

**STANDARD STARS**

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**Supporting Commissions** : 29, 30, 45

## THE MICROFICHE OF STANDARD STARS

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At the meeting, Calibration of Fundamental Stellar Quantities, IAU Symposium No. 111 held in Como, Italy in May, 1984, Philip and Egret (1985) suggested that the facilities of the Strasbourg Data Center be used to construct a microfiche of standard stars and other stars for which fundamental data have been obtained. A start had been made on this idea in Egret and Philip (1979) who published a microfiche, "Photometric Systems and Standard Stars" as part of the proceedings of the workshop "Problems of Calibration of Multicolor Photometric Photometry". Now the plan is to expand this idea to cover standard stars in many systems and other stars for which fundamental data have been obtained. Standard stars in the following systems were selected for inclusion:

### Spectroscopic Standards

1. MK types
2. Radial Velocities
3.  $V \sin i$
4. Equivalent Widths \*

### Photometric Standards

1. UBV
2. Four-Color and  $H\beta$
3. Geneva
4. DDO
5. Vilnius
6. Walraven
7. Washington
8. Eight Color
9. UBVRI
10. Polarization

## Fundamental Parameters \*

1. Temperature Determinations
2. Radius Determinations
3. Mass Determinations
4. Spectrophotometric Standards
5. [Fe/H] values

The \* indicates lists of stars for which important data have been gathered, but which are not standard stars.

A preliminary version of the microfiche, "A Compilation of Standard Stars" was produced at the Stellar Data Center and has been included with the proceedings of IAU Symposium No. 111. The catalog begins with a general index table in which the star names are listed down the left side of the page and the various systems are listed across the top of the page. An X appears in each column when a given star is a standard or is a star for which a "best" value has been derived. An example of such a page is shown in Fig. 1. It is possible, by perusing such a list, to pick out stars which have been measured in many systems. Such stars, which have been measured in a number of spectroscopic and photometric systems, are useful when one is trying to relate parameters of one system to another. It would be useful if a subset of the stars in the general index table could be made standards in as many systems as possible.

As an example of a data page in the catalog, page 83 is shown in Fig. 2. This page shows standards in the DDO system and lists the HD and DM numbers for each star followed by the colors in the DDO system. In the next edition of the catalog the stars in each of the standard lists will be sorted by the various colors in a set of tables in the second section of the catalog to aid persons who are interested in finding stars of certain color ranges.

Before each data section in the catalog there is an index listing the tables in that section and the source of the data. An example is shown in Fig. 3a which lists some tables concerning stars for which some fundamental parameters have been measured or derived. In Fig. 3b a typical data table is shown (Table 20) which contains temperature determinations.

This new version of the catalog will be printed in a hardcopy version, in addition to a microfiche copy. As people work with the tables it is hoped that if any errors are found, or if there are new standards that should be listed, they will communicate such information

Standard stars --- General Index Table

Ident.	Table number:																								
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
HD 155876B																									X
HD 156014		X	X					X																	
HD 156164		X																							
HD 156247A																									X
HD 156247B																									X
HD 156277		X																							
HD 156283		X						X																	
HD 156384A																									X
HD 156384B																									X
HD 156633A																									X
HD 156633B																									X
HD 156965A																									X
HD 156965B																									X
HD 157056		X		X																					
HD 157089								X																	
HD 157214								X																	
HD 157246				X																					
HD 157457			X																						
HD 157881								X																	
HD 157967		X																							
HD 157999		X						X																	
HD 158094				X																					
HD 158408				X																					
HD 158427				X																					
HD 158614A																									X
HD 158614B																									X
HD 158855								X																	
HD 158899		X																							
HD 158926		X																							
HD 159026		X																							
HD 159181		X						X																	
HD 159482								X																	
HD 159561		X		X																		X	X		X
HD 159876								X																	
HD 160269		X																							
HD 160315								X																	
HD 160365		X																							
HD 160371		X																							
HD 160529										X															
HD 160578				X																					
HD 160693								X																	
HD 160762		X		X																					
HD 160964		X																							
HD 161096		X	X					X																	X
HD 161239		X																							
HD 161321A																									X
HD 161321B																									X
HD 161471		X																							
HD 161568																									X
HD 161664		X																							
HD 161783A																									X
HD 161783B																									X

Fig. 1. A page from the General Index Table.

Table 8 DDO Photometry (McClure, 1981)

HD number	DM number	m48	(45-48)	(42-45)	(41-42)	(38-41)	(35-38)
	BD+01 4474	9.671	+1.242	+1.429	-0.224	-0.414	+1.237
	BD+04 3560	10.345	+1.396	+1.888	-0.309	-0.680	+1.273
HD 166	BD+28 4704	6.369	+1.056	+0.753	+0.023	-0.658	+0.88
HD 571	BD+45 17	5.205	+0.944	+0.429	+0.053	-0.876	+1.507
HD 886	BD+14 14	2.737	+0.724	+0.249	+0.009	-1.414	+0.636
HD 1013	BD+19 27	5.483	+1.354	+1.381	+0.132	+0.014	+1.400
HD 1280	BD+37 34	4.673	+0.727	+0.312	+0.036	-0.846	+1.308
HD 1326A	BD+43 44	8.858	+1.282	+1.484	-0.208	-0.374	+1.150
HD 3360	BD+53 105	3.588	+0.730	+0.248	+0.012	-1.400	+0.654
HD 3651	BD+20 85	6.174	+1.082	+0.865	+0.060	-0.538	+0.912
HD 4628	BD+04 123	6.055	+1.101	+0.921	+0.000	-0.479	+0.861
HD 4656	BD+06 107	5.030	+1.351	+1.344	+0.222	-0.046	+1.283
HD 4965	BD-03 113	7.338	+0.741	+0.329	+0.042	-0.798	+1.280
HD 5448	BD+37 175	3.954	+0.753	+0.331	+0.048	-0.794	+1.333
HD 6582	BD+54 223	5.419	+1.055	+0.693	-0.019	-0.804	+0.845
HD 6734	BD+01 212	6.759	+1.117	+0.785	+0.058	-0.620	+0.949
HD 6763	BD+04 190	5.665	+0.885	+0.413	+0.063	-0.910	+1.101
HD 6833	BD+53 236	7.226	+1.250	+0.912	+0.077	-0.389	+1.097
HD 6860	BD+34 198	2.735	+1.403	+1.364	+0.203	+0.014	+1.386
HD 8334	BD+00 223	6.800	+1.367	+1.302	+0.242	-0.049	+1.335
HD 8512	BD-08 244	3.994	+1.204	+0.910	+0.209	-0.467	+1.084
HD 8949	BD+07 213	6.613	+1.218	+0.937	+0.289	-0.456	+1.134
HD 8956	BD+07 214	8.251	+0.981	+0.559	+0.037	-0.840	+0.962
HD 9826	BD+40 332	4.300	+0.978	+0.550	+0.036	-0.843	+0.967
HD 10307	BD+41 328	5.183	+1.010	+0.630	+0.020	-0.786	+0.908
HD 10476	BD+19 279	5.538	+1.079	+0.855	+0.026	-0.557	+0.886
HD 12929	BD+22 306	2.432	+1.239	+0.978	+0.238	-0.395	+1.103
HD 13520	BD+43 447	5.428	+1.372	+1.255	+0.244	-0.092	+1.272
HD 13611	BD+08 345	4.686	+1.150	+0.725	+0.170	-0.608	+1.056
HD 13936	BD-10 460	6.569	+0.758	+0.282	+0.019	-0.977	+1.392
HD 14872	BD+49 656	5.345	+1.390	+1.328	+0.245	-0.043	+1.303
HD 16160	BD+06 398	6.162	+1.111	+1.025	+0.011	-0.377	+0.911
HD 16901	BD+43 566	5.782	+1.168	+0.674	+0.135	-0.587	+1.240
HD 17709	BD+34 527	5.191	+1.380	+1.371	+0.193	+0.010	+1.326
HD 18604	BD+08 455	4.676	+0.741	+0.267	+0.015	-1.184	+0.956
HD 18884	BD+03 419	3.246	+1.428	+1.377	+0.156	+0.007	+1.409
HD 19058	BD+38 630	4.239	+1.387	+1.082	+0.055	+0.004	+1.646
HD 19373	BD+49 857	4.270	+0.999	+0.606	+0.027	-0.786	+0.931
HD 19445	BD+25 495	8.257	+0.979	+0.464	+0.034	-1.092	+0.883
HD 19525	BD+07 478	6.659	+1.201	+0.891	+0.199	-0.493	+1.061
HD 20468	BD+33 619	5.409	+1.421	+1.096	+0.403	-0.330	+1.248
HD 20630	BD+02 518	5.101	+1.034	+0.687	+0.011	-0.743	+0.892
HD 20902	BD+49 917	1.984	+0.983	+0.469	+0.076	-0.789	+1.528
HD 21120	BD+08 511	3.935	+1.152	+0.738	+0.168	-0.616	+1.049
HD 21197	BD-05 642	8.313	+1.128	+1.264	+0.009	-0.272	+0.982
HD 22211	BD+05 511	6.731	+1.033	+0.583	+0.049	-0.820	+1.046
HD 23180	BD+31 642	3.879	+0.824	+0.316	+0.023	-1.372	+0.686
HD 23230	BD+42 815	3.944	+0.948	+0.447	+0.068	-0.821	+1.427
HD 23324	BD+24 546	5.652	+0.740	+0.274	+0.017	-1.130	+1.022
HD 23841	BD+09 494	7.176	+1.261	+1.004	+0.152	-0.294	+1.145
HD 25291	BD+58 690	5.273	+0.957	+0.436	+0.066	-0.763	+1.836
HD 26514	BD+23 642	7.585	+1.187	+0.795	+0.151	-0.587	+1.080
HD 26965	BD-07 780	4.713	+1.080	+0.833	-0.008	-0.564	+0.883

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Fig. 2. Photometric Standards in the DDO System, Page 83 of the Microfiche.

C. FUNDAMENTAL PARAMETERS

The following Tables are included:

- Table 20 Temperature determinations (Code et al.)  
Ref.: A.D. Code, J. Davis, R.C. Bless, and R. Hanbury Brown, Ap.J. 203, 417 (1976).
- Table 21.1 Radius Determinations (Davis)  
Ref.: J. Davis, communication for Como meeting (1984).
- Table 21.2 Radius determinations (Fracassini et al.)  
Ref.: M.Fracassini, L.E. Pasinetti and B. Valentini, Bull. Inf. CDS 24, 31 (1983).
- Table 22 Mass Determinations (Popper)  
Ref.: D.M. Popper, Ann.Rev.Astron.Astrophys. 18, 115 (1980).
- Table 23.1 Spectrophotometric standards (Glushneva)  
Ref.: I.N. Glushneva, Bull.Inf.CDS 24, 7 (1983).
- Table 23.2 Spectrophotometric standards (Oke)  
Ref.: J.B. Oke, Ap. J. 140, 689 (1964).
- Table 23.3 Spectrophotometric standards (Taylor)  
Ref.: B.J. Taylor, ApJ Suppl. 54, 259 (1981).
- Table 23.4 Spectrophotometric secondary standards  
Ref.: A.G.D. Philip and D. Hayes, Ap. J. Suppl. 53, 751 (1983).  
and : D. Hayes and A.G.D. Philip, Ap. J. Suppl. 53, 759 (1983).

Fig. 3a. A Typical Table of Parameters and Their References. Such a table precedes each section of the Microfiche.

Table 20 Temperature Determinations (Code et al.)

Ident.	V	T eff	error	bol corr	error
HD 10144	(0.47)	14510	390	-1.32	0.09
HD 34085	0.13	11550	170	-0.60	0.05
HD 35468	1.64	21580	790	-2.09	0.10
HD 37128	1.50	24820	920	-2.46	0.11
HD 37742	1.95	29910	2110	-2.93	0.29
HD 38771	1.96	26390	1270	-2.26	0.15
HD 44743	1.97	25180	1130	-2.38	0.15
HD 45348	-0.75	7460	460	0.11	0.05
HD 47105	1.92	9260	310	-0.12	0.04
HD 48915	-1.46	9970	160	-0.20	0.04
HD 52089	1.50	20990	760	-2.06	0.09
HD 54605	1.47	6110	430	0.07	0.08
HD 58350	2.44	13310	560	-0.87	0.06
HD 61421	0.37	6510	130	-0.02	0.05
HD 66811	2.13	32510	19308	-3.18	0.21
HD 68273	* 1.97	32510	2520	-3.12	0.23
HD 80007	1.68	9240	220	-0.16	0.04
HD 87901	1.35	12210	31072	-0.72	0.06
HD 102647	2.14	8850	340	-0.04	0.04
HD 106625	2.58	12450	530	-0.72	0.07
HD 111123	* 1.23	27600	1110	-2.75	0.16
HD 116658	* 1.14	23930	840	-2.44	0.12
HD 118716	2.21	25740	1190	-2.54	0.15
HD 140538	* 1.96	31460	1970	-3.07	0.22
HD 149757	1.57	31910	2040	-2.96	0.22
HD 159561	2.07	8020	330	0.01	0.04
HD 169022	1.85	9460	220	-0.22	0.04
HD 172167	0.03	9660	140	-0.25	0.04
HD 187642	0.76	8010	210	0.02	0.04
HD 193924	1.94	17880	680	-1.80	0.10
HD 209952	1.74	14050	540	-1.08	0.07
HD 216956	1.16	8800	300	-0.03	0.04

\* Primary component

Fig. 3b. One of the Tables of Fundamental Parameters listed in Fig. 3a, Temperature Determinations by Code et al. (1976).

to the author or to the Strasbourg Data Center. The files at the Data Center will be kept up to date and when enough new information is added a new version of the catalog can be produced. Through such an interaction with the user community the "Compilation of Standard Stars" will become a useful tool.

## REFERENCES

- Egret, D. and Philip, A. G. D. 1979 in Problems of Calibration of Multicolor Photometric Systems, A. G. D. Philip, ed., Dudley Obs. Rept. No. 14, microfiche.
- Philip, A. G. D. and Egret, D. 1985 in IAU Symposium No. 111. Calibration of Fundamental Stellar Quantities, D. S. Hayes, L. E. Pasinetti and A. G. D. Philip, eds., Reidel, Dordrecht, p. 353 and microfiche.