

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 2857

Konkoly Observatory
Budapest
31 January 1986
HU ISSN 0374 - 0676

PHOTOMETRY OF COMPARISON STARS

As part of a photometric program to check the fluctuation of selected known variable stars in the H-Beta photometric system, comparison stars have been observed for constancy. Observations were made in the Johnson UBV passbands, as well as with H-Beta narrow and wide interference filters. The broadband filters provide a well-defined measure of comparison for the H-Beta measurements of the variable stars. All observations were performed on the No. 4 16-inch telescope at Kitt Peak National Observatory in 1983 and 1984.

Observations and reductions of UBV data were done using techniques and formulae presented by Hardie (1962). Standard stars were chosen from the equatorial network of Landolt (1973). Additional extinction stars were selected from the list of Priser (1966) for the reduction of program stars at high northern declinations. Standard stars and H-Beta observation and reduction techniques were taken from the work of Crawford and Mander (1966). Secondary faint standards were selected from photometry of the prominent open clusters Praesepe (Crawford and Barnes 1969a), Coma (,1969b), and IC 4665 (,1972). Approximately 12 H-Beta standards and 16 UBV standards were observed on a typical complete night.

Table I presents the available photometric data for the comparison stars, and includes the corresponding variable star. A description of each of the data columns is given under the table. All variables are short period eclipsing binaries (Algol-type), except for the dwarf Cepheid VZ Cnc. Previous photometric data for the comparison stars was located in the SKYMAP Catalog Version 3.1 (McLaughlin 1983) for only two stars, and is presented for comparison in Table II.

Table I-A : Derived Magnitudes for Comparison Stars

ID	HD	SAO	RA (2000)	DEC	V	B-V	U-B	Beta
1002	25679	76440	4 05 29	27 52 47	8.422	0.417	0.192	2.797
2002	25488	76419	4 03 58	27 42 34	8.801	0.376	0.060	2.758
2005	-	131124	4 20 16	- 6 10 04	9.469	0.580	0.068	2.637
1009	46536	114066	6 34 17	9 05 00	8.701	-0.061	-0.205	2.791
2009	46199	114019	6 32 17	8 49 06	6.977	0.285	0.123	2.745
1016	85030	61706	9 50 00	33 36 07	7.940	0.458	0.136	2.645
1017	89369	178651	10 18 23	-22 45 22	8.288	0.265	0.185	2.818
2017	89473	178673	10 19 05	-23 10 53	8.533	0.437	0.015	2.666
1020	115390	157833	13 17 07	-17 54 09	9.417	0.467	-0.034	2.629
2020	114945	157804	13 14 03	-17 25 36	9.584	0.592	0.071	2.597
1023	139549	16777	15 35 07	64 05 40	9.112	0.403	-0.060	2.675
2023	-	16752	15 30 17	64 00 46	9.440	0.319	-0.005	2.733
1024	152761	30134	16 52 29	52 55 47	8.465	0.268	0.090	2.794
2024	154199	30200	17 01 14	52 36 17	6.894	0.074	0.051	2.898
1026	180401	124450	19 16 07	9 19 41	7.689	0.156	-0.276	2.690
3026	181122	124497	19 18 53	9 37 05	6.294	1.053	0.880	2.549
1028	181361	104720	19 19 26	19 43 07	8.175	0.063	-0.106	2.782
2028	181523	104723	19 20 02	19 23 20	8.517	0.139	0.106	2.891
2029	182256	87134	19 22 47	25 19 34	8.612	0.436	0.038	2.666
1030	73295	97982	8 37 58	10 02 53	9.412	0.101	0.131	2.896
2030	73411	116986	8 38 38	9 23 59	8.805	0.327	0.075	2.737

Description of Columns:

ID : Star Identification, internal
 HD : Henry Draper Number
 SAO : Smithsonian Astrophysical Observatory number
 RA,DEC : Epoch 2000 coordinates
 V B-V U-B : Standard Johnson magnitudes derived from mean of observations
 Beta : Standard H-Beta magnitudes from mean of observations

Table I-B : Derived Magnitudes for Comparison Stars

ID	Sv	Nv	Sbv	Nbv	Sub	Nub	Sbt	Nbt	Nts	Var
1002	0.008	13	0.004	13	0.012	13	0.008	13	2	RW Tau
2002	0.005	12	0.004	12	0.011	12	0.010	12	2	RW Tau
2005	0.007	2	0.002	2	0.041	2	0.021	2	1	TZ Eri
1009	0.003	11	0.004	11	0.010	11	0.008	11	1	RW Mon
2009	0.003	12	0.004	12	0.008	12	0.004	11	2	RW Mon
1016	0.005	11	0.001	11	0.002	11	0.005	11	1	T LMi
1017	0.008	14	0.005	14	0.006	14	0.004	14	4	VY Hya
2017	0.006	21	0.004	21	0.004	21	0.004	21	4	VY Hya
1020	0.005	11	0.007	10	0.004	11	0.012	11	1	UW Vir
2020	0.007	12	0.005	12	0.005	12	0.013	12	1	UW Vir
1023	0.004	17	0.005	18	0.008	17	0.008	18	2	TW Dra
2023	0.006	10	0.004	10	0.009	10	0.013	10	2	TW Dra
1024	0.003	27	0.003	27	0.003	27	0.004	27	4	AI Dra
2024	0.004	28	0.003	28	0.004	28	0.004	27	4	AI Dra
1026	0.009	9	0.007	9	0.008	8	0.008	9	2	V342 Aql
3026	0.004	4	0.003	4	0.002	4	0.009	4	1	V342 Aql
1028	0.005	6	0.003	6	0.005	6	0.007	6	1	U Sge
2028	0.011	2	0.005	2	0.004	2	0.004	2	1	U Sge
2029	0.000	2	0.003	2	0.003	2	0.005	2	1	Z Vul
1030	0.008	13	0.003	13	0.003	13	0.011	13	2	VZ Cnc
2030	0.006	20	0.003	20	0.002	20	0.006	20	2	VZ Cnc

Description of Columns:

ID : Star identification, internal
S : Mean standard deviation of each of the
4 derived magnitude/color fields
N : Number of values of each of the derived
fields used for mean
Nts : Number of nights each star was observed
Var : Associated variable star for which these
stars served as comparisons

Table II : Previous Photoelectric Photometry

ID	V	B-V	U-B
2024	6.82	0.09	0.07
3026	6.32	1.05	0.89

The author thanks Dr. C.C. Wu and Dr. P. Perry of Computer Sciences Corporation for assistance in funding these observations, the staff of Kitt Peak National Observatory for their assistance, and Dr. C. Sturch and E. Medeiros for several helpful discussions.

STEVEN F. MCLAUGHLIN *
 Astronomy Programs
 Computer Sciences Corporation
 8728 Colesville Rd.
 Silver Spring, MD 20910 USA

References:

- Crawford, D.L. and Mander, J. (1966). *Astron.J.* 71, 114.
 Crawford, D.L. and Barnes, J.V. (1969a). *Astron.J.* 74, 818.
 Crawford, D.L. and Barnes, J.V. (1969b). *Astron.J.* 74, 407.
 Crawford, D.L. and Barnes, J.V. (1972). *Astron.J.* 77, 862.
 Hardie, R.H. (1962). in *Astronomical Techniques*,
 W.A. Hiltner, ed. (U. of Chicago Press), p. 178.
 Landolt, A.U. (1973). *Astron.J.* 78, 959.
 McLaughlin, S.F. (1983). *Astron.J.* 88, 1633.
 Priser, J.B. (1966). *Publ. Astron. Soc. Pac.* 78, 474.

* Visiting Astronomer, Kitt Peak National Observatory,
 National Optical Astronomy Observatories, operated
 by the Association of Universities for Research in
 Astronomy, Inc. under contract with the National
 Science Foundation