ASTRONOMY & ASTROPHYSICS
SUPPLEMENT SERIES

JANUARY 1990, PAGE 57

Astron. Astrophys. Suppl. Ser. **82**, 57-63 (1990)

UBVRI photometry of G, K, M Hipparcos stars

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Received June 20, accepted September 11, 1989

Abstract. — *UBVRI* data are presented for a set of 229 late-type stars, most of them being high proper motion stars. All these data are part of the Input Catalogue planned observations for the Hipparcos mission.

Key words: photoelectric photometry — late spectral type stars — high proper motion stars.

1. Introduction.

Among the data necessary to build up the Input Catalogue for the E.S.A.'s Hipparcos mission photometric data are needed to attribute observing time to each one of the about 120 000 stars included in it and to determine the observability conditions for faint stars (Grenon, 1988). Stars not satisfying photometric requirements and included in the successive versions of the Input Catalogue were selected by M. Grenon at the Geneva Observatory who is responsible for the photometric tasks developed by the Hipparcos Input Catalogue Consortium.

The stars whose photometric data we report here are mainly high proper motion G, K, M stars belonging to several catalogues (G, LTT, LP, MCC) containing suspected nearby stars, plus a set of late type giants. They have declinations greater than $+20°$ and mostly belong to the zone 2^h to 12^h. Apparent magnitudes are comprised between 9 and 12.5 mag.

2. Observations and data reduction.

The observations were made at Calar Alto (Almeria, Spain) with the 1.23 m telescope of Centro Astronómico Hispano-Alemán (C.A.H.A.) and the 1.52 m telescope of the Observatorio Astronómico Nacional (O.A.N.) and at the Observatorio del Roque de los Muchachos (O.R.M.) using the 1 m Jakobus Kapteyn telescope. Both Calar Alto telescopes are equipped with a one channel photometer with a dry-ice cooled RCA 31034 photomultiplier. The observations with the Jakobus Kapteyn telescope were made using the People's photometer, a two channel one, equipped with EMI 9658 AM photomultipliers.

The standard stars were taken from the list of Neckel and Chini (1980). As indicated by Bessell (1983) and Taylor *et al.* (1989), the system they define diverges from the Johnson system, specially for red stars. However, Neckel and Chini system and Cousins system are closely comparable and improved transformation equations can be found in Taylor *et al.* (1989).

The observations we report here were carried out between September 1987 and December 1988. In table I we give for each one of the eight observing runs the whole number of nights, the number of useful ones, as well as the number of observations of program and standard stars. The observing procedure and data reduction have been performed as described in Rossello *et al.* (1985, 1988).

3. Results.

Table II contains the final results for the sample of 229 stars of our program. When there is no identification number for a star, the reference number (I XXX YYY) in the INCA Data Base is included (Gómez, 1988). The quoted error is always the standard deviation of the average. Mean values for these errors are $\sigma(V) = \pm 0.012$, $\sigma(B - V) = \pm 0.010$, $\sigma(U - B) = \pm 0.014$, $\sigma(V - R) = \pm 0.008$ and $\sigma(V - I) = \pm 0.010$ and they never exceed 0.045 mag, except for $(U - B)$ color index of five stars which are given in parenthesis, and for one faint companion (BD + 33 2134B). The last column gives the number of useful observations of each program star.

When a program star appeared to be double in the viewer the observations were made following the specific conditions necessary for the Hipparcos mission (Dommanget,

TABLE I. — *Observing runs.*

Periods	Nights	Useful Nights	Program Stars	Standard Stars
16Set.-1 Oct. 1987 (CAHA)	16	6	68	74
15-22 Dec. 1987 (OAN)	8	2	41	45
6-12 Jan. 1988 (ORM)	7	4	116	117
9-18 Mar. 1988 (CAHA)	10	7	107	108
14-20 Mar. 1988 (ORM)	7	2	70	138
2-9 Aug. 1988 (CAHA)*	8	7	56	32
2-8 Nov. 1988 (ORM)	7	0	-	-
9-19 Dec. 1988 (CAHA)*	11	11	282	157
	74	39	740	671

CAHA : Centro Astronómico Hispano Alemán
OAN : Observatorio Astronómico Nacional
ORM : Observatorio del Roque de los Muchachos

(*) These periods were not only devoted to this program

1985). The estimated values for their angular separation and the angle θ, from the North to the East, are indicated in the remarks to table II. A "J" following the star identification in table II indicates joint photometry for A and B components.

We have not made an exhaustive literature search to find all the overlaps of our observational program with other observers. However, an estimation of the external errors can be obtained through the comparison of our results with those published by Sandage and Kowal (1986), Carney and Latham (1987) and Weis (1987, 1988), hereafter referred to as SK, CL and WE, respectivelu. In the sense ours-others, we find for six stars in common with SK the computed external errors to be $\Delta V = 0.018 \pm 0.037$, $\Delta(B-V) = -0.010 \pm 0.010$ and $\Delta(U-B) = 0.080 \pm 0.017$. For the four stars in common with CL, these values become $\Delta V = 0.048 \pm 0.030$, $\Delta(B-V) = 0.005 \pm 0.010$ and $\Delta(U-B) = 0.005 \pm 0.017$. The small number of stars in common does not give enough significance to these external errors, although they seen to confirm the scatter between our values and those of SK in the $(U-B)$ color index that Rosselló *et al.* (1988) already found, while this difference does not exist when comparing with $(U-B)$ values of CL. To compute the external errors with WE, we applied successively the transformation equations between Kron and Cousins systems and from this to the Neckel and Chini system, given respectively, by Bessel and Weis (1987) and Taylor *et al.* (1989). The values obtained are $\Delta V = -0.003 \pm 0.013$, $\Delta(V-R) = 0.006 \pm 0.007$ and $\Delta(V-I) = -0.035 \pm 0.024$ for twelve stars in common. This last value is reduced to $\Delta(V-I) = -0.005 \pm 0.010$ if stars G47-28 and G214-14, which show large discrepancies, are omitted, so further observations will be necessary to improve $V-I$ data for these stars.

Acknowledgements.

We would like to thank the O.A.N. operated by the Instituto Geográfico Nacional, the C.A.H.A. operated by the Max Planck Institute für Astronomie (Heidelberg) jointly with the Spanish National Commission for Astronomy and the O.R.M. (La Palma island) of the Instituto Astrofísico de Canarias where the JKT is operated by the Royal Greenwich Observatory. We are very grateful to M. Grenon who supplied the finding charts.

This work has been supported by the Comisión Interministerial de Ciencia y Tecnología under contract PB85-0017 and the Direction General de Investigación Cientifica y Técnica.

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TABLE II. — *Photometry for program stars.*

Identification			R.A. (2000)	DEC (2000)	V	error	B-V	error	U-B	error	V-R	error	V-I	error	Obs.
G 171-54			0 22 27	+47 46.6	11.212	0.010	1.293	0.037	1.225	0.037	1.007	0.011	1.841	0.023	3
G 069-09			0 38 50	+33 1.4	11.041	0.006	1.136	0.030	1.022	0.029	0.952	0.000	1.743	0.003	3
G 243-50			1 1 15	+61 22.1	11.115	0.015	1.510	0.037	1.293	0.015	1.426	0.004	2.883	0.015	3
G 172-34			1 2 50	+47 2.1	10.801	0.020	1.407	0.041	1.328	0.030	1.207	0.008	2.242	0.035	3
G 172-35			1 2 50	+47 2.1	12.762	0.013	1.508	0.031	1.082	0.014	1.376	0.013	2.807	0.019	5
G 173-18			1 45 16	+46 32.0	11.426	0.017	1.428	0.015	1.152	0.027	1.387	0.000	2.932	0.020	6
	BD +49 0542		2 4 26	+50 15.3	8.912	0.043	1.531	0.009	1.863	0.020	1.096	0.034	2.066	0.011	4
LTT 10712	BD +76 0069		2 ? 40	+77 35.2	9.699	0.002	0.631	0.009	0.139	0.007	0.525	0.017	0.917	0.001	4
I 189 25			2 12 5	+56 16.4	11.128	0.013	1.281	0.010	1.156	0.036	0.909	0.012	1.633	0.005	5
	BD +49 0602		2 15 11	+50 19.6	8.903	0.022	0.830	0.023	0.409	0.033	0.642	0.014	1.189	0.007	3
LP 245-014			2 18 54	+35 13.2	11.747	0.016	1.494	0.019	1.141	0.038	1.225	0.003	2.356	0.007	3
	BD +59 0450		2 19 6	+59 45.1	9.142	0.025	1.635	0.001	1.751	0.029	1.177	0.014	2.176	0.006	4
HD 14311			2 20 51	+58 53.7	9.283	0.030	1.136	0.005	0.821	0.026	0.828	0.019	1.521	0.007	2
	BD +20 0381A		2 21 9	+21 34.9	10.060	0.011	0.826	0.001	0.519	0.004	0.654	0.008	1.125	0.008	3
	BD +75 0093		2 22 19	+75 59.7	8.520	0.021	1.495	0.016	0.924	0.004	1.199	0.003	2.200	0.012	2
	BD +55 0604		2 23 24	+56 6.9	9.968	0.038	1.237	0.007	1.201	0.028	0.878	0.004	1.537	0.003	2
LP 353-076			2 28 20	+22 52.4	11.401	0.045	1.049	0.002	1.039	0.009	0.835	0.002	1.349	0.001	2
I 189 43			2 31 15	+58 32.3	9.881	0.018	1.295	0.010	1.299	0.013	0.980	0.015	1.704	0.022	3
LP 197-027		A	2 36 30	+40 1.7	10.729	0.045	0.827	0.001	0.539	0.005	0.667	0.016	1.146	0.005	2
MCC 403			2 47 56	+28 42.7	11.071	0.009	1.462	0.014	1.188	0.032	1.207	0.016	2.234	0.010	4
	BD +78 0101		3 4 12	+78 42.3	10.013	0.045	0.771	0.001	0.307	0.001	0.603	0.006	0.985	0.014	2
LP 299-018			3 6 11	+28 53.3	11.598	0.005	1.019	0.006	0.859	0.006	0.849	0.007	1.442	0.007	5
LP 299-031			3 11 10	+30 7.8	11.414	0.006	0.673	0.006	0.385	0.004	0.611	0.012	1.061	0.002	3
LTT 11030	BD +68 0224		3 11 59	+69 14.9	9.894	0.003	0.598	0.005	0.027	0.008	0.530	0.001	0.890	0.001	3
LP 299-051			3 12 34	+32 54.3	11.509	0.005	0.656	0.004	0.009	0.001	0.616	0.003	1.077	0.015	4
	BD +49 0873		3 13 8	+50 27.0	9.920	0.006	1.064	0.009	0.931	0.001	0.901	0.014	1.514	0.009	2
LP 299-053			3 18 35	+32 38.9	11.326	0.006	1.474	0.008	1.366	0.009	1.349	0.008	2.590	0.004	2
I 221 23		A	3 19 9	+41 16.2	10.551	0.007	1.101	0.010	0.765	0.004	0.843	0.001	1.480	0.001	2
G 174-46	BD +48 0884		3 19 20	+49 18.5	10.129	0.001	0.726	0.007	0.240	0.002	0.601	0.004	1.023	0.005	3
LP 355-064			3 22 26	+27 9.4	11.031	0.009	1.431	0.004	1.344	0.003	1.252	0.011	2.294	0.007	2
GJ 140A			3 24 4	+23 47.2	10.441	0.005	1.494	0.010	1.282	0.021	1.334	0.005	2.646	0.013	2
LP 300-003			3 27 14	+27 23.2	11.765	0.035	1.540	0.024	(1.1)		1.285	0.018	2.551	0.014	3
	BD +22 0492		3 27 38	+22 53.9	10.965	0.004	0.732	0.001	0.237	0.006	0.617	0.024	1.064	0.005	2
	BD +45 0769	A	3 27 52	+46 14.4	10.172	0.004	0.465	0.013	0.334	0.007	0.395	0.009	0.656	0.020	2
Mel 22 3408			3 31 31	+26 15.9	10.610	0.007	0.614	0.016	0.154	0.002	0.538	0.003	0.919	0.016	2
	BD +26 0568		3 32 27	+26 44.1	10.076	0.001	0.835	0.003	0.456	0.005	0.660	0.011	1.116	0.003	2
	BD +23 0486		3 39 12	+24 27.8	10.395	0.003	0.616	0.005	0.109	0.002	0.528	0.007	0.905	0.002	2
MCC 424			3 41 33	+55 13.6	11.344	0.030	1.427	0.025	(1.0)		1.237	0.006	2.342	0.009	3
	BD +25 0591		3 41 34	+25 37.3	10.104	0.001	0.589	0.004	0.086	0.001	0.411	0.009	0.881	0.008	2
WOLF 212			3 41 57	+46 41.5	10.729	0.003	0.461	0.001	0.191	0.002	0.428	0.021	0.756	0.034	2
G 175-8			3 48 52	+56 1.5	10.938	0.002	0.787	0.005	0.385	0.012	0.648	0.003	1.114	0.002	2
G 246-50			3 50 30	+63 27.1	11.386	0.008	1.421	0.026	1.232	0.035	1.318	0.003	2.644	0.004	5
LP 248-023			3 51 35	+36 15.7	11.711	0.007	1.356	0.018	1.207	0.028	1.134	0.010	2.038	0.005	4
MCC 431			3 51 47	+44 57.0	11.514	0.012	1.194	0.006	1.089	0.035	0.990	0.008	1.684	0.004	5
LP 156-063		J	3 58 56	+49 12.9	10.920	0.011	0.975	0.010	0.758	0.019	0.807	0.004	1.357	0.002	3
LP 248-028			3 59 12	+37 58.0	11.762	0.001	1.108	0.013	0.902	0.040	0.980	0.013	1.709	0.015	2
I 192 10173			4 0 41	+54 47.1	10.396	0.010	1.123	0.007	0.951	0.002	0.915	0.003	1.547	0.005	2
LP 156-048			4 22 17	+45 37.0	10.321	0.006	0.673	0.002	0.204	0.002	0.576	0.003	0.970	0.002	3
LP 156-052			4 24 17	+49 15.6	11.469	0.004	0.844	0.003	0.322	0.004	0.747	0.001	1.303	0.001	3
MCC 230			4 28 39	+26 13.6	10.924	0.002	1.389	0.006	1.235	0.040	1.149	0.015	2.091	0.012	4

TABLE II (*continued*)

Identification			R.A. (2000)	DEC (2000)	V	error	B-V	error	U-B	error	V-R	error	V-I	error	Obs.
LP 084-029			4 35 20	+60 44.7	11.664	0.005	0.982	0.002	0.684	0.034	0.839	0.005	1.415	0.012	2
I 189 51		A	4 37 50	+43 38.3	10.524	0.006	1.466	0.013	1.555	0.040	1.091	0.005	1.955	0.003	3
MCC 450		A	4 38 50	+48 36.9	11.894	0.004	0.798	0.015	0.055	0.026	0.725	0.008	1.330	0.020	4
G 247 -30			4 40 10	+67 35.4	10.780	0.012	1.311	0.010	1.248	0.004	1.071	0.006	1.881	0.010	5
G 175-45			4 42 14	+57 42.7	11.372	0.001	1.415	0.013	1.319	0.022	1.218	0.001	2.332	0.023	4
	BD +42 1037		4 45 16	+42 26.9	9.796	0.005	1.481	0.026	1.355	0.036	1.072	0.012	1.923	0.015	3
I 189 63		A	4 46 20	+44 53.5	11.545	0.016	0.964	0.007	0.438	0.031	0.758	0.003	1.363	0.010	3
	BD +43 1052		4 46 26	+43 30.7	9.375	0.013	1.160	0.010	0.853	0.017	0.868	0.004	1.539	0.005	3
HD 282407			4 46 38	+32 39.1	10.155	0.010	0.814	0.010	0.502	0.016	0.633	0.005	1.059	0.002	3
G 247-36			4 50 23	+63 19.3	9.919	0.032	1.269	0.031	1.260	0.035	1.017	0.011	1.783	0.021	6
I 189 67			4 51 31	+42 38.6	10.127	0.028	1.758	0.037	2.013	0.037	1.298	0.001	2.373	0.004	2
	BD +43 1099	J	4 52 24	+43 34.6	11.527	0.012	1.232	0.032	1.026	0.004	0.907	0.028	1.552	0.015	3
	BD +44 1041		4 52 37	+44 37.7	10.230	0.018	1.432	0.015	1.634	0.038	1.021	0.004	1.766	0.007	3
G 081-41			4 55 2	+45 43.8	11.114	0.012	1.121	0.020	1.107	0.034	0.941	0.011	1.668	0.027	3
MCC 456			4 58 30	+51 49.5	11.093	0.004	1.407	0.006	1.378	0.009	1.142	0.016	2.074	0.003	3
MCC 458			5 0 41	+30 54.4	10.838	0.004	1.243	0.013	1.266	0.035	1.008	0.003	1.729	0.005	5
I 221 31			5 0 42	+84 34.5	10.884	0.011	0.444	0.002	0.012	0.003	0.368	0.001	0.674	0.011	3
HD 242386	BD +30 0850		5 18 29	+30 15.5	9.862	0.008	0.137	0.009	-0.345	0.019	0.186	0.009	0.274	0.007	4
G 248-38			5 23 45	+68 40.8	10.987	0.006	1.311	0.027	1.228	0.037	1.032	0.023	1.903	0.002	3
G 191 -47	BD +52 0976		5 37 3	+52 31.5	10.148	0.005	1.121	0.002	0.943	0.004	0.954	0.003	1.672	0.005	5
HD 246421	BD +22 0997	A	5 42 5	+23 0.8	10.193	0.009	0.097	0.023	-0.530	0.021	0.118	0.008	0.173	0.003	5
HD 247040			5 45 28	+32 13.6	11.088	0.006	1.634	0.023	1.667	0.013	1.185	0.005	2.125	0.006	3
HD 247206			5 46 16	+32 52.4	10.429	0.009	0.548	0.012	0.097	0.013	0.492	0.014	0.833	0.013	2
I 189 78			5 46 34	+33 31.2	11.390	0.007	1.534	0.010	1.495	0.036	1.122	0.007	2.016	0.006	3
I 189 87		A	5 53 16	+30 32.5	10.861	0.013	1.504	0.008	1.539	0.001	1.102	0.011	1.946	0.012	2
HD 248924	BD +24 1011		5 54 18	+24 19.7	9.658	0.009	0.180	0.004	-0.305	0.002	0.230	0.014	0.367	0.010	3
I 189 91			5 57 29	+33 34.0	10.324	0.009	1.229	0.001	1.128	0.007	0.901	0.008	1.561	0.008	3
I 189 92			5 57 34	+32 0.6	10.453	0.003	1.682	0.019	1.932	0.017	1.213	0.006	2.169	0.008	3
I 189 95			5 57 40	+22 31.8	10.765	0.018	1.022	0.008	0.661	0.012	0.794	0.011	1.390	0.038	2
	BD +30 1066		5 57 50	+30 37.3	9.701	0.009	1.319	0.007	1.225	0.013	0.973	0.008	1.724	0.010	3
I 189 98			5 58 24	+23 58.2	10.634	0.017	1.010	0.007	0.577	0.027	0.776	0.002	1.342	0.005	3
I 189 99			5 58 31	+23 46.9	10.181	0.022	1.150	0.005	0.902	0.026	0.803	0.020	1.473	0.031	2
HD 249959	BD +33 1208		6 0 8	+33 54.5	9.377	0.013	0.061	0.001	-0.230	0.004	0.131	0.002	0.129	0.016	2
	BD +22 1159		6 4 53	+22 18.9	9.552	0.002	1.004	0.008	0.740	0.005	0.732	0.004	1.266	0.001	3
	BD +24 1087		6 5 42	+24 8.9	10.890	0.004	1.238	0.007	0.821	0.001	0.922	0.005	1.625	0.003	3
LTT 11829			6 21 2	+67 43.7	11.321	0.003	0.995	0.005	0.817	0.023	0.757	0.006	1.255	0.002	3
HD 259616	BD +20 1485		6 34 8	+20 40.6	10.165	0.001	0.063	0.006	-0.089	0.005	0.128	0.017	0.190	0.003	3
LP 087-070			6 34 30	+57 49.7	10.185	0.007	0.689	0.011	0.170	0.007	0.564	0.002	0.946	0.009	4
I 139 120105			6 36 4	+66 21.5	11.273	0.010	1.060	0.003	1.049	0.032	0.835	0.001	1.522	0.005	3
G 107 -12			6 38 25	+39 44.7	10.442	0.028	0.980	0.004	0.811	0.029	0.791	0.007	1.303	0.007	3
HD 263139			6 46 7	+34 25.8	13.124	0.019	1.396	0.045	(1.5)		1.071	0.009	1.834	0.027	3
LTT 11921			6 52 48	+78 12.5	10.934	0.008	0.865	0.014	0.632	0.011	0.684	0.003	1.159	0.011	3
LP 205-037			6 55 23	+44 25.4	11.273	0.013	1.344	0.035	1.315	0.015	1.111	0.001	1.933	0.004	2
	BD +55 1142		6 55 50	+55 38.1	10.235	0.005	1.352	0.010	1.294	0.008	1.128	0.005	1.985	0.003	3
MCC 484			7 1 12	+59 50.8	10.931	0.006	1.476	0.018	1.210	0.041	1.226	0.006	2.260	0.001	3
	BD +58 1015		7 16 2	+57 59.3	10.017	0.006	0.725	0.003	0.304	0.016	0.549	0.001	0.948	0.001	2
	BD +63 0700	J	7 18 42	+63 31.4	9.553	0.005	0.524	0.001	0.040	0.004	0.455	0.001	0.785	0.010	2
MCC 491			7 19 43	+50 26.4	11.221	0.002	1.129	0.003	1.078	0.011	0.942	0.002	1.576	0.001	2
LP 058-170			7 23 29	+66 47.2	10.958	0.005	0.714	0.015	0.121	0.009	0.592	0.014	1.015	0.016	3
	AC +66 2298		7 23 37	+66 10.5	10.813	0.005	0.876	0.012	0.671	0.005	0.671	0.003	1.110	0.001	3

TABLE II (*continued*)

Identification			R.A. (2000)	DEC (2000)	V	error	B-V	error	U-B	error	V-R	error	V-I	error	Obs.
MCC 492			7 24 22	+67 21.2	10.299	0.015	0.951	0.014	0.718	0.001	0.804	0.005	1.361	0.005	3
MCC 495			7 25 39	+44 3.0	10.951	0.012	1.411	0.007	1.241	0.033	1.196	0.005	2.189	0.012	3
HD 58185	BD +38 1757		7 26 8	+37 49.4	8.377	0.009	0.927	0.007	0.655	0.019	0.691	0.007	1.195	0.004	3
LTT 12019			7 27 4	+24 9.6	10.950	0.015	1.194	0.010	1.104	0.028	0.990	0.001	1.683	0.011	2
LP 365-014			7 31 13	+23 15.4	11.222	0.013	1.173	0.001	1.018	0.003	0.977	0.007	1.650	0.018	3
LP 365-024			7 34 37	+22 20.3	11.532	0.008	1.498	0.012	1.319	0.012	1.335	0.002	2.585	0.017	2
LP 256-033			7 35 47	+32 53.7	10.545	0.007	1.025	0.006	0.918	0.003	0.817	0.001	1.353	0.003	2
G 193 -57	BD +54 1165		7 38 39	+54 26.0	9.919	0.005	0.883	0.001	0.519	0.004	0.729	0.007	1.253	0.004	3
G 90 -15			7 39 10	+29 54.6	10.919	0.028	1.277	0.022	1.288	0.031	1.036	0.014	1.762	0.003	5
LP 365-032			7 39 44	+21 4.8	12.251	0.005	1.449	0.023	(1.4)		1.293	0.004	2.506	0.013	3
G 234 -7			7 41 55	+60 34.1	9.693	0.002	0.699	0.003	0.177	0.002	0.573	0.003	0.991	0.008	5
LP 366-052			8 1 37	+24 47.8	12.586	0.006	1.319	0.003	1.191	0.037	1.099	0.001	1.971	0.044	2
LP 366-035			8 3 28	+21 18.3	11.908	0.004	1.412	0.007	1.270	0.001	1.186	0.002	2.171	0.005	3
LP 123-075			8 6 34	+55 53.8	11.481	0.005	1.492	0.001	1.278	0.036	1.402	0.001	2.853	0.004	2
LP 366-047			8 10 9	+22 18.7	11.646	0.002	1.054	0.005	0.697	0.038	0.760	0.009	1.366	0.015	2
MCC 517			8 11 50	+31 53.0	11.324	0.016	1.267	0.026	1.091	0.013	1.085	0.001	1.876	0.006	2
MCC 516			8 12 9	+51 56.0	10.197	0.002	1.319	0.002	1.224	0.009	1.106	0.009	1.946	0.002	2
LP 017-112			8 14 15	+79 44.1	10.746	0.007	0.713	0.004	0.173	0.003	0.593	0.004	1.005	0.005	3
	BD +44 1727	J	8 15 27	+43 58.2	9.405	0.012	0.685	0.014	0.332	0.004	0.700	0.025	1.040	0.036	3
G 51 -8			8 21 40	+35 29.5	10.688	0.013	0.982	0.004	0.738	0.002	0.776	0.006	1.307	0.012	4
WOLF 306			8 26 46	+43 57.1	11.609	0.012	1.138	0.010	1.081	0.015	0.917	0.001	1.542	0.002	2
MCC 524			8 29 9	+45 45.8	11.115	0.006	1.195	0.005	1.080	0.011	1.036	0.001	1.789	0.012	2
LP 258-029			8 30 50	+33 18.6	11.428	0.007	0.935	0.001	0.651	0.009	0.772	0.005	1.331	0.005	2
NGC 2632 7626			8 31 21	+22 2.8	10.607	0.010	0.562	0.007	0.010	0.002	0.498	0.001	0.852	0.015	2
LTT 12216	BD +72 0421		8 33 2	+71 33.5	10.445	0.009	0.985	0.003	0.822	0.020	0.763	0.006	1.296	0.001	4
NGC 2632 4346			8 34 59	+21 5.9	11.149	0.002	0.687	0.002	0.194	0.007	0.539	0.005	0.896	0.007	4
	BD +63 0786		8 35 24	+63 17.7	10.024	0.013	0.669	0.023	0.236	0.002	0.606	0.025	0.917	0.027	3
	BD +29 1784		8 36 2	+29 2.3	10.483	0.004	0.565	0.004	-0.033	0.004	0.529	0.003	0.880	0.011	2
	BD +44 1761		8 36 11	+43 36.8	10.744	0.007	0.476	0.003	0.012	0.003	0.423	0.021	0.685	0.023	4
I 221 49			8 38 0	+70 49.6	10.985	0.004	0.539	0.006	0.092	0.014	0.453	0.003	0.785	0.003	2
	BD +32 1769		8 38 29	+31 57.4	10.819	0.006	0.493	0.001	0.020	0.007	0.440	0.008	0.710	0.008	3
	BD +62 1010	A	8 41 58	+62 1.4	9.590	0.004	0.464	0.001	-0.030	0.003	0.427	0.009	0.716	0.019	3
		B			10.431	0.001	0.566	0.003	0.016	0.006	0.499	0.007	0.836	0.014	3
	BD +24 1981		8 43 1	+24 9.1	10.103	0.009	1.332	0.015	1.265	0.012	1.035	0.009	1.853	0.026	3
LP 090-028			8 45 24	+60 1.0	10.638	0.001	0.812	0.010	0.333	0.008	0.704	0.005	1.209	0.014	2
	BD +22 1985		8 45 28	+21 39.7	10.527	0.016	0.551	0.016	0.073	0.013	0.463	0.002	0.781	0.001	4
	BD +46 1436	J	8 47 54	+45 31.5	9.206	0.005	0.786	0.003	0.286	0.014	0.636	0.002	1.087	0.001	4
LP 259-011	BD +32 1766		8 50 49	+32 31.7	10.592	0.015	1.076	0.007	0.992	0.017	0.905	0.002	1.502	0.003	3
HD 75949	BD +44 1798	J	8 54 43	+43 35.2	7.705	0.012	0.618	0.004	0.114	0.009	0.561	0.015	0.893	0.024	3
LP 036-078		J	8 56 30	+70 58.5	10.520	0.018	0.929	0.005	0.721	0.003	0.755	0.016	1.185	0.008	2
LP 312-057			9 1 40	+30 34.1	11.455	0.011	1.204	0.007	1.190	0.009	0.989	0.002	1.671	0.012	2
	BD +38 1992		9 3 24	+38 5.9	9.813	0.008	0.669	0.005	0.170	0.009	0.486	0.023	0.914	0.019	4
	BD +45 1673		9 5 17	+44 29.9	11.379	0.029	0.548	0.026	-0.098	0.018	0.354	0.021	0.637	0.023	4
MCC 539	BD +33 1813	J	9 9 2	+32 27.8	10.657	0.010	1.158	0.008	0.994	0.038	0.956	0.016	1.664	0.021	2
G 047-28			9 12 2	+27 54.7	12.332	0.036	1.569	0.009	1.214	0.039	1.550	0.039	2.948	0.006	4
	BD +30 1835		9 15 32	+29 47.5	10.050	0.012	1.497	0.008	1.810	0.045	1.113	0.004	2.025	0.009	5
LP 427-018			9 16 20	+20 22.2	12.109	0.009	1.455	0.007	1.196	0.003	1.227	0.019	2.276	0.002	3
	BD +41 1944		9 17 9	+40 35.7	9.116	0.009	1.436	0.002	1.717	0.003	1.041	0.002	1.828	0.002	3
	BD +38 2037		9 28 53	+38 3.8	10.412	0.010	1.294	0.009	1.211	0.019	1.058	0.007	1.842	0.002	3
AG +70 369			9 31 29	+69 54.3	12.393	0.021	0.788	0.007	0.320	0.029	0.613	0.006	1.063	0.001	3

TABLE II (*continued*)

Identification			R.A. (2000)	DEC (2000)	V	error	B-V	error	U-B	error	V-R	error	V-I	error	Obs.
LP 091-197			9 33 21	+56 7.7	10.998	0.011	0.674	0.002	0.025	0.018	0.577	0.009	1.003	0.001	3
MCC 549	BD +38 2052		9 36 10	+37 33.6	8.242	0.004	0.758	0.004	0.364	0.005	0.604	0.004	1.002	0.001	3
LTT 12555			9 41 8	+66 43.4	11.306	0.015	0.812	0.014	0.297	0.005	0.623	0.016	1.084	0.019	3
G 116 -44	BD +45 1755		9 44 24	+44 29.2	10.360	0.007	1.057	0.002	0.927	0.006	0.885	0.010	1.537	0.013	3
LP 314-064			9 46 50	+28 45.3	11.407	0.001	1.153	0.001	1.113	0.012	0.985	0.002	1.684	0.010	3
LP 261-052			9 48 8	+37 23.5	10.023	0.015	0.631	0.003	0.113	0.010	0.565	0.015	0.920	0.010	3
	BD +57 1235		9 50 16	+57 6.8	9.906	0.013	0.505	0.003	0.010	0.015	0.479	0.015	0.746	0.009	3
LP 126-053			9 50 28	+50 43.3	11.830	0.009	1.252	0.016	(1.2)		1.055	0.015	1.781	0.014	3
LTT 18089			9 56 45	+74 12.2	11.951	0.011	0.611	0.002	0.062	0.034	0.525	0.004	0.892	0.013	3
LTT 12657			9 58 42	+67 3.7	10.382	0.027	1.322	0.007	1.205	0.008	1.105	0.012	1.968	0.017	3
	BD +65 0751	J	10 9 1	+64 26.8	9.628	0.014	0.467	0.017	-0.022	0.013	0.466	0.012	0.794	0.020	3
LP 261-222			10 9 18	+37 52.3	10.470	0.019	0.467	0.008	-0.147	0.021	0.461	0.004	0.796	0.007	3
LP 127-183			10 13 53	+55 8.1	10.333	0.002	0.634	0.002	0.048	0.016	0.595	0.009	0.980	0.002	3
	BD +56 1448		10 18 10	+56 6.6	10.168	0.013	0.473	0.002	-0.039	0.006	0.464	0.020	0.774	0.005	3
HD 90007	BD +41 2080	J	10 24 4	+40 33.8	8.897	0.025	0.687	0.001	0.246	0.012	0.578	0.015	0.943	0.003	2
LP 213-012		A	10 29 8	+42 8.9	11.008	0.011	0.639	0.008	0.056	0.010	0.555	0.008	0.927	0.006	4
HD 91313	BD +38 2152	J	10 33 16	+37 40.1	9.246	0.004	0.576	0.004	0.005	0.006	0.505	0.012	0.852	0.005	4
	BD +29 2067	A	10 37 27	+28 17.4	10.585	0.001	1.278	0.011	1.248	0.006	1.034	0.003	1.789	0.001	3
LP 213-048		A	10 38 53	+39 42.8	11.508	0.002	1.159	0.008	1.115	0.001	0.992	0.012	1.749	0.002	4
HD 92684	BD +47 1803	J	10 42 53	+46 41.5	8.900	0.007	0.780	0.002	0.339	0.020	0.642	0.004	1.090	0.009	5
LP 213-061			10 44 5	+43 2.7	12.173	0.001	1.218	0.018	1.191	0.007	1.031	0.005	1.787	0.004	3
G 196 -42			10 46 11	+56 28.3	10.415	0.017	0.768	0.003	0.378	0.002	0.684	0.001	1.195	0.013	3
	BD +46 1664		10 47 19	+45 28.1	10.386	0.017	0.552	0.001	0.050	0.008	0.446	0.005	0.765	0.010	3
	BD +53 1434	A	10 48 3	+52 46.9	10.493	0.004	0.546	0.003	0.014	0.004	0.477	0.005	0.804	0.006	3
LP 373-021	BD +22 2283		10 52 33	+21 50.4	10.821	0.010	0.658	0.007	0.086	0.004	0.552	0.005	0.959	0.003	4
	BD +28 1943		10 52 44	+28 13.0	10.044	0.003	1.075	0.011	0.996	0.011	0.863	0.002	1.456	0.002	4
	BD +57 1297		10 56 54	+56 37.9	9.778	0.008	0.517	0.001	-0.063	0.005	0.497	0.007	0.784	0.007	2
	BD +33 2059	J	10 58 57	+32 56.5	10.755	0.007	0.597	0.007	0.097	0.008	0.496	0.006	0.842	0.006	3
	BD +33 2071	J	11 3 38	+32 51.8	10.550	0.034	1.094	0.001	1.149	0.041	0.881	0.023	1.563	0.025	4
LP 214-026			11 4 16	+40 0.3	10.745	0.011	1.401	0.025	1.233	0.017	1.212	0.007	2.192	0.019	4
LP 214-047			11 10 8	+39 24.1	11.049	0.004	1.095	0.015	0.945	0.011	0.952	0.008	1.543	0.017	3
	BD +24 2328		11 12 38	+23 25.6	9.746	0.018	0.860	0.001	0.547	0.005	0.693	0.003	1.162	0.006	3
I 119 354			11 14 45	+29 3.7	12.829	0.006	0.426	0.014	-0.292	0.005	0.471	0.007	0.791	0.008	3
LP 318-355			11 16 57	+26 4.6	11.105	0.002	0.652	0.003	0.139	0.006	0.569	0.001	0.949	0.013	3
	BD +30 2129		11 17 3	+29 19.8	9.860	0.015	0.573	0.034	-0.087	0.019	0.507	0.031	0.899	0.014	3
LP 169-014			11 17 36	+46 23.5	11.123	0.008	0.676	0.013	0.144	0.019	0.590	0.002	0.960	0.023	2
LP 214-066			11 18 2	+41 1.2	10.766	0.017	0.590	0.001	-0.024	0.007	0.544	0.024	0.878	0.037	3
LP 129-080	BD +51 1661		11 18 36	+50 45.6	10.775	0.003	0.591	0.003	0.007	0.007	0.479	0.027	0.888	0.014	3
LP 264-037			11 19 18	+36 29.9	11.776	0.009	1.320	0.006	1.294	0.012	1.088	0.004	1.945	0.007	4
LP 093-554			11 20 18	+59 48.1	10.633	0.027	0.743	0.009	0.190	0.001	0.668	0.003	1.131	0.010	2
G 197 -14			11 27 18	+59 33.7	11.401	0.002	0.662	0.002	-0.075	0.006	0.585	0.009	1.003	0.007	5
G 147 -58			11 30 22	+35 50.4	9.887	0.012	0.669	0.008	0.112	0.007	0.551	0.001	0.954	0.012	4
	LTT 18170		11 31 29	+63 49.9	12.696	0.024	0.529	0.015	-0.086	0.020	0.522	0.002	0.829	0.017	4
	BD +51 1675		11 33 20	+50 44.5	9.773	0.005	1.035	0.008	0.843	0.001	0.784	0.001	1.359	0.006	4
HD 100574	BD +71 0576	J	11 35 18	+70 48.1	8.847	0.024	0.572	0.004	0.138	0.024	0.509	0.038	0.827	0.044	3
LP 129-373			11 37 0	+52 21.4	10.448	0.014	1.146	0.019	1.164	0.005	0.917	0.005	1.569	0.041	3
LP 063-220		A	11 37 4	+67 4.9	10.926	0.008	0.633	0.003	0.148	0.003	0.590	0.010	0.950	0.011	3
	BD +33 2134	A	11 38 6	+32 46.3	10.842	0.009	0.522	0.003	-0.017	0.017	0.434	0.008	0.755	0.003	3
		B			12.134	0.054	0.716	0.036	0.394	0.044	0.623	0.024	1.001	0.032	3
	BD +55 1479		11 38 47	+55 6.4	9.959	0.003	0.825	0.008	0.532	0.001	0.651	0.004	1.083	0.007	4

TABLE II (*continued*)

Identification			R.A. (2000)	DEC (2000)	V	error	B-V	error	U-B	error	V-R	error	V-I	error	Obs.
	BD +32 2173		11 39 51	+31 52.7	10.842	0.005	0.761	0.004	0.377	0.005	0.623	0.008	1.064	0.011	2
LP 169-076			11 40 52	+47 40.9	12.063	0.010	0.943	0.010	0.563	0.010	0.793	0.009	1.422	0.015	4
LP 375-023			11 42 18	+23 1.6	11.576	0.011	1.492	0.015	1.171	0.040	1.284	0.006	2.412	0.005	3
PLX 2710.1			11 43 48	+32 33.3	11.127	0.006	1.191	0.022	1.135	0.006	0.986	0.008	1.673	0.010	3
LP 319-021			11 45 59	+30 13.9	11.600	0.011	1.216	0.013	1.207	0.022	1.001	0.001	1.706	0.010	4
LP 375-039			11 47 34	+24 0.9	9.713	0.001	0.613	0.015	0.136	0.010	0.520	0.006	0.848	0.018	2
LP 064-029			11 49 41	+67 19.3	11.052	0.003	0.969	0.011	0.849	0.010	0.853	0.006	1.440	0.006	4
	BD +30 2196		11 51 4	+29 50.3	10.207	0.009	0.331	0.008	0.032	0.007	0.352	0.001	0.542	0.003	2
LP 130-238			11 51 39	+55 29.5	11.000	0.033	0.574	0.012	-0.020	0.005	0.511	0.005	0.894	0.005	3
I 221 73			11 53 36	+49 36.1	11.237	0.045	1.316	0.015	1.208	0.012	1.100	0.006	1.920	0.002	5
	BD +30 2201		11 53 56	+29 33.7	10.894	0.001	1.225	0.001	1.198	0.018	0.986	0.004	1.739	0.003	2
G 202-68			16 39 29	+50 34.2	11.797	0.010	1.595	0.005	1.347	0.016	1.301	0.006	2.594	0.023	5
G 138-64			16 46 13	+16 28.9	11.622	0.000	1.489	0.023	1.208	0.019	1.433	0.002	3.051	0.029	4
G 169-30			16 51 57	+23 51.5	11.642	0.004	1.425	0.008	1.157	0.019	1.164	0.021	2.115	0.013	5
G 203-47			17 9 29	+43 41.0	11.782	0.039	1.459	0.029	0.938	0.019	1.632	0.005	3.604	0.002	4
G 205-19			18 22 43	+37 58.1	11.611	0.033	1.435	0.037	1.283	0.016	1.312	0.015	2.609	0.012	5
G 206-30			18 25 9	+30 16.8	11.704	0.010	1.325	0.025	1.392	0.024	1.195	0.008	2.231	0.019	3
G 186-23			20 21 23	+23 15.4	10.778	0.006	1.048	0.002	0.956	0.004	0.816	0.012	1.437	0.010	6
G 212-18			21 3 4	+44 48.3	9.125	0.021	0.683	0.004	0.170	0.030	0.585	0.005	1.020	0.021	4
G 187-21			21 5 41	+26 38.5	10.745	0.004	1.076	0.002	0.924	0.028	0.874	0.001	1.489	0.020	4
G 214-14			22 11 17	+41 0.9	11.105	0.000	1.456	0.025	1.229	0.002	1.208	0.015	2.242	0.040	3
G 128-02			22 47 2	+29 51.2	11.549	0.018	0.683	0.001	0.076	0.010	0.609	0.005	1.132	0.003	3
G 128-10			22 51 50	+31 45.0	9.675	0.041	1.057	0.023	1.068	0.002	0.843	0.031	1.486	0.002	2
G 128-08			22 51 50	+31 45.0	11.649	0.016	1.470	0.032	1.206	0.001	1.514	0.036	3.395	0.001	3
G 128-11			22 53 26	+27 45.6	11.566	0.026	0.805	0.009	0.285	0.018	0.688	0.004	1.209	0.002	3
G 216-30			23 10 20	+50 37.8	10.973	0.022	1.196	0.030	1.169	0.007	0.998	0.007	1.806	0.009	3
G 241-68			23 43 52	+64 44.4	11.304	0.015	1.398	0.001	1.116	0.028	1.317	0.001	2.652	0.001	3
G 171-19			23 48 0	+49 0.7	12.033	0.007	1.641	0.024	1.334	0.012	1.395	0.007	2.779	0.008	5
G 217-25		J	23 59 45	+50 6.7	9.901	0.018	0.899	0.012	0.779	0.006	0.756	0.003	1.246	0.006	3

REMARKS:

LP 197-027	ρ = 30" θ = 80°
I 221 23	ρ = 36" θ = 100°
BD +45 0769	ρ = 28" θ = 160°
LP 156-063	ρ = 17" θ = 260°
I 189 51	ρ = 36" θ = 250°
MCC 450	ρ = 27" θ = 340°
I 189 63	ρ = 15" θ = 80°
BD +43 1099	ρ = 10" θ = 170°
BD +22 0997	ρ = 31" θ = 100°
I 189 87	ρ = 40" θ = 70°
BD +63 0700	ρ = 15" θ = 220°
BD +44 1727	ρ = 5" θ = 300°
BD +62 1010	ρ = 17" θ = 210°
BD +46 1436	ρ = 5" θ = 200°
BD +44 1798	ρ < 5" θ = 0°
LP 036-078	ρ = 5" θ = 10°
MCC 539	ρ = 13" θ = 145°
BD +65 0751	ρ = 3" θ = 45°
BD +41 2080	ρ = 12" θ = 180°
LP 213-012	ρ = 34"
BD +38 2152	ρ < 10" θ = 170°
BD +29 2067	ρ = 10" θ = 270°
LP 213-048	ρ = 40"
BD +47 1803	ρ = 8" θ = 260°
BD +53 1434	ρ = 15" θ = 145°
BD +33 2059	ρ = 6" θ = 120°
BD +33 2071	Multiple system of three components:
	A - B : ρ = 17" , θ = 340°
	A - C : ρ < 5" , θ = 45° (joint photometry A+C)
BD +71 0576	ρ = 8" θ = 110°
LP 063-220	ρ = 34" θ = 150°
BD +33 2134	ρ = 15" θ = 340°
G 217-25	ρ = 7" θ = 310°