.625	1	
KUI 82 AB-C	17293+2924	9.7 9.1	311.4	49.95	2006.614	1	"C" optical
BRT2434 AB	17299+2246	11.2 11.7	268.5	3.69	2006.625	1	
DAL 3 AC	17299+2246	11.2 <b>12.5</b>	262.9	63.60	2006.625	1	
STF 35	17322+5511	4.9 4.9	310.9	62.54	2006.627	1	
STF A34 AB	17346+0935	5.8 7.6	190.1	41.44	2006.627	1	
STI2354	17373+5640	11.8 12.0	86.6	4.42	2006.603	1	
STI2355	17432+5744	11.6 11.6	45.6	7.83	2006.603	1	
STI2357	17462+5613	10.2 10.6	171.4	11.82	2006.603	1	
STI2359	17489+5805	9.5 12.5	88.7	8.48	2006.605	1	
STI2360	17510+5709	11.0 12.8	230.9	9.86	2006.605	1	
STI2361	17536+5816	10.8 11.7	13.3	4.34	2006.605	1	
STI2363	17571+5755	10.9 12.3	279.1	14.08	2006.611	1	
STI2364	18004+5704	11.2 12.0	297.6	16.48	2006.611	1	1m103, note 3
STI2366	18006+5841	9.9 11.4	297.0	8.90	2006.614	1	"fixed" pair
STI2369	18075+5514	12.3 12.6	188.2	15.31	2006.622	1	1m,89, flying apart
STF2280 Aa-B	18078+2606	5.8 5.8	182.9	14.27	2006.666	1	
STI2370	18106+5512	12.5 13.1	294.3	5.39	2006.622	1	
STI2372	18174+5433	11.6 12.6	103.2	8.67	2006.622	1	note 4
STI2375	18268+5633	10.2 10.8	177.2	4.45	2006.625	1	
STI2376	18329+5846	12.5 13.1	53.5	13.64	2006.638	1	secondary slightly fuzzy
STI2379	18351+5521	12.2 12.8	357.8	14.45	2006.638	1	
STI2380	18380+5722	9.8 10.8	3.2	10.43	2006.663	1	
STI2381	18414+5849	11.1 11.7	138.7	8.75	2006.638	1	motion indeterminate
STI2382	18426+5727	12.5 13.1	137.2	12.40	2006.663	1	little motion
STF2398 AB	18428+5938	9.1 10.0	175.5	12.26	2006.611	1	24 images measured

*Table continued on next page*

### Double Star Measures for the Year 2006

Designation	RA & Dec	Mags	PA	Sep	Date	n	Notes
STI2383	18433+5637	11.1 11.2	342.3	14.58	2006.663	1	cute binary
STI2384	18440+5558	11.8 11.8	141.2	3.62	2006.666	1	
STI2385	18449+5759	12.1 13.1	142.8	12.53	2006.685	1	
STI2386	18459+5731	12.0 12.6	9.3	16.94	2006.685	1	1m103, flying apart
DAL 31	18463+5630	<b>11.0 11.5</b>	264.7	49.32	2006.663	1	cpm pair, discovery note
STI2387	18478+5826	10.1 13.0	82.0	12.35	2006.685	1	little motion
STI2389	18481+5721	12.3 12.9	226.8	13.67	2006.685	1	1m103, opening
STI2390	18483+5752	10.6 11.6	-----	-----	2006.690	2	1m103, no secondary found
STI2392	18494+5811	10.4 12.0	140.6	5.48	2006.696	1	
STI2393	18510+5713	10.0 13.1	203.6	11.32	2006.696	1	large motion
STI2395	18542+5535	11.4 11.4	163.5	12.23	2006.696	1	practically fixed
STI2397	18549+5823	11.7 12.7	234.2	14.53	2006.699	1	fixed
STI2400	18563+5713	11.7 12.2	136.7	12.91	2006.696	1	
STF2433 AB	18569+5645	7.2 10.1	123.6	7.47	2006.756	1	
STF2433 AC	18569+5645	7.0 11.9	138.7	39.50	2006.756	1	
STI2402	18590+5713	12.7 12.7	56.2	4.44	2006.699	1	1m103,25E PA decr, opening
STI2403	18596+5635	11.7 12.7	95.0	6.05	2006.699	1	
STI2406	19014+5720	12.2 12.2	106.4	4.19	2006.740	1	1m103, raw CCD $\Delta m=1.19$
ARG 33	19037+5727	8.5 9.3	57.3	10.63	2006.756	1	
STI2414	19070+5613	12.1 12.3	84.3	13.14	2006.734	1	1m89, opening
STI2415	19074+5618	11.3 11.7	349.6	3.73	2006.723	1	1m89, raw CCD $\Delta m=2.77$
STF2486 AB	19121+4951	6.5 6.7	205.5	7.36	2006.625	1	WDS calibration pair
DAL 27 AD	19508+0852	0.76 <b>11.7</b>	96.0	32.15	2006.715	2	Altair
BU 469	19595+2443	8.3 11.1	189.0	14.64	2006.663	1	
STI2503	20084+5524	9.8 12.9	158.6	11.01	2006.783	1	
A 387	20151+4118	7.9 11.5	149.5	5.27	2006.767	1	
ES 1674	20181+4122	9.6 10.3	125.0	4.90	2006.767	1	note 5
STF2666 Aa-C	20181+4044	5.8 11.1	206.6	33.98	2006.764	1	
TAR 5 Aa-D	20181+4044	5.8 10.4	180.6	49.63	2006.764	1	
STI2543	20354+5435	12.4 13.0	209.9	3.17	2006.797	1	PA decr, closing
ES 991 AB	20358+5435	9.7 10.7	297.3	16.17	2006.797	1	

Table continued on next page

**Double Star Measures for the Year 2006**

Designation	RA & Dec	Mags	PA	Sep	Date	n	Notes
ES 991 AC	20358+5435	9.3 10.8	105.9	62.20	2006.797	1	
ES 991 CD	20358+5435	10.6 13.0	122.2	2.52	2006.797	1	PA decreasing,
STI2545	20369+5429	12.4 13.0	158.8	3.17	2006.838	1	1m101, closing
STI2547	20380+5522	12.4 12.4	85.5	2.53	2006.838	1	1m101, PA incr, opening
STF2727	20467+1607	4.4 5.0	266.0	9.10	2006.773	1	Gamma Del
STF2758 AB	21069+3845	5.3 6.1	151.0	30.97	2006.836	1	61 Cyg, 4images measured
STI2587	21429+5448	12.1 13.0	109.3	9.07	2006.849	1	1m89, slight closing
STI2606	22008+5802	11.1 11.1	127.0	9.20	2006.849	1	1m102, closing
STI2608	22029+5512	12.7 12.7	40.6	7.23	2006.860	1	1m89
STI2612 BC	22052+5502	12.7 12.7	31.2	6.90	2006.882	1	
STI2630	22105+5525	11.7 12.7	186.2	7.19	2006.888	1	1m89, Optical?
STI2649	22136+5514	12.1 12.1	114.5	12.20	2006.890	1	1m89, Optical?
STI2655	22142+5632	13.1 13.1	54.9	9.18	2006.889	1	1m89, PA decrease, opening
STI2664	22151+5555	12.5 12.5	186.1	3.97	2006.901	1	1m89, PA increase, opening
STI2662	22151+5457	12.6 12.6	26.5	4.59	2006.899	1	1m89, PA decreasing
STI2666	22154+5446	11.6 12.5	232.2	5.09	2006.899	1	1m89, PA decrease, opening
BU 377 AB	22159+5440	7.5 10.4	61.5	38.04	2006.889	1	
BU 377 AC	22159+5440	7.5 11.4	51.8	35.24	2006.889	1	
BU 377 Aa	22159+5440	7.5 12.8	158.2	22.18	2006.889	1	
BU 377 AS	22159+5440	7.5 12.4	335.7	55.35	2006.889	1	
GIC 177 AT	22159+5440	7.5 14.5	107.2	77.18	2006.889	1	
BU 377 BC	22159+5440	10.4 11.4	302.2	6.65	2006.889	1	
STI2680	22174+5555	12.5 13.1	161.1	2.79	2006.929	1	1m89, PA decreasing, closing
STI2681	22177+5444	12.5 12.5	105.3	7.98	2006.929	1	1m89, PA decrease ,opening
STI2688	22185+5525	13.1 13.1	4.4	8.30	2006.948	1	1m89, closing
STI2691	22187+5521	11.6 13.1	167.7	4.12	2006.948	1	
STI2690	22187+5507	11.3 13.1	254.0	11.91	2006.929	1	1m89, flying apart
STI2694	22191+5618	13.1 13.1	80.7	4.58	2006.929	1	1m89, PA increase, closing

*Table notes on next page.*

### Double Star Measures for the Year 2006

#### LSO 2006 Notes

1) STI 2212 - This is a perplexing pair to say the least. Stein's use of blue plates just can't explain the disparity in magnitudes and magnitude difference of the discoverer's values and those measured at LSO. Delta m-wise, this pair is very difficult indeed. This is not suggested in Stein's measure where a  $\Delta m$  of only 0.5 is inferred. LSO  $\Delta m$  values are as follows: V-band 3.74 N3, I-band 3.63 N2. The measure of relative position, including the PA motion trend, is so close to past measures that misidentification is doubtful. The LSO V-band magnitude of 10.04 is very close to the Tycho- 2 catalog value for the primary. The secondary may possibly be a variable. If not, this star should perhaps be listed as  $\sim 10.1$  and 13.8 to avoid confusion at the telescope. This double is relatively nearby at  $\sim 65$  LY.

2) STI 2326 - Flying apart about 3 arc seconds over the last century, this pair is interesting because of their almost identical magnitude and color. The secondary seems ever so slightly the brighter with delta m values as follows: V= -0.06 N12, I= -0.04 N7, Unfiltered= -0.03 N6 . Nice mini-research project.

3) STI 2364 - No double star was found at WDS position for this pair, however, a likely candidate reported here is located at RA 17597 + 5704. The primary is GSC 3910 120, a star with sufficient proper motion in both magnitude and direction to account for the increase in PA and separation observed.

4) STI 2372 - Unfiltered images used for measurement showed the secondary to be the brighter component. Photometry indicates the secondary to be rather red. LSO  $\Delta m$  values follow: V-band = 0.29 N6, I-band = -0.93 N7. A rough measure of color index gives: V-I primary = 0.65, V-I secondary = 1.87! Is the primary a white dwarf? The PA has increased  $\sim 10$  degrees since discovery, however, the separation has changed little, closing by about 0.3". All in all, a somewhat interesting STI pair.

5) ES 1674 - This pair is WDS listed having a spectral class B0, however, LSO color measures strongly suggest a very red primary with a closely matching secondary. LSO photometric measures:  $\Delta m$  V-band = 0.62 N8, R-band = 0.64 N8, I=band = 0.62 N8. V-I: primary = 1.72, secondary = 1.71.

#### 2006 Discoveries

DAL 30 - 9h06m28.0019s +54d 43'57.741"- Easy object, found in very narrow acquisition field with STI 2219. A cpm pair with the following LSO photometric measures:  $\Delta m$  V-band = 2.07 N6, I-band = 1.81 N6, V-I primary = 0.65, secondary = 0.91.

DAL 31 - 18h46m20.6448s +56d 29'46.874" - A fairly wide cpm pair near STI 2383, the object for that night. LSO mags are listed in the results. LSO photometric measures:  $\Delta m$  V-band = 0.45 N4, I-band = 0.42 N4, V-I primary = 0.68, secondary = 0.71.