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NEW VARIABLE STARS IN THE NORTHERN MILKY WAY

The following is an evaluation of a $20° \times 15°$ area centered at 22^h42^m, $+60°$ (1950) in my series of Milky Way fields. Four fields have been previously described (Dahlmark 1982, 1986, 1993, 1996).

Nineteen plate pairs (Kodak 103aD + GG11 and 103aO) were exposed between 1967 and 1982, and forty-four were exposed on Kodak TechPan 4415 + GG495 filter in the years 1985 to 1996. Ten plate pairs were examined using a blink comparator as well as four stereo comparators in the method described by Dahlmark (1982, 1993). Magnitudes for the comparison stars were taken from the Guide Star Catalogue (GSC).

In this field 60 variables were found, of which 57 appear to be new. Table 1 shows positions and identifications. The coordinates were extracted from either the GSC (source code G), the U.S. Naval Observatory A1.0 catalogue (code A), or using the Goddard SkyView facility (code S, Scollick 1997). The lightcurves are based on 64 magnitude estimates for each star. From them the magnitude range, colour-index, provisional variability type, epoch of maximum, and period have been determined. These are collected in Table 2. An asterisk next to the star name indicates a note at the bottom of the table.

The finding charts are based on 200/210/300mm Schmidt camera photographs taken when the variable stars were at maximum light.

Table 1. Positions and identifications, LD 221–280

Name	RA (2000)	Dec	s	GSC	IRAS	Remarks
LD 221	21 13 49.9	+61 51 23	A	4248-0077	21126+6138	
LD 222	21 19 27.2	+61 26 13	A		21182+6113	
LD 223	21 24 11.8	+59 27 49	A			
LD 224	21 25 02.0	+61 59 36	A	4252-0770	21237+6146	
LD 225	21 27 27.3	+62 53 24	A		21262+6240	
LD 226	21 33 08.2	+61 46 29	A	4249-0543	21318+6133	
LD 227	21 34 31.9	+58 51 03	A			StRS 407
LD 228	21 35 55.0	+54 49 09	A			
LD 229	21 36 50.8	+54 40 58	A		21352+5427	
LD 230	21 40 06.2	+59 35 43	A		21386+5922	
LD 231	21 44 03.8	+66 39 12	A		21429+6625	
LD 232	21 48 25.2	+58 00 53	A		21468+5747	
LD 233	21 48 17.9	+62 38 07	A		21469+6224	
LD 234	21 50 59.2	+59 27 39	A		21494+5913	
LD 235	21 52 19.4	+62 48 40	A		21509+6234	
LD 236	21 53 43.3	+52 21 26	A		21519+5207	
LD 237	21 54 44.1	+63 56 22	A			
LD 238	21 55 15.4	+63 43 33	G	4266-3002	21538+6329	
LD 239	21 55 29.1	+63 56 24	A	4270-0646	21540+6341	see note
LD 240	21 57 26.1	+64 12 49	A		21560+6358	
LD 241	21 57 47.4	+64 35 26	A			
LD 242	21 58 08.6	+66 00 03	A			

Table 1. Positions and identifications, LD 221–280 (cont'd.)

Name	RA (2000)	Dec	s	GSC	IRAS	Remarks
LD 243	21 58 25.6	+63 43 28	A	4266-2925	21570+6329	
LD 244	22 01 10.5	+66 10 30	G	4275-2480		
LD 242	21 58 08.6	+66 00 03	A			
LD 243	21 58 25.6	+63 43 28	A	4266-2925	21570+6329	
LD 244	22 01 10.5	+66 10 30	G	4275-2480		
LD 245	22 01 36.7	+62 59 27	A		22001+6244	
LD 246	22 02 40.4	+61 37 30	G	4263-0653		
LD 247	22 03 21.3	+62 18 29	A		22018+6203	CGCS 5565
LD 248	22 04 21.7	+64 10 44	S		22029+6356	
LD 249	22 04 30.0	+62 04 48	A	4267-0544	22029+6150	CGCS 5569
LD 250	22 06 33.8	+64 39 59	A		22051+6425	
LD 251	22 06 59.8	+65 28 10	A	4271-0380	22056+6513	
LD 252	22 08 33.6	+63 34 54	A	4267-2710		
LD 253	22 11 00.2	+59 38 43	A	3981-0582	22093+5923	
LD 254	22 11 37.4	+60 05 32	A		22099+5950	
LD 255	22 14 26.1	+60 04 31	S		22127+5949	CGCS 5613
LD 256	22 15 39.4	+66 17 53	A			
LD 257	22 20 14.5	+60 46 14	A			
LD 258	22 22 30.0	+64 09 26	A		22208+6354	
LD 259	22 23 06.5	+56 42 50	A		22212+5627	CGCS 5644
LD 260	22 23 40.5	+58 44 56	A			24P 116
LD 261	22 26 40.3	+58 31 35	A	3995-0119	22248+5816	
LD 262	22 32 14.9	+55 10 52	A		22302+5455	
LD 263	22 35 42.0	+64 39 57	A		22339+6424	
LD 264	22 37 36.0	+61 16 09	A		22357+6100	
LD 265	22 42 54.6	+65 58 53	A		22411+6543	
LD 266	22 47 46.2	+55 18 13	A		22457+5502	GY Lac
LD 267	22 50 54.0	+62 04 43	A		22489+6148	
LD 268	22 51 32.9	+58 25 57	A		22495+5810	
LD 269	23 15 26.1	+57 27 05	A		23132+5710	
LD 270	23 18 10.6	+65 52 44	A		23160+6536	
LD 271	23 18 36.0	+64 08 52	A		23164+6352	
LD 272	23 20 00.9	+65 32 08	A		23178+6515	
LD 273	23 23 01.9	+56 15 25	S		23207+5558	
LD 274	23 25 31.3	+55 22 07	G	4003-1940	23232+5505	
LD 275	23 26 27.2	+53 53 07	A		23241+5336	see note
LD 276	23 29 25.1	+64 59 40	A		23271+6443	CGCS 5885
LD 277	23 37 39.7	+58 50 47	S		23352+5834	see note
LD 278	23 46 10.0	+58 40 17	A		23437+5823	
LD 279	23 49 13.4	+54 54 04	A		23467+5437	
LD 280	23 52 09.1	+66 34 50	A		23496+6618	see note

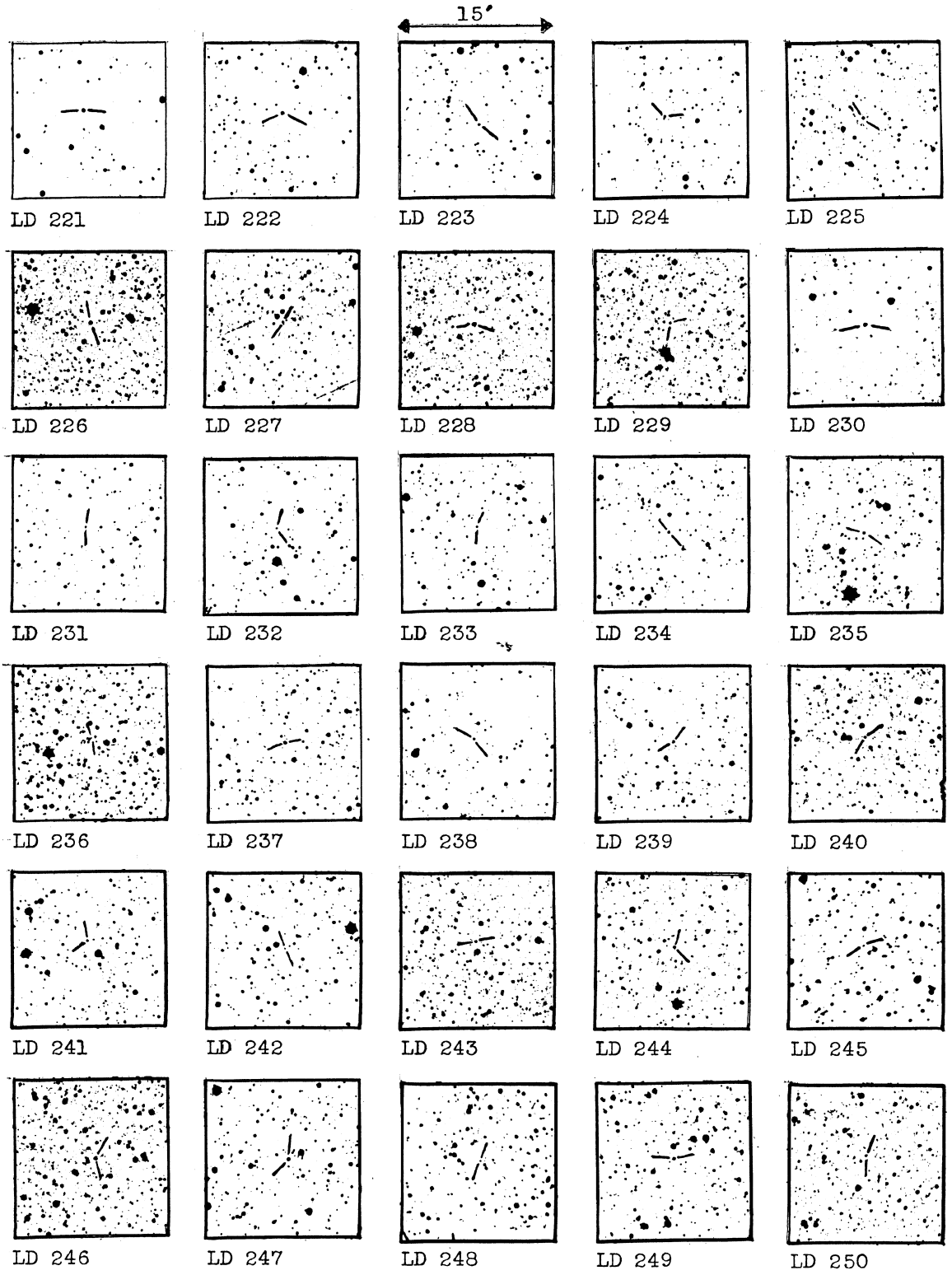
Notes to Table 1:

LD 239 CGCS 5508, also Cl* Berkeley 93 SSWZ 154 from Saurer *et al.* (1994); from plates on five nights and CCD frames on two nights, they find: $14.6 < V < 15.4$, $B–V = 3.8$.

LD 275 V354 Cas: GCVS4 position error; ID verified on MVS no. 281.

LD 277 spectral type M5/7 (Dolidze 1975).

LD 280 IRC +70202 = TASV J2352+665 (Collins 1996).


15′
LD 221
LD 222
LD 223
LD 224
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LD 243
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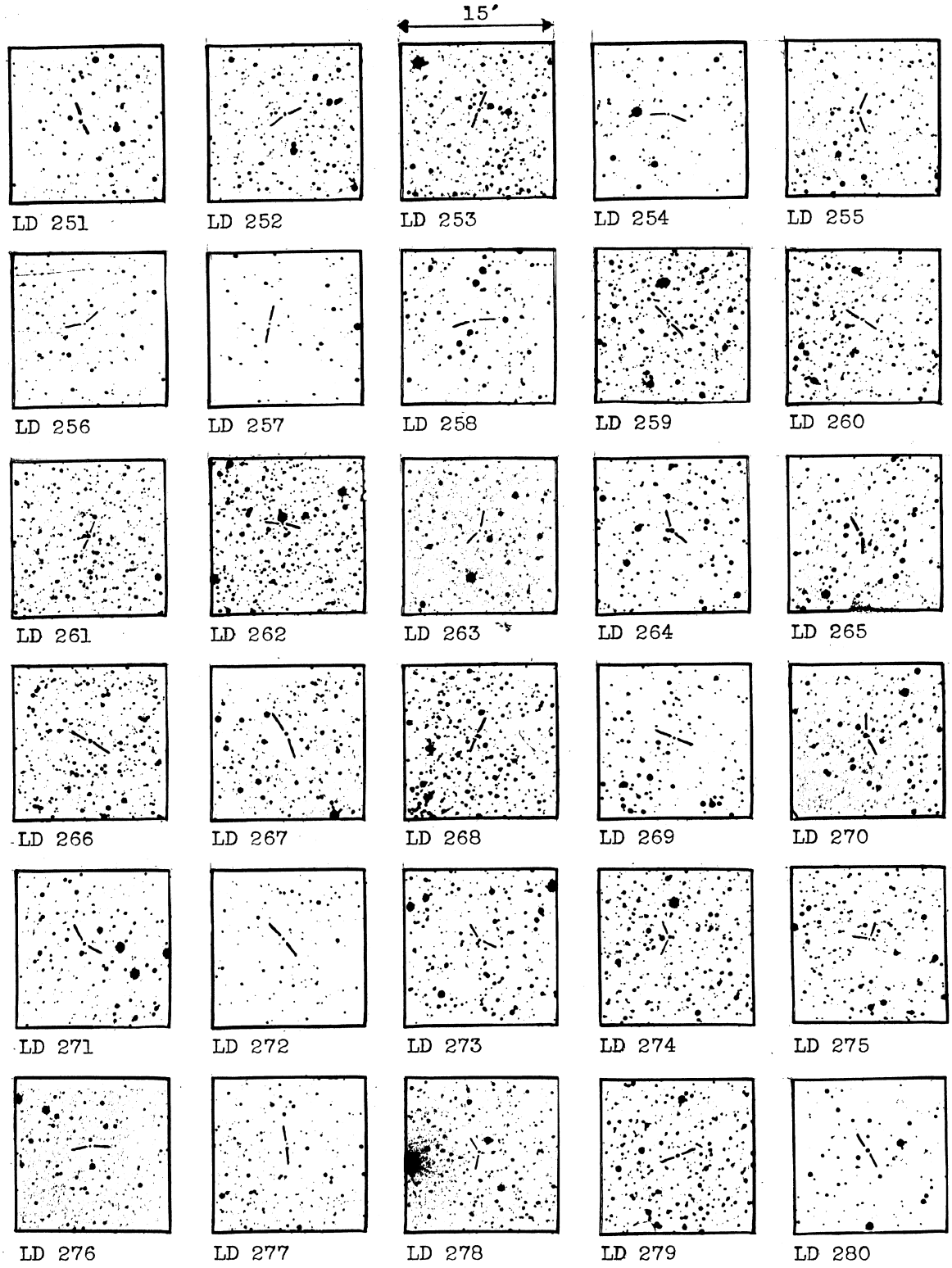
LD 246
LD 247
LD 248
LD 249
LD 250

Figure 1


15′
LD 251
LD 252
LD 253
LD 254
LD 255
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LD 279
LD 280

Figure 2

Table 2. Elements of variation, LD 221–280

Name	max min (mv)	mb–mv	type	epoch JD 2400000+	period (days)
LD 221	11.8 – 13.7	2.1	SRa	50273	254
LD 222	12.1 – 16.0	1.4	M	49681	353
LD 223	13.5 – 15.5	>2	SRa	47862	315
LD 224	13.4 – 15.3	0.8	SRa	49541	265
LD 225	13.2 – 15.0	1.0	SRa	50273	246
LD 226	11.8 – 14.3	2	SRa	50200	248
LD 227	13.5 – 15.6	1.2	SRa	49954	331
LD 228	11.7 – 13.6	>2	Lb		
LD 229	13.3 – >16.2		L		
LD 230	12.3 – 14.7	>2.5	SRa	49954	404
LD 231	14.3 – 15.3	1	Lb		
LD 232*	13.7 – 15.1	>1.5	SRb	49681	390
LD 233	12.6 – 14.5	1.1	SRb	49870	120
LD 234	12.8 – 14.8	1.2	Lb		
LD 235	12.9 – >16.0		M	49920	495
LD 236	12.4 – >16.0	>1.6	M	49809	611
LD 237	11.5 – >16.0	2	M	50360	380
LD 238	12.0 – 14.7	2.5	M	49809	212
LD 239	13.5 – 14.8	>2	Lb		
LD 240	12.2 – 15.5	2.3	M	50305	310
LD 241	14.1 – 15.3	0.7	SRa	50337	146
LD 242	11.8 – 16.0	1.3	M	49809	155
LD 243*	11.4 – 15.2	2.1	M	50250	453
LD 244	12.0 – 14.5	>2	SRb		392?
LD 245	12.4 – 15.3	>2.2	M	50188	350
LD 246*	12.4 – 14.7	1.8	SRa		350
LD 247	11.8 – 14.1	3.5	Lb		
LD 248	14.1 – >16.0		Lb		
LD 249	12.0 – 14.3	>3	Lb		
LD 250*	13.0 – 14.9	2.2	SRb	50188	224
LD 251	11.8 – 14.6	2.0	M	49681	381
LD 252	12.5 – >16.0		M	49895	283
LD 253	12.5 – 16.0	>2	M	50305	266
LD 254	13.2 – >16.0	2.6	M	50337	231
LD 255	12.7 – 14.4	>3	SRa	50305	398
LD 256	13.8 – 15.0	>1.5	Lb		
LD 257	13.2 – 14.0	1	L		
LD 258	13.6 – >16.0	>2	M	50360	335
LD 259	12.2 – 14.6	>1	M	50000	370
LD 260	14.0 – 15.2		L		
LD 261	11.0 – 13.3	2	Lb		
LD 262	13.8 – 15.5		SRb	49360	339
LD 263	13.0 – 15.8	>1.3	M	49987	318
LD 264	11.8 – >14.5	2.0	M	50350	227
LD 265	10.9 – 16.0	>1.6	M	49809	341
LD 266*	11.6 – 15.2	1.6	M	49650	380

Table 2. Elements of variation, LD 221–280 (cont'd.)

Name	max – min (mv)	mb–mv	type	epoch JD 2400000+	period (days)
LD 267*	12.8 – 16.0		M	50337	265
LD 268	12.6 – >16.0	>1.5	M	50188	162
LD 269	12.5 – >16.2		L		
LD 270	11.9 – 16.1	1.1	M	50360	366
LD 271	13.0 – 15.0	>1	SR	50360	232
LD 272	12.7 – 16.0	>1.8	M	49919	151
LD 273	12.6 – >15.0	>1.2	SR		265?
LD 274	12.5 – >15.0		M	50360	273
LD 275	11.0 – 15.2	>2	M	49843	369
LD 276	12.6 – 15.3	>1	L		
LD 277	12.9 – 15.2		SR	49809	365
LD 278	13.1 – 15.1	>1	SR	49954	255
LD 279	12.5 – 15.5		M	49542	400
LD 280*	11.3 – 14.6	2.1	M	50360	332

Notes to Table 2:

LD 232 period variable: 380–400^{d}?
LD 243 period decreasing: 1968-77 = 469^{d}, 1977-87 = 462^{d}, 1992-96 = 453^{d}.
LD 246 period unstable: 330-370^{d}.
LD 250 period variable: 1975 = 202^{d}.
LD 266 period decreasing: 1975 = 408^{d}, 1985 = 391^{d}, 1995 = 380^{d}.
LD 267 period decreasing: 1967-70 = 288^{d}, 1987 = 276^{d}, 1994 = 273^{d}, 1995 = 267^{d}, 1996 = 264^{d}.
LD 280 period increasing: 1970-79 = 328^{d}, 1979-88 = 330^{d}, 1988-1996 = 332^{d}.

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References:

Collins, M. 1996, *The Astronomer*, **33**, 67
Dahlmark, L., 1982, *IBVS*, No. 2157
Dahlmark, L., 1986, *IBVS*, No. 2878
Dahlmark, L., 1993, *IBVS*, No. 3855
Dahlmark, L., 1996, *IBVS*, No. 4329
Dolidze, M. V. 1975, *Byull. Abastuman. Astrofiz. Obs.*, **47**, 171
Saurer, W., Seeberger, R., Weinberger, R., and Ziener, R. 1994, *Astron. J.*, **107**, 2101
Scollick, K. 1997, `http://skview.gsfc.nasa.gov/cgi-bin/v3.0/skyview_advanced.pl`