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NINE NEW VARIABLES IN THE η HERCULIS FIELD

This paper continues the study begun in my previous publication (Antipin, 1994). Nine more new variables (Var 43–51) have been discovered in the $10° \times 10°$ field centered on η Her. So the number of new variable stars in this field has increased to 27, mostly RR type variables (17 stars) and eclipsing systems (7 stars). This study is based on Moscow collection of photographic plates taken with the 40 cm astrograph in Crimea.

Tables 1–2 contain information on the new variable stars. The standard sequence near M13 (Arp and Johnson, 1955; Forbes and Dawson, 1986) was used to obtain magnitudes of comparison stars given in Table 3. Finding charts and phased light curves are shown in Figures 1 and 2, respectively.

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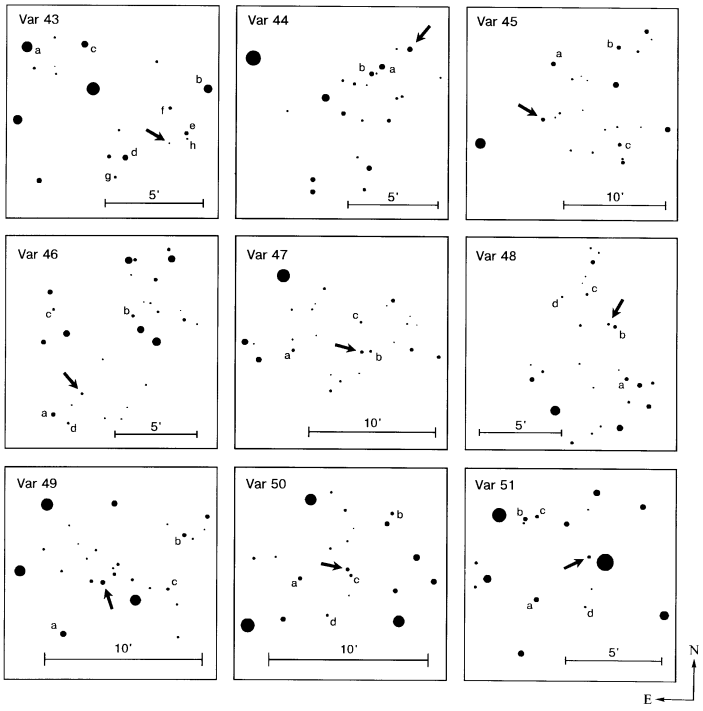

Figure 1. Finding charts

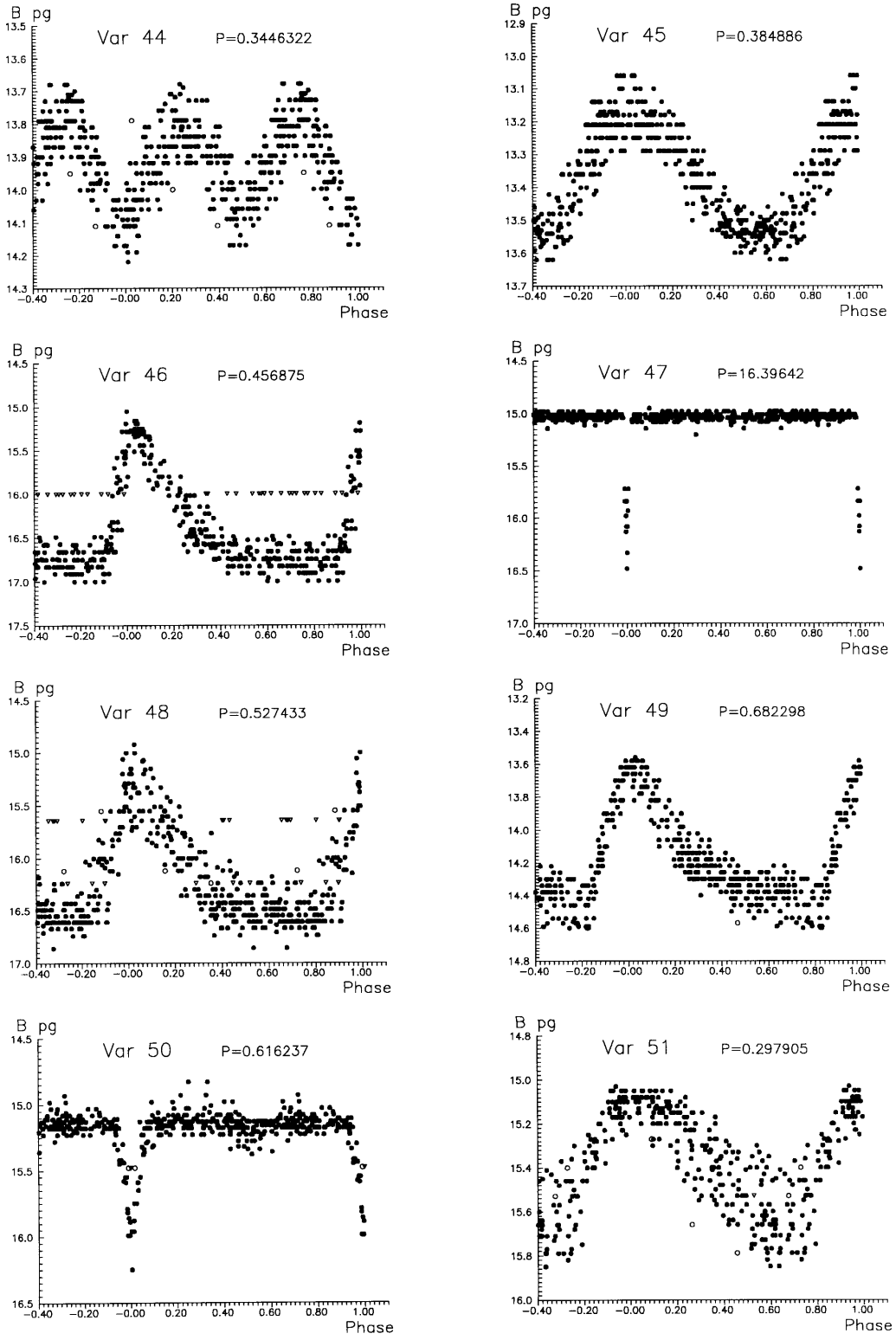
B pg
Var 44 P=0.3446322
Var 45 P=0.384886
Var 46 P=0.456875
Var 47 P=16.39642
Var 48 P=0.527433
Var 49 P=0.682298
Var 50 P=0.616237
Var 51 P=0.297905
Phase

Figure 2

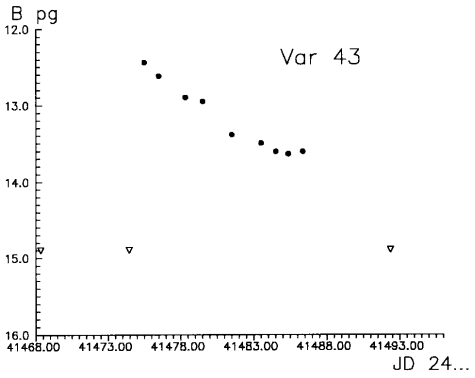

Figure 3

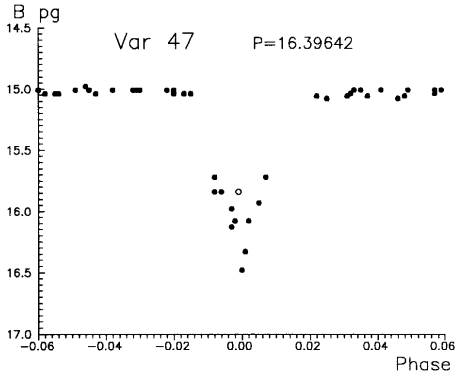

Figure 4

Remarks on individual stars

Var 43. Blue on Palomar prints. In minimum brightness, the star is apparent on good plates. The duration of the best-observed outburst is between 12 and 18 days (Figure 3). Outbursts (JD 24...):

#1	41475.489	12.44	41483.505	13.50	#2	43693.355	13.28
	41476.494	12.62	41484.504	13.61		43700.386	14.14
	41478.323	12.90	41485.350	13.64	#3	45144.378	13.39
	41479.506	12.95	41486.350	13.61	#4	49564.341	16.72
	41481.506	13.39					

Var 44. The star was observed photoelectrically during three nights in July 1995 (JD 2449921–25). Sixteen observations in B and V bands were obtained. The observations were made with a photoelectric photometer at the 60 cm reflector in Crimea. The magnitude ranges are B=$13^{m}.69$-$14^{m}.09$, V=$13^{m}.09$-$13^{m}.44$, and average $B-V$ is 0.63 mag. The primary minimum was not covered. These observations are in good agreement with photographic light elements. The phased light curve (Figure 2 for Var 44) includes photoelectric observations in B band.

Var 47. The minimum is shown in Figure 4. Primary minima (JD 24...):

37115.347	16.08	41952.228	15.84	42247.451	15.84:
37115.377	16.48	41952.362	16.08	42362.187	15.98
41837.423	15.84	41985.202	15.93	42952.460	16.13
41919.396	15.72	41985.225	15.72	45592.348	16.33

Var 50. *Min II* 15.20.

Table 1. Coordinates and Identifications of Variable Stars

Var	α(2000.0)	δ(2000.0)	GSC
Var 43	$16^h25^m01^s.7$	39°09'26"	
Var 44	16 51 12.8	41 17 58	3079.0201
Var 45	16 56 03.6	40 09 02	3075.0885
Var 46	16 37 38.2	36 31 57	
Var 47	17 02 17.2	38 36 24	3072.0441
Var 48	17 00 23.6	38 16 38	
Var 49	16 57 34.5	41 31 45	3079.0460
Var 50	17 08 23.6	39 57 49	3076.0951
Var 51	16 24 04.9	41 15 06	3065.1355

Table 2. Data on New Variable Stars

Var	N	JD 24...	Type	Max	Min	$M-m$ or D	Max (Min) JD 24...	Period, days
Var 43	419	37080–49571	UG	12.50	17.50			
Var 44	377	37080–49571	EW	13.80	14.15		43684.325	0.3446322
Var 45	389	37080–49564	RRc	13.15	13.55	0.40	41945.36	0.384886
Var 46	318	37080–49564	RRab	15.20	16.80	0.10	40744.41	0.456875
Var 47	384	37080–49564	EA	15.05	16.40	0.03	37115.38	16.39642
Var 48	354	37080–49564	RRab	15.20	16.60	0.20:	42867.51	0.527433
Var 49	350	37087–49564	RRab	13.60	14.50	0.18	41948.29	0.682298
Var 50	355	37080–49564	EA	15.10	16.20	0.10	42311.24	0.616237
Var 51	299	37103–49564	RRc	15.10	15.70	0.30	42992.39	0.297905

Table 3. Comparison Stars

Var	a	b	c	d	e	f	g	h
Var 43	12.20	13.14	13.86	14.10	14.92	16.15	16.65	17.4
Var 44	13.68	14.22						
Var 45	12.65	13.40	13.60					
Var 46	15.07	15.37	16.00	16.83				
Var 47	15.06	15.88	16.38					
Var 48	15.20	15.64	16.24	16.86				
Var 49	13.74	14.54	14.84					
Var 50	14.78	15.28	15.48	16.16				
Var 51	14.70	15.20	15.53	16.17				

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