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PHOTOMETRY OF STARS IN THE FIELD OF
AF CYGNI AND AW CYGNI

SKIFF, BRIAN A.

Lowell Observatory, 1400 West Mars Hill Road, Flagstaff AZ 86001-4499, USA (bas@lowell.edu)

At the request of AAVSO chartmaker Charles Scovil, I observed a number of comparison stars in the field of the carbon star variable AW Cygni and the brighter star AF Cygni. The preliminary AAVSO sequence had both a zero-point and scale error at the faint end, evident even from visual observations. The present results were originally distributed via the ‘vsnet’ list-server (Skiff 1996).

The observations were made with the Lowell 53-cm photometric telescope on the UT dates 14 and 25 August, 1 September 1992, 4 October 1995, and 9 October 1996 using either 19" or 29" diaphragms and Strömrgren *b* and *y* filters. The number of standard stars ranged from a handful to a couple dozen on each night. The field was observed at low airmass, so mean extinction values (Lockwood & Thompson 1986) were applied in the reductions. The per-star residuals in the linear fits to the standards averaged between 0^m.004 and 0^m.008 in both *V* and *b* – *y*. Data on the first night were taken only in the Strömrgren *y* filter. These were re-reduced to add in the color term to correct them to standard *V* using colors from later observations. I have left the 14 August 1992 magnitude of AF Cygni without adjustment, since the color at that time could have been somewhat different than what was observed later.

Table 1 shows the results for the stars in order of decreasing brightness; observations of the variables are given in the first two entries. An asterisk by the star name indicates a note following the table. The positions are from Tycho-2 (Høg *et al.* 2000) except for the last four stars, which are from the GSC-ACT (Gray 1999). Where two observations have been made, the *rms* scatter of these are given in the second line of the relevant entries.

BD+45°2901 is a little-reddened early-M giant, and my two observations are sufficiently different to suggest it is perhaps slightly variable, but not at a level to make it unsuitable as a comparison star for visual observers. It is worth noting that the colors of the two named variables lie well beyond the range of the standard stars, and so are subject to both ‘reduction’ and ‘conformity’ errors of the type described by Manfroid & Sterken (1992). Based on my experience with this particular instrumental set-up, the errors in color and magnitude for AF Cyg will not be substantial, but those for the very red carbon star AW Cyg could amount to several percent.

Table 1: Photometry of stars in the field of AF and AW Cygni

Name	RA (2000)	Dec	V	$b - y$	n	spec	Remarks
AF Cygni*	19 ^h 30 ^m 12 ^s .86	+46°08'52".1	7.65	—		M4III	HD 184008
			7.49	1.50			
AW Cygni*	19 28 47.57	+46 02 38.2	8.86	3.21		C5,4	BD+45°2906
HD 184147*	19 31 01.09	+46 19 54.5	7.166	-0.016	2,1	A0	
			.007				
HD 183299*	19 26 52.82	+45 50 09.8	8.022	0.694	2,1	G5	
			.006				
BD+45°2898	19 26 40.94	+46 10 15.1	9.293	0.577	2	G5	
			.004	.003			
HD 183829	19 29 17.81	+46 21 26.1	9.338	0.076	2,1	A0	
			.006				
BD+45°2901*	19 27 25.86	+46 08 06.9	9.665	1.016	2	M1	DO 37291
			.034	.016			
GSC 3543-2174	19 27 58.03	+45 54 46.8	10.174	0.224	2		
			.014	.001			
GSC 3543-2617	19 28 18.15	+45 59 59.8	11.008	0.111	2		
			.002	.008			
GSC 3543-2408	19 28 00.17	+45 52 37.5	11.180	0.669	2		
			.003	.010			
GSC 3543-0802	19 29 16.07	+46 01 50.0	11.848	0.263	2		
			.001	.003			
GSC 3543-0998	19 28 50.40	+46 00 10.6	12.570	0.360	2		
			.020	.024			
GSC 3543-1411	19 28 40.69	+46 01 44.0	13.19	0.45	2		
			.02	.05			
GSC 3543-2413	19 28 51.16	+46 01 44.9	13.84	0.84	2		
			.02	.04			

Notes

AF Cyg	observations on 14 Aug 1992 UT (JD 2448848.7) and 4 Oct 1995 UT (JD 2449994.7).
AW Cyg	GSC 3543-2275; observation on 4 Oct 1995 UT (JD 2449994.7).
HD 184147	$V = 7.160$ (Kornilov <i>et al.</i> 1991).
HD 183299	$V = 8.026$, $b - y = 0.693$ (Olsen 1993).
BD+45°2901	slightly variable?

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