

COMMISSIONS 27 AND 42 OF THE IAU
INFORMATION BULLETIN ON VARIABLE STARS

Number 4734

Konkoly Observatory
Budapest
7 July 1999

HU ISSN 0374 – 0676

NEW VARIABLE STARS IN ANDROMEDA
AND CASSIOPEIA

LENNART DAHLMARK

Residence Jeanne d'Arc, 166A Avenue Majoral Arnaud, F-04100 Manosque, France

This report summarizes the results of a variable-star search in the $20^\circ \times 15^\circ$ area centered at $0^{\text{h}}30^{\text{m}}/+45^\circ$ (1950). Six similar fields have been previously described (Dahlmark 1982, 1986, 1996, 1997, 1998). The two earliest reports describe the camera systems used for the survey.

Seventeen yellow/blue plate pairs (Kodak 103a-D + GG11 filter and 103a-O unfiltered) were exposed between 1967 and 1981, and forty-seven films (Kodak TechPan 4415 + GG495 filter) taken in the years 1987 to 1999. Six exposures with a 200/210/300-mm Schmidt camera taken 1987–1998 on TechPan without a filter were also examined and used to prepare finding charts. Ten plate or film pairs were scanned for variables with a blink comparator and with four stereo comparators used in tandem. Magnitudes were determined in a stereomicroscope using comparison stars taken from the Guide Star Catalogue (GSC, Lasker *et al.* 1990). The yellow-light magnitudes ' m_v ' shown in Table 2 are thus tied to the GSC (northern) magnitude scale and will be systematically somewhat brighter than standard Johnson *V*.

In this field twenty-six variables were found, one of which appears only on two photos taken on the same night. Table 1 shows positions and identifications. The coordinates were drawn mostly from the comprehensive USNO–A2.0 catalogue (Monet *et al.* 1998); one star appears only in the GSC, and another was estimated ($\pm 2''$) using the Digitized Sky Survey via the Goddard SkyView facility. The source of the positions is coded in column 's' as follows: A = USNO–A2.0, G = GSC v1.2, S = SkyView.

The elements of variation are collected in Table 2. An asterisk by the star name indicates a note at the bottom of the table. The lightcurve determinations are based usually on sixty-eight magnitude estimates for each star. From these the magnitude range, provisional variability type, epoch of maximum, and period have been determined. For several of the long-period variables it appeared that the variations, though well-marked, were not always consistent from cycle-to-cycle. The period ranges found for such stars from photos taken over a 30-year interval are given in the last column. The column ' $b-r$ ' shows star colors from USNO–A2.0; these are not well calibrated to any standard system, but serve to indicate in a qualitative way the sorts of stars involved.

The star LD 324 is listed as a possible dwarf nova candidate, and deserves some discussion. It was observed on two simultaneous exposures centered on 1996 Sept. 9.92 UT (JD 2450336.42) at $m_v = 13.8$. The star is, however, not present on sixty other plates from 1967 to 1999. A semi-accurate position, reliable to within $10''$ radius, is shown

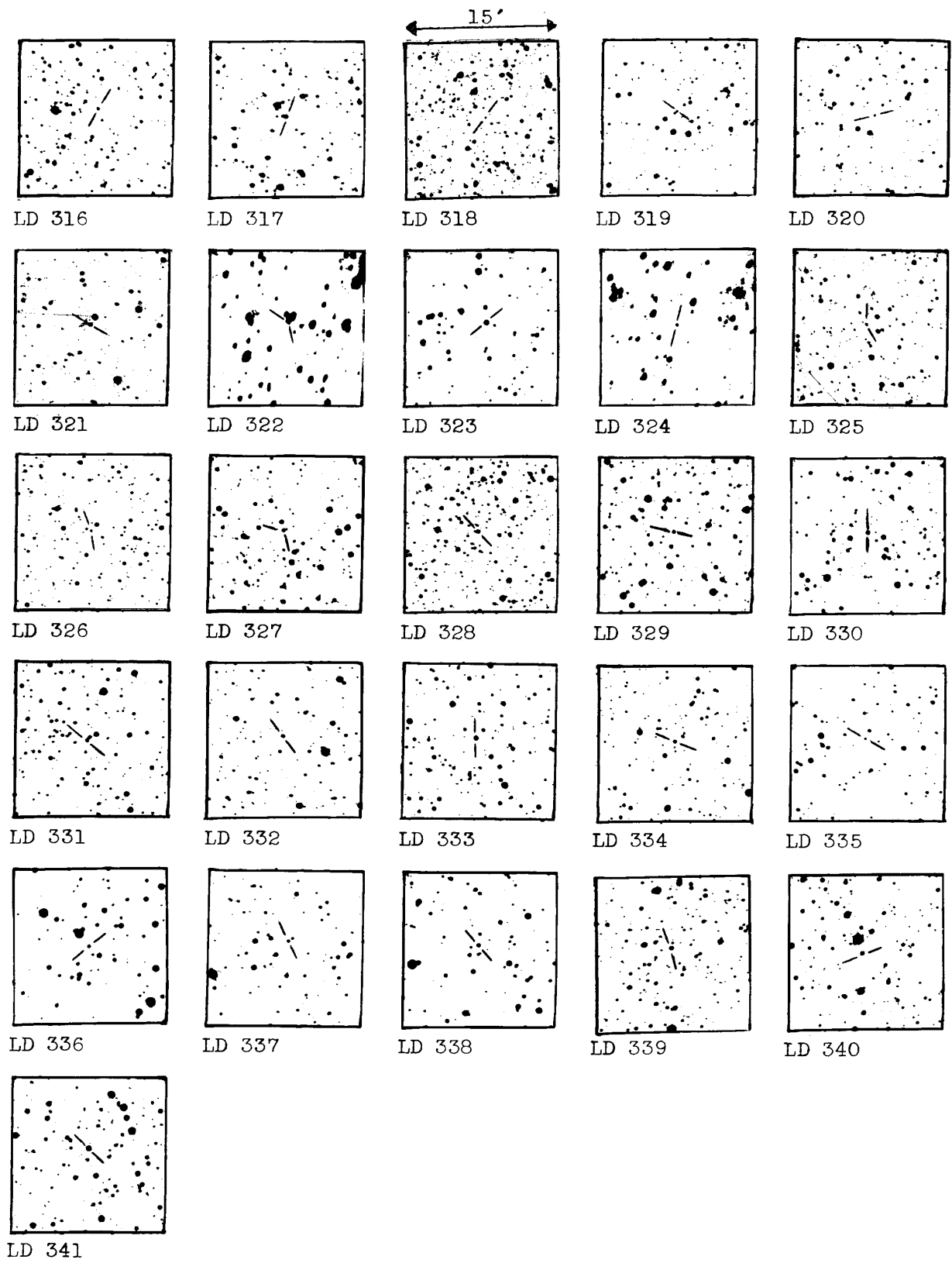


Figure 1.

in Table 1. Arne Henden (USNO/USRA) kindly obtained BV photometry of the field on 23 June 1999 UT with the USNO–Flagstaff 1-meter telescope. The results are posted at: <ftp://ftp.nofs.navy.mil/pub/outgoing/aah/sequence/dahl1.dat>. There are no blue objects in the immediate vicinity of the object shown on the 1996 photographs. The objects closest to the candidate are three mag. 19–20 stars with $B - V$ color corresponding to K dwarfs or giants, and some very faint galaxies. Although no known asteroids were in the field at the time of the exposures, the possibility remains that the object photographed is a satellite glint of extremely short duration (completely circular image), or some exotic object, as with recently-observed visible transients of gamma-ray bursts.

The finder charts show a field of $15' \times 15'$ centered on the variables; north is up and east to the left.

I would like to thank Arne Henden for his effort to identify LD 324 in quiescence. Brian Skiff (Lowell Observatory) aided in obtaining identifications and precise positions for the stars.

Table 1: Positions and identifications, LD 316 – LD 341

Name	RA (2000)	Dec	s	GSC	IRAS	Remarks
LD 316	23 38 21.2	+51 30 53	A			
LD 317	23 44 57.4	+43 31 22	A			
LD 318	23 53 44.9	+50 59 19	G	3651-0927	23512+5042	
LD 319	0 05 29.3	+52 52 58	A			
LD 320	0 06 42.7	+52 27 33	A		00041+5210	
LD 321	0 09 36.9	+37 47 32	A	2781-1738	00070+3730	FBS 0007+375
LD 322	0 09 39.8	+53 10 11	A		00070+5253	
LD 323	0 10 55.1	+48 15 33	A	3250-0239	00083+4758	
LD 324	0 12 42	+52 47.4				
LD 325	0 12 55.6	+50 55 37	A	3259-1582		
LD 326	0 19 10.7	+52 02 03	A		00164+5145	
LD 327	0 21 20.7	+51 21 39	A		00186+5104	
LD 328	0 26 49.1	+49 40 36	A	3256-0458		
LD 329	0 29 21.3	+49 38 42	A			
LD 330	0 36 22.7	+48 21 49	A	3253-0615		
LD 331	0 38 40.2	+53 16 12	A		00358+5259	
LD 332	0 38 51.8	+45 33 50	A			at minimum on POSS-I
LD 333	0 45 01.1	+48 41 03	A	3266-1137	00422+4824	
LD 334	0 46 24.8	+47 41 33	A	3266-1510	00436+4725	
LD 335	0 50 43.3	+46 30 32	S		00479+4614	
LD 336	0 53 32.8	+44 02 27	A	2810-0523		
LD 337	0 54 09.2	+46 21 49	A			
LD 338	1 10 30.4	+45 06 12	A	3264-0924	01076+4450	
LD 339	1 16 04.7	+50 11 45	A	3272-0151	01131+4955	
LD 340	1 17 11.2	+42 02 04	A	2808-1655		
LD 341	1 30 05.8	+50 10 01	A	3286-2177	01270+4954	StM 10 (M8)

References:

- Dahlmark, L., 1982, *IBVS*, No. 2157
Dahlmark, L., 1986, *IBVS*, No. 2878
Dahlmark, L., 1993, *IBVS*, No. 3855
Dahlmark, L., 1996, *IBVS*, No. 4329

Table 2: Elements of variation, LD 316 – LD 341

Name	max (m_v)	min	$b - r$	type	epoch JD 2400000+	period (days)	period range 1967–1999
LD 316	13.0	14.4	2.9	I			
LD 317*	12.6	14.8	0.1	Ia			
LD 318	13.5	15.3		SR	51071	381	360–400 ^d
LD 319*	12.6	>16.0	3.3	M	50611	266	
LD 320	12.5	14.8	3.6	SR	51193	305	278–330 ^d
LD 321	12.4	15.5	2.6	M	50691	288	
LD 322	12.5	>15.2	4.1	M	50863	446	
LD 323	10.7	11.9	2.4	L			
LD 324*	13.8	>19.5		UG?			
LD 325	13.8	>16.0	0.7	Ia			
LD 326	13.0	15.3	6.4	SR	51193	370	355–390 ^d
LD 327	10.5	15.5	2.3	M	51101	383	
LD 328*	12.4	13.8	0.7	E	51223	≤38	
LD 329	13.1	13.8	1.7	L			
LD 330	11.6	12.8	3.0	SR		440?	
LD 331	11.0	>16.0	3.8	M	51071	376	253–413 ^d
LD 332	11.9	16.1	1.2	M	51163	394	
LD 333	10.7	13.1	6.3	SR	51071	358	
LD 334*	11.0	14.8	7.7	Lb			
LD 335	13.0	>16.0		SR	51071	460	401–593 ^d
LD 336	13.4	14.5	0.8	L			
LD 337	13.5	14.4	0.9	Lb			
LD 338	11.7	>14.7	3.3	M	50611	359	
LD 339	11.1	14.7	2.6	M	51129	281	238–304 ^d
LD 340	12.6	14.5	0.7	Isa			
LD 341	11.3	14.4	3.2	M	51161	305	288–320 ^d

Notes:

- LD 317 blue; from 1995 minima a period of $\sim 400^d$ is suggested.
LD 319 two maxima in 1998 expected but not observed.
LD 324 see text.
LD 328 six minima observed, eclipse duration $< 24^h$; period is probably some fraction of 38^d .
LD 334 perhaps a very long period: maxima observed in 1968, 1987, 1993, and 1999, but not 1974 or 1980 (one observation only, however).

Dahlmark, L., 1997, *IBVS*, No. 4458

Dahlmark, L., 1998, *IBVS*, No. 4642

Lasker, B. M., Sturch, C. R., McLean, B. J., Russell, J. L., Jenkner, H., Shara, M. M., 1990, *Astron. J.*, **99**, 2019

McGlynn, T., Scollick, K., and White, N., 1996, <http://skview.gsfc.nasa.gov>; see also *SkyView: The Multi-Wavelength Sky on the Internet*; in McLean, B. J. *et al.*, “New Horizons from Multi-Wavelength Sky Surveys”, IAU Symposium No. 179, p. 465, Kluwer

Monet, D., Bird, A., Canzian, B., Harris, H., Reid, N., Rhodes, A., Sell, S., Ables, H., Dahn, C., Guetter, H., Henden, A., Leggett, S., Levison, H., Luginbuhl, C., Martini, J., Monet, A., Pier, J., Riepe, B., Stone, R., Vrba, F., Walker, R., 1998, USNO–A2.0; U.S. Naval Observatory, Washington DC; see also <http://www.nofs.navy.mil/projects/pmm>