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CATALOGUE OF B-V MAGNITUDES AND SPECTRAL CLASSES OF 18,000 STAR--ETC(U)
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DEPARTMENT OF THE NAVY
NAVAL INTELLIGENCE SUPPORT CENTER
TRANSLATION DIVISION
4301 SUITLAND ROAD
WASHINGTON, D.C. 20390

(3)

CLASSIFICATION: UNCLASSIFIED

APPROVED FOR PUBLIC RELEASE, DISTRIBUTION UNLIMITED

TITLE: (6) Catalogue of B-V Magnitudes and Spectral Classes of 18,000 Stars (Katalog BV-Velichin i spektral'nykh klassov 18,000 zvezd)

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PAGES: 6

SOURCE: Naukova Dumka Publishing House, Kiyev, 1976
Pages 3-6

ORIGINAL LANGUAGE: Russian

TRANSLATOR: C

(14) NISC-TRANSLATION NO. — 3958

APPROVED f.T.k

DATE (11) 22 August 1977

(12) 7p.

407 682

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CATALOGUE OF B-V MAGNITUDES AND SPECTRAL CLASSES OF 18,000 STARS

(Katalog B V-Velichin i spektral'nykh klassov 18,000 zvezd, Akademiya Nauk UkSSR, Glavnaya Astronomicheskaya Observatoriya, Publishing house "Naukova Dumka", Kiyev, 1976)

The present catalogue compiled by the Main Astronomical Observatory of the Ukrainian Academy of Sciences (AS UkSSR) and the Abastuman Astrophysical Observatory of the Georgian Academy of Sciences (AS GSSR) is a continuation of [1] and is intended for the investigation of the structure of the galaxy. The photometric magnitudes of stars in six areas were determined at the Main Astronomical Observatory of AS UkSSR and the spectral classes, at the Abstuman Observatory of AS GSSR. The areas selected are located near the equitorial plane of the galaxy, in the direction of the Eagle, Swan, Casseopia, and Orion constellations. An open stellar constellation is at the center of each area which has a diameter of 4° 30'. The photoelectric magnitudes of stars in the open constellation were used as the photometric standard [5]. [3

Table 1 shows the equatorial (1900 epoch) and galactic coordinates of the centers of the areas, the number of stars in the areas, and the names of authors of photometric catalogues.

The B-V magnitudes up to $12^m.7$(V) were determined from the plates obtained using a two-chamber astrograph at the Main Geophysical Observatory (D = 120 mm, F = 700 mm) [2] with a 30 minute exposure time. The ORWO NP-27 plates with a 5 mm ZhS-12 film were used to determine the V magnitudes. The ORWO ZU-2 plates with a 5 mm SZS-22 filter were used to determine the B magnitudes. The plates and the filters were selected to provide an instrumental color system as close as possible to the B-V system.

The data obtained were compared with the B-V magnitudes of general stars from the catalogue [6]. Results of the comparison lead to the following equations:

$$V = -0^m.26 + 0^m.999 V_G + 0^m.59(B - V)_G \pm 0.055 \pm 0.05 \pm 0.017,$$

$$B = 0^m.119 + 0^m.989\, B_G + 0^m.033(B - V)_G \pm 0.049 \pm 0.005 \pm 0.016.$$

The subscript G refers to the Goloseyev system. The cumulative errors were found to be less than errors determining stellar magnitudes and were neglected. Corrections for the differences in azimuthal distances between the center and the edge of the plate measured at the edge of the area did not exceed $0^m.02$ and were not taken into account.

Measurements of plates (3 - 4 plates in each color) were made on the MF-2 microphotometer. The magnitudes of stars the images of which on plates were close to each other were not determined. The lens of the

Numbers in right margin indicate pagination in original text

two-chamber astrograph has a fairly large corrected field (the field error up to a distance of 4° from the center of the plate is practically absent [3]), therefore, no attempt was made to compensate for the field error.

The mean square errors in determining catalogue magnitudes per 1^m unit of V are given in Table 2. A comparison of the V- magnitudes in the catalogue with the photoelectric magnitudes from the catalogue in reference [6] is shown in Fig. 1. A similar comparison for the B - magnitudes is shown in Fig. 2. In both figures, the magnitudes from the catalogue in reference [6] are plotted along the horizontal axis, while the magnitudes determined at the main Astronomical Observatory are plotted along the vertical axis. [4

The spectral classification of stars was made in the Abastuman Astrophysical Observatory by M.B. Kalandadze (the areas around constellations NGC 2129, 6834, 6913, and 7654) and M.B. Metreveli (areas around constellations NGC 6802, 6823). Plates obtained at the meniscus telescope of the Abastuman Observatory (D = 700 mm, F = 2100 mm) with 8°,and 4° prisms (dispersion near H_γ is 166 and 666 A/mm, respectively) were used. The criteria for the two dimensional spectral classification were developed by N.B. Kalandadze based on the MKK system of Morgan, Keenan, and Kellman and are close to the classification criteria of the Abastuman system described in reference [4]. The temperature ranges were evaluated for stars up to $12^m.7$(V) and luminosity classes, up to $11^m.7$(V). When the 8° prism was used, the spectral classification was accurate within 0.1 of the spectral class and 1.0 of the luminosity class. The error in evaluating spectra obtained with the 4° prism reached 0.2 to 0.3 of the spectral class. [5

The maps (up to 16 maps for each area) made from the V plates and given at the end of the catalogue are intended for star identification. Each of the areas is divided into 1° wide zones. Within each zone, the number of stars increases from left to right in the direction of direct ascent. North is upward. The numbering of maps is the same for all areas and is shown in Fig. 3. The number of the star is written either to the right or above its image. A line identifies doubtful cases. The first column in the catalogue gives the order number of the star; second column, BD number; third column, B magnitude; fourth column, V magnitude and fifth column, spectral class. Within each area numbering is along the declination zones.

The photo-electric determinations from [5] are denoted by a star. A colon indicates doubtful determination ($\epsilon_{av} > 0^m.07$). For $\epsilon_{av} > 0^m.10$, the star luminosity is given with an accuracy up to tenths of a stellar magnitude. [6

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Table 1

Area	α1900	δ1900	l	b	n	Author
NGC 2129	$5^h55^m.0$	+ 23° 19'	186°6	+ 0°1	2047	Kuznetsov, V.I.
NGC 6802	19 26.1	+ 12 00	55.3	+ 0.9	2100	Guseva, N.G.
NGC 6823	19 38.9	+ 23 06	59.4	- 0.1	1779	Kheylo, Ye. S.
NGC 6834	19 47.9	+ 29 08	65.7	+ 1.2	4719	Guseva, N.G.
NGC 6913	20 20.3	+ 38 12	76.9	+ 0.6	3656	Kolesnik, L.N.
NGC 7654	23 20.0	+ 61 03	112.8	+ 0.5	3503	Voroshilov, V.I.

Table 2

	NGC 2129		NGC 6802		NGC 6823		NGC 6834		NGC 6913		NGC 7654	
N	B	V	B	V	B	V	B	V	B	V	B	V
7.00-7.99	-	0.015	-	-	-	-	-	-	0.036	-	-	-
8.00-8.99	0.043	0.046	-	-	-	0.045	-	-	0.047	0.046	0.033	0.025
9.00-9.99	0.042	0.044	0.041	0.035	0.026	0.038	0.045	0.030	0.038	0.043	0.032	0.029
10.00-10.99	0.039	0.038	0.044	0.036	0.034	0.051	0.038	0.044	0.034	0.044	0.034	0.038
11.00-11.99	0.041	0.042	0.048	0.040	0.048	0.045	0.045	0.039	0.047	0.044	0.040	0.044
12.00-12.99	0.048	0.051	0.052	0.050	0.053	0.055	0.050	0.043	0.046	0.051	0.047	0.047
13.00-13.99	0.050	-	-	-	0.053	-	-	-	0.048	-	0.056	0.054

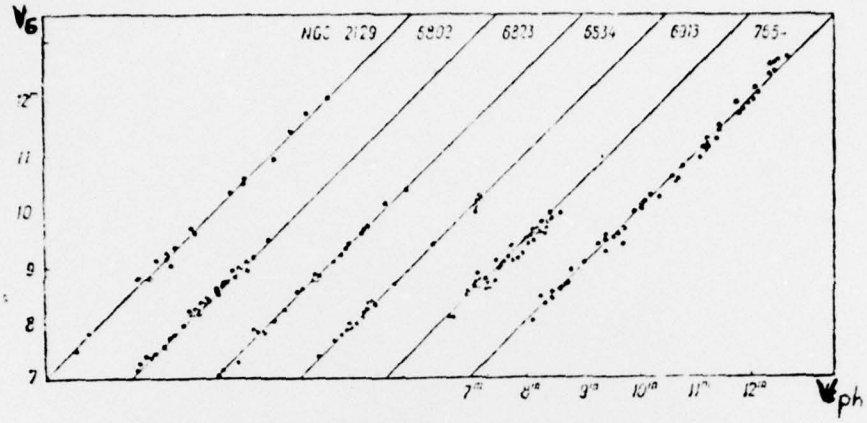

Fig. 1.

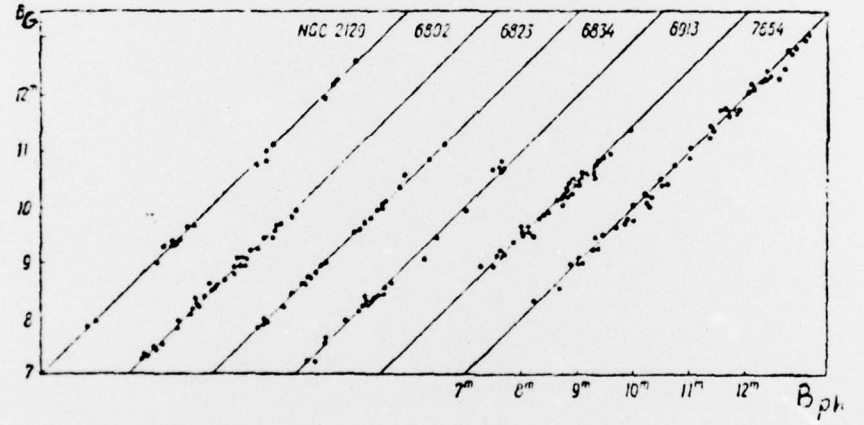

Fig. 2.

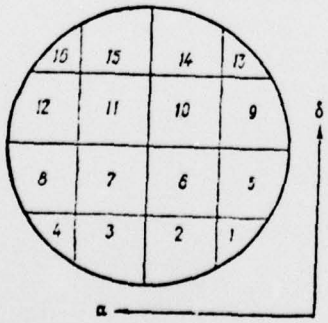

Fig. 3.

Area NGC 2129

$\alpha_{1900} = 05^h55^m \cdot 0$ $\quad \delta_{1900} = 23°19'$
$l = 186°.6$ $\quad b = +0°.1$

№	BD	B	V	Sp
		Zone +20°		
1		11.95	11.08	—
2		12.44	11.85	—
3	+20°1184	10.39	10.12	—
4	+20°1187	8.27	8.11	A5 V
5		11.80	10.38	K2:
6		12.08	11.57	F8
7		12.19	11.68	B8—A1:
8	+20°1193	10.64	10.29	F5:
9	+20°1192	10.30	10.19	A2:
10	+20°1194	10.26	10.14	A3 V
11		12.45	11.82	—
12		12.57	12.07	F8
13	+20°1196	10.58	10.45	B8 V
14	+20°1197	9.22	8.84	B
15		12.21	11.78	G0 V
16	+20°1200	11.22	9.84	G5:
17	+20°1205	11.26	9.80	G8 III
18		12.56	12.11	F6
19		12.51	11.54	K2
20	+20°1208	11.00	10.41	G5
21		12.22	11.71	—
22	+20°1210	10.08	9.71	F2
23	+20°1212	9.86	9.92	A0 V
24		11.73	11.16	G1
25		12.01	11.62	—
26		12.4	11.73	A1 V
27		12.43	12.01	—
28	+20°1215	10.42	9.50	—
29		11.92	11.30	G5
30	+20°1214	11.32	10.94	F8
31		11.72	11.15	G5
32		10.96	10.86	—
33		12.8	11.62	F3
34		12.22	11.55	A5 V
35		11.24	11.08	A5 V
36	+20°1217	10.11:	9.66	G0:
37		12.49	12.21	B8 V
38	+20°1220	11.03	10.30	—
39		12.41	12.08	F8
40	+20°1221	10.52	9.91	G5 III
41		12.73	12.36	B8 V
42		12.22	11.76	B3 III:
43		12.69	12.24	—
44		12.66	12.25	—
45		12.72	12.17	G0:
46		12.44	12.22	—
47		12.65	12.16	F6:
48		12.79	12.20	F0:
49		12.79	12.06	B2
50	+20°1226	10.55	10.34	—
51	+20°1227	10.35	9.41	—
52	+20°1231	11.27	10.64	K0 III
53		11.70	11.43	—
54	+20°1232	11.88	10.22	K3:
55		11.19	11.08	A2 V
56		12.40	11.95	A5 V
57		10.77	10.73	B8 V
58		12.53	12.32	—
59		12.01	11.6	—
60	+20°1240	10.30	10.12	—
61		11.79	11.56	—
62		11.89	10.73	—
63	+20°1250	11.41	11.18	B9 V
		Zone +21°		
1		12.77	11.02	M0:
2		12.29	11.76	—
3	+21°1016	9.81	9.70	B8 V
4	+21°1017	11.30	10.96	A3 V
5		12.34	11.56	G0:
6		12.65	12.29	A7:
7		12.67	12.06	—
8	+21°1019	10.43	10.27	F2
9	+21°1021	11.24	9.35	M
10		10.78	10.41	B0 V
11		12.16	11.79	F8
12		13.02	12.79	—
13		12.95	12.62	—
14		12.66	12.21	—