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OVERLAPPING OPEN CLUSTERS NGC 1750 AND NGC 1758 BEHIND THE TAURUS DARK CLOUDS. II. CCD PHOTOMETRY IN THE VILNIUS SYSTEM

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Abstract. Seven-color photometry in the *Vilnius* system has been obtained for 420 stars down to $V = 16$ mag in the area containing the overlapping open clusters NGC 1750 and NGC 1758 in Taurus. Spectral and luminosity classes, color excesses, interstellar extinctions and distances are given for 287 stars. The classification of stars is based on their reddening-free Q-parameters. 18 stars observed photoelectrically were used as standards. The extinction vs. distance diagram exhibits the presence of one dust cloud at a distance of 175 pc which almost coincides with a distance of other dust clouds in the Taurus complex. The clusters NGC 1750 and NGC 1758 are found to be at the same distance of ~760 pc and may penetrate each other. Their interstellar extinction A_V is 1.06 mag which corresponds to $E_{B-V} = 0.34$ mag.

Key words: techniques: photometric: Vilnius photometric system – stars: fundamental parameters, classification – ISM: extinction, dust clouds – open clusters: individual objects: NGC 1750, NGC 1758

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1. INTRODUCTION

NGC 1750 and NGC 1758 are a pair of partly overlapping open clusters in Taurus, first investigated in the Vilnius photometric system by Straižys, Černis & Meištas (1992, hereafter Paper I). Photoelectric photometry of 116 stars down to 13th magnitude has revealed that the clusters are at 510 and 680 pc distances, respectively. Interstellar reddening E_{B-V} of both clusters was found to be close to 0.4 mag. The distance of the dust layer responsible for the reddening was found to be at 175 pc. The reality of the clusters was verified by their photometric distances and proper motions of the cluster members.

Paper I has increased the interest in this pair of clusters. In a series of papers Galadi-Enriquez et al. (1998a,b,c) have confirmed the reality of the two clusters. Their investigation was based on stellar photometry in the *UBVRI* photometric system by CCD and photographic techniques down to 18–20 mag and on the proper motions of stars based on a plate collection covering a broad range of epochs (from 1891 to 1994). The lists of NGC 1750 and NGC 1758 members down to $V = 15$ mag were composed containing 79 and 57 stars respectively. For both clusters the reddening $E_{B-V} = 0.34$ mag, based on the member stars measured by Straižys et al. (1992) in the Vilnius system and by the authors in the Strömgren system. The distances to the clusters were found to be 630 pc and 760 pc. Another proper motion study in the area was published by Tian et al. (1998).

Trying to obtain an independent criterion of membership to both clusters, based on photometric classification of stars in terms of MK spectral and luminosity classes, we have started a new investigation of the cluster area in the Vilnius system by CCD photometry, extending photometric classification down to a fainter limit in comparison to Paper I. Although the preliminary results of the present study were known already in 1995–1996, the publication was delayed due to problems of flat-fielding and CCD non-linearity.

2. CCD OBSERVATIONS, REDUCTIONS AND RESULTS

CCD exposures of two areas centered on NGC 1750 and NGC 1758 were obtained by R. P. Boyle and F. J. Vrba in 1994 with the 1-meter Ritchey telescope of the Flagstaff Station of the U.S. Naval Observatory. A nitrogen-cooled Tektronix chip of 2048×2048 pixels giving an area of $23' \times 23'$ was used. The filters of the Vilnius system were combined from two sets. The passbands U, P, Y and V were set up by square glass filters of 80×80 mm and the passbands X, Z and S were set up by round interference filters of 60 mm diameter. The glass filters covered the whole CCD area without vignetting ($23' \times 23'$ field). The interference filters gave an unvignetted field of $20'$ diameter. The exposure lengths were from 45 min for U to 4 min for Z, V and S.

For reductions the standard routines of the IRAF 2.11 software package were used. Instrumental CCD magnitudes were obtained by using aperture photometry. Flat-fielding corrections were obtained from twilight exposures with corrections obtained from multiple exposures of the standard field – open cluster M 67 (for more details see Laugalys et al. 2003). A small non-linearity in the CCD response was found and taken into account. Stars with non-symmetrical images were excluded from photometry.

The measured stars are identified in Figures 1 and 2. Figure 3 shows the rms errors σ for the magnitude V and six color indices calculated from the signal-to-noise ratios. For the stars brighter than $\sim$14.5 mag the values of σ in all colors are $<$0.01 mag. For these stars a good classification accuracy is expected. For the majority of stars down to 15.5 mag σ does not exceeds 0.02 mag: their classification should be also of reasonable accuracy.

Instrumental V magnitudes and $U{-}V$, $P{-}V$, $X{-}V$, $Y{-}V$, $Z{-}V$ and $V{-}S$ color indices were transformed to the standard *Vilnius* system by color equations obtained for the cluster M 67 observed during the same nights, as the NGC 1750/1758 area. The zero points of the transformation equations were fixed by 18 stars of magnitudes 11–13 measured photoelectrically by A. Kazlauskas and V. Laugalys with the 1.5-meter telescope at Mount Lemmon (Arizona) in 2001 (Table 1).

The results of photometry for 420 stars are given in Table 2 which lists the identification number, the coordinates for 2000.0, V magnitudes and six *Vilnius* color indices. The last three columns contain spectral types determined photometrically, interstellar extinctions and distances. Their determination is described in the next section.

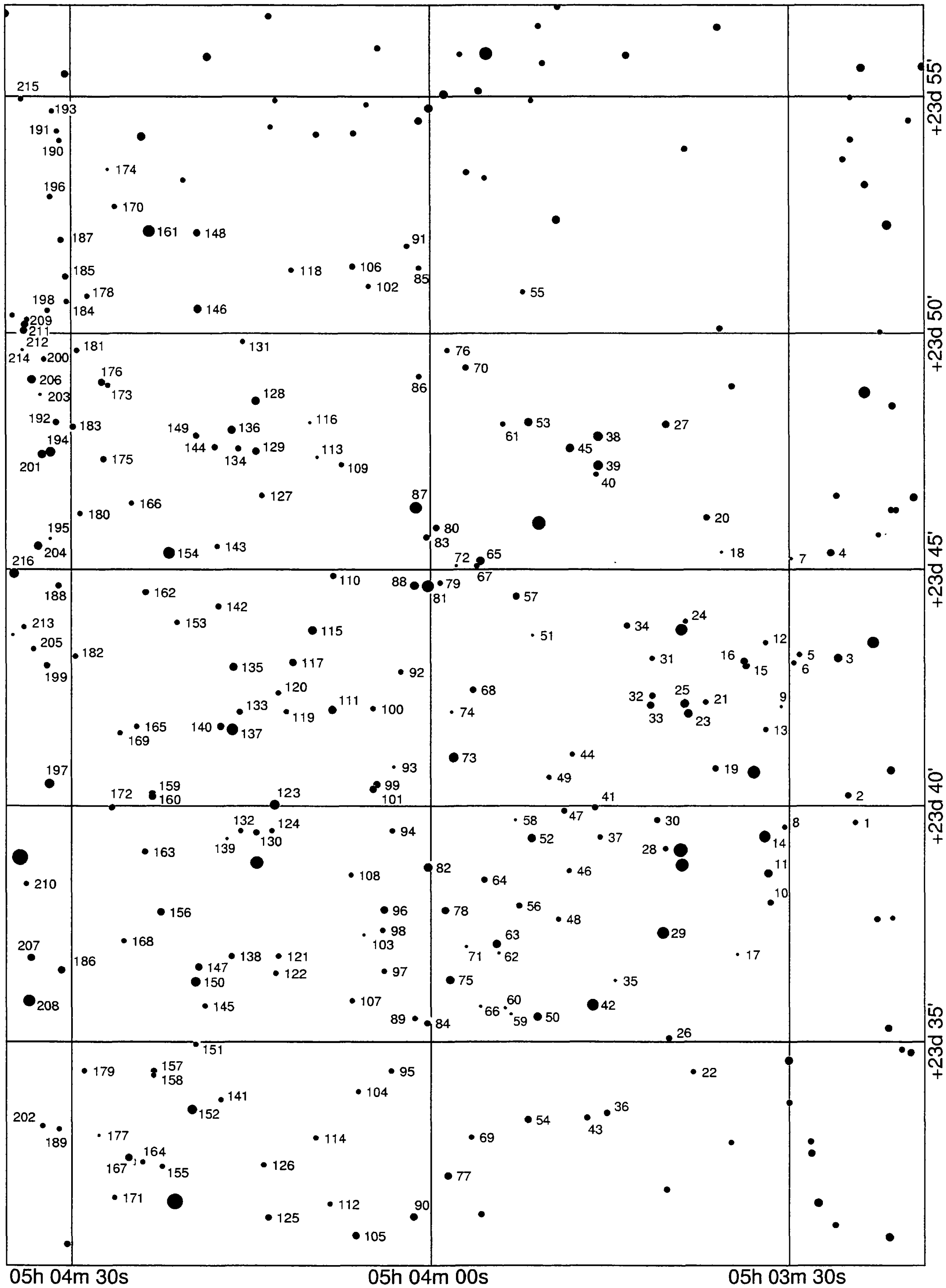

Fig. 1. Identification chart of the NGC 1750/1758 area, western part.

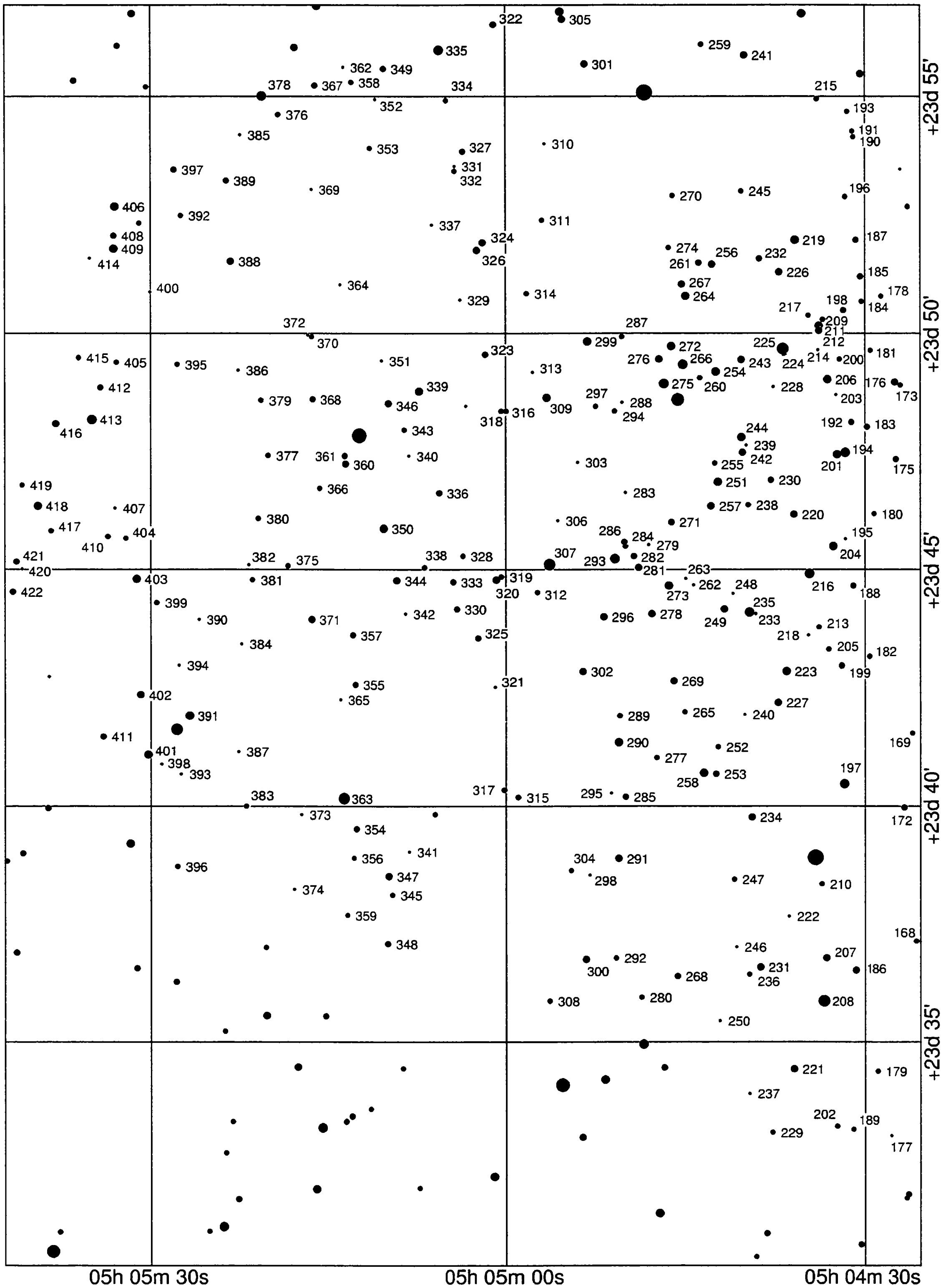

Fig. 2. Identification chart of the NGC 1750/1758 area, eastern part.

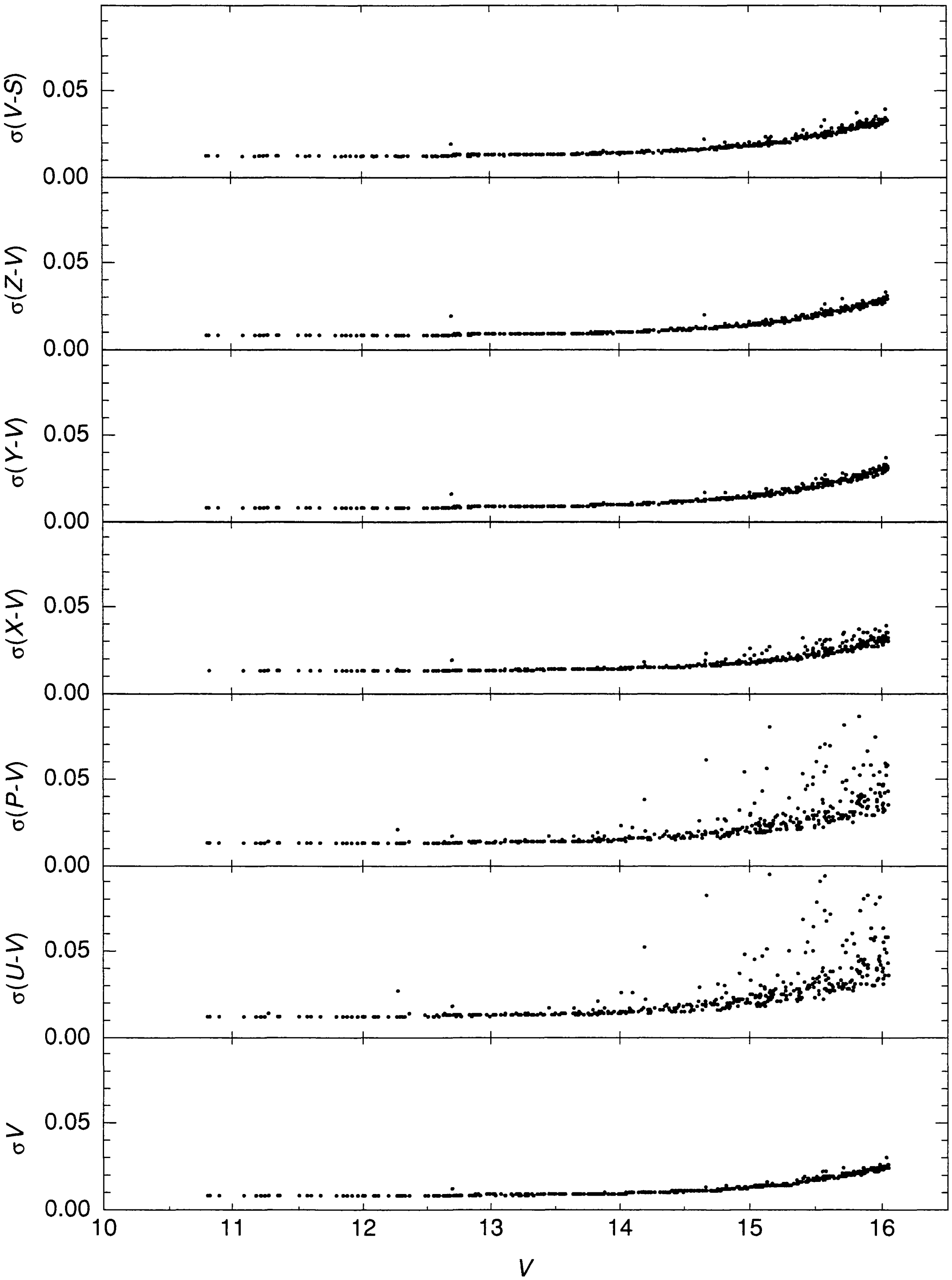

Fig. 3. Instrumental errors of magnitudes and color indices as a function of the magnitude V.

Table 1. Results of photoelectric photometry of standard stars. The numbers correspond to Table 2 and Figures 1 and 2.

No.	V	$U-V$	$P-V$	$X-V$	$Y-V$	$Z-V$	$V-S$	σV	$\sigma(U-V)$	$\sigma(P-V)$	$\sigma(X-V)$	$\sigma(Y-V)$	$\sigma(Z-V)$	$\sigma(V-S)$	n
128.	12.738	2.812	2.227	1.582	0.742	0.270	0.685	0.009	0.008	0.006	0.009	0.011	0.008	0.009	2
137.	11.227	2.412	1.722	0.890	0.427	0.150	0.344	0.008	0.007	0.006	0.008	0.007	0.007	0.008	2
146.	12.576	2.765	2.040	1.121	0.507	0.185	0.410	0.008	0.009	0.012	0.009	0.008	0.009	0.012	2
154.	11.238	2.411	1.748	0.956	0.446	0.152	0.385	0.008	0.007	0.006	0.008	0.007	0.011	0.009	2
161.	11.087	2.788	1.926	1.023	0.486	0.183	0.410	0.008	0.006	0.006	0.008	0.007	0.007	0.007	2
197.	12.025	2.714	2.012	1.132	0.492	0.179	0.452	0.007	0.006	0.005	0.007	0.010	0.007	0.010	3
204.	12.923	2.781	2.071	1.192	0.527	0.184	0.447	0.010	0.009	0.008	0.009	0.009	0.010	0.021	2
216.	12.090	2.631	1.947	1.044	0.464	0.167	0.380	0.007	0.006	0.007	0.007	0.006	0.007	0.009	3
219.	12.724	2.741	2.029	1.131	0.503	0.186	0.414	0.009	0.008	0.006	0.008	0.007	0.008	0.009	2
223.	12.328	2.762	2.079	1.162	0.501	0.193	0.408	0.009	0.008	0.006	0.008	0.008	0.009	0.010	2
225.	10.807	2.744	1.909	1.009	0.487	0.174	0.411	0.011	0.006	0.006	0.008	0.007	0.007	0.008	2
235.	11.952	2.633	1.903	1.019	0.449	0.182	0.395	0.008	0.007	0.006	0.010	0.007	0.007	0.013	2
275.	12.095	2.766	1.987	1.082	0.499	0.188	0.440	0.014	0.013	0.013	0.010	0.018	0.014	0.009	2
324.	13.280	2.674	2.058	1.389	0.654	0.236	0.589	0.009	0.009	0.009	0.013	0.013	0.011	0.016	3
350.	12.585	2.740	2.030	1.140	0.523	0.201	0.418	0.009	0.010	0.006	0.009	0.008	0.009	0.010	2
391.	12.515	3.339	2.849	1.941	0.769	0.350	0.764	0.008	0.010	0.008	0.013	0.008	0.008	0.009	2
403.	12.979	2.666	2.016	1.251	0.570	0.219	0.510	0.009	0.008	0.007	0.013	0.014	0.009	0.014	2
413.	11.986	2.577	1.878	0.968	0.418	0.153	0.335	0.008	0.007	0.006	0.008	0.011	0.009	0.010	2

Table 2. Results of CCD photometry.

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	U–V mag	P–V mag	X–V mag	Y–V mag	Z–V mag	V–S mag	Photom. sp. type	A_V mag	r pc
1.	5 3 24.1	23 39 44	15.449	2.880	2.206	1.599	0.734	0.318	0.586	f/g		
2.	5 3 24.7	23 40 18	14.527	3.103	2.517	1.871	0.819	0.312	0.753	g5 V:	1.04	500
3.	5 3 25.5	23 43 12	12.629	2.878	2.201	1.406	0.605	0.210	0.574	f0 IV:	1.08	780
4.	5 3 26.1	23 45 26	13.884	2.892	2.322	1.676	0.737	0.230	0.700	g2/3 V	0.75	510
5.	5 3 28.7	23 43 17	15.150	2.990	2.313	1.716	0.774	0.276	0.640	f8 V	1.08	1030
6.	5 3 29.2	23 43 06	15.589	3.882	3.232	2.447	1.060	0.523	0.748	g		
7.	5 3 29.4	23 45 19	15.798	3.457	3.033	2.287	1.033	0.519	0.736	g6/k0		
8.	5 3 30.0	23 39 38	15.439	2.826	2.236	1.545	0.722	0.193	0.691	f5 V	1.08	1480
9.	5 3 30.3	23 42 11	15.713	3.606	3.012	2.175	0.918	0.352	0.853	g8 IV	1.08	2020
10.	5 3 31.2	23 38 02	14.565	2.849	2.277	1.662	0.751	0.263	0.722	f9 V	0.96	790
11.	5 3 31.4	23 38 39	12.643	4.082	3.458	2.426	1.002	0.367	0.952	g8 III	1.16	1370
12.	5 3 31.6	23 43 32	15.499	2.991	2.265	1.679	0.842	0.345	0.614	f5 V	1.58	1210
13.	5 3 31.6	23 41 42	14.838	2.747	2.182	1.522	0.654	0.212	0.668	f8/9 V	0.58	1130
14.	5 3 31.7	23 39 26	10.473	2.322	1.681	0.880	0.401	0.160	0.355	b9 V	1.16	610
15.	5 3 33.3	23 43 03	13.805	2.818	2.094	1.334	0.506	0.188	0.545	f8 (I)		
16.	5 3 33.4	23 43 08	13.269	2.741	2.097	1.391	0.602	0.203	0.623	a/f		
17.	5 3 34.0	23 36 56	15.869	2.795	2.297	1.617	0.603	0.145	0.813	g5		
18.	5 3 35.3	23 45 27	15.695	3.077	2.513	1.893	0.924	0.440	0.641	f/g		
19.	5 3 35.8	23 40 52	14.049	2.813	2.234	1.608	0.729	0.244	0.705	f8 V	0.92	670
20.	5 3 36.5	23 46 11	14.431	2.919	2.398	1.760	0.811	0.323	0.683	g0 V	1.16	620
21.	5 3 36.6	23 42 17	15.041	4.024	3.206	2.387	0.964	0.396	0.923	k0 IV	1.08	1480
22.	5 3 37.6	23 34 27	14.936	2.865	2.270	1.667	0.731	0.239	0.738	g0 V:	0.83	920
23.	5 3 38.0	23 42 02	12.672	2.762	2.085	1.223	0.516	0.186	0.477	a7 V	1.04	770
24.	5 3 38.2	23 43 59	15.417	2.654	2.146	1.091	0.591	0.217	0.652	a0:		
25.	5 3 38.3	23 42 15	12.745	2.786	2.089	1.244	0.543	0.191	0.513	a7 V	1.12	760
26.	5 3 39.6	23 35 10	14.187	2.809	2.137	1.461	0.685	0.252	0.594	f5 IV-V	0.92	1130
27.	5 3 39.8	23 48 09	13.643	3.945	3.297	2.373	1.006	0.366	0.910	g8 III	1.21	2120
28.	5 3 39.9	23 39 11	14.830	2.800	2.337	1.651	0.732	0.195	0.871	g0:		
29.	5 3 40.1	23 37 24	11.277	5.311	4.515	3.231	1.222	0.511	1.158	k/m III		
30.	5 3 40.6	23 39 47	14.219	2.804	2.251	1.591	0.721	0.229	0.694	f8 V	0.87	740

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	$U-V$ mag	$P-V$ mag	$X-V$ mag	$Y-V$ mag	$Z-V$ mag	$V-S$ mag	Photom. sp. type	A_V mag	r pc
31.	5 3 41.0	23 43 12	15.082	2.970	2.208	1.551	0.742	0.333	0.615	f5 V:	1.16	1210
32.	5 3 41.0	23 42 25	14.670	3.107	2.453	1.806	0.787	0.303	0.749	g0 V	1.08	720
33.	5 3 41.1	23 42 13	13.842	3.109	2.579	1.884	0.797	0.305	0.757	g5 V	0.96	380
34.	5 3 43.1	23 43 54	14.085	2.900	2.276	1.648	0.788	0.309	0.656	f5 V	1.37	700
35.	5 3 44.1	23 36 23	15.852	2.915	2.354	1.732	0.869	0.391	0.576	f7 V	1.54	1210
36.	5 3 44.8	23 33 35	14.652	2.935	2.318	1.721	0.831	0.312	0.659	f9 V	1.29	710
37.	5 3 45.4	23 39 25	15.543	4.378	3.681	2.654	0.988	0.496	1.023	k2 IV:		
38.	5 3 45.5	23 47 54	11.594	2.472	1.818	0.910	0.413	0.139	0.329	a1/2 V	0.87	840
39.	5 3 45.5	23 47 17	11.666	2.590	1.909	0.976	0.434	0.146	0.352	a3 V	0.87	760
40.	5 3 45.7	23 47 06	15.513	4.043	3.259	2.223	0.999	0.322	0.929	g		
41.	5 3 45.8	23 40 03	14.626	3.823	3.243	2.280	0.949	0.431	0.830	k0 IV	0.99	1280
42.	5 3 46.0	23 35 52	10.605	2.123	1.533	0.820	0.386	0.160	0.346	b8 V	1.25	720
43.	5 3 46.5	23 33 29	14.502	3.016	2.284	1.664	0.835	0.290	0.666	f5:		
44.	5 3 47.7	23 41 10	15.486	3.049	2.589	1.830	1.001	0.525	0.607	f8:		
45.	5 3 47.9	23 47 39	12.194	2.667	1.997	1.066	0.453	0.168	0.368	a6 V	0.79	760
46.	5 3 48.0	23 38 42	14.915	2.929	2.234	1.587	0.679	0.224	0.708	g0		
47.	5 3 48.4	23 39 59	14.383	3.008	2.421	1.795	0.798	0.314	0.722	g0 V	1.12	620
48.	5 3 48.9	23 37 41	15.212	3.390	2.733	2.109	0.959	0.422	0.769	g1:		
49.	5 3 49.7	23 40 41	14.886	3.014	2.451	1.865	0.900	0.375	0.674	f8 V	1.62	710
50.	5 3 50.7	23 35 37	12.487	2.867	2.160	1.344	0.605	0.199	0.542	a8 V	1.29	580
51.	5 3 51.1	23 43 41	15.842	3.779	2.934	2.091	0.914	0.312	0.930	g		
52.	5 3 51.2	23 39 24	12.917	3.113	2.430	1.695	0.767	0.268	0.723	f8 IV	1.08	670
53.	5 3 51.4	23 48 12	13.037	2.806	2.228	1.583	0.727	0.249	0.684	f8 V	0.92	420
54.	5 3 51.5	23 33 26	13.580	2.867	2.180	1.511	0.725	0.249	0.618	f5 V	1.08	630
55.	5 3 51.9	23 50 57	15.562	3.353	2.572	1.996	0.877	0.327	0.778	g0/5		
56.	5 3 52.3	23 37 58	14.352	3.133	2.687	1.995	0.904	0.329	0.791	g2/5		
57.	5 3 52.5	23 44 31	13.657	2.761	2.195	1.567	0.716	0.255	0.643	f8 V	0.87	570
58.	5 3 52.6	23 39 47	15.924	3.455	3.027	2.125	0.813	0.299	0.868	g8/k0		
59.	5 3 53.0	23 35 40	15.727	4.425	3.565	2.539	0.945	0.386	0.986	k1/2 III:		
60.	5 3 53.5	23 35 48	15.837	2.965	2.285	1.727	0.734	0.273	0.716	g0/5		

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	U–V mag	P–V mag	X–V mag	Y–V mag	Z–V mag	V–S mag	Photom. sp. type	A_V mag	r pc
61.	5 3 53.6	23 48 09	15.296	3.927	3.107	2.301	1.104	0.460	0.802	f8/g2		
62.	5 3 54.0	23 36 58	15.870	3.675	2.917	2.229	0.869	0.357	0.900	k0 IV	0.67	2630
63.	5 3 54.2	23 37 09	12.199	2.730	2.031	1.145	0.503	0.155	0.411	a2/5m	1.12	860
64.	5 3 55.2	23 38 31	14.682	5.172	4.379	3.141	1.173	0.508	1.110	k3 III:		
65.	5 3 55.5	23 45 16	12.551	2.693	1.928	1.006	0.442	0.141	0.368	a3 V	0.92	1110
66.	5 3 55.5	23 35 50	15.789	3.548	2.711	2.183	0.800	0.324	0.931	g/k		
67.	5 3 55.8	23 45 10	15.486	3.657	3.108	2.073	0.864	0.289	0.897	g/k		
68.	5 3 56.1	23 42 32	14.008	2.699	2.107	1.470	0.657	0.244	0.612	f7 V	0.67	770
69.	5 3 56.3	23 33 04	15.462	2.919	2.226	1.638	0.690	0.227	0.682	g0/5		
70.	5 3 56.7	23 49 21	14.740	3.067	2.240	1.433	0.691	0.264	0.539	f0 III	1.46	2380
71.	5 3 56.7	23 37 06	15.990	3.573	2.743	2.138	0.943	0.288	0.941	k		
72.	5 3 57.5	23 45 10	15.834	4.297	3.600	2.560	1.001	0.396	0.943	k1 III	1.04	6580
73.	5 3 57.7	23 41 06	11.344	2.344	1.701	0.874	0.419	0.151	0.317	b9.5 V	1.12	840
74.	5 3 57.9	23 42 04	15.900	2.756	2.116	1.481	0.630	0.222	0.570	f8		
75.	5 3 58.0	23 36 24	12.362	4.150	3.513	2.431	0.969	0.398	0.934	k0 III	0.83	1460
76.	5 3 58.2	23 49 43	15.042	2.993	2.270	1.642	0.824	0.329	0.639	f5		
77.	5 3 58.2	23 32 15	13.118	3.782	3.073	2.247	0.967	0.329	0.916	g5 III	1.29	1530
78.	5 3 58.4	23 37 52	13.688	3.294	2.776	1.988	0.806	0.323	0.825	g9 V	0.79	275
79.	5 3 58.8	23 44 48	15.406	3.969	3.254	2.456	1.011	0.321	0.961	g/k		
80.	5 3 59.1	23 45 58	14.455	2.992	2.301	1.589	0.717	0.207	0.701	f5 V	1.08	940
81.	5 3 59.8	23 44 44	10.899	2.197	1.597		0.401	0.127	0.355			
82.	5 3 59.8	23 38 47	12.835	2.762	2.086	1.257	0.558	0.178	0.477	a8 V	1.12	730
83.	5 3 59.9	23 45 46	14.365	3.372	2.858	2.073	0.870	0.348	0.860	g8 V	1.08	360
84.	5 3 59.9	23 35 29	13.962	2.819	2.186	1.550	0.710	0.234	0.664	f5 V:	1.04	770
85.	5 4 00.5	23 51 27	15.616	4.064	3.545	2.476	0.890	0.481	1.028	k4 V	0.62	420
86.	5 4 00.5	23 49 10	15.573	4.179	3.277	2.410	1.083	0.438	0.884	g		
87.	5 4 00.8	23 46 24	11.217	2.351	1.693	0.858	0.403	0.118	0.333	a0 V	0.96	820
88.	5 4 00.9	23 44 45	12.723	2.795	2.094	1.261	0.556	0.190	0.480	a8 V	1.12	690
89.	5 4 00.9	23 35 35	15.492	3.865	3.203	2.272	0.959	0.435	0.943	k0 V	1.33	450
90.	5 4 01.0	23 31 23	13.812	2.875	2.213	1.527	0.706	0.294	0.658	f5 IV	1.04	1130

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	$U{-}V$ mag	$P{-}V$ mag	$X{-}V$ mag	$Y{-}V$ mag	$Z{-}V$ mag	$V{-}S$ mag	Photom. sp. type	A_V mag	r pc
91.	5 4 01.5	23 51 55	15.006	3.760	3.050	2.227	0.945	0.390	0.888	g8 IV	1.37	1280
92.	5 4 02.0	23 42 55	15.442	2.808	2.207	1.518	0.686	0.238	0.661	f5		
93.	5 4 02.6	23 40 54	15.897	3.863	3.244	2.368	0.908	0.323	0.969	k0 III	0.58	8400
94.	5 4 02.7	23 39 33	15.078	2.865	2.351	1.713	0.755	0.253	0.755	g1 V	0.87	920
95.	5 4 02.8	23 34 28	15.431	3.752	3.168	2.565	0.964	0.423	0.919	k2 III	0.46	7480
96.	5 4 03.4	23 37 53	13.478	2.416	1.740	0.917	0.417	0.144	0.371	a1 V	0.96	2010
97.	5 4 03.4	23 36 35	14.884	2.930	2.331	1.760	0.774	0.290	0.772	g0 V	1.00	820
98.	5 4 03.5	23 37 27	15.446	2.680	2.115	1.427	0.644	0.231	0.665	f6 V	0.67	1720
99.	5 4 04.0	23 40 32	13.863	2.898	2.350	1.691	0.781	0.301	0.712	g0 V	1.04	500
100.	5 4 04.3	23 42 08	15.158	2.596	1.916	1.026	0.431	0.138	0.366	a6 V	0.71	3090
101.	5 4 04.3	23 40 26	13.826	2.831	2.193	1.539	0.714	0.263	0.650	f5 V	1.04	720
102.	5 4 04.6	23 51 04	15.138	2.956	2.352	1.683	0.785	0.283	0.690	f7 V	1.16	1040
103.	5 4 05.1	23 37 21	15.839	2.682	2.345	1.614	0.717	0.277	0.770	g0/4		
104.	5 4 05.6	23 34 02	14.820	3.712	3.078	2.237	0.961	0.356	0.923	g8 IV	1.25	1240
105.	5 4 05.8	23 30 59	13.203	2.778	2.131	1.350	0.610	0.222	0.549	f0 V	1.12	750
106.	5 4 06.0	23 51 29	14.023	2.869	2.126	1.303	0.588	0.206	0.531	a8 V	1.25	1180
107.	5 4 06.1	23 35 57	15.155	4.680	4.158	2.842	1.100	0.489	1.042	k3 III	0.79	5940
108.	5 4 06.2	23 38 37	15.155	2.868	2.274	1.699	0.749	0.288	0.748	g0 V	0.92	970
109.	5 4 07.0	23 47 18	15.515	3.138	2.356	1.814	0.842	0.356	0.602	g0/3		
110.	5 4 07.7	23 44 57	14.190	5.165	4.347	3.103	1.217	0.472	1.112	k2 III	2.33	1790
111.	5 4 07.8	23 42 07	12.658	2.794	2.113	1.426	0.660	0.230	0.592	f2 IV	1.08	720
112.	5 4 08.0	23 31 39	15.615	2.836	2.124	1.540	0.728	0.273	0.621	f5/g0		
113.	5 4 09.0	23 47 28	15.952	3.367	2.489	1.883	0.962	0.432	0.544	f5/8:		
114.	5 4 09.2	23 33 03	15.381	2.960	2.187	1.563	0.721	0.250	0.671	f/g		
115.	5 4 09.4	23 43 48	12.861	2.779	2.048	1.202	0.554	0.194	0.434	a5		
116.	5 4 09.6	23 48 11	16.014	3.299	2.570	1.927	0.774	0.242	0.910	g2/4:		
117.	5 4 11.0	23 43 07	13.877	2.756	2.145	1.542	0.730	0.263	0.639	f5 V	1.12	710
118.	5 4 11.1	23 51 25	15.480	3.050	2.373	1.772	0.807	0.292	0.734	g3/5		
119.	5 4 11.5	23 42 04	15.179	2.951	2.381	1.736	0.784	0.302	0.756	f9 V	1.08	1000
120.	5 4 12.2	23 42 28	15.458	2.793	2.221	1.625	0.769	0.221	0.738	f8		

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	U–V mag	P–V mag	X–V mag	Y–V mag	Z–V mag	V–S mag	Photom. sp. type	A_V mag	r pc
121.	5 4 12.2	23 36 54	15.495	2.779	2.199	1.627	0.736	0.275	0.755	f8		
122.	5 4 12.4	23 36 32	15.370	3.422	2.899	2.137	0.819	0.388	0.901	g/k		
123.	5 4 12.5	23 40 06	12.121	2.680	1.979	1.057	0.484	0.181	0.379	a3 V	1.08	850
124.	5 4 12.7	23 39 33	15.273	2.886	2.329	1.789	0.815	0.306	0.757	g5		
125.	5 4 13.0	23 31 22	14.449	2.855	2.248	1.656	0.720	0.262	0.712	g2 V:	0.71	700
126.	5 4 13.4	23 32 29	14.859	2.941	2.189	1.334	0.539	0.168	0.527	a5m:		
127.	5 4 13.5	23 46 39	15.241	2.931	2.386	1.759	0.827	0.295	0.758	f7 V	1.37	990
128.	5 4 14.0	23 48 39	12.729	2.815	2.232	1.597	0.733	0.265	0.684	f8 V	0.92	360
129.	5 4 14.0	23 47 35	13.683	2.873	2.223	1.560	0.729	0.266	0.664	f5 V	1.12	650
130.	5 4 14.0	23 39 31	14.101	4.158	3.500	2.517	1.067	0.430	0.968	k0 IV	1.54	780
131.	5 4 15.1	23 49 54	15.436	3.033	2.449	1.799	0.783	0.292	0.740	g2 V	0.92	960
132.	5 4 15.3	23 39 33	15.048	2.995	2.307	1.529	0.668	0.282	0.616	f7 IV-V	0.71	1690
133.	5 4 15.4	23 42 04	14.037	2.786	2.099	1.442	0.681	0.245	0.648	f5 V	0.92	840
134.	5 4 15.5	23 47 38	13.990	2.897	2.304	1.660	0.764	0.283	0.685	f8 V	1.04	620
135.	5 4 15.9	23 43 01	12.276	6.255	5.248	3.873	1.497	0.623	1.384	k4/5		
136.	5 4 16.0	23 48 02	12.700	1.946	1.435	0.812	0.416	0.148	0.361	b7 V	1.33	2160
137.	5 4 16.0	23 41 42	11.229	2.416	1.713	0.858	0.419	0.153	0.341	b9 V	1.16	860
138.	5 4 16.1	23 36 54	14.077	2.720	2.132	1.490	0.701	0.276	0.635	f6 V	0.92	820
139.	5 4 16.5	23 39 23	15.701	2.757	2.055	1.367	0.668	0.181	0.676	f2/8		
140.	5 4 17.0	23 41 46	13.528	2.908	2.260	1.593	0.734	0.257	0.696	f5 V	1.12	600
141.	5 4 17.0	23 33 52	15.184	3.084	2.589	1.830	0.777	0.281	0.836	g5 V	0.87	730
142.	5 4 17.2	23 44 18	14.701	2.905	2.325	1.675	0.794	0.312	0.690	f7 V	1.21	830
143.	5 4 17.3	23 45 34	15.113	3.240	2.714	1.932	0.859	0.287	0.813	g7		
144.	5 4 17.5	23 47 40	14.091	2.824	2.201	1.515	0.703	0.259	0.630	f5 V	1.00	830
145.	5 4 18.4	23 35 51	15.086	3.436	2.866	2.108	0.922	0.351	0.893	g6 V	1.37	510
146.	5 4 18.9	23 50 36	12.584	2.773	2.036	1.125	0.501	0.182	0.423	a5 V	1.04	890
147.	5 4 18.9	23 36 40	13.367	2.759	2.111	1.424	0.648	0.253	0.600	f5 V	0.79	650
148.	5 4 19.0	23 52 12	13.416	2.863	2.079	1.200	0.561	0.197	0.471	a7 V	1.21	1000
149.	5 4 19.1	23 47 55	14.215	3.076	2.444	1.791	0.818	0.309	0.749	f9 IV-V	1.25	820
150.	5 4 19.2	23 36 22	11.879	2.538	1.894	1.049	0.428	0.183	0.433	a5 V:	0.75	730

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	$U-V$ mag	$P-V$ mag	$X-V$ mag	$Y-V$ mag	$Z-V$ mag	$V-S$ mag	Photom. sp. type	A_V mag	r pc
151.	5 4 19.2	23 35 02	14.884	2.803	2.150	1.495	0.708	0.258	0.695	f5 V	1.04	1170
152.	5 4 19.5	23 33 39	11.507	2.574	1.774	0.902	0.419	0.153	0.386	a1 V	0.96	810
153.	5 4 20.7	23 43 58	14.879	3.966	3.334	2.341	1.025	0.420	0.914	k0 IV	1.33	1230
154.	5 4 21.4	23 45 26	11.249	2.424	1.765	0.934	0.447	0.159	0.382	b9 V	1.29	820
155.	5 4 22.0	23 32 27	15.395	2.762	2.171	1.564	0.746	0.282	0.679	f8		
156.	5 4 22.1	23 37 50	13.651	2.758	2.086	1.340	0.629	0.257	0.589	f1 V	1.08	860
157.	5 4 22.7	23 34 28	14.090	2.802	2.103	1.359	0.616	0.228	0.634	f2 IV	0.92	1490
158.	5 4 22.7	23 34 23	14.860	2.750	2.007	1.224	0.527	0.198	0.474	a5m:		
159.	5 4 22.8	23 40 20	13.214	2.739	2.085	1.440	0.683	0.250	0.633	f4 V	1.00	600
160.	5 4 22.8	23 40 17	13.224	2.732	2.088	1.449	0.670	0.231	0.636	f5 IV	0.87	930
161.	5 4 23.0	23 52 14	11.092	2.781	1.909	1.015	0.486	0.178	0.410	a1 V	1.25	590
162.	5 4 23.3	23 44 36	14.397	2.825	2.263	1.613	0.749	0.236	0.722	f7 V	1.04	780
163.	5 4 23.4	23 39 07	14.672	2.962	2.407	1.759	0.829	0.338	0.709	f8 V	1.33	740
164.	5 4 23.6	23 32 32	14.970	4.273	3.974	2.750	1.077	0.502	0.954	k2/3 III:		
165.	5 4 24.1	23 41 46	15.007	3.147	2.593	1.885	0.820	0.315	0.785	g3 V	1.08	700
166.	5 4 24.5	23 46 29	15.388	4.095	3.443	2.480	1.006	0.409	0.947	k0 III-IV	1.16	2920
167.	5 4 24.8	23 32 38	13.837	4.162	3.529	2.567	1.065	0.406	1.000	k0 III-IV	1.37	1300
168.	5 4 25.2	23 37 13	15.584	4.374	3.628	2.533	0.959	0.430	1.030	k2 IV:		
169.	5 4 25.5	23 41 37	15.323	2.905	2.244	1.567	0.737	0.293	0.657	f7 V	1.00	1210
170.	5 4 25.9	23 52 45	14.834	3.031	2.420	1.767	0.807	0.318	0.670	g0 V	1.16	750
171.	5 4 26.0	23 31 47	14.915	2.918	2.425	1.752	0.804	0.306	0.732	g0 V	1.12	790
172.	5 4 26.2	23 40 03	14.301	2.830	2.245	1.627	0.754	0.293	0.690	f8 V	1.00	720
173.	5 4 26.5	23 48 59	15.055	3.118	2.557	1.877	0.881	0.368	0.742	g2 V	1.33	670
174.	5 4 26.5	23 53 33	15.794	2.799	2.199	1.580	0.720	0.305	0.623	f8		
175.	5 4 26.9	23 47 25	14.005	4.509	3.777	2.666	1.120	0.436	1.018	k0 III	1.46	2330
176.	5 4 27.0	23 49 03	13.555	3.281	2.627	1.948	0.903	0.356	0.829	f9 V	1.58	380
177.	5 4 27.3	23 33 06	15.741	3.540	2.931	2.122	0.959	0.372	0.900	g5 V	1.62	670
178.	5 4 28.2	23 50 52	15.288	3.004	2.457	1.797	0.806	0.337	0.724	g2 V	1.04	850
179.	5 4 28.5	23 34 28	15.589	2.964	2.362	1.694	0.735	0.261	0.785	g0 V	0.87	1210
180.	5 4 28.8	23 46 16	15.072	4.333	3.702	2.672	1.074	0.480	0.955	k1 III-IV	1.21	2470

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	U–V mag	P–V mag	X–V mag	Y–V mag	Z–V mag	V–S mag	Photom. sp. type	A_V mag	r pc
181.	5 4 29.1	23 49 43	15.043	3.173	2.614	1.920	0.845	0.340	0.781	g5/8		
182.	5 4 29.2	23 43 15	15.455	3.057	2.545	1.866	0.874	0.401	0.777	g0/2		
183.	5 4 29.4	23 48 06	14.429	3.043	2.446	1.777	0.855	0.359	0.749	f7 V	1.50	640
184.	5 4 29.9	23 50 45	14.920	3.108	2.525	1.856	0.820	0.352	0.750	g1/2		
185.	5 4 30.0	23 51 17	14.049	2.762	2.155	1.490	0.724	0.295	0.605	f5 V	1.08	780
186.	5 4 30.4	23 36 36	13.294	3.327	2.742	1.955	0.843	0.331	0.816	g5 IV	0.96	730
187.	5 4 30.4	23 52 03	14.402	2.861	2.280	1.637	0.778	0.296	0.680	f7 V	1.16	740
188.	5 4 30.6	23 44 45	14.167	2.772	2.166	1.529	0.717	0.249	0.676	f6 V	1.00	820
189.	5 4 30.6	23 33 14	15.052	3.148	2.643	1.947	0.842	0.330	0.840	g5/k0		
190.	5 4 30.6	23 54 14	15.374	3.014	2.347	1.709	0.796	0.311	0.615	f8/g0		
191.	5 4 30.7	23 54 21	15.135	2.840	2.211	1.587	0.766	0.336	0.573	f5 V	1.29	1170
192.	5 4 30.8	23 48 12	14.700	3.062	2.413	1.757	0.844	0.320	0.788	f5 V	1.58	840
193.	5 4 31.2	23 54 51	15.719	2.916	2.321	1.731	0.825	0.362	0.610	f8		
194.	5 4 31.3	23 47 34	11.355	2.710	1.909	0.978	0.476	0.189	0.383	a0 IV	1.29	900
195.	5 4 31.3	23 45 44	15.896	3.024	2.409	1.743	0.888	0.387	0.721	f		
196.	5 4 31.3	23 52 58	15.358	2.713	2.206	1.545	0.703	0.254	0.601	f8 V	0.79	1300
197.	5 4 31.4	23 40 33	12.023	2.705	1.999	1.111	0.502	0.181	0.426	a5 V	1.04	680
198.	5 4 31.5	23 50 33	14.434	2.878	2.256	1.609	0.783	0.302	0.679	f5 V	1.33	830
199.	5 4 31.6	23 43 03	14.676	2.887	2.350	1.716	0.791	0.290	0.729	g0 V	1.08	720
200.	5 4 31.8	23 49 32	15.240	3.268	2.728	1.997	0.945	0.350	0.821	f9 V	1.75	760
201.	5 4 32.0	23 47 31	12.687	3.125	2.583	1.841	0.801	0.325	0.769	g4 V	0.96	232
202.	5 4 32.0	23 33 18	15.378	2.674	2.113	1.507	0.704	0.232	0.734	f8 V	0.79	1310
203.	5 4 32.1	23 48 47	15.838	2.979	2.331	1.759	0.909	0.358	0.701	sdF?		
204.	5 4 32.3	23 45 35	12.926	2.788	2.079	1.207	0.536	0.201	0.445	a7 V:	1.12	840
205.	5 4 32.7	23 43 24	15.185	3.267	2.775	2.041	0.921	0.419	0.814	g2		
206.	5 4 32.8	23 49 06	12.871	2.916	2.193	1.319	0.608	0.232	0.516	a7 V	1.41	710
207.	5 4 32.9	23 36 52	13.337	2.873	2.173	1.401	0.615	0.245	0.583	f0 V	1.16	790
208.	5 4 33.1	23 35 57	10.813	2.305	1.606	0.820	0.391	0.140	0.360	b9 V	1.08	740
209.	5 4 33.2	23 50 22	14.919	2.841	2.307	1.611	0.763	0.305	0.719	f8 V	1.04	950
210.	5 4 33.3	23 38 26	15.188	2.758	2.157	1.504	0.691	0.226	0.714	f7 V	0.79	1260

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	U–V mag	P–V mag	X–V mag	Y–V mag	Z–V mag	V–S mag	Photom. sp. type	A_V mag	r pc
211.	5 4 33.5	23 50 14	12.712	2.810	2.052	1.174	0.543	0.216	0.468	a5 V	1.21	870
212.	5 4 33.5	23 50 08	13.807	2.782	2.130	1.414	0.668	0.264	0.609	f0/5		
213.	5 4 33.5	23 43 52	15.200	2.973	2.394	1.772	0.856	0.358	0.711	f7 V	1.50	910
214.	5 4 33.6	23 49 44	16.023	3.282	2.820	2.141	0.994	0.486	0.780	g3		
215.	5 4 33.7	23 55 02	15.252	3.808	3.162	2.279	0.936	0.422	0.852	k0 IV	1.00	1700
216.	5 4 34.3	23 45 00	12.089	2.652	1.962	1.044	0.473	0.167	0.356	a5 V	0.92	750
217.	5 4 34.4	23 50 27	15.050	3.145	2.527	1.886	0.866	0.364	0.796	g2 V	1.29	680
218.	5 4 34.4	23 43 42	15.951	3.475	2.970	2.231	0.938	0.502	0.837	k1		
219.	5 4 35.5	23 52 03	12.731	2.748	2.047	1.127	0.511	0.195	0.405	a5 V	1.08	930
220.	5 4 35.6	23 46 15	13.859	3.130	2.489	1.778	0.798	0.312	0.721	g1 V	1.04	480
221.	5 4 35.6	23 34 31	13.115	2.749	2.085	1.344	0.605	0.218	0.589	f2 V	0.83	720
222.	5 4 36.0	23 37 45	16.031	3.749	3.288	2.407	1.039	0.391	0.952	g5/8		
223.	5 4 36.2	23 42 56	12.336	2.760	2.070	1.176	0.504	0.182	0.414	a7 V	0.96	680
224.	5 4 36.4	23 49 41	13.020	2.797	2.080	2.478	0.339	0.339	0.442			
225.	5 4 36.5	23 49 45	10.833	2.724	1.881	0.958	0.480	0.191	0.397	a0 V	1.29	590
226.	5 4 36.8	23 51 22	13.319	2.775	2.151	1.458	0.689	0.258	0.607	f3 V:	1.12	660
227.	5 4 36.9	23 42 16	13.453	4.182	3.502	2.505	1.062	0.403	0.952	k0 III	1.21	2030
228.	5 4 37.3	23 48 57	15.846	3.278	2.644	1.976	0.940	0.416	0.779	g0		
229.	5 4 37.4	23 33 10	15.565	3.105	2.432	1.887	0.883	0.377	0.639	f8		
230.	5 4 37.5	23 46 59	14.165	2.923	2.297	1.696	0.809	0.330	0.703	f6 V	1.37	690
231.	5 4 38.4	23 36 40	13.554	2.858	2.222	1.567	0.716	0.272	0.633	f5 V	1.08	620
232.	5 4 38.5	23 51 39	14.560	2.983	2.423	1.745	0.814	0.337	0.717	g0 V	1.16	660
233.	5 4 38.8	23 44 09	15.890	3.008	2.384	1.530	0.464	0.412	0.448			
234.	5 4 39.1	23 39 51	13.765	2.763	2.141	1.495	0.706	0.250	0.637	f5 V	1.04	700
235.	5 4 39.3	23 44 11	11.970	2.613	1.911	1.009	0.447	0.178	0.367	a3 V	0.96	840
236.	5 4 39.3	23 36 31	14.971	2.791	2.134	1.466	0.696	0.262	0.618	f3 V	1.16	1390
237.	5 4 39.3	23 34 00	16.016	2.718	2.040	1.395	0.621	0.153	0.692	f5/g5		
238.	5 4 39.4	23 46 27	15.128	2.910	2.220	1.613	0.784	0.324	0.651	f5 V	1.33	1150
239.	5 4 39.6	23 47 43	16.033	3.256	2.706	1.809	0.800	0.326	0.837	g4		
240.	5 4 39.7	23 42 01	15.804	2.801	2.209	1.560	0.750	0.326	0.610	f5 V	1.21	1650

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	$U-V$ mag	$P-V$ mag	$X-V$ mag	$Y-V$ mag	$Z-V$ mag	$V-S$ mag	Photom. sp. type	A_V mag	r pc
241.	5 4 39.7	23 55 57	13.270	3.959	3.271	2.350	0.998	0.381	0.892	g8 III	1.21	1790
242.	5 4 39.9	23 47 34	13.245	2.881	2.164	1.403	0.653	0.246	0.571	f2 IV	1.04	950
243.	5 4 40.0	23 49 31	13.825	2.853	2.228	1.564	0.743	0.297	0.660	f6 V	1.08	670
244.	5 4 40.0	23 47 53	12.271	2.800	2.022	1.108	0.516	0.192	0.417	a3 V	1.25	840
245.	5 4 40.0	23 53 05	15.363	2.601	1.902	0.981	0.413	0.164	0.327	a3m:		
246.	5 4 40.4	23 37 06	15.728	2.799	2.144	1.457	0.730	0.282	0.597	a7/f5		
247.	5 4 40.6	23 38 32	15.017	3.036	2.456	1.687	0.776	0.262	0.782	g0 V	1.04	860
248.	5 4 40.7	23 44 35	15.766	3.047	2.573	1.848	0.808	0.281	0.764	g6 V	0.92	850
249.	5 4 41.4	23 44 15	13.545	2.762	2.090	1.347	0.640	0.224	0.543	f0 V	1.25	830
250.	5 4 41.8	23 35 32	16.034	3.390	2.984	2.101	0.817	0.301	0.840	g8 III	0.46	8990
251.	5 4 41.9	23 46 56	12.669	2.865	2.154	1.352	0.616	0.238	0.518	f0 IV	1.16	760
252.	5 4 41.9	23 41 20	15.350	3.078	2.492	1.786	0.805	0.307	0.728	g0/1 V	1.08	990
253.	5 4 42.1	23 40 46	13.942	2.898	2.106	1.331	0.608	0.199	0.556	f1/2 III	0.96	1890
254.	5 4 42.1	23 49 16	12.968	2.820	2.108	1.266	0.585	0.214	0.484	a7/8 V	1.25	760
255.	5 4 42.2	23 47 20	15.145	2.927	2.341	1.715	0.790	0.292	0.742	g1 V	1.00	890
256.	5 4 42.4	23 51 32	13.850	2.750	2.139	1.457	0.668	0.261	0.589	f4 V	0.96	830
257.	5 4 42.5	23 46 26	13.647	2.764	2.140	1.475	0.702	0.267	0.602	f5 V	1.00	680
258.	5 4 43.1	23 40 47	12.769	2.761	2.033	1.155	0.506	0.176	0.421	a7 V	1.00	820
259.	5 4 43.3	23 56 11	15.079	2.755	2.124	1.456	0.713	0.290	0.613	f5 V	1.04	1280
260.	5 4 43.4	23 49 08	14.915	2.761	2.319	1.677	0.750	0.287	0.707	g3 V	0.79	770
261.	5 4 43.5	23 51 34	14.481	2.786	2.162	1.541	0.748	0.304	0.651	f5 V	1.21	900
262.	5 4 44.0	23 44 46	15.921	2.902	2.383	1.817	0.827	0.278	0.818	f8/g0		
263.	5 4 44.6	23 44 54	16.012	3.220	2.743	1.893	0.832	0.269	0.835	g5		
264.	5 4 44.6	23 50 52	13.030	2.782	2.071	1.241	0.567	0.204	0.481	a7 V	1.25	820
265.	5 4 44.7	23 42 04	14.976	2.840	2.259	1.658	0.795	0.307	0.685	f8 V	1.21	900
266.	5 4 44.8	23 49 25	11.566	2.594	1.864		0.444	0.160	0.335			
267.	5 4 44.9	23 51 07	13.160	2.800	2.173	1.368	0.618	0.227	0.535	f0 V	1.16	720
268.	5 4 45.3	23 36 29	14.751	2.897	2.262	1.659	0.762	0.277	0.703	f8/g5		
269.	5 4 45.6	23 42 44	13.545	2.719	2.046	1.319	0.618	0.215	0.549	f0 V	1.16	860
270.	5 4 45.7	23 52 59	15.278	3.014	2.450	1.773	0.816	0.344	0.673	g2 V	1.08	830

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	$U-V$ mag	$P-V$ mag	$X-V$ mag	$Y-V$ mag	$Z-V$ mag	$V-S$ mag	Photom. sp. type	A_V mag	r pc
271.	5 4 45.8	23 46 05	14.121	2.790	2.152	1.504	0.719	0.271	0.636	f4 V	1.16	860
272.	5 4 45.8	23 49 48	12.307	2.808	2.091	1.210	0.551	0.194	0.450	a3 V	1.37	810
273.	5 4 46.0	23 44 45	12.525	2.720	2.013	1.101	0.499	0.188	0.375	a4 V	1.08	930
274.	5 4 46.0	23 51 53	15.275	3.297	2.693	1.893	0.896	0.362	0.722	g1 V	1.46	770
275.	5 4 46.4	23 49 01	12.095	2.744	1.967	1.062	0.499	0.177	0.396	a2 V	1.21	870
276.	5 4 46.8	23 49 32	13.408	2.798	2.099	1.289	0.586	0.212	0.513	a8 V	1.25	900
277.	5 4 47.0	23 41 06	15.124	2.967	2.301	1.629	0.765	0.323	0.682	f6 V	1.16	1180
278.	5 4 47.4	23 44 09	13.315	2.820	2.117	1.338	0.636	0.253	0.508	f0 V	1.25	750
279.	5 4 47.7	23 45 36	15.886	3.150	2.525	1.955	0.863	0.324	0.794	g/k		
280.	5 4 48.3	23 36 02	15.607	3.262	2.577	1.908	0.851	0.348	0.781	g0 IV-V		
281.	5 4 48.5	23 45 08	13.216	2.734	2.083	1.340	0.632	0.244	0.538	f2 V	0.96	710
282.	5 4 48.9	23 45 22	14.783	2.862	2.279	1.643	0.770	0.294	0.663	f8 V	1.08	870
283.	5 4 49.6	23 46 43	15.925	2.862	2.154	1.550	0.789	0.318	0.639	f		
284.	5 4 49.6	23 45 35	15.089	3.063	2.388	1.754	0.718	0.320	0.723	g3 V	0.67	880
285.	5 4 49.6	23 40 17	14.058	3.435	2.890	2.102	0.910	0.399	0.845	g9 V	1.21	269
286.	5 4 49.7	23 45 40	14.590	3.205	2.620	1.889	0.835	0.346	0.797	g3 V	1.16	560
287.	5 4 49.9	23 50 00	15.603	3.418	2.835	2.146	1.006	0.401	0.797	g2 V	1.87	670
288.	5 4 49.9	23 48 37	15.873	3.401	2.783	2.078	1.067	0.508	0.791	f8		
289.	5 4 50.1	23 42 00	15.133	3.097	2.529	1.883	0.859	0.356	0.756	g2 V	1.25	720
290.	5 4 50.2	23 41 26	12.887	2.759	2.041	1.200	0.541	0.213	0.458	a7 V	1.12	820
291.	5 4 50.2	23 38 58	13.805	3.757	3.047	2.216	0.961	0.367	0.882	g5 III	1.25	2140
292.	5 4 50.4	23 36 52	15.574	3.198	2.612	1.900	0.822	0.339	0.802	g2 V	1.08	950
293.	5 4 50.5	23 45 19	11.937	2.614	1.884	0.963	0.456	0.180	0.339	a1 V	1.12	920
294.	5 4 50.5	23 48 26	14.858	2.914	2.363	1.729	0.798	0.310	0.724	g0 V	1.12	770
295.	5 4 50.8	23 40 21	15.894	2.813	2.121	1.488	0.691	0.249	0.679	f5 V	0.96	1930
296.	5 4 51.4	23 44 05	13.401	3.017	2.396	1.726	0.793	0.296	0.720	f8 V	1.16	445
297.	5 4 52.1	23 48 32	15.280	2.802	2.065	1.382	0.657	0.245	0.602	f3 III	1.00	328
298.	5 4 52.6	23 38 37	15.664	2.716	2.090	1.386	0.639	0.221	0.686	f3 V	0.92	2130
299.	5 4 52.8	23 49 54	12.769	2.807	2.114	1.313	0.610	0.231	0.505	a7 V	1.41	680
300.	5 4 52.9	23 36 50	13.913	2.740	2.145	1.491	0.670	0.246	0.653	f6 V	0.79	800

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	U–V mag	P–V mag	X–V mag	Y–V mag	Z–V mag	V–S mag	Photom. sp. type	A_V mag	r pc
301.	5 4 53.0	23 55 46	13.722	2.784	2.049	1.171	0.552	0.198	0.472	a3 V	1.37	1550
302.	5 4 53.2	23 42 56	13.520	3.024	2.507	1.805	0.832	0.388	0.699	g1 V	1.16	390
303.	5 4 53.6	23 47 21	15.709	2.774	2.169	1.596	0.770	0.293	0.724	g0		
304.	5 4 54.2	23 38 43	15.173	4.114	3.412	2.418	1.016	0.443	0.965	k1 V	1.54	320
305.	5 4 54.9	23 56 43	13.765	2.735	2.062	1.342	0.641	0.255	0.596	f1 V	1.12	890
306.	5 4 55.3	23 46 07	16.022	2.832	2.209	1.682	0.920	0.369	0.688	f/g		
307.	5 4 56.0	23 45 12	10.613	2.210	1.540	0.780	0.403	0.140	0.308	b9 V	1.04	670
308.	5 4 56.0	23 35 57	15.117	2.669	2.154	1.519	0.703	0.260	0.656	f9 V	0.75	1130
309.	5 4 56.2	23 48 43	12.285	2.715	1.971	1.047	0.489	0.189	0.367	a1 V	1.25	1010
310.	5 4 56.4	23 54 05	15.986	3.471	2.960	2.042	0.866	0.298	0.873	g		
311.	5 4 56.6	23 52 28	15.649	2.954	2.343	1.722	0.868	0.366	0.618	f7 V	1.54	1100
312.	5 4 57.0	23 44 36	15.100	2.833	2.313	1.674	0.762	0.298	0.699	g0 V	0.96	930
313.	5 4 57.4	23 49 15	16.023	3.545	2.846	2.218	1.082	0.463	0.753	g		
314.	5 4 57.9	23 50 55	15.064	3.040	2.476	1.846	0.887	0.345	0.687	f7 V	1.62	810
315.	5 4 58.6	23 40 16	15.053	2.832	2.232	1.569	0.738	0.280	0.687	f5 V	1.16	1200
316.	5 4 59.5	23 48 26	15.630	3.116	2.483	1.892	0.808	0.375	0.767	g2		
317.	5 4 59.7	23 40 25	15.233	2.960	2.387	1.708	0.773	0.304	0.781	g0 V	1.00	970
318.	5 4 59.9	23 48 26	15.004	3.061	2.464	1.793	0.808	0.291	0.729	g0 V	1.16	810
319.	5 4 59.9	23 44 56	15.398	2.779	2.205	1.592	0.684	0.323	0.631	g1 V	0.54	1240
320.	5 5 00.3	23 44 52	13.657	2.700	2.081	1.412	0.662	0.281	0.573	f5 V	0.83	730
321.	5 5 00.4	23 42 36	15.921	3.784	3.002	2.263	0.949	0.376	0.989	g		
322.	5 5 00.5	23 56 36	14.270	3.786	3.162	2.251	1.004	0.434	0.883	g8 V	1.62	269
323.	5 5 01.2	23 49 38	14.752	3.711	3.147	2.265	0.934	0.436	0.875	k1 V	1.16	315
324.	5 5 01.4	23 52 00	13.290	2.709	2.064	1.397	0.649	0.238	0.582	f3 IV-V	0.96	840
325.	5 5 01.8	23 43 38	14.551	2.726	2.161	1.571	0.746	0.292	0.672	f7 V	1.04	840
326.	5 5 01.9	23 51 50	13.680	2.827	2.081	1.252	0.562	0.216	0.470	f0 V	0.92	1030
327.	5 5 03.1	23 53 55	13.939	2.850	2.063	1.200	0.562	0.228	0.420	a6 IV-V	1.25	1540
328.	5 5 03.1	23 45 22	15.499	2.720	2.042	1.424	0.686	0.192	0.651	f		
329.	5 5 03.3	23 50 47	16.050	2.956	2.484	1.871	0.915	0.321	0.692	g		
330.	5 5 03.6	23 44 15	14.462	3.707	3.137	2.188	0.921	0.421	0.873	k0 V	1.16	300

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	$U-V$ mag	$P-V$ mag	$X-V$ mag	$Y-V$ mag	$Z-V$ mag	$V-S$ mag	Photom. sp. type	A_V mag	r pc
331.	5 5 03.8	23 53 37	15.676	3.279	2.701	2.040	0.932	0.412	0.773	g1/2 V:	1.58	830
332.	5 5 03.9	23 53 34	15.719	3.152	2.671	1.991	0.986	0.470	0.742	f/g		
333.	5 5 03.9	23 44 49	14.218	2.694	2.096	1.485	0.723	0.289	0.612	f5 V	1.08	850
334.	5 5 04.5	23 55 00	15.057	2.930	2.379	1.660	0.772	0.349	0.602	g0 IV-V		
335.	5 5 05.1	23 56 04	11.844	2.635	1.980	1.103	0.499	0.186	0.420	a5 V	1.04	630
336.	5 5 05.1	23 46 42	14.240	2.891	2.335	1.653	0.750	0.283	0.691	g0 V	0.92	640
337.	5 5 05.7	23 52 22	15.744	4.058	3.418	2.499	1.116	0.507	0.866	g6 III	1.87	3930
338.	5 5 06.4	23 45 08	15.108	2.905	2.408	1.792	0.839	0.333	0.802	g3		
339.	5 5 06.8	23 48 51	12.834	4.125	3.449	2.472	1.029	0.414	0.953	k0 IV	1.37	470
340.	5 5 07.7	23 47 29	15.820	3.395	2.855	2.082	0.946	0.410	0.776	g5/6		
341.	5 5 07.7	23 39 07	15.802	3.038	2.557	1.917	0.942	0.378	0.685	g		
342.	5 5 08.0	23 44 09	16.049	3.201	2.764	2.019	0.883	0.382	0.959	g		
343.	5 5 08.1	23 48 02	15.585	2.735	2.137	1.550	0.691	0.311	0.610	f5/g0		
344.	5 5 08.7	23 44 51	13.828	2.713	2.134	1.530	0.728	0.304	0.656	f6 V	1.04	690
345.	5 5 09.1	23 38 12	15.591	3.067	2.499	1.807	0.811	0.316	0.856	g2 V	1.04	980
346.	5 5 09.4	23 48 36	13.782	2.717	2.121	1.505	0.706	0.304	0.600	f5 V	1.04	700
347.	5 5 09.4	23 38 36	13.494	2.660	2.047	1.385	0.646	0.241	0.595	f5 V	0.79	690
348.	5 5 09.5	23 37 10	14.647	2.776	2.021	1.203	0.562	0.194	0.539	f0 IV	0.92	2120
349.	5 5 09.8	23 55 40	14.505	2.706	2.106	1.449	0.686	0.254	0.629	f5 V	0.96	1020
350.	5 5 09.8	23 45 57	12.595	2.714	2.007	1.148	0.539	0.235	0.422	a7 V	1.12	720
351.	5 5 10.0	23 49 30	15.737	3.112	2.466	1.815	0.780	0.298	0.764	g2 IV-V	0.92	1640
352.	5 5 10.5	23 55 01	15.828	3.405	2.982	2.055	0.990	0.468	0.758	f8/g5		
353.	5 5 11.0	23 53 59	15.273	3.034	2.547	1.848	0.895	0.348	0.773	f8/g2		
354.	5 5 12.2	23 39 36	14.199	4.403	3.722	2.714	1.131	0.471	1.027	k0/1 III	1.41	2620
355.	5 5 12.3	23 42 39	14.767	4.281	3.601	2.598	1.092	0.463	0.986	k0 IV	1.62	1020
356.	5 5 12.4	23 38 59	14.797	3.826	3.162	2.332	0.987	0.364	0.951	g8 IV	1.37	1160
357.	5 5 12.5	23 43 42	14.617	3.761	3.086	2.269	0.987	0.406	0.923	g8 V	1.58	320
358.	5 5 12.6	23 55 23	14.852	2.791	2.202	1.573	0.748	0.293	0.673	f5 V	1.21	1070
359.	5 5 13.0	23 37 46	15.389	2.735	2.023	1.410	0.673	0.231	0.659	f5/g0		
360.	5 5 13.1	23 47 19	13.217	2.785	2.202	1.555	0.716	0.313	0.648	f7 V	0.92	480

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	$U-V$ mag	$P-V$ mag	$X-V$ mag	$Y-V$ mag	$Z-V$ mag	$V-S$ mag	Photom. sp. type	A_V mag	r pc
361.	5 5 13.2	23 47 29	14.673	2.887	2.334	1.686	0.766	0.404	0.628	g1/5		
362.	5 5 13.3	23 55 42	16.011	2.911	2.361	1.703	0.854	0.440	0.644	f8/g2		
363.	5 5 13.3	23 40 15	11.182	2.370	1.691		0.397	0.165	0.311			
364.	5 5 13.6	23 51 06	15.945	2.692	2.188	1.595	0.612	0.259	0.825	g2/8		
365.	5 5 13.6	23 42 20	16.007	3.048	2.504	1.844	0.791	0.315	0.845	g5/8		
366.	5 5 15.4	23 46 48	15.531	3.050	2.510	1.822	0.832	0.343	0.738	g3 V	1.12	870
367.	5 5 15.8	23 55 19	13.991	2.904	2.326	1.667	0.782	0.329	0.726	f8 V	1.12	590
368.	5 5 16.0	23 48 41	14.607	3.259	2.714	1.971	0.864	0.401	0.837	g5/k0		
369.	5 5 16.1	23 53 07	15.847	2.966	2.346	1.759	0.905	0.439	0.644	f7 V	1.66	1140
370.	5 5 16.1	23 50 00	14.814	2.821	2.227	1.621	0.736	0.293	0.680	f8 V	0.96	930
371.	5 5 16.1	23 44 02	13.225	3.591	2.993	2.163	0.925	0.401	0.862	g9 V	1.25	179
372.	5 5 16.4	23 50 02	15.759	2.847	2.419	1.618	0.355	0.424	0.739			
373.	5 5 17.0	23 39 54	15.979	3.440	3.110	2.322	1.033	0.489	0.858	k0/2		
374.	5 5 17.6	23 38 19	15.710	3.030	2.312	1.788	0.912	0.369	0.674	f5/g2		
375.	5 5 18.1	23 45 10	15.501	2.659	2.166	1.580	0.752	0.312	0.720	f8 V	1.00	1260
376.	5 5 18.9	23 54 42	15.116	3.059	2.520	1.792	0.854	0.377	0.710	g0 V	1.33	790
377.	5 5 19.7	23 47 30	15.368	2.844	2.149	1.472	0.729	0.288	0.663	f3 IV-V	1.29	1890
378.	5 5 20.2	23 55 06	11.794	2.591	2.025	1.371	0.633	0.335	0.608	f5/8		
379.	5 5 20.3	23 48 40	15.615	2.879	2.131	1.674	0.757	0.252	0.811	f/g		
380.	5 5 20.5	23 46 10	15.581	3.600	2.948	2.257	1.029	0.421	0.869	g/k		
381.	5 5 21.0	23 44 52	15.605	3.004	2.326	1.718	0.800	0.331	0.778	f8 V	1.21	1200
382.	5 5 21.3	23 45 11	15.716	3.134	2.578	1.923	0.906	0.393	0.752	f/g		
383.	5 5 21.5	23 40 05	15.206	2.975	2.521	1.831	0.797	0.292	0.812	g5 V	0.96	710
384.	5 5 21.9	23 43 31	15.985	3.504	3.124	2.318	0.980	0.499	0.921	k0		
385.	5 5 22.0	23 54 16	15.976	3.014	2.383	1.666	0.776	0.251	0.720	f5 V	1.33	1700
386.	5 5 22.2	23 49 18	15.685	3.078	2.435	1.789	0.821	0.253	0.751	f8 V	1.29	1200
387.	5 5 22.2	23 41 14	16.012	2.690	2.181	1.587	0.765	0.275	0.732	f8 V	1.04	1560
388.	5 5 22.8	23 51 36	13.674	2.882	2.265	1.589	0.727	0.286	0.674	f6 V	1.04	640
389.	5 5 23.2	23 53 18	14.234	2.865	2.093	1.203	0.562	0.243	0.421	a5 V	1.29	1690
390.	5 5 25.6	23 44 02	15.750	2.901	2.284	1.682	0.874	0.394	0.650	f7		

Table 2 (continued)

No.	α(2000) h m s	δ(2000) ° ′ ″	V mag	U–V mag	P–V mag	X–V mag	Y–V mag	Z–V mag	V–S mag	Photom. sp. type	A_V mag	r pc
391.	5 5 26.4	23 42 00	12.509	3.350	2.870	1.952	0.759	0.352	0.754	k1 V	0.46	155
392.	5 5 27.1	23 52 34	15.576	3.204	2.655	1.892	0.879	0.345	0.706	g2/3 V	1.33	850
393.	5 5 27.1	23 40 46	16.011	3.931	3.080	2.332	1.011	0.433	0.885	k0 IV	1.29	2110
394.	5 5 27.3	23 43 04	15.965	2.986	2.510	1.910	0.826	0.361	0.809	g/k		
395.	5 5 27.4	23 49 25	15.567	2.545	2.033	1.343	0.608	0.208	0.659	f5 V	0.62	1950
396.	5 5 27.4	23 38 48	14.804	2.900	2.341	1.696	0.760	0.285	0.722	g0 V	0.96	810
397.	5 5 27.7	23 53 32	14.787	2.766	2.028	1.086	0.518	0.275	0.370	a0		
398.	5 5 28.7	23 40 58	15.931	2.576	2.013	1.467	0.665	0.207	0.818	f8		
399.	5 5 29.1	23 44 23	15.112	3.783	3.024	2.243	0.955	0.356	0.902	g5 III	1.25	3900
400.	5 5 29.6	23 50 57	15.768	3.094	2.573	1.798	0.841	0.359	0.745	g0 V	1.29	1090
401.	5 5 29.8	23 41 10	12.853	2.578	2.007	1.412	0.657	0.238	0.634	f3 V	1.00	560
402.	5 5 30.4	23 42 26	13.229	2.714	2.158	1.578	0.728	0.276	0.702	f8 V	0.92	460
403.	5 5 30.7	23 44 53	12.991	2.665	2.011	1.257	0.566	0.213	0.517	f0 V	0.96	730
404.	5 5 31.6	23 45 45	15.627	3.017	2.428	1.750	0.800	0.287	0.780	g0 V	1.12	1100
405.	5 5 32.4	23 49 28	15.088	2.904	2.362	1.709	0.777	0.325	0.695	g0 V	1.04	890
406.	5 5 32.5	23 52 45	12.880	2.663	1.994	1.127	0.472	0.335	0.401	f		
407.	5 5 32.5	23 46 23	15.966	3.361	2.780	2.054	0.870	0.354	0.884	g		
408.	5 5 32.6	23 52 08	14.411	2.661	2.105	1.476	0.696	0.311	0.668	f6 V	0.92	950
409.	5 5 32.6	23 51 52	12.902	3.279	2.693	1.917	0.833	0.376	0.783	g5 V	1.08	230
410.	5 5 33.1	23 45 47	15.533	2.997	2.404	1.781	0.719	0.285	0.783	g5 V	0.62	960
411.	5 5 33.5	23 41 33	14.435	2.657	2.076	1.481	0.657	0.237	0.656	f7 V	0.67	940
412.	5 5 33.7	23 48 56	14.580	3.068	2.505	1.831	0.834	0.356	0.737	g2 V	1.12	590
413.	5 5 34.4	23 48 15	11.997	2.588	1.878	0.953	0.414	0.150	0.337	a4 V	0.71	870
414.	5 5 34.6	23 51 40	15.888	2.837	2.195	1.669	0.840	0.472	0.588	f/g		
415.	5 5 35.5	23 49 34	14.819	2.994	2.414	1.704	0.770	0.310	0.696	g0 V	1.00	800
416.	5 5 37.4	23 48 10	13.080	2.640	2.060	1.440	0.661	0.237	0.625	f6 V	0.75	560
417.	5 5 37.8	23 45 54	15.641	3.711	2.964	2.228	0.946	0.364	0.921	g4 V	1.58	680
418.	5 5 38.9	23 46 26	12.557	2.775	2.041	1.171	0.505	0.189	0.422	a7 V	0.96	760
419.	5 5 40.2	23 46 52	15.313	3.869	3.157	2.344	0.985	0.362	0.919	g5 III	1.33	4130
420.	5 5 40.2	23 45 06	15.789	2.690	1.963	1.367	0.636	0.212	0.599	f		

3. TWO-DIMENSIONAL CLASSIFICATION, INTERSTELLAR EXTINCTIONS AND DISTANCES

For two-dimensional classification of stars in terms of MK spectral types we have used the COMPAR program written by A. Kazlauskas. The program compares interstellar reddening-free Q-parameters of program stars with a set of 8500 comparison stars. The Q-parameters for each star are defined by the equation:

$$Q_{1234} = (m_1 - m_2) - (E_{12}/E_{34})(m_3 - m_4), \tag{1}$$

and

$$E_{k,\ell} = (m_k - m_\ell)_{\text{reddened}} - (m_k - m_\ell)_{\text{intrinsic}}. \tag{2}$$

where m are the magnitudes in four (sometimes three) passbands, $m_1 - m_2$ and $m_3 - m_4$ are the two color indices and E_{12} and E_{34} are the corresponding color excesses. In the medium-band *Vilnius* system the ratios of color excesses depend slightly on spectral and luminosity classes, and this dependence is taken into account. In calculating the Q-parameters, we used the color excess ratios E_{12}/E_{34} corresponding to the normal interstellar extinction law (see Straižys 1992). The extinction law, i.e., the dependence of the extinction on the wavelength, is known to be normal in the Taurus areas which does not contain dense molecular clouds. The matching of Q-parameters leads to a selection of some standard stars which have a set of Qs most similar to those of the program star. The match quality is characterized by

$$\sigma Q = \pm\sqrt{\frac{\sum_n \Delta Q_i^2}{n}}, \tag{3}$$

where ΔQ are differences of corresponding Q-parameters of the program star and the standard, n is a number of the compared Q-parameters (in our case, $n = 14$). If the σQ value is sufficiently small (i.e., the Q differences between the program and the standard star are small), the spectral and luminosity classes of the closest star may be prescribed to the program star. For photometry of Population I stars measured with the 1% accuracy, σQ is usually of the order of $\pm(0.01 - 0.02)$ mag. In most cases, for the program star we have accepted the average spectral and luminosity classes of the three best fitted standard stars. The classification was considered to be acceptable if σQ was ≤ 0.03 mag. The stars with ≥ 0.035 were suspected to be either unresolved binaries or peculiar stars.

The last three columns of Table 2 give the photometric spectral types, interstellar extinctions and distances of the stars. The lower case letters are used to indicate that our spectral types are determined from photometry using the calibration in MK spectral types. Interstellar extinctions were determined from color excesses:

$$A_V = R_{YV} \times E_{Y-V}, \tag{4}$$

where

$$E_{Y-V} = Y - V - (Y - V)_0. \tag{5}$$

The intrinsic color indices $(Y–V)_0$ were taken from Straižys (1992, Tables 66–69) corresponding to the given MK spectral type. The normal value of the coefficient $R_{YV} = 4.16$ was used. The distances r in parsecs, given in Table 2, are calculated by the equation

$$5 \log r = V - M_V + 5 - A_V. \tag{6}$$

Absolute magnitudes were taken from the MK type versus M_V tabulation by Straižys (1992), adjusted to the Hyades distance modulus of $V - M_V = 3.3$. The values of distances at $r > 300$ pc are rounded off to the nearest number multiple of 10.

Using the same method we have also classified all stars from Paper I. Their newly determined spectral types, A_V and r values are listed in Table 3.

Figure 4 shows the extinctions A_V plotted as a function of distances r for the 287 stars from Table 2 (dots) and for 95 stars from Table 3 (circles). 18 stars are common between the two lists – they are plotted according to their data from Table 2, since we consider that CCD photometry is more accurate than photoelectric photometry near the limiting magnitude.

It is evident that the extinction run with distance for the stars from both lists in the overlapping part of the graph is in perfect agreement. Paper I stars give information on extinction from the Sun up to ~500 pc, and the CCD stars extend the information to distances larger than 1 kpc. The graph exhibits the same extinction level from 300 pc up to 8 kpc. This confirms the conclusion of Paper I that the extinction in this direction originates in a single dust cloud which belongs to the Taurus-Auriga star forming complex.

The distance of the cloud can be estimated using the nearest reddened stars and the most distant unreddened stars, taking into account a distance error of 25%. The closest reddened star appears

Table 3. New photometric quantification, extinctions and distances of stars from Paper I. Numbers are from Paper I.

No.	Photom. sp. type	A_V mag	r pc	No.	Photom. sp. type	A_V mag	r pc
1.	b6 III-IV	1.25	570	43.	b3 IV	1.08	870
2.	b3 V	1.25	700	44.	b9 V	1.16	610
3.	b3 IV-V	1.21	950	45.	b6 IV	1.21	760
4.	g5 V	0.00	78	46.	b9 III	1.25	710
5.	g9 III	1.12	215	47.	b9 IV	0.92	760
6.	f6 V	0.00	161	48.	b7 IV	1.21	610
7.	b8 V	0.92	380	49.	k3 III	1.46	690
9.	f5 V	0.67	171	50.	b7 IV	1.16	680
10.	b3 V	0.96	320	51.	b8 V	1.25	720
11.	a3 V	0.62	340	52.	b7 V	1.25	500
12.	a1 V	0.92	243	53.	k1 III	0.62	217
13.	f2 V	0.75	242	54.	b8 V	0.96	640
14.	a0 V	1.04	610	55.	g2 V	0.00	157
15.	b9 III	0.79	225	56.	b8 V	1.16	540
16.	k0 III	1.00	550	58.	a0 IV-V	1.08	980
17.	g0 IV	0.92	154	59.	a7 V	0.58	730
18.	f2 III	0.79	153	62.	b6 IV	1.12	680
19.	b9.5 V	1.04	360	63.	a1 IV	1.25	780
22.	b4 V	1.46	450	64.	g6 IV	0.58	660
23.	a5 V	0.42	208	65.	f0 IV:	0.87	970
24.	b7 V	0.87	650	66.	b9 V	1.08	740
26.	a0 V	0.58	370	67.	a2 V	0.96	970
27.	g2 V	0.00	139	69.	a6 V	0.83	800
28.	b9.5 IV	0.75	232	70.	a0 IV-V	1.29	630
29.	b8.5 IV	1.16	680	71.	a3 V	0.83	890
30.	b6 IV	1.12	610	72.	a1 V	1.37	450
31.	b8.5 V	0.96	470	74.	f0 V	1.29	710
32.	b8 IV	1.41	680	75.	a8 V	1.16	670
34.	f2 IV-V	0.67	224	76.	f6 V	0.75	730
35.	k2 III	0.58	300	77.	a6 V	1.21	900
36.	f5 V	0.08	155	78.	a7 IV	1.12	1160
37.	k3.5 III	1.21	181	79.	a2 V	0.83	790
38.	b7.5 IV	1.46	550	81.	a1 V	1.21	450
39.	f8 V	0.00	137	82.	a5 V	1.12	760
40.	b7 V	1.33	510	83.	a7 V	0.79	660
42.	b7.5 V	1.25	420	84.	a5 V	0.87	940

Table 3 (continued)

No.	Photom. sp. type	A_V mag	r pc	No.	Photom. sp. type	A_V mag	r pc
85.	f0 V	0.96	900	102.	b8 V	0.92	310
86.	a8 V	0.87	1040	104.	a1 III	1.16	350
88.	a5 V	0.75	940	105.	f2 V	0.00	47
90.	f3 III-IV	0.25	214	107.	b3 IV	1.62	560
91.	b9 V	1.04	670	108.	g5 V	0.00	43
92.	a4 V	0.83	950	109.	g5 V	0.00	43
93.	k0 III	0.17	165	110.	g6 V	0.00	50
94.	b9 IV	0.96	580	111.	b5 V	1.16	390
95.	g9 IV	0.92	151	112.	b4 V	1.50	750
96.	b6 V	0.83	710	113.	a7 III:	1.04	241
98.	a4 V	0.79	550	115.	a1 V	0.79	239
99.	f9 V	0.00	90				

at 151 pc, and this gives a cloud distance of 151/0.75 = 201 pc. The most distant star with small reddening ($A_V < 0.25$ mag) is seen at 214 pc, and this gives a cloud distance of 214/1.25 = 171 pc. The average value of the two determinations is 186 pc. The statistical significance of this distance determination is relatively low, since it is based on the single reddened and unreddened stars. However, within rms errors this distance coincides with the distance of Taurus clouds determined in our earlier papers (Straižys & Meištas 1980, Meištas & Straižys 1981, Černis 1987).

The average extinction of all plotted stars, more distant than the cloud, is 1.15 mag with a scatter to both sides of ±0.6 mag. According to our estimate, the A_V error is about ±0.15 mag only. Consequently, the observed amplitude is a result of the real extinction variations across the investigated area. The largest extinction ($A_V = 2.33$ mag) is found for the k2 III star No. 110, but classification of this star is of low accuracy ($\sigma Q > 0.04$ mag).

The apparent changes of distribution of points along the distance in Figure 4 can be explained by several factors acting at the same time – the real fall of star density with increasing distance from the galactic plane, the real concentration of stars at the cluster distances and the apparent diminution of low luminosity stars and the stars affected by interstellar extinction due to the limiting magnitude effect.

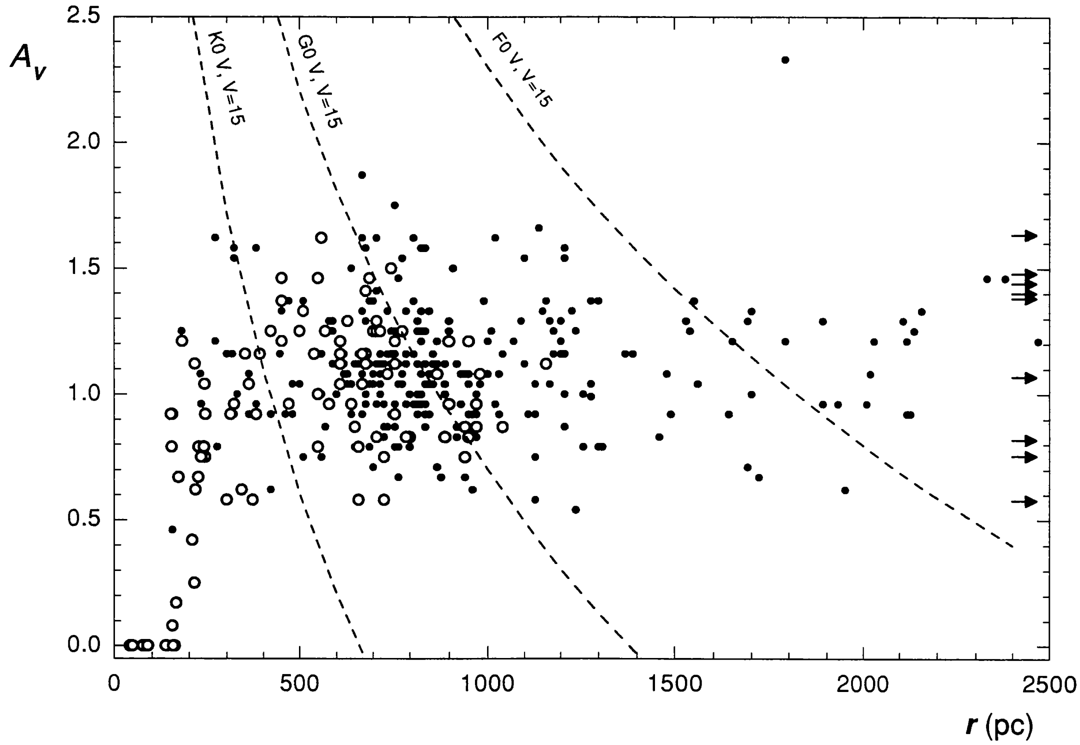

Fig. 4. The dependence of interstellar extinction A_V on distance. Dots are for CCD photometry and circles are for photoelectric photometry. The arrows at the right edge are for the stars whose distances exceed 2.5 kpc.

The last effect is demonstrated in Figure 4 by the limiting magnitude curves for $V = 15$ mag and for absolute magnitudes corresponding to F0 V, G0 V and K0 V stars. The stars of these spectral types in Figure 4 are seen only below the corresponding curves. Most of the stars more distant than 2 kpc are G5–K3 giants.

4. DISTANCES TO THE CLUSTERS AND CONCLUSIONS

For estimation of the distances to the clusters NGC 1750 and NGC 1758 we have used the lists of the cluster members from Paper III by Galadi-Enriquez et al. (1998c). In Table 3 we find 42 members of NGC 1750 and 40 members of NGC 1758 with sufficiently accurate classification and distances. The average distances of these stars are: 740±90 pc for NGC 1750 and 793±100 pc for NGC 1758. Thus, the distances of both clusters coincide within the determination errors.

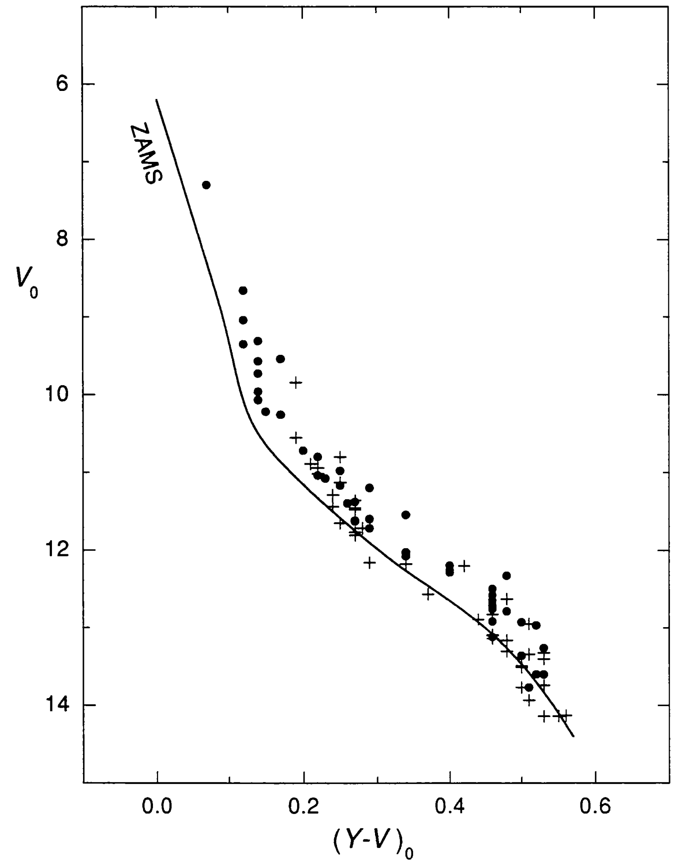

Fig. 5. Intrinsic color magnitude diagram for the members of the clusters NGC 1750 (dots) and NGC 1758 (crosses).

Both clusters show the same value of extinction $A_V = 1.06$ mag with the standard deviations of ±0.16 mag and ±0.19 mag for NGC 1750 and NGC 1758 members, respectively. This corresponds to $E_{B-V} = 0.34$ mag in full agreement with the value obtained by Galadi-Enriquez et al. (1998c).

Another possibility to measure distances of the clusters is based on their HR diagrams. Figure 5 shows the V_0 vs. $(Y–V)_0$ diagram for the cluster members. Here $V_0 = V - A_V$ and $(Y–V)_0 = Y–V - E_{Y-V}$, i.e., magnitudes and color indices of stars are plotted after exclusion of their individual extinctions and reddenings. 49 members of NGC 1750 are plotted as dots, and 40 members of NGC 1758 as crosses. The three brightest stars were too bright for CCD photometry: their classification was based on photoelectric photometry (Table 3). The line is the zero-age main sequence (ZAMS) fitted to the unevolved part of the cluster sequence with a true distance modulus of V_0–M_V = 9.4.

The following conclusions can be drawn from the HR diagram of the clusters.

(1) The stars of both clusters form the same sequence with the width about 1 mag in V_0. This means that distances of both clusters are more or less the same. The scatter of points may be caused by evolutionary effects, unresolved duplicity, different axial rotation velocities and rotation axes orientations or different chromospheric activity.

(2) The ZAMS line shows that the true distance modulus V_0–M_V = 9.4 mag is valid for the common sequence of the clusters. The stars brighter than $V_0 = 12$ show evolutionary deviation upwards. This distance modulus gives a common distance of both clusters of 758 pc, in good accordance with the average distances of the cluster stars.

(3) We also attempted to plot a HR diagram for both clusters without exclusion of interstellar extinction A_V and reddening E_{Y-V}. In this case the scatter of points in the sequence is much larger, which is undoubtedly caused by the reddening differences across the cluster faces.

The distance of the double cluster found in the present paper is larger than the preliminary distances of both clusters found in Paper I. This increase of distance may be explained by the fact that the limiting magnitude of Paper I was too low to reach the majority of member stars in both clusters. Thus, the distance determination was based mainly on evolved stars. Also, the accuracy of photoelectric photometry of Paper I for the stars of magnitudes 12–13, close to the limiting magnitude, was relatively low and their classification uncertain.

Thus, there are strong arguments that both clusters are at the same distance and show the same interstellar reddening. A similar conclusion has been made by Galadi-Enriquez et al. (1998a) in their first paper: it was not possible to distinguish the single or double nature of the cluster from their *UBVRI* photometry. However, proper motion studies of Galadi-Enriquez et al. (1998b,c) and Tian et al. (1998) show the presence here of two populations with somewhat different directions of movement. Thus, the presence of two clusters in this direction seems to be real. However, it is not excluded that they penetrate each other.

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