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FIRST BYURAKAN SPECTRAL SKY SURVEY. STARS OF LATE-SPECTRAL TYPES. XIV. Zone $+13^{\circ} \leq \delta \leq +33^{\circ}$

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We present the fourteenth list of faint late M and carbon type stars detected on the plates of the First Byurakan Spectral Sky Survey in the zone $+13^{\circ} \leq \delta \leq +33^{\circ}$ covering about 4736 sq. degrees. From 260 stars, 118 are newly detected objects: they are 19 carbon stars, 5 carbon star candidates and 94 M-type stars. Among 118 detected objects 73(57 PSC + 16 FSC) are unclassified IRAS sources. Accurate positions, spectral classes, red magnitudes, color indices and near-infrared *J*, *H* and *K* photometry are given, using several astronomical databases. Finding charts from DSS are given for the most interesting objects.

Key words: *stars:survey - stars:classification:carbon stars*

1. *Introduction.* The study of the faint stellar populations at high Galactic latitudes, particularly stars of the late spectral classes, is of prime importance to better understanding the Galaxy formation problems and properties of the halo of Galaxy. This paper is the continuation of the detection and listing of faint late M-type and C (carbon) stars at high Galactic latitudes on the basis of the low-dispersion material provided by the First Byurakan Spectral Sky Survey (FBS) [1]. Information about FBS and the description of the spectroscopic criteria for selecting M-type and C stars on the 1-m Schmidt telescope objective-prism plates has been given in earlier papers in this series [2,3]. In addition, subsequent spectroscopic and photometric studies of the newly discovered C and M stars are in progress [4,5].

2. *Previous surveys and investigations.* The main works devoted to the faint C and M stars studied at high Galactic latitudes are appeared in last decade and were reviewed in our paper [6] of the present series. We would like to briefly recall that before 1990's these objects were mostly provided by the Case-Western [7] and University Michigan [8] surveys. Subsequent spectroscopic and photometric investigations were reported then by various authors for C stars [9-12] found by the Case and Michigan surveys, and also for faint M-type stars [13,14] discovered by Stephenson's extensive search at the Warner and Swasey observatory [15].

Near-infrared photometry in combination with IRAS colors used by authors

[16-18] allowed to select C and M-type stars. IRAS Low-Resolution Spectra (LRS) in wavelength range 7-23 microns of unidentified infrared sources also allowed the detection of additional late-type stars [19-21].

In the past few years a growing number of faint high-latitude carbon stars (FHLC) have been discovered. For instance the APM survey by Irwin and Totten [22] resulted in the identification of 28 faint C stars selected through red $B-R$ indices and confirmed spectroscopically. Recently, Christlieb et al. [23] presented a list of ~400 new faint C stars at high latitudes, selected automatically on the Hamburg/ESO Schmidt telescope plates. A few faint Galactic latitude C stars were serendipitously identified [24-28]. Last studies led to discovery of the first few dwarf C stars found at high latitudes [29].

More recently, the list of the 39 extremely distant FHLC stars have been presented by Margon et al. [30] on the base of the Sloan Digital Sky Survey (SDSS) commissionning data. The selection of faint AGB (Asymptotic Giant Branch) cool stars in the Galactic Halo from a Two Micron All Sky Survey (2MASS [31]) database is in progress [32].

3. *Photographic material.* In this paper we present the results of search for five zones FBS:

a) zone $+13^\circ \le \delta \le +17^\circ$, $00^h00^m \le \alpha \le 03^h40^m$, $07^h50^m \le \alpha \le 16^h40^m$ and $21^h10^m \le \alpha \le 24^h00^m$.

b) zone $+17^\circ \le \delta \le +21^\circ$, $00^h00^m \le \alpha \le 03^h20^m$, $07^h20^m \le \alpha \le 18^h15^m$ and $22^h00^m \le \alpha \le 24^h00^m$.

c) zone $+21^\circ \le \delta \le +25^\circ$, $00^h00^m \le \alpha \le 03^h55^m$, $07^h00^m \le \alpha \le 18^h20^m$ and $22^h30^m \le \alpha \le 24^h00^m$.

d) zone $+25^\circ \le \delta \le +29^\circ$, $00^h00^m \le \alpha \le 03^h00^m$, $07^h00^m \le \alpha \le 19^h30^m$ and $22^h40^m \le \alpha \le 24^h00^m$.

e) zone $+29^\circ \le \delta \le +33^\circ$, $00^h00^m \le \alpha \le 02^h50^m$, $07^h00^m \le \alpha \le 18^h20^m$ and $21^h45^m \le \alpha \le 24^h00^m$.

Five zones ($+13^\circ \le \delta \le +33^\circ$) corresponded to about 4736 sq. deg. and covered 296 $4^\circ \times 4^\circ$ fields have been surveyed. From 1967 to 1980 530 photographic plates (Kodak IIF, IIaF and IIF (baked)) have been obtained by Markarian and collaborators. This photographic material was scrutinized three times in order to identify C and M stars.

4. *Late-type star identification.* The survey resulted in the identification of 260 objects, showing the spectral characteristics of very red stars, including 215 M-type stars, 38 C stars plus 5 C star candidates and 2 S type stars. Identifications and cross-identifications of these objects have been made using SIMBAD astronomical database at the CDS (http://simbad.u-strasbg.fr). For this purpose we selected on the Palomar Atlas a circular area of 3 arcmin radius with the nominal position of each object as center.

215 of these 260 very red star candidates appear in various catalogues [33-38]. Among them 73 objects are unclassified IRAS [39,40] sources. The data of the 45 stars are not contained in existing catalogues.

For 73 FBS stars identified as infrared sources, using SIMBAD database, a cross-identification with IRAS Faint Source Catalogue [40] sources was repeated. For this purpose we took advantage of remote access, over the Internet. to the XCATSCAN program for automatic IRAS source identification provided by the Infrared Processing and Analysis Center (IPAC) at Pasadena. This led us to generate $4' \times 4'$ field sky maps showing the positional uncertainty ellipse for the nearest IRAS FSC object at the nominal position of each FBS star as center. Comparison with visual sources provided the Palomar Digital Sky Survey (DSS) (http://skyview.gsfc.nasa.gov/) resulted in a cross-identification for all 73 FBS red stars. Note that 57 of them belong to the IRAS Point Source Catalogue [39] while the 16 remaining stars are IRAS Faint Source Catalogue [40] sources only. More specifically, identifications of detected faint FBS red stars with the IRAS FSC sources by help of XCATSCAN program are described in last two papers of the present series [3,6].

5. *The fourteenth list of red stars.* Data for the 118 newly discovered objects in the aforementioned five zones covered by the FBS plates are gathered in Table 1, successive column of which presents:

Column 1: Running list number, column 2: FBS designation, column 3, 4: Equatorial coordinates for J2000.0 determined using POSS images in combination with the USNO - A2.0 catalogue [41], colunm 5: Rough spectral subtype estimated from the visual inspection of the object spectral features displayed by our low-dispersion objective-prism plates, column 6, 7: The R magnitude and $B-R$ color index as given in the USNO - A2.0 catalogue [41], column 8: Cross-identification with IRAS PSC [39] and FSC [40] catalogue number, if any.

When necessary, notes on individual stars are given at the end of Table 1. We give finding charts, extracted from the DSS for all new C stars, C star candidates and other more interesting stars listed in Table 1.

Table 1

THE LIST OF THE NEW M AND C STARS

No	FBS Number	Coordinates α_{2000}	Coordinates δ_{2000}	Spec. Type	R mag.	$B-R$ color	IRAS PSC and FSC Identifications
1	2	3	4	5	6	7	8
1	0004+309	$00^h07^m12.9^s$	+31°15'26"	M5-M6	10.6	2.9	PSC 00045+3058
2	0014+326	00 17 24.4	+32 52 41	M7-M8	10.2	2.5	PSC 00148+3236
3	0018+213	00 21 33.4	+21 35 26	C (R)	9.3	1.6	
4	0029+235	00 31 47.8	+23 51 13	C (R)?	14.1	2.0	
5	0041+204	00 43 56.5	+20 45 18	M7-M8	12.9	1.8	PSC 00413+2028

Table 1 (continued)

1	2	3	4	5	6	7	8
6	0042+149	00 45 04.2	+15 10 12	M4-M5	12.3	3.0	PSC 00424+1453
7	0045+267	00 48 20.8	+27 03 26	M8-M9	13.7	2.6	PSC 00456+2647
8	0048+319	00 51 19.4	+32 16 02	M7-M8	12.6	2.3	
9	0101+285	01 03 47.3	+28 47 38	M5-M6	12.8	2.6	
10	0125+282	01 28 05.0	+28 31 34	M5-M6	10.9	2.5	PSC 01253+2816
11	0138 276	01 41 14.2	+27 54 40	M7-M8	11.7	2.7	FSC 01384+2739
12	0155+223	01 58 14.0	+22 34 11	M6-M7	12.2	2.0	
13	0212+239	02 15 06.5	+24 13 07	M6-M7	13.2	2.2	FSC 02122+2359
14	0232+258	02 35 41.5	+26 03 03	M6-M7	12.3	2.9	PSC 02327+2549
15	0237+225	02 40 13.7	+22 43 46	M7-M8	13.2	2.7	PSC 02373+2230
16	0240+218	02 43 16.4	+22 03 35	M8-M9	12.4	3.3	PSC 02404+2150
17	0250+167	02 52 53.7	+16 54 40	M7-M8	---	---	
18	0304+181	03 06 58.7	+18 20 44	M4-M5	10.7	2.7	PSC 03041+1809
19	0304+210	03 07 05.8	+21 14 11	M6-M7	11.9	2.7	PSC 03042+2102
20	0315+215	03 18 09.7	+21 43 53	M7-M8	12.5	3.5	PSC 03152+2133
21	0318+238	03 21 16.2	+23 58 51	C (R)	10.7	1.7	
22	0318+154	03 21 46.1	+15 36 13	M8-M9	17.5	0.8	
23	0324+236	03 27 07.7	+23 48 47	C (R)?	13.7	2.0	
24	0328+232	03 31 13.1	+23 22 59	M4-M5	11.9	2.9	
25	0331+229	03 34 13.4	+23 04 09	M5-M6	12.7	3.5	PSC 03311+2253
26	0703+211	07 06 45.5	+21 03 23	M5-M6	12.4	1.3	
27	0704+243	07 07 35.9	+24 13 20	M8-M9	18.6	0.5	PSC 07045+2418
28	0707+270	07 10 47.9	+26 59 02	C (N)	11.3	7.2	PSC 07076+2704
29	0707+310	07 10 48.3	+30 55 46	C (N)	11.0	4.7	
30	0709+232	07 12 20.9	+23 07 17	M6-M7	11.9	3.3	PSC 07093+2312
31	0727+227	07 30 31.5	+22 36 56	M4-M5	12.4	2.7	PSC 07275+2242
32	0729+269	07 32 32.7	+26 47 16	C (N)	11.7	2.6	
33	0731+274	07 34 23.9	+27 19 11	C (N)	12.0	4.4	
34	0756+234	07 59 35.8	+23 20 41	C (R)?	12.3	2.5	
35	0826+185	08 29 15.1	+18 23 07	C (N)?	11.3	3.8	FSC 02863+1833
36	0904+213	09 07 12.0	+21 08 52	C (R)	11.6	2.1	
37	0910+197	09 13 31.8	+19 34 22	M7-M8	11.4	4.6	
38	0930+252	09 33 06.5	+25 03 45	M6-M7	12.1	2.5	PSC 09302+2517
39	1043+213	10 46 05.8	+21 02 26	C (R)	11.2	2.3	
40	1043+253	10 46 38.6	+25 03 06	C (R)	13.1	1.8	
41	1116+243	11 19 29.4	+24 05 08	M8-M9	---	---	
42	1440+263	14 42 48.4	+26 10 31	C (R)	12.4	2.6	
43	1516+151	15 18 40.2	+14 59 03	C (N)	11.1	3.8	
44	1612+262	16 15 03.4	+26 07 50	C (R)	13.1	2.2	
45	1615+188	16 17 34.8	+18 44 31	M3-M4	13.1	2.1	
46	1619+160	16 21 29.3	+15 52 57	C (R)	11.8	2.5	
47	1712+227	17 14 28.6	+22 39 41	M5-M6	11.4	2.5	PSC 17123+2243
48	1715+172	17 17 29.2	+17 13 57	C (R)	12.2	2.7	
49	1717+181	17 19 34.0	+18 07 09	M7-M8	12.2	2.8	PSC 17173+1810
50	1725+196	17 27 35.2	+19 36 05	M6-M7	12.2	2.1	PSC 17254+1938
51	1728+216	17 30 53.7	+21 38 41	C (R)	11.1	1.9	
52	1728+210	17 30 54.1	+21 02 01	M6-M7	12.8	2.0	FSC 17287+2104
53	1740+230	17 42 52.7	+23 00 58	M6-M7	12.5	3.0	PSC 17407+2302
54	1740+196	17 42 54.4	+19 38 09	M4-M5	12.5	2.3	
55	1742+190	17 44 34.1	+19 00 38	M4-M5	12.8	2.7	

Table 1 (continued)

1	2	3	4	5	6	7	8
56	1743+294	17 45 44.9	+29 27 36	M6-M7	12.1	2.5	PSC 17438+2928
57	1745+239	17 47 52.6	+23 56 15	M5-M6	12.5	2.7	PSC 17458+2357
58	1745+200	17 48 05.2	+20 00 26	M4-M5	12.9	2.6	
59	1748+325	17 50 28.7	+32 30 47	M4-M5	12.4	1.5	FSC 17486+3231
60	1749+327	17 51 04.3	+32 42 56	M3-M4	11.0	2.0	PSC 17492+3243
61	1751+266	17 53 38.5	+26 39 25	M4-M5	11.4	3.0	PSC 17516+2639
62	1752+253	17 54 05.1	+25 22 40	M5-M6	12.3	2.6	FSC 17520+2523
63	1752+174	17 54 12.3	+17 28 55	M4-M5	11.7	3.8	
64	1753+218	17 55 10.3	+21 49 57	M7-M8	16.2	1.9	
65	1753+251	17 55 10.4	+25 06 17	M7-M8	12.5	3.1	PSC 17531+2506
66	1753+186	17 55 14.9	+18 40 07	M7-M8	11.8	2.6	PSC 17530+1840
67	1754+259	17 56 48.3	+25 54 22	M6-M7	11.6	2.0	FSC 17547+2554
68	1756+319	17 58 13.4	+31 55 10	M4-M5	11.4	2.5	PSC 17563+3155
69	1756+226	17 58 15.6	+22 35 51	C (N)	12.0	3.7	
70	1800+212	18 02 24.7	+21 15 47	M6-M7	12.2	2.5	PSC 18002+2115
71	1800+232	18 03 00.9	+23 14 34	M6-M7	12.9	2.8	FSC 18009+2314
72	1803+289	18 05 29.9	+23 58 38	M4-M5	12.2	2.1	FSC 18034+2358
73	1804+218	18 06 17.6	+21 53 21	M5-M6	11.9	2.3	FSC 18041+2152
74	1804+272	18 07 00.5	+27 17 39	M5-M6	16.7	1.3	PSC 18050+2717
75	1805+270	18 07 09.5	+27 05 47	M5-M6	12.3	2.7	FSC 18051+2705
76	1805+240	18 07 33.5	+24 03 55	M4-M5	11.3	1.9	PSC 18054+2403
77	1806+282	18 08 06.3	+28 17 36	M7-M8	12.6	3.5	PSC 18061+2817
78	1806+221	18 09 05.1	+22 07 41	M8-M9	12.5	2.2	PSC 18069+2207
79	1807+273	18 09 30.8	+27 20 54	M6-M7	12.7	3.2	PSC 18074+2720
80	1808+313	18 09 54.7	+31 21 46	M5-M6	12.6	2.8	PSC 18080+3121
81	1809+220	18 11 23.1	+22 04 16	M5-M6	11.9	1.8	PSC 18092+2203
82	1810+220	18 12 18.8	+22 04 52	M5-M6	12.2	2.4	FSC 18102+2204
83	1812+292	18 14 53.4	+29 16 34	M5-M6	11.8	2.7	FSC 18129+2915
84	1813+230	18 15 29.4	+23 03 07	M4-M5	10.5	3.3	PSC 18134+2302
85	1813+282	18 15 30.7	+28 15 27	M4-M5	11.7	2.4	PSC 18135+2814
86	1813+244	18 15 43.1	+24 25 46	M6-M7	12.9	3.2	PSC 18136+2424
87	1814+242	18 16 17.0	+24 14 14	M4-M5	12.6	1.1	
88	1814+223	18 16 55.0	+22 23 31	M6-M7	13.2	1.9	
89	1815+283	18 17 04.0	+28 23 42	M5-M6	12.3	2.7	PSC 18151+2822
90	1821+324	18 22 55.6	+32 31 12	M5-M6	11.4	3.1	PSC 18210+3229
91	1822+288	18 24 44.3	+28 52 13	M5-M6	12.0	3.5	PSC 18227+2850
92	1822+321	18 24 45.7	+32 12 37	M5-M6	11.0	3.4	PSC 18228+3210
93	1825+272	18 27 10.1	+27 14 38	C (R)	12.1	1.5	
94	2114+140	21 16 34.6	+14 17 21	M2-M3	11.0	3.4	PSC 21141+1404
95	2122+137	21 25 19.0	+13 58 32	M7-M8	12.2	2.4	FSC 21229+1345
96	2123+158	21 25 44.0	+16 02 11	M6-M7	11.8	2.5	
97	2127+165	21 29 47.4	+16 46 38	M5-M6	13.0	2.2	
98	2134+138	21 37 11.0	+14 01 06	M6-M7	13.1	2.8	
99	2158+197	22 01 17.4	+20 01 49	C (R)	12.5	1.5	
100	2159+182	22 02 09.3	+18 31 04	M7-M8	10.9	3.6	
101	2203+198	22 05 43.8	+20 08 08	C (R)	13.2	1.9	
102	2205+185	22 07 48.0	+18 44 44	M4-M5	11.9	2.2	
103	2207+185	22 09 55.8	+18 47 55	M7-M8	10.4	3.5	
104	2218+324	22 20 21.6	+32 42 48	M6-M7	12.5	0.5	
105	2219+135	22 21 58.1	+13 46 38	M7-M8	14.4	3.2	

Table 1 (the end)

1	2	3	4	5	6	7	8
106	2235+301	22 37 34.8	+30 22 34	M4-M5	11.8	2.6	PSC 22352+3006
107	2238+193	22 41 17.0	+19 36 01	C (R)?	13.2	1.9	
108	2251+223	22 54 12.0	+22 39 35	M8-M9	11.3	3.5	PSC 22517+2223
109	2305+235	23 07 36.3	+23 46 56	M8-M9	14.1	2.9	PSC 23051+2330
110	2305+290	23 07 48.1	+29 17 56	M5-M6	14.3	2.9	PSC 23053+2901
111	2309+280	23 12 24.5	+28 17 03	M4-M5	12.3	2.5	PSC 23099+2800
112	2338+195	23 31 06.5	+19 49 03	M4-M5	11.1	3.1	PSC 23285+1932
113	2338+247	23 40 49.0	+25 02 35	M8-M9	12.4	2.2	PSC 23383+2445
114	2340+172	23 42 56.4	+17 30 25	M7-M8	11.5	2.8	PSC 23404+1713
115	2343+301	23 46 17.1	+30 24 47	M5-M6	12.5	2.4	PSC 23437+3008
116	2348+230	23 50 42.0	+23 19 41	M8-M9	14.3	2.2	FSC 23481+2303
117	2349+181	23 52 08.2	+18 25 00	M4-M5	11.2	2.8	PSC 23496+1808
118	2354+238	23 57 27.4	+24 07 31	M6-M7	11.7	2.0	PSC 23548+2350

Notes to Table 1

0250-167 Object is not seen on Palomar Atlas E and O charts, approximate coordinates are provided and assumed position is shown on the DSS finding chart. The USNO - A2.0 [41] catalogue contained no data for this object. A possible Mira type varable star.

0318+154 A possible binary system.

0704+243 IRAS Low-Resolution Spectra (LRS) classification 29 [39] indicate a present of the dust shell around this object. Probable, binary system.

0707+270 A large $B-R$ (7.2) colour index indicates a possible existence of a dense gas-dust shell around this object.

1116+243 Object is not seen on Palomar Atlas E and O charts, consequently, approximate coordinates are provided and assumed position is shown on the DSS finding charts. The USNO - A2.0 [41] catalogue contained no data for this object. A possible Mira type variable star.

1619+160 A star of R0 - R1 subtype.

1728+210 ROTSE1 J173053.98 + 210200.4 [42].

1740+230 ROTSE1 J174252.68 + 230104.4 [42].

1743+294 ROTSE1 J174544.94 + 292733.0 [42].

1749+327 ROTSE1 J175104.11 + 324256.9 [42].

1751+266 ROTSE1 J175338.23 + 263922.9 [42].

1753+186 In IRAS PSC [39] catalogue this object has identification with source SSC 17530+1840.

1754+259 ROTSE1 J175648.63 + 255417.7 [42].

1800+232 ROTSE1 J180300.95 + 231437.7 [42].

1804+272 A probable binary system.

1807+273 In IRAS PSC [39] catalogue this object has identification with source SSC 18074+2720.

1808+313 ROTSE1 J180955.10 + 312147.2 [42].

1812+292 ROTSE1 J181453.28 + 291633.9 [42].

1813+244 ROTSE1 J181543.02 + 242549.0 [42].

1815+283 ROTSE1 J181704.17 + 282343.1 [42].

1821+324 ROTSE1 J182255.58 + 323115.1 [42].

1822+288 ROTSE1 J182444.17 + 285214.7 [42].

2218+324 A probable binary system.

2338+247 A probable binary system.

2348+230 1RXS J235048.1 + 231939 [43].

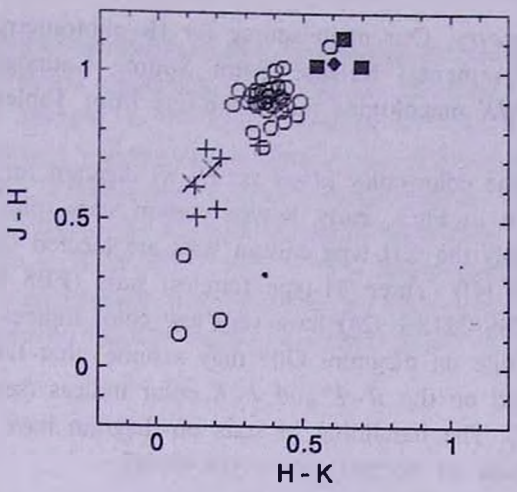

Fig.1. The color-color ($J-H$ vs. $H-K$) diagram for 55 FBS red stars. Symbols represents: circles - M-type stars, plus sign - C(R) stars, crosses - C(R)? stars, filled squares - C(N) stars, lozanges - C(N)? stars.

Table 2

IR DATA FOR 55 FBS STARS

FBS Number	J mag.	$J-H$ mag.	$H-K$ mag.	FBS Number	J mag.	$J-H$ mag.	$H-K$ mag.
0018+213	7.827	0.507	0.134	1752+174	7.574	0.898	0.363
0029+235	12.537	0.620	0.115	1754+259	7.900	0.797	0.327
0041+204	6.816	0.921	0.382	1756+319	7.855	0.935	0.356
0048+319	9.334	0.938	0.277	1803+289	7.855	0.935	0.356
0101+285	8.293	0.890	0.388	1804+218	7.537	0.921	0.379
0155+223	5.999	0.920	0.420	1808+313	7.242	0.814	0.387
0212+239	8.022	0.942	0.370	1812+292	7.265	0.896	0.333
0237+225	6.728	0.953	0.412	1813+282	6.973	0.937	0.336
0304+210	6.186	0.977	0.359	1813+244	6.378	0.910	0.431
0318+238	8.529	0.535	0.204	1814+242	11.497	0.112	0.076
0318+154	16.109	0.161	0.216	1814+223	8.046	0.918	0.365
0328+232	8.082	1.007	0.403	1821+324	6.567	0.948	0.411
0331+229	6.740	1.016	0.429	1822+288	5.993	0.949	0.441
0707+310	8.156	1.022	0.546	1822+321	6.073	0.944	0.389
0709+232	6.958	0.919	0.392	2122+137	7.381	0.896	0.366
0727+227	6.966	0.834	0.433	2123+158	8.169	0.746	0.361
0729+269	9.851	1.022	0.696	2127+165	8.286	0.921	0.318
0731+274	9.286	1.117	0.637	2203+198	11.202	0.707	0.217
0826+185	8.727	1.033	0.604	2218+324	11.233	0.377	0.091
0910+197	9.043	1.090	0.590	2235+301	6.647	0.902	0.348
0930+252	6.650	0.886	0.394	2238+193	10.498	0.671	0.186
1043+213	9.381	0.738	0.167	2305+290	7.100	0.904	0.489
1615+188	10.041	0.889	0.256	2309+280	6.780	0.898	0.369
1619+160	9.934	0.752	0.347	2340+172	6.188	0.901	0.416
1715+172	10.721	0.611	0.128	2348+230	8.484	0.858	0.478
1717+181	5.660	0.867	0.424	2349+181	5.964	0.899	0.309
1748+325	8.349	0.872	0.371	2354+238	6.570	0.890	0.441
1749+327	7.327	0.923	0.339				

6. *IR-Photometry.* Our main source for IR-photometry is the 2MASS in its Second Incremental Release Point Source Catalogue (PSC) [31], which provided *JHK* magnitudes for 55 objects from Table1. The data are listed in Table 2.

Fig.1 displays the color-color ($J-H$ vs. $H-K$) diagram for objects Table 2. As can be seen in Fig.1, early R-type carbon stars (plus sign) occupy a region, where usually the CH-type carbon stars are located (see, for example, Fig.5a, b of paper [4]). Three M-type (circles) stars (FBS 0318 + 154, FBS 1814 + 242, and FBS 2218 + 324) have very low color indices and are located on the lower-left side on diagram. One may assume, that these three objects are M-dwarfs, based on the $R-K$ and $J-K$ color indices (see, for details the Fig.4 of paper [5]). The remaining M stars on diagram have $J-H$ and $H-K$ color indices, similar to normal giants [14,44-46].

7. *Conclusion.* In the FBS $+13^\circ \le \delta \le +33^\circ$ zone we have identified 260 red stars, 118 of which are newly discovered objects: they are 19 carbon stars, 5 carbon star candidates and 94 M-type stars. 73 are cross-identified with unclassified IRAS point sources. The lack of optical counterpart on Palomar E and O maps for two stars (FBS 0250+167 and FBS 1116+243) indicates a large brightness variability of these objects, making them bona fide long-period Mira candidates.

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ПЕРВЫЙ БЮРАКАНСКИЙ СПЕКТРАЛЬНЫЙ ОБЗОР НЕБА. ЗВЕЗДЫ ПОЗДНИХ СПЕКТРАЛЬНЫХ КЛАССОВ. XIV. ПОЛОСА $+13^\circ \le \delta \le +33^\circ$

К.С.ГИГОЯН[1], Г.В.АБРАМЯН[1], М.АЗЗОПАРДИ[2], Н.МАУРОН[3], Д.РУССЕЙ[2], П.СИНАМЯН[1]

Приводится четырнадцатый список слабых углеродных и М-звезд, выявленных на пластинках Первого Бюраканского спектрального обзора неба в полосе $+13^\circ \le \delta \le +33^\circ$ с площадью около 4736 кв. градусов на

высоких Галактических широтах. Из 260 отобранных звезд 118 обнаружены впервые. 19 объектов являются углеродными звездами, 5 - кандидатами в углеродные звезды и 94 звезд класса М. Из 118 объектов 73 идентифицированы с неизвестными точечными источниками IRAS, причем 57 являются PSC-источниками, а 16 FSC-источниками. Приводятся точные координаты, спектральные классы, звездные величины в красном цвете, показатели цветов, а также *J*, *H*, *K* ИК-фотометрия, для чего были использованы современные астрономические базы данных. Для наиболее интересных объектов даются карты отождествления из DSS.

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FINDER CHARTS FOR FBS RED STARS

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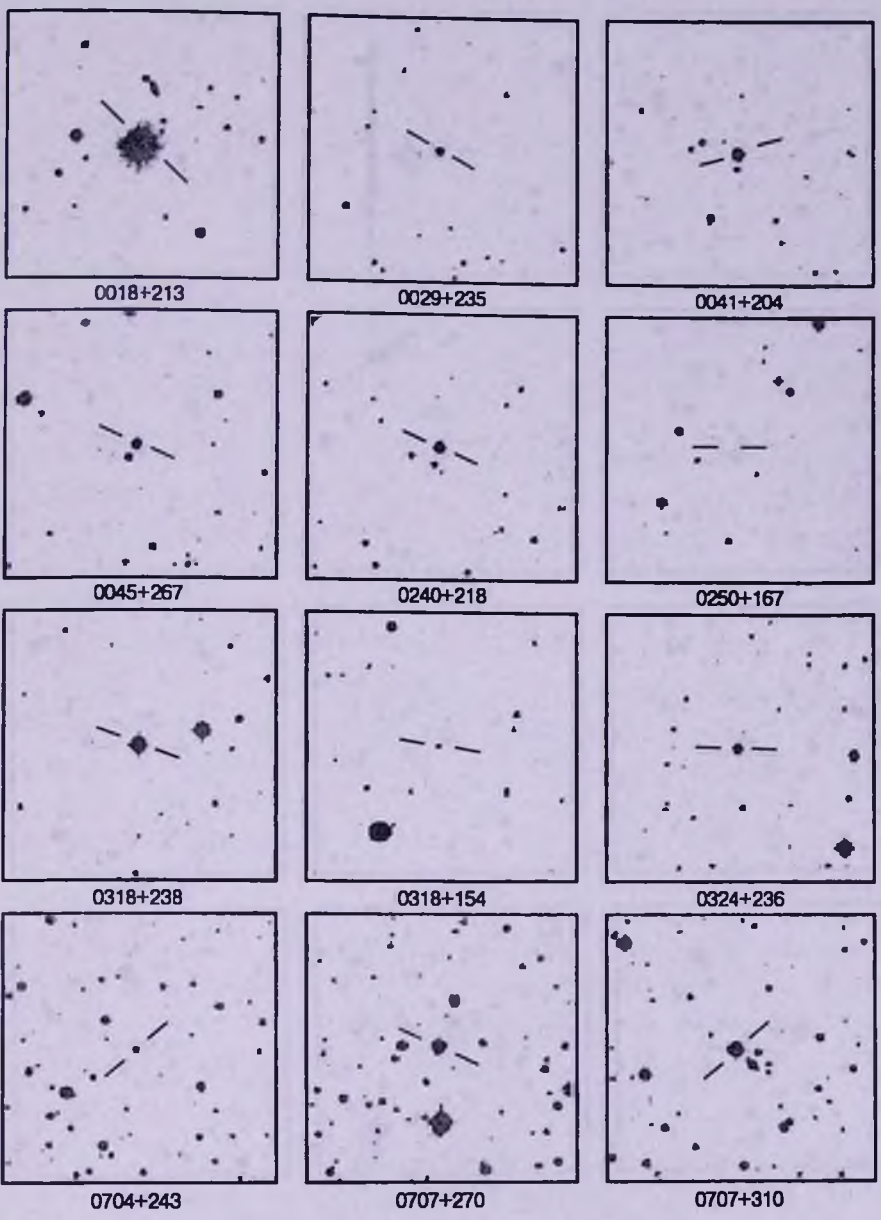

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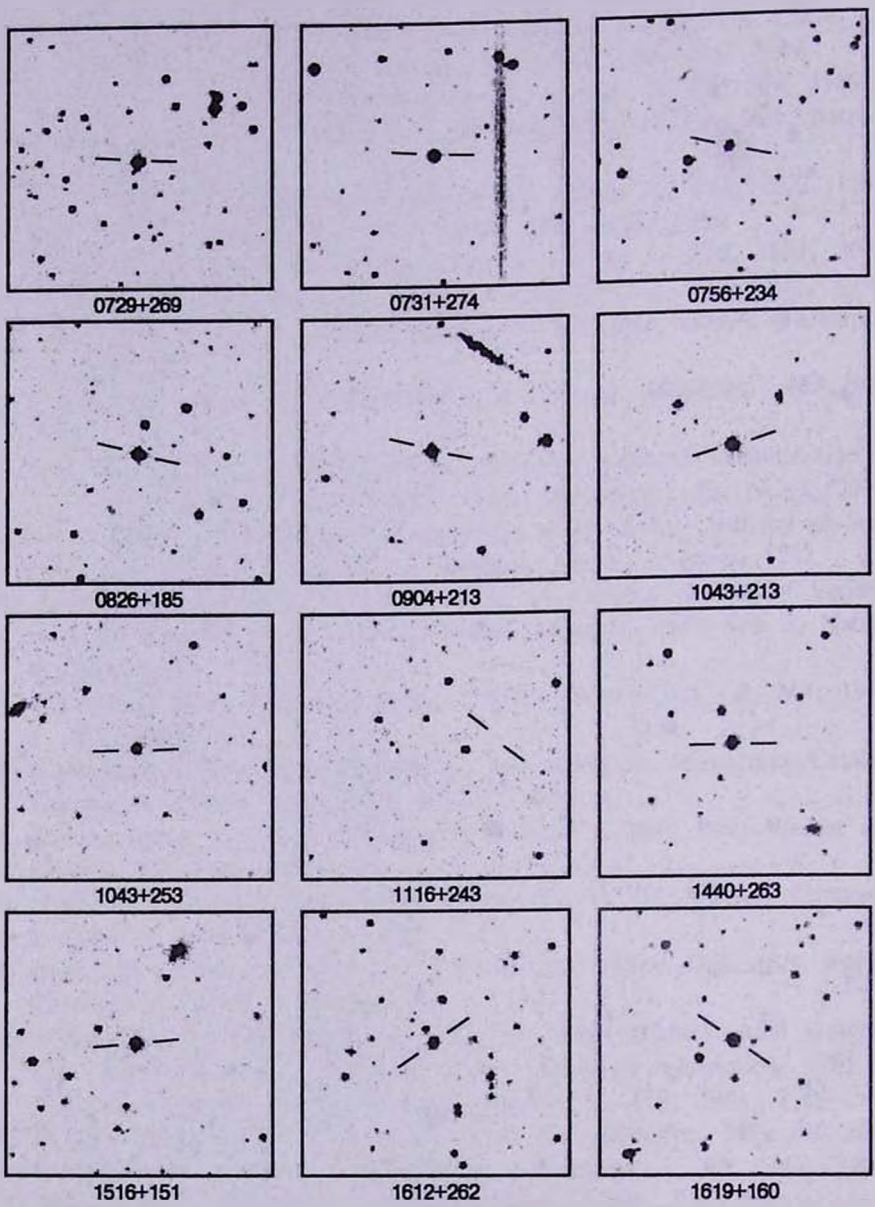

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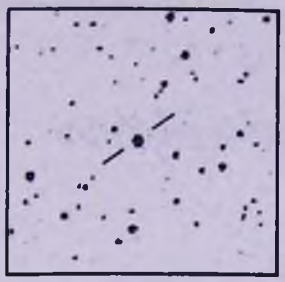
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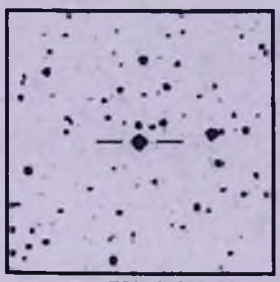
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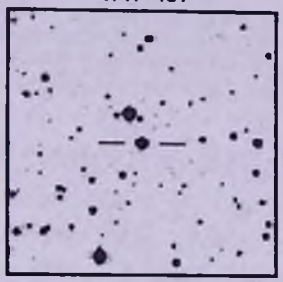
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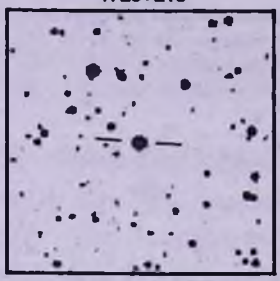
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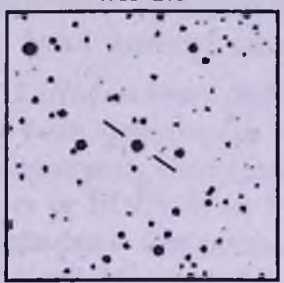
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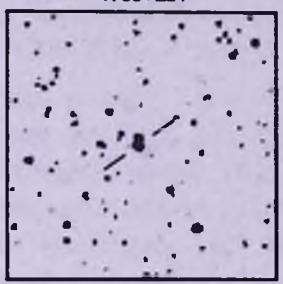
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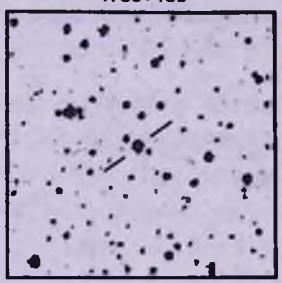
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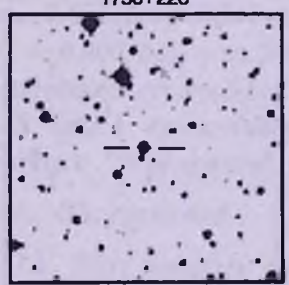
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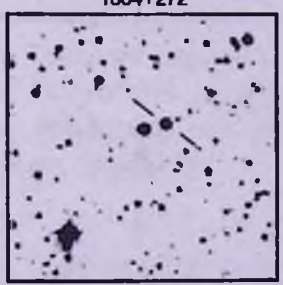
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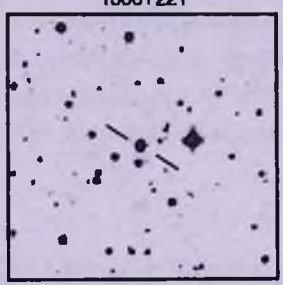
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FINDER CHARTS FOR FBS RED STARS

(North is Up, East is Left, 5' x 5')