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Nos. 801-900

1973 June – 1974 June

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Konkoly Observatory
Budapest
1973 June 4

PHOTOELECTRIC OBSERVATIONS OF THE FLARE STAR AD Leo DURING THE 1973 JANUARY 27 - FEBRUARY 9 INTERNATIONAL PATROL

Photoelectric observations of the flare star AD Leo have been carried out at the stellar station of the Catania Astrophysical Observatory according to the observing schedule proposed by the IAU Working Group on Flare Stars (Chugainov 1972).

The preliminary results are here reported.

In Table 1 the detailed coverage is given. During the 18.6 hours of observations two flares were detected. Their characteristics and light curves are given in Table 2, and in Figure 1, respectively.

The explanation of the symbols and details, both on the observing equipment and on the reduction procedure are given in a preceding number of this Bulletin (Cristaldi S., Rodonò M. 1971).

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M. RODONÒ

May 20, 1973

References:

Chugainov, P.F. 1972. Comm.27 IAU,I.B.V.S. No.744.
Cristaldi, S., Rodonò, M. 1971, Comm.27 IAU, I.B.V.S. No.525.

Table 1

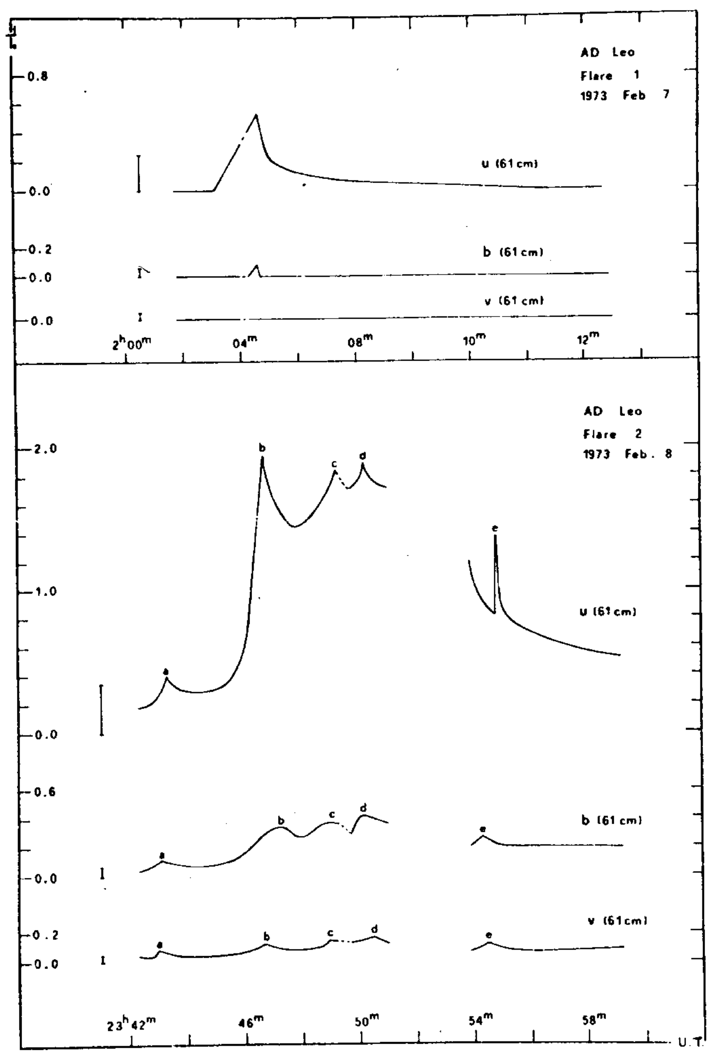
Detailed Coverage

Date	Tel.	Light	Coverage (UT)	Total coverage	$\overline{3\sigma/I_o}$
Jan. 30-31	61	U/B/V	21^h30^m-2146;2149-2218;2227-2230; 2232-2249;2254-0115;0130-0141; 0157-0336;0347-0406.	335	.04/.02/.02
Feb. 6-7	61	U/B/V	2037-2114;2125-2346;0025-0121; 0134-0149;0156-0159;0202-0239; 0248-0431.	392	.17/.02/.02
Feb. 7-8	61	U/B/V	2041-2306;2309-2327;2330-2345; 2348-0034;0036-0057;0100-0153; 0155-0224;0225-0252;0256-0430; 0432-0444.	460	.11/.02/.02
Feb. 8-9	61	U/B/V	2051-2123;2137-2146;2149-2200; 2237-2242;2246-2253;2256-2314; 2316-2324;2327-2339;2342-2351; 2354-2359;0007-0009;0113-0116; 0156-0207;0210-0213;0217-0231; 0233-0246;0301-0440.	261	.09/.04/.02

Table 2

Flare Characteristics

no.	Tel.	Light	t_{max}(UT)	J.D.	d_b	d_a	$3\sigma/I_{or}$	$(\frac{I_f}{I_o})_{max}$	P	Energy erg	Air mass	f	sky
			Feb. 1973										
1	61	u	$7;02^h02^m.60$	1720.5905	1.5	9.8	0.12	0.53	1.56		1.16	0	0
		b	02.60		0.3	0.1	0.03	0.08	0.02				
		v	(not detectable)				0.02	0.02	0.00				
		U						0.49	1.44	$9.2x10^{30}$			
		B						0.07	0.01	$5.9x10^{29}$			
2 (b)	61	u	8;23 46.70	1722.4961	0.8	-	0.15	1.93	17.23		1.03	3-4-5	0
(d)		b	23 50.05		1.0	-	0.03	0.42	3.87				
(d)		v	23 50.50		1.5	-	0.02	0.16	1.44				
		U						1.76	16.02	$1.0x10^{32}$			
		B						0.38	3.56	$1.6x10^{32}$			
		V						0.13	1.17	$1.1x10^{32}$			



AD Leo
Flare 1
1973 Feb 7
u (61 cm)
b (61 cm)
v (61 cm)
0.8
0.0
0.2
0.0
0.0
2h00m
04m
08m
10m
12m
AD Leo
Flare 2
1973 Feb. 8
2.0
1.0
0.0
0.6
0.0
0.2
0.0
u (61 cm)
b (61 cm)
v (61 cm)
a
b
c
d
e
23h42m
46m
50m
54m
58m
U.T.

COMMISSION 27 OF THE I. A. U.
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NUMBER 802

Konkoly Observatory
Budapest
1973 June 4

PHOTOELECTRIC OBSERVATIONS OF EV Lac DURING THE 1972, SEPTEMBER 1-15 INTERNATIONAL PATROL

Photoelectric observations of EV Lac were carried out at the McDonald Observatory in coincidence with the observation campaign organized by the I.A.U. Working Group on Flare Stars of Comm. 27. The multicolor high speed photometer described by Nather and Warner (1971), fed by a 75 cm cassegrain reflector, was used. This photometer allows to obtain a rapid succession of photon count measurements in four sequential colors by means of an automatically rotating wheel. Four holes are provided in the rotating wheel to locate filters. This system proves to be suitable for good color determination at peak light only for relative slow flares. Moreover, each filter change requires 0.25 sec, so that the effective integration time for each of the four colors is 0.25 sec less than those quoted in Table 1.

A standard set of filters matching the UBV system was used: Corning 9863 (U), Corning 5030 + Shott GG13 (B) and Corning 3384 (V). No filters were located in the fourth filter hole.The corresponding photon counts are referred to in this Bulletin as U,B,V and NF.

A blue sensitive photomultiplier tube (RCA 8575) was operated cooled at - 75°C. During the 12.4 hours of patrol four flares were observed, two of which were not detectable in V light.

In Table 1 the time coverage and in Table 2 the flare characteristics are given. Note that the NF characteristics are comparable with the B ones because of the relative high blue sensitivity of the photomultiplier tube. The accompanying figure shows a plot of the detected photon counts which refers to flares No.1 and 2.

The colors at flare maximum are consistent with those observed by Cristaldi and Rodonò (1973) with a synchronous three color photometer.

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M. RODONÒ

May 23, 1973

References:
Cristaldi, S., Rodonò, M. 1973, Astron.Astrophys.Suppl.(in press).
Nather, R.E., Warner, B. 1971, Monthly Notices Roy.Astr.Soc.152,209.

Table 1

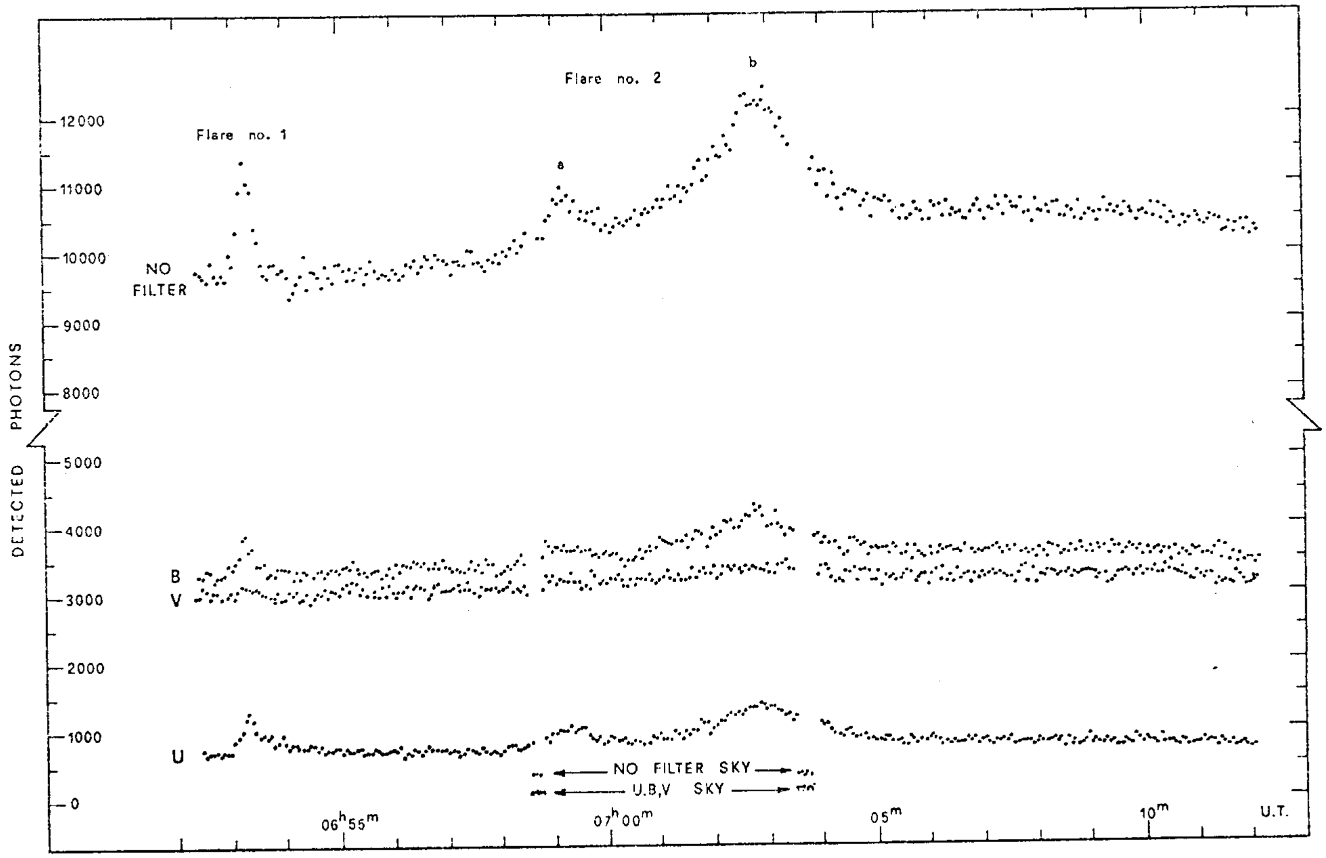
Date 1972	Colors Integration time (sec)	Coverage (UT)	Total coverage
Sep. 5	NF/1, U/1, B/1, V/1	0334-0515,0528-51, 0618-21,0626-0830	251^m
7	NF/1, U/2, B/1, V/1	0454-0746,0755-0806, 0811-29	205
9	NF/1, U/2, B/1, V/1	0436-0639,0653-0711	141
10	NF/1, U/2, B/1, V/1	0417-0532,0536-0647	146

Table 2 (*)

N	Date (1972 Sep.)	t_{max} (UT)	Light	d_b	d_a	$(I_f/I_o)_{max}$	P	U-B	B-V	Sky
1	5	$06^h53^m.2$	U	0.3	2.5	1.96	1.60	-0.86	-	clear
			B	0.3	1.3	0.33	0.19			
			V	-	-	(not detectable)				
			NF	0.3	0.8	0.26	0.14			
2	5	07/02.9	U	3.0	23.0	2.00	11.10	-0.66	+0.55	clear
			B	3.0	23.0	0.41	3.04			
			V	3.0	23.0	0.16	1.37			
			NF	3.0	23.0	0.36	2.74			
3	9	05:39.7	U	2.1	24.0	0.54	0.42	-1.32	-	foggy
			B	2.1	24.0	0.07	0.06			
			V	-	-	(not detectable)				
			NF	2.1	24.0	0.07	0.06			
4	9	06:04.3	U	0.3	1.5	0.83	0.63	-0.94	+0.90	cirrus
			B	0.3	24.0	0.13	0.12			
			V	0.3	24.0	0.07	0.05			
			NF	0.3	24.0	0.14	0.10			

(*) For explanation of symbols see IBVS no. 525

For multiple flares, the t_{max}, d_a, d_b and (I_f/I_o)max values refers to the highest peak, while the P value includes pre- and post-maximum activity, whatever, during the given flare.


Flare no. 1
Flare no. 2
a
b
NO FILTER
B
V
U
DETECTED PHOTONS
12000
11000
10000
9000
8000
5000
4000
3000
2000
1000
0
NO FILTER SKY
U,B,V SKY
06h55m
07h00m
05m
10m
U.T.

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Konkoly Observatory
Budapest
1973 June 10

NEW FLARES IN THE PLEIADES

In course of searching flares in the Pleiades ten new flares were observed in 28 hours of effective observational time in the period from September 6, 1972 to March 7, 1973. Among the stars flared up seven new flare stars were discovered. The observations were made on 103a-O plates without or with UG_1-1 mm filter (12.4 hours and 15.6 hours, respectively). The exposure time was 4 minutes on the direct plates and 10 minutes on the UV plates. The necessary informations about our flares are summarized in the Table. Figures Nos 1 - 10 show the brightnesses of the flares in course of the time.

Table

No	Design.	α (1900)	δ (1900)	Δm (pg)	Δm (u)	m_{min} (pg)	m_{min} (u)	Date
1	K14=Ton36	$3^h36^m.4$	+23°35'	1.5		17.0		Sept.6, 1972
2	K15	3 42.7	22 24	1.6		16.1		Sept.6, 1972
3	K16	3 39.7	22 42	0.9		16.6		Sept.9, 1972
4	K17	3 33.2	23 59	1.1		17.3		Dec.28, 1972
5	K18=Ton82	3 41.5	23 58	1.1		16.4		Dec.29, 1972
6	K19	3 49.6	24 25	1.4		16.8		Dec.29, 1972
7	K20	3 41.5	24 36	1.3		17.3		Dec.30, 1972
8	K21=Ton75	3 38.9	24 56		1.7		15.9	Jan.25, 1973
9	K22	3 37.0	24 00		3.2		19.0	Feb. 2, 1973
10	K23=HII2368	3 43.7	23 8		2.4		16.4	Feb. 2, 1973

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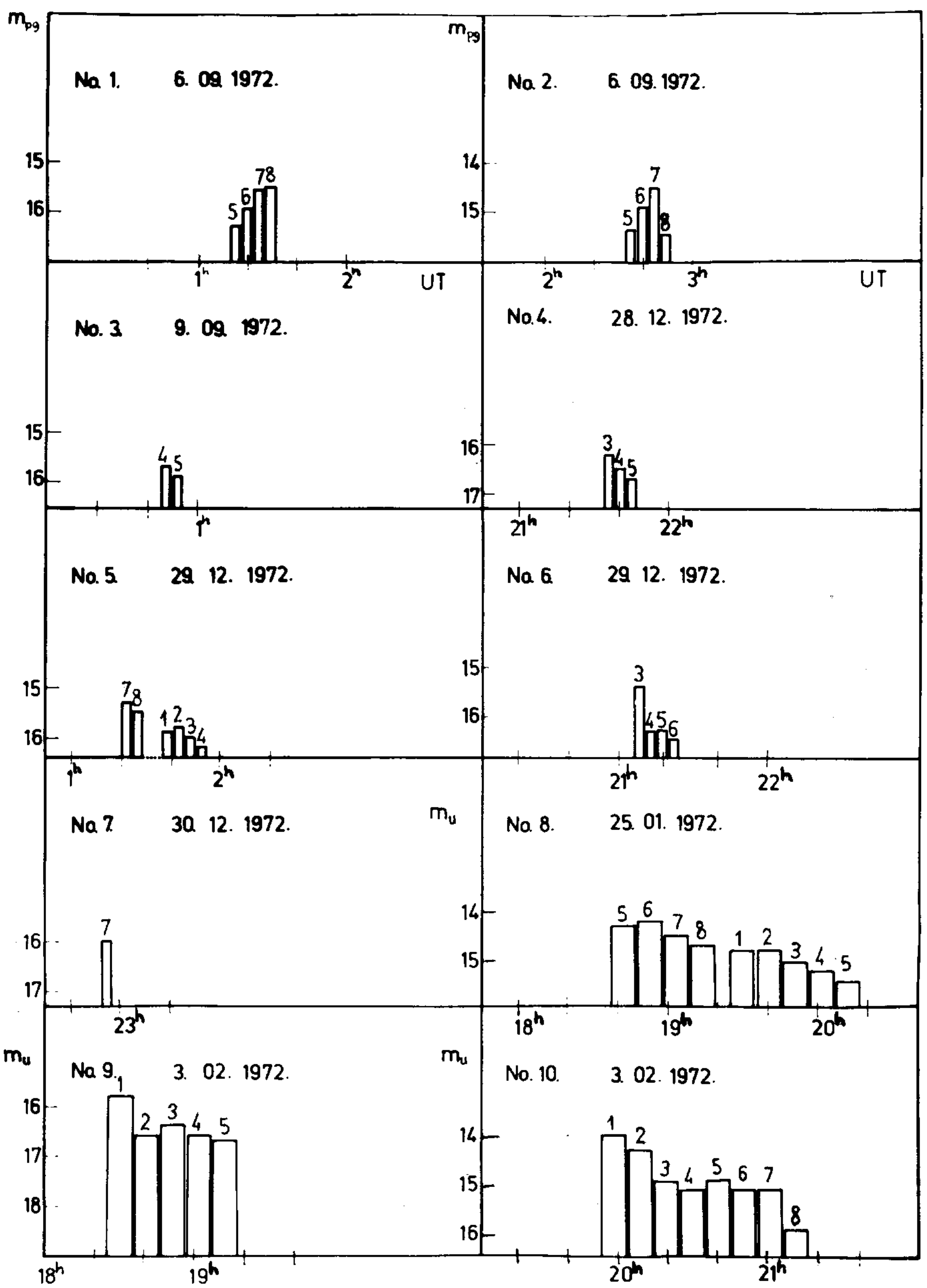

(Numbers at the top of the columns are the serial numbers of the exposures on the plate.)

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Konkoly Observatory
Budapest
1973 June 22

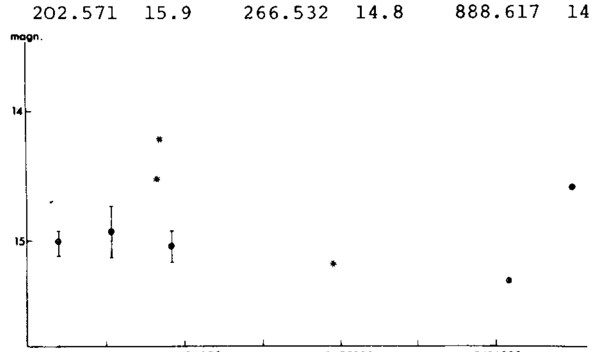
NOTE ON THE PHOTOMETRIC HISTORY OF HBV 475

The peculiar variable star V1329 Cygni (=HBV 475) was found and its photometric behaviour studied on 22 plates taken at the University of Oklahoma Observatory between 1950 and 1957. The instrument used was the 83 mm astrograph in combination with Kodak 103aO plates. The brightness of the variable was estimated on the plates using the set of comparison stars as adopted by Kohutek (I.B.V.S. 384, 1969).

The results are given in the table below. The figure shows three normal points formed from these data, two later single observations and magnitude estimates based on the Lick and Palomar Sky Atlas prints, as given by Kohutek and Bossen (Ap Letters 6, 157). The figure indicates a relatively constant brightness of the variable near 15.0 magn. for the period considered; this also fits the observations by Arhipova and Mandel (I.B.V.S. No.762,1973). Only the two estimates on Palomar prints differ to some extent.

The indicated scatter may not be entirely due to observational errors. There is a possibility of short term variations: on JD 2433202, a definite change in the brightness is recorded on two plates exposed 17 minutes apart.

JD 243....	Mag.	JD 243....	Mag.	JD 243....	Mag.	JD 243....	Mag.
3179.583	15.4	3202.583	14.7	3503.681	15.9	3927.576	15.2
179.694	15.3	205.558	14.8	533.658	14.9	949.554	15.0
182.706	14.8	205.668	14.8	563.677	15.2	6110.687	15.3
185.621	14.8	215.566	14.8	564.706	14.8	495.700	14.6
200.573	14.8	239.564	14.9	585.590	14.8		
202.571	15.9	266.532	14.8	888.617	14.7		



Oklahoma Measurements of HBV 475. Asterisks mean estimates on Sky Atlas prints.

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Konkoly Observatory
Budapest
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PHOTOELECTRIC OBSERVATIONS OF BETA LYRAE IN 1967 AND 1969

In this note two series of photoelectric observations of Beta Lyrae are presented, taken at the Hamburg Observatory in June-July 1967 and August-September 1969. The total of individual observations is 179, normal points are given in the table.

The observed light curves remained rather fragmentary but it was possible to derive an epoch of primary minimum for each of the years. Later, the photometric Beta Lyrae program was discontinued as important, regular coverage of the light curve by several stations had been organized by the Dyer Observatory (Nashville, Tenn.)

1. Two-color observations in 1967 were carried out by Prof. A. Wachmann and the present writer, using the 60 cm reflector in Bergedorf. The instrumental b and v color are supposedly close to the UBV system. As comparison star HR 6997 was used, check star was 9 Lyrae. From 6 comparisons in as many nights, the magnitude difference between these stars turned out to

$$\Delta m = +0.179 \pm 0.003 \text{ in v}, \quad \Delta m = -0.023 \pm 0.004 \text{ in b}.$$

(in the sense comp-check). The standard deviations correspond to a mean error of $\pm$0.007 resp. $\pm$0.009 mag. of a single observation; all observations were taken near culmination.

On the basis of these observations the date of primary minimum can only be bracketed: it probably occurred between JD 2439677.2 and 2439677.3. This datum refers to E = 255, if we use the linear ephemeris of Wood and Walker (1).

2. For the 1969 set of observations the 1 m reflector was used, diaphragmed to 40 or 45 cm. The team of observers consisted of Messr. U. Gehlich, T. Herczeg, J. Prölss and R. Wehmeyer. These were 3-color measurements, the instrumental ubv system again following the UBV prescription. No color transformation formula was established but we notice that the reference stars indicated slightly different Δm values:

$+0.174 \pm 0.0035$ in v, -0.008 ± 0.004 in b, -0.575 ± 0.009 in u.

(Again in the sense comp-check, 8 measurements in 7 nights.) This time the zenith distances of the observed stars were much greater than in 1967, resulting in the mean errors ±0.010, ±0.012 and ±0.025 mag. for a single v, b or u observation.

The second series of measurements, especially the observations made on September 13 and 27, can define a more reliable epoch of minimum light: JD 2440479.04. Comparison with observations published by Lovell and Hall (2) reveals a difference of about three hours, our epoch being late. Part of this deviation may be ascribed to erratic changes in the light curve; such effects are clearly noticeable in the 1958 and 1959 campaign results, see Larsson-Leander (3). Also, the Chagrin Falls observations extended over two seasons and during this time, the rapid change of the period can shift the minimum epoch by about one hour.

The Wood-Walker ephemeris gave residuals already in excess of 0.6 day. For the years around 1970, the linear ephemeris

Min. I = JD 2440479.033 + $12\overset{d}{.}93386$ E gives reasonably small O-C values. No doubt this formula too will soon prove its "ephemeral" character; for the present season, residuals of the order of $0\overset{d}{.}05$ or $0\overset{d}{.}06$ are to be expected.

Table of observations (comp-var)

JD 2439657.513	n = 5		b = 1.532	v = 1.617	
658.502	4		1.611	1.700	
660.502	4		1.920	2.013	
665.501	4		1.600	1.719	
676.509	4		1.216	1.373	
677.506	4		0.924	1.082	
685.501	2		1.80	1.91	C
JD 2439694.448	n = 4		b = 1.848	v = 1.936	
JD 2440448.435	n = 3	u = 1.917	b = 1.799	v = 1.881	
451.380	4	1.928	1.877	1.979	
452.390	2	1.41	1.40(5)	1.51	C
456.413	5	2.059	1.959	2.054	
477.345	4	1.855	1.807	1.899	
478.344	6	1.195	1.232	1.378	
.496	4	1.146	1.168	1.296	
492.338(5)	2	1.019	1.020	1.145	
.378(5)	2	1.025	1.008	1.178	
.421	2	1.090	1.061	1.195	C
JD 2440493.351	n = 5	u = 1.749	b = 1.690	v = 1.768	

C = measurements interrupted by clouds

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Hamburg - Bergedorf, Germany

References:

(1) Wood, D.B. and Walker, M.F. (1960) Ap. J. 131, 363.

(2) Lovell, L.P. and Hall, D.S. (1970) P.A.S.P. 82, 345.

(3) Larsson-Leander, G. (1970) Vistas in Astronomy (ed. A. Beer), Vol. 12, 183-197.

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Budapest
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PHOTOGRAPHIC OBSERVATIONS OF V 1057 CYG

Since the discovery by Welin (Astr.Astrophys. 12,312, 1971), that in late 1969 the low luminosity irregular variable V 1057 Cyg had brightened up several magnitudes, some papers had been published about the light curve of this remarkable variable. Minunger and Wenzel (MVS 5,170, 1971) published some magnitudes in the rising portion of the light curve, Mendoza (Ap.J.Lett. 169,117, 1971),Cohen and Woolf (Ap.J. 169,543, 1971), Simon, et al.(Astr.Astrophys.20,99, 1972), Rieke, Lee and Coyne (PASP 84,37, 1972)and Bossen (IBVS 722, 1972) published some magnitudes in the post-outburst portion of the light curve in different colour systems.

Here we present a light curve of V 1057 Cyg in a unique colour system which covers the rising portion and some parts of the post-outburst portion.

On a total of 97 patrol plates taken on Kodak 103a-O and Agfa 67 A 50 with the 30 cm Sonnefeld-4-lens astrograph of the Observatorium Hoher List of Bonn University between 1969 Oct. 28 and 1973 May 25 we measured the magnitudes of V 1057 Cyg with a Becker type iris-photometer using 8 nearby stars of a photoelectric UBV-sequence in SA 40 (Bigay and Garnier 1970, Astr.Astrophys.Suppl. 1,15).The average error of each measurement is of the order of ± $0^m.063$ (see error bar in the figure). For each measurement corrections with respect to different plate background had been computed. The results listed in the table below are plotted in the figure (dots). In addition one measurement (open circle) and the first (dashed) portion of the light curve around the 16th magnitude is taken from Meinunger and Wenzel.

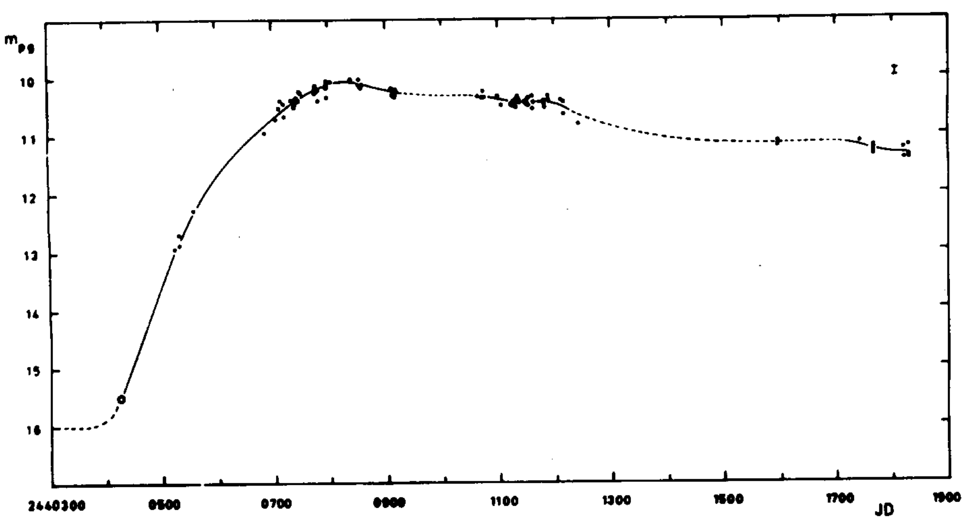
The light curve shows two remarkable phases:

1. The well known rapid brightening phase from about JD 244 0400 to JD 244 0830, that is over about 430 days (much more than estimated by Meinunger and Wenzel).
2. A very slow but steady darkening phase with the indication of two

or more plateaus of nearly constant light. During the last 1000 days from reaching maximum light to the preliminary last measurement on 1973, May 25 the decrease of magnitude of V 1057 Cyg is already of the order of about $1^m_{.}3$ in the photographic region.

More details of this study will be published elsewhere.

Acknowledgements: I like to thank H. Dürbeck, W. Gieren, M. Hoffman and R. Lukas for taking some additional patrol plates.



1973, June 20

F. GIESEKING
Observatorium Hoher List
der Universitäts-Sternwarte Bonn
D-5568 Daun, Germany

Julian Date	m_{pg}	Julian Date	m_{pg}	Julian Date	m_{pg}
244 0523.38	12.92	244 0795.51	10.13	244 1148.46	10.42
0531.33	12.68	0796.42	10.17	1149.51	10.45
0532.28	12.87	0797.44	10.06	1150.49	10.40
0557.29	12.26	0798.44	10.33	1151.50	10.47
0685.60	10.93	0804.45	10.06	1153.47	10.36
0705.54	10.70	0837.37	10.02	1159.48	10.32
0711.51	10.51	0852.37	10.12	1159.54	10.54
0711.58	10.50	0854.35	10.02	1161.42	10.43
0713.52	10.37	0857.34	10.16	1162.43	10.43
0714.57	10.38	0859.33	10.12	1180.39	10.45
0720.46	10.65	0910.28	10.18	1181.39	10.39
0720.57	10.44	0914.24	10.30	1181.57	10.52
0732.49	10.37	0916.25	10.32	1188.41	10.31
0738.49	10.45	0916.34	10.29	1189.47	10.39
0739.42	10.47	0917.29	10.20	1210.33	10.38
0739.49	10.42	1062.59	10.31	1214.41	10.64
0739.55	10.38	1070.59	10.34	1215.36	10.42
0740.44	10.44	1071.58	10.24	1216.32	10.41
0740.51	10.41	1075.59	10.34	1241.32	10.80
0741.45	10.37	1098.52	10.32	1593.34	11.19
0741.51	10.41	1104.54	10.48	1593.37	11.12
0742.46	10.40	1124.54	10.48	1741.66	11.13
0742.48	10.34	1125.50	10.46	1765.62	11.31
0746.51	10.38	1126.48	10.47	1765.628	11.23
0749.43	10.23	1126.52	10.49	1765.63	11.34
0749.50	10.25	1127.49	10.40	1765.64	11.21
0774.44	10.25	1130.46	10.52	1819.506	11.24
0774.53	10.22	1131.48	10.52	1819.510	11.42
0775.43	10.19	1133.48	10.37	1828.550	11.37
0776.50	10.20	1133.53	10.33	1828.555	11.42
0777.45	10.13	1134.49	10.38	1828.559	11.20
0780.48	10.21	1136.50	10.42		
0781.44	10.39	1146.42	10.42		

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Konkoly Observatory
Budapest
1973 June 30

SIX NEW VARIABLE B-STARS

Definite changes in brightness were observed by the author in six B-stars of the southern hemisphere during observing campaigns at the ESO Observatory on La Silla mountain (Chile) in 1970 and at the Boyden Observatory (Bloemfontein-South Africa) in 1973. They are listed in the table by their HD number; their m_V, spectral class and RV have been copied from the Catalogue of Bright Stars, 3^d edition, while the elements of the light variation are added in so far as they could be determined.

Table I

*	m_V	S	RV	Type	Period	Amplitude
HD 55857	6,11	B3-IV	--	β CMa	2^h41^m	0^m,02
HD 55958	6,53	B3	+28V?	?	?	≥,06
HD 57219	5,10	B3-V	<3V	Ell.SB	~24^h	,045
				+β CMa	~ 3^h	,02v
HD 74146	5,20	B5-V	+36V	Ell.SB?	?	≥,01
HD 74195	3,61	B3-III	+17V	β CMa	3^h10^m	±,02
HD 74375	4,32	B1-III	+13V	β CMa	?	≥,02
				+ SB	133^d92	

Remarks to the individual objects.

1. HD 55857 - Was discovered with the photometric equipment attached to the 6" Zeiss telescope of La Silla Observatory in 1970. Its period is the shortest known among βCMa stars. The lightcurve is a sinusoid, so is the RV-curve with V_γ = +30 Km/sec and 2K ≥ 40 Km/sec.

2. HD 55958 - was discovered with the 60" Rockefeller telescope of Boyden Observatory in March 1973 when being used as a comparison star for HD 55857. Figure 1 shows the portions of the lightcurve which were obtained. The star might well be of the same nature as the next one.

3. HD 57219 (υ^2Pup) - discovered with the 6" Zeiss telescope at La Silla in 1970. The star was under photometric observation during seven hours in each of nine nights in January of that year; moreover spectrograms were taken with the 152 cm telescope on two successive nights. All the tracings showed grosso modo the same im-

age for every night (see Figure 2) namely 3^h -waves superposed on the rising branch of a much longer wave. This longer wave had a smaller amplitude in U than in V, a circumstance which ruled out the possibility that it be due to a pulsation. The phase relation between the lightcurves and the RV-curves strengthened this conclusion.

The only way to combine all the observed facts into a coherent scheme is to admit that υ^2 Pup is the brighter component of a single lined spectroscopic binary with an orbital period close to 24^h. This component is ellipsodial in shape whereby its revolution produces two maxima and two minima and thus a photometric period of 12^h. It is at the same time a βCMa star of short period (3^h). The star thus provides an oppotunity to look into the details of the pulsations of an elongated star.

Confirmation of this interpretation must come from observations made at three southern observatories widely separated in longitude: Australia, South Africa and South America.

4. HD 74146 - was discovered in 1973 at Boyden when being used as a comparison star to o Vel. The mean difference m(4)-m(5) over a cycle of the latter changed from $1^m_{,}55$ to $1^m_{,}64$. The star is probably an ellipsoidal binary.

5. HD 74195 (o Vel) - was already proclaimed a β CMa star from its radial velocity changes. (Van Hoof, Astr.Astrophys.18,51-54,1972) Photometric observations made at Boyden in 1973 have confirmed the earlier statement. The lightcurve is unstabil as was suspected to be the case from the large dispersion of the individual RV's from the mean velocity curve.

6. HD 74375 - this single lined spectroscopic binary was suspected by the author to be also a β CMa star, a suspicion that arose from the dispersion of the individual RV's around the mean orbital curve and from the very sharp epctral lines. (Van Hoof, Med.Kon.Ac. Wet., en Sch.K. v. België , XXXIV,no.4,1972.) Observations made this year at Boyden with the 60" show indeed a variation of the difference m(HD 74375)-m(HD 75086) by $0^m_{,}02$. The period could not be derived because the runs obtained were too short. There is a fair chance that the star is also an eclipsing binary.

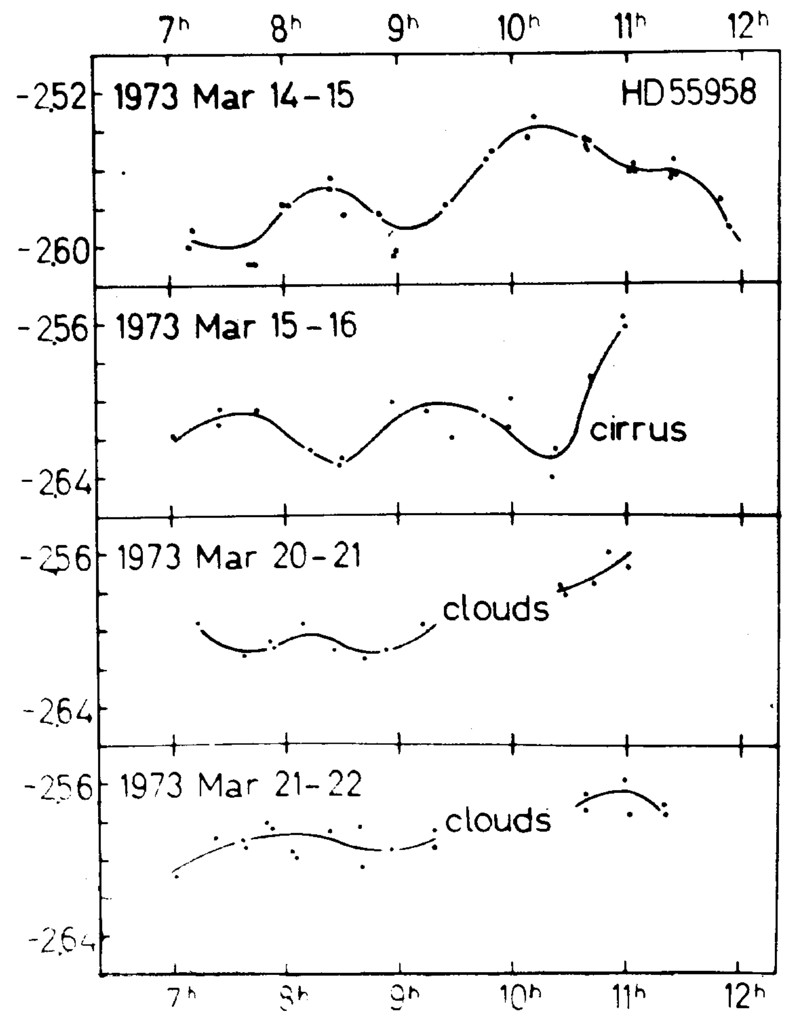

Figure 1. - Observed lightchanges in HD 55958.Absc.:Sid. Time Bloemfontein ($\lambda_{Bfn} = 1^h45^m$ E). Ord.: m_V(ω CMa - HD 55958).

Full details about the observations of stars 1,3 and 5 of the list will be published in one of the forthcoming numbers of the Mededelingen van de Koninklijke Academie voor Wetenschappen, Letteren en Schone Kunsten van België.

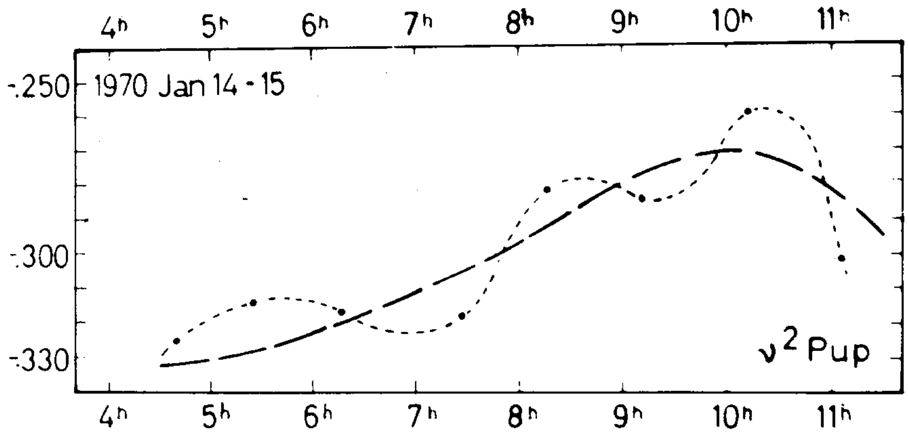

Figure 2. - Lightchanges in HD 57219 observed in the night 1970 Jan 14/15
Absc. : Sid. Time La Silla ($\lambda_{LS} = 4^h43^m$ W). Ord . : m_v (HD 57219 - HD 56733);
add - 1^m for step difference.

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NOTE ON THREE OF G.HILL'S STARS

In Astrophysical Journal Supplement Series Nr.130 (1967) G.Hill published the results of an extensive search for new variable B stars. His findings meant a substantial widening of the region in the H-R diagram within which β CMa stars had been found up to then; also overrun were the barriers set by low rotational velocity and by the period-luminosity law. But Hill's method to derive periods is open to serious scepticism when it is applied to stars which have beats and phase shifts of the maxima and minima in their lightcurves, and this is known to be quite common among β CMa stars. Hill's results should therefore be checked by means of conventional long photometric runs on each of his stars.

The author spent several nights in observing three of them, two β CMa stars and one eclipsing variable, during observation campaigns at the ESO Observatory in Chile during 1968 and 1969-70. He arrived at the following conclusions:

1. HD 53755, BO-V, a β CMa star with amplitude Δm_b=0,032 and Δm_U=0,031 and P=$0^d_,43389$ according to Hill: neither the period nor the amplitude could be found back. If there is any periodicity at all discernable in the small lightfluctuations of the star, we would suggest 6^h25^m for the period length and $0^m_,02$ for the amplitude in v.

2. HD 53794, BO,5-IV, a β CMa star with amplitude Δm = 0,027 and P = $0^d_,12377$ according to Hill: only on one occasion, namely in the night of 20 December 1968 was a period of 3^h found back for a lightvariation of $0^m_,01$. For the rest a period of $10^h52^m_,5$ is not unlikely associated with lightchanges of the order of $0^m_,01$-$0^m_,02$, and RV changes observed on spectrograms taken in the course of one and the same night. But the star in certainly a spectroscopic binary with very long period; this can be concluded from our RV measurements which reveal the RV to drop steadily from ∿+50 Km/sec on 19 Nov 1969 to ∿-20 Km/sec on 21 Jan. 1970.

3. HD 53756, B2-IV, an eclipsing binary with Δm=0,025 and P = $4^d_,1237$ according to Hill: this star is indeed an eclipsing binary with slightly elongated components, but the period is P=$2^d_,8$. A secondary minimum almost as deep as the primary but revealing a slightly eccentric orbit caused Hill's mistake.

This star will be extensively reported on in a separate publication.

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Konkoly Observatory
Budapest
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PHOTOELECTRIC OBSERVATIONS OF THE FLARE STAR EV LAC

Continuous photoelectric monitoring of the flare star EV Lac has been carried out at the Stephanion Astronomical Station ($\lambda=-22^{\circ}49'44''$, $\phi=+37^{\circ}45'15''$) during the following periods: 1.) the period August 14-31, 1972, 2.) the period of cooperative optical observations of this star proposed by the IAU Working Group on Flare Stars i.e. September 1-15, 1972 (Chugainov, IBVS,No.605,1971) and 3.) the period September 16-19, 1972, using the 30-inch Cassegrain reflector of the Department of Geodetic Astronomy, University of Thessaloniki. Observations have been made with a Johnson dual channel photoelectric photometer in the B color of the international UBV system. The telescope and photometer will be described elsewhere. Here we mention only that the transformation of our instrumental ubv system to the international UBV system is given by the following equations:

$$V = v_o + 0.018(b-v)_o + 1.788,$$
$$(B-V) = 0.814 + 0.930(b-v)_o,$$
$$(U-B) = -0.951 + 0.864(u-b)_o.$$

The monitoring intervals in UT as well as the total monitoring time for each night are given in Table 1. Any interruption of more than one minute has been noted.

During the 44.2 hours of monitoring time 6 flares were observed the characteristics of which are given in Table 2. For each flare following characteristics (Andrews et.al. IBVS No.326,1969) are given: a) the date and universal time of flare maximum, b) the duration before and after maximum (t_b and t_a respectively) as well as the total duration of the flare, c) the value of the ratio $(I_f-I_o)/I_o$ corresponding to flare maximum, where I_o is the intensity deflection less sky background of the quiet star and I_f is the total intensity deflection less sky background of the star plus flare, d) the integrated intensity of the flare over its total duration, including pre-flares, if present, $P=\int(I_f-I_o)/I_o\,dt$, e) the increase of the apparent magnitude of the star at flare maximum $\Delta m(b) = 2.5 \log(I_f/I_o)$, where b is the blue magnitude of the star in our instrumental system, f the standard deviation of random noice fluctuation $\sigma(mag) = 2.5\{\log(I_o+\sigma)/I_o\}$ and g) the air mass. The light curves of the observed flares in the b color are shown in Figs. 1-6.

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G.ASTERIADIS,L.N. MAVRIDIS and D.STAVRIDIS

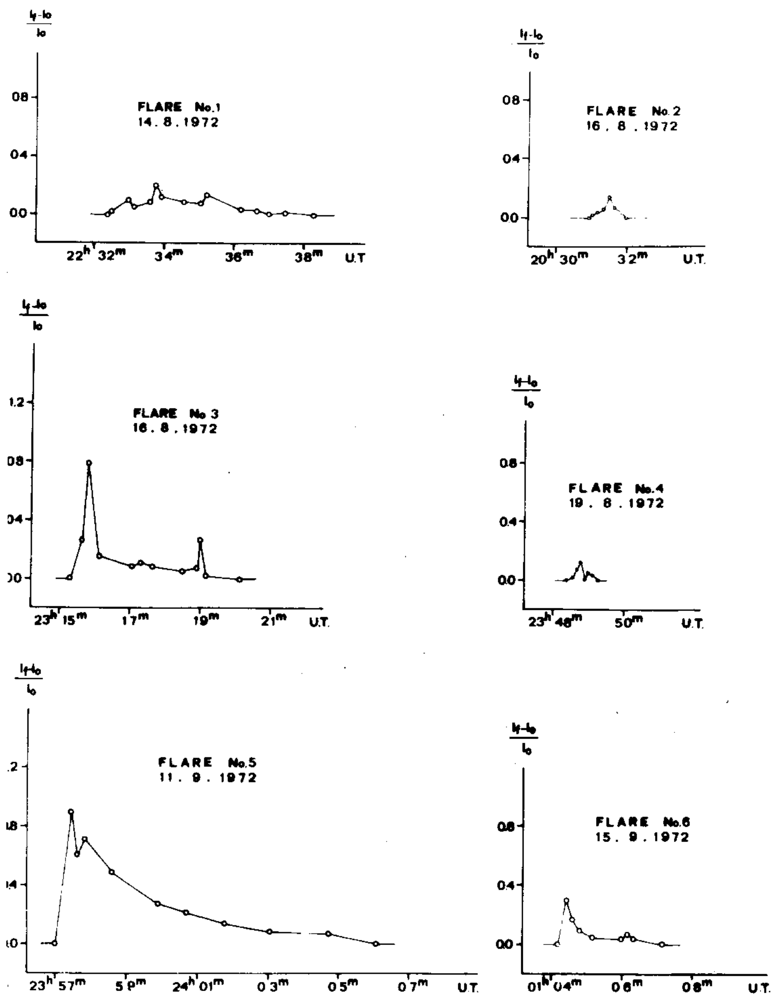
TABLE 1

Date 1972 Aug.	Monitoring intervals	Total Monitoring Time
14-15	19^h36^m-19^h49^m, 1954-2013, 2017-2031, 2032-2037, 2137-2159, 2202-2214, 2217-2224, 2227-2244, 2302-2321, 2325-2332, 2338-2347, 2350-2358, 2359-0009, 0020-0032, 0041-0100, 0109-0134, 0137-0150.	3^h 51^m
15-16	1936-1951, 1955-2015, 2018-2036, 2040-2100, 2111-2131, 2134-2152, 2156-2214, 2307-2316, 2318-2333, 2337-2358, 0001-0021, 0024-0041, 0051-0110, 0114-0131, 0134-0201.	4^h 34^m
16-17	1949-2006, 2009-2025, 2028-2042, 2051-2109, 2112-2130, 2133-2148, 2258-2323, 2337-2353, 2356-0015, 0018-0037, 0044-0100, 0102-0121, 0123-0141, 0143-0200.	4^h 07^m
17-18	2343-2354, 0002-0029, 0031-0056, 0110-0131, 0133-0204.	1^h 55^m
19-20	2135-2155, 2156-2202, 2204-2227, 2338-2357, 0000-0028, 0037-0100, 0103-0128, 0136-0200.	2^h 48^m
20-21	2026-2055, 2059-2120, 2154-2158, 2309-2335, 2338-2351, 0002-0032, 0035-0104, 0115-0138, 0141-0200.	3^h 14^m
21	2045-2111, 2115-2142, 2150-2157.	1^h
30-31	2257-2321, 0025-0053, 0057-0114.	1^h 09^m
31	2019-2036, 2038-2048, 2051-2123, 2129-2156, 2200-2229, 2329-0000.	2^h 26^m
Sept.		
1	0004-0033, 0042-0110, 0113-0142, 0149-0238.	2^h 15^m
6-7	1952-2026, 2034-2042, 2049-2115, 2118-2158, 2219-2226, 2336-0003.	2^h 22^m
8-9	2114-2139, 2141-2154, 2157-2227, 2231-2256, 2320-2333, 2345-0012.	2^h 13^m
9-10	2206-2231, 2233-2309, 2312-2346, 2349-0001, 0012-0112.	2^h 47^m
11-12	2221-2246, 2248-2326, 2327-2339, 2343-0008, 0010-0144, 0147-0157.	3^h 24^m
12-13	2229-2250, 2254-2347, 2352-0027, 0028-0105, 0109-0120, 0123-0135, 0138-0152, 0155-0208.	3^h 16^m
16	2210-2317.	1^h 07^m
18-19	2350-0023, 0025-0043, 0054-0113, 0115-0151.	1^h 46^m
	Total	44^h 14^m

TABLE 2

Characteristics of the flares observed

Flare No.	Date	U.T.	t_b	t_a	Duration	$(I_f-I_o)/I_o$	P	Δm	σ	Air
	1972	maximum	min.	min.	min.	maximum	min.	mag	mag.	mass
	Aug.									
1	14	$22^h33^m.8$	1.3	4.5	5.8	0.21	0.35	0.21	0.01	1.03
2	16	$20^h31^m.5$	0.6	0.4	1.0	0.15	0.06	0.16	0.02	1.21
3	16	$23^h15^m.8$	0.4	4.3	4.7	0.79	0.57	0.63	0.01	1.02
4	19	$23^h48^m.8$	0.3	0.5	0.8	0.11	0.05	0.11	0.01	1.01
	Sept.									
5	11	$23^h57^m.4$	0.4	8.7	9.1	0.90	2.14	0.70	0.01	1.10
6	19	$01^h04^m.4$	0.2	2.8	3.0	0.29	0.21	0.28	0.01	1.34



FLARE No.1
14. 8. 1972
22h 32m
34m
36m
38m
U.T
FLARE No.2
16 . 8 . 1972
20h 30m
32m
U.T.
FLARE No 3
16 . 8 . 1972
23h 15m
17m
19m
21m
U.T.
FLARE No.4
19 . 8 . 1972
23h 48m
50m
U.T.
FLARE No.5
11 . 9 . 1972
23h 57m
24h 01m
03m
05m
07m
U.T.
FLARE No.6
15 . 9 . 1972
01h 04m
06m
08m
U.T.

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PHOTOELECTRIC MONITOR OF THE FLARE STARS AD Leo AND EV Lac

Five flares were detected during a photoelectric monitor of the star AD Leo over a total of 22^h19^m spread over eight nights during the period 12 March - 4 May 1973. No flare on EV Lac could be detected over a coverage of nearly 2^h between 4 - 6 December 1972. The details of observations are contained in Tables Ia and Ib. Table II records the flare characteristics of AD Leo which were computed using the same techniques and procedures as those employed earlier (Kapoor and Sinvhal, 1972). For all the energy calculations the quiescent state luminosity of the star was taken to be 1.25×10^{29} erg sec^{-1} 100 A^{-1} in the U filter and 8.2×10^{29} erg sec^{-1} 100 A^{-1} in the B filter with reference to Oke and Schild's (1970) calibration of α Lyr.

The light curves of the flares, shown in Figs. 1, 3 and 4 imply that we have to do with Type II flares of Oskanyan (1969) although once again the classification is not too exact (see e.g.,Kapoor and Sinvhal, 1972; Kapoor, 1973). The other flares (Figs. 2 and 5) seem to be Type I flares.

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Kapoor, R.C., 1973, I.B.V.S. No. 758.
Oke, J.B., and Schild, R.E. 1970, Astrophys.J., 161, 1015.
Oskanyan, V.S., 1969, Non-periodic Phenomena in Variable Stars Ed. L.Detre, Academic Press, Budapest, p.131.

TABLE Ia

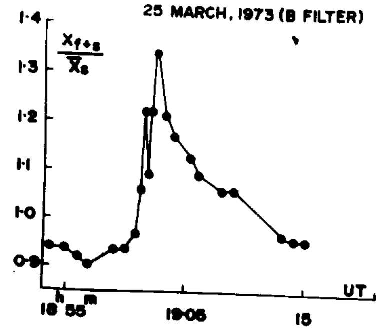
COVERAGE OF AD Leo

Date, 1973	Telescope	Filter	(Times rounded to the nearest minute of UT)	Effective Coverage
12 Mar.	56 - cm	U	15^h27^m- 32^m;	15^h34^m- 56^m;
			15 58 - 16^h37^m;	16 38 - 49 ;
			17 01 - 50	18 27 - 31 ;
			18 33 - 19 08;	19 09 - 39 ;
			19 40 - 20 23.	
14 Mar.	56 - cm	B	18 13 - 42;	18 43 - 19 43;
			20 08 - 24.	
23 Mar.	56 - cm	B	16 38 - 17 08;	17 09 - 14 ;
			17 31 - 39;	17 44 - 48 ;
			17 52 - 55;	17 59 - 18 12;
			18 17 - 21;	18 42 - 50 ;
			18 52 - 19 01;	19 06 - 18 ;
			19 30 - 33.	
25 Mar.	56 - cm	B	15 22 - 29;	15 33 - 46 ;
			15 48 - 16 10;	16 11 - 28 ;
			16 37 - 59;	17 00 - 15 ;
			17 20 - 36;	17 37 - 47 ;
			17 50 - 53;	17 54 - 18 03;
			18 04 - 20;	18 21 - 47 ;
			18 48 - 19 09;	19 11 - 13 ;
			19 14 - 17;	19 18 - 22 ;
			19 23 - 40;	19 41 - 46.
27 Mar.	56 - cm	B	15 05 - 24;	15 28 - 40 ;
			15 41 - 54;	15 55 - 16 09;
			16 10 - 14;	16 18 - 33 ;
			16 34 - 17 15;	17 16 - 20 ;
			17 21 - 32;	17 33 - 54 ;
			17 55 - 18 24;	18 25 - 55 ;
			18 56 - 19 20;	19 21 - 48 ;
			19 49 - 20 12;	20 13 - 18 ;
			20 20 - 33.	
8 Apr.	104 - cm	U	15 37 - 47;	15 50 - 59 ;
			16 01 - 17 33;	17 35 - 18 25.
28 Apr.	104 - cm	U	16 13 - 55;	16 57 - 59 ;
			17 01 - 25;	17 30 - 19 17.
4 May	56 - cm	B	15 57 - 16 00;	16 01 - 27 ;
			16 28 - 59;	17 00 - 33 ;
			17 34 - 18 02;	18 03 - 31 ;
			18 33 - 19 00;	19 03 - 25 ;
			19 27 - 36;	19 38 - 42 ;
			19 43 - 51.	

Notes: 1. The flare intervals have been underlined.
2. TOTAL COVERAGE: 22^h19^m spread over eight nights.
3. Photomultiplier: 1P21, unrefrigerated.

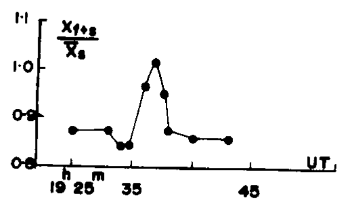
FIG·1

25 MARCH, 1973 (B FILTER)



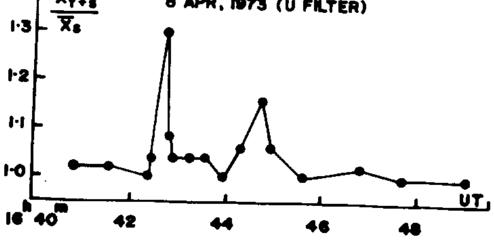
FIG·2

25 MARCH, 1973 (B FILTER)



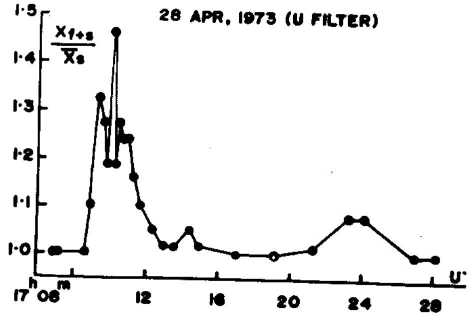
FIG· 3

8 APR, 1973 (U FILTER)



FIG· 4

28 APR, 1973 (U FILTER)



FIG· 5

4 MAY, 1973 (B FILTER)

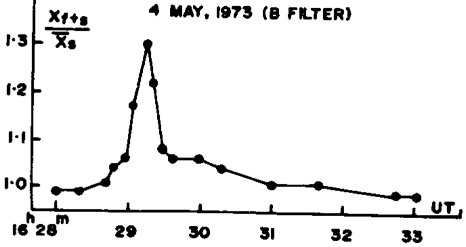


TABLE Ib

COVERAGE OF EV Lac

Date, 1972	Telescope	Filter	(Times rounded to the nearest minute of UT)	Effective Coverage
4 Dec.	56 - cm	B	16^h25^m- 29^m; 17 00 - 12;	16^h32^m- 59^m; 17 14 - 25.
6 Dec.	56 - cm	B	15 26 - 33 ; 15 42 - 16 10; 16 51 - 59.	15 34 - 40 ; 16 28 - 48 ;

Notes: 1. TOTAL COVERAGE: 2^h03^m spread over two nights.
2. Photomultiplier: 1P21, unrefrigerated.
3. No flare noticed.

TABLE II

CHARACTERISTICS OF THE FLARES ON AD LEONIS (dM4e:V=$9\overset{m}{.}43$;U-V=$2\overset{m}{.}61$)

Date 1973	UT_{max}	Flare duration t_b	t_a	$\frac{Xfm+s}{\overline{X}_s}$	Δm	$\frac{\sigma}{\overline{X}_s}$	P (min)	F(z)	Energy released at flare max. (10^{29}erg/s)	Total emission during the flare-up (10^{30}erg/s
25 Mar.	$19^h02^m27^s$	$5\overset{m}{.}6$	$12\overset{m}{.}5$	1.34	0.42	0.06	2.56	1.18	6.74	70.57
25 Mar.	19 36 48	2.0	6.0	1.02	0.02	0.06	0.43	1.29	4.66	11.85
8 Apr.	16 42 43	0.3	5.0	1.3	0.28	0.024	0.27	1.03	1.62	1.99
28 Apr.	17 10 06	1.38	18.05	1.46	0.41	0.038	1.99	1.24	1.82	14.93
4 May	16 29 14	0.9	3.5	1.3	0.28	0.021	0.24	1.19	5.95	6.53

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NUMBER 811

Konkoly Observatory
Budapest
1973 July 16

ANOMALOUS BRIGHTENING OF TX Cam NEAR MINIMUM LIGHT

The long-period (P = 557.4 days) M-type Mira variable,TX Cam has been included in a photographic program to monitor the light and spectral variations of several infrared objects. On March 23, 1973 a photograph was obtained which indicated that TX Cam was unusually bright. The observations summarized below were determined from one hour exposures on Kodak 103a-D plates behind a Wratten 12 filter.

U.T. Date 1973	J.D. 2.440.000+	TX Cam V	Nearby Star V
14 February	1728.3	15.3	14.8
23 March	1765.2	14.5	14.9
24 March	1766.2	15.5	14.9

The magnitudes were derived from an extrapolation of the UBV sequence determined by Wing et al.[1] As a consistency check on the extrapolation, the magnitude of a companion star only eight seconds of arc distance was also determined on each plate.The images of TX Cam and the companion on the plates were well-separated and easily measurable. We estimate the errors of the extrapolated magnitudes to be $\pm 0^m.2$.

Evidently TX Cam brightened by one magnitude sometime between February 14 and March 23. That it was a short-term phenomenom is suggested by the fact that TX Cam returned to V = 15.5 in only twenty-four hours. Such a large and rapid change in the V magnitude,if real, is difficult to explain for a long-period variable. Both the observed magnitudes and the light elements of Kukarkin et al.[2] indicate that TX Cam was very close to minimum light in March 1973.

An image-tube spectrogram (495 Åmm^{-1}) obtained on April 3,1973 reveals the spectrum of a normal late-type long-period variable with very strong VO band features indicating a spectral type of M10. A spectrogram at the same dispersion in the 4000 to 5000 A region reveals no evidence of unusual features in the blue and rules out the presence of a close, unresolved companion with a B magnitude brighter than 17.

Additional observations are needed to confirm this anomalous, short-term brightening of TX Cam near minimum light.

We acknowledge the support of Smithsonian Research Foundation Grant SFC-0-3005.

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INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
1973 July 20

ON THE CHARACTER OF LIGHT VARIATIONS OF THE INFRARED CARBON STAR CIT 6

The object CIT 6 = IRC + 30219 = RW LMi (1) represents the carbon star with the largest colour index I-K in the catalogue of Neugebauer and Leighton (2). In order to find out the character of the light variation of CIT 6 photographic observations in red passbands R′(plate ORWO ZP3, filter RG1) or R (plate ORWO ZP1, filter RG1) similar to that of W. Becker's system, as well as in V-, and less frequently in B- and U- band have been carried out with the Schmidt camera of the Radioastrophysical Observatory since the spring 1970.

According to 42 observations in R- band the star CIT 6 seems to belong to the long period variable stars with a period of about 570 days and an amplitude of about 1,5 mag. (see Fig.)

Besides general long period changes the observations in V- band, only 14 in number, show a rapid decrease of brightness by approximately 1 mag. within a time interval not more than seven days between J.D. 2441053 and 2441060, followed by a slower return to the "normal" value. Judging by the scanty R′ - magnitudes a brightness drop has taken place in the red light, as well.

In the following cycle of the light variation of CIT 6 we have very few observations at the same phase (0.8 P). Nevertheless, a decrease of brightness in noticeable.

Fortunately, polarimetric and photometric observations of the star made by Kruszewski happened to coincide with what seemed to be a similar phenomenon in the second cycle, and a sudden decrease of brightness in V-, B- and U- bands with amplitude of around 1 mag. as well as a large and fast change of the degree of polarization during only three days was established (3).

One more short minimum was observed in the light variation around J.D. 2441765 near the maximum brightness of the long period variations.

Possibly, in the case of CIT 6 we deal with an extremely sharply expressed phenomenon inherent in many Mira-type stars, so called bump or wave or secondary minimum, connected with a more or less definite phase of long period variations for a particular star (4). If so, the next interval of time favorable for observations of such a phenomenon in CIT 6 might be expected in Febr.-March 1976. Some other explanations of the phenomenon and a different time of its next appearance cannot be exluded, the more so because CIT 6 has some other photometric peculiarities.

Compared to other infrared or late type carbon stars (e.g.CIT 5, CIT 13, IRC + 10216) the colour indices B-V=1,2 and U-B=1,0 are unusually small. If the anomaly of CIT 6 is due to the presence of a bluer unresolved companion (5) the radiation in B- and even more so in U-band refers mainly to the latter. The long period variations observed in R-band, on the other hand,are due to the very red carbon star. If the observed fast decreases of brightness, indeed, depend on long period variations, then their cause is connected with the carbon star component. Evidently, both components are influenced by the same process, e.g., sudden ejection of dust shall. Detailed continuous observations of the fast changes in CIT 6 might give some more definite conclusions.

The two first of our observations in B do not agree with long period variations in R magnitudes. The mean colour index B-R=4,1 for these two measurements is considerably larger than for the latest observations (B-R=2,7). Possibly, this may reflect brightness changes of the bluer companion.

The alternate explanation of CIT 6 as a single star leads to unusual distribution of energy in its spectrum: in the ultraviolet and visible part it corresponds to an early C-star. In the near infrared strong bands of CN discovered by Wisniewski et al. testify to the fact that CIT 6 belongs to the late C-stars.

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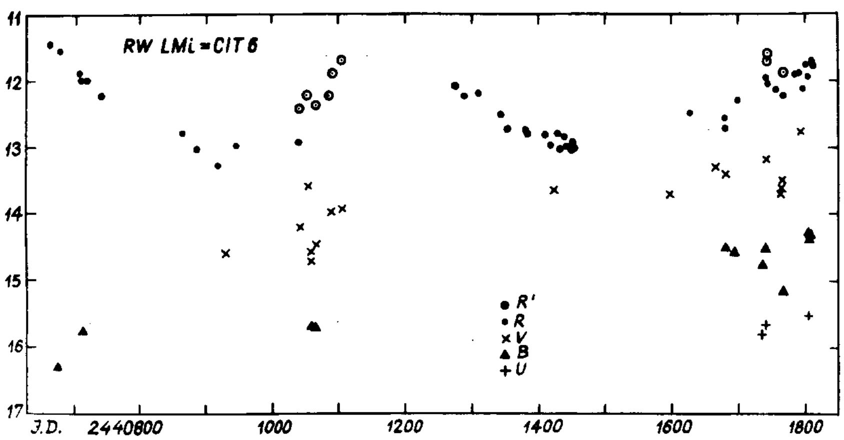

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THE UNUSUAL SPECTRUM OF CSV 1855

The faint southern star No. 1855 in the 1951 Catalogue of Stars Suspected of Variability, discovered by Hoffmeister to range from m_{pg}=11 to 13, is contained, though not so noted, in Wackerling's (1970) catalogue of early-type emission-line stars and in Stephenson and Sanduleak's (1971) list of luminous stars in the Southern Milky Way. It was found to show bright $H\alpha$ by Henize and Wray and by Stephenson and Sanduleak, and the latter further noted the presence of line emission in the blue spectral region.

A recent inspection of an excellent 60-minute blue objective-prism plate taken by N. Sanduleak on Feb. 25, 1968 with the Curtis Schmidt at Cerro Tololo indicates that this star shows several fairly strong unusual emission features, probably due to Fe II, in addition to very strong $H\beta$ and moderately strong $H\gamma$. The emission lines are not seen below $H\delta$, and the spectrum is nearly continuous at shorter wavelengths. Comparison of this exposure with earlier plates taken in June and July 1967 for the Southern OB Survey, which are less well exposed, indicates little spectrum or magnitude change. In view of the variability of the object, a possible similarity with XX Ophiuchi is suggested.

I am happy to acknowledge the assistance of Drs. W. P. Bidelman and N.J. Irvine in the preparation of this note. This work was supported in part by NSF Grant GP-21203 to Case Western Reserve University.

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Budapest
1973 July 23

PHOTOELECTRIC OBSERVATIONS OF PLEIONE (BU TAU) IN 1972-1973

During the period from August 1972 to March 1973 photoelectric UBV observations of the well-known shell variable Pleione (BU Tau) were continued at the Crimea Station of the Sternberg Astronomical Institute. Results of our observations are given in the Table.

J.D.2441	U	B	V	J.D.2441	U	B	V
548.570	4.87	5.18	5.26	599.437	4.91	5.28	5.31
550.580	4.91	5.21	5.25	605.455	4.94	5.27	5.30
558.525	4.89	5.26	5.31	629.431	4.91	5.33	5.32
569.461	4.91	5.27	5.31	665.226	4.90	5.28	5.30
571.440	4.89	5.26	5.30	685.362	4.92	5.28	5.31
578.587	4.92	5.30	5.33	719.183	4.91	5.28	5.34
596.443	4.89	5.27	5.32	730.316	4.94	5.29	5.33
597.588	4.93	5.28	5.31	749.307	4.95	5.30	5.33
598.599	4.91	5.25	5.30	770.217	4.94	5.30	5.32

The UBV light curves of the star from October 1971 (A.S. Sharov, V.M. Lyutiy, IBVS 698 and Variable Stars 18, 377, 1972) to March 1973 are shown in the Figure. Last months the star was in the minimum of brightness that is connected with a new shell episode.

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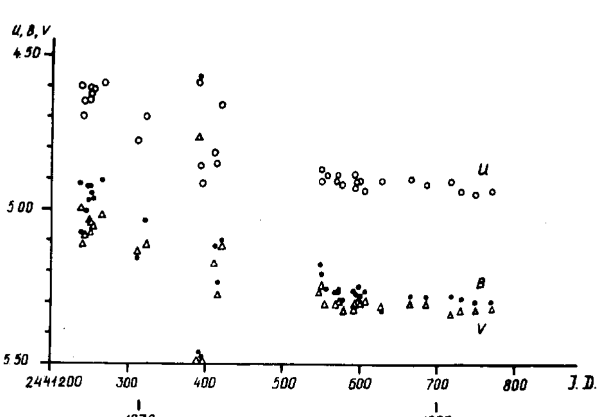

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Konkoly Observatory
Budapest
1973 July 31

A PRELIMINARY REPORT ON THE FLARE ACTIVITY OF THE U Gem-TYPE STAR VY Scl

1. Introduction

Iriarte and Chavira (1957) were the first who discovered the star to be variable. In the course of the search for faint blue stars in high southern latitudes, Luyten and Haro (195?) found that the range of this star, designated as SPC VAR.4, was at least 4 mag. Haro (1959) suggested that it was similar to the U Gem-type stars (or SS Cyg-type variables). Haro and Chavira (1960) and Pişmiş (1972) studied photographic material and concluded that VY Scl can be classified as an R CrB-type star. Pişmiş' material showed two minima of roughly 4.5 mag deep with an interval of 600 days. In the maximum, at the 13th mag, VY Scl showed an irregular variability of 0.75 mag. However he cites Herbig who concluded that the spectral characteristics are not like those of any R CrB-type star.

2. The Observations

The observations have been made with the Walraven five-colour simultaneous photometer, attached to the 90-cm Light-Collector of the Leiden Southern Station (at the Republic Observatory Annexe) Hartebeestpoortdam, South-Africa, during several nights in June and July 1973. The variable, during that time around the 13.5 mag, was compared with the 11th mag star close to it and marked on Pişmiş finding chart as the brightest star. In four nights of observing the star longer than half an hour, it showed intensive flare activity and in a very short time. A tentative reduction of the longest run in shown in Fig.1 for the B and U passbands of which the effective wave lengths are 4260 and 3620 A respectively (Walraven and Walraven, 1960; Rijf, Tinbergen and Walraven, 1969). Generally the integration time for the variable was 1.5 min. and for the comparison star 0.5 min. The differences variable star minus comparison star are given in log intensity. The variable exhibits a relatively high U intensity, while the amplitude of the flares is nearly twice that in B. During the time span of over one month the average brightness of the star was more or less constant.

3. Discussion

Because of the relatively high U intensity, the absence of any R CrB spectral characteristics and the very short time scale of the sudden outburst, VY Scl might be classified as an U Gem-type star (or SS Cyg-type), which are all small double star systems, one component being a white dwarf while the other is an underluminous later type star, which overflows its inner Lagrangian surface. The ejected material forms a ring or disk around the blue star (Kraft,1962). New ejected material falling into the ring or disk can result in a hot spot and irregularities in the amount of infalling mass explain the sudden light outburst. This seems to be supported by recent spectroscopic observations by Feast (private communication), who found no spectral changes at all during several hours of observing. The strong decrease in intensity reported by Pişmiş might be the result of a decrease in mass exchange. VY Scl would be a very valuable object to observe with a high speed photometer.

Acknowledgement. It is a pleasure to thank Dr. M.W.Feast for calling my attention to VY Scl and for his advices and very valuable discussions and Dr. Th.Walraven for reading the manuscript.

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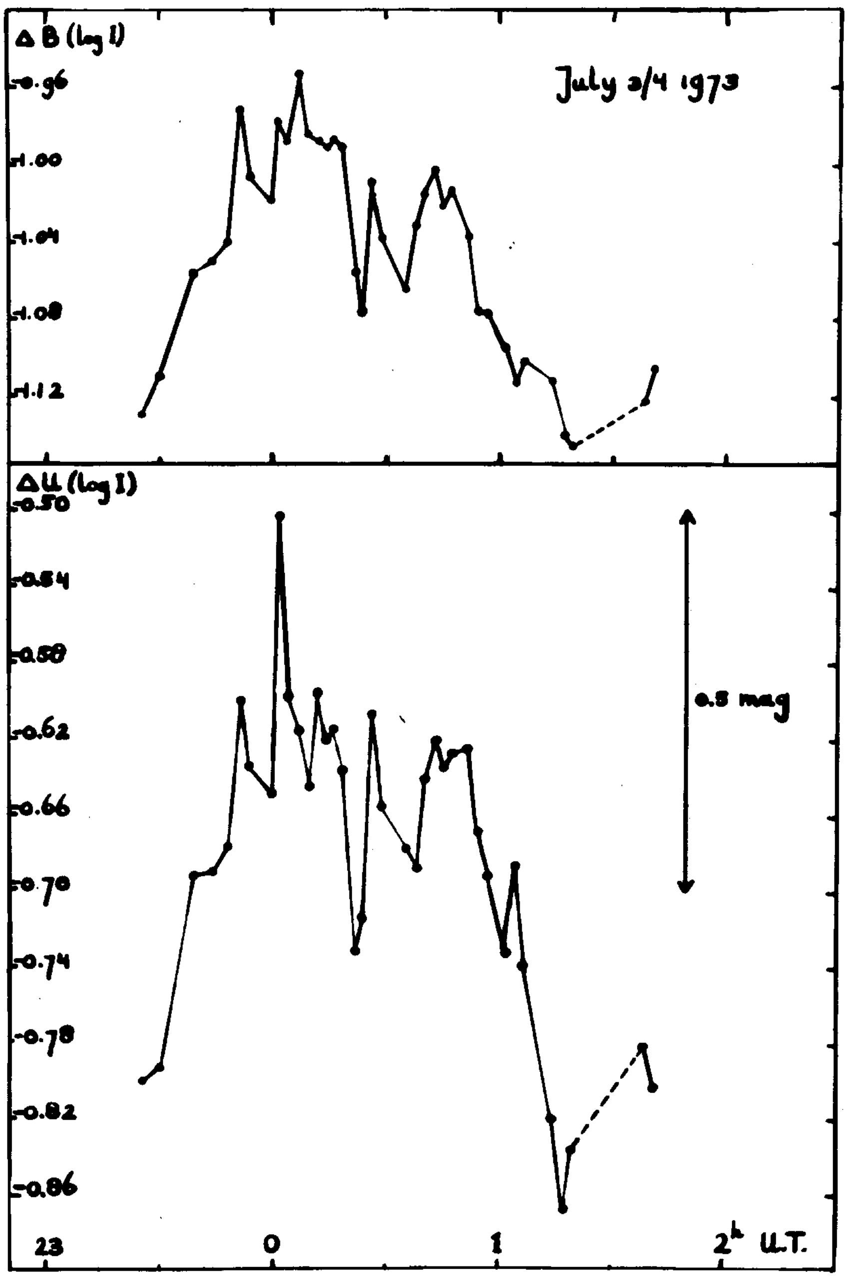
Fig. 1



The brightnesses VY Scl minus comparison star (in log intensity) plotted against universal time for the B- (4260 A) and U- passbands (3620 A).

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Budapest
1973 August 2

PHOTOELECTRIC OBSERVATIONS OF THE FLARE STAR AD Leo

Continuous photoelectric monitoring of the flare star AD Leo has been carried out at the Stephanion Astronomical Station ($\lambda = -22^{\circ}49'44''$, $\phi = +37^{\circ}45'15''$) during the period of cooperative optical observations of this star proposed by the IAU Working Group on Flare Stars i.e. January 27-February 9,1973 (Chugainov,1972) using the 30-inch Cassegrain reflector of the Department of Geodetic Astronomy University of Thessaloniki. Observations have been made with a Johnson dual channel photoelectric photometer in the B color of the international UBV system. The telescope and photometer will be described elsewhere. Here we mention only that the transformation of our instrumental ubv system to the international UBV system is given by the following equations:

$$V = v_o + 0.039(b-v)_o + 1.560,$$
$$(B-V) = 0.737 + 1.033(b-v)_o ,$$
$$(U-B) = -1.365 + 1.007(u-b)_o .$$

The monitoring intervals in UT as well as the total monitoring time for each night are given in Table 1. Any interruption of more than one minute has been noted.

TABLE 1

Date 1973 Feb.	Monitoring intervals (UT)	Total Monitoring time
6-7	$20^h56^m-21^h13^m$, 2114-2121, 2127-2200, 2203-2225, 2228-2258, 2304-2333, 2335-0005, 0007-0101, 0104-0133.	4^h11^m
7-8	2102-2130, 2133-2159, 2204-2234, 2237-2314, 2317-2337, 2343-0033, 0035-0110.	3^h46^m
	Total	7^h57^m

During the 7.95 hours of monitoring time no flare was observed. It should be noted that the standard deviation of random noise fluctuation $\sigma(mag) = 2.5\{\log(I_o + \sigma)/I_o\}$ (Andrews et al., 1969) was equal to $\sigma = 0^m.01$ during all the monitoring time.

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INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 817

Konkoly Observatory
Budapest
1973 August 11

MINIMA OF ECLIPSING VARIABLES

The list below contains photoelectric minima of eclipsing variables observed with the 60 cm reflector of the Bologna Observatory. The heliocentric moments of minima and limits of errors were obtained by the method of Kwee and Van Woerden. Linear elements in the 1969 General Catalogue of Variable Stars were used to compute the E and O-C values. N denotes the number of single observations used in computing the time of minimum; the color of the observations is reported in the last column.

The moment of secondary minimum of TW Dra obtained by fitting the observations of J.D. 2441861 (descending branch) and those of J.D.244139 (ascending branch) and using the period in the 1969 General Catalogue of Variable Stars.

Star	J.D. hel. (2400000)		N	E	O-C	
AR Aur	40930.5414	±0.^{d}0001	23	3431.5	+0.^{d}0196	yellow
	40930.5415	0.0002	23	3431.5	+0.0197	blue
BF Aur	40567.4101	0.0002	88	3860.5	+0.0029	yellow
	40628.3645	0.0002	69	3899	+0.0034	"
	40916.5107	0.0002	88	4081	+0.0039	"
	40931.5513	0.0002	37	4090.5	+0.0039	"
	40939.4671	0.0002	47	4095.5	+0.0037	"
	41668.5406	0.0002	61	4556	+0.0052	"
	41691.4976	0.0003	48	4570.5	+0.0055	"
AH Cep	40873.622	0.002	14	3315.5	+0.143	"
	40873.617	0.001	14	3315.5	+0.138	blue
EK Cep	40882.523	0.002	31	424.5	+0.204	yellow
	40882.524	0.003	26	424.5	+0.205	blue
V 1143 Cyg	40837.4314	0.0001	33	2007	+0.0462	yellow
	40837.4312	0.0001	33	2007	+0.0460	blue
	41135.4208	0.0005	6	2046	+0.0468	blue
TW Dra	41068.4066	0.0001	83	2558	-0.0189	blue
	41395.467	0.002	19	2674.5	+0.041	blue
u Her	40053.4646	0.0002	31	16686	-0.0019	blue
	41176.402	0.001	42	17233.5	-0.002	blue
AR Lac	40932.3168	0.0003	65	7214.5	+0.0270	yellow

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Konkoly Observatory
Budapest
1973 August 12

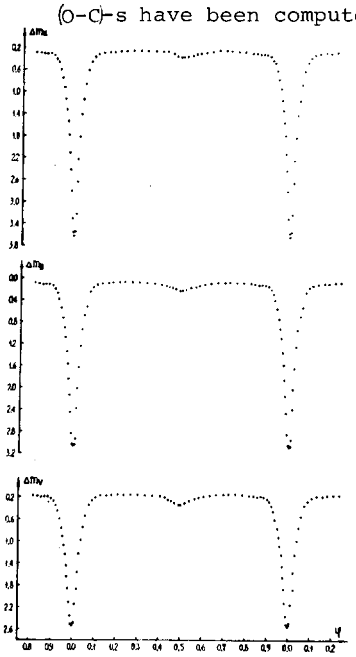
X TRIANGULI

Three-colour photoelectric observations of the star X Tri in the system close to U, B, V have been carried out by means of the telescope A3T-14 during 1969/1972.

Five individual photoelectric minima have been obtained on the basis of our observations:

J.D.	E	O-C	n
2440535.3780	3050	-0.0129	28
538.2918	3053	-0.0137	17
2441327.1738	3865	-0.0207	18
661.3800	4209	-0.0237	44
663.3220	4211	-0.0248	38

(O-C)-s have been computed with the elements given in GCVS 1969/70. n is the number of observations in the minimum brightness.



Using the elements corrected by us and grouping all the observations (431 observations in each colour) in 60 normal points we have plotted the average light curves, their graphic representation is given in the Figure attached.

In the near future we are going to calculate the elements of the orbit and publish the results of the thorough investigation of the system X Tri.

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Konkoly Observatory
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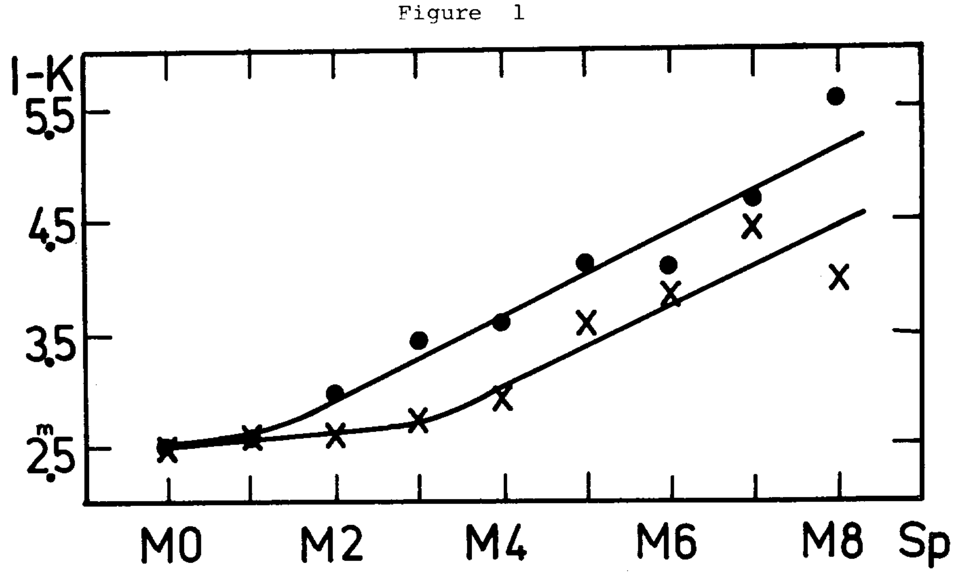
1973 August 15

ON THE RELATIONSHIP BETWEEN THE I-K COLOUR INDEX AND THE INTRINSIC POLARIZATION OF THE LATE-TYPE STARS

As is well known (1,2), the intrinsic polarization of the M-type stars changes along with the brightness variation of the stars and also depends on their spectral type. The observations also show that within the same spectral class the intrinsic polarization of the stars can be different.

We made a detailed investigation of the observational data and found an interesting relation between the I-K colour index and the intrinsic polarization of the M-type stars. Serkowski's polarimetric data (3) and the I-K colour indices of the CIT-catalogue (4) formed the basis of the present investigation. The effective wavelength of the I magnitude is at 0.9 μm and that of the K magnitude is at 2 μm. In each spectral class (from M0 to M8) we selected the stars whose intrinsic polarizations at maximum light exceeded the average value of the polarization of the corresponding spectral class ($p>\bar{p}$).

Figure 1



In Fig. 1 we plotted the $\overline{I-K}$ average colour indices of the highly polarized stars (dots) and that of other stars (crosses) against the spectral classes.

As can be concluded from Figure 1, in one and the same spectral class later than M1 the average colour indices $\overline{I-K}$ of the stars having intrinsic polarizations are systematically larger than that of the stars with non-polarized light. We note that the I-K colour index of a star is generally between the two lines of Fig.1 if its intrinsic polarization is smaller than the average polarization $\overline{p}$ of the spectral class which the star belongs to.

These facts indicate that the stars with intrinsic polarizations show I-K excess compared with the other stars of the same spectral class.

Using the data of (3,4) we obtained the following relation between $\overline{I-K}$ and log $\overline{p}$:

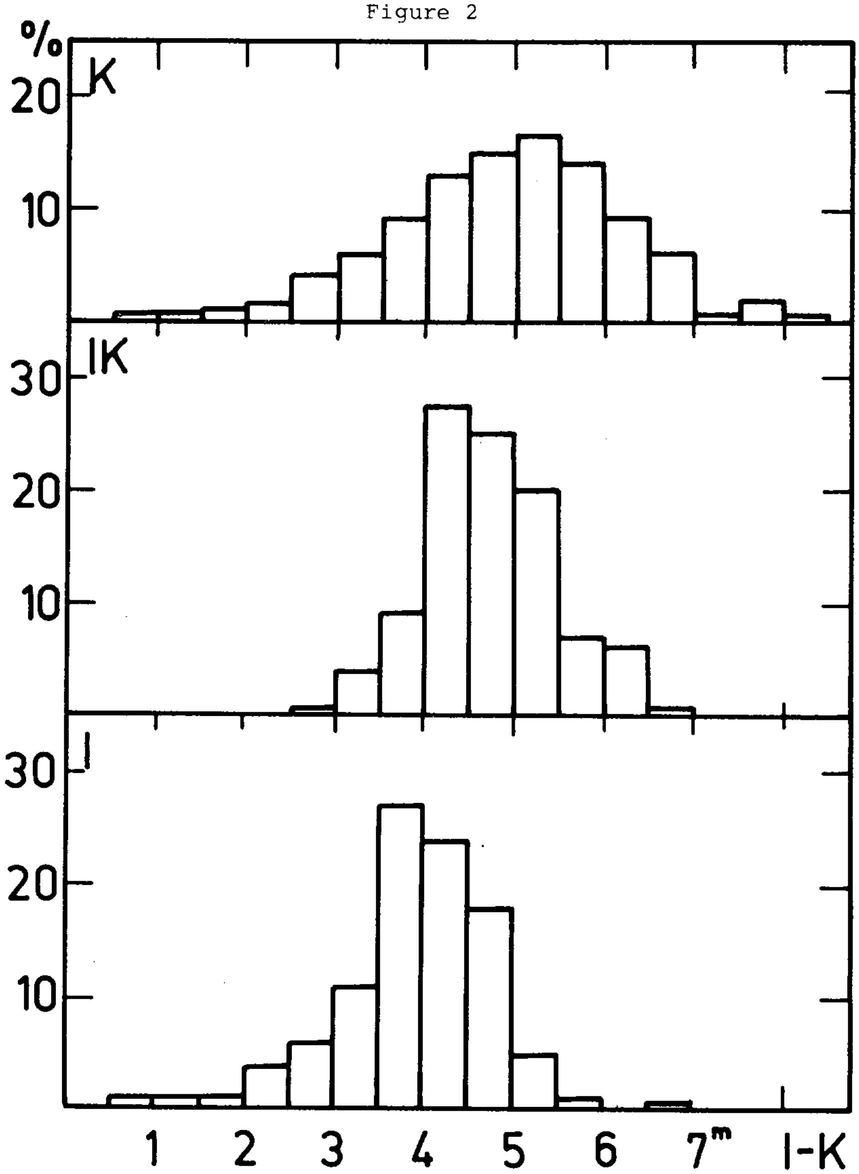
$$\overline{I-K} = 4.65 + 2.58 \log \overline{p}$$

In connection with this a further qualitative analysis can be made. In the CIT-catalogue the stars showing brightness variations in I- and/or K-spectral range are marked. Further on we call these stars I-, K- and IK-type variables, respectively.

The frequency of the I-, K- and IK-type variables, as a function of I-K was investigated. The frequency distributions are shown in Figure 2. As can be seen from the Figure, the maxima of the frquency distributions of the K- and IK-type variables are shifted towards the higher I-K values. Compared with the formula obtained this means that the occurrence of intrinsic polarization is more probable among the K-type variables. The calculations reveal that the frequency of the stars having intrinsic polarization is, indeed, 1.5 times greater among the K- and IK-type than among the I-type variables. This relation is also in accordance with the fact that near the galactic equator ($|b| < 25^{o}$) the intrinsic polarization of the stars and the ratio n_K/n_I of the numbers of the K- and I-type variables are 1.5-2.0 times greater than the corresponding quantities for the stars at high galactic latitudes ($|b| > 25^{o}$).

Since the intrinsic polarization of a late-type variable increases with the decrease of the brightness of the star, it would be worth investigating the relation between the polarization and the I-K colour index during the light variation separately for each late-type variable.

Figure 2



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INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 820

Konkoly Observatory
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AN IMPROVED EPHEMERIS FOR BETA LYRAE

As Beta Lyrae is presently under intense study using both ground based equipment and space facilities, there is a need for more reliable phases in the binary orbit. It is the aim of this note to warn observers that the currently accepted cubic ephemeris formula by Wood and Forbes (1) is already more than 9 hours off and to supply an improved (quadratic) ephemeris giving reasonable representation of the minimum epochs observed during the last 25-30 years.

In the table we assembled all available photoelectrically determined times of primary minimum since 1944. In the column of O-C values, the heading (Herczeg) stays for the proposed formula:

$$\text{Min.I} = \text{JD}2439108.12 + 12\overset{d}{.}93266\text{E} + 0.458 \times 10^{-5}\text{E}^2.$$

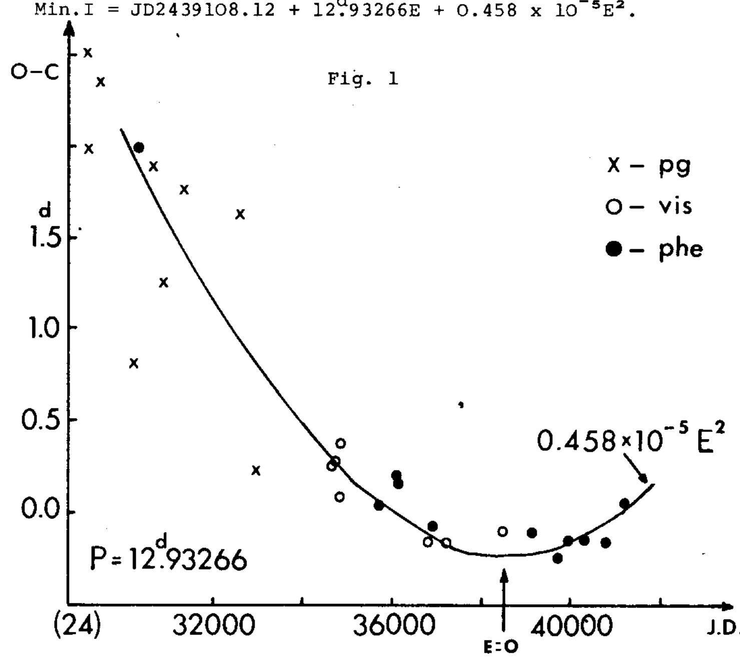


Fig. 1

Fig. 1 shows these observations, plotted against a linear formula and supplemented, in order to fill the rather serious gaps, by a few visual minima determined by Gaposchkin (11),by the Berliner Arbeitsgemeinschaft (12), further a number of photographically derived epochs also published by Gaposchkin. Plates of photographic patrol seem to be ill-suited for the photometry of such a bright variable but careful visual epoch determinations compare surprisingly well with photoelectric results.

The following comments may be of interest.

1. It was impossible to derive a minimum epoch from Belton and Woolf's six-color photometry in 1961 (13). Moreover,a plot of the individual observations reveals how strongly asymmetric the light curve was at the time of observations (more precisely, on JD2437491): the actual minimum of light has not been reached before phase 0.03. This is a quite characteristic, recurrent disturbance, a drop of brightness immediately following zero phase, resulting in a "wedge-shaped" bottom of the light curve; see for instance Fig. 1 in Larsson-Leander's report of the 1959 campaign (4).

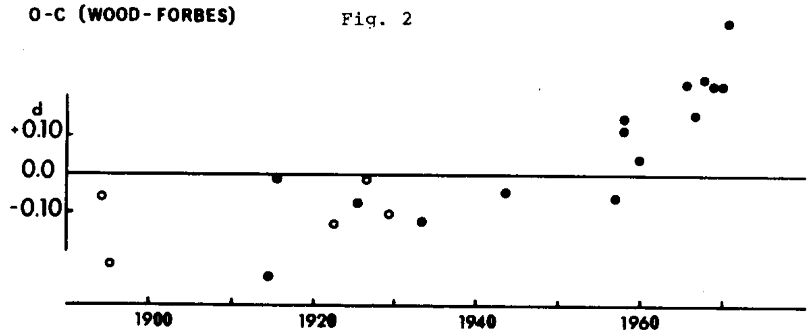
2. Minimum epochs of the same campaign all show markedly positive residuals. Our Fig. 1 indicates, however, that these O-C values are either due to a short-term period change or, possibly, to the above mentioned distortions of the light curve. It is worth mentioning that a comparison between Stebbins' observations in 1915 and those of Guthnick in 1916 discloses almost exactly the same temporary phase shift.

3. Under these circumstances the scatter in Fig. 1 and 2 may not entirely be due to errors of observation or reduction. Times of minimum light referred to under (7) through (10) are not given in the original publications: they are normal epochs derived by the present author, using simple graphical construction. Since some of these series of measurements show difficult, asymmetric light curves, the 3-decimal accuracy of the timing is probably not granted.

As to the basic period variation exhibited in Fig.1, it deserves some further comment.

Recent failures of the Wood-Forbes ephemeris formula correspond almost entirely to an unexpected and unusual increase of the binary period. In Fig. 2, the residuals of photoelectrically determined epochs are shown against Wood and Forbes (dots) together with a few

O-C (WOOD-FORBES) Fig. 2



visual timings by Pannekoek, Menze, Danjon, Parenago and McLaughlin, based mainly on longer series of observations (circles). The O-C values are systematically negative but, apart from the scatter, nearly constant indicating a correct representation of the period changes between about 1890 and 1960. In this case, as in the case of Prager's earlier formula (14) too, this is equivalent to an approximately linear increase of the period, for several decades, since the cubic term has a small coefficient. Thus the contribution to the O-C values of the E^3 term in the Wood-Forbes formula remains less than $0^{d}.01$ from its zero epoch in 1950 up to 1969. The sudden increase of the residuals after 1960 can only be explained by a substantial change in the rate of the lengthening of the period: for the time interval 1950-1966, Wood and Forbes predicted an increase of the period of $0^{d}.00315$ while the actual increase turned out to be close to $0^{d}.004$.

This is a novel feature in the period changes exhibited by Beta Lyrae, for earlier evidence strongly suggests that $dP/dE > 0$, yet $d^2P/dE^2 \leq 0$ throughout. It is an obvious challenge to the "asymptotic" representation, using exponential terms, as put forward recently (15). Further observations may indicate whether this abrupt change in the pattern of period variations could be related to reports of an increased spectroscopic "activity" in the system.

A more complete discussion of the period of Beta Lyrae is in progress. I am much obliged to Dr. Douglas Hall (Dyer Obs., Nashville) for sending lists of unpublished observations and to Dr. Kwan-Yu Chen (U. of Florida, Gainesville) for supplying information from the files of the Card Catalogue of Eclipsing Variables.

TABLE

Beta Lyrae, photoelectric minima 1944-72

Min. I (hel.)	O-C (Wood-Forbes)	(Herczeg)	Obs.	Ref.
JD2431337.30	-0.05	+0.05(5)	Guthnick	(2)
36379.472	-0.049	0.00	Wood, Walker	(3)
793.47	+0.12	+0.15	IAU campaign,	(4)
806.405	+0.124	+0.15	1959	(4)
819.36	+0.15	+0.18		(4)
37478.72	+0.05	+0.04	Engelkeimer	(5)
39677.24:	+0.24:	+0.07:	Herczeg	(6)
40142.713	+0.157	-0.05	Lovell, Hall	(7)
479.04	+0.24(5)	+0.01	Herczeg	(6)
724.751	+0.239	-0.02	Lovell, Hall	(8)
41086.860	+0.235	-0.06	Landis et al.	(9)
JD2441539.661	+0.388	+0.04	Landis et al.	(10)

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PHOTOGRAPHIC PHOTOMETRY OF BL LACERTAE

BL Lacertae was first observed and classified as an optical variable by Hoffmeister (1929). Independently VRO 42.22.01 was observed by MacLeod et al. (1965). In 1968 Schmidt identified BL Lac with the radio source VRO 42.22.01. Since 1968 MacLeod et al. (1971) have been monitoring this variable source at 2.8, 3.75, and 4.5 cm. With the available photographic data, Shen and Usher (1970) report a range in photographic magnitude of 12.4-16.4 for BL Lacertae and that the light curve shows no periodicity. Photoelectric studies by Racine (1970) and by Milone (1972) show irregular rapid variability. Day-to-day variations usually amount from $0^m.1$ to $0^m.3$. Milone (1972) reported a variation of $0^m.4$ in four minutes. The spectrum of BL Lac reveals one doubtful spectral feature and the distance to the object is essentially unknown (Oke et al. 1969). Bertaud et al. (1973) have constructed a light curve for the period of June, 1968 - January, 1971. A correlation between the color index B-V and the magnitude is reported.

Photographic photometry has been obtained for BL Lacertae with the 102-cm Ritchey-Chretien reflector at Prairie Observatory of the University of Illinois. Plates were taken at the f/7.6 Cassegrain focus at irregular intervals during each observing season from September, 1969 to September, 1972. Plate-filter combinations were used to give approximate U, B, and V magnitudes. Kodak 103a-D emulsion behind a Schott GG11 filter (V), Kodak IIa-O, 103-O, or Ia-O emulsion behind a Schott GG13 filter (B), and Kodak IIa-O or 103a-O emulsion behind a Schott UG2 filter (U) were used to obtain the magnitudes. These plates were measured with an Astro Mechanics iris photometer. The photoelectric sequence of Bertaud et al. (1969) was used for forming calibration curves. The internal plate accuracy is approximately ± 0.05 magnitudes for all three colors.

Table I contains for each observations: the Julian date to hundredths of a day, and the U, B, or V magnitude. These 1969

Table I

UBV Photometry of BL Lacertae

JD	U	B	V	JD	U	B	V
2440485.72		15.05		2441161.74	15.68	15.88	14.66
2440504.71		15.04		2441164.72		15.34	
2440504.73			14.20	2441176.85		15.40	
2440825.71		14.59		2441236.59			15.03
2440825.74			13.63	2441236.63		16.22	
2440834.82		14.87		2441236.69	17.08		
2440834.84			13.86	2441262.60		16.08	
2440858.74			14.00	2441262.64			14.50
2440875.72		14.82		2441269.61		16.43	
2440875.75	15.32			2441269.65			15.24
2440875.80			13.87	2441278.56		16.06	
2440878.63			13.82	2441504.78		15.68	
2440885.65		14.85		2441504.80			14.62
2440885.76	15.88			2441541.76			14.69
2440885.79			13.89	2441541.79		15.83	
2440889.63	16.88			2441547.75			14.77
2440895.61		15.87		2441547.77		16.03	
2440896.60	17.15			2441558.59			14.60
2440896.63			14.78	2441558.61		15.85	
2440896.77		15.91		2441570.75			14.13
2440907.58		15.88		2441570.77		15.30	
2440907.62	15.68			2441577.65		15.72	
2440911.59			13.84	2441577.66			14.93

and 1970 observations support those of Bertaud et al. (1973) and in a few cases supplement certain portions of the light curve not observed by them. The observations obtained during the 1971 and 1972 observing seasons show the same type of irregular behavior observed in the past. Our observations show a B-V, V relation that is consistent with those of others (Bertaud et al. 1973). Our observations introduce more scatter into this relation since our B-V was derived photographically.

We are indebted to Dr. E. A. Avner, Dr. E. W. Weis, Mr. B. W. Rust, and Mr. T. V. Smith for obtaining some of the observations. Two of us (G.D. and D.D.) gratefully acknowledge support of departmental assistantships.

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Budapest
1973 August 31

UBV OBSERVATIONS OF V603 Aql = NOVA Aql 1918 IN 1968 AND 1969

A few UBV photoelectric observations were made of V603 Aql = = Nova Aql 1918 in October 1968 and in June 1969 at the No. 4 16-inch telescope of the Kitt Peak National Observatory. Observation and data reduction procedures are described elsewhere (Landolt 1973a,b). The mean error of a single observation is no more than $\pm$ 0^m.02 in each instance. The observations are given in Table I wherein the heliocentric Julian Day times of observation are known within $\pm$ 0^d.0005.

Table I

Photoelectric Observations of V603 Aql.

$JD_\odot$ 2440000.+	V	B-V	U-B
161.5993	11.66	+0^m.05	-0^m.89
389.9025	11.54	+0.01	-0.87
389.9047	11.51	-0.01	-0.86
390.8295	11.63	+0.04	-0.92
390.8315	11.64	+0.02	-0.93

Comparison with previous photoelectric measurements (Landolt 1968) shows that the colors appear to remain virtually constant.The visual magnitudes found herein are within the overall range of variation known for this object (see, for instance, brightness estimates made by members of the American Association of Variable Star Observers, quoted in the AAVSO *Circulars*).

Thanks are due the Director of the Kitt Peak National Observatory for the telescope time. This work was supported by the Louisiana State University Council on Research.

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NUMBER 823

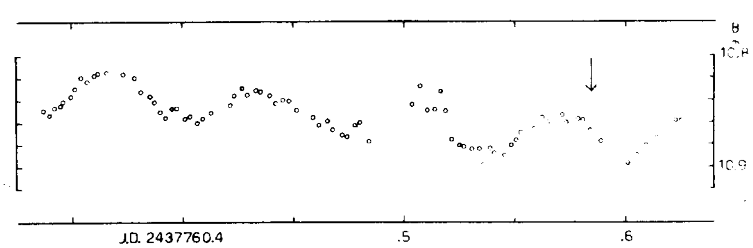
Konkoly Observatory
Budapest
1973 September 1

A DELTA SCUTI COMPONENT IN THE BINARY SYSTEM Y CAMELOPARDALIS

B and V photometric observations of the eclipsing binary Y Cam have been obtained with the 102-cm reflector of the Merate Observatory from 1961 to 1970. The mean light curves display that,out of the deepest part of the primary minimum, small brightness fluctuations lay upon the main light variation produced by the eclipse. Therefore the warmer A7V component of the system seems to be a variable star. The total amplitude of the fluctuation can reach $0^m.04$, as we can see from the figure where the arrow indicates the central instant of the secondary minimum and it has a mean period of $0^d.063$.

However the plot of the single night runs displays that the amplitude of the fluctuation can reduce also to zero and that the period can also deviate by $0^d.01$ around the mean value. The photometric behaviour and the spectral type give evidence that the principal component of Y Cam is a Delta Scuti variable.

The detailed observations, a study of the variation of the orbital and Delta Scuti periods and a derivation of the elements will be published elsewhere.



August 20, 1973

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Merate Observatory

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OBSERVATIONS OF VARIABLES ON SKY PATROL PLATES

GK And = Wr 170 was discovered by Weber and announced as an eclipsing binary ($11^m.4$ - $12^m.2$ ph) (Weber, R. 1967, IBVS 183). Elements of light variations were found by Kholopov (GCVS 1st Suppl. 1971). On 118 sky patrol plates (Sonneberg Obs. JD. 2439024 - 41602) I examined the star and found 5 minima and improved elements:

Min. (hel.) = JD. 2438643.430 + $2^d.009365$ · E (EA)
($11^m.28$ - $12^m.36$/$11^m.5$ ph; D = $0^p.08$)

EY Vul = GR 37 is a variable star discovered by Romano in 1958 (Oss. Treviso Pubbl. No.14). It is an eclipsing binary (11.2 - 12.0ph). I examined the star on sky patrol plates (Sonneberg Obs.) n = 374, JD. 2435685 - 41602 (Hartha Obs.) n = 274, JD.2436810 - 41570 and found the improved elements:

Min. (hel.) = JD. 2435771.238 + $4^d.103052$ · E (EA)
(Max. = 11.16 , Min.I = 12.19 , Min.II = 11.21 ph, DI = $0^p.08$)

HBV 489 This star was discovered in 1972 by Wachmann as an Algol-type variable ($11^m.80$ - $12^m.63$ ph). No elements were given (IBVS No.749). Using 384 sky patrol plates (Sonneberg Obs.) I obtained the following elements:

Min. (hel.) = JD. 2430633.378 + $4^d.980605$ · E (EA)
(12.02 - 12.8 ph; D = $0^p.04$)

BD -5^o2893 By observations of RU Sex I suspected the variability of BD -5^o2893. In order to test the variability I obtained 70 short-exposures. There are irregular variations between $10^m.7$ - $11^m.1$ ph. The star seems to be coloured.

VV 423 Miller discovered this variable star in 1971 and Wachmann, (Hamburg Obs.) examined but could not find elements of this eclipsing binary (Ric. astr. Specola Vatic.Vol. 8 No. 12). So I observed the star on 472 sky patrol plates (Sonneberg Obs. JD. 2435695 - 41604). 12 minima and the following elements were obtained:

Min. (hel.) = JD. 2433562.520 + $5^d.5337615$ · E (EB)
(Max. = $10^m.72$, Min.I = $11^m.10$, Min.II = $11^m.76$ ph)

CSV 8484 = GR 43 was discovered by Romano in 1958 ($11^m.6-12^m$ph). 220 plates of the sky patrol confirm the variability between the limits $11^m.50 - 12^m.33$ ph. The type is presumable Isa.
Details for all these variables will be published in "Mitt. der Bruno-H.-Bürgel-Sternwarte Hartha" Heft 6.

H. BUSCH

OBSERVATIONS OF 5 CSV - STARS ON SKY PATROL PLATES

CSV 4548 = BD + 36^o3414 (9.2)= SVS 868 = P 2486
I examined 140 plates of Hartha Observatory (JD. 2436817 - 38372). No light variations were found.

CSV 8390 = GR 32. 249 plates (JD. 2436810 - 41570)of Hartha Obs. The period is about $0^d.5$, the type is RR Lyrae.
Observed maxima: JD.(hel.) 2436847.314, 2437129.379, 2437575.399, 2437886.446, 2437940.428, 2438351.304, 2438640.354, 2440483.341.

CSV 8392 = GR 56. 136 plates of Sonneberg Observatory(JD. 2437559-39792). The light variations are longperiodic.

CSV 8474 = BD + 21^o4117 = GR 54. 298 plates of Hartha Obs. (JD. 2436810 - 41570). Unperiodical light variations were observed.The star is not noticable coloured. The type is presumably Isa.

CSV 8518 = GR 52 = BD + 24^o4131. 287 plates of Hartha Obs. (JD. 2436810 - 41570). The star is probable a SRa - star with late spectral type. I found a mean cycle of 362.5 days.The increasing lasts 20 - 40^d. Mira - type is impossible bacause the amplitude is only $0^m.5$ (10.7 - $11^m.2$ ph). Observed maxima: JD. 243 6825, 243 7195, 243 7947, 243 8284, 243 8664, 243 8995.
Further particulars and light curves will be given in "Mitt. der Bruno-H.-Bürgel-Sternwarte Hartha" Heft 6.

K. HÄUSSLER

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REVISED ELEMENTS OF ECLIPSING VARIABLES

WY Cancri

Min.= J.D. 2426 352.3895 + $0^d.82937122 \cdot E$, $\sigma = \pm 0^d.0051$, n = 42.
These elements of GCVS 1969 are fully satisfactory from 1931 to 1973. The period given in SAC 44 (1973) must be diminished.

TY Delphini

Min.= J.D. 2428 020.400 + $1^d.1911204 \cdot E$, $\sigma = \pm 0^d.0060$, n = 48.
The period seems to be constant between 1935 and 1972. An increase to about $1^d.191123$ since 1960 is possible, but not guaranteed.

VX Lacertae

Mean elements:	Min.= J.D. 2424 791.481	+ $1^d.0744953 \cdot E$,	$\sigma = \pm 0^d.0104$
Instant elements 1:	24 791.488	+ $1^d.0744891 \cdot E$,	$\sigma = \pm 0^d.0049$
" " 2:	32 479.477	+ $1^d.0744991 \cdot E$,	$\sigma = \pm 0^d.0041$
" " 3:	40 750.971	+ $1^d.0744881 \cdot E$,	$\sigma = \pm 0^d.0028$

The elements have been derived from 73 minima from 1926 till 1973. The period undergoes strong variations of nearly 1 second.

UV Leonis

Min.= J.D. 2425 574.302 + $0^d.60008516 \cdot E$, $\sigma = \pm 0^d.0047$, n = 295.
These elements satisfy all observations from 1928 till 1973. Instantaneous elements do not diminish the scattering visibly.

FL Lyrae

Min.= J.D. 2433 440.506 + $2^d.1781527 \cdot E$, $\sigma = \pm 0^d.0067$, n = 70.
Observations from 1950 to 1973.

n = number of available minima.

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Konkoly Observatory
Budapest
1973 September 18

Veröffentlichungen der Remeis-Sternwarte Bamberg
Astronomisches Institut der Universität Erlangen-Nürnberg
Band X, Nr.107

Rosemary Hill Observatory, University of Florida
Contribution No.40

NEW SOUTHERN VARIABLE STARS

On sky patrol plates taken at the Southern Station of the University of Florida, Gainesville and the Remeis-Sternwarte, Bamberg, at the Mount John Observatory, New Zealand, the stars in the following list were found to be variable.

The brightness of these stars were estimated by comparison with standard stars in the Harvard-Groningen Atlas, Selected Areas (1965, A.Brun and H. Vehrenberg).

Finding charts, 1° in declination, with south up, are also given.

BV-Nr.	RA 1900.0 Dec.	Maximum Brightness pg	Ampl. pg	Remarks
BV 1572 Pup	= CoD $-44^\circ 3424$ (10^m) = CAP $-44^\circ 1555$	($9^m.8$)	$0^m.5$	
BV 1573 Pup	= CoD $-44^\circ 3450$ (10^m) = CAP $-44^\circ 1584$	($9^m.8$)	0.4	
BV 1574 Pup	$7^h 55^m 13^s$ $-38^\circ 43'.3$	$11^m.0$	1.0	1
BV 1575 Pup	= CoD $-40^\circ 3763$ ($9^m.3$) = CAP $-40^\circ 2030$ = HD 66436 (F8)	($9^m.2$)	0.4	
BV 1576 Vel	= CoD $-42^\circ 4345$ (10^m) = CAP $-42^\circ 2626$	($10^m.0$)	0.3	
BV 1577 Vel	= CoD $-40^\circ 4603$ ($9^m.1$) = CAP $-40^\circ 2859$	($9^m.1$)	0.3	
BV 1578 Vel	= CoD $-42^\circ 4977$ ($9^m.1$) = CAP $-42^\circ 3348$	($9^m.8$)	0.5	
BV 1579 Vel	= CoD $-42^\circ 5032$ ($9^m.8$) = CAP $-42^\circ 3425$ = HD 79101 (A2)	($8^m.8$)	0.6	2
BV 1580 Pyx	= CoD $-32^\circ 6252$ ($9^m.3$) = CAP $-32^\circ 2570$	($9^m.4$)	0.8	
BV 1581 Cen	= CoD $-47^\circ 6586$ (10^m)		4.0^x	3
BV 1582 Cen	= CoD $-50^\circ 5778$ ($9^m.9$) = CAP $-50^\circ 4038$	($9^m.8$)	0.6	4

^{x}Amplitude until plate limit (14^m)

Remarks:

1) BV 1574 is a Cepheid variable, whose ephemeris can be given as Max.= JD 243 8442.354 + $15^{d}.565 \cdot E$

The following maxima were found:

Maximum	E	O-C	Maximum	E	O-C
JD 243 8442.354	0	$0^{d}.000$	JD 243 9205.247	49	$+0^{d}.208$
8739.551	19	+1.462	9562.256	72	-0.778
8816.335	24	+0.421	9935.885	96	-0.709
9143.419	45	+0.640	244 0589.469	138	-0.855
9174.343	47	+0.434	1710.500	210	-0.504

Minimum occurs about phase 0.7.

2) BV 1579 is an Algol-type eclipsing binary. Only three minima were found: JD 243 8443.399
244 1394.906
244 1689.080

3) BV 1581 is a Mira variable. The following maxima were found from a plot of magnitude estimates from all available patrol plates. In parenthesis after each maximum is given the number of points used to determine that maximum.

JD 243 8473 (13)
8793 (15)
JD 244 0723 (6)
1035 (9)
1721 (4)

From these is obtained the ephemeris

$$\text{Max.} = \text{JD } 243\ 8793 + 325^{d} \cdot E$$

The variable is above the plate limit (14^{m}) for approximately 120 days around the time of maximum.

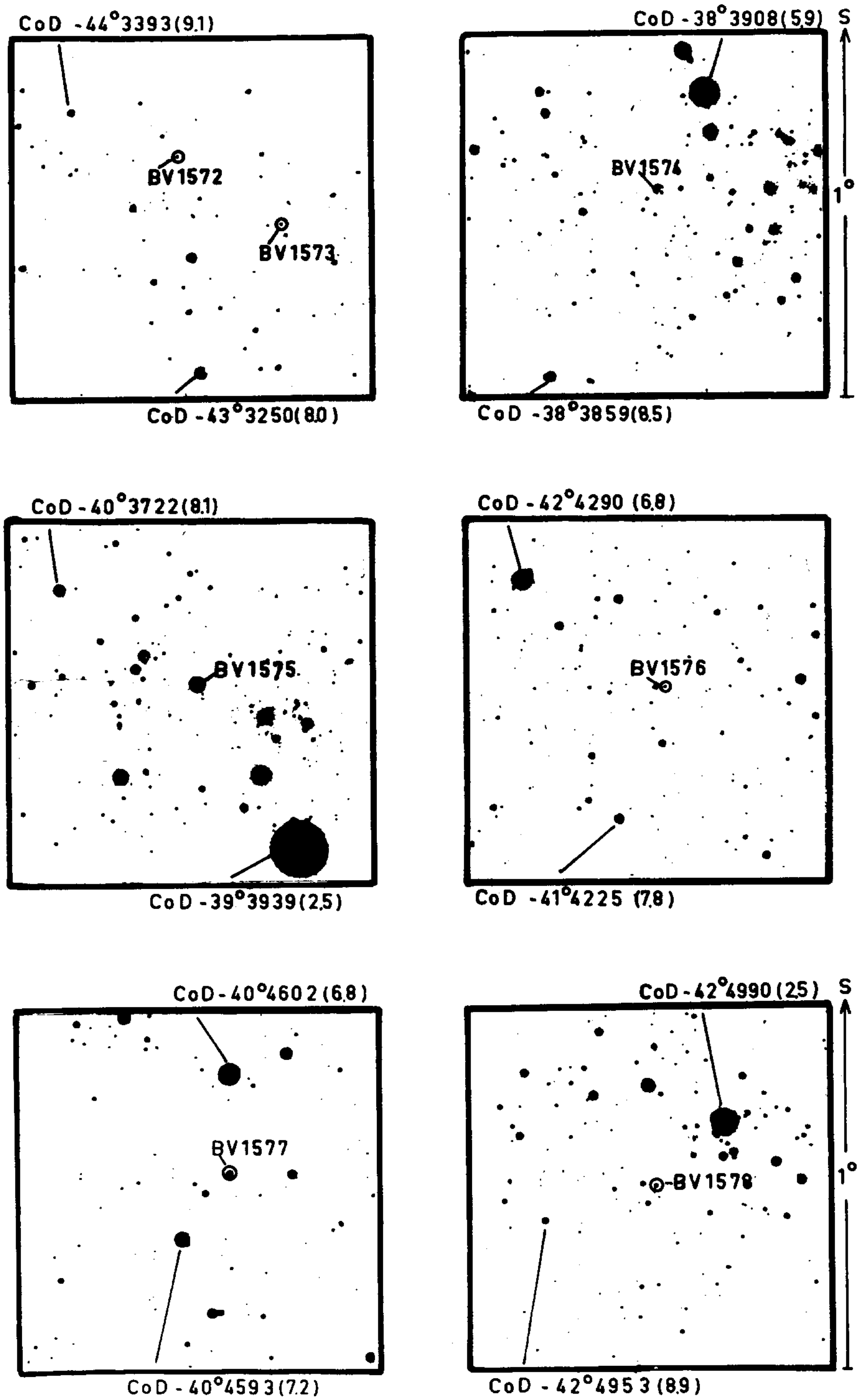
Print 36 of the Canterbury Sky Atlas (1972, N.A. Doughty, C.D. Shane, and F.B. Wood), made from a plate exposed 120 days after maximum, may just barely show the variable. Since the limiting photographic magnitude of the atlas is stated to be magnitude 16, BV 1581 has an amplitude of at least six magnitudes.

4) BV 1582 is an Algol-type eclipsing binary, whose ephemeris is Min. = JD 243 8471.404 + $1^{d}.776028 \cdot E$

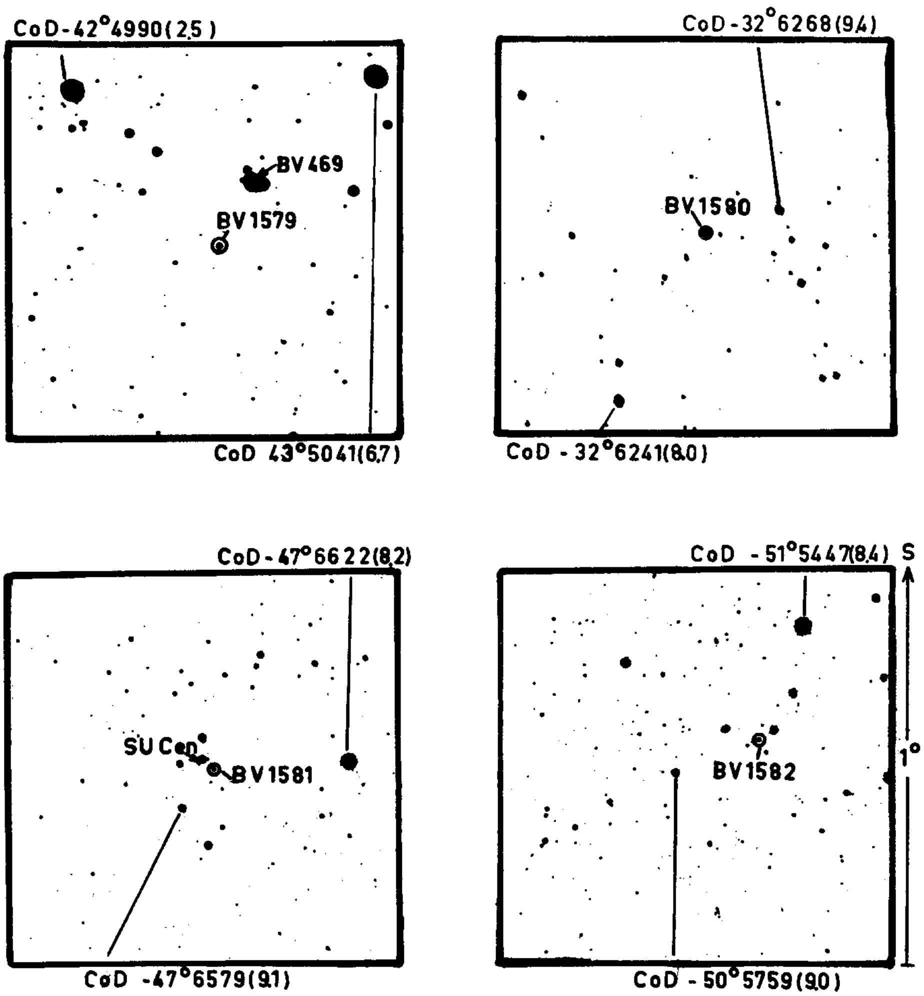
The following minima were found:

Minimum	E	O-C	Minimum	E	O-C
JD 243 8407.549	-36	$+0^{d}.082$	JD 243 8885.266	233	$+0^{d}.047$
8471.404	0	0.000	8901.213	242	+0.010
8504.304	18.5	+0.079	9200.396	410.5	-0.067
8520.252	27.5	+0.008	9566.384	616.5	+0.059
8529.248	32.5	+0.084	9614.269	643.5	-0.009
8820.446	196.5	+0.052	244 0735.809	1275	-0.031
8828.408	201	+0.022	1059.907	1457.5	-0.058
8844.382	210	+0.012	1092.823	1476	+0.002
8877.269	228.5	+0.043			

The light curve shows a deep secondary eclipse.



CoD -44°3393(9.1)
BV1572
BV1573
CoD -43°3250(8.0)
CoD -38°3908(5.9)
S
BV1574
1°
CoD -38°3859(8.5)
CoD -40°3722(8.1)
BV1575
CoD -39°3939(2.5)
CoD -42°4290 (6.8)
BV1576
CoD -41°4225 (7.8)
CoD-40°4602(6.8)
BV1577
CoD -40°4593(7.2)
CoD-42°4990(2.5)
S
BV1578
1°
CoD -42°4953(8.9)



Bamberg, September 1973

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Remeis-Sternwarte Bamberg
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Gainesville

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 827

Konkoly Observatory
Budapest
1973 September 18

OBSERVATIONS PHOTOMETRIQUES DE NOVA CEPHEI 1971

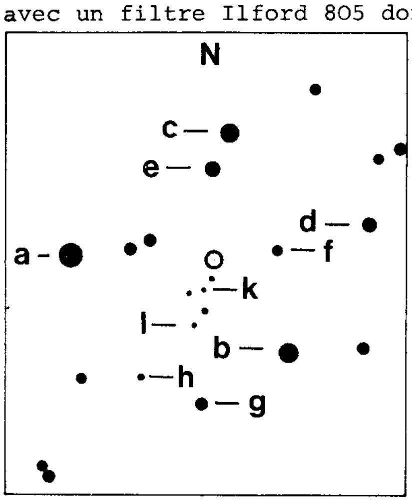
Cette nova a été observée à l'Observatoire de Meudon et à l'Observatoire de Haute-Provence du 13 juillet au 18 décembre 1971. Deux clichés ont encore été obtenus en mai et juillet respectivement. 51 clichés ont été pris avec le télescope Schmidt de Meudon (O=40 cm, F=100 cm) et 6 avec le télescope Schmidt de l'Observatoire de Haute-Provence.

Avec ces deux instruments on a déterminé les magnitudes de 9 étoiles de comparaison à l'aide de deux transferts avec l'amas galactique voisin NGC 7235. On a ajouté à cette liste une étoile brillante, a=HD 209900, de magnitude connue, B=9,16.

Etoiles de comparaison

Etoile	B	Etoile	B
a	9,16	f	12,19
b	10,46	g	12,70
c	10,76	h	13,76
d	11,30	k	14,72
e	11,82	l	14,75

Les clichés de l'Observatoire de Haute-Provence ont été pris avec un filtre Ilford 805 donnant sensiblement, avec l'émulsion IIaO, la magnitude B. Le filtre employé avec le Schmidt de Meudon ne correspondant pas exactement à la magnitude B, une correction fonction de l'indice de couleur de la nova été appliguée aux magnitudes obtenues avec cet instrument. Les valeurs adoptées pour B-V proviennent des valeurs publiées par MacConnell et Thomas (1972), Mollerus (1971), Alksnis et Dunazans (1971) Pour ces derniers deux valeurs ont été déduites d'observations très rapprochées en B et en V.



Magnitudes de Nova Cephei 1971

Date TU		B	Date TU		B	Date TU		B	
1971 juil.	13,915	8,36	1971 août	20,014	11,22	1971 sept.	23,894	11,61	
	13,932	8,51		20,975	11,26	oct.	14,790	12,48	*
	14,913	8,82		20,982	11,01		14,860	12,20	
	14,921	9,17		23,988	11,31		14,870	12,34	
	15,912	9,00		24,953	11,07		15,851	12,41	*
	15,920	8,75		24,960	11,07		15,921	12,21	
	17,953	9,05		26,860	11,34		15,931	12,11	
	19,029	9,21		26,866	11,28		17,857	12,53	*
	19,036	9,28		27,922	11,34		18,885	12,54	*
	20,053	9,22		27,929	11,30		22,879	12,46	
	20,060	9,30	sept.	13,889	11,70		23,911	12,32	
	26,966	9,68		14,927	11,42	nov.	8,866	12,33	
	26,975	9,60		15,924	11,44		10,857	12,39	
	30,001	10,69		16,899	11,42		13,753	12,64	*
	30,009	10,57		17,913	11,38	déc.	14,849	12,88	
août	16,943	11,36		20,922	11,70		18,912	13,02	
	16,950	11,32		20,930	11,42	1972 mai	11,096	15,0:	*
	17,942	11,05		21,899	11,36				
	17,949	11,22		21,908	11,49				
	20,007	11,17							

Les erreurs quadratiques moyennes respectives pour le Schmidt de Meudon et celui de Haute-Provence sont égales à $0^{m},13$ et $0^{m},08$. Les valeurs obtenues avec le Schmidt de Haute-Provence sont marquées d'un asterisque.

Sur un cliché pris le 30 juillet 1972 à l'Observatoire de Meudon, une extrapolation donne une magnitude légèrement supérieure à 15.

Observatoire de Meudon

CH. BERTAUD
C. POLLAS

Références

Alksnis, A., Dunazans, L. (1971) Astron.Tsirk. No.681.
MacConnell, D.J., Thomas, J.C. (1972) I.B.V.S. No. 706.
Mollerus, B., (1971) I.A.U. Circ. No.2353.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 828

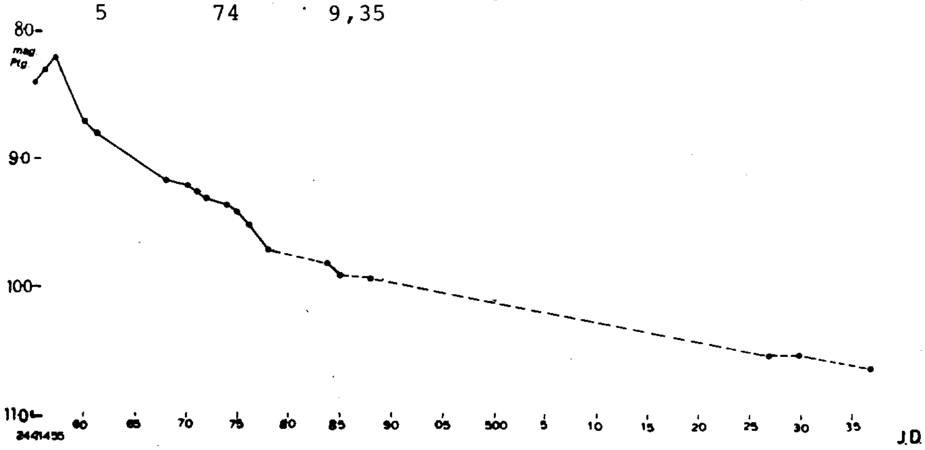
Konkoly Observatory
Budapest
1973 September 21

THE SUPERNOVA IN NGC 5253

The Supernova discovered by Kowal (IAU Circ.No.2405,1972) in NGC 5253 (R.A.$13^h37^m.1$, Declination $-31^o24"$) was observed over the period May to August at Boyden Observatory.The Supernova was located 56" west and 85" south of the nucleus of NGC 5253.

The 41cm aperture Nishimura reflector was used in these observations. The detector was a solid CO_2 cooled EMI 6256A photomultiplier tube, using a Johnson B filter.

Date 1972	Julian Date	m_{ptg}	Date 1972	Julian Date	m_{ptg}
May 17	2441455	8,40	June 6	2441475	9,40
18	56	8,30	7	76	9,50
19	57	8,20	9	78	9,70
22	60	8,70	15	84	9,80
23	61	8,80	16	85	9,90
30	68	9,15	19	88	9,90
June 1	70	9,20	July 28	527	10,50
2	71	9,25	31	530	10,50
3	72	9,30	Aug 7	537	10,60
5	74	9,35			



An examination of the light curve indicates an initial decline of approximately 0.04 magnitude per day, followed by a steady decline of 0.01 magnitude per day.

The falloff in intensity along with the regularity of the light curve suggests a type 1 Supernova.

10th September,1973.

A.H. JARRETT
Boyden Observatory

PHOTOGRAPHIC OBSERVATIONS OF ECLIPSING VARIABLES

Var.	Min. helioc. J.D.244...	O-C_M	O-C_K	n
EG Cep	1918.502	$+0^d.007$	$+0^d.007$	14
V787 Cyg	1922.486	+0.041	+0.041	13
UX Her	1831.479	-0.037	-0.001	9
UV Leo	1796.406	0.000	+0.012	9
FL Lyr	1900.4515	-0.004	+0.0025	10
X Tri	1930.4905	-0.0293	-0.0267	12
	1931.4625	-0.0288	-0.0263	11
RU UMi	1798.438	-0.004	-0.004	12

C_M from GCVS 1969/70, C_K from SAC 44 (1973), n=number of plates. Observations made in the same manner as described in IBVS 786.

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Sonneberg

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NUMBER 829

Konkoly Observatory
Budapest
1973 September 22

NOTE ON THE PERIOD OF THE PULSATING VARIABLE V 477 Oph

The variable V 477 Oph was discovered by Hoffmeister (1943 Kl. Veröff.Babelsberg No.28). Using 16 times of maximum he classified the variable as a cepheid with a period of $1^{d}.9729$. Recently Mandel (1970 Per.Zv.17,347) made new photographic observations of this star and found that Hoffmeister's period was in error. According to Mandel it should be $2^{d}.015702$. Moreover, he found that in order to fit Hoffmeister's epochs, a considerable change in the period had occurred around 1940.

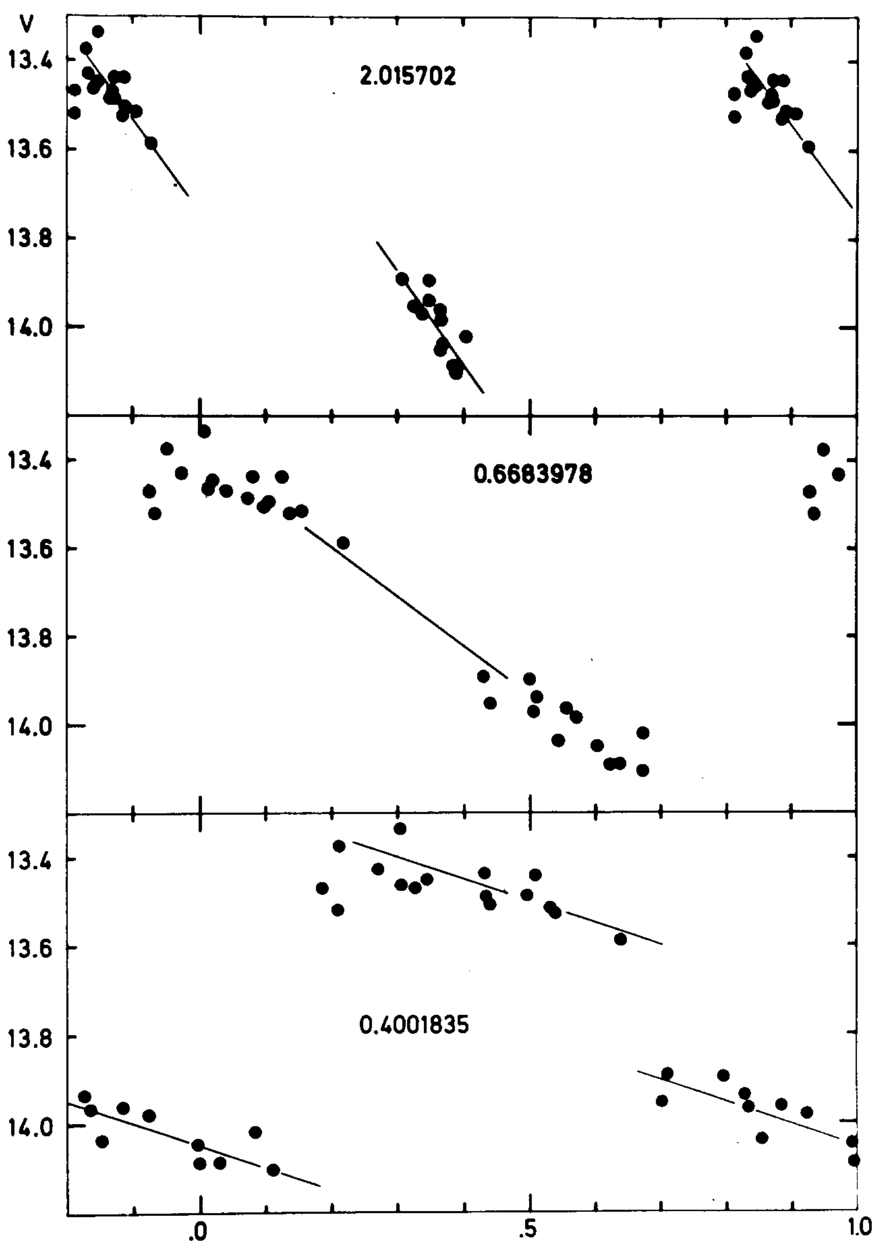
A closer investigation of Mandel's observations learned, however, that two other periods, shorter than a day. fit as well as the $2^{d}.015702$ period. In the accompanying table the four concerned periods have been listed together with their reciprocals, to show their relationships.

Period in days	Reciprocal	Reference
1.9729	0.50687	Hoffmeister
2.015702	0.49611	Mandel
0.6683978	1.49612	first alternative
0.4001835	2.49885	second alternative

In the course of a running investigation on UBV photometry of Population II cepheids with periods between 1 and 3 days, the present author also observed this variable on 8 nights between 21 and 30 August 1973, at the European Southern Observatory at La Silla in Chile. On 7 nights the star was observed over a period of 4 hours. The period of the variable allowed the cover of only two stretches in the phase of the lightvariation for a large number of cycles.

In the accompanying figure, provisional V magnitudes have been plotted against the phases of the three concerned periods. Regarding the slopes of the observed stretches in the phase, one can see, that the period of $0^{d}.6683978$ is the most likely one of the three. Moreover when this period is adopted, there appears to be no need for assuming a substantial change in the period in order to fit Hoffmeister's early epochs of maximum. Therefore, one may safely conclude, that V 477 Oph is in fact an RR Lyrae variable with a period of $0^{d}.6683978$.

More detailed information of the observations will appear in a future publication elsewhere.



European Southern Observatory,
La Silla, Chile
3 September, 1973.

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Sterrewacht
Leiden

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INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 830

Konkoly Observatory
Budapest
1973 October 2

SECONDARY MINIMUM FOR WY HYDRAE

WY Hydrae was observed photoelectrically on the UBV system on one night in January 1970 at the No. 1 36-inch telescope of the Kitt Peak National Observatory. The observational data are of sufficient accuracy only for a minimum determination since the data were obtained through intermittant clouds. The observations are given in Table I. Columns 1, 2, 3, and 4 in Table I list the heliocentric Julian date, and the differential V, (B-V), and (U-B) magnitude and color indices, respectively. The differential measurements are in the sense variable minus comparison. Star "c" (Solovyev, Per.Zv.12, 262, 1958) was used as primary comparison star. There are just enough observations to obtain an approximate time of secondary minimum, namely JD$_{\odot}$2440612.8627$\pm$0$^{d}_{.}$0015 (estimated). Comparison if this observed time of minimum with that predicted by the light elements given by Koch, Sobieski and Wood (Publ.Univ.Pennsylvania, Astr.Ser. Vol.9., 1963) gives an O-C of -0$^{d}_{.}$029 for this secondary minimum.

Table I

JD hel. 2440612	Δ V	Δ (B-V)	Δ (U-B)	JD hel. 2440612	Δ V	Δ (B-V)	Δ (U-B)
.8525	-0$^{m}_{.}$128	-0$^{m}_{.}$180	-0$^{m}_{.}$112	.8952	-0.469	-0.198	-0.128
.8543	-0.100	-0.184	-0.127	.9042	-0.589	-0.204	-0.148
.8627	+0.264	-0.306	-0.274	.9063	-0.523	-	-
.8652	+0.300	-0.408	-0.304	.9102	-0.617	-0.192	-0.166
.8704	-0.090	-0.168	-0.140	.9123	-0.620	-0.150	-0.168
.8723	-0.118	-0.176	-0.117	.9210	-0.734	-0.194	-0.114
.8769	-0.212	-0.173	-0.142	.9232	-0.730	-0.174	-0.120
.8790	-0.250	-0.153	-0.166	.9288	-0.726	-0.182	-0.117
.8840	-0.311	-0.199	-0.150,	.9307	-0.734	-0.192	-0.134
.8861	-0.349	-0.180	-0.153	.9345	-0.778	-0.205	-0.140
.8931	-0.453	-0.200	-0.128	.9367	-0.771	-0.224	-0.119

This work was supported by a travel grant from the Louisiana State University Council on Research.

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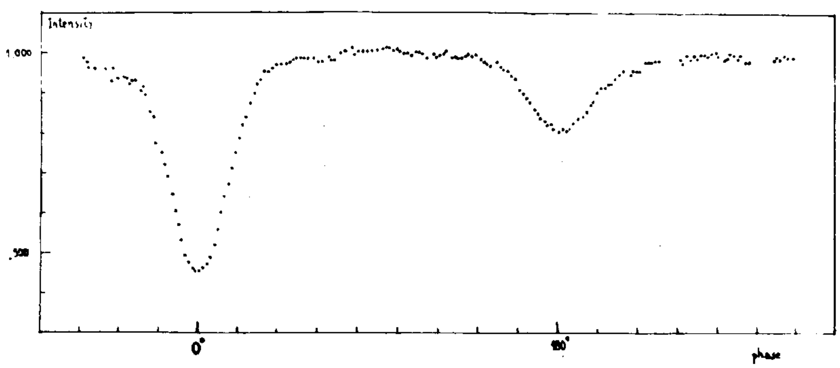
NEW ELEMENTS OF THE ECLIPSING BINARY RT ANDROMEDAE

It is well-known that the eclipsing binary system RT And presents some problems on the variability of the light curve between the minima as well as on the asymmetry of both minima.

Since the observational material is very poor and the elements of the system are uncertain, 1268 observations were obtained during the period October 1 - 8, 1971 with the aim to get the photometric elements. The observations were performed at the Ondrejov Observatory, using the 65 cm Cassegrain telescope. The observed curve (normal points) is plotted in the Figure.



We found the following constants of rectification and photometric elements for the system: A_0=+0,9702 $\pm$ 0,0015; A_1=-0,0066 $\pm$ 0,0019, A_2=-0,0268 $\pm$ 0,0022; B_1=+0,0075 $\pm$ 0,0010; B_2=+0,0002 $\pm$ 0,0012.
k= 0,696; r_s= 0,247; i= 87^o; L_g= 0,8530; L_s= 0,1470; J_g/J_s= 2,90; x_g=x_s= 0,80.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
1973 October 3

PHOTOELECTRIC OBSERVATIONS OF 31 CYGNI DURING THE 1972 ECLIPSE

On seventeen nights between April and July, 1972, photoelectric observations of 31 Cygni were obtained in three colors (UBV) by Landis at his observatory in East Point, Georgia, with a 20.3 cm reflector. An unrefrigerated 1P21 photomultiplier was used with the cathode at -800 volts. The filters used to reproduce the UBV system are Corning 3384 (4.5 mm) for visual, Corning 5030 (4.9 mm) plus Schott GG13 (2 mm) for blue, and Corning 9863 (3 mm) for ultraviolet. A full description of the photoelectric equipment used has been made elsewhere (PASP 85, 133, 1973).

All observations were transformed from the natural instrumental system to the standard UBV system. The transformation coefficients and their mean errors were found to be $\varepsilon = -0.01 \pm 0.01$, $\mu = 1.05 \pm 0.01$, and $\psi = 1.00 \pm 0.02$. Mean extinction coefficients for the Atlanta area were determined from standard stars and were found to be 0.364, 0.471 and 0.765 for yellow, blue and ultraviolet respectively. The data reduction was done by Williamon through the facilities available to the Fernbank Science Center.

Table I

UBV Photoelectric Observations of 31 Cygni

J.D. Hel 2441000+	ΔV	ΔB	ΔU	J.D. Hel 2441000+	ΔV	ΔB	ΔU
431.8855	-1.298	-1.122	-1.671	483.7468	-1.188	-0.752	-0.070
.9024	-1.289	-1.120	-1.691	.7683	-1.191	-0.753	-0.091
432.8835	-1.275	-1.126	-1.671	490.7459	-1.174	-0.728	-0.050
.9043	-1.268	-1.110	-1.685	.7616	-1.167	-0.740	-0.061
433.8838	-1.323	-1.133	-1.644	491.7255	-1.191	-0.736	-0.053
.9060	-1.352	-1.153	-1.668	.7417	-1.189	-0.733	-0.046
441.8857	-1.202	-0.757	-0.084	492.7714	-1.188	-0.750	-0.055
.9042	-1.218	-0.786	-0.143	.7888	-1.182	-0.738	-0.042
442.8818	-1.205	-0.779	-0.114	498.7253	-	-0.764	-0.092
.8990	-1.202	-0.757	-0.065	.7413	-1.176	-0.742	-0.078
446.8679	-1.191	-0.777	-0.130	.7568	-1.185	-0.756	-0.059
.8852	-1.219	-0.712	-0.099	.7730	-1.175	-0.738	-0.065
447.8566	-1.210	-0.786	-0.089	501.7388	-1.268	-1.003	-1.057
.8760	-1.244	-0.798	-0.137	.7548	-1.279	-0.999	-1.063
469.8031	-1.189	-0.760	-0.097	.7702	-	-0.983	-1.065
.8186	-1.166	-0.735	-0.077	504.6875	-1.304	-1.082	-1.528
470.8018	-1.225	-0.739	-0.097	.7019	-1.264	-1.088	-1.551
.8247	-1.176	-0.745	-0.019	519.6520	-1.271	-1.116	-1.728
				.6659	-1.271	-1.120	-1.739

All observations of 31 Cygni were made differentially with respect to 26 Cygni. 30 Cygni was used as an early type check star on several nights and gave no indication of any variability of 26 Cygni. The magnitude differences in each of the three colors are listed in Table I. The first column contains the heliocentric Julian date and the second column the differential magnitude for each color.

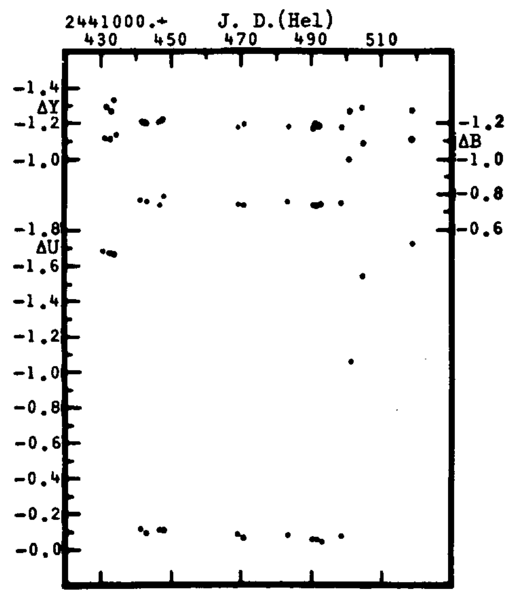

Table II

Properties of the Light Curves

	ΔV	ΔB	ΔU
Light outside eclipse	-1.2934 (8)	-1.1251 (8)	-1.6870 (8)
Light during eclipse	-1.1935 (23)	-.07526 (24)	-0.0797 (24)
Depth	0.0999	0.3625	1.6073

( ) gives the number of observations

From the average values of ΔV, ΔB, and ΔU during totality and outside of eclipse, the corresponding depths of the eclipses were deduced and are given in Table II. The light curve shown in the figure uses the average value of ΔV, ΔB, and ΔU for each night.

20 August, 1973

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COMMISSION 27 OF THE I. A. U.
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Konkoly Observatory
Budapest
1973 October 14

BRIGHTENING OF HERBIG-HARO OBJECT NO. 1

Slow time variations have been observed or suspected in the structure of several Herbig-Haro Objects for which long series of direct photographs of uniform quality and adequate scale are available. The best-documented case is HH 2 = Haro 12a (Herbig, Non-Periodic Phenomena in Variable Stars, p. 75, 1968).

I wish here to call attention to a new example: the brightening of one portion of the brightest known Object, HH 1 = Haro 11a, also near NGC 1999. This Object has the form of a 4" x 8" ellipse, elongated in about p.a. 130°. The best 120-inch direct plates show that there are 3 or 4 very sharp nuclei within this small area, together with considerable nebulous structure. In 1959-60, when the first 120-inch plates were obtained, the two star-like nuclei at the northwest end of this Object were very faint. They must also have been very faint (although unresolved) on 36-inch (Crossley) reflector plates extending back to 1946 because in those years HH 1 always appeared as a slightly diffuse star with only a very short, curved nebulous tail extending for 5" toward the northwest (Herbig, Ap.J. 113, 697, 1951). At some time between 1962 and 1968, during the only large gap in the Lick plate series, one or both of the close pair of faint nuclei (separation 1") at the northwest end of this Object underwent a large increase in brightness. A very slight further rise may have taken place between 1968 and 1973. As a consequence, the northwest end of HH 1 -- formerly the faint end — now dominates the structure, and appears at Crossley scale (39"/mm) like a star of $m_{pg} \approx 16.0$ with a nebulous appendage to the southeast, in the opposite sense as before.

Possibly this brightening is related to the changes in the integrated spectrum of HH 1 that were noted by Böhm, Perry, and Schwartz (Ap.J. 179, 149, 1973) between 1955 and 1969.

The gradual changes in the structure of the nearby Object HH 2 (described in 1968) continue. Nucleus H is now the brightest point in HH 2 at about $m_{pg} = 16.2$. This came about as the result of a slow, steady increase since its initial rise from invisibility prior to 1953. Nucleus A itself has disappeared except for an appendage, or possibly another nucleus, slightly north of the original position of A; this feature is now about mag. 18.0. There have been only small changes in the other nuclei of HH 2 since 1968.

I am very indebted to Mr. E. A. Harlan, who has obtained all of the Crossley plates in this series since 1968.

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1973 October 2

COMMISSION 27 OF THE I. A. U.
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NUMBER 833

Konkoly Observatory
Budapest
1973 October 15

A NEW FLARE STAR NEAR HZ HER

While obtaining high-speed photometric observations of the X-ray source HZ Her, a nearby field star was observed to flare. The star is indicated by the arrow in Figure 1.

The observations were obtained on the 91-cm reflector at McDonald Observatory using the high-speed photometer described by Nather and Warner (1971). The observed flare is shown in Figure 2 and was detected with an Amperex 56DVP, operated uncooled, with no filter (white light).

Preliminary colors, based on only one observation, were provided by P.E. Boynton (1973) which show the star to be about 10th magnitude and having colors consistent with a K-dwarf. If spectra of the star confirm its suspected K-type classification, it will be one of the few early type (K) UV Ceti stars known.

Its proximity to the X-ray source Her X-1 = HZ Her may allow simultaneous optical and X-ray monitoring to look for X-ray emission produced by flare events, as predicted by Grindlay (1970).

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PAUL A. VANDEN BOUT

References:
Boynton, P.E. 1973, private communication.
Grindlay, J.E. 1970, Ap.J. 162, 187.
Nather, R.E., and Warner, B. 1971, M.N.R.A.S. 152, 209.

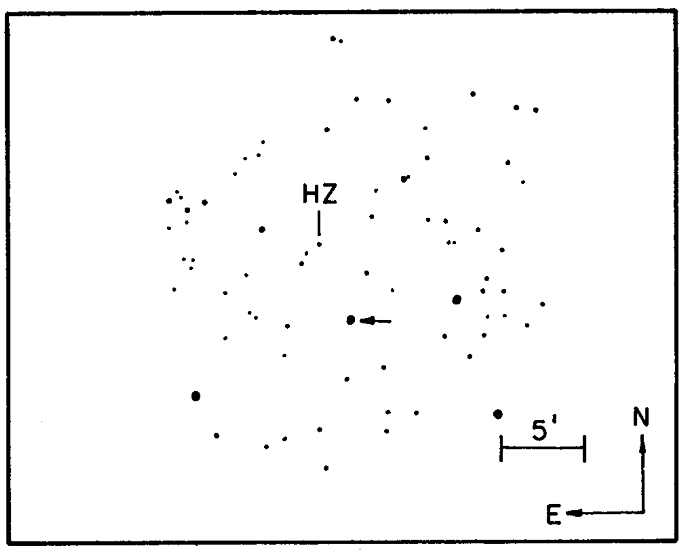

Figure 1. Field centered on HZ Her ($16^h54^m14^s$, +35° 29:8 (1900)).
The flare star is indicated by the arrow.

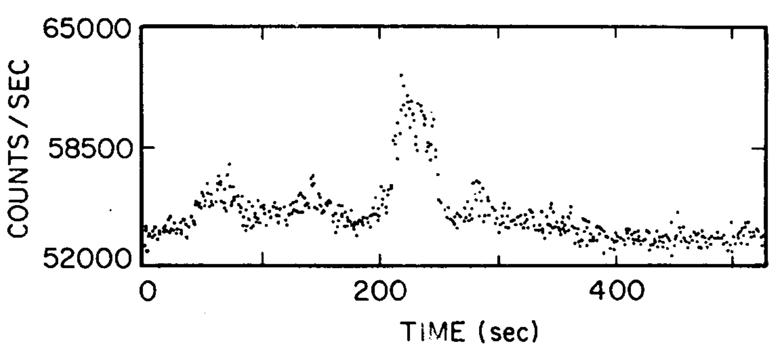

Figure 2.

Light curve of flare event observed on 02 July 1973 using no filter.
The origin of the time axis is UT 08 02 51.

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59^{th} NAME – LIST OF VARIABLE STARS

The present 59^{th} Name – list of variable stars has been compiled in accordance with the rules established in the 56^{th} list. It contains all necessary identifications for 653 new variable stars designated in 1973. In the square brackets the reference number is given for the work where (not always firstly) the information on discovery of the variable had been published. This reference number accompanies designation or number of the star given for it in the cited work. Name of the discoverer is mentioned only in the cases when it does not coincide with the name of the author of the cited work.

Reference numbers 0001–5216 correspond to the numbers from literature list published in the first volume of the 3^{rd} edition of General Catalogue of Variable Stars (pages A42–A121). The numbers 5217–5824 correspond to the supplementary list published in the First supplement to the third edition of the General Catalogue of Variable Stars (pages 279–289). The numbers 5840–6417 correspond to the list given in the present edition (pages 19–22).

The serial numbers of flare variables in the Pleiades cluster are preceded here by the symbol Plf.

We are grateful to *E.B. Khoteemskaya* and *T.D. Nishtcheva* for their help in compiling of this list.

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Moscow Bureau of Variable Stars,
Astronomical Council of the
USSR Academy of Sciences,
Sternberg Astronomical Institute

Moscow, July, 1973

GW And = HV 4014[1985] = P 19 = КЗП 61.
GI Aps = S 5494[4001] = BV 1088 [5523] = КЗП 7157.
GK Aps = S 5496 [4001] = КЗП 7169.
GL Aps = S 5497 [4001] = КЗП 7171.
GM Aps = S 5500 [4001] = КЗП 7172.
GN Aps = S 5502 [4001] = КЗП 7177.
GO Aps = S 5506 [4001] = КЗП 7183.
GP Aps = S 5509 [4001] = КЗП 7190.
GQ Aps = S 5510 [4001] = КЗП 7194.
GR Aps = S 5514 [4001] = КЗП 7198.
GS Aps = S 5517 [4001] = КЗП 7200.
GT Aps = S 5518 [4001] = КЗП 7201.
GU Aps = S 5519 [4001] = КЗП 7204.
GV Aps = S 5523 [4001] = BV 1108 [5502] = КЗП 7207.
GW Aps = S 5526 [4001] = BV 1109 [5502] = КЗП 7212.
GX Aps = S 5530 [4001] = КЗП 7214.
GY Aps = S 5532 [4001] = КЗП 7222.
GZ Aps = S 5533 [4001] = КЗП 7229.
HH Aps = S 5540 [4001] = КЗП 7237.
HI Aps = S 5542 [4001] = КЗП 7243.
HK Aps = S 5546 [4001] = КЗП 7251.
HL Aps = S 5545 [4001] = КЗП 7252.
HM Aps = S 5550 [4001] = КЗП 7255.
HN Aps = S 5549 [4001] = КЗП 7256.
HO Aps = S 5552 [4001] = КЗП 7257.
HP Aps = S 5556 [4001] = КЗП 7261.
HQ Aps = S 5558 [4001] = КЗП 7262.
HR Aps = S 5559 [4001] = КЗП 7267.
HS Aps = S 5560 [4001] = КЗП 7269.
HT Aps = S 5561 [4001] = КЗП 7271.
HU Aps = S 5562 [4001] = КЗП 7273.
HV Aps = S 5568 [4001] = КЗП 7289.
HW Aps = S 5573 [4001] = КЗП 7297.
HX Aps = S 5574 [4001] = КЗП 7301.
HY Aps = CoD–73°1203(9.4) = CPD–73°1723 (9.5) = S 5577 [4001] = КЗП 7306.
HZ Aps = S 5578 [4001] = BV 1114 [5502] = КЗП 7310.
II Aps = S 5582 [4001] = КЗП 7320.
IK Aps = S 5583 [4001] = BV 1115 [5502] = КЗП 7325.
IL Aps = S 5584 [4001] = КЗП 7327.
IM Aps = S 5586 [4001] = КЗП 7347.
IN Aps = S 5587 [4001] = КЗП 7351.
IO Aps = S 5588 [4001] = КЗП 7365.
IP Aps = S 5589 [4001] = КЗП 7375.
South-following component of a close pair.
IQ Aps = S 5590 [4001] = КЗП 7376.
IR Aps = S 5594 [4001] = КЗП 7395.
IS Aps = S 5600 [4001] = КЗП 7408.
IT Aps = S 5601 [4001] = BV 1433 [6031] = КЗП 7414.
IU Aps = S 5602 [4001] = КЗП 7443.
IV Aps = S 5605 [4001] = КЗП 7455.
IW Aps = S 5607 [4001] = КЗП 7466.
IX Aps = S 5610 [4001] = КЗП 7486.
IY Aps = S 5612 [4001] = КЗП 7488.
IZ Aps = S 5614 [4001] = КЗП 7497.
KK Aps = S 5616 [4001] = КЗП 7519.
KL Aps = S 5622 [4001] = КЗП 7543.
KM Aps = CoD–75°946 (10.0) = S 5624 [4001] = КЗП 7555.
KN Aps = S 5626 [4001] = КЗП 7562.
KO Aps = S 5629 [4001] = КЗП 7575.
KP Aps = S 5632 [4001] = КЗП 7577.
KQ Aps = S 5633 [4001] = КЗП 7579.
KR Aps = S 5635 [4001] = КЗП 7587.
Not far from W Aps.
KS Aps = S 5636 [4001] = КЗП 7592.
KT Aps = S 5639 [4001] = КЗП 7596.
KU Aps = S 5637 [4001] = КЗП 7598.

KV Aps = S 5641 [4001] = КЗП 7603.
KW Aps = S 5651 [4001] = КЗП 7635.
KX Aps = S 5654 [4001] = КЗП 7636.
KY Aps = S 5661 [4001] = КЗП 7656.
KZ Aps = S 5664 [4001] = КЗП 7658. North-following component of a close pair.
LL Aps = S 5665 [4001] = КЗП 7663.
LM Aps = S 5669 [4001] = КЗП 7675.
LN Aps = S 5670 [4001] = BV 1122 [5502] = КЗП 7678.
LO Aps = S 5676 [4001] = КЗП 7691.
LP Aps = S 5678 [4001] = КЗП 7710.
LQ Aps = S 5679 [4001] = КЗП 7782.
EN Aqr = 3 Aqr [4971] = k Aqr = HR 7951 [1371] = BD−5° 5378 (4.2) = SAO 144814 = HD 198026 (Ma) = IRC−10548 = КЗП 8571.
EO Aqr = 3 [4392] = HV 10132 = КЗП 5433.
EP Aqr = BD−2° 5631 (6.8) = SAO 145652 = HD 207076 (Mb) = DO 7589 (M7) = IRC 00509 = Bm 596 [6300] = Zi 2041 = КЗП 5468.
EQ Aqr = BD−16° 6201 (9.1) = SAO 165473 = HD 217932 (Ma) = IRC−20625 [6005] = BV 208 [4054] = КЗП 8817.
ER Aqr = CoD−23° 17733 (7.3) = CPD −23° 8269 (8.2) = SAO 191638 = HD 218074 (Mb) [5973] = IRC−20627.
ES Aqr = CoD−24° 17778 (9.2) = SAO 192052 = HD 222159 (Mb) = P 5774 = 659.1935 [5028] = КЗП 5769.
ET Aqr = 108 Aqr [4170] = HR 9031 = BD−19° 6522 (5.0) = CPD −19° 8426 (5.0) = SAO 165918 = HD 223640 (A0p) = КЗП 8887.

V1293 Aql = BD+4° 4152 (7.2) = SAO 124777 = HD 184201 (Mb) [6302] = DO 5886 (M7) = IRC 00443 = 69.1942 [6301] = КЗП 101855.
V1294 Aql = BD+3° 4065 (7.4) = SAO 124788 = HD 184279 (B5) [2602] = КЗП 8199.
V1295 Aql = BD+5° 4393 (8.0) = SAO 125381 = HD 190073 (A0) [6303].
V621 Ara = S 5807 [4001] = КЗП 7391.
V622 Ara = S 5812 [4001] = КЗП 7396.
V623 Ara = CoD−59° 6230 (10 1/4) = CPD−59° 6781 (10.0) = HD 149408 (Ma) = S 5813 [4001] = КЗП 7397.
V624 Ara = S 5819 [4001] = КЗП 7402.
V625 Ara = S 5825 [4001] = КЗП 7406.
V626 Ara = HR 6576 = CoD−50° 11474 (6.9) = CPD−50° 10303 (8.0) = SAO 244954 = HD 160342 (Ma) [6304].
V627 Ara = HV 7797 [1021] = 356.1937 = КЗП 3437. South-following component of a close pair.
V628 Ara = HV 7959 [4230, *Boyd*] = КЗП 3647. Followed by brighter star.
UX Ari = BD+28° 532 (7.0) [6305] = SAO 75927 = HD 21242 (G5).
NQ Aur = СПЗ 1694 [5882].
NR Aur = СПЗ 1744 [6306]. Near EZ Aur.
NS Aur = СПЗ 1746 [6306].
NT Aur = HV 6880 [0607] = P 2688 = КЗП 499.
NU Aur = HV 6881 [0607] = P 2689 = КЗП 501.
NV Aur = IRC+50137 [6605].

NW Aur = Var. in NGC 1893 [6307]. Near NX Aur.

NX Aur = 30.1907 [6308] = Zi 370 = = K3Π 553; in NGC 1893 cluster, near NW Aur.

π Aur = 35 Aur [6309] = HR 2091 [1371, 4590, 3659] = BD+45°1217 (4.8) = = SAO 040756 = HD 40239 (Ma) = = DO 29882 (M2) = IRC+50156 = = Zi 495 = K3Π 700.

BY Boo = 9 H Boo = HR 5299 [1371, 5840] = = BD+ 44°2325 (5.3) [4513] = = SAO 044901 = HD 123657 (Mb) = = DO 34564 (M6) = IRC+40253 = = K3Π 7099.

BE Cam = $12^h 44^m.8$ + 77°22′ [6310].

BF Cnc = 27 Cnc [1371] = HR 3319 = = BD+13°1912 (5.8) = = SAO 097819 = HD 71250 (Ma) [6412] = DO 2504 (M5) = IRC+ +10189 = F 544 = K3Π 1302.

BQ Cnc = BD+ 20°2169 (8.8) = = SAO 080343 = HD 73729 (A0) [5842]. In Praesepe cluster.

AP CVn = C [6064].

FR CMa = HR 2284 [6311, 5890] = BD −11°1460 (5.9) = SAO 151401 = = HD 44458 (B2p) = ADS 4978.

FS CMa = BD−12°1500 (7.7) = = SAO 151534 = HD 45677 (B0p) [6312].

FT CMa = 10 CMa = HR 2492 [6311] = = CoD−30°3484 (5.7) = CPD −30°1404 (5.1) = SAO 197149 = = HD 48917 (B3p) [6171].

FU CMa = HR 2628 [6311] = BD −21°1695 (6.7) = CPD −21°1662 (6.9) = SAO 172725 = = HD 52437 (B5).

FV CMa = HR 2690 [6311, 5890] = = CoD−23°4908 (6.3) = CPD −23°1827 (6.4) = SAO 173002 = = HD 54309 (B3p) [6313].

FW CMa = HR 2825 = BD−15°1810 (5.8) = = SAO 152834 = HD 58343 (B3p) [6171].

FX CMa = BD−11°1941 (8.9) [6314, 4643] = = SAO 152891 = HD 58881 (Rp) = = HV 100 = Zi 630 = K3Π 1051.

FY CMa = HR 2855 [6311, 5890] = = BD−22°1874 (6.0) = = CoD−22°4526 (5.7) = CPD −22°2178 (5.7) = SAO 173752 = = HD 58978 (B2p) [6311].

o^1 CMa [4619, 6315] = 16 CMa = = HR 2580 = CoD−24°4567 (3.9) = = CPD−24°1745 (7.2) = = SAO 172542 = HD 50877 (K2p) [6413, 6313] = IRC−20112 = = Zi 591 = BV 652 [4665] = = K3Π 100781.

σ CMa [4619, 6315] = 22 CMa = = HR 2646 = CoD−27°3544 (3.6) = CPD−27°1648 (7.1) = = SAO 172797 = HD 52877 (K5) = = IRC−30072 = ADS 5719 = = Zi 600 = K3Π 100796.

AC Cap = 47 Cap = HR 8318 [5195] = = BD − 9°5833 (6.7) = = SAO 145648 = HD 207005 (Ma) = = IRC−10570 = K3Π 8685.

V336 Car = BV 1505 [6316].
V337 Car = q Car [6315] = HR 4050 [4619, 6352] = CoD−60°3010 (3.0) = = CPD−60°1817 (6.1) = = SAO 250905 = HD 89388 (K5) = = Zi 812 = КЗП 101115.
V338 Car = CoD−57°3785 (9.3) = = CPD−57°4451 (9.3) = = HD 97726 (B9) = BV 1491 [6317].
V339 Car = 135.1934 [4618] = HV 8356 = = BV 1545 [6318] = P 3477 = = КЗП 1729.
V510 Cas = sH 15 [5529].
V511 Cas = H 10 [5529].
V512 Cas = H 9 [5529].
V513 Cas = v 4 [5529].
V514 Cas = GR 205 [6319].
V515 Cas = GR 208 [6319].
V516 Cas = GR 210 [6319].
V517 Cas = GR 211 [6319].
V518 Cas = 136 [6320] = Stock 208. In the region of the cluster Stock 2.
V519 Cas = СПЗ 1143 [0947] = КЗП 6005.
V520 Cas = S 10125 [3903].
V521 Cas = No. 573 in NGC 7789 [6321]. Near to CSV 8897.
V522 Cas = H 19 [5529].
V763 Cen = C^1 Cen = HR 4463 [4457, 4456] = CoD−46°7199 (6.0) = = CPD−46°5425 (7.0) = = SAO 222887 = HD 100733 (Ma) [5992, 6322] = КЗП 6847.
V764 Cen = CoD−32°9477 (8.5) = CPD −32°3443 (8.8) = SAO 204640 = = HD 118238 (K5) [4457, 6323] = = КЗП 7060.
V765 Cen = HR 5135 [5840, 5890] = CoD −39°8390 (6.7) = CPD−39°6036 (7.6) = SAO 204708 = = HD 118781 (Mb).
V766 Cen = HR 5171 [4456, 4457, 6324] = CoD−61°3988 (7.0) = = CPD−61°4003 (8.3) = = SAO 252448 = HD 119796 (G5p) = КЗП 7083.
V767 Cen = HR 5223 [6324, 6311] = = CoD−46°8931 (6.6) = = CPD−46°6546 (6.8) = = SAO 224514 = HD 120991 (B3p).
V768 Cen = HR 5519 = CoD−36°9645 (6.8) = = CPD−36°6562 (7.4) = = SAO 205966 = HD 130328 (Mb) = BV 524 [4381].
δ Cen = HR 4621 [4619, 4621, 6352, 6311] = CoD−50°6697 (2.8) = = CPD−50°4862 (3.7) = = SAO 239689 = = HD 105435 (B3p) = КЗП 6892.
LM Cep = 94.1934 [0491] = HBV 479 [6325] = P 5466 = КЗП 5274.
LN Cep = HBV 481 [6325, 6326].
LO Cep = HBV 483 [6325].
LP Cep = СПЗ 681 [1315, *A. Beljawsky*] = HBV 484 [6325] = = P 5577 = КЗП 5400.
LQ Cep = HBV 485 [6325, 6326]. Eastern component of double star.
LR Cep = HBV 487 [6325].
LS Cep = HBV 488 [6325].
LT Cep = HBV 490 [6325].

LU Cep = BD+60°2267 (9.5) [4448; 6414, *Wells*] = HD 205777 (N) = = DO 39823 (R) = IRC+60321 = = 25.1919 = HBV 491 [6325] = = Zi 2030 = КЗП 102116.

LV Cep = HBV 492 [6325, 6326].

LW Cep = HBV 493 [6325].

LX Cep = HBV 494 [6325].

LY Cep = HBV 495 [6325].

LZ Cep = 14 Cep [6327, 6328] = HR 8406 = = BD+57°2441 (6.4) = SAO 033990 = = HD 209481 (B0) = КЗП 8739.

MM Cep = VV 439 [6329].

MN Cep = S 4575 [4455] = VV 440 [6329] = = КЗП 5510.

MO Cep = 18 Cep [1371] = HR 8416 = = BD+62°2028 (5.9) = SAO 019828 = = HD 209772 (Mb) [6330] = = IRC+60338 = P 2318 = КЗП 102144.

MP Cep = VV 443 [6329].

MQ Cep = VV 446 [6329].

MR Cep = S 4582 [4455] = VV 449 [6329] = = КЗП 5527.

MS Cep = VV 450 [6329].

MT Cep = VV 463 [6329].

MU Cep = 393.1933 [4120] = VV 469 [6329] = = P 2335 = КЗП 5549.

MV Cep = СПЗ 1742 [6331].

MW Cep = СПЗ 1743 [6331].

MX Cep = BD+58°2497 (7.9) = SAO 034915 = = HD 216533 (A0p) = КЗП 8799 = = Babcock 83 [4170].

MY Cep = *b* [6332] = IRC+60375 = = КЗП 8802; in the region of NGC 7419 cluster.

MZ Cep = *g* [6332] = КЗП 8803.

NN Cep = BD+61°2384 (8.0) = SAO 020381 = = HD 217796 (A5) = КЗП 8815 = = BV 386 [3835].

NO Cep = H 3 [5529].

AC Cet = BD−19°7 (8.0) = CPD−19°9 (8.4) = = SAO 147130 = HD 672 (Mb) = = IRC−20003 = HV 3313 [6333] = = 30.1911 = Zi 2 = КЗП 12.

AD Cet = HR 46 [1371, 5195, 5841] = = BD−8°26 (5.8) = SAO 128655 = = HD 1014 (Ma) = IRC−10005 = = ADS 180 = P 7 = КЗП 24.

AE Cet = 7 Cet = HR 48 [5909] = = BD−19°21 (5.0) = CPD−19°18 (5.8) = SAO 147169 = HD 1038 (Ma) [5182, 5138] = IRC−20006 = = КЗП 5843.

AF Cet = CoD−24°100 (9.4) = HD 1628 (Mb) [5973].

AG Cet = BD−12°72 (6.7) = SAO 147289 = = HD 2438 (Mb) [5973] = IRC−10010 = = HV 3229 [6334] = 43.1910 = = BV 603 [4350] = Zi 24 = = КЗП 100029.

AH Cet = BD−22°105 (9.0) = CoD −22°196 (9.2) = CPD−22°58 (9.4) = = HD 3514 (Mb) [5973].

AI Cet = BD−10°136 (9.0) = SAO 128907 = = HD 3953 (Mb) [5973] = = IRC−10011.

AK Cet = BD−12°183 (8.1) = SAO 147564 = = HD 5920 (Mb) [5973] = IRC−10016.

AL Cet = BD−17°198 (8.3) = SAO 147633 = = HD 6816 (Ma) [5973].

AM Cet = BD−14°225 (6.8) = SAO 147656 = = HD 7122 (Mb) [5973] = = IRC−10019.

AN Cet = BD–2°185 (8.8) = SAO 129190 = = HD 7421 (Mb) [5973] = DO 178 (M4) = IRC 00017.

AO Cet = BD–10°288 (8.8) = SAO 147744 = = HD 8102 (Mb) [5973].

AP Cet = IRC–20015 [6005] = 154.1932 [5148] = P 39 = KЗП 154.

AQ Cet = BD–5°323 (8.5) = SAO 129519 = = HD 11193 (Mc) [5973] = = IRC–10025 = 157.1932 [5148] = = P 43 = KЗП 169.

AR Cet = HR 587 [1371, 6335, 5150, 5841] = = BD–9°380 (5.8) = SAO 129624 = = HD 12292 (Mb) = IRC–10030 = = P 54 = KЗП 187.

AS Cet = BD–14°423 (7.2) = SAO 148319 = = HD 14284 (Mb) [5973] = = IRC–10033 = KЗП 102380 = = No. 140 in SA 118 [5208].

AT Cet = CoD–23°1029 (7.8) = = CPD–23°285 (8.6) = SAO 167977 = = HD 16896 (Mc) = IRC–20036 = = 45.1901 = HV 133 = Gou 2859 [2948] = Zi 146 = KЗП 240.

AU Cet = BD–20°6700 (9.2) = HD 225016 (Mb) [5973] = 262.1932 [5148] = = P 2424 = KЗП 5830.

BN Cir = CoD–59°5602 (9.6) = = CPD–59°5885 (9.2) = = HD 135432 (A0) = BV 1512 [6336].

SW Col = HR 1793 [4456, 4457] = CoD –39°1940 (6.2) = CPD–39°652 (7.0) = SAO 195807 = = HD 35515 (Ma) = KЗП 6171.

SX Col = HR 2393 [5839, 5840] = = CoD–36°2962 (6.9) = = CPD–36°988 (7.4) = SAO 196906 = = HD 46431 (Ma).

GH Com = B [6064].

GI Com = СПЗ 1737 [6337].

V668 CrA = CoD–42°13358 (9.2) = = CPD–42°8418 (8.2) = = SAO 229101 = HD 170625 (A5) [6338].

SU Crt = BD–11°3123 (8.2) = = SAO 156747 = HD 100363 (A2) [6338].

V1421 Cyg = S 10033 [3903] = GR 232 [6339].

V1422 Cyg = СПЗ 1747 [6306] (erratically printed as СПЗ 1947).

V1423 Cyg = S 10038 [3903] = СПЗ 1748 [6306].

V1424 Cyg = $21^h00^m.5 + 42°07'.8$; 1950 [6340].

V1425 Cyg = BD+54°2489 (7.3) [4794] = = SAO 033196 = HD 202000 (B8) = = KЗП 8632 = BV 346 [4115].

V1426 Cyg = DO 20612 (N) [6341] = = IRC+40485 [6005] = CIT 13 = = KЗП 5438.

V1427 Cyg = BD+47°3487 (9.1) [4529] = = SAO 051076.

V1428 Cyg = СПЗ 1749 [6306].

V1429 Cyg = S 4572 [4455] = VV 430 [6329] = KЗП 5488.

V1430 Cyg = S 4573 [4455] = VV 431 [6329] = KЗП 5491.

V1431 Cyg = VV 432 [6329].

V1432 Cyg = СПЗ 570 [6342] = 226.1935 = = VV 433 [6329] = F 5647 = = KЗП 5492.

V1433 Cyg = VV 434 [6329].

V1434 Cyg = VV 435 [6329].

V1435 Cyg = СПЗ 1133 [1316] = VV 437
[6329] = КЗП 8737.

CP Dra = n[6343] = SN or Nova near
NGC 3147 [6344].

CQ Dra = 4 Dra [1371, 6345] = HR 4765
[5841] = BD+70°700 (4.7) =
= SAO 015816 = HD 108907 (Ma) =
= DO 34086 (M4) = IRC+70113 =
= Zi 943 [1371] = КЗП 1876.

DI Eri = CoD−46°769 (8.6) = CPD−46°246
(9.4) = HD 16554 (Mb) [5973] =
= КЗП 102386 = No. 103 in SA 166
[5208].

DK Eri = CoD−42°922 (9.7) = HD 17462
(Mb) [5973].

DL Eri = HR 1225 [6346] = BD−10°793 (6.5) =
= SAO 130833 = HD 24832 (F0).

DM Eri = 54 Eri [5859] = HR 1496 [4590] =
= BD−19°988 (4.5) = CPD−19°611
(6.1) = SAO 149818 = ADS 3380 =
= HD 29755 (Ma) [6347] = IRC−20059 =
= Zi 306 = КЗП 100402.

o^1 Eri = 38 Eri [6346] = HR 1298 = BD
−7°764 (4.4) = SAO 131019 =
= HD 26574 (F2).

π Eri = 26 Eri = HR 1162 [5909] =
= BD−12°707 (4.3) = SAO 149158 =
= HD 23614 (Ma) = IRC−10051 =
= КЗП 6050.

τ^4 Eri = 16 Eri [4970, 4971] = HR 1003
[3659] = BD−22°584 (4.0) = CoD
−22°1154 (3.4) = CPD−22°352 (5.7) =
= SAO 168460 = ADS 2472 A =
= HD 20720 (Mb) = IRC−20041 =
= КЗП 6025.

TT For = CoD−27°682 (9.0) = CPD−27°186
(10.2) = SAO 167437 = HD 12066
(Mb) [5973].

NQ Gem = BD+24°1686 (8.2) = SAO 79474 =
= HD 59643 (R8) [6348] =
= DO 13087 (N).

μ Gem = 13 Gem = HR 2286 [1371] =
= BD+22°1304 (3.0) [4513] =
= SAO 078297 = ADS 4990 =
= HD 44478 (Ma) = DO 12155 (M2) =
= IRC+20144 = P 372 = КЗП 740
[6349].

AS Gru = CoD−42°16163 (9.3) = CPD
−42°9513 (10.2) = HD 217362 (Mb)
[5973].

β Gru = HR 8636 [4970, 5150, 63[illegible]] =
= CoD−47°14308 (2.2) = CPD
−47°9896 (5.2) = SAO 231258 =
= HD 214952 (Mb) [6350, 4457] =
= КЗП 8784.

V642 Her = HR 6543 [5840] = BD+14°3279
(6.2) = SAO 102918 = HD 159354
(Mb) = DO 16057 (M5) =
= IRC+10330.

V643 Her = Ross 304 [2604, 5185] =
= F 1628 = КЗП 4205.

TV Hor = CoD−58°510 (7.4) = CPD
−58°217 (7.9) = SAO 232795 =
= HD 15793 (Mb) [6323, 6351] =
= КЗП 5991.

TW Hor = HR 977 [4456, 5182, 5890,
6258, 6352, 5840] = CoD
−57°626 (5.7) = CPD−57°513 (7.4) =
= SAO 233037 = HD 20234 (Na) =
= Herschel 10 [6353] = КЗП 6019.

TX Hor = S 4828 [4455] = КЗП 379.

IL Hya = CoD−23°8347 (7.6) =
= CPD−23°4473 (7.9) =
= SAO 177412 = HD 81410 (K2)
[4456, 5182, 5998] = КЗП 6716.

IM Hya = BV 1508 [6316].

BC Hyi = HV 11932[0357] = BV 1521[6318] = = КЗП 306.
PQ Lac = СПЗ 1750 [6306].
PR Lac = СПЗ 1134[1316] = VV 438[6329] = = КЗП 8741.
PS Lac = VV 442[6329].
PT Lac = S 4579[4455] = VV445[6329] = = КЗП 5514.
PU Lac = СПЗ 1751[6306].
PV Lac = GR 66 [4321] = КЗП 8748.
PW Lac = GR 67 [4321] = КЗП 8749.
PX Lac = VV 456 [6329].
PY Lac = VV 457[6329].
PZ Lac = S 4584[4455] = VV 458[6329] = = КЗП 5535.
QQ Lac = S 4585[4455] = IRC+50424 [6005] = VV 460 [6329] = КЗП 5538.
QR Lac = VV461 [6329].
QS Lac = VV466 [6329].
QT Lac = VV468[6329].
QU Lac = VV470 [6329].
QV Lac = S 4589[4455] = VV471[6329] = = КЗП 5558.
QW Lac = VV473 [6329].
QX Lac = VV474 [6329].
QY Lac = VV475 [6329].
QZ Lac = VV476 [6329].
V335 Lac = VV477 [6329].
V336 Lac = S 4594 [4455] = VV478[6329] = = КЗП 5586.
DD Leo = BD+18°2321 (9.1) = = DO 14093(M7) = IRC+20217 = = P 3380 = 359.1934[5175] = = КЗП 1557.
DE Leo = 44 Leo [1371] = HR 4088 [5150, 6354] = BD+9°2351(6.0) = SAO 118286 = HD 90254 (Ma) [5896] = DO 2938 (M4) = = IRC+10230 = КЗП 6783.
σ Lib = 20 Lib = HR 5603 [5182, 4456, 4590, 5840] = CoD–24°11834 (3.5) = CPD–24°5432 (6.2) = = SAO 183139 = HD 133216(Mb) = = IRC–30228 = КЗП 7165.
GM Lup = HR 5604 [6355, 5150] = CoD –40°9243 (7.0) = CPD–40°6802 (7.6) = SAO 225422 = = HD 133220 (Mb) = КЗП 7166.
δ Lup [5859, 6356] = HR 5695 = = CoD–40°9538(3.7) = CPD –40°6933(3.6) = SAO 225691 = = HD 136298 (B2) = Zi 1116 = = КЗП 101496.
UW Lyn = 1 Lyn [1371] = HR 2215[3659] = = BD+61°869(5.5) = SAO 013787 = = HD 42973(Ma) = DO 30184(M5) = = IRC+60166 [6005] = P 359 = = КЗП 726.
UX Lyn = BD+39°2193(7.0) [6357] = = SAO 061226 = HD 77443(Mb) = = DO 13765(M7) = IRC+40201.
V443 Lyr = S 9313 [3910].
V444 Lyr = GR 243 [6358].
V445 Lyr = GR 244 [6358].
V446 Lyr = GR 245 [6358].
V447 Lyr = GR 247 [6358].
V448 Lyr = GR 248 [6358].
V449 Lyr = GR 249 [6358]. Not far from MV Lyr.
V450 Lyr = GR 250 [6358].
V451 Lyr = GR 251 [6358].
V452 Lyr = GR 252 [6358].
V453 Lyr = GR 255 [6358].
V454 Lyr = GR 256[6358]. Not far from V372 Lyr.
V455 Lyr = GR 257 [6358].

θ[1] Mic = HR 8151 = CoD−41°14475 (4.8) = = CPD−41°9606 (5.0) = SAO 230644 = = HD 203006 (A2p) = КЗП 8644 = = Babcock 79 [4170].

V587 Mon = СПЗ 1695 [5882].

V588 Mon = BD+9°1320 (9.5) = HD 261331 (F0) = W2 in NGC 2264 [6359].

V589 Mon = BD+9°1323 (9.5) = HD 261446 (A7) = W20 in NGC 2264 [6359].

V590 Mon = 90 [6360] = КЗП 6475 = = Lick Hα 25.

V591 Mon = LHα 61 [6361] = СПЗ 1876.

V592 Mon = HR 2534 = BD−7°1592 (6.8) = = SAO 133761 = HD 49976 (A0p) = = КЗП 6508 = Babcock 24 [4170].

EG Mus = $12^h 39.^m 1$ −68°33.′2, 1950 [6362].

ε Mus = HR 4671 [4619, 6352] = CoD −67°1216 (4.7) = CPD−67°1931 (6.6) = SAO 251830 = HD 106849 (Mb) [4734] = Zi 926 = = КЗП 101257 = BV 872 [5579].

μ Mus = HR 4530 [4619, 6352] = = CoD−66°1114 (5.3) = CPD −66°1649 (7.5) = SAO 251597 = = HD 102584 (K5) = КЗП 6868.

LX Nor = S 5683 [4001] = КЗП 7270.

LY Nor = S 5684 [4001] = КЗП 7274.

LZ Nor = S 5687 [4001] = КЗП 7278.

MM Nor = S 5693 [4001] = КЗП 7286.

MN Nor = S 5695 [4001] = КЗП 7287.

MO Nor = S 5696 [4001] = КЗП 7288.

MP Nor = S 5697 [4001] = КЗП 7290.

MQ Nor = S 5703 [4001] = КЗП 7296.

MR Nor = S 5705 [4001] = КЗП 7298.

MS Nor = S 5706 [4001] = КЗП 7299.

MT Nor = S 5708 [4001] = КЗП 7300.

MU Nor = S 5712 [4001] = КЗП 7303.

MV Nor = S 5714 [4001] = КЗП 7304.

MW Nor = S 5715 [4001] = КЗП 7308.

MX Nor = S 5719 [4001] = КЗП 7309.

MY Nor = S 5717 [4001] = КЗП 7311.

MZ Nor = S 5727 [4001] = КЗП 7319.

NN Nor = S 5737 [4001] = КЗП 7331.

NO Nor = S 5742 [4001] = КЗП 7333.

NP Nor = S 5744 [4001] = КЗП 7336.

NQ Nor = S 5748 [4001] = КЗП 7339.

NR Nor = S 5756 [4001] = КЗП 7342.

NS Nor = CoD−57°6406 (9.6) = CPD −57°8085 (9.3) = HD 147944 (A0) = S 5758 [4001] = КЗП 7343.

NT Nor = S 5759 [4001] = КЗП 7344.

NU Nor = S 5761 [4001] = КЗП 7345.

NV Nor = S 5765 [4001] = КЗП 7349.

NW Nor = S 5768 [4001] = КЗП 7354.

NX Nor = S 5772 [4001] = КЗП 7356.

NY Nor = S 5775 [4001] = КЗП 7359.

NZ Nor = S 5774 [4001] = КЗП 7360.

OO Nor = S 5776 [4001] = КЗП 7361.

OP Nor = S 5777 [4001] = КЗП 7362.

OQ Nor = S 5778 [4001] = КЗП 7363.

OR Nor = S 5781 [4001] = КЗП 7367.

OS Nor = S 5780 [4001] = КЗП 7368.

OT Nor = S 5783 [4001] = КЗП 7370.

OU Nor = S 5785 [4001] = КЗП 7372.

OV Nor = S 5788 [4001] = КЗП 7378.

OW Nor = S 5789 [4001] = КЗП 7379.

OX Nor = S 5805 [4001] = КЗП 7386.

OY Nor = S 5804 [4001] = КЗП 7387.

BP Oct = HR 5491 [6363, 6364] = CoD −87°73 (6.0) = CPD−87°235 (7.2) = = SAO 258720 = HD 129723 (A2).

V2049 Oph = HV 10519 [5056] = КЗП 2567.

V2050 Oph = HV 10529 [5056] = КЗП 2593.

V2051 Oph = $17^h02^m.2 - 25°40'$, 1900.0 [6365].

V2052 Oph = HR 6684 [6366] = BD+0°3813 (5.8) [6367] = SAO 122935 = HD 163472 (B3) = Zi 1357 = КЗП 101690.

V2053 Oph = $18^h12^m20^s + 05°11'.4$, 1950.0 [6368].

V964 Ori = Alg ph–2°5^{h}4^m № 364 (10.9) = 44.1929 [0132] = P 165 = КЗП 503.

V965 Ori = 9 [6369] = СПЗ 1861.

V966 Ori = 10 [6369] = СПЗ 1862.

V967 Ori = 1 [6369] = СПЗ 1855.

V968 Ori = 36 [6370] = СПЗ 1878.

V969 Ori = 22 [6369] = СПЗ 1873.

V970 Ori = 8 [6369] = СПЗ 1860.

V971 Ori = 24 [6370] = СПЗ 1879. Close to V694 Ori.

V972 Ori = 11 [6369] = СПЗ 1863.

V973 Ori = 5 [6369] = СПЗ 1858.

V974 Ori = 15 [6369] = СПЗ 1866.

V975 Ori = 20 [6369] = СПЗ 1871.

V976 Ori = 13 [6369] = СПЗ 1865. Close to V395 Ori.

V977 Ori = 12 [6369] = СПЗ 1864.

V978 Ori = 2 [6369] = СПЗ 1856.

V979 Ori = 19 [6369, 6370] = СПЗ 1870.

V980 Ori = Brun 327 [2849, 6371] = П 1535 = КЗП 6221.

V981 Ori = 32 [6370] = СПЗ 1881.

V982 Ori = Brun 525 [1698] = П 1755 = КЗП 6246.

V983 Ori = 38 [6370] = СПЗ 1882.

V984 Ori = 35 [6370] = СПЗ 1883.

V985 Ori = 37 [6370] = СПЗ 1884.

V986 Ori = 7 [6369] = СПЗ 1859.

V987 Ori = 25 [6370] = СПЗ 1885.

V988 Ori = 16 [6369] = СПЗ 1867.

V989 Ori = 21 [6369] = СПЗ 1872.

V990 Ori = 17 [6369] = СПЗ 1868.

V991 Ori = 27 [6370] = СПЗ 1886.

V992 Ori = 28 [6370] = СПЗ 1887.

V993 Ori = 37.1932 [4663] = HV 8048 = P 299 = КЗП 640 = Var No.39 [6372].

V994 Ori = 18 [6369] = СПЗ 1869.

V995 Ori = 26 [6370] = СПЗ 1888. Close to DK Ori.

V996 Ori = 31 [6370] = СПЗ 1889.

V997 Ori = 30 [6370] = СПЗ 1890.

o^1 Ori = 4 Ori [1371, 5138] = HR 1556 = BD+14°777 (5.0) = SAO 094176 = HD 30959 (Ma) = DO 10825 (M6) = IRC +10072 = P 143 = КЗП 448.

NT Pav = HV 7845 [1021] = 404.1937 = КЗП 3582.

NU Pav = 85 G Pav = HR 7625 [5890] = CoD–59°7361 (6.0) = CPD –59°7564 (7.0) = SAO 246389 = HD 189124 (Mb) = Zi 1843 = КЗП 101918.

GY Peg = GR 69 [4321] = КЗП 8761.

GZ Peg = 58 Peg [2650] = HR 8815 [5150] = BD+7°4981 (5.3) = ADS 16550 = SAO 128001 = HD 218634 (Mb) = DO 7958 (M5) = IRC+10529 = P 2381 = КЗП 5667.

HH Peg = 80 Peg [5859] = HR 9030 [5150, 5195] = BD+8°5127 (6.5) = SAO 128421 = HD 223637 (Ma) = DO 8083 (M3) = IRC+10541 = Zi 2158 = КЗП 102286.

V393 Per = СПЗ 1733 [6337].
V394 Per = S 9544 [3905] = IRC+30072 [6005].
V395 Per = СПЗ 1693 [5882].
AF Phe = CoD–49°44(8.3) = CPD–49°30 (8.5) = HD 1198 (Mb) [5973].
AG Phe = CoD–40°85 (8.6) = CPD–40°32 (8.2) = SAO 215098 = HD 2320(A3) = BV 1488 [6317].
AH Phe = CoD–48°182(9.1) = CPD–48°88 (9.6) = HD 4544(Mb) [5973].
AI Phe = CoD–46°322(8.3) = CPD–46°120 (8.2) = SAO 215389 = HD 6980(G0) = BV 1513[6336].
AK Phe = CoD–47°389(7.2) = CPD–47°153 (8.2) = SAO 215460 = HD 8106 (Mb) [4457, 5945, 5973] = КЗП 5915.
AL Phe = CoD–46°394(8.6) = CPD–46°149 (8.8) = SAO 215498 = HD 8729(Mb) [4457, 5945] = КЗП 5921 = BV 433 [4670].
AM Phe = CoD–43°565(9.6) = HD 11278 (Mc) [5973].
AN Phe = CoD–45°15067(9.3) = CPD –45°10439(9.4) = HD 221621(Mc) [5973] = S 5163 [4455] = КЗП 5750.
ψ Phe [4971] = HR 555[4970, 5150, 4589, 6355] = CoD–46°552 (4.8) = CPD–46°195(6.3) = SAO 215696 = HD 11695(Mb) = КЗП 5951.
WW Psc = HR 284 [5195] = BD+5°131(6.3) = SAO 109581 = HD 5820(Ma) = DO 133 (M3) = IRC+10008 = КЗП 5884.
WX Psc = IRC+10011[6005] = CIT 3.
WY Psc = PHL 7332 [6373].
WZ Psc = HR 614[5150] = BD+7°324(7.0) = SAO 110337 = HD 12872(Mb) = DO 383(M3) = IRC+10027.
TT PsA = CoD–32°16875(7.3) = CPD –32°6447(8.0) = SAO 213500 = HD 209336 (Mb) [6374] = IRC–30449 = КЗП 8735.
TU PsA = CoD–25°16142(9.5) = HD 216300(Mc) = IRC–30455 [6005] = HV 1173 [6375] = 71.1905 = Zi 2115 = КЗП 5621.
TV PsA = CoD–26°16396(8.3) = CPD –26°7432(9.0) = HD 217005(Mb) [5973].
MY Pup = HR 2957 [5890, 6376] = CoD–48°3091(6.0) = CPD –48°1235(7.0) = SAO 218852 = HD 61715(F5p) = BV 664[4665].
MZ Pup = HR 3170[6304] = CoD–32°4796 (5.8) = CPD–32°1955(7.9) = SAO 198764 = HD 66888(Ma) = IRC–30115.
NN Pup = IRC–30121[6005] = S 4895 [4455] = КЗП 1260.
NO Pup = HR 3327 [6324, 6377] = CoD–38°4462(6.5) = CPD –38°2296(6.6) = SAO 199222 = HD 71487(A0).
γ Ret = HR 1264[5909, 4613, 6352] = CoD–62°149(5.0) = CPD –62°312(6.5) = SAO 248925 = HD 25705 (Mb) = КЗП 6073.
V3791 Sgr = 1[6378]. Near to CSV 7750.
V3792 Sgr = HR 6773 = CoD–25°12793 (7.2) = CPD–25°6353 (7.0) = SAO 186350 = HD 165814(B8) = BV 552 [4381].

V3793 Sgr = HV 7279 [5200] = P 4575 = = КЗП 3826.
V3794 Sgr = $18^h06^m47^s$ –21°56ʹ.0; 1900 [6379], *Keyes*.
V3795 Sgr = 1 [6274], *Hu*.
V3796 Sgr = 2 [6380].
V3797 Sgr = 4 [6380].
V3798 Sgr = 5 [6380].
V3799 Sgr = 13 [6380].
V3800 Sgr = 25 [6380].
V3801 Sgr = 27 [6380].
V3802 Sgr = 29 [6380]. Near to V2524 Sgr.
V3803 Sgr = 31 [6380].
V3804 Sgr = AS 302 [1687], *Minkowsky* = = 633 [6102].
V3805 Sgr = 41 [6380].
V3806 Sgr = 42 [6380].
V3807 Sgr = 176.1937 [6382] = HV 9407 [4487] = КЗП 4041 = 43a [6380].
V3808 Sgr = 44 [6380].
V3809 Sgr = 45 [6380].
V3810 Sgr = 51 [6380].
V3811 Sgr = 52 [6380].
V3812 Sgr = 53 [6380].
V3813 Sgr = 57 [6380].
V3814 Sgr = 58a [6380].
V3815 Sgr = 65b [6380]. Close to V1656 Sgr.
V3816 Sgr = 68a [6380].
V3817 Sgr = 73 [6380].
V3818 Sgr = 76 [6380].
V3819 Sgr = 760.1936 [4579] = = HV 9439 = 77 [6380] = = P 4652 = КЗП 4091.
V3820 Sgr = 78 [6380].
V3821 Sgr = 75c [6380].
V3822 Sgr = 83a [6380].
V3823 Sgr = 85a [6380].
V3824 Sgr = 89 [6380].
V3825 Sgr = 90 [6380].
V3826 Sgr = 95 [6380].
V3827 Sgr = 91b [6380].
V3828 Sgr = 102b [6380].
V3829 Sgr = 107a [6380].
V3830 Sgr = 113 [6380].
V3831 Sgr = 116c [6380].
V3832 Sgr = 117a [6380].
V3833 Sgr = 118 [6380].
V3834 Sgr = 1010 [6102]. Near to V1304 Sgr.
V3835 Sgr = 120 [6380].
V3836 Sgr = 2 [6274] = 117b [6380]. Near to V2565 Sgr.
V3837 Sgr = 124 [6380].
V3838 Sgr = 131a [6380]. Close component $15^m.8$. Near to V2570 Sgr.
V3839 Sgr = 3 [6274] = 131b [6380].
V3840 Sgr = 134a [6380].
V3841 Sgr = IRC–20489 [6005] = = 5 [6384], *Bonnell*.
V3842 Sgr = 134b [6380].
V3843 Sgr = 137b [6380]. Near to V2358 Sgr.
V3844 Sgr = 140 [6380].
V3845 Sgr = 144a [6380].
V3846 Sgr = 150a [6380].
V3847 Sgr = 157 [6380].
V3848 Sgr = 162 [6380].
V3849 Sgr = 167 [6380].
V3850 Sgr = 169 [6380].
V3851 Sgr = 174 [6380].
V3852 Sgr = 176 [6380].
V3853 Sgr = 7 [4409] = 173b [6380]. Member of the M22 cluster.

V3854 Sgr = 179 [6380].
V3855 Sgr = 185 [6380].
V3856 Sgr = 193 [6380]. The companion of 15^m.
V3857 Sgr = 195 [6380].
V3858 Sgr = 198 [6380].
V3859 Sgr = 204 [6380].
V3860 Sgr = 205 [6380].
V3861 Sgr = 207 [6380].
V3862 Sgr = 208 [6380].
V3863 Sgr = 213 [6380].
V3864 Sgr = 216 [6380].
V3865 Sgr = 220 [6380].
V3866 Sgr = СПЗ 616 [1659] = 223 [6380] = = P 4819 = КЗП 4299.
V3867 Sgr = Innes 150 [4930] = Zi 1492 = = КЗП 4309.
V3868 Sgr = 12 [5595] = 226b [6380].
V3869 Sgr = 227 [6380].
V3870 Sgr = 229 [6380].
V3871 Sgr = 232b [6380].
V3872 Sgr = c Sgr [5859] = 62 Sgr [4970] = = HR 7650 [5890] = CoD −28°16355 (4.7) = CPD −28°7105 (6.7) = SAO 188844 = = HD 189763 (Mb) = IRC −30423 = = Zi 1856 = КЗП 101927.
V863 Sco = 68.1914 [5203] = Zi 1191 = = КЗП 2542.
V864 Sco = 884.1936 [4579] = HV 8830 = = P 3997 = КЗП 2546.
V865 Sco = 69.1914 [5203] = Zi 1195 = = КЗП 2550.
V866 Sco = AS 205 [6415].
V867 Sco = Ross 371 [6386] = BV 958 [5234] = P 1078 = КЗП 2622.
V868 Sco = HV 10556 [5056] = КЗП 2647.
V869 Sco = 236.1935 = СПЗ 669 [4386] = = P 4037 = КЗП 2662.
V870 Sco = 92 in NGC 6231 [6387].
V871 Sco = HV 11712 [0248] = КЗП 3540.
κ Sco [6388] = HR 6580 = CoD −38°12137 (2.6) = CPD −38°6992 (4.0) = SAO 209163 = = HD 160578 (B2).
λ Sco [6388] = 35 Sco = HR 6527 = = CoD −37°11673 (2.0) = CPD −37°7265 (2.9) = SAO 208954 = = HD 158926 (B2).
XY Scl = CoD −33°3 (8.5) = CPD −33°1 (9.2) = HD 178 (Mb) [5973] = = IRC −30001.
XZ Scl = CoD −38°2 (9.0) = CPD −38°1 (9.8) = HD 180 (Mb) [5973].
YY Scl = CoD −26°22 (8.0) = CPD −26°5 (9.2) = SAO 166074 = HD 393 (Ma) [5973].
YZ Scl = CoD −36°144 (8.3) = CPD −36°37 (9.0) = SAO 192550 = = HD 2489 (Ma) [5973].
ZZ Scl = CoD −25°212 (8.0) = CPD −25°58 (8.7) = SAO 166393 = HD 3287 (Mb) [5973] = IRC −30010.
AA Scl = CoD −31°228 (8.0) = CPD −31°67 (9.0) = SAO 192633 = HD 3373 (Mb) [5973].
AB Scl = CoD −34°263 (8.5) = CPD −34°65 (9.4) = SAO 192707 = = HD 4226 (Ma) [5973].
AC Scl = CoD −26°300 (7.7) = CPD −26°73 (9.0) = SAO 166692 = = HD 5473 (Ma) [5973].
AD Scl = CoD −32°425 (9.5) = CPD −32°114 (10.4) = IRC −30013 [6005] = S 4795 [4455] = КЗП 119.

AE Scl = S 4796 [4455] = BV 1499 [6316] = = КЗП 123.

AF Scl = CoD−26°16483(8.5) = CPD−26°7454 (9.3) = SAO 191666 = HD 218348(Mb) [5973] = IRC−30464.

AG Scl = CoD−36°15725(9.0) = CPD −36°9701(9.8) = SAO 214335 = = HD 218414(Mb) [5973].

AH Scl = CoD−32°17539(8.7) = CPD −32°6608(10.2) = SAO 214568 = = HD 220979(Mb) [5973].

η Scl = HR 105 [5909, 4589, 4613] = = CoD−33°152(5.2) = CPD −33°48(6.4) = SAO 192545 = = HD 2429(Mb) [4457] = КЗП 5855.

V371 Sct = СПЗ 1739 [6389].

FL Ser = HR 5654 [1371, 5840] = BD +19°2935(5.9) = SAO 101429 = = HD 134943(Mb) = IRC+20277 = = P 995 = КЗП 2291.

FM Ser = Var 14 [6390].

FN Ser = Var 42 [6390].

FO Ser = BD−15°4923(9.0) [2948] = = SAO 161327 = HD 168227(N) [6391] = IRC−20464 = = PSD 134.1901(R) = HV 170 = = S9.1901 = Zi 1380 = КЗП 4006.

RW Sex = BD−7°3007(9.3) [6392]; [6416], *Hiltner*.

RX Sex = BD+4°2328(7.0) = SAO 118299 = = ADS 7773 = HD 90386(A2) [6393, 6417] = КЗП 6785.

V485 Tau = Plf 226 [6394], *Pigatto, Rosino*.

V486 Tau = 9 Tau [4170] = BD+22°518 (7.0) = SAO 076029 = HD 22374 (A0p) = КЗП 6038.

V487 Tau = Plf 261 [6394] = СПЗ 1913.

V488 Tau = 1 b [6395].

V489 Tau = 2 b [6395].

V490 Tau = Plf 231 [6394] = СПЗ 1914.

V491 Tau = Plf 297 [6394] = СПЗ 1915.

V492 Tau = Plf 223 [6394] = СПЗ 1916.

V493 Tau = Plf 225 [6394]; *Pigatto, Rosino*.

V494 Tau = Plf 224 [6394], *Pigatto, Rosino*.

V495 Tau = Plf 255 [6394] = СПЗ 1971.

V496 Tau = Plf 262 [6394] = СПЗ 1919.

V497 Tau = 3 b [6395].

V498 Tau = Plf 266 [6394] = СПЗ 1920.

V499 Tau = 13b [6397].

V500 Tau = Plf 256 [6394] = СПЗ 1921.

V501 Tau = Plf 288 [6394] = СПЗ 1922.

V502 Tau = Plf 289 [6394] = СПЗ 1923.

V503 Tau = Plf 237 [6394] = СПЗ 1924.

V504 Tau = Plf 278 [6394] = СПЗ 1925. Close to V433 Tau.

V505 Tau = Plf 286 [6394] = СПЗ 1926.

V506 Tau = Plf 222 [6394] = СПЗ 1927.

V507 Tau = Plf 236 [6394] = СПЗ 1928.

V508 Tau = 2 [6398].

V509 Tau = Plf 245 [6394] = СПЗ 1929. Close to LU Tau.

V510 Tau = 15 b [6397].

V511 Tau = 17 b [6397].

V512 Tau = 18 b [6397].

V513 Tau = Plf 280 [6394] = СПЗ 1930.

V514 Tau = 19 b [6397].

V515 Tau = Plf 249 [6394] = СПЗ 1931.

V516 Tau = Plf 281 [6394] = СПЗ 1932.

V517 Tau = Plf 296 [6394] = СПЗ 1933.

V518 Tau = Plf 243 [6394], *Pigatto, Rosino*. Close to OR Tau.

V519 Tau = 20b [6397].
V520 Tau = 28 [5603] = Plf 143.
V521 Tau = 22b [6397].
V522 Tau = 21b [6397].
V523 Tau = Plf 250 [6394] = СПЗ 1912.
V524 Tau = Plf 284 [6394] = СПЗ 1917.
V525 Tau = Plf 263 [6394] = СПЗ 1918.
V526 Tau = Plf 259 [6394] = СПЗ 1934.
V527 Tau = 4b [6395].
V528 Tau = 23b [6397].
V529 Tau = 24b [6397].
V530 Tau = Plf 244 [6394] = СПЗ 1935.
V531 Tau = 1 [6398].
V532 Tau = 25b [6397].
V533 Tau = 26b [6397].
V534 Tau = BD+24°563(8.4) = SAO 076184 = HD 23567(A2) = КЗП 102421 = TR 359 [6400].
V535 Tau = 27b [6397].
V536 Tau = 28b [6397].
V537 Tau = 29b [6397].
V538 Tau = 30b [6397].
V539 Tau = 6b [6395].
V540 Tau = Plf 271 [6394] = СПЗ 1938.
V541 Tau = Plf 270 [6394] = СПЗ 1940.
V542 Tau = Plf 268 [6394] = СПЗ 1941. Close to V457 Tau.
V543 Tau = 6 [6398].
V544 Tau = Plf 264 [6394] = СПЗ 1942.
V545 Tau = 9b [6395]. Close to V460 Tau.
V546 Tau = 10b [6395].
V547 Tau = Plf 232 [6394] = СПЗ 1943.
V548 Tau = Plf 239 [6394], *Pigatto, Rosino.*
V549 Tau = 31b [6397].
V550 Tau = 32b [6397].
V551 Tau = Plf 242 [6394], *Pigatto, Rosino.*
V552 Tau = Plf 246 [6394] = СПЗ 1944.
V553 Tau = Plf 294 [6394] = СПЗ 1945.
V554 Tau = Plf 273 [6394] = СПЗ 1946.
V555 Tau = Plf 272 [6394] = СПЗ 1947.
V556 Tau = Plf 253 [6394] = СПЗ 1948.
V557 Tau = Plf 290 [6394] = СПЗ 1949.
V558 Tau = Plf 238 [6394], *Pigatto, Rosino.*
V559 Tau = Plf 241 [6394], *Pigatto, Rosino.*
V560 Tau = Plf 295 [6394] = СПЗ 1950.
V561 Tau = 11b [6395].
V562 Tau = 5 [6398].
V563 Tau = Plf 227 [6394] = СПЗ 1951.
V564 Tau = Plf 287 [6394] = СПЗ 1952.
V565 Tau = Plf 233 [6394] = СПЗ 1953.
V566 Tau = Plf 269 [6394] = СПЗ 1954.
V567 Tau = Plf 291 [6394] = СПЗ 1955.
V568 Tau = Plf 274 [6394] = СПЗ 1956.
V569 Tau = 12b [6395].
V570 Tau = Plf 265 [6394] = СПЗ 1957.
V571 Tau = Plf 254 [6394] = СПЗ 1958.
V572 Tau = Plf 230 [6394] = СПЗ 1959.
V573 Tau = Plf 258 [6394] = СПЗ 1960.
V574 Tau = Plf 260 [6394] = СПЗ 1961.
V575 Tau = Plf 282 [6394] = СПЗ 1962.
V576 Tau = Plf 234 [6394] = СПЗ 1963.
V577 Tau = Plf 235 [6394] = СПЗ 1964.
V578 Tau = Plf 277 [6394] = СПЗ 1965.
V579 Tau = 34b [6397].
V580 Tau = Plf 247 [6394] = СПЗ 1966.
V581 Tau = Plf 293 [6394] = СПЗ 1967.
V582 Tau = Plf 276 [6394] = СПЗ 1968.
V583 Tau = Plf 275 [6394] = СПЗ 1969.
V584 Tau = Plf 285 [6394] = СПЗ 1970.
V585 Tau = СПЗ 1735 [6337].

V586 Tau = СПЗ 1848 [6401].
V587 Tau = СПЗ 1847 [6401, *Бадалян*].
V588 Tau = V [5129] = СПЗ 1564 [6402], *Холопов*.
V589 Tau = СПЗ 1736 [6337].
V590 Tau = СПЗ 1853 [6403], *Уреке*.
V591 Tau = DO 10751 (M7) = HV 6858 [5074] = P 2642 = КЗП 439.
V592 Tau = HV 6867 [5074] = P 2664 = КЗП 475.
V593 Tau = BD+ 26°985(8.1) [5522] = SAO 077668 = HD 39340(B3).
α Tau [4610, 6406] = 87 Tau = HR 1457 [6404, 6405] = BD+16°629(1.1) = HD 29139(K5) = SAO 094027 = IRC+ 20087 = ADS 3321 = КЗП 6116.
ζ Tau = 123 Tau = HR 1910 [6404] = BD+ 21°908(3.1) [6408] = HD 37202(B3p) = SAO 077336 = IRC+ 20113 = Zi 454 = КЗП 633.
NU Tel = HV 9782 [4230] = КЗП 3817.
HP TrA = CoD−62°935(8.8) = CPD −62°4477(8.2) = HD 136828(B8) = SAO 253159 = BV 1511 [6336].
HQ TrA = S 5682 [4001] = КЗП 7259.
HR TrA = S 5685 [4001] = КЗП 7275.
HS TrA = S 5692 [4001] = КЗП 7285.
HT TrA = S 5713 [4001] = КЗП 7305.
HU TrA = S 5725 [4001] = КЗП 7316.
HV TrA = S 5736 [4001] = КЗП 7330.
HW TrA = S 5739 [4001] = КЗП 7332.
HX TrA = S 5745 [4001] = КЗП 7337.
HY TrA = S 5746 [4001] = КЗП 7338.
HZ TrA = S 5750 [4001] = КЗП 7340.
II TrA = S 5751 [4001] = КЗП 7341.
IK TrA = S 5766 [4001] = КЗП 7352.
IL TrA = S 5773 [4001] = КЗП 7357.
IM TrA = S 5786 [4001] = КЗП 7373.
IN TrA = S 5793 [4001] = КЗП 7380.
IO TrA = S 5803 [4001] = КЗП 7388.
CG UMa = HR 3698 [1371, 5841] = BD +57°1214(5.8) = HD 80390(Mb) = DO 32807 (M5) = SAO 027219 = IRC+ 50193 = P 609 = КЗП 1434.
CH UMa = СПЗ 1851 [6409].
CI UMa = СПЗ 1755 [6410].
CK UMa = A [6064].
CL UMa = СПЗ 1741 [6411].
GN Vel = BV 1507 [6316].
λ Vel = HR 3634 [5909] = CoD −42°4990(2.5) = CPD−42°3366 (6.0) = HD 78647 (K5) [6350] = SAO 220878 = КЗП 6689.
o Vel = HR 3447 [5909, 6352] = CoD −52°2487(3.5) = CPD−52°1583 (4.1) = HD 74195(B3) = SAO 236164 = КЗП 6651.
FG Vir = BD−4°3235(6.9) = HD 106384 (A5) [6338] = SAO 138664 = ADS 8471 A.
FH Vir = BD+7°2627(7.0) = HD 115322 (Mb) [6396] = SAO 119843 = IRC+10268 [6005].
ψ Vir = 40 Vir = HR 4902 [4619, 5150, 5840, 6404] = BD−8°3449(5.3) = HD 112142(Mb) = SAO 139033 = IRC−10274 = КЗП 6966.
ω Vir = 1 Vir = HR 4483 [1371, 5840, 6405] = BD+8°2532 (6.1) = SAO 118965 = HD 101153 (Mb) = DO 3130 (M5) = IRC+ 10243 = P 753 = КЗП 1760.

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New abbreviations

IRC — Infra – Red Catalog (Two-Micron Sky Survey, a preliminary Catalog prepared by G. Neugebauer and R.B. Leighton, 1969)

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 835

Konkoly Observatory
Budapest
1973 October 20

PHOTOELECTRIC OBSERVATIONS OF V 1216 Sgr DURING THE 1973 JUNE 23 - JULY 7 INTERNATIONAL PATROL

According to the observation schedule proposed by the I.A.U. Working Group on Flare Stars (Chugainov IBVS 744,1972) V 1216 Sgr has been observed at the Catania Astrophysical Observatory using a 61 cm universal type reflector feeding a synchronous U,B,V photometer. D.C. amplifiers and strip chart recorders with a time-constant of 1 sec. f.s. were used. Some preliminary resul:s of the observations are here presented.

Table 1 gives the detailed coverage in U.T. Patrol interruptions longer than one minute are noted. During 29.1 hours of effective coverage one flare was observed.

Table 1. Detailed Coverage (Tel. 61cm,Light u,b,v)

Date 1973	Coverage (U.T.)	Total coverage	$\overline{3\sigma/I_o}$ u b v
June 23-24	22^h05^m-2213,2234-2303,2305-2310,2319-2400, 0000-0036,0040-0125,0138-0203;	189	.50/.07/.08
24-25	2134-2151,2153-2280,2227-2322,2331-2348, 2350-2400,0000-0024,0030-0058,0126-0205;	197	.50/.07/.09
25-26	2230-2249,2251-2400,0000-0004,0026-0044, 0047-0206;	189	.50/.07/.04
26-27	2323-2338,0006-0100,0102-0205;	132	.60/.08/.05
27-28	2249-2302,2306-2324,2328-2339,2342-2400, 0000-0004,0026-0125,0139-0204;	148	.50/.08/.05
28-29	2303-2320,2345-2400,0000-0053,0055-0206;	156	.70/.10/.05
July 01-02	2028-2132,2134-2150,2221-2325,2332-2352, 2358-2400,0000-0038,0104-0210;	270	.60/.09/.04
02-03	2048-2300,2324-2400,0000-0033;	81	.70/.10/.05
05-06	2212-2350,2354-2400,0000-0010;	114	.70/.10/.06
06	2118-2213;	55	.80/.12/.06
07-08	2145-2157,2200-2328,2337-2356,0023-0205;	216	.60/.09/.05

Some characteristics of this flare are given in Table 2. The three colour light curves, as relative intensities in the instrumental photometric system versus U.T. are shown in the accompaniing figure. The error bars indicate the maximum noise fluctuations of the recordings.

Table 2. Characteristics of the Flare

Light	t_{max} (U.T.) 1973	J.D. 2441...	d_b	d_a	$3\sigma/I_{or}$	$(I_f/I_o)_{max}$	Energy P	Energy erg	Air mass
	July 2								
u	01 12.1	865.5559	0.2	5.5	0.45	3.25	5.13		2.158
b	01 12.2		0.2	5.4	0.09	1.16	1.23		
v	01 12.3		0.3	5.2	0.04	0.21	0.28		
U						3.01	4.77	5.95×10^{30}	
B						1.00	1.10	4.68×10^{30}	
V						0.14	0.19	2.14×10^{30}	

The explanation of the symbols and further details both on the observing equipment and on the reduction procedure can be found in Cristaldi and Rodonò Astr.Astrophys.Suppl.10, 47,1973.

C.Lo Presti, F. Spinella and V. Stancanelli have cooperated in this work.

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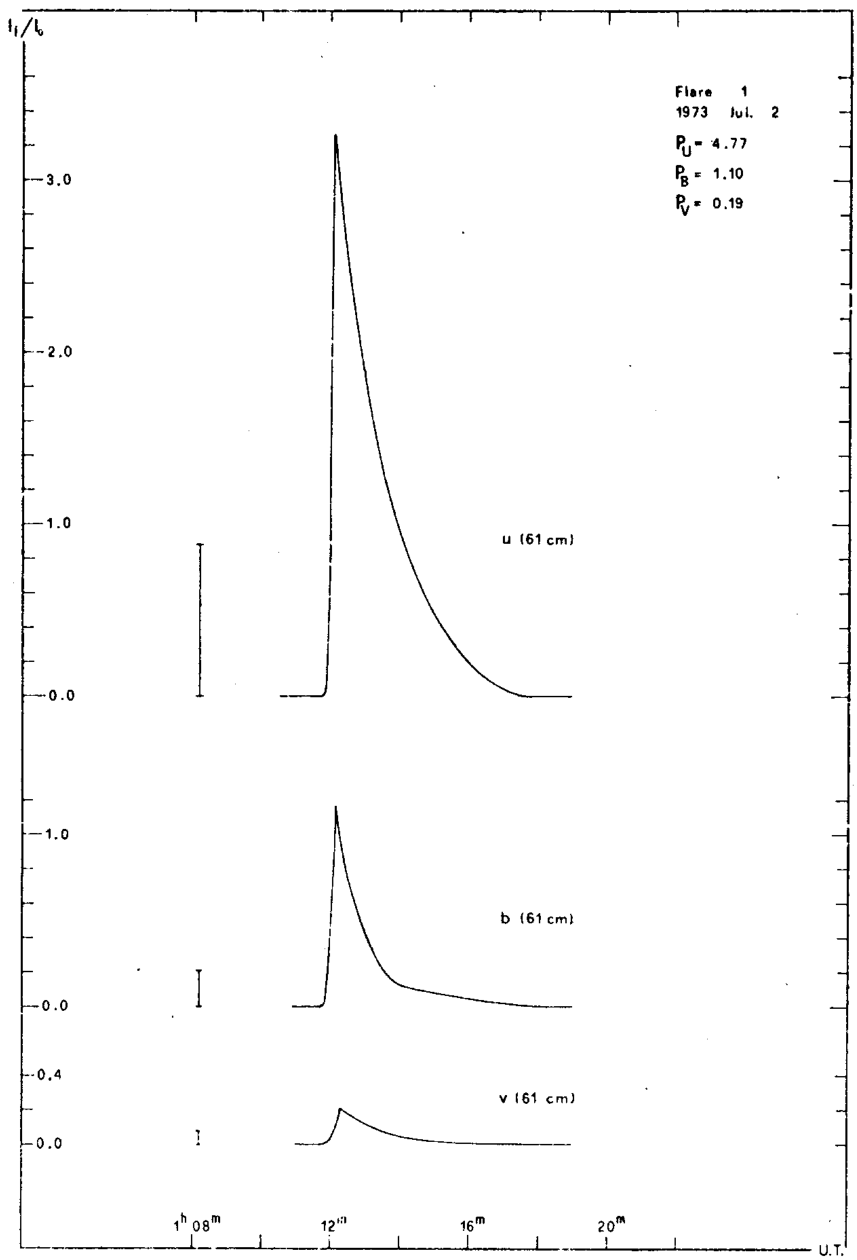

I_f/I_0
Flare 1
1973 Jul. 2
P_U = 4.77
P_B = 1.10
P_V = 0.19
3.0
2.0
1.0
0.0
u (61 cm)
1.0
0.0
b (61 cm)
0.4
0.0
v (61 cm)
$1^h\,08^m$
12^m
16^m
20^m
U.T.

COMMISSION 27 OF THE I. A. U.
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NUMBER 836

Konkoly Observatory
Budapest
1973 October 20

PHOTOELECTRIC OBSERVATIONS OF EV Lac DURING THE 1973 AUGUST 22 - SEPTEMBER 4 INTERNATIONAL PATROL

According to the observation schedule proposed by the I.A.U. Working Group on flare stars (Chugainov, IBVS 744, 1972) EV Lac has been observed at the Catania Astrophysical Observatory using

i) a synchronous UBV photometer fed by a 61 cm universal type reflector, or

ii) three similar one-channel photometers fed by a 91 cm cassegrain reflector and two 30 cm cassegrain reflectors, respectively. The 30 cm reflectors were fixed on a common mounting.

Table 1. Detailed Coverage

Date 1973	Tel.	Light	Coverage (U.T.)	Total coverage	$\overline{3\sigma/I_o}$
Aug. 23	91	u	00^h23^m-0045,	22	.04
	91/30/ /30	u/b/v	0045-0134,0148-0247,0254-0303;	117	.04/06/05
24	91	u	0027-0134.	67	.04
	91/30/ /30	u/b/v	0134-0305;	91	.04/07/02
24-25	61	u/b/v	2158-2301,2307-2347.	103	.17/03/02
	30/30	b/v	0010-0114.	64	.04/03
	91/30/ /30	u/b/v	0114-0139.	25	.08/04/03
25-26	61	u/b/v	2110-2228,2238-2324,2333-2338.	129	.13/03/02
26-27	61	u/b/v	2104-2139,2213-2245,2250-2354.	131	.16/03/03
	30/30	b/v	0041-0050,0053-0259.	135	.03/03
29-30	61	u/b/v	2109-2152,2222-2324.	105	.15/03/03
	30/30	b/v	2333-2400,0000-0122.	109	.05/03
30-31	91	u	2152-2249.	57	.08
	91/30/ /30	u/b/v	2254-2302,2306-2333,2357-2400, 0000-0315.	233	.08/05/04
Aug.31- Sep.1	61	u/b/v	2109-2123.	14	.16/03/03
Sep. 3-4	61	u/b/v	2101-2202.	61	.14/03/03
	30/30	b/v	2145-2216,2239-2251.	43	.07/04
	91/30/ /30	u/b/v	2254-2338,0056-0218,0221-0309.	174	.12/07/04

D.C. amplifires and strip chart recordes with a time-constant of 1 sec.f.s. were used.

Some preliminary results of the observations are here presented.

Table 1 gives the detailed coverage in U.T. Patrol interruption longer than one minute are noted. During 28.0 hours of effective coverage 4 flares were observed. Some characteristics of these flares are given in Table 2. Their light curves, as relative intensities in the instrumental photometric system versus U.T. are shown in the accompaniing figures. The error bars indicate the maximum noise fluctuations of the recordings.

The explanation of symbols and further details both on the observing equipment and on the reduction procedure can be found in Cristaldi and Rodonò Astr.Astrophys.Suppl. 10, 47.1973.

R.Barbagallo, A.Cali and C.Lo Presti have cooperated in this work.

Table 2

No.	Tel.	Light	t_{max} (U.T.) 1973	J.D.hel. 2441...	d_b	d_a	$3\sigma/I_{or}$	$(I_f/I_o)max$	P	Energy erg	Air mass
			August 23								
1	91	u	00 27.9	917.5226	0.4	5.1	0.04	5.09	5.80	1.83×10^{31}	0.827
2	91	u	24,(0049.3)	918.5375	-	13.6	0.04	(0.40)	(1.75)	5.53×10^{30}	.841
3	91	u	30,2223.7	925.4366	0.2	8.8	0.08	1.78	1.52	4.82×10^{30}	.826
			September								
4	91	u	03,2256.9	929.4598	0.4	38.6	0.12	13.86	26.23		.817
	30	b	2256.9		0.4	18.6	.07	2.91	4.68		
	30	v	2256.9		0.4	9.5	.04	0.72	0.97		
		U						15.80	29.90	9.45×10^{31}	
		B						1.89	3.03	6.68×10^{31}	
		V						0.62	0.84	4.13×10^{31}	

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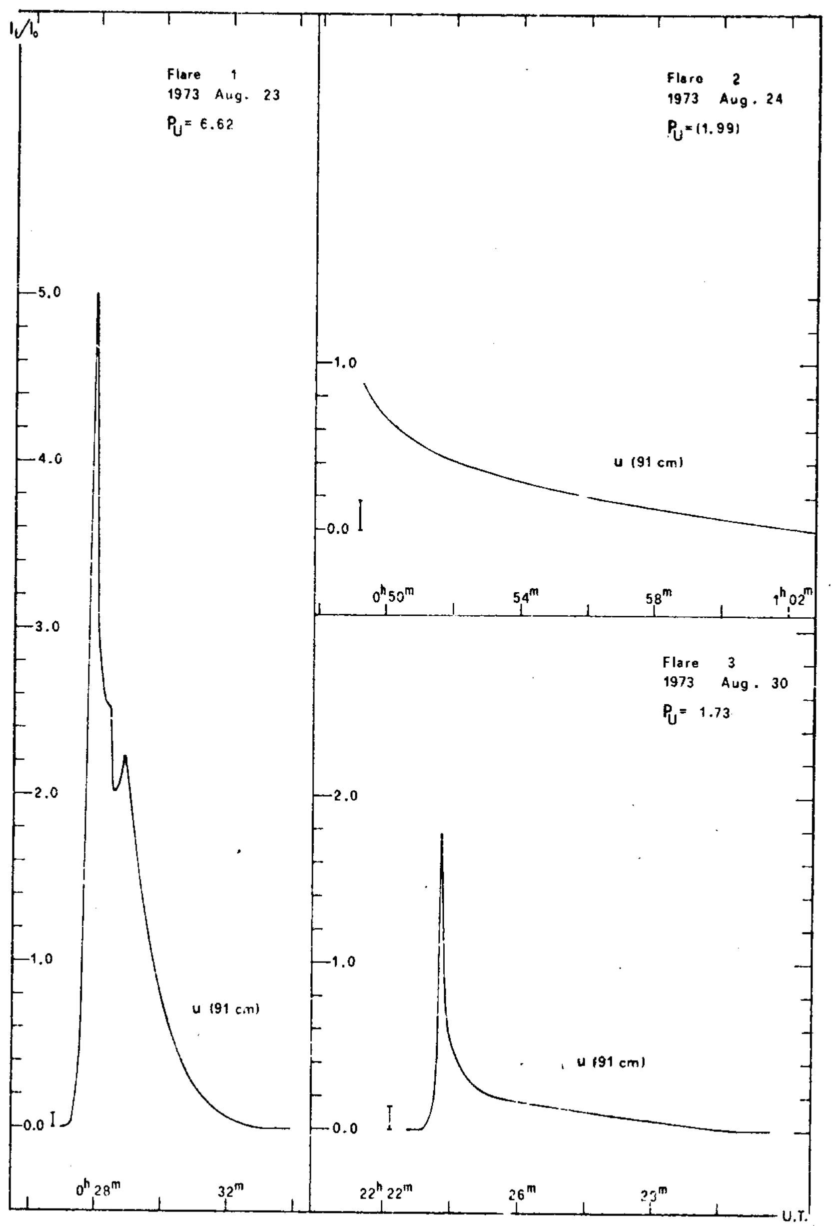
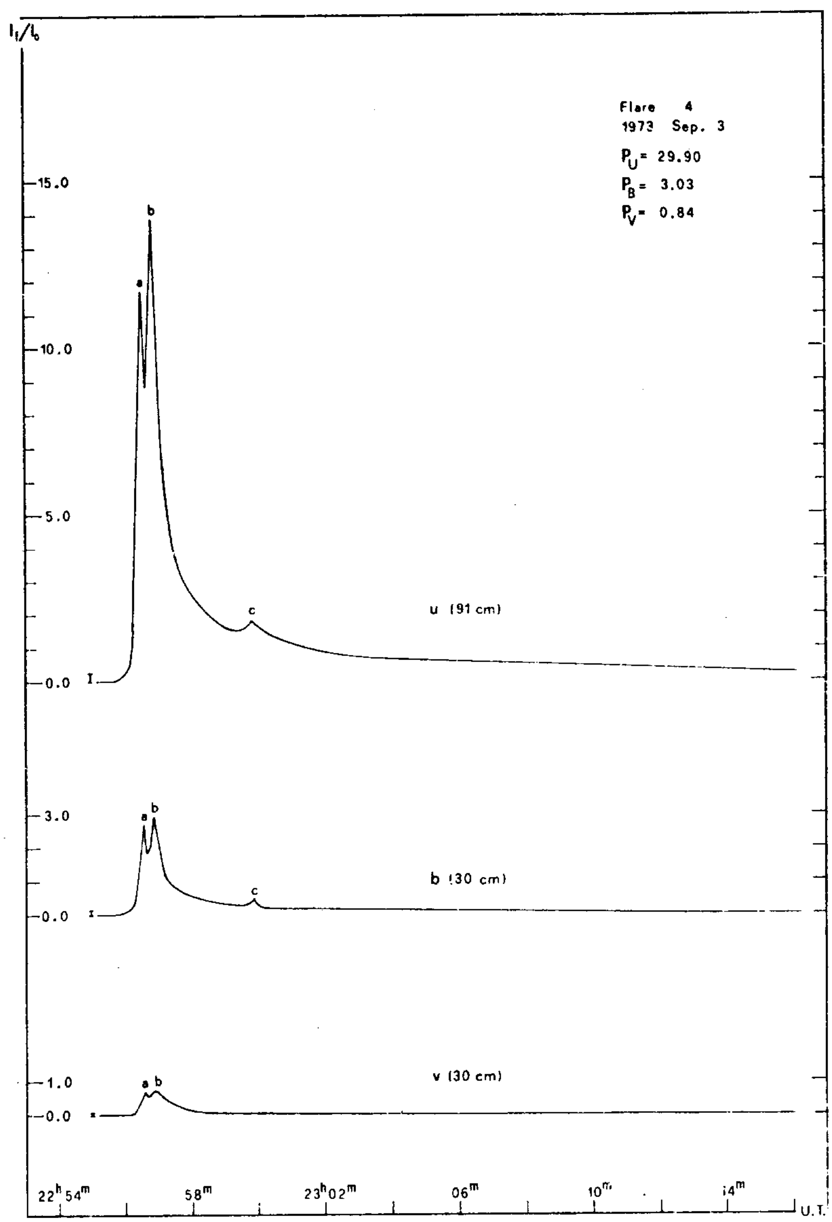
S. CRISTALDI
M. RODONÒ



I_f/I_0
Flare 1
1973 Aug. 23
P_U = 6.62
5.0
4.0
3.0
2.0
1.0
0.0
u (91 cm)
0^h28^m
32^m
Flaro 2
1973 Aug. 24
P_U = (1.99)
1.0
0.0
u (91 cm)
0^h50^m
54^m
58^m
1^h02^m
Flare 3
1973 Aug. 30
P_U = 1.73
2.0
1.0
0.0
u (91 cm)
22^h22^m
26^m
23^m
U.T.



I_f/I_o
Flare 4
1973 Sep. 3
P_U= 29.90
P_B= 3.03
P_V= 0.84
15.0
10.0
5.0
0.0
3.0
0.0
1.0
0.0
a
b
c
u (91 cm)
b (30 cm)
v (30 cm)
22h 54m
58m
23h 02m
06m
10m
14m
U.T.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 837

Konkoly Observatory
Budapest
1973 October 23

NONVARIABILITY OF 59 PSC

59 Psc (=HR 214) was reported to be a Delta Scuti variable by Gupta and Bhatnagar (IBVS 751,1972), who found a period of 2 1/2 hours and an amplitude of about 0.04 mag. This period seems to be in reasonable agreement with the expected period derived from the luminosity and color of the star. The two light curves published seem convincing to us. We have recently started a program at the University of Mexico to determine multiple periods for Delta Scuti stars with amplitudes larger than 0.0[illegible] mag. This star, therefore, seemed to be an excellent candidate.

59 Psc was observed photoelectrically in the visual region for two nights at the Observatorio de Astronomia Nacional in Baja California. No variability could be found and the star appeared to be constant to 0.002 mag on both occasions. Furthermore, the residuals were random and were similar to those for the comparison stars. Further observational details are given below. It should be interesting to determine the behavior of this star at a later date.

Observational Details

Date (U.T.)	Equipment	Comparison Stars	Constancy (mag)	Time Observed
73-09-27	32", RCA 1P21	HR 225 HR 254 HR 311	.002	4^h46^m
73-09-30	60", RCA 7102	HR 217 HR 254	.002	3^h22^m

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 838

Konkoly Observatory
Budapest
1973 October 26

MINIMA OF ECLIPSING VARIABLES

The list below contains minima of eclipsing variables observed at the "Guido Horn D'Arturo" Observatory of Tizzano, near Bologna. All are photoelectric timings reduced by the tracing paper method.

Column "N" denotes the number of observations. Column "O - C" was determined with elements given in "Rocznik Astronomiczny Obserwatorium Krakowskiego 1973".

The observations were made with the 350 mm ∅, f=180 cm newtonian reflector of our observatory and a photometer employing an unrefrigerated 1P21 photomultiplier tube.

Star	J.D. hel. 2441...	O - C	N
UX Her	543.3884	-0.0047	12
W UMa	720.3828	-0.0047	41
	740.4014	-0.0044	52
	742.4045	-0.0038	40
	743.4023	-0.0062	43
RX Her	885.4053	+0.0020	19
SW Las	900.4293	-0.0509	14
RX Her	901.4136	+0.0032	46
RT And	905.4092	-0.0098	25

Bologna, October 16, 1973

L. BALDINELLI, F. BENFENATI, P. CORTELLI
"G. Horn D'Arturo" Observatory

OBSERVATIONS OF LONG PERIOD VARIABLE STARS

These are the results of systematic observations of some long period variable stars. The observations were made with the 350 mm ∅, f=180 cm newtonian reflector of the Tizzano Observatory, uring a 1P21 unrefrigerated photomultiplier and yellow filter (V in the UBV system).

For each variable, a comparison star was selected and also a check star; the second being a star of well known photoelectric magnitude (Ref.: Photoelectric Catalogue by Blanco and Others; U.S.N.O. Publ. II, vol. XXI; 1970). The check star was also used to determine the magnitude of the comparison star. We give here also the data on the comparison and check stars used.

RY Dra check star: BD +67°773 $m_V = 5.32$
comparison star: BD+65°913 $m_V=6.41$
RY UMa check star: BD +62°1227 $m_V = 8.20$
comparison star: BD +62°1228 $m_V=6.70$
VW UMa check star: BD +73°504 $m_V = 6.92$
comparison star: BD +69°602 $m_V=6.35$
R CrB check star: HD 140913 $m_V = 8.08$
comparison star: the same

Observations (V magnitudes)

J.D. 2441...	RY Dra	RY UMa	VW UMa	R CrB	J.D. 2441...	RY Dra	RY UMa	VW UMa	R CrB
392	6.08	6.95	7.47	-	477	-	-	-	8.61
398	6.03	6.83	7.45	-	478	-	-	-	8.52
399	6.08	6.81	7.27	-	481	-	-	-	8.11
412	6.06	6.82	-	-	486	6.23	6.88	7.12	7.53
413	-	6.83	7.20	-	487	-	-	-	7.39
415	6.08	6.90	7.19	-	502	6.22	6.97	7.20	6.06
418	6.07	6.98	7.11	-	539	6.30	7.02	7.00	-
449	6.10	6.86	7.18	10.06	545	6.35	6.97	7.06	-
462	6.18	-	-	-	692	6.51	6.93	7.01	-
467	6.24	6.68	-	-	721	6.45	6.89	6.85	-
468	-	-	-	9.90	737	6.47	6.92	7.16	-
474	-	6.82	7.10	8.89	739	6.49	7.00	7.19	-
476	6.25	6.77	6.98	8.67					

J.D.2441...	RY Dra	RY UMa	VW UMa	J.D.2441...	RY Dra	RY UMa	VW UMa
745	6.47	7.03	7.21	815	6.55	6.95	7.57
753	6.47	6.97	7.20	835	6.65	6.86	7.71
764	6.50	6.85	7.45	892	6.62	7.11	7.58
778	6.58	6.96	-	906	6.55	7.16	7.60

Bologna, October 17,1973

L. BALDINELLI, F. BENFENATI, P. CORTELLI
"G. Horn D'Arturo" Observatory

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 839

Konkoly Observatory
Budapest
1973 October 25

SEVENTEEN NEW FLARE STARS IN THE PRAESEPE-REGION

We have continued the survey for flare stars in the region of the Praesepe cluster initiated by G. Haro and E. Chavira (1, 2) and L. Rosino (3).

The observations centred at RA = $8^h37^m05^s$, D = $19^o51'$ (1950) have been carried out with the Schmidt telescopes of the Byurakan Observatory (40" and 21" telescopes) and the Konkoly Observatory (24"). 17 new flare stars have been discovered during 247,8 hours of effective coverage. One (No.4 Haro) of the already known stars showed three more flares.

The intention of this communication is to report briefly about the observations.

Table 1 gives some data concerning the used telescopes and the plate-filter combinations.

Table 1

Tel.	Scale	Field □°	Plate-filter combinations		Average limiting magnitudes u	pg
40"	97"/mm	16.3	Kodak 103aO Orwo ZU-2 UG-2 2mm	Kodak 103aO Orwo ZU-2	17.8	18.0
24"	112"/mm	17.2	Kodak 103aO UG-1 1mm	Kodak 103aO	17.2	17.3
21"	114"/mm	22.6	-	Kodak 103aO Orwo ZU-2	-	16.7

The method of observations was the common one of multiple and equal exposures of 4,5 or 10 minutes in pg and 10 minutes in U.

Table 2 shows the distribution of effective observational times, the number of the exposures, the number of the plates as well as the number of the discovered flares for each telescope.

Table 2

	40" telescope		Synchr. with 21"		21" telescope	Synchr. with 40"	24" telescope		Total
	pg	u	u	Sp	pg	pg	pg	u	
Obs. time	23^h15^m	44^h05^m	15^h51^m	1^h40^m	109^h25^m	17^h31^m	19^h52^m	33^h50^m	265^h20^m
Numb. of exp.	279	255	95	10	1144	105	293	203	2384
Numb. of plates	52	54	17	5	156	19	38	26	367
Numb. of flares	2+1 *	4	1**	-	7	1**	2	3+1*	20

Remark: * The same flare star.
** The same flare star.

Table 3 gives some data of the observed flares as follow:

Column 1. The serial number of the flare stars discovered at the Byurakan (By) and Konkoly (K) Observatories.

Column 2 and 3. Coordinates for 1950.

Column 4. The approximate photographic magnitudes at minimum.

Column 5. The observed amplitude of the flare in pg or in U light.

Column 6 and 7. The date of the flare-up and the telescope used.

Table 3

Designation	RA (1950.0)	D (1950.0)	mpg	Δ mpg	Date of flare-up	Tele-scope
By 1	$8^h33^m.9$	$19^\circ29'.4$	17.9	3.3	22.03.1971	21"
By 2	40.5	19 22.9	19.1	2.6	22.04.1971	40"
By 4	39.2	20 7.9	17.5	1.4	10.02.1972	21"
By 5	39.7	18 44.6	17.4	1.2	10.02.1972	21"
By 6	29.7	19 34.7	16.1	0.9	13.02.1972	21"
By 7	44.5	19 37.6	18.0	1.9	13.02.1972	21"
By 8	27.7	19 12.3	15.6	0.7	09.03.1972	21"
K 2	38.3	17 59.7	18.5	1.0	14.03.1972	24"
By 9	35.7	21 56.5	16.6	3.4u	17.03.1972	40",21"
By10	38.3	18 56.0	18.3	0.8	19.03.1972	40"
By11	40.0	18 24.9	18.6	2.5	06.04.1972	21"
By12	41.2	21 14.7	18.2	2.0u	05.01.1973	40"
By13	44.9	18 32.4	18.3	3.9u	07.01.1973	40"
K 3	35.7	19 26.1	18.9	4.8u	29.01.1973	24"
By14	38.6	18 24.8	17.3	2.8u	27.02.1973	40"
By15 =K 4	38,7	18 55.5	18.4	1.9	05.03.1973	40",24"
K 5	39.7	20 52.5	15.3	1.6u	24.03.1973	24"

Table 4 shows the repeated flares of the star No. 4 of Haro's list (2).

Table 4

Designation	RA 1950.0	D	mpg	Δmpg	Date of flare-up	Telescope
K 1	$8^h37^m.9$	$18^\circ35'.2$	18.9	1.6	21.01.1972	24"
				4.3u	29.11.1972	24"
By 3 =No.4 Haro				4.7u	10.02.1973	40"

Our observations augment the number of the known flare stars in the Praesepe region to thirty. One of them (No. 4 of Haro's list) is probably not a cluster member as the difference between its positions on the Palomar Sky Survey and on our plates reveals a rather large proper motion for this star.

At present the total effective coverage for the Praesepe cluster is about 390^h (1,2,3 and this paper).

Three or more flare-ups of the same star have not been observed (exception No. 4 Haro).

A short calculation according to the formula given in (5) suggests that the number of flare stars in the Praesepe cluster must be close to

$$N = \sum_k n_k = 146 \qquad (k = 0,\ 1,\ 2,\ \ldots)$$

Coming out from the earlier experience (4, 5, 6, 7) it is probable that the number of flare stars in Praesepe calculated in this way is close to the real one.

Already these preliminary results show a lower flare activity in the Praesepe cluster than in the Pleiades.

Details of our observations, identification charts, light curves of the flares and discussions will be published in forthcoming papers.

I. JANKOVICS

Byurakan and Konkoly Observatories

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COMMISSION 27 OF THE I. A. U.

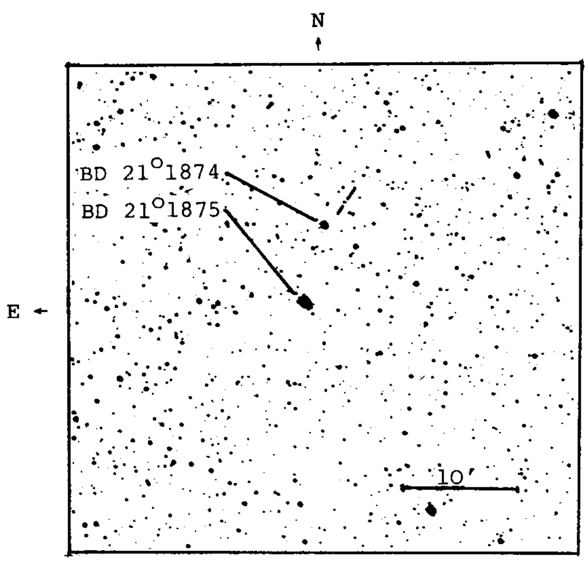
INFORMATION BULLETIN ON VARIABLE STARS

NUMBER 840

Konkoly Observatory
Budapest
1973 October 25

A NEW U GEMINORUM STAR IN CANCER

While searching for flare stars on the plates of the Praesepe region taken by H.C. Chavushian at the Byurakan Astrophysical Observatory with the 40" Schmidt telescope on April 27, 1971, I found a



star which was 2.5 magn. brighter than on plates taken two days before. The position of the object is

$$RA = 8^h33^m\!.4 \; ; \quad Decl. = 21^\circ31'\!.5 \quad (1950)$$

The figure presents the identification chart. Later on this object has been examined on the Byurakan-plates taken in the years 1968, 1969, 1970 and 1971. Only on one of these plates was the star brighter than generally.

During the survey-program for flare stars in the Praesepe region until 19 April 1973 the star has shown two more outbursts.

Table 1 gives the data of observations.

Table 1

No. of outburst	J.D. 244....	m_{pg}	m_u	Notes	Observer
1.	0326.281	15.1	-	multiple exp.plate with 10 images	Erastova
2.	1066.221	17.5	-	multiple exp. plates	Chavushian
	067.231	17.5	-		
	069.263	14.9	-		
	070.249	15.0	-		
3.	1692.391	-	16.3	multiple exp.	Jankovics
	713.347	-	12.6		
	715.270	13.1_B	-		
	716.361	13.8_B	13.1		
	719.326	14.9_B	13.6		
	720.340	14.2_B	13.7		
	723.350	14.7_B	(13.6)		
	724.384	14.9_B	14.4		
	733.172	17.6_B	16.3		
4.	1792.211	~17.5	-	multiple exp.plates	Jankovics
	794.246	15.0	-		

The approximate magnitude and colours of the variable at minimum are B = 17,6; B-V = +0,2; U-B = -1,3. The star has been observed at maximum or near the maximum only four times, but nevertheless there are strong indications, that the variable may be an explosive variable of U Geminorum type with a period not longer than three months.

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on leave from the
Konkoly Observatory

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 841

Konkoly Observatory
Budapest
1973 October 25

ON THE BRIGHTNESS VARIATIONS OF A STAR IN THE VICINITY OF Cyg X-I WITH THE TIME-SCALE OF TEN MS

At the Crimean Astrophysical Observatory a special TV method is used to detect short-periodic light variations (pulsations) of stellar objects with periods down to 0.001 sec (1). Its principle is as follows. Periodic stepwise variations of electro-magnetic field applied to the image tube, used as a light preamplifier, cause discrete shifts of the image on the TV screen. If the field variation period equals the light variation period of the object the multiple picture of he object on the screen covers all phases of its light variation. In other words,we get a resolution of the light into phase intervals. To detect an object with unknown pulsation period the period of resolution has to be varied constantly.

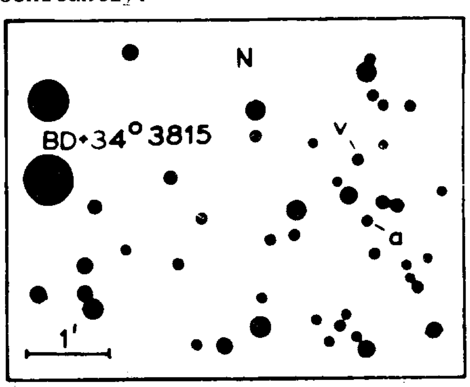

Figure 1

Using such a method a blue star of 17th magnitude situated 3'.3 westward from the X-ray source Cyg X-I labelled by v in Fig.1 was observed in 1971 and 1972 with a 50 cm telescope (F= 6.5 m). The observable field was 1'.5 which enabled to photograph some neighbouring stars together with the mentioned star. The search for pulsations of the star has been carried out with the resolution into eight phase intervals, the resolution periods varying in the limits between 0.0731 and 0.0754 sec. A comparison star labelled by a in Fig.1 chosen inside the field was also observed. Three pairs of histograms for both stars showing frequencies of deviation from the mean brightness were plotted using three random samples each amounting to about hundred brightness measurements of both stars. As can be seen in Figure 2, the brightness scattering of the star under consideration is about twice larger than that of the control star. Besides, the histograms of tha star under consideration are asymmetric and have different shapes on the right and left wings. This might be

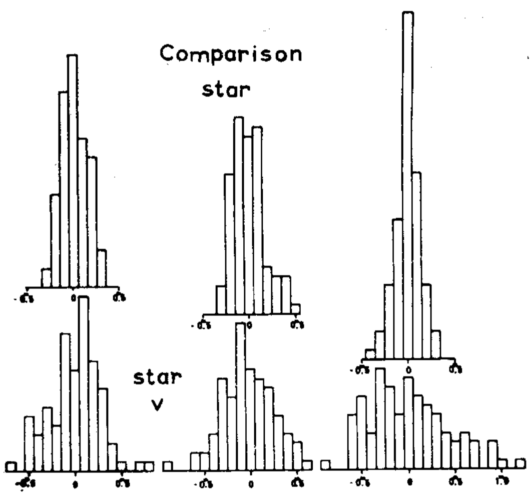

Figure 2

due to short-time brightness variations having a non-periodic or quasi-periodic character. From the observational material obtained on July 30,1971 (30 sec exposures) it was possible to reveal the periodicity of the pulsations of the star with p=0.0745 sec, and according to the observations of August 18, 1972 (60 sec exposure) the period was 0.07395 sec. In both cases the characteristic radiation pulses had a duration about of 10 msec.

The brightness and B-V colour of the star obtained from television pictures taken on October 31, 1972 was $m_V=17^m.21 \pm 0.10$, $B-V = 0^m.57 \pm 0.10$. In the colour-luminosity diagram (Fig. 3) the object is situated in the white dwarf region, if being at a distance of about 100 ps, or near the region of the X-ray source Sco X-I and the pulsar NP 0532,if being at a distance of 1.2-1.5 kps.

The detected peculiarities of the star are similar to those predicted for the black holes accreting interstellar gas (2).

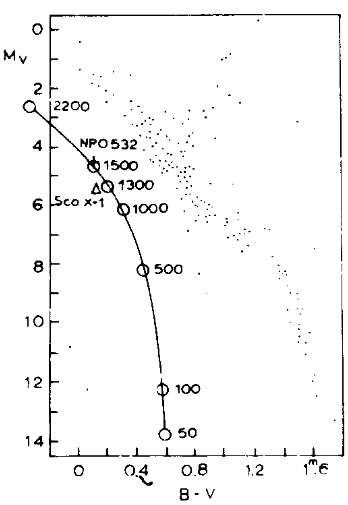

Figure 3

References:
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Crimean Astrophysical Observatory of the Academy of the Sciences of the USSR.

October 8, 1973

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 842

Konkoly Observatory
Budapest
1973 October 26

PHOTOELECTRIC OBSERVATIONS OF THE ECLIPSING BINARY V502 OPHIUCHI

Observations of the eclipsing variable star V502 Ophiuchi (HD 150484, GO) were made at the Stefanion Astronomical Station ($\lambda = 1^h31^m19^s$, $\phi=+37^\circ45'09''$) with the 40 cm Van Straten telescope of the Astronomical Institute at Utrecht, equipped with a photoelectric photometer. Three filters u, b, v were used which closely matched the U, B, V system. The observations were carried out on J.D. 244 1833, 44, 58, 59 and 60. The comparison stars were HD 150732 (GO) = BD+0°3569 and HD 149933 (G5) = HD +0°3555.

The magnitudes of the variable and the comparison stars were corrected for atmospheric extinction using different extinction coefficients for each night, whereafter both the differences between the magnitude of the variable and the magnitudes of the comparison stars were calculated in each point. The light curves were obtained by taking the mean of these differences without transforming them to the U, B, V system. Individual observations are shown in the figure. The phase was calculated with the period as given in the GCVS, 3rd edition, 1st supplement, viz. $0^d45339304$, hence

Phase = $2^{d-1}.205592$ (heliocentric Julian Date -244 0000)

The epochs of the minima were found to be

minimum I = J.D. 244 1833.462
1844.344:
1858.400
minimum II = J.D.244 1860.440

The estimated mean error of a single epoch is about ±0.003 days; the estimated mean error of a single observation is about ±0.04 mag. for U, ±0.02 for B, and ±0.02 for V.

New accurate observations are needed to obtain a good idea on the behavior of the period; see L. Binnendijk, 1969, A.J. 74, 218.

Kapteyn Astronomical Institute
Groningen, The Netherlands
8 October 1973

PATRICIA VADER
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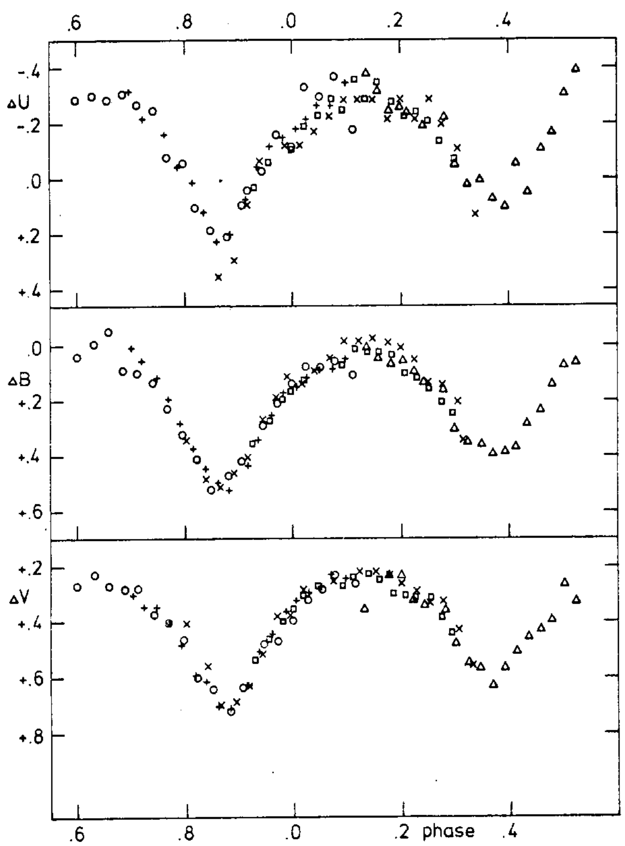

o J.D. 244 1833
x 1844
+ 1858
□ 1859
Δ 1860

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 843

Konkoly Observatory
Budapest
1973 October 31

ON THE PERIOD VARIATION IN RS CVn AND SS Cam

There is an error in sign in the theory offered to explain the period variation in RS CVn (Hall, P.A.S.P.84,323,1972) and SS Cam (Arnold, Hall, Montle, IBVS 796, 1973). Mass loss from the leading hemisphere of one star in a binary system would decrease the orbital period (not increase it, as stated in the two papers). The correlation between the orientation of the fainter hemisphere of the cool peculiar star and the period variation is, of course, unchanged. But the proper interpretation is that the mass loss is occurring preferentially from the brighter hemisphere (not the fainter hemisphere, as was stated in the two papers). We still do not know why the mass loss should be anisotropic, nor why the one hemisphere should be brighter.

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PHOTOELECTRIC MAXIMA OF XZ Cyg

The RR Lyrae-type variable XZ Cyg has been observed photoelectrically at the Odessa Observatory near Majaky (USSR) with the 22-inch reflector, during the period from August 8 to September 12,1972.

Max.Hel. 2441...	Cycles	O - C	Max.Hel 2441...	Cycles	O - C
541.5218	2348.853	$-0\overset{d}{.}0686$	564.4270	2397.953	$-0\overset{d}{.}0218$
542.4642	2350.873	-0.0592	565.3527	2399.938	-0.0291

The table shows the moments of four maxima in blue and the corresponding O-C's. The O-C values were calculated with the elements:

Max.Hel.= 2 440 445,789 + $0\overset{d}{.}466497 \cdot E$;

A more detailed analysis and reductions of the obtained 420 observations will be published later.

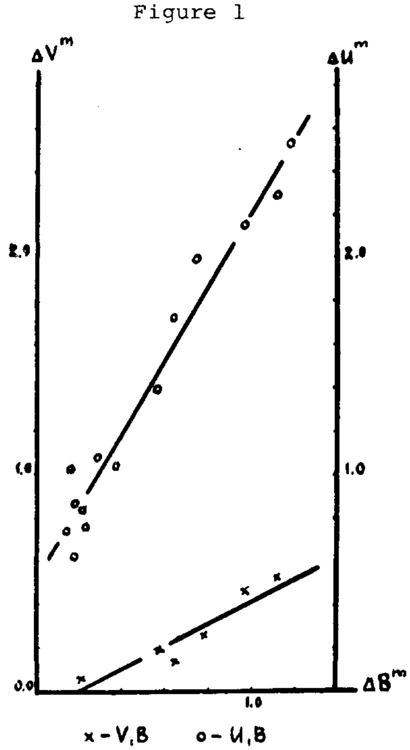
University of Sofia, Bulgaria and
Odessa Observatory, USSR.

P. KUNCHEV

THE ANALYSIS OF UBV OBSERVATIONS OF UV TYPE VARIABLES

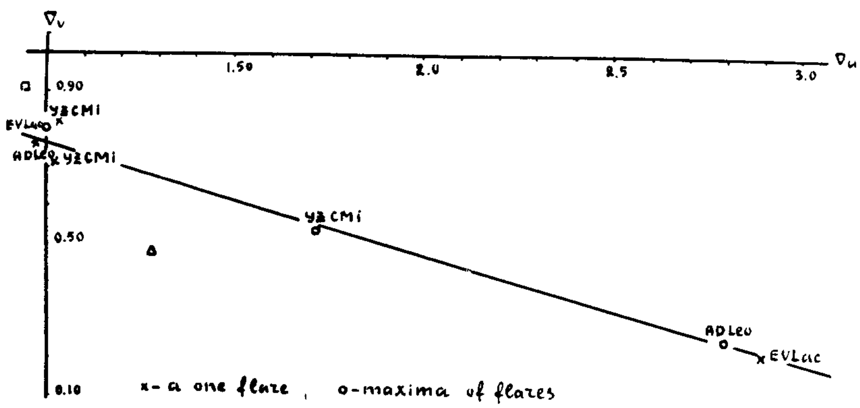
The method of brightness gradients [1] was applied to an analysis of UBV observations of YZ CMi, EV Lac and AD Leo. Brightness gradients are angular coefficients of regression lines of V,B and U,B-relations for simultaneous photoelectric observations: $\nabla_V = \frac{\Delta V}{\Delta B}$, $\nabla_u = \frac{\Delta U}{\Delta B}$

Figure 1



In [2] ∇_u and ∇_V were obtained for the light variations between maxima and minima for two flares of YZ CMi and one flare of AD Leo. They are given in the table as well as ∇_u and ∇_V for one flare of EV Lac, obtained from observations [3]. On Fig.1. V,B and U,B relations are given for maxima of YZ CMi flares according to synchronous observations in [4]. The relations are similar for the flares of EV Lac and AD Leo (photometric data taken from [5-8] and [9], correspondingly). All the obtained ∇_u and ∇_V are given in the table with their errors and plotted on the (∇_u, ∇_V) plane (Fig.2). They are situated inside a narrow band determined by the equation: $\nabla_V = 1.09 - 0.31\ \nabla_u$.

The brightness gradients are determined by intensity variations in UBV regions of spectra. Therefore their values and the relation between them are directly connected with the nature of radiation. Taking this into account it can be said that the results of the analysis carried out are in agreement with the following conclusions about the basic continuous radiation of UV type flares that correspond to regression lines: 1.The nature of radiation is the same at all stages of brightness descent of a flare, so breaks are absent on the V,B, and U,B - relations. [2]. 2. The nature of radiation in maxima is the same for flares of different intensity (Fig.1). 3. The nature of radiation on the descending branches is the same as in the maxima, so the relation between ∇_u and ∇_v is described by the same equation. The redden-ing of flare radiation in early descent [10] has apparently a sec-ondary nature as well as [11] other differences in continuous radia-tion in maxima of flares.



Table

Flare	∇_v	$\sigma\nabla_v$	∇_u	$\sigma\nabla_u$	Annot. to observations or calculations
YZ CMi 1965,1 27.3264	0.82	0.13	1.03	0.06	[11]
YZ CMi 1965,1 28.2499	0.72	0.04	1.02	0.04	"
AD Leo 1965,11 10.1708	0.76	0.02	0.97	0.05	"
EV Lac 1968,V111 18	0.22	0.04	2.90	0.04	[3]
YZ CMi	0.54	0.06	1.72	0.04	[4]
EV Lac	0.80	0.01	1.00	0.06	[5-8]
AD Leo	0.26	0.02	2.80	0.01	[9]
Sum of bremsstrahlung and invers Compton-effect rad.	0.91		0.94		[12](□ on fig.2)
Hydrogen plasma optically thick in Balmer lines	0.48		1.28		[13](Δ on fig.2)

As here the results of the analysis made by a new method are present-ed it seems expedient to point out the advantages of this method com-paritively with the widely used method of analysis of UBV observations by U-B and B-V color-indices. ∇_u and ∇_v do not depend on interstel-lar absorption, errors in magnitudes of comparison stars and intensi-ties of spectral lines. They are unrandom parameters of irregular light variation processes and describe them in UBV regions by two numbers, for which the errors can be easily calculated. Different types of pure ra-diations (thermal, nonthermal of different types, hot gas of small op-tical thickness, hydrogen plasma optically thick in Balmer line frequen-ces and others) are represented by points on the (∇_u, ∇_v) plane if only one parameter is variable.

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TIMES OF MINIMA OF SOME ECLIPSING VARIABLES

Times of minima of several eclipsing variables have been observed at the University of Victoria in 1969, 1970, 1971 and 1973. The equipment used was described by Scarfe and Brimacombe (A.J. 76, 50, 1971). All the times of minima listed in table 1 were calculated by the method of Kwee and van Woerden (BAN 12, 327, 1956) using a programme written by one of us (B.W.B.) for the University of Victoria's IBM 370 computer. The ephemerides used to find the O-C's in column 4 of table 1, as well as references for them, are given in table 2.

Table 1, Observed Times of Minima

Star	H.J.D. (2,440,000+)	E	O-C (days)	Observer
44iBoo	801.7627±0.0005	8544.5	+0.0074	N
	812.7448±0.0007	8585.5	+0.0091	N
	1110.8264±0.0013	9698.5	+0.0134	S
	1131.8469±0.0004	9777	+0.0105	N
	1147.7804±0.0004	9836.5	+0.0090	S
	1814.7746±0.0006	12327	+0.0117	Br
	1816.7854±0.0006	12334.5	+0.0139	Br
	1818.7946±0.0006	12342	+0.0145	S
	1827.7682±0.0008	12375.5	+0.0163	Br
	1829.7737±0.0005	12383	+0.0132	S
UCep	512.8046±0.0007	13086	+0.4130	S
	1190.9261±0.0002	13358	+0.4655	Bl
	1210.8706±0.0003	13366	+0.4668	Bl
	1215.8567±0.0002	13368	+0.4671	Bl
	1938.8476±0.0003	13658	+0.5169	Bl
VWCep	799.8225±0.0002	5157	+0.0008	N
	802.7478±0.0007	5167.5	+0.0038	N
	806.7797±0.0006	5182	+0.0002	N
	811.7900±0.0003	5200	+0.0008	N
	817.7761±0.0001	5221.5	+0.0032	N
	817.9134±0.0002	5222	+0.0013	N
	823.7579±0.0002	5243	+0.0012	N
	1139.7890±0.0009	6378.5	+0.0071	N
	1139.9250±0.0003	6379	+0.0039	N
	1842.8107±0.0002	8904.5	+0.0083	Br
	1880.8027±0.0005	9041	+0.0105	S
UCrB	1099.7889±0.0012	10704	+0.0028	N
MRCyg	1146.8181±0.0007	4621.5	+0.0003	N
AIDra	1875.8287±0.0003	3613	-0.0001	Br
ZHer	1111.8211±0.0003	7019	+0.0015	N
RXHer	813.8142±0.0002	4741.5	+0.0006	N
	838.7135±0.0003	4755.5	-0.0001	S

Table 1 continued

Star	H.J.D. (2,440,000+)	E	O-C (days)	Observer
RXHer	1134.8458±0.0001	4922	-0.0001	N
	1175.7531±0.0003	4945	+0.0001	N
	1833.8250±0.0005	5315	+0.0003	Br
	1889.8506±0.0007	5346.5	+0.0009	Br
UOph	1117.8769±0.0002	19577.5	-0.0074	N
	1133.8082±0.0004	19587	-0.0109	N
	1866.8090±0.0003	20024	-0.0103	Br
V566Oph	1119.8018±0.0004	10681	+0.0073	N
	1145.8170±0.0005	10744.5	+0.0102	N
	1835.8616±0.0002	12429	+0.0147	S
	1843.8498±0.0002	12448.4	+0.0149	S
	1877.8508±0.0002	12531.5	+0.0157	Br
EEPeg	1174.7726±0.0003	704	+0.0052	N
USge	422.8795±0.0004	6890	+0.0036	S
	821.7923±0.0002	7008	+0.0035	N
	1132.8083±0.0002	7100	+0.0026	N
	1896.8276±0.0001	7326	+0.0021	Br
RSVul	809.8450±0.0005	1787	+0.0033	N
	818.8001±0.0003	1789	+0.0031	N

Observers: Bl = B.W. Baldwin, Br = D.J. Barlow, N = R.J. Niehaus, S = C.D. Scarfe.

Table 2, Ephemerides for the Systems Studied

Star	(H.D.J.)$_o$ (2,400,000+)	Period	References
44i Boo	38,513.4160	$0^d.26781430$	Pohl IBVS 209. 1967
U Cep	7,890.2957	2.4929005	Svechnikov PZ 10,262,1955
VW Cep	39,364.5578	0.27831373	Scarfe and Brimacombe AJ 76, 50, 1971.
U CrB	4,147.4297	3.4522008	Hellerich AN 220,331, 1924
MR Cyg	33,396.4069	1.67703362	Battistini et al. Ap.Sp.Sc. 19,395, 1972
AI Dra	37,544.5095	1.19881520	Winiarski Act.Ast.21,517,1971
Z Her	13,086.348	3.9928012	Plavec et al.BAC 12,125, 1961
RX Her	32,380.7145	1.7785720	Wood ApJ 110,465,1949
U Oph	8,279.643	1.6773460	Parenago PZ 7,102, 1949
V566 Oph	36,744.4200	0.40964091	Bookmyer AJ74,1197, 1969
EE Peg	39,324.509	2.628208	Wellmann ZfAp 32,1,1953
US ge	17,130.4151	3.3806184	Svechnikov PZ 10,262,1955
RS Vul	32,808.257	4.4776635	Martynov PZ 9,343, 1953

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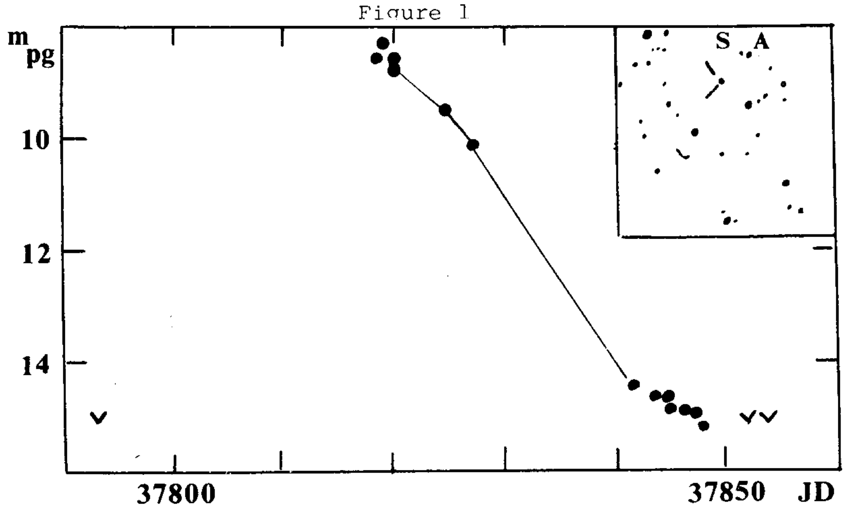
NOVA SAGITTARII 1962

With the Rodman blink microscope I discovered a probable nova on two plates taken by Dr. Dirrit Hoffleit with the 7.5-inch Cook triplet at the Maria Mitchell Observatory. The magnitude of the nova was about 8.4 pg on the plate taken on JD 37818, and it was fainter than the plate limit (about $15\overset{m}{.}0$) on JD 37929. Plates taken on the intervening days yielded the light curve in Figure 1. Unfortunately there were no previous plates closer in time to JD 37818 than 37795, so that the exact date of outburst cannot be determined from these data. On JD 37795 the star was fainter than $15\overset{m}{.}2$, the approximate plate limit, and it returned to this magnitude within a period of between one and two months after outburst. That the star is a nova is concluded from the shape of the light curve and the fact that it did not reappear on the Nantucket plates covering JD 36000 to the present, nor on Harvard patrol plates of the RB-RH series between JD 26000 and 33000, which reach an average limiting magnitude of 14.5. Some 700 plates were examined. About 70 scattered Harvard A plates from JD 20000 to 30000 showed no object as bright as $15\overset{m}{.}0$.*

Figure 1



Photographic magnitudes for the brighter points were estimated using the Smithsonian Astrophysical Observatory Star Catalog magnitudes of surrounding stars corrected from visual to photographic.For the fainter points a nearby Harvard sequence was used. The approximate position, interpolated from the Smithsonian Catalog position of four nearby stars, is $18^h24^m36^s, -24^\circ04'.8$ (1900).

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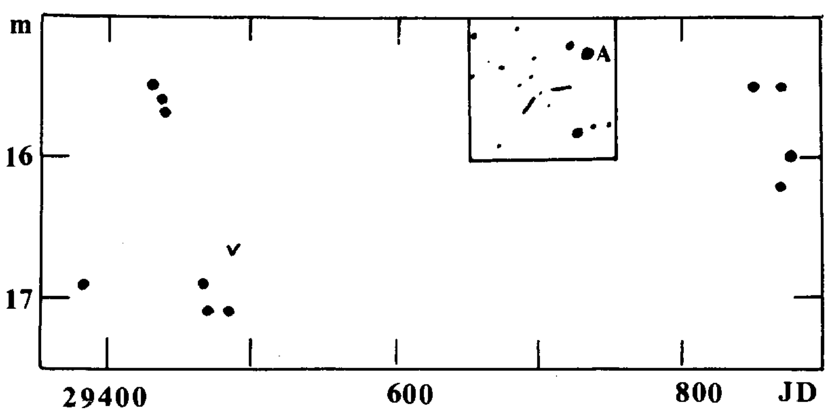
Figure 2



* ADDENDUM - The Harvard A-plates (24-inch Bruce refractor, scale 60"/mm in contrast to 248"/mm for the Nantucket plates) show a faint variable star in the position of the nova. It varies from $15^m.5$ to $17^m.0$. This star is also weakly visible on a few plates of the Harvard B and MF series, but there are too few positive observations to ascertain whether or not the variation is periodic. Figure 2 shows the most definitive run of observations, together with an enlarged diagram showing fainter stars than the insert in Figure 1. The star marked A in both diagrams is CoD $-24^\circ14410$.

DORRIT HOFFLEIT

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Budapest
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FORTY ECLIPSING BINARIES PROBABLY WITHIN 100 PS FROM THE SUN WITH UNKNOWN TRIGONOMETRIC PARALLAXES

Dealing with the problem of distances of eclipsing binaries the writer found that forty eclipsing variables with so far unknown trigonometric parallaxes are within 100 ps of the Sun. The distances were found by using a new method of determination of photometric parallaxes of eclipsing binaries. The genera.. idea of this new method is given in the writer's paper (Acta Cosmologica 2, 1973, in press).

The data necessary for the computations of photometric parallaxes were taken from the following sources: Eggen (MN 84, No.5, 1967) Koch, Plavec and Wood (Publ.Pennsylvania,Astr.Ser.X. 1970), Kordylewski (Roczn.Astr.Obs.Krakow,1973.Int.Suppl. 44.1972),Kukarkin et al. (GCVS 1969; First Suppl. 1971), Mauder (Astr.Aph.17,1) and Tschudovitschev (Kazan Bull. 28.1952). The stars are listed in the Table. The consecutive columns contain the name of the star,the photometric parallax with its mean error.

Name	π_f (0".001)	m.e. 0".001	Name	π_f (0".001)	m.e. (0".001)	Name	π_f (0".001)	m.e. (0".001)	Name	π_f (0".001)	m.e. (0".001)
RT And	10	±2	RW Dor	35	±10	AM Leo	10	±3	SZ Psc	11	±4
S Ant	10	2	BV Dra	16	5	TZ Lyr	13	2	UV Psc	12	6
OO Aql	10	2	CM Dra	16	4	FL Lyr	11	2	TY Pyx	18	8
WW Aur	13	1	YY Eri	18	2	TY Men	15	4	W Ser	13	3
HS Aur	11	5	BZ Eri	10	8	V502 Oph	11	1	TY Tau	10	4
ZZ Boo	12	3	Z Her	11	2	V566 Oph	13	2	CD Tau	15	2
WY Cnc	15	5	AW Her	12	2	V839 Oph	12	4	XY UMa	11	4
EX Car	10	4	GK Hya	14	5	V1010 Oph	12	3	AW UMa	13	2
RR Cen	11	1	AR Lac	19	3	LX Per	17	8	AH Vir	11	2
V636 Cen	11	4	XY Leo	16	4	AE Phe	16	5	ER Vul	17	2

In my opinion, trigonometric parallaxes for these 40 stars should be determined in the first term. This would allow to verify the calculated photometric parallaxes and, on the other hand, it would considerably amplify the material for further investigation of the physical properties of eclipsing systems.

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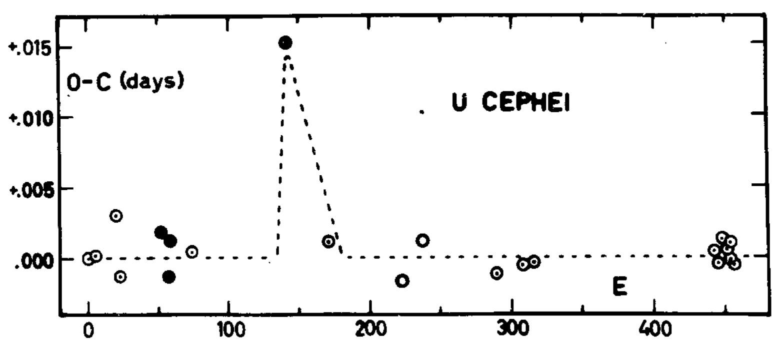
A RECENT VERY LARGE PERIOD INCREASE IN U CEPHEI ?

Recently Bakos and Tremko (1973) made the interesting observation that in 20 days in August 1969 the period of U Cephei increased by about $0^{d}.0015$. Such an increase is extremely large, as they pointed out, corresponding to $\Delta P/P = + 6 \times 10^{-4}$. Additional times of minimum, obtained since 1969, suggest that this very large increase is not well established.

The figure below is an O-C diagram based on the ephemeris

$$JD(hel.) = 2440086^{d}.4915 + 2^{d}.493047\ E + 7^{d}.8 \times 10^{-8}\ E^{2}\ .$$

The filled circles are the four times of Bakos and Tremko. The open circles are two heretofore unpublished times of my own. The circled



points are the 16 photoelectric times later than JD 2440000 listed in Table 14 of Batten (1973).

My two new times of primary minimum are

$$JD\ (hel.) = 2440644^{d}.9351 \pm 0^{d}.0002$$

and $$JD\ (hel.) = 2440679^{d}.8413 \pm 0^{d}.0003$$

In both cases the error is based on the standard deviation of separate determinations in U,B, and V. But the external errors could be larger, as much as $\sim\pm\ 0^{d}.001$. The second time was determined by the tracing paper method. The first time was determined with the help of the second, since only the falling branch was observed, and hence should be relatively less reliable. To avoid an asymmetry at the bottom of the light curve (rising branch brighter) the lowest $\sim 0\overset{m}{.}3$ was not used.

The problem is that the later limes continue to be satisfied by the pre-1969 ephemeris. The broken line, which is the O-C curve which would be required by the interpretation of Bakos and Tremko, implies that three large period changes occurred within approximately 100 days. The first change is drawn to occur, as they suggest, 20 days before their last time of minimum. Such an interpretation is possible but would have the following implications which should be appreciated:

1. The three period changes are very large: $\Delta P/P = 7.5 \times 10^{-4}$, -9.0×10^{-4}, $+1.5 \times 10^{-4}$. These are between one and two orders of magnitude larger than the alternate period changes of $\Delta P/P \sim 10^{-5}$ which are characteristic of similar binary systems.

2. The time scale of $\sim$100 days is much shorter than the 5 - 10 year time scale for alternate period changes observed in U Cephei in the past.

3. After a sequence of three very large changes the period has returned, seemingly by coincidence, to very nearly its original value.

The case for a large period increase rests on only one time of minimum. Therefore (although admittedly the other three points of Bakos and Tremko fit very well in the O-C diagram, their average deviation being only a bit more than $\pm 0\overset{d}{.}001$) a reasonable alternate interpretation would be that the last time is, for some reason, in error by $\sim 0\overset{d}{.}01$.

13 November 1973

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A FLARE ON AD LEONIS

A flare has been recorded on the dMe star AD Leo during an effective photoelectric covering of about 4.3 hours on the nights of June 1 and 3, 1973. Details of observations and findings are contained in Tables I and II respectively. The flare characteristics have been calculated along the lines of Kapoor and Sinvhal (1972) and Kapoor et al. (1973).

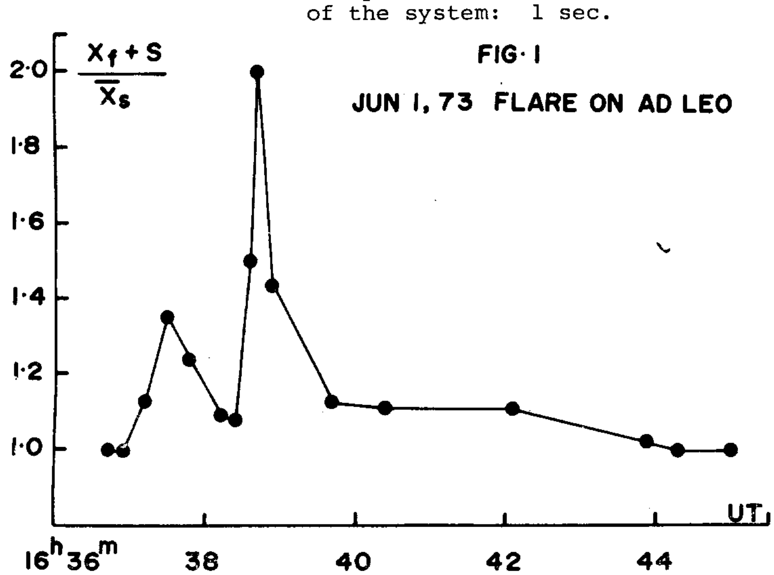
Table I

Coverage of AD Leo

(56-cm reflector, standard B filter)

Date, 1973 (U.T.)	Effective Coverage
June 1	15^h33^m - 16 08, 16 11 - 42, 16 43 - 17 24, 17 26 - 18 32.
June 3	16 42 - 17 12, 17 13 - 17 34 17 38 - 18 15.

Notes: 1. Times have been rounded off to the nearest minute.
2. Total Coverage : 4^h20^m.
3. Flare interval is underlined.
4. Photomultiplier: 1P21, unrefrigerated; d.c. amplifier; Honeywell Brown Recorder; time constant of the system: 1 sec.



FIG· I
JUN I, 73 FLARE ON AD LEO

The flare light curve, shown in fig.1, seems difficult to fit in any of the standard Oskanyan Types. One could regard it as a rapid succession of two Type I flares.

Table II

Characteristics of Flares of June 1, 1973

UT_{max}	: I :	$16^h37^m24^s$
	II :	16 38 42
Total duration of the flare	:	7.4 min.
$X_{fm+s}/\overline{X}_s$	: I :	1.39
	II :	2.11
Δm_B	: I :	$0\overset{m}{.}36$
	:II :	$0\overset{m}{.}81$
σ	: 0.314	
Confidence level $3\sigma/\overline{X}_s$	: 0.11	
P	: 1.31 min	
F(z)	: I :	1.91
	II :	1.92
Energies released at flare maxima	: I :	6.39×10^{29} erg sec^{-1}
	:II :	9.71×10^{29} erg sec^{-1}
Total emission during the events	: 3.71×10^{31} ergs.	

Note: $\overline{X}s$ is the average steady state intensity deflection minus sky and X_{f+s} that due to flare plus $\overline{X}s$ minus sky; X_{fm+s} corresponds to flare maximum.

Part of this work was done with financial assistance by funds under the Smithsonian Institution Project No. SFG-0-6425.

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R.C. KAPOOR

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Kapoor, R.C., Sanwal, B.B., and Sinvhal, S.D., 1973, I.B.V.S.No.810.

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CONCERNING VARIABLE STAR 3 OF M13

In 1915 Shapley (1915, Mt.Wilson Contr.No.116) gave a list of seven stars in the globular cluster M13 that he considered to definitely vary in brightness. Subsequent investigations have since shown five of these to indeed be variables, but the remaining two stars have not been studied in detail and the question of the variability is still unanswered. In this note we report the results of a study of one of the two stars, that denoted Variable 3 of the cluster (Sawyer Hogg 1972, The Third Catalogue of Variable Stars in Globular Clusters).

For the realization of our investigation we had available 54 plates of the cluster taken in the years 1967 - 1969 with the 1.5m reflector of the U.S. Naval Observatory. The brightness of Variable 3 was measured in relation to five nearby comparison stars using a Becker type iris photometer. As a control, the non-variable star Arp III-10 (Arp 1955, Astr.J.60,317) and the confirmed variable No.8, which are in the same region, were also measured and reduced in the same manner as for Variable 3. A quick look at the magnitudes derived for Variable 3 showed that they were nearly all the same and hence the variations, if any, are of very small amplitude. Calculation of the standard deviation of the measures with respect to the mean gave a value of ±0.06 mag., equal to that found from the measures of the non-variable control star. Furthermore, in both cases the histogram of the distribution of the measures closely approximates the Gaussian curve for the above sigma, indicating that the small differences in the derived magnitudes can be entirely attributed to random measuring errors. A histogram of the earlier measures of this star by Kollnig-Schattschneider (1942, Astr.Nach. 273,145) also gives a Gaussian distribution. In contrast, histograms of measures from the same plates of known variable stars, both Variable 8 that we measured and the low amplitude Variable 7 measured by Ibañez and Osborn (1973,IBVS No.769) show distinctly non-Gaussian shapes. We conclude that Variable 3 is most likely not variable.

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Konkoly Observatory
Budapest
1973 November 30

HIGH SPEED PHOTOMETRY OF THE X-RAY BINARY HD 153919

HD 153919, an O6F star (Thackeray and Walker, 1973), lies in the error box of the variable X-ray source 2U 1700-37 (Giacconi et al, 1972).

Photometric observations in the UBV system (Penny, Olowin, Penfold and Warren, 1973) made at the SAAO have confirmed that the star is optically variable with a period of 3.4120 days equal to that of the X-ray source. The variation has two minima of equal depth, but of differing shape. One minimum is coincident with the X-ray occultation, which occurs at phase 0.68 $\pm$ 0.02. Both the X-ray and V-band data from Penny et al are presented in Fig.1.

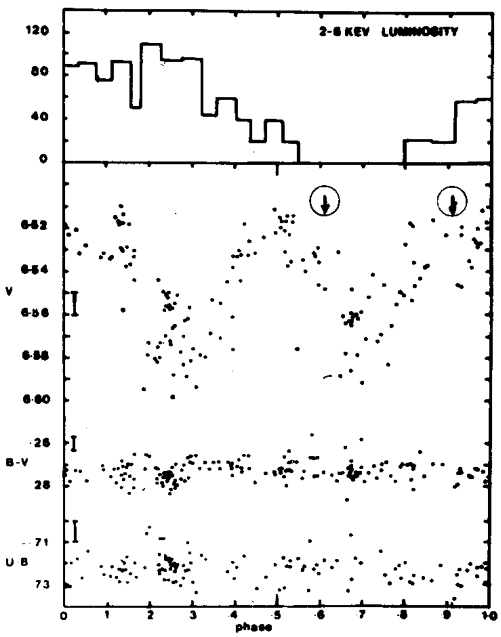
Due to the rapid fluctuations observed in similar objects such as the black hole candidate Cyg X-1, a pilot attempt was made to monitor the star with a high-speed photometric system. This was done at the SAAO observing station at Sutherland using a 50cm telescope and a computer supported photometer with an uncooled EMI photomultiplier designed at the University of Cape Town.

Integrations of one second duration in the V band were made for 1.14 hours on 11 May 1973 and integrations of 100ms duration using a clear aperture for 350 seconds were made on the night of 12 May 1973. The observations refer to phases 0.61 and 0.91 respectively of the X-ray source according to the ephemeris calculated by Penny, et al, and are indicated by arrows in fig.1.

The resulting observations were subject to spectral analysis by performing a fast Fourier transform using the Cooley-Tukey algorithm on a set of equally spaced data points. The input was normalized to remove the instrumental sensivity as well as smoothed to remove any linear trends. This normalization allows the comparison of power spectra taken with different instruments, sampling intervals and data lengths. The procedure is similar to that used by Robinson and Warner, 1972.

The power spectra of the observations of HD 153919 made on the nights in question reveal no coherent periodicities for all frequencies investigated. The power level at frequencies higher than

Figure 1



Optical and X-ray variations of HD 153919 from Penny, et al.

0.01 HZ represents the constitution to the signal from photon counting noise and scintillation. There are no significant power peaks above this general trend within the interval defined by the frequency .02 ⩽ HZ ⩽ 5. For periods shorter than 100 second the lack of large spikes in the power spectrum indicates that at the epoch of observations, the power spectrum is due entirely to stochastic processes.

This lack of significant power during the period of observation demonstrates either the lack of intrinsic variability of the object, or that it was observed during a quiescent phase. Further observations are being made in order to resolve this question.

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Budapest
1973 December 4

PULSE-COUNTING OBSERVATIONS OF EV LAC
DURING THE 1973 INTERNATIONAL PATROL

The flare star EV Lac was monitored on 5 nights at the 36-inch reflector of the Royal Greenwich Observatory during the period 22 August to 4 September 1973 proposed by the I.A.U. Working Group on UV Ceti-type stars (Ref.1). One major flare was observed in the ultraviolet and a number of other events suspected from a preliminary examination of the data. Details of coverage and some remarks on dual-channel pulse-counting techniques are presented.

The Two-Star Photometer and Auxiliary Equipment. Instrumentation consisted of a two-star photometer developed by Dr.Bingham at the R.G.O. incorporating two uncooled E.M.I. 6256A photomultipliers in conjuction with a Brookdeal 5Cl photon-counting system capable of handling two 100 MHz pulse trains with integration times of one second. Output was in the form of a print-out of the simultaneous pulse-counts in the two channels through a data logger.

The single-photon peak was adjusted with the use of an oscilloscope following the manufacturer's instructions, with pulse discrimination set to reject the asymptotic contribution of small amplitude pulses (the dark current "grass") and the large amplitude pulses ("spikes"). The selected threshold voltages for the two tubes differed considerably, the comparison-star channel being somewhat noisier, and consequently the threshold of the latter was raised such that the noise count-rates were similar. The same pulse discriminator windows were used, however, and all settings maintained throughout the observations. A number of tests were performed on standard stars each night to assess the reliability of the equipment.

Observational Procedure. Continuous monitoring in the auto-repeat mode was performed with a 10-second time-cycle for EV Lac and a comparison star, BD +43°4310 (Sp.KO), which gave satisfactory count rates in the ultraviolet at about 12th magnitude. The signal-to-noise count-ratio was approximately 10. A 3mm diaphragm (45 arcsecs) was necessary for the permanent inclusion of the faint optical companion to EV Lac (approx. 10 arcsecs west) over reasonable lengths of time ($\frac{1}{2}$ to 1 hour). This entailed accepting rather low signal-to-sky count-ratios of 2 to 3. Utilization of +43°4310 as a comparison star at an angular separation of 25 arcmins was dictated by the mechanical configuration of the two-star photometer and the matching of magnitude and colour.

The flare star and comparison star were set in Channels 1 and 2, respectively. The signal channel-controls of the photon counter then gave a rapid numeric display of Ch.1 and Ch.2 followed by a 10-second display of Ch.1 maintained until the next counting cycle was completed. This allowed large flares to be readily noticeable to the observer and the unintentional interruption, e.g. by sky measurements etc., to be avoided. Dome adjustment and handset, both causing interference in the pulse counts with the existing equipment, were generally made at the same time so little time was actually lost, and the print-out always marked accordingly. Universal time was recorded also at frequent intervals since the time is not directly indicated by the successive 10-second cycles. There is an apparent "loss" amounting to 0.86 seconds per count for the present integration times.

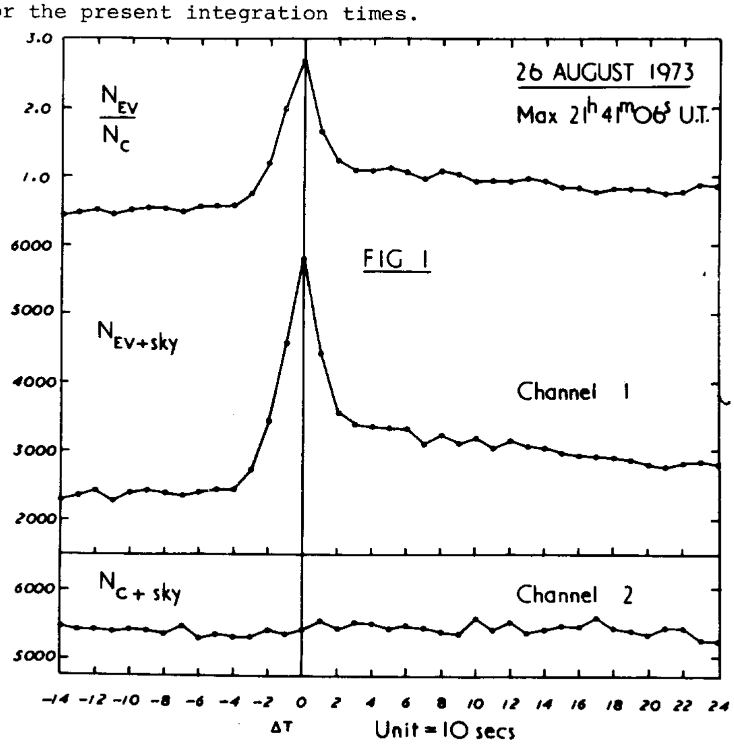
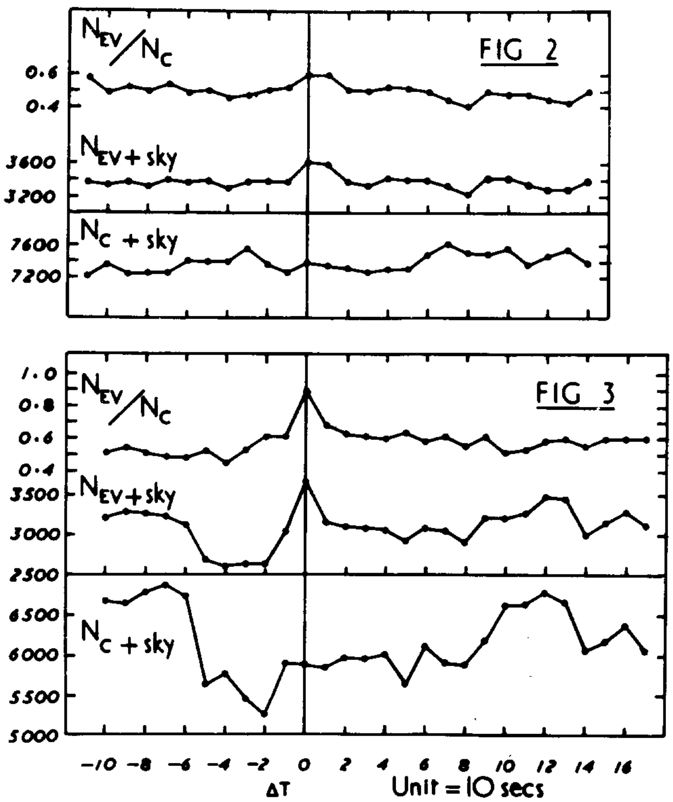


FIG 1



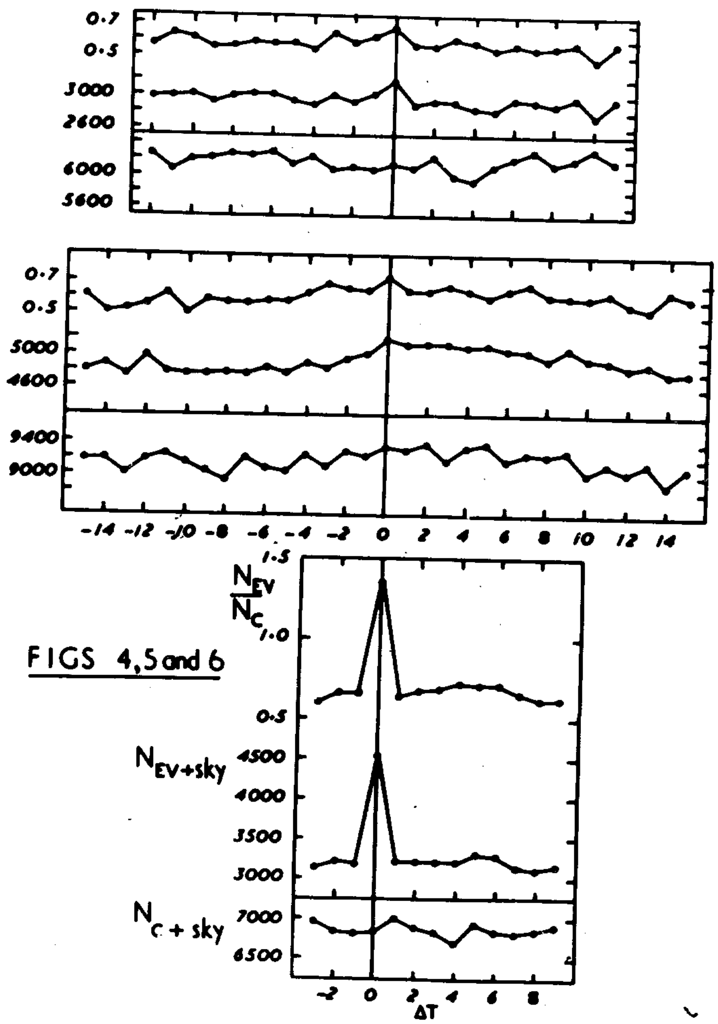
Observing procedure was planned such that ultraviolet monitoring was as complete as possible. The dual channels offered a fair assessment of the sky conditions and in general the U-sky was measured as the mean of three counts 4 or 5 times per night. The nature of long monitoring runs also allows the observer more than average visual assessment of sky conditions, haze and encroaching thin could, as well as extraneous lights. In addition to EV Lac, two other stars with photoelectric magnitudes, $+43^{o}4303$ and $+43^{o}4304$, in the immediate field were also measured in UBV each night in Channel 1. Assuming linearity of $\log(N - N_{sky})$ against magnitude, these published magnitudes (Ref.2) appear good to at least $\pm 0\overset{m}{.}03$. This suggests not only that the equipment was functioning adequately but that these two stars might serve as suitable additional standards to those recommended by the I.A.U. Working Group for the investigation of slow, possibly secular variations of other UV Ceti-type stars (Ref.3).

Preliminary Results. About 3000 dual counts were accumulated over 20 hours' telescope time under fair to good sky conditions. A few percent were obtained in the B-band under fair conditions or during late evening twilight. The total coverage of EV Lac was 9^h18^m, as given in Table 1. Times are given to the nearest minute and the parentheses indicate intervals of only fair sky. Only one major flare was detected on 26 August at $21^h41^m06^s$ U.T. It showed an amplitude of $1\overset{m}{.}8$ in U, and the decline was followed for 5 minutes after which a malfunction occurred in the data logger, but EV Lac had returned to its quiescent brightness 23 mins later when the fault was rectified. After subtraction of the close companion star's constant contribution (U=12.95 from Ref.2) the flare amplitude is $2\overset{m}{.}5$. In Fig.1 the pulse counts are shown for each channel, N_{C+sky} and N_{EV+sky}, and the ratio, N_{EV}/N_C less sky, is plotted at 10-second intervals about maximum.

Table 1

Date 1973	Coverage (U.T.)	Filter
Aug.24	2053-2149	B
	2149-57,2159-2203,2206-09,2210-31,2236-2301,2307-37	U
25	2125-27,2141-56,2158-2209,2210-13,2217-19,2253-55,2303-05, 2309-31,2332-51,2352-2400	U
26	0000-07,0008-27,0028-30,0038-0104,0108-17,0120-22,2102-25, 2129-46,2210-19,2238-40,2300-02,2311-29,2332-2400	U
27	0000-07	U
30	2034-40,2041-43,2044-2107,(2110-22),2134-37,2153-2203, 2204-13,(2214-27) (2230-35)	U
31	(2217-19,2229-32,2237-39,2241-49),2314-20,2351-2400	B
Sept.1	0000-01	B
	0001-34,0058-59,0100-05,0110-11,0115-20,0122-27,0131-56, 0157-0222	U
	Total Coverage 9^h18^m over 5 nights	

Further Discussion. From a plot of all the dual-count data a number of minor flares were suspected at the 3-sigma level but it is necessary to exercise caution in the acceptance of these events. A prime consideration was that under stable sky conditions an event is detectable in the EV Lac channel only. A few such "events" are illustrated in Figs. 2,4,5 and 6. The two-star photometer does not compensate for changes in sky brightness which is important in the present instance where the sky contributes a sizable fraction of the total signal. However, an event not immediately credible from the raw data is shown in Fig.3, an event of amplitude $0\overset{m}{.}6$ in U, which appears to be at least as acceptable as the best of the other suspected events in the N_{EV}/N_C plot. The details relating to the Figures are given in Table 2.



FIGS 4,5and 6

Table 2

Date 1973	U.T. Max.	Remarks	Fig.
Aug. 25	$22^h03^m00^s$	Doubtful	5
25	23 38 20	Doubtful	4
26	21 41 00	Amp. $1^m.8$	1
30	20 36 30	Amp. $0^m.2$	2
30	22 23 30	Amp. $0^m.6$	3
Sept. 1	01 31 30	Amp. $0^m.75$	6

Another aspect of the two-star photometer to consider is the effect of cloud structure which introduces phase from one channel to the other, but this does not appear to be a major effect when using 10-second counting cycles at the angular separation employed here. The present preliminary results from the total data does not indicate that night-to-night intensity variations occur in EV Lac in the ultraviolet. For example, from 16 compounded means from four nights, we find:

$$\Delta U\ (EV - BD\ +43^{\circ}4310) = 0\overset{m}{.}71 + \text{const}\ \pm 0\overset{m}{.}06$$

which is the magnitude difference between the two channels derived with nightly interpolated values for the sky pulse-counts. Furthermore, from Channel 1 alone, we find:

$$\Delta(B - V)(BD\ +43^{\circ}4303 - EV) = 0\overset{m}{.}029 + \text{const}\ \pm 0\overset{m}{.}033$$

$$\Delta(U - B)(\quad \text{ditto} \quad) = 0\overset{m}{.}712 + \text{const}\ \pm 0\overset{m}{.}021$$

from four nights' observations. No significant variations in colour were found.

Acknowledgements. It is a pleasure to acknowledge the generous cooperation and invaluable assistance of Dr.R.G.Bingham and Dr.D.H.P. Jones in the setting up of the equipment. I should especially like to express my thanks to the Director, Prof.E.M.Burbidge, and the staff of the Royal Greenwich Observatory for the enthusiastic hospitality which I received. Not least, my thanks extend to the Science Research Council for financial support of this project.

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1) Chugainov,P.F., 1972. I.B.V.S. No.744.
2) Andrews, A.D., and Chugainov,P.F., 1969.I.B.V.S. No.370.
3) Andrews, A.D., Chugainov, P.F., Gershberg, R.E. and Oskanian,V.S., 1969, I.B.V.S. No.326.

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INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
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ECLIPSE TIMINGS OF CATACLYSMIC VARIABLES

The following heliocentric times of mid-eclipse of the cataclysmic variables Z Cha, U Gem, EX Hya, VZ Scl and RW Tri have been obtained over the past few years from observations made at the McDonald Observatory of the University of Texas and at the Sutherland site of the South African Astronomical Observatory.

I)

Z Cha JD hel 2441000+	O - C	Z Cha JD Hel 2441000+	O - C
660.5002	-.0002	692.4605	-.0001
660.5747	-.0002	693.3542	-.0004
661.5435	.0001	695.4400	-.0005
691.4177	.0001	784.3182	.0001
691.4923	.0002	987.5521	.0001
691.5668	.0002	991.5747	-.0002
692.3858	-.0003		

O - C values are with respect to the revised elements:

Hel.Minimum Light = JD 2440264.6828 + $0^{d}.07449923$E

where we have used Mumford's epoch (Astrophys.J. 165, 369, 1971) combined with our more recent observations. The minima during the period 691 - 695 were omitted from consideration when deriving the revised period as they occurred during an outburst of this dwarf nova.

II)

U Gem JD hel 2440000+	O - C	U Gem JD hel 2440000+	O - C
679.6662	.0035	1356.6862	.0046
680.7279	.0037	1361.8161	.0042
976.8680	.0033	1365.7083	.0045
1281.8543	.0039	1368.7153	.0041
1296.8915	.0041	1676.5322	.0047
1297.7760	.0040		

O - C values are with respect to the elements given by Krzeminski (Astrophys.J. 142, 1051, 1965).

III)

EX Hya JD hel	O - C
2441844.2601	-.0004

O - C value with respect to Mumford's elements (Astrophys.J. Suppl. Ser. 15, 1, 1967).

IV) VZ Scl Ton 120

JD hel 2441000 +	O - C
209.8175	-
279.6700	.0000

These eclipse timings, together with the epoch given by Krzeminski (IBVS No.160), give revised elements:

Hel.Minimum Light = JD 2441209.8175 + $0^{d}14462220$ E

V) RW Tri

RW Tri JD hel 2440000+	O - C	RW Tri JD hel 2440000+	O - C
890.7570	-.0015	1515.8570	-.0020
891.9154	-.0025	1221.8855	-.0025
895.8580	-.0019		

O - C values are taken with respect to the elements given by Walker (Astrophys.J. 137, 485, 1963).

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NUMBER 853

Konkoly Observatory
Budapest
1973 December 18

UV Cet

Photoelectric monitoring of the flare star UV Cet was carried out at the Okayama Station of the Tokyo Astronomical Observatory over the period of 26 October to 1 November, 1973. The observations were made with the simultaneous three-colour photometer attached to the 91 cm reflector. The observational results are summarized in the Table. Some more details will be published in the Tokyo Astronomical Bulletin.

Date	Time of Monitoring (UT)	Filter	Time of Max. (UT)	$\frac{I_{o+f}-I_o}{I_o}$	Max. Δm	Flares P	Flares d_b	Flares d_a	σ
					mag	min	min	min	mag
Oct. 28	$11^h51^m-12^h12^m$		-	-	-	-	-	-	
	12 32 -13 05	V	-	-	-	-	-	-	V 0.03
	13 32 -13 48	B	-	-	-	-	-	-	B 0.06
	14 00 -15 32		-	-					
29	11 20 -17 40	V	$15^h09^m.5$	0.21	0.21	0.3	0.5	4.0	
		B	15 09.4	0.99	0.75	1.0	0.5	4.0	
		V	15 48.9	0.48	0.43	0.3	0.1	3.0	V 0.03
		B		2.18	1.26	0.9	0.1	3.0	B 0.05
		V	15 56.4	0.36	0.33	0.1	0.2	0.2	
		B		2.16	1.25	0.2	0.1	0.5	
30	11 10 -17 45	V	12 21.4	1.14	0.83	0.6	0.2	5.0	
		B		6.32	2.16	3.1	0.3	6.0	
		V	14 48.6	0.68	0.56		0.5	7.0	
		B		2.59	1.39		0.8	7.7	
		V	14 49.9	0.19	0.19	V1.0			
		B	14.49.8	1.26	0.89	B4.2			V 0.03
									B 0.04
		V	14 50.6	0.32	0.30				
		B		1.45	0.97				
		V	15 36.0	1.11	0.81	13.5	2.9	53.1	
		B		4.39	1.83	56.9	3.5	61.5	
		V	16 45.5	1.04	0.77	1.8	<0.5	8.0	
		B		3.44	1.62	2.1	<0.5	11.0	
Nov. 1	11 02 -12 42	V	-	-	-	-	-	-	V 0.05
	14 25 -16 54	B	-	-	-	-	-	-	B 0.07

K. OSAWA, K. ICHIMURA, T. OKADA, M. YUTANI, H. KOYANO, K. OKIDA
Tokyo Astronomical Observatory, November 28, 1973.

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Budapest
1973 December 22

SIX NEW VARIABLE STARS IN TAURUS

On 15 plates obtained with the 65/90/210 cm Schmidt telescope of the Asiago Astrophysical Observatory six new variable stars have been discovered by stereoscopic comparisons. The period of observation is from 1967 September 29 to 1968 November 23. Besides to the fifteen plates 103a-O, six IN plates with RG5 filter have been examined.

The finding charts of the new variables are shown in the Figure (north at the top, area 15'x15'); position and characteristics of the stars are given in Table I while their observed photographic magnitudes are reported in Table II. All the variable stars belongs probably to the T Tauri class.

In infrared all of the stars show variations and in particular GR 270 presents some important fluctuations of light.

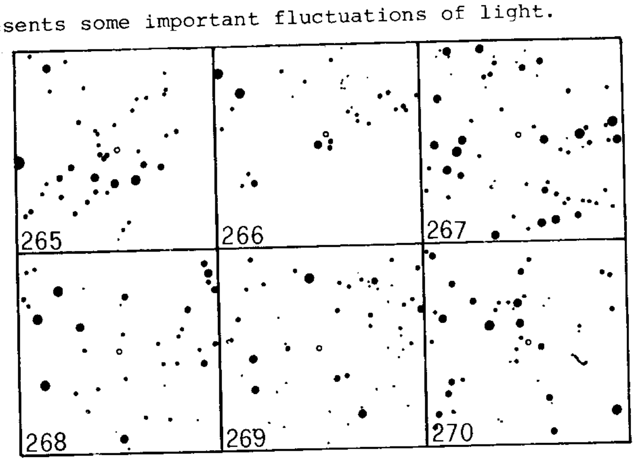

Table I

Var.	R.A. 1950	D.	Max.	Min.
GR 265	$4^h18^m46^s$	$+25^\circ30'$	16.0	16.5
GR 266	4 18 48	+25 14	17.0	17.9
GR 267	4 19 28	+24 03	17.7	18.4
GR 268	4 28 18	+23 46	18.0	18.7
GR 269	4 30 37	+23 34	16.4	17.6
GR 270	4 35 33	+23 32	14.0	15.1

Table II

J.D. 24...	GR 265	GR 266	GR 267	GR 268	GR 269	GR 270
39763.618	16.4	17.2	17.7	18.3	17.4	14.4
769.585	16.0	17.5	17.7	18.0	16.6	14.3
770.504	16.2	17.9	17.7	18.3	17.5	14.0
771.649	16.2	17.2	17.7	18.5	17.0	14.1
772.477	16.3	17.1	17.7	18.4	17.0	14.1
773.545	16.5	17.6	18.2	18.1	17.6	14.2
775.594	16.2	17.9	17.8	18.5	17.5	14.6
830.643	16.2	17.4	17.7	18.5	16.9	14.2
831.662	-	-	17.7	18.4	17.2	14.3
832.332	16.0	17.3	18.4	18.6	17.3	15.1
852.583	16.3	17.3	17.7	18.7	17.6	14.1
857.313	16.0	17.0	17.7	18.4	16.4	14.0
858.360	-	17.2	17.7	18.3	16.9	14.3
860.365	16.1	17.2	17.7	18.3	17.2	14.3
40184.384	16.1	17.2	17.7	18.4	16.8	14.8

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Budapest
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A NEWLY DISCOVERED W URSAE MAJORIS SYSTEM: ADS 1693 A

ADS 1693 A ($2^h05^m.9$, $+44^o12'$; 1900) is the brightest component of a multiple star system (see Figure I). In 1908 Espin mentioned that either the A or the B component was a variable. In 1971 and 1972 F. Josties and J. Christy obtained multi-exposure-astrometric plates of this system at the U.S. Naval Observatory in Washington, D.C. Visual estimates from these plates by K.A.A.Strand showed the A component to be variable with a brightness change of 0.6 magnitudes in thirty minutes.

In October and November of 1973 250 sets of UBV observations were obtained of ADS 1693 A on five nights with the 102 cm reflector at the Flagstaff Station of the U.S. Naval Observatory. The information obtained from these data is tabulated in this report.

A composite light curve of observations obtained on two consecutive nights is presented in Figure II. Close examination of the individual light curves for each night show variations in the maxima and minima. This is typical of W Ursae Majoris systems.

Times of minima were determined by the Hertzsprung method and are listed in Table I. All the minima were combined by the method of least squares and produced the following light elements:

$$T_I = 244\ 1976.69136 \pm 0^d.30573\ n$$

From the residuals in Table I it is obvious that the period is not constant over the observed interval (another characteristic of W Ursae Majoris systems). A second set of light elements was determined using only the primary eclipses:

$$T_{II} = 244\ 1976.69458 \pm 0^d.30501\ n$$

The magnitudes and colors of the variable at maxima and minima are given in Table II. The B component was used as the comparison star and the C and D components were used as check stars (see Table III).

The spectral types listed in Tables II and III were inferred from the colors (assuming no reddening) and were based upon the work of M.P. Fitzgerald (Astron.and Astrophys. 1970, 4,234). The spectral types listed in Table II are further evidence that ADS 1693A is a W Ursae Majoris system.

Table I

Times of Minima

JD O 244 0000.0000+	Eclipse	n	T_I O-C	T_{II} O-C
1976.8470	sec	0.5	+0^d.0028	-0^d.0001
1977.7605	sec	3.5	-0.0009	-0.0016
1977.9146	pri	4.0	+0.0003	0.0000
1992.8599	pri	53.0	-0.0352	0.0000
1993.9981	sec	56.5	+0.0330	+0.0707

Table II
Magnitudes and Colors of ADS 1693 A

Phase	V	B-V	U-B	sp
0.00	11.61	+0.82	+0.35	K0
0.25	10.88	+0.74	+0.24	G7
0.50	11.58	+0.80	+0.34	K0
0.75	10.83	+0.77	+0.27	G7

Table III

Magnitudes and Colors of Comparison and Check Stars

Star	V	B-V	U-B	sp
ADS 1693 B	11.13	+0.70	+0.18	G5
ADS 1693 C	11.91	+1.10	+0.89	K4
ADS 1693 D	12.65	+0.72	+0.30	G7

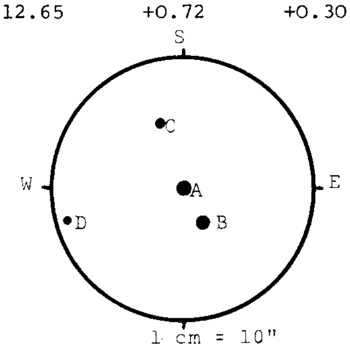

Figure I

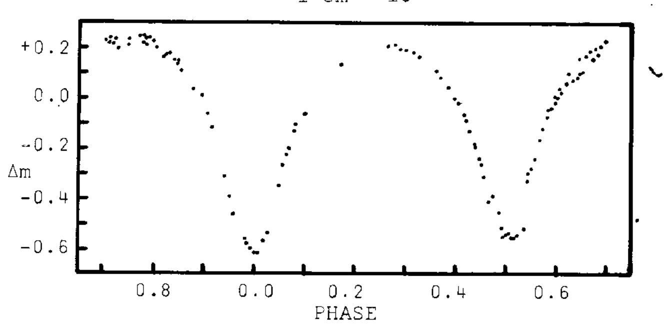

Figure II

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Konkoly Observatory
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A PRELIMINARY REPORT ON THE LIGHT - VARIATION OF THE SUGGESTED IDENTIFICATIONS OF FOUR X-RAY SOURCES

1. Introduction

A preliminary report is presented on photo-electric observations of four stars, which have been suggested to be the optical counterparts of the X-Ray sources 3U 1223-62 (= Henize 788?, we also show observations of Henize 787 which is at a close distance from 788), 3U 1543-47 (= HDE 330036?), 2U 1639-62 (= Henize 177?) and 3U 1700-37 (= HD 153919). The observations have been made with the Walraven five-colour simultaneous photometer, attached to the 90-cm Light-Collector of the Leiden Southern Station (at the South-African Astronomical Observatory Annexe, formerly the Republic Observatory Annexe) Hartebeestpoortdam, South-Africa. A description of the photometer and the photometric system is given by Walraven and Walraven (1960) and Rijf, Tinbergen and Walraven (1969). We only give preliminary lightcurves in one or two passbands.

2. 3U 1223-62 (= Henize 788 or WRA 977?).

Independently of each other, Crampton (private communication to Feast) and Vidal (1973) suggested Henize 788, an 11.5 mag star, as a possible candidate for 3U 1223-62. For the sake of completeness we also made observations of Henize 787 of the 10.5 mag and also an Hα emission object, which is situated within a distance of 1.′5 from Henize 788. The comparison star for both was HD 109164, an 8 mag star. The integration time for one observation of H 787 was generally 1.5 min and for H 788 2 min. Figure 1 shows the brightness difference (in log intensity) between these two stars and the comparison star in the Walraven V band (5590 A). Obviously H 787 is constant, while H 788 is an irregular variable star, of which the maximum range of the variation is nearly 0.15 mag. The broken part of the light-curve represents the less accurate part because of too little observations.

Our observations of H 788 support Vidal's conclusion based on his spectroscopic observations, that H 788 was active on a time scale of days and that these characteristics combined with the high reddening may be correlated with the active X-Ray source reported by McClintock et al. (1971) and catalogued by Giacconi et al. (1973) as 3U 1223-62.

3. 3U 1543-47 (= HDE 330036?)

HDE 330036, an 11 mag star was first proposed as the optical counterpart by Sanduleak and Bidelman (1971) and catalogued in the 2U and 3U catalogues of Giacconi et al. (1972,1973). However the distance of this candidate to the X-Ray source is more than 1°, which is far outside the error box. This makes the identification very doubtful. Forman and Liller (1973) recently proposed an other candiate viz. a 15 mag star within the error box. This one however was too faint for our telescope.

HDE 330036 showed to be a peculiar emission object typical for a yellow symbiotic star and with a large infared excess (Webster, 1966; Glass and Webster, 1973). As a comparison star we used the A 2 star HD 141448 roughly $3\overset{'}{.}5$ N of the candidate and two magnitudes brighter. The integration time for one observation of the candidate was generally 2.5 min. Figure 2 shows the brightness differences (in log intensity) between HDE 330036 and the comparison star in the Walraven B band (4260 A). The variability suggested in Figure 2 would be a support of Webster's classification that HDE 330036 is a symbiotic star, had the weather conditions during these observations been satisfactory. We therefore have the feeling that more accurate observations are necesarry to confirm these variations.

4. 2U 1639-62 (= Henize 177?).

This source is listed in the 2U catalogue of Giacconi et al. (1972), but later also in the 3U catalogue (Giacconi et al.1973)

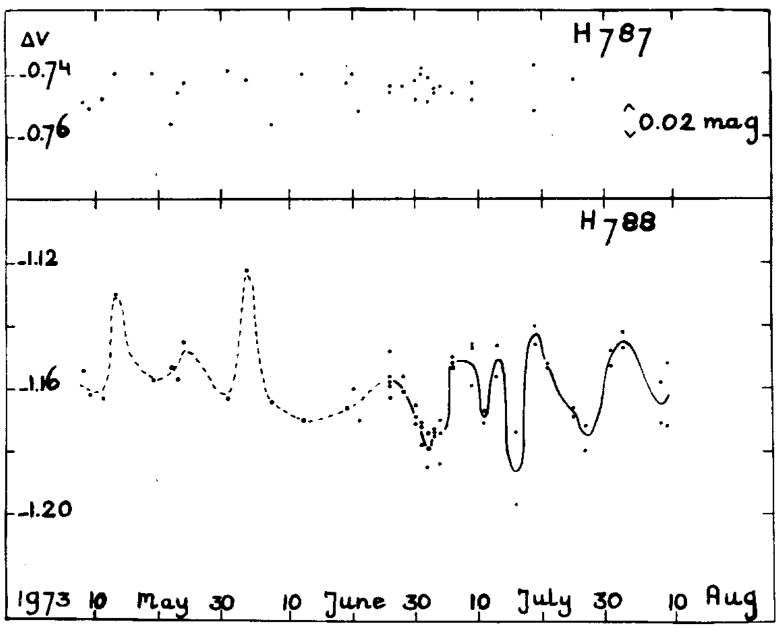

Fig.1. The brightnesses H 787 and H 788 (= 3U 1223-62?) minus comparison star (in log intensity) plotted against the calendar dates for the V-passband.

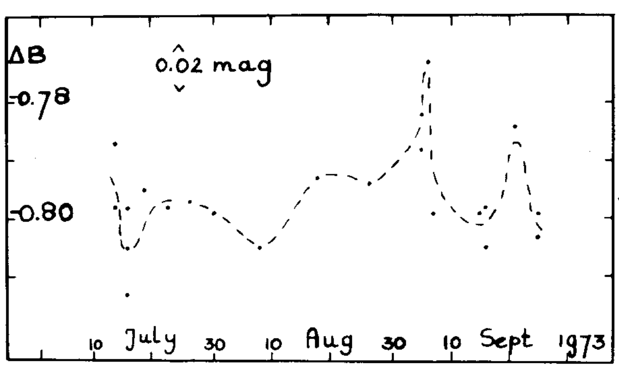

Fig.2. The brightnesses HDE 330036 (= 3U 1543-47?) minus comparison star (in log intensity) plotted against the calendar dates for the B-passband.

where it got the number 3U 1632-64 but with a larger error box.

Independently of each other Webster (1972) and Brucato and Lanning (1972) suggested that Henize 177, of roughly the 13 mag might be the optical counterpart for 2U 1639-62. The star is spectroscopically very interesting with a peculiar emission spectrum and a strong infrared excess (Webster, 1966, 1973; Glass and Webster, 1973). As a comparison star we used a roughly 3.5 mag brighter star within a distance of 2' SW of H 177 (see the finding chart given by Perek and Kohoutek Plate 32 (326-10°1) (1967)). The integration time for one observation of the candiate was generally 2.5 min. Figure 3 shows the brightness difference (in log intensity) between H 177 and the comparison star in the Walraven B band (4260 A). During the 3.5 months that the star was followed the brightness increased by more than 0.4 mag. Sudden drops of 0.05 mag are clearly visible. The star exhibits a relatively high brightness in the ultra-violet. In the Walraven U band (3620 A) the total increase was nearly twice that in blue viz. 0.7 mag. Our conclusion is that although the identification of H 177 with the X-Ray source is highly questionable after the new position of the source in the 3 U catalogue, it still is a very interesting object because the light-variation supports Webster's (1973) classification that it belongs to the group of slow novae and symbiotic stars.

5. 3U 1700-37 (= HD 153919)

The likely candidate for 3U 1700-37 is the 6.7 mag star HD 153919 of spectral type Of. The star, first suggested by Jones et al. (1973), appeared to be an eclipsing binary with a period of $3^{d}.4120$ (Jones et al. 1973, Penny et al. 1973). We used HD 153767 (7.4 mag and A0) as the comparison star. A second star was sometimes used to check the constancy of the first one. Generally the variable was observed ten times alternated by the comparison star. The average of the brightness differences revealed one normal point. The integration time for one observation was 0.5 min. Figure 4 shows the curves in the Walraven V band and that for the

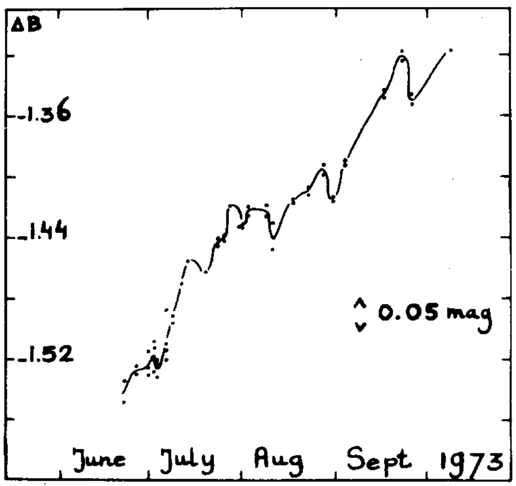

Fig.3. The brightness H 177 (= 2U 1639-62?) minus comparison star (in log intensity) plotted against the calendar for the B-passband.

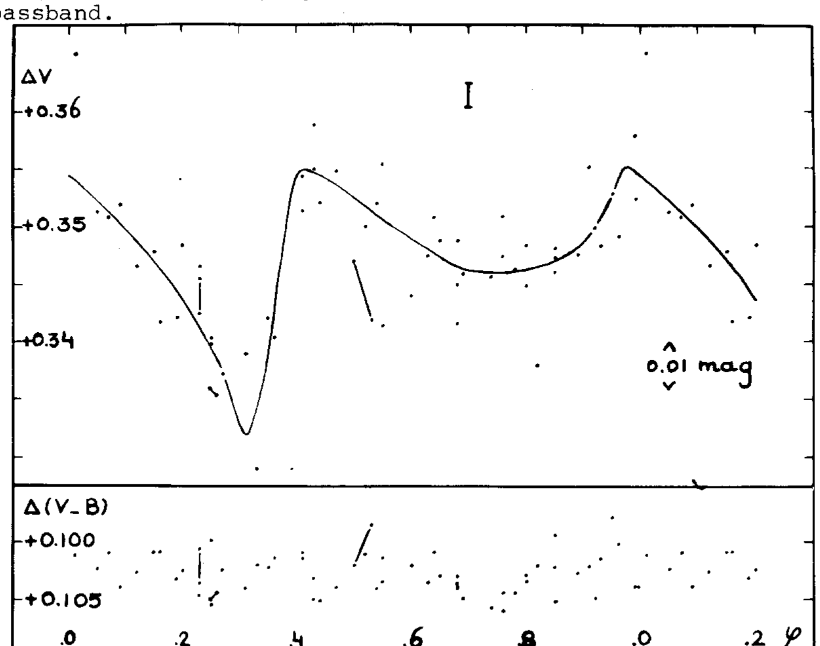

Fig.4.The brightnesses HD 153919 (= 3U 1700-37) minus comparison star (in log intensity) plotted against the phase for the V-passband and for the index V-B. The points connected with a line are normal points obtained in the same night.The estimated mean error is indicated by the bar (±0.003 mag).

index V-B given as the differences variable minus comparison star. The error bar indicates roughly the mean error one normal point. Phases have been derived with the same ephemerides of Penny et al. Points connected with a line indicate normal points obtained in the same night.

Just like Penny et al's light-curve in the V of the UBV system, ours shows that an important part of the scatter is intrinsic. There is no indication for a period change between the observations of Penny et al. in February and March of 1973 and those presented here made in May till October of the same year, at least when we compare the phases of the minima. Other similarities are the equal height of the maxima and the fact that the colour curve does not show any appreciable colour change. Probably there is some tendency for the star to be redder during the secondary minimum, but this is not conclusive at all. The secondary minimum is also the X-Ray minimum, apparently at this stage the X-Ray source is eclipsed by the bright O component. This is also proved by spectroscopic work (van den Heuvel, 1973; Hutchings et al. 1973). Further we notice some important differences in the shape of our light-curve compared with that of Penny et al.:

1. our primary minimum is 0.06 mag deep, against 0.07 mag.
2. the secondary minimum is also less deep but even more pronounced viz. 0.022 mag, against 0.05 mag.
3. a more pronounced asymmetry for our curve. The rising branch after the primary minimum needs only 0.1 of the period to reach the maximum, that is half the value of Penny et al.'s light-curve.

It is true that the intrinsic dispersion is very high so that these differences may only be apparent, or that they are caused by the slightly different photometric bands. However the differences are probably too large to be only interpreted by these facts. We cannot therefore exclude the possibility that a real change has taken place. Penny et al. suggested three hypotheses for the non-sinusoidal shape of the light-curve, ellipticity of the orbit (in this case one should expect the descending branch at phase .4 to be much steeper than that at phase .0, in fact we see the reverse), non-symmetric distortion of the O star about the separation axis and another source of emission or absorption of light in the system. The fact that the light-curve may have changed within a few months, makes it not very likely that only geometrical or orbital elements cause the light variation. As shown by Hutchings et al. the system exhibits complex atmospheric phenomena, so that an explanation must await further spectroscopic and photometric observations.

Acknowledgement. It is a pleasure to thank Dr.M.W.Feast for calling my attention to these stars and for his very valuable discussions.

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PHOTOELECTRIC OBSERVATIONS OF THE FLARE STAR UV Cet DURING THE 1973, SEPTEMBER 20 - OCTOBER 5 INTERNATIONAL PATROL

Preliminary results of the UV Cet photoelectric observations which were carried out at Catania Astrophysical Observatory during the observing period scheduled by the I.A.U. Working Group on Flare Stars (Chugainov, IBVS No.744, 1972) are given.

The observations were made at the 91 cm Cassegrain reflector using standard filters and an EMI 6256 (S13) photomultiplier tube matching the B colour of the standard photometric system. A DC amplifier and a strip-chart recorder with a time constant of 1 sec. f.s. were used.

In Table 1 the detailed coverage in U.T. is given. Patrol interruption longer than one minute are noted. During the 42.8 hours of effective coverage 39 flare events were observed.

Table 1. Detailed Coverage

Date	Coverage (U.T.)	$\overline{3\,\sigma/I_o}$
Sep.		
19-20	23^h12^m-2400, 0000-0026, 0029-0113, 0118-0126, 0208-0247, 0250-0325;	.08
20-21	2247-2257, 2259-2400, 0000-0131, 0134-0157, 0201-0232, 0251-0257, 0300-0329;	.08
21-22	2255-2342, 2346-2349, 2357-2400, 0036-0055, 0058-0105;	.09
22	2136-2153, 2157-2235, 2239-2250, 2318-2333;	.09
23-24	2341-2400, 0000-0057, 0059-0144, 0152-0237, 0247-0333;	.09
28-29	2253-2302, 2325-2348, 0003-0104, 0115-0325;	.06
29-30	2240-2334, 2338-2400, 0000-0142, 0146-0337;	.05
30-Oct.1.	2147-2244, 2332-2400, 0000-0050, 0058-0130, 0140-0154, 0203-0220, 0224-0314, 0320-0331;	.05
Oct. 1-2	2126-2143, 2145-2210, 2214-2227, 2235-2400, 0002-0019, 0022-0113, 0115-0258, 0303-0315;	.05
2-3	2238-2327, 2343-2400, 0000-0148, 0152-0246, 0259-0318;	.09
4-5	2051-2105, 2110-2400, 0000-0313, 0327-0338.	.06

Some characteristics of these flares in the instrumental photometric system are given in Table 2. Also the light curves which are shown in the accompanying figures as relative intensities versus U.T. are given in the instrumental photometric system. However, those P_B values which are referred to in the figures have been reduced to the standard photometric system using a method previously indicated by the authors (Cristaldi and Rodonò, Astr.,Astrophys.Suppl.10,47,1973). The error bars indicate the maximum noise fluctuation in the relative intensity scale.

The observed flares have been attributed to the fainter component of the L 726-8 binary system. This is of course an arbitrary assumption since also the brighter component is a good flare star candidate.However, no information are at present available on the relative flare incidence on the individual components of the system.

Table 2. Flare Characteristics

No.	t_{max}(U.T.)	J.D.	d_b	d_a	$3\sigma/I_{or}$	I_f/I_o	Energy		f
	September	24419..				max.	P	erg	
1/c	20,0233.50	44.6115	0.5	2.9	0.21	1.24	0.98	$2.18x10^{30}$	0
2/c(a)	20,2306.05	46.4675	0.2	2.2	.18	3.97	1.40	$3.10x10^{30}$	2
3/c	20,2339.65	46.4908	0.1	3.0	.21	2.19	1.21	$2.68x10^{30}$	0
4/c(a)	21,0022.00	46.5184	0.05	3.7	.21	1.32	0.80	$1.76x10^{30}$	2
5/c	21,0034,75	46.5291	.05	1.5	.21	1.41	0.31	$6.83x10^{29}$	0
6/c	21,0113.85	46.5563	.25	10.6	.21	16.56	18.71	$4.15x10^{31}$	4
7/c	21,0137.85	46.5729	.1	2.4	.21	2.45	0.92	$2.03x10^{30}$	0
8/c(b)	21,0307.20	46.6350	.1	12.8	.24	147.89	61.38	$1.36x10^{32}$	3-4
9/c(b)	22,2218.9	48.4348	.4	13.5	.21	18.06	37.59	$8.33x10^{31}$	3-4-5
10/c(a)	23,2347.8	49.4965	.15	10.8	.18	15.53	112.92	$2.50x10^{32}$	3-4
11/c	24,0049.3	49.5393	.2	1.4	.18	0.47	0.24	$5.30x10^{29}$	-
12/c(a)	29,0006.60	54.5097	.18	7.2	.16	0.90	1.88	$4.16x10^{30}$	2
13/c	29,0034.65	54.5292	.06	3.1	.16	3.86	0.92	$2.04x10^{30}$	0
14/c	29,0040.50	54.5332	.10	2.2	.16	1.99	0.36	$7.98x10^{29}$	0
15/c	29,(0105.20)	54.5504	-	25.0	.16	1.05	(4.69)	$(1.04x10^{31})$	5
16/c	29,0226.50	54.6068	.10	1.6	.16	0.69	0.24	$5.26x10^{29}$	0-1
17/c	30,0010.30	55.5123	.20	1.9	.13	0.89	0.32	$7.09x10^{29}$	1
18/c	30,0126.45	55.5652	.15	10.0	.13	14.86	7.22	$1.60x10^{31}$	
19/c	30,0153.05	55.5836	.1	1.8	.16	0.85	0.33	$7.29x10^{29}$	0
20/c	30,2234.60	56.4458	.10	(15.0)	.18	16.37	12.59	$2.79x10^{31}$	0-5
21/c	30,2355.85	56.5022	.15	10.0	.16	1.17	1.34	$2.98x10^{30}$	4
	October								
22/c	1,0036.25	56.5303	.25	10.6	.16	0.89	1.38	$3.05x10^{30}$	0
23/c	1,0309.35	56.6366	.15	1.8	.24	2.79	1.00	$2.22x10^{30}$	0
24/c	1,0330.00	56.6510	.05	0.10	.21	20.97	(1.12)	$(2.49x10^{30})$	5-1
25/c	1,2138.60	57.4069	.15	2.2	.13	1.73	0.50	$1.10x10^{30}$	0

Table 2 (cont.)

No.	t_{max} U.T.	J.D.	d_b	d_a	$3\sigma/I_{or}$	I_f/I_o max.	Energy P	erg	f
26/c	1,2311.72	57.4716	.05	0.4	0.13	0.44	0.07	1.58×10^{29}	1-0
27/c	2,0149.37	57.5811	.06	.05	.13	0.88	0.04	9.72×10^{28}	1-6
28/c(a)	2,0311.10	57.6378	.1	.9	.16	0.59	0.20	4.36×10^{29}	1-2
29/c	2,2241.45	58.4506	.05	.6	.26	7.72	0.41	9.06×10^{29}	0
30/c	2,2246.02	58.4538	.10	1.7	.26	2.37	0.60	1.33×10^{30}	0
31/c(a)	2,2353.65	58.5007	.05	1.1	.21	1.38	0.32	7.18×10^{29}	2
32/c	3,0227.80	58.6078	.15	.50	.21	0.88	0.14	3.18×10^{29}	0-1
33/c	4,2128.20	60.3997	.10	.90	.21	1.81	0.33	7.27×10^{29}	0
34/c	4,2144.20	60.4108	.10	2.80	.16	0.60	0.48	1.06×10^{30}	0-1
35/c	4,2310.37	60.4707	.05	2.50	.12	2.48	0.54	1.41×10^{30}	4
36/c(a)	5,0042.22	60.5345	.20	6.00	.10	1.39	2.40	5.33×10^{30}	3
37/c(a)	5,0200.32	60.5887	.25	8.50	.12	1.49	2.39	5.30×10^{30}	3
38/c(a)	5,0208.77	60.5946	.10	.90	.13	0.63	0.18	3.96×10^{29}	1-3
39/c(a)	5,0259.07	60.6295	.10	2.4	.15	1.16	0.52	1.15×10^{30}	2

The explanation of symbols and further details on the observing equipment can be found in Cristaldi and Rodonò (loc.cit).

R. Barbagallo, C.Lo Presti, F. Spinella and M.C. Stancanelli Consoli have cooperated in this work.

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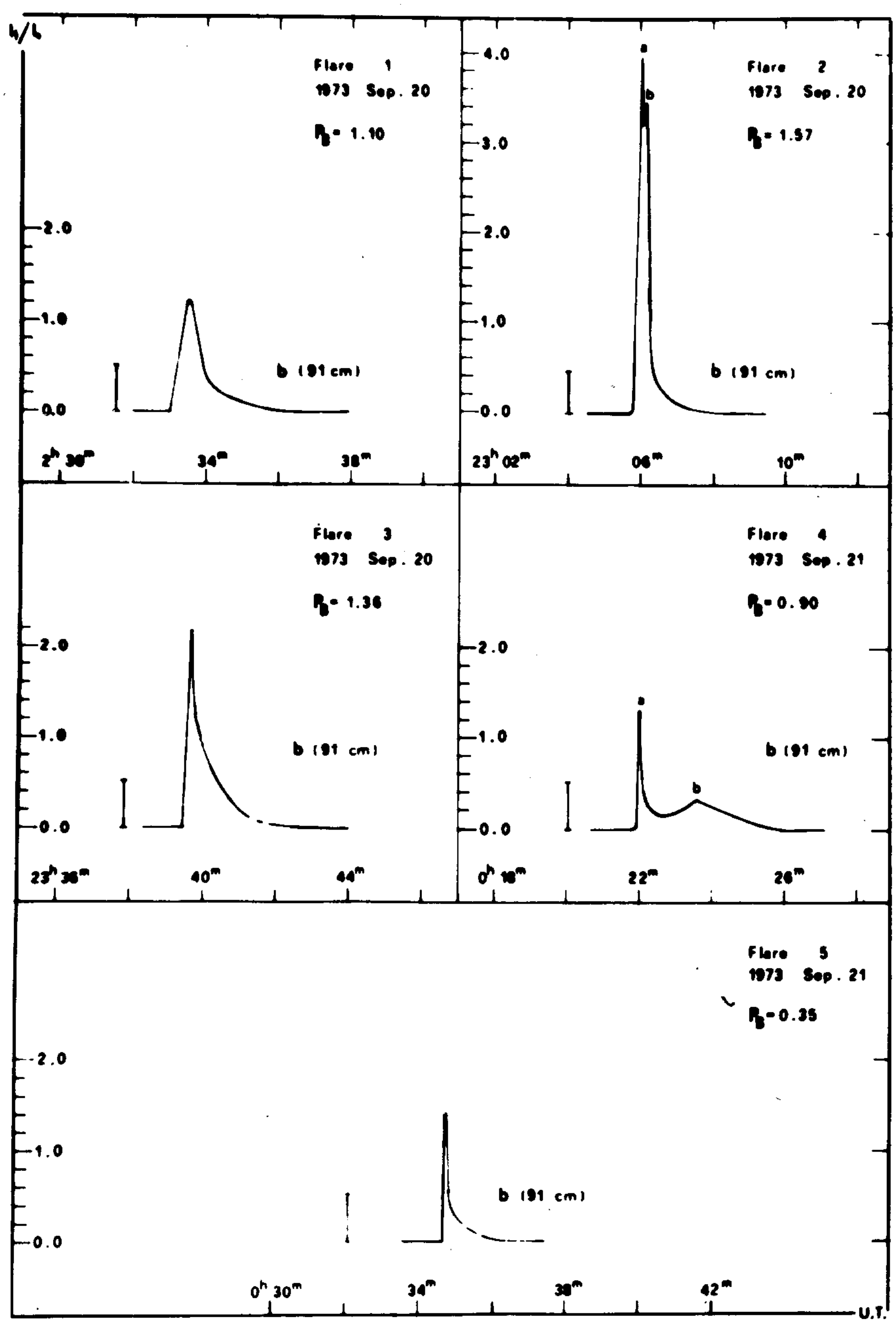
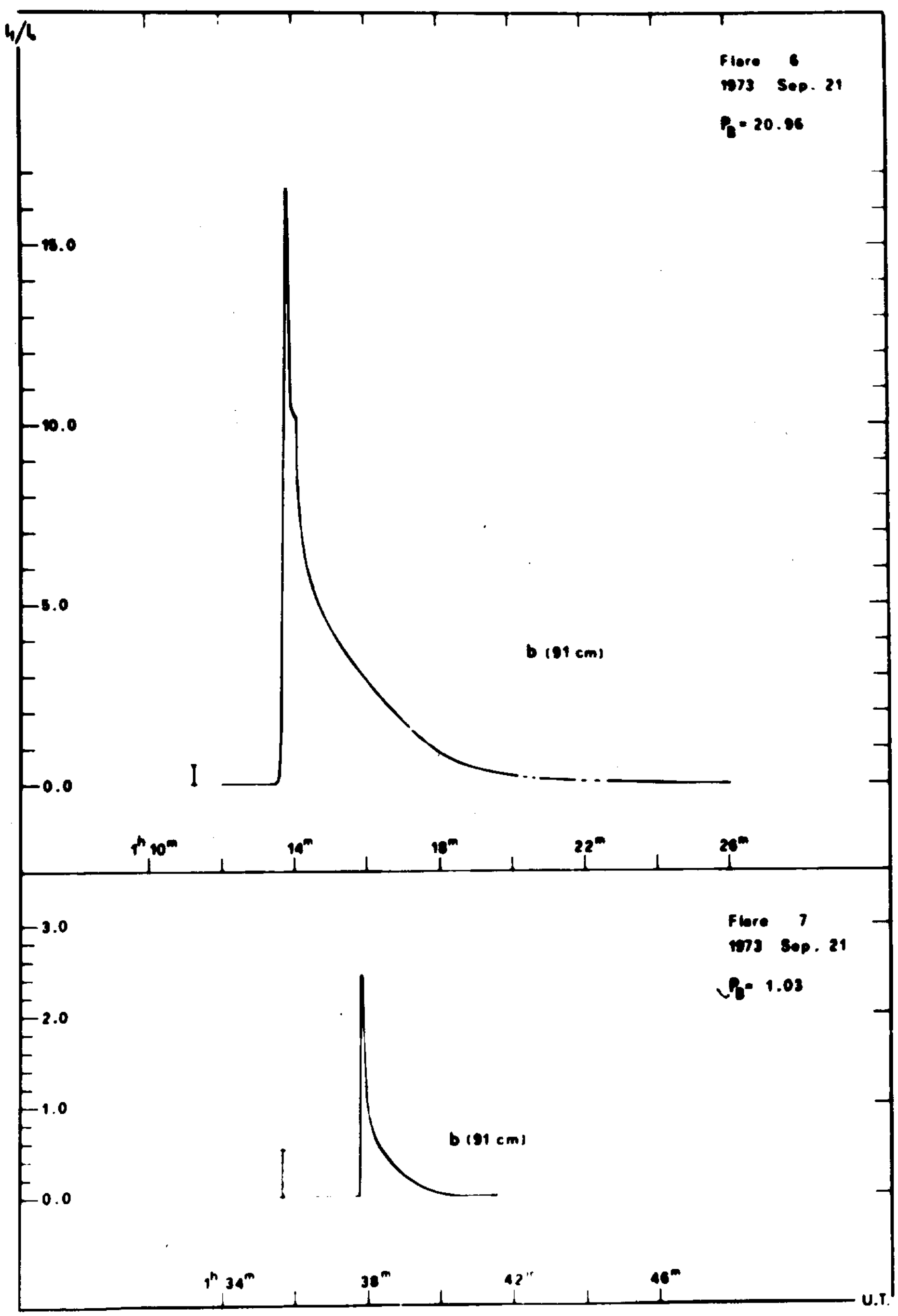
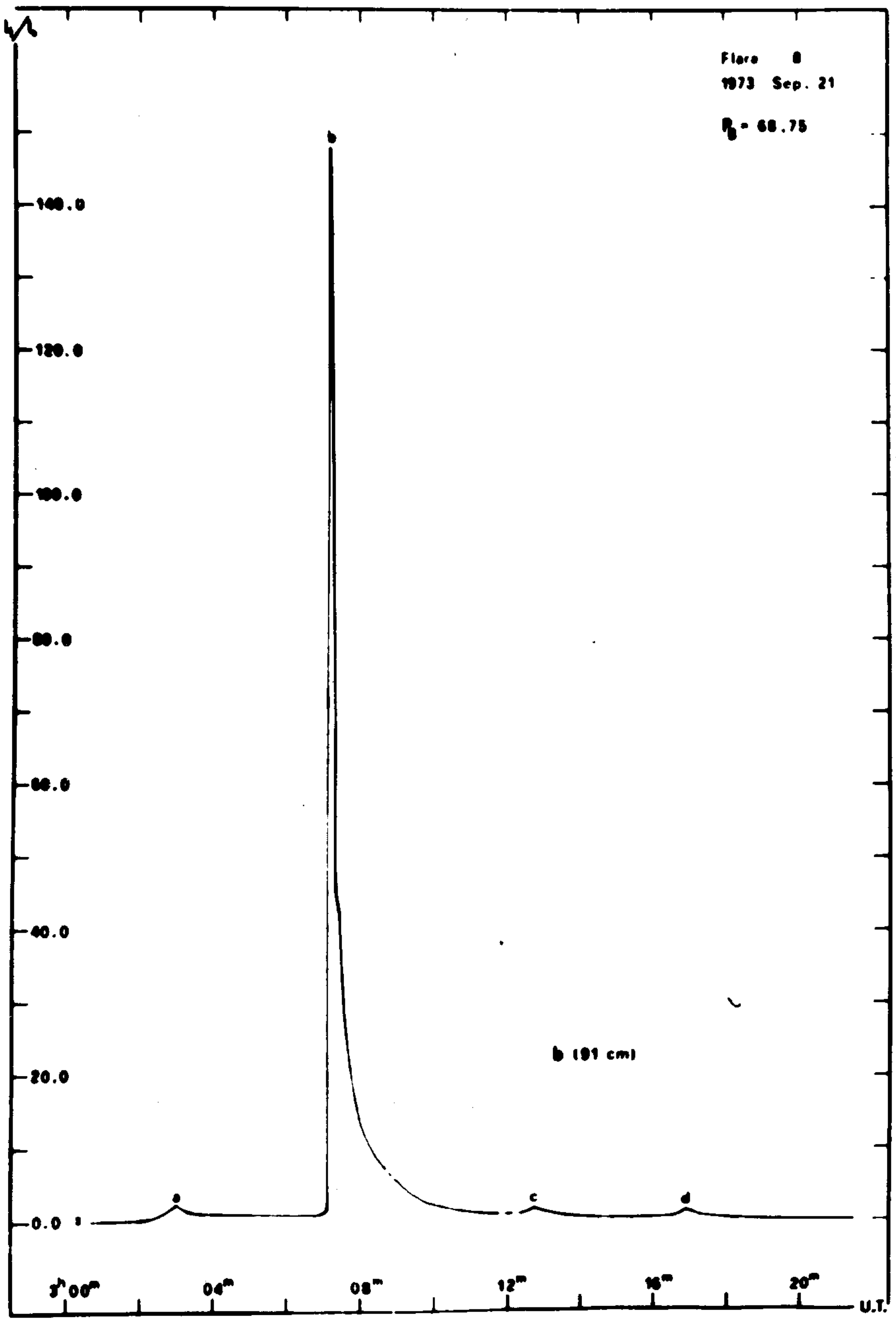


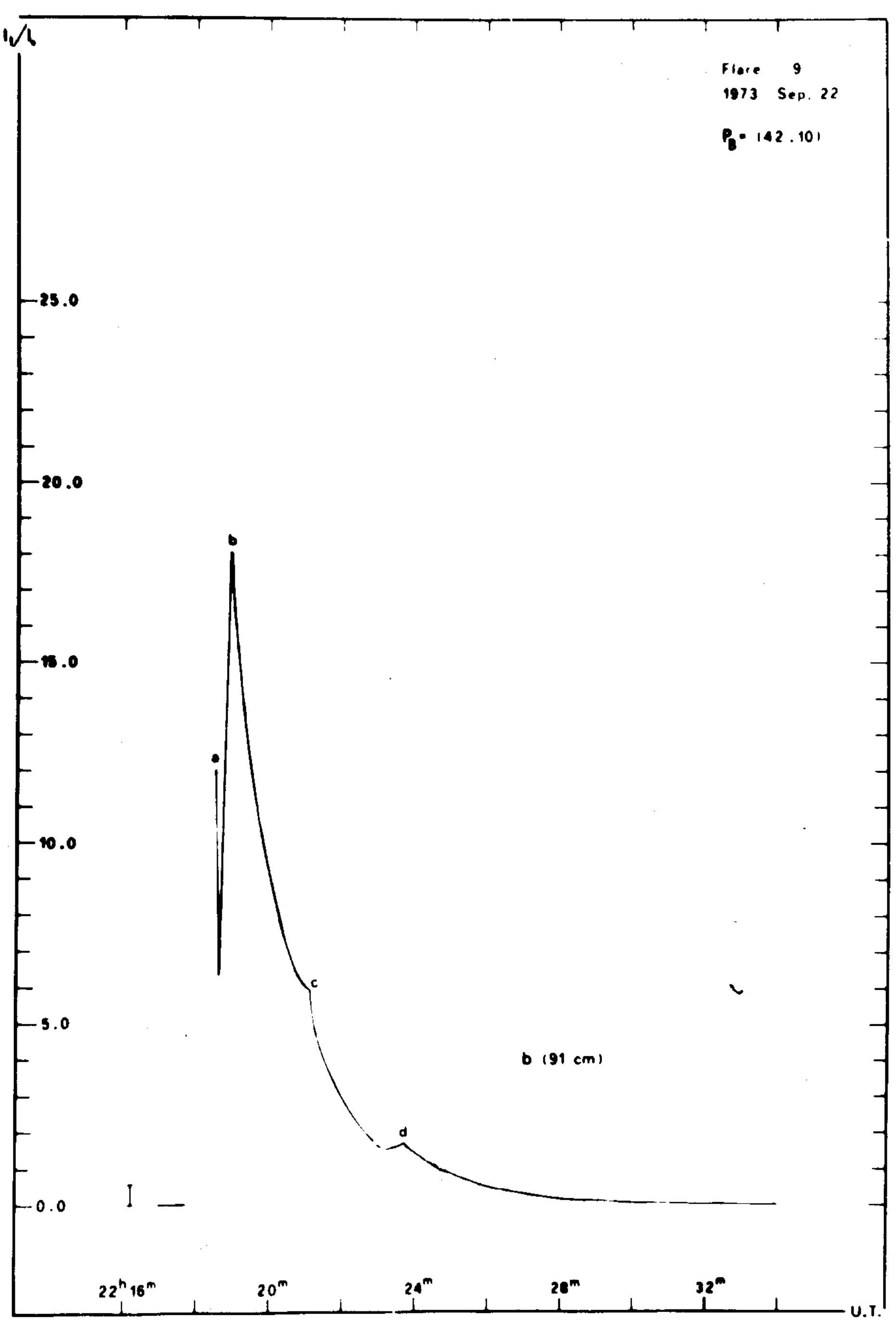
I₁/I₀
Flare 1
1973 Sep. 20
R_B = 1.10
b (91 cm)
2ʰ 30ᵐ
34ᵐ
38ᵐ
Flare 2
1973 Sep. 20
R_B = 1.57
b (91 cm)
23ʰ 02ᵐ
06ᵐ
10ᵐ
Flare 3
1973 Sep. 20
R_B = 1.36
b (91 cm)
23ʰ 36ᵐ
40ᵐ
44ᵐ
Flare 4
1973 Sep. 21
R_B = 0.90
b (91 cm)
0ʰ 18ᵐ
22ᵐ
26ᵐ
Flare 5
1973 Sep. 21
R_B = 0.35
b (91 cm)
0ʰ 30ᵐ
34ᵐ
38ᵐ
42ᵐ
U.T.



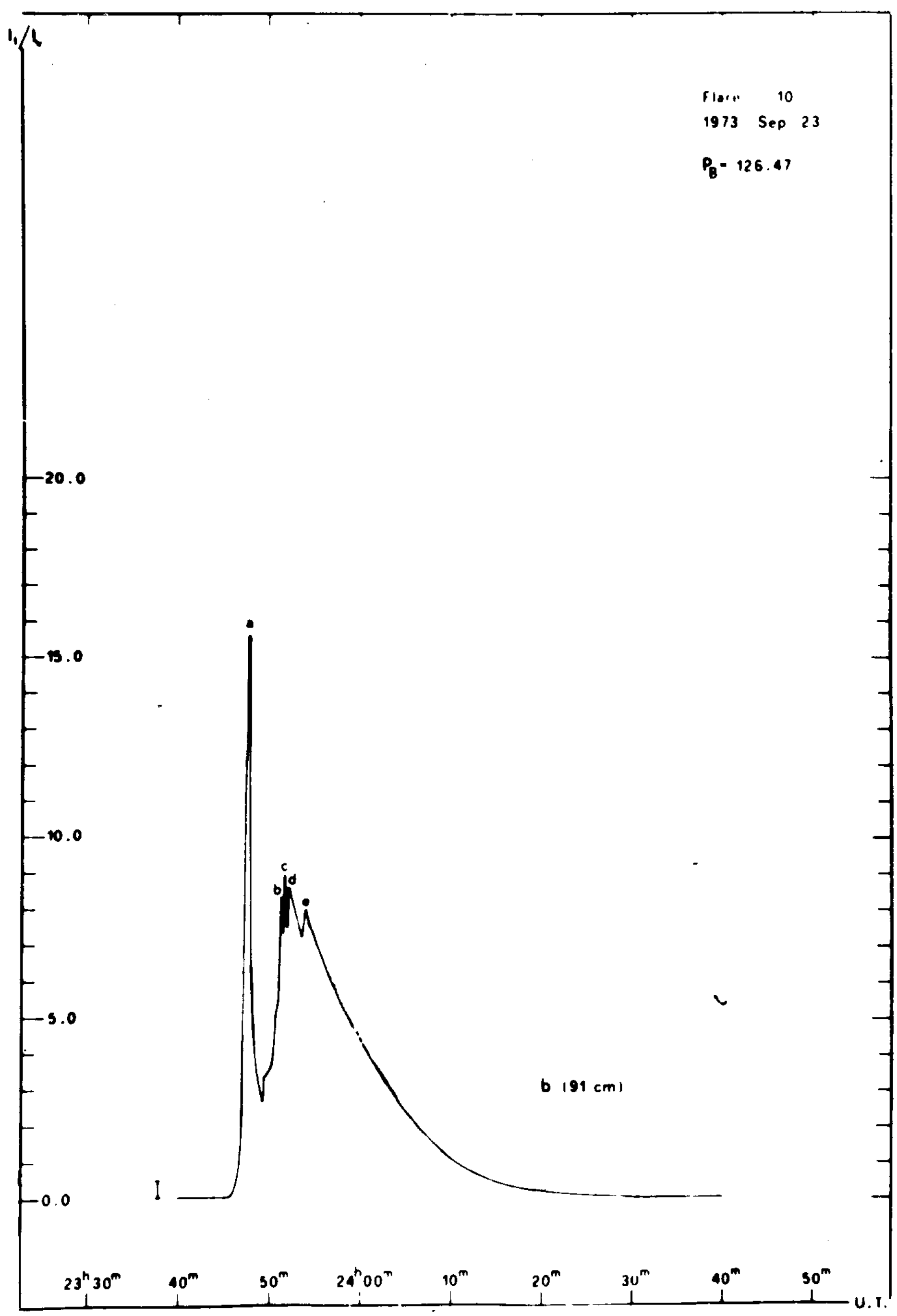
I_f/I_o
Flare 6
1973 Sep. 21
P_B = 20.96
15.0
10.0
5.0
0.0
b (91 cm)
1h 10m
14m
18m
22m
26m
Flare 7
1973 Sep. 21
P_B = 1.03
3.0
2.0
1.0
0.0
b (91 cm)
1h 34m
38m
42m
46m
U.T.



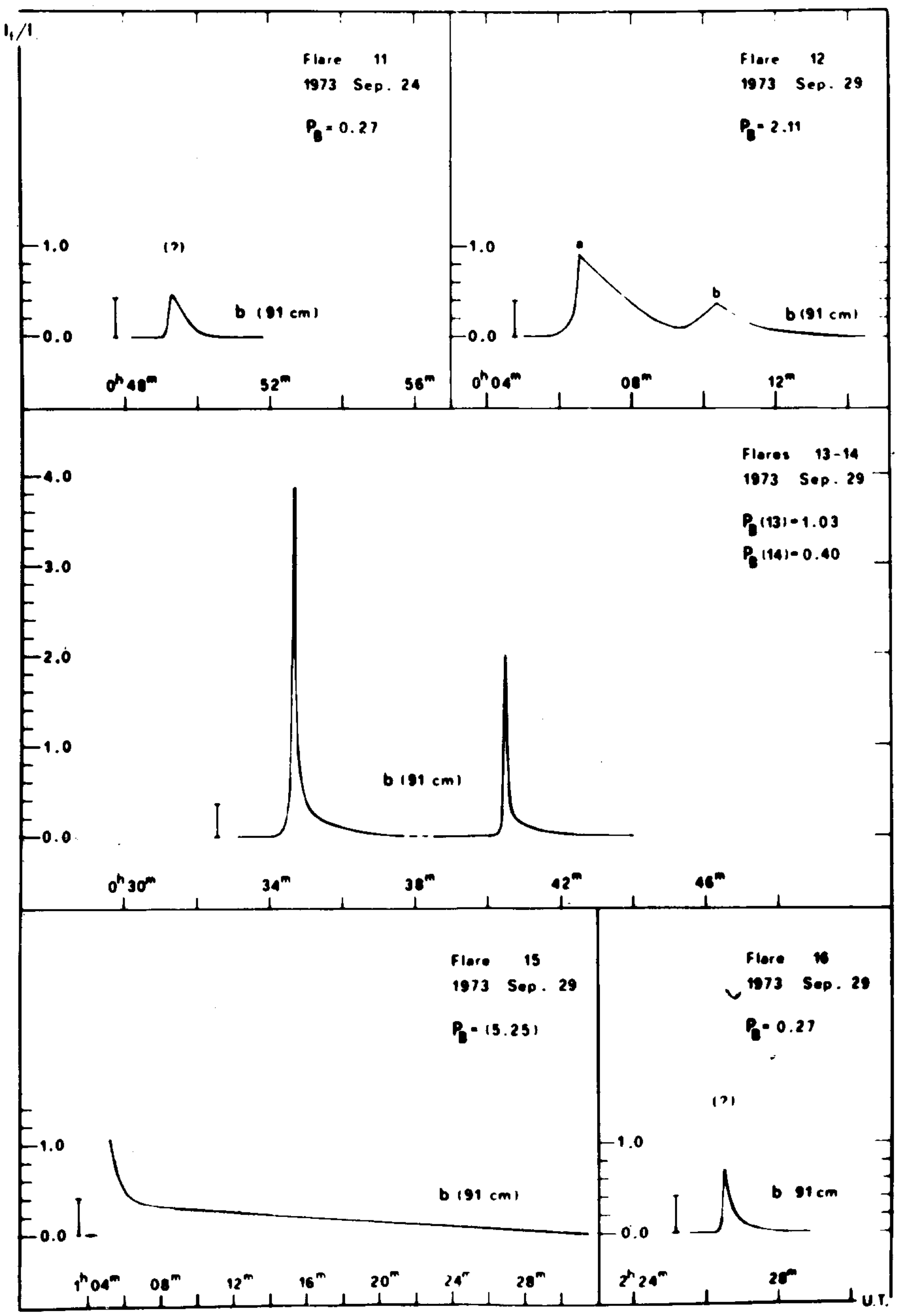
Flare 8
1973 Sep. 21
R_B = 68.75
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
a
b
c
d
b (91 cm)
3^h00^m
04^m
08^m
12^m
16^m
20^m
U.T.



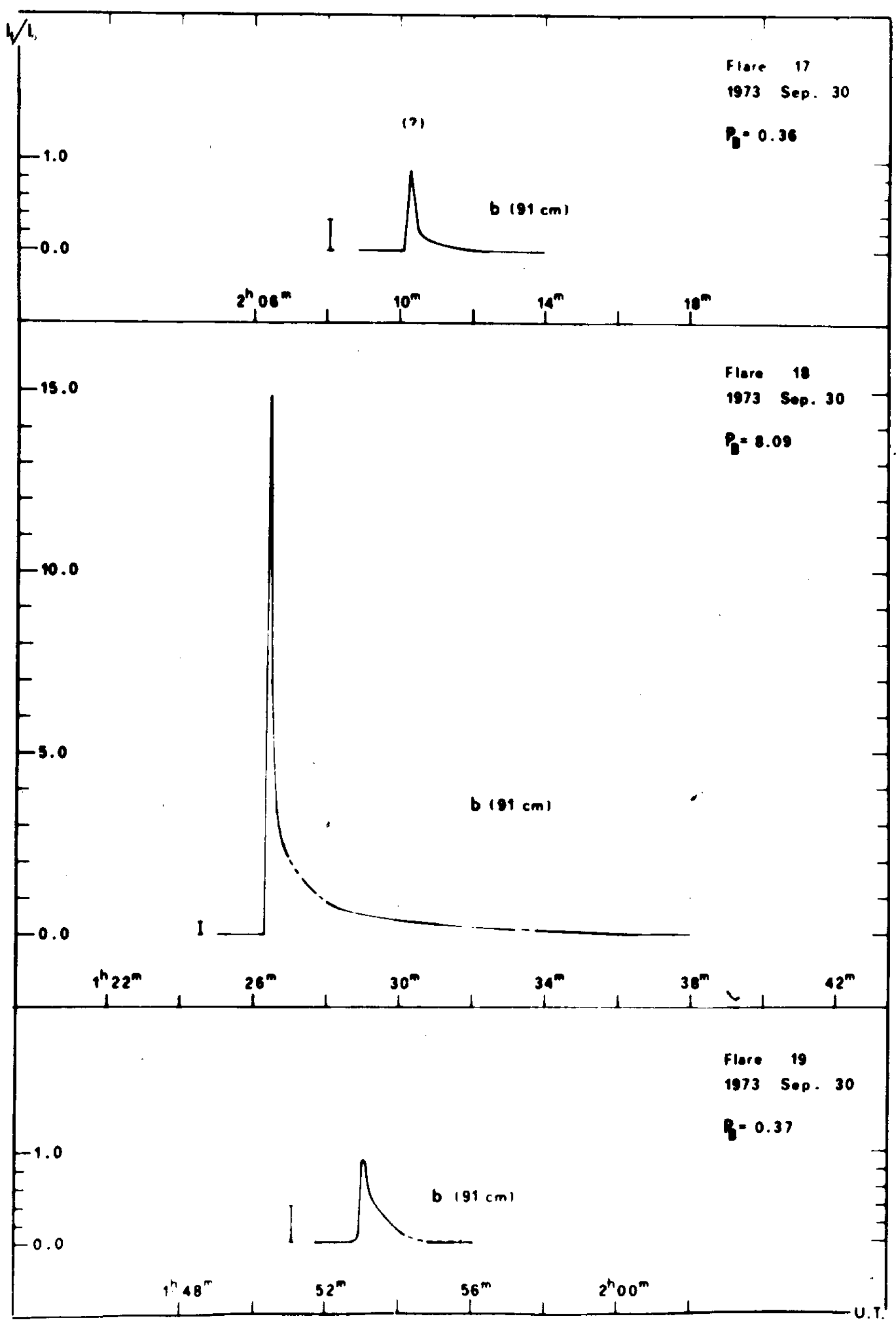
I₁/I₀
Flare 9
1973 Sep. 22
P_B = (42,10)
25.0
20.0
15.0
10.0
5.0
0.0
a
b
c
d
b (91 cm)
22h16m
20m
24m
28m
32m
U.T.

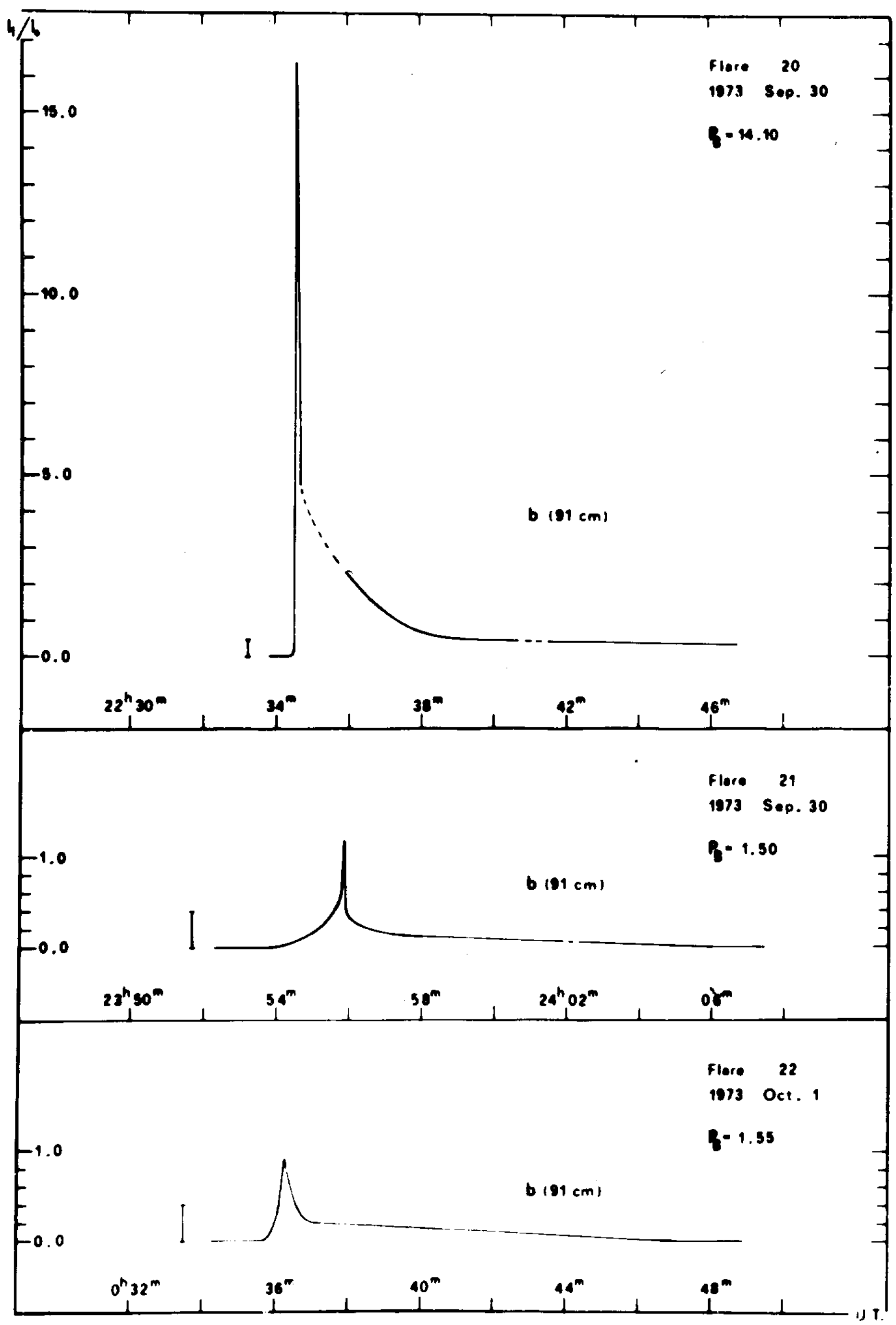


I₁/I₀
Flare 10
1973 Sep 23
P_B = 126.47
20.0
15.0
10.0
5.0
0.0
a
b
c
d
e
b (91 cm)
23h 30m
40m
50m
24h 00m
10m
20m
30m
40m
50m
U.T.

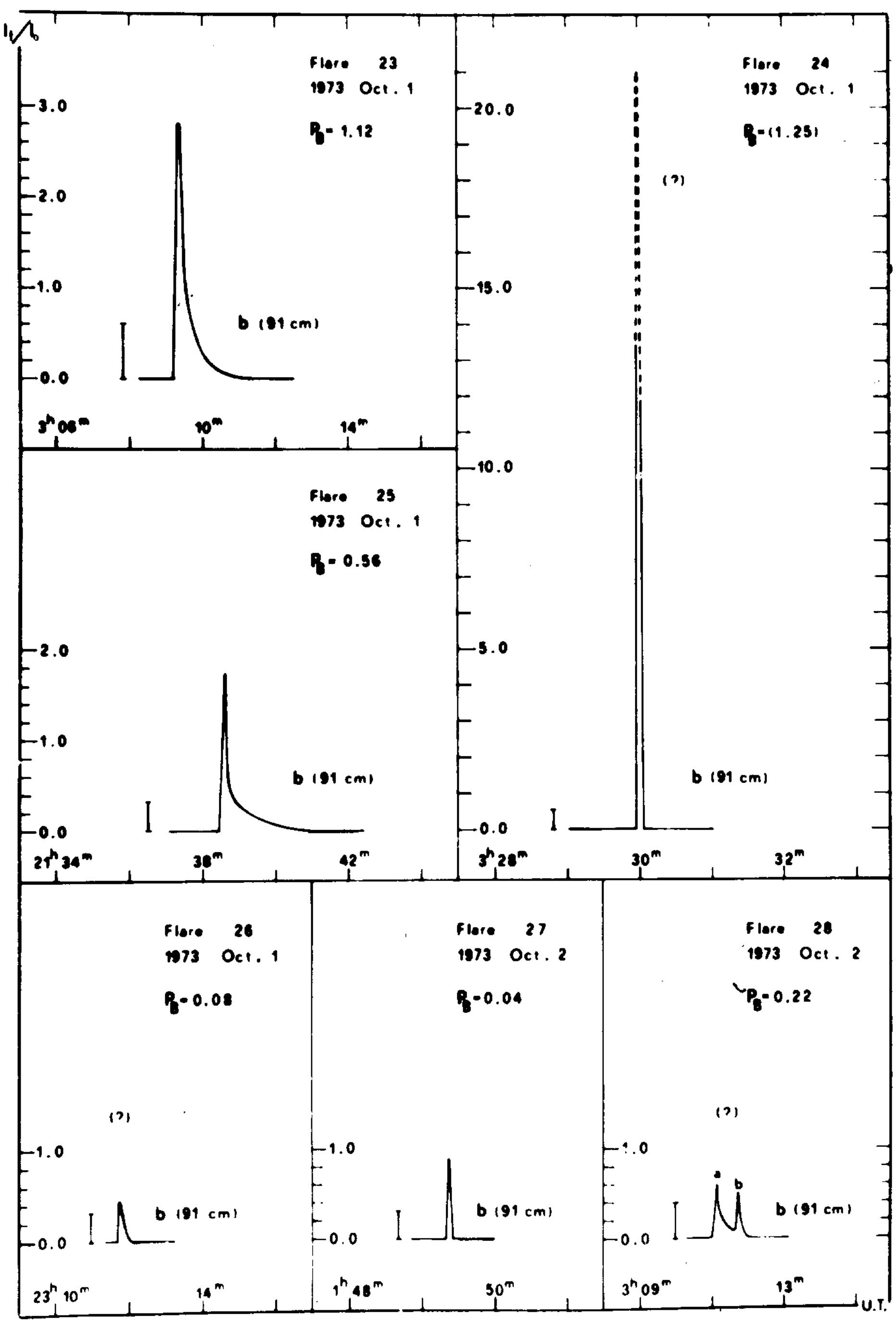


I_f/I
Flare 11
1973 Sep. 24
P_B = 0.27
1.0
0.0
(?)
b (91 cm)
0h48m
52m
56m
Flare 12
1973 Sep. 29
P_B = 2.11
a
b
b (91 cm)
0h04m
08m
12m
Flares 13-14
1973 Sep. 29
P_B (13) = 1.03
P_B (14) = 0.40
4.0
3.0
2.0
b (91 cm)
0h30m
34m
38m
42m
46m
Flare 15
1973 Sep. 29
P_B = (5.25)
b (91 cm)
1h04m
08m
12m
16m
20m
24m
28m
Flare 16
1973 Sep. 29
P_B = 0.27
(?)
b 91 cm
2h24m
28m
U.T.

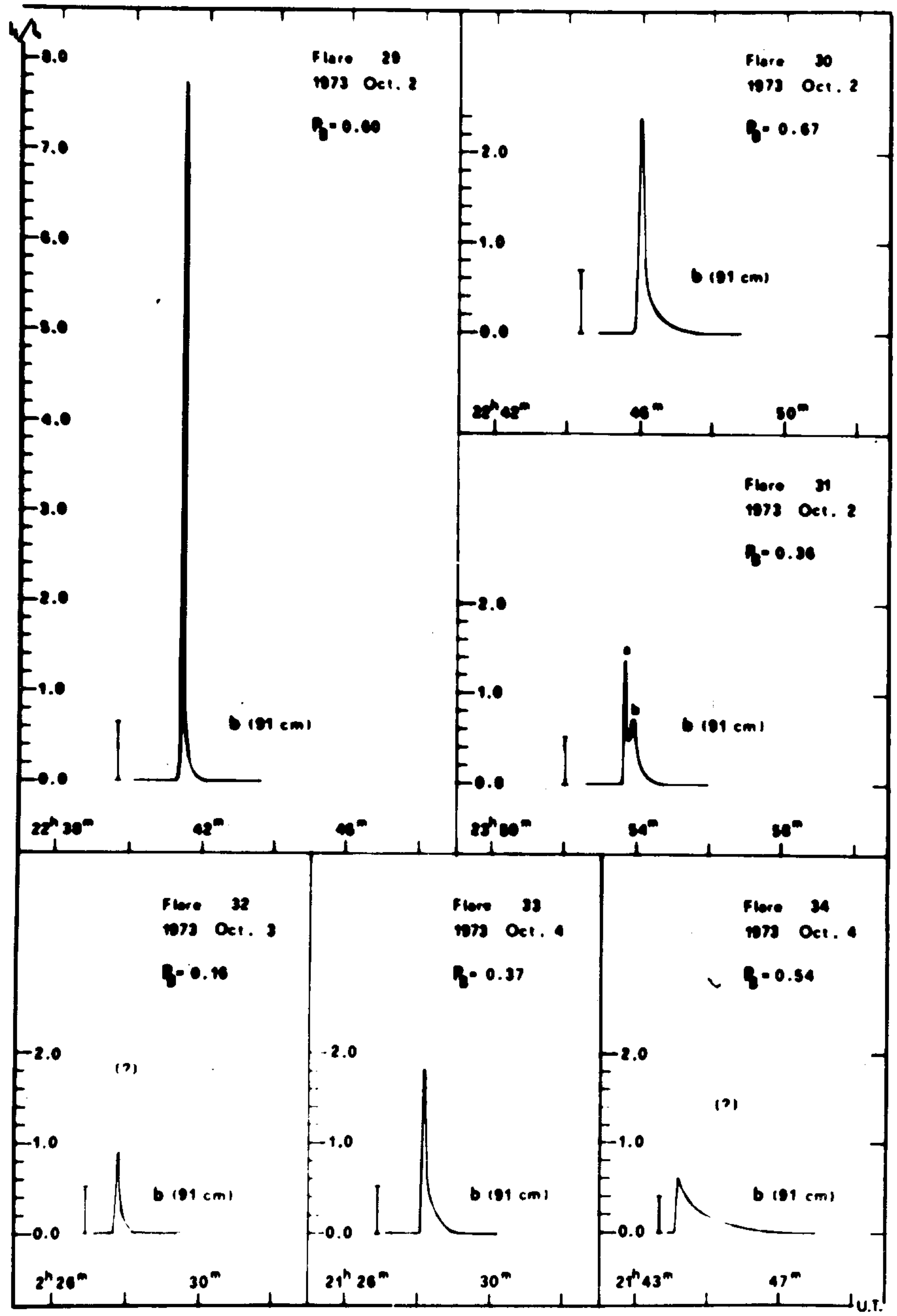

I/I
Flare 17
1973 Sep. 30
(?)
1.0
b (91 cm)
0.0
2h 06m
10m
14m
18m
Flare 18
1973 Sep. 30
15.0
10.0
5.0
b (91 cm)
0.0
1h 22m
26m
30m
34m
38m
42m
Flare 19
1973 Sep. 30
1.0
b (91 cm)
0.0
1h 48m
52m
56m
2h 00m
U.T.



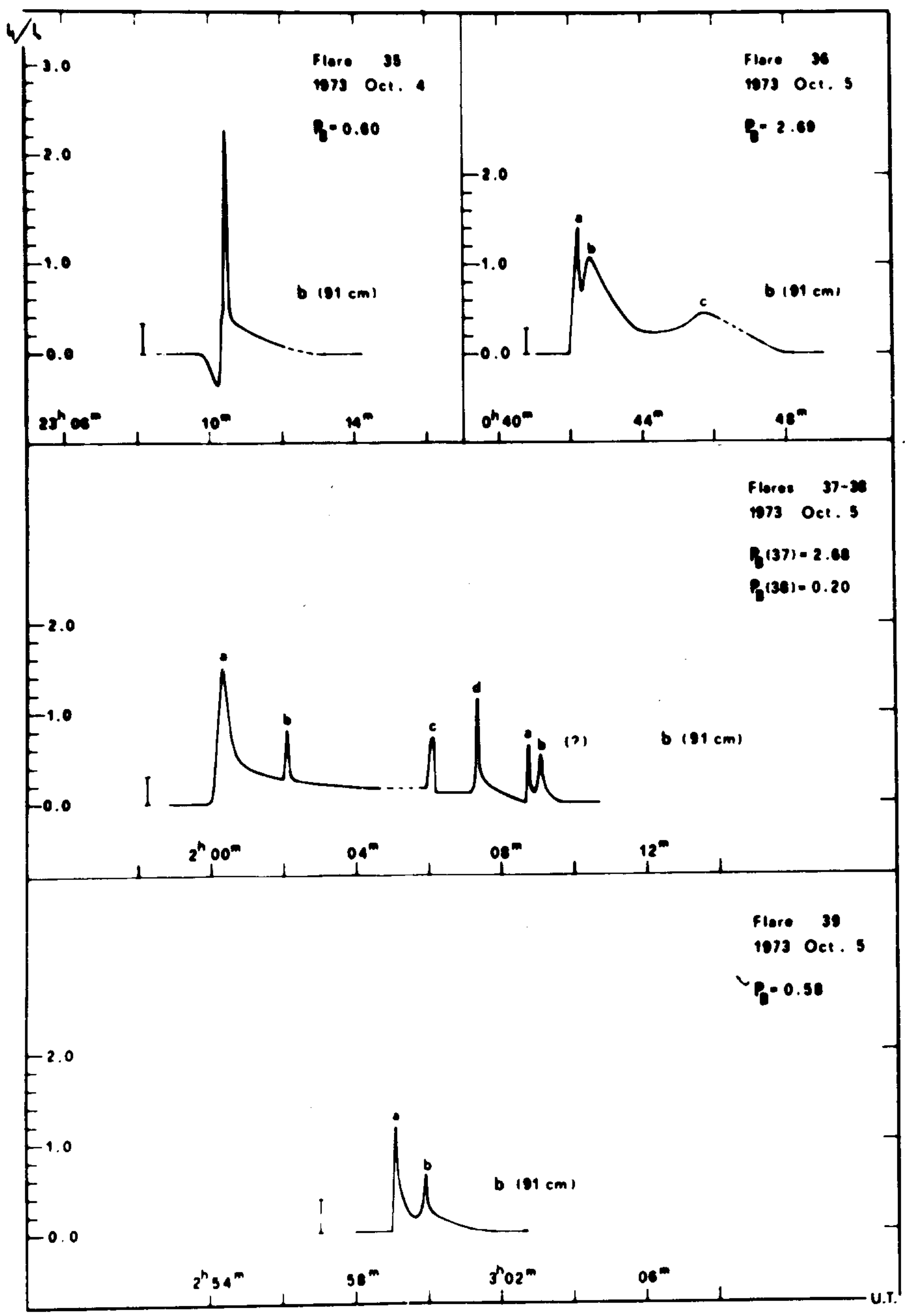
I_f/I_0
Flare 20
1973 Sep. 30
P_s = 14.10
15.0
10.0
5.0
0.0
b (91 cm)
22h30m
34m
38m
42m
46m
Flare 21
1973 Sep. 30
P_s = 1.50
1.0
0.0
b (91 cm)
23h50m
54m
58m
24h02m
06m
Flare 22
1973 Oct. 1
P_s = 1.55
1.0
0.0
b (91 cm)
0h32m
36m
40m
44m
48m
U.T.



I/I₀
Flare 23
1973 Oct. 1
P_B = 1.12
b (91 cm)
3ʰ 06ᵐ
10ᵐ
14ᵐ
Flare 24
1973 Oct. 1
P_B = (1.25)
(?)
b (91 cm)
3ʰ 28ᵐ
30ᵐ
32ᵐ
Flare 25
1973 Oct. 1
P_B = 0.56
b (91 cm)
21ʰ 34ᵐ
38ᵐ
42ᵐ
Flare 26
1973 Oct. 1
P_B = 0.08
(?)
b (91 cm)
23ʰ 10ᵐ
14ᵐ
Flare 27
1973 Oct. 2
P_B = 0.04
b (91 cm)
1ʰ 48ᵐ
50ᵐ
Flare 28
1973 Oct. 2
P_B = 0.22
(?)
a
b
b (91 cm)
3ʰ 09ᵐ
13ᵐ
U.T.



Flare 29
1973 Oct. 2
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
b (91 cm)
42m
46m
Flare 30
1973 Oct. 2
R_B = 0.67
2.0
1.0
0.0
b (91 cm)
46m
50m
Flare 31
1973 Oct. 2
R_B = 0.36
2.0
1.0
0.0
a
b
b (91 cm)
54m
58m
Flare 32
1973 Oct. 3
R_B = 0.16
2.0
1.0
0.0
(?)
b (91 cm)
2h 26m
30m
Flare 33
1973 Oct. 4
R_B = 0.37
2.0
1.0
0.0
b (91 cm)
21h 26m
30m
Flare 34
1973 Oct. 4
R_B = 0.54
2.0
1.0
0.0
(?)
b (91 cm)
21h 43m
47m
U.T.


I/I
3.0
2.0
1.0
0.0
Flare 35
1973 Oct. 4
P_B = 0.60
b (91 cm)
23h 06m
10m
14m
Flare 36
1973 Oct. 5
P_B = 2.60
a
b
c
b (91 cm)
0h 40m
44m
48m
Flares 37-38
1973 Oct. 5
P_B(37) = 2.68
P_B(38) = 0.20
a
b
c
d
a
b
(?)
b (91 cm)
2h 00m
04m
08m
12m
Flare 39
1973 Oct. 5
P_B = 0.58
a
b
b (91 cm)
2h 54m
58m
3h 02m
06m
U.T.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

NUMBER 858

Konkoly Observatory
Budapest
1974 January 7

THE SPECTRUM OF BC DRACONIS

BC Draconis = Bamberg Variable No.222, found by Strohmeier (Kl.Ver.Bamberg, No.23.,1958) and identified as a cepheid with P = 2.566033 days by Strohmeier and Knigge (Veröff.Bamberg No.5, No. 11, p.5,1961), has been reported to have a late B spectral type (Götz and Wenzel, Mitt.Ver.St.,2,85,1964). Its galactic latitude is +28.5.

In an effort to resolve the apparent discrepancy between the spectral type and variable class the star was observed with the 36-inch Cassegrain grating spectrograph and Westinghouse image tube. A spectrogram at 100 A/mm was obtained on each of three nights; October 23, 24 and 27, 1973. The epoch of maximum and the period given by Strohmeier and Knigge indicate that the observations were made at phases .178, .550, and .731 respectively. The low resolution of the spectrograms does not permit a luminosity classification but all three show the temperature class of the star to be about F5, consistent with the cepheid interpretation of the light curve.

For log P = 0.4 the period-luminosity relation for classical cepheids (Allén, Astrophys.Quantities,2nd.ed.,p.210,1963) gives $M_B = -2.2$. The photographic interstellar extinction in the region of BC Draconis is approximately 1.1 magnitudes (Shane and Wirtanen, Pub.Lick Obs.,22,part 1,1967). Therefore, from its mean apparent photographic magnitude of 11,7 the star is found to be at a distance of 3630 pc and 1730 pc above the galactic plane. From the period-luminosity relation for W Virginis stars ($M_B = -0.9$) the corresponding distances are 2000 pc and 950 pc. It appears that the star is a Population II cepheid although this has not been confirmed spectroscopically.

NELSON J. IRVINE

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 859

Konkoly Observatory
Budapest
1974 January 8

FIVE MORE VARIABLE STARS IN NGC 6402

Twelve new variable stars in NGC 6402 (M14) were recently discovered and announced (1) as a result of investigating those stars which were known to fall in the variable star gap. The plates which were used in that earlier study have now been blinked and five more variables found.

In the table below, the coordinates x and y were measured using the system of reference originally used by Helen Sawyer (2). The B magnitudes were determined using standards given in Demers and Wehlau (3). Since most of these variables are not seen at maximum on the few plates available, the values given in the table for maximum are probably low.

Var.No.	x	y	max.	min.
89	-19	-17	17.55	18.00
90	-39	-31	17.65	18.60
91	-96	-39	17.75	18.45
92	-47	+40	17.65	18.40:
93	-17	+29	17.65	18.25

A.WEHLAU, L.DAVIS, and N.POTTS
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London, Ontario, Canada.

(1) Wehlau, A. and Potts, N.,1972, I.B.V.S. No.752.
(2) Sawyer, H.B. 1938, Pub. Dom. Ap. O. 7, 121.
(3) Demers, S. and Wehlau, A. 1971, Astron. J. 76, 916.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 860

Konkoly Observatory
Budapest
1974 January 9

FURTHER OBSERVATION OF RAPID OSCILLATIONS IN VW Hyi

During the supermaximum of VW Hyi in December 1972, oscillations of VW Hyi were observed with periods in the range 28 to 34 secs (Warner and Harwood, IBVS No.756, 1973; Warner and Brickhill, MNRAS, in press).

A further supermaximum started on November 22, 1973 and we have observed this extensively using the McClean 24 inch refractor in Cape Town and the Elizabeth 40 inch reflector at Sutherland. As with the previously observed supermaximum, no oscillations were detected throughout the maximum of the outburst, but rapid periodic variations were seen on 6th December 1973 when VW Hyi was well down the recovery part of its light curve.

The behaviour is quite complex, with evidence of changes in period. Periods of 31.0 and 33.6 secs are seen in power spectra of the light curve. These were present at the beginning of the observing run but died out during the run. A detailed analysis is being undertaken.

Department of Astronomy,
University of Cape Town,
20th December, 1973.

B. WARNER
G.W. VAN CITTERS
A.J. BRICKHILL
P.R. HURLY
A.R. WALKER

NOVA IN LARGE MAGELLANIC CLOUD

J.A. Graham reported in IAU Circ. 2605 the discovery of a nova in the L.M.C. at (1975) $5^h15.5^m$ $-69^o41'$.

An examination of patrol photographs by B. Ward (Tirau) and R. North (Blenheim) provide the following observations:

1973 Oct.	29 U.T.	Nova invisible < 13 ptg.	B.Ward
Nov.	16.44 U.T.	Nova invisible < 13.3 ptg.	R.North
	19.43 U.T.	Nova = 13.4 ptg.	R.North
	26.36 U.T.	Nova = 11.6 ptg.	B.Ward

Magnitudes were determined by comparison with the sequence by Bok and Bok (MNRAS, 121, 1960). R.L. Millington, Carter Observatory, reported the nova at magnitude 14.0 visual on December 7.

1973 Dec.26

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Tauranga, N.Z.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 861

Konkoly Observatory
Budapest
1974 January 11

NEW SPECTRAL CLASSIFICATIONS FOR VARIABLES WRONGLY SUSPECTED OF BEING CARBON STARS

The following named variable stars either have published spectral classifications as carbon stars, or are near enough to known carbon stars to suggest that they may be identical with them; the published C classifications, where they exist, are cited here. My classifications were performed on red-region objective prism plates.

Star	Warner and Swasey type	Type in GCVS	Notes
IM Cyg	M8		
ER Del	S	M2	1
V512 Ori	M4		
BZ Pup	M5		2
EP Vul	S	K5e	3

Notes: (1) Called N: in Publs. McCormick Observatory, Vol.13. (2) Only 80" west of star No. 975 in my General Catalogue of Cool Carbon Stars. Not included in the reference cited for it in the GCVS, 3d ed.; the correct reference appears to be Dirks, BAN 339, 202. (3) Called C in Mitt. Veränd.Sterne, No. 386.

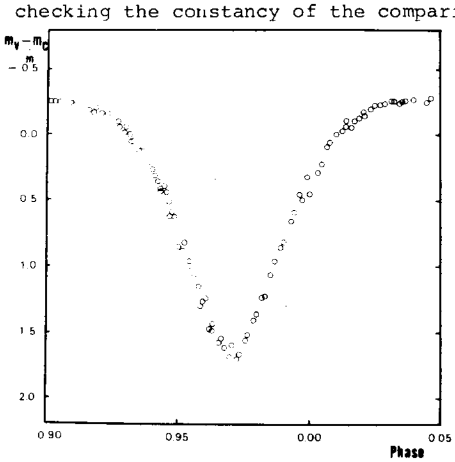
C.B. STEPHENSON
Warner and Swasey Observatory

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 862

Konkoly Observatory
Budapest
1974 January 14

PHOTOELECTRIC MINIMA OF THE ECLIPSING VARIABLE T LEO MINORIS

The 10th magnitude eclipsing variable T LMi was observed photoelectrically with the 36-inch reflectors at the Dodaira Station of Tokyo Astronomical Observatory and at the Okayama Astrophysical Observatory on twenty nights during the winters of 1972-73 and 1973-74. The standard UBV colour filters were used. BD+34°2032 was used as the primary comparison star through the observations, and BD+33°1905 was occasionally observed for checking the constancy of the comparison star.



The whole UBV light curve was covered and it is found that the depth of the primary minimum in V is $1^m.92$, being different from the value $2^m.48$ previously reported by McDiarmid, Princ. Contr. 7, 43, 1924. The corresponding depths in U and B are $2^m.76$ and $2^m.50$ respectively. A shallow secondary minimum was also detected. The figure shows the light variation in V for the primary minimum. Two epochs of the observed minima were obtained as

JD(Hel) 2441725.1811, O-C = $-0^d.0890$,
and JD(Hel) 2442042.2719 O-C = $-0^d.0912$,

where the O-C residuals are calculated from the light elements JD 2423856.323+$3^d.0199336$E taken from the GCVS (1970).

Further photoelectric observations are being done. Some image-intensified coudé spectra were also taken with the 74-inch reflector at the Okayama Astrophysical Observatory.

1974 January 4

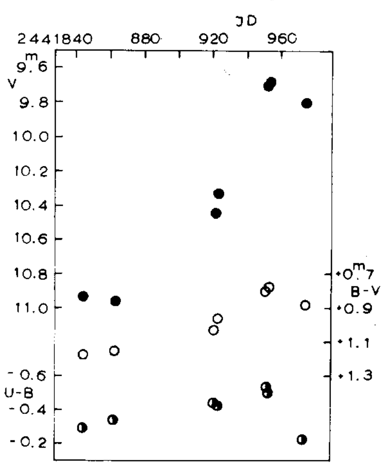
A.OKAZAKI, University of Tokyo and
M.KITAMURA, Tokyo Astronomical Observatory.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 863

Konkoly Observatory
Budapest
1974 January 16

ON THE LIGHT VARIATIONS OF CI Cyg IN 1973

Photographic observations of the symbiotic star CI Cyg through 1890-1967 showed light variations with a period equal to 855^d and an amplitude of about 1 magn. having considerable dispersion (m_{pg} $0\overset{m}{.}5$) (N.K.G.Greenstein HB 906,5,1937;L.H.Aller Publ.Astroph.Obs.9,343, 1954; D.Hoffleit Irish Astr.J.8 149, 1968.) .The form of the light-curve was stable enough.However, two outburst were noted in 1911 and 1937 when the brightness of the star reached $m_{pg}=10\overset{m}{.}7$ and $m_{pg}=10\overset{m}{.}2$ respectively.The duration of each outburst was about 200^d.In 1971-72 the brightness of CI Cyg increased once again up to $m_{pg}=9\overset{m}{.}9$ (W.M.Lowder IAU Circ.2335,1971;D.Hoffleit IAU Circ.2336,1971;F.M.Stienon BAAS 5,17,1973;M.W.Mayall J.R. A.S. Canada 67,101,1973).



Through 1973 June-October 7 UBV observations of CI Cyg were made at the Crimean Astrophysical Observatory. These observations (s.Fig.) showed an outburst during this period.The maximal brightness was about $9\overset{m}{.}7$ in V, $10\overset{m}{.}5$ in B, which is close to the photographic magnitude.

Thus a considerable increase of CI Cyg was observed twice during 1971-1973. That indicates a possible increase of the activity of this star as far as during 1890-1967 only two outbusts were noted. It should be noted that the outbursts of 1911 and 1937 occurred at the maximum of the composite light-curve and outbursts of 1971-72 and 1973 arised immediately after the minimum.

Crimean Astrophysical
Observatory

T.S. BELYAKINA

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 864
Konkoly Observatory
Budapest
1974 January 25

AN ORBITAL PERIOD FOR VW HYDRI

The dwarf nova VW Hyi has been observed since 1968 at the Auckland Observatory using the 50 cm telescope and associated photoelectric equipment. Although this system does not exhibit eclipses, in earlier papers in "Southern Stars" we drew attention to repetetive features in the light curve which indicated a period of around 100 minutes. More extensive observations now indicate a period of 106.95 minutes.

We have extended our series of observations to provide a base line of over 25,000 cycles. Using all these which show unambiguous repetitive features, as listed in Table I, we have derived the elements given below for a bright regular feature of the light curve. Our curves have not been treated to remove the

Table I Observed Times of Peak on 'Minimum Light' Light-Curves

HJD 2440000+	Cycle No.	O - C	HJD 2440000+	Cycle No.	O - C
128.0222	0		1620.8785	20100	+0.0072
128.0953	1	-0.0012	1620.9549	20101	+0.0093
394.1375	3583	+0.0021	1633.9444	20276	+0.0014
394.2153	3584	+0.0055	1634.0177	20277	+0.0004
456.0826	4417	+0.0050	1778.9264	22228	+0.0062
456.1581	4418	+0.0062	2005.8924	25284	-0.0003
470.1125	4606	-0.0024	2005.9661	25285	-0.0009
484.0049	4793	+0.0013	2006.0404	25286	-0.0008
484.1549	4795	+0.0028	2006.9316	25298	-0.0009

well known rapid irregular flickering which is present in VW Hyi, as in other cataclysmic variables.

Elements: H.J.D. 2,440,128.0222 + $0^d.0742711$ E
$\pm$ 0.0000002

These elements provide a reliable ephemeris for the system at minimum light, subject to the expected uncertainties of a feature of this type. Figures 1 and 2 show typical light curves. The points shown are from 30 second integrations in white light

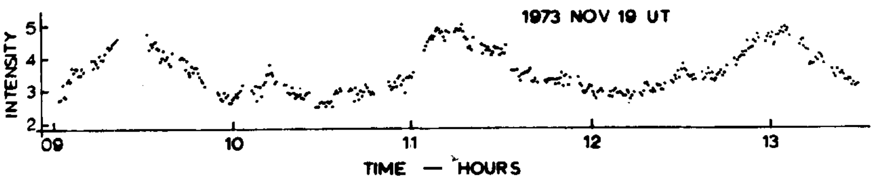


FIGURE 1

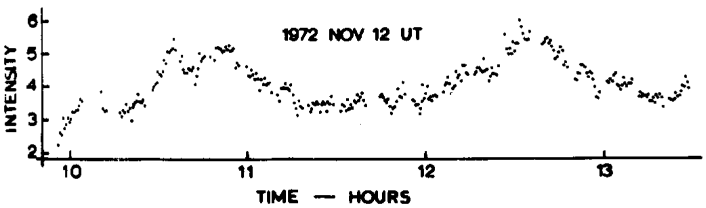


FIGURE 2

using a blue-sensitive EMI 9502 photomultiplier tube.

Once the star brightens more than two magnitudes (as during outbursts) this feature quickly disappears. It may be replaced by other similar appearing peaks but these are usually displaced in phase and cannot be fitted with any degree of certainty to the foregoing elements. Table II lists some features observed during the recent supermaximum outburst. These show a change

Table II Observed Times of Peak on 'Minimum Light' Light-Curves

HJD 2442000+	Cycle No.	O-C	Phase	HJD 2442000+	Cycle No.	O-C	Phase
010.9632	25352	+0.0201	0.27	020.0198	25474	+0.0156	0.21
011.0368	25353	+0.0194	0.26	020.9383	25486	+0.0428	0.58
011.1097	25354	+0.0180	0.24	020.9638	25487	+0.0059	0.08
012.8924	25378	+0.0182	0.25	021.0157	25487	+0.0460	0.62
012.9660	25379	+0.0176	0.24	021.9322	25500	+0.0031	0.04
019.8885	25472	+0.0328	0.44	021.9611	25500	+0.0258	0.35
019.9448	25473	+0.0149	0.20	022.0047	25501	-0.0048	0.94
019.9684	25473	+0.0385	0.52	022.0385	25501	+0.0290	0.39

in phase, and in some cases an occurrence of more than one peak per cycle. Generally the quiescent peaks are 0.5 to 0.9 magnitudes amplitude. Those noted in Table II are pretty much the same but tended to reduce in amplitude in the later stages.

At times the system exhibits flare-like behaviour which can completely submerge the more normal light peak. This is especially pronounced at times between phase 0.60 and 0.90. A small 'flare' of this type is shown in Figure 2. Confusion over these, and attempts to fit the peaks occurring during outbursts, can lead to a variety of incorrect orbital periods for this star, and led to our earlier, too short, period.

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References:

Southern Stars Vol. 23 No. 6 p 124 Dwarf Novae and the Auckland Observatory Programme - W.S.G. Walker.

Southern Stars Vol. 24 No. 7 o 126-129 An Outburst of VW Hydri Brian F. Marino and W.S.G. Walker.

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 865

Konkoly Observatory
Budapest
1974 February 6

PERIODICAL COMPONENT IN THE LIGHT CURVE OF R CORONAE AUSTRINAE

R CrA undoubtedly belongs to the class of Ins variable stars. This is confirmed by its connection with a cometary nebula, rapid irregular variations of its brightness and its spectral peculiarities. But by the method of sliding differences (1,2) a periodical component in the light variations of the star was discovered. Fig.1 shows the mean difference as a function of time interval. The long sequence of Jones' observations (3) was used. The brightness is expressed in intensity scale.

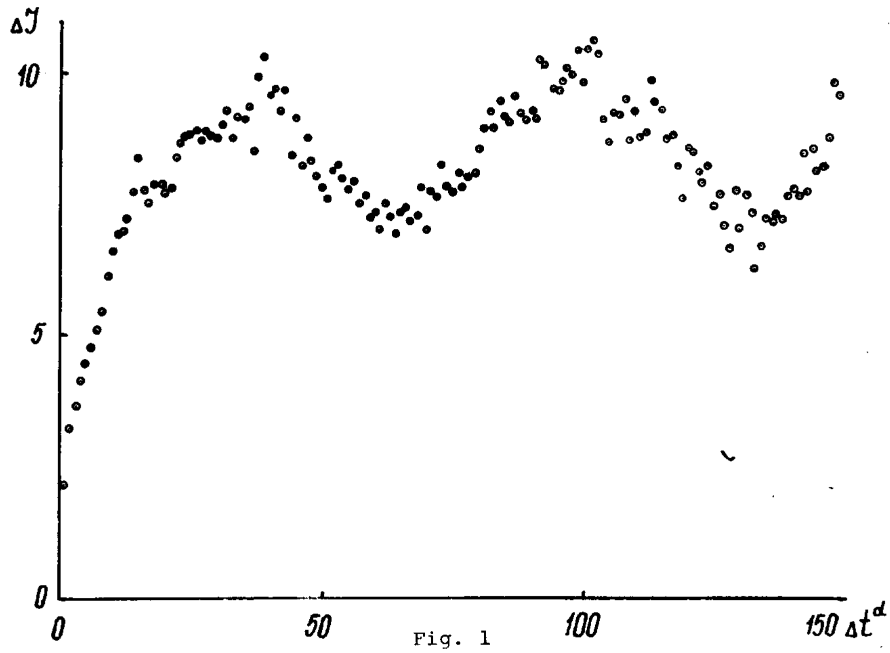


Fig. 1

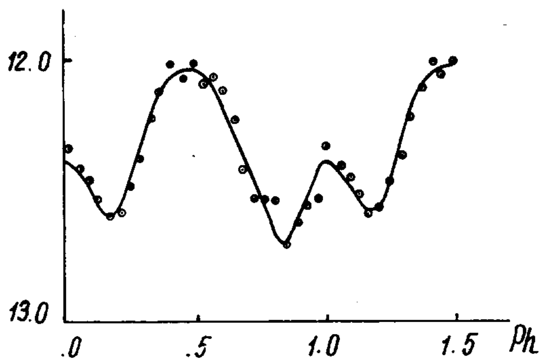


Fig. 2

Each point is obtained from 310 differences in average.

The regularity cannot be explained by axial rotation of the star by analogy with RW Aur (2). The curve considerably differs from analogous curves for the solar activity and RW Aur. Instead of fading of the amplitude with increasing time interval one can see its rise. A drift of the second minimum in the direction of the longer time intervals is also absent. Absence of the fading of the mean difference curve and an accurate multiplicity of the time intervals between the first and the second minima can be explained by some periodical light variations with a constant initial phase. We have found

$$Max_2 = 2426497 + 65^d.67\ E$$

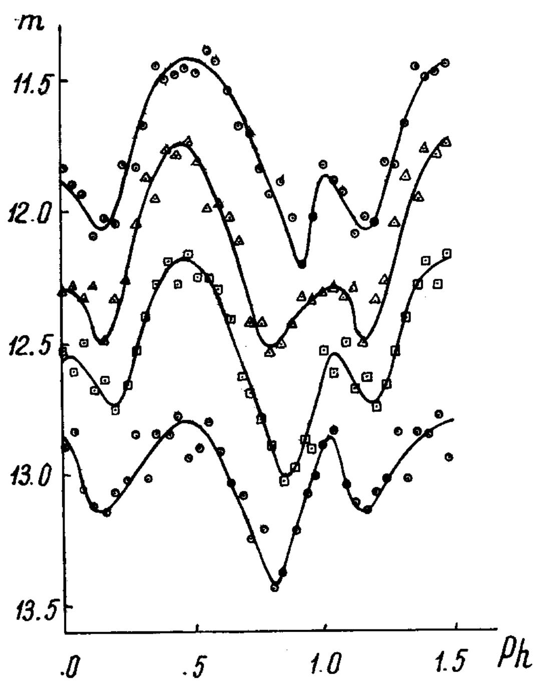
and obtained the mean curve (Fig.2).

The curve is obtained from all the published observations(n=3407, JD 2426537 - 2440861). The very large dispersion of the mean curve ($\Delta m = \pm 0^m.6$) considerably exceeds the probable accidental error of the observations.

Fig.2 shows a peculiarity of the light curve. It consists of two light waves with maxima a half of the period away. The waves differ from each other in amplitude. The first is larger than the second. The main maximum has a symmetrical shape.

A relation between the light curve shape and the mean brightness is detected. The curves for four intervals of mean brightness are shown in Fig.3. As the brightness weakens the difference between the two maximum heights decreases.

The brightness of the star has two fluctuations. Regular fluctuations interfere with rapid and irregular ones. The amplitude of the periodical fluctuations is some three times smaller



than the amplitude of the irregular fluctuations. Herein is the reason why the periodicity in the britghtness variations was unknown though there are long sequences of observations.

It is not probable that a star has both periodical pulsations and irregular light variations with larger amplitude simultaneously. Duplicity of the star is more obvious.

It is impossible to work out a model of a system only on the base of visual estimates of a star brightness without accurate colorimetric and spectral data. The light variations of the system are evidently under the influence of a gas nebula into which it is immersed.

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Physics department of the Tashkent
Electrotechnical Institute of
Communications.

References

1 I.M. Ishchenko, VS 16, No.2, 157, 1967.
2 I.M. Ishchenko, VS 18, No.3, 293, 1972.
3 Jones A., NZAS Circ.No.23-133.

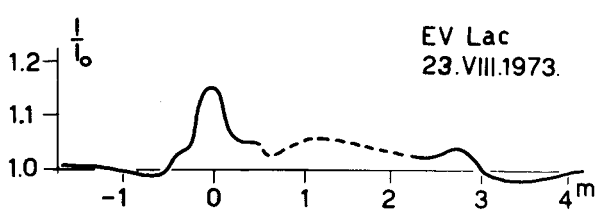
COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 866

Konkoly Observatory
Budapest
1974 February 7

PHOTOELECTRIC OBSERVATIONS OF EV Lac DURING
THE 1973 INTERNATIONAL PATROL

EV Lac was photoelectrically monitored at the Belgrade Observatory during the night 1973 August 22/23 within the international patrol interval.

The observations lasted for 163 minutes covering the following time intervals: 00 04 - 00 45; 00 57 - 01 19 and 01 22 - 03 02 UT. The observations were made in the V spectral region using an EMI 9502 S photomultiplier and GG-11 filter at the 65-cm refractor. The accuracy of the flare detection can be described by the error σ_m= 0.010, and the limiting magnitude difference Δm_{lim}= +3.8 (the symbols have been explained in IBVS No 627).



A flare with intensity maximum at $0^h27^m_.9$ UT has been noticed. The light curve is shown in Figure 1. The dashed part of the curve has been only approximately recorded because of guiding difficulties. The other characteristics of the flare are: the intensity rise time $\Delta t_1=0^m_.5$, the duration of the flare after the maximum $\Delta t_2=3^m_.0$, the maximum brightness difference Δm_f=0.154 magnitudes, the integrated intensity $P=0^m_.172$ and the air mass X=1.050.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 867

Konkoly Observatory
Budapest
1974 February 8

V 445 Cas IS AN ECLIPSING VARIABLE

The variable star V 445 Cas (=Wr 172) discovered by Weber (IBVS No 230,1967) was reported to be a cepheid variable probably with a short period. This variable star was observed photoelectrically with the 20 inch Cassegrain reflector of the Konkoly Observatory at the Piszkéstető Mountain Station. The stars BD +52°87 and BD +52°84 were used as comparison and check stars, respectively. According my tie-in observations made on a not quite uniform night, the magnitudes and colours of the comparison and check stars are as follow:

	V	B-V
BD +52°87	$10^m.91$	$0^m.51$
BD +52°84	$10^m.53$	$1^m.41$

My photoelectric observations transformed to the UBV international system are listed in the Table.

According to my observations the star is a β Lyrae type eclipsing binary with the following elements:

Min I = J.D. 2441921.3782 + $0^d.67352 \cdot E$

The depth of the primary minimum is about $0^m.42$ while that of secondary minimum is $0^m.19$ in V light. The B-V colour does not vary noticeably during the eclipses, ie. both components are of about the same spectral type.

The light and colour curves are shown in the Figure.

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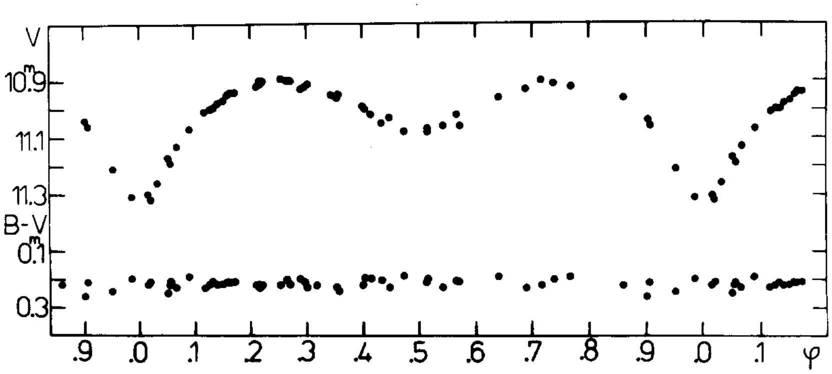
J.D.2441000+	V	B-V	J.D.2441000+	V	B-V
596.4330	$11^m.06$	$0^m.23$	917.4818	$10^m.90$	$0^m.22$
597.4360	11.26	.27:	.5151	10.90	.20
.5246	10.94	.21	.5679	10.95	.22
625.2692	10.95	.24	918.3567	11.08	.20
.3207	11.05	.21	.4749	10.93	.23
.3754	11.07	.21	.5067	10.91	.20
.4143	11.06	.21	921.3114	11.04	.26
629.2525	10.90	.22	.3453	11.21	.24
631.3696	11.02	.20	.3883	11.30	.22
634.3010	10.92	.19	.4223	11.13	.23
.3635	10.96	.22	.4629	11.00	.22
650.3304	11.02	.21	.4941	10.94	.21
.3804	10.96	.19	.5267	10.90	.22
.4325	10.90	.22	.5486	10.89	.22
651.2332	11.06	.21	.5815	10.91	.23
.3304	11.17	.25	944.2679	11.31	.20
.3908	10.98	.22	.2908	11.32	.21
662.2198	10.91	.23	.3144	11.19	.22
.2672	10.93	.20	.3380	11.07	.19
.3445	11.00	.20	.3658	11.00	.21
689.2130	10.92	.21	.3839	10.95	.21
.2512	10.96	.23	.4199	10.92	.22
917.3741	11.19	.21	949.2610	10.99	.22
.4151	11.01	.23	.2932	11.03	.23
.4378	10.97	.22	.3112	11.08	.19



COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 868

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Budapest
1974 February 10

THE PECULIAR VARIABLE STAR V 361 Per

The variability of the star BD +55° 605=HD 14605 was discovered by Weber (1). The preliminary notation of this variable was Wr 175. In the First Supplement to the GCVS (2) it received the final name V 361 Per. On the basis of Weber's observations the star was catalogued as probably cepheid.

This variable star was observed photoelectrically in three colours of the UBV system using the 24 inch reflector at Budapest and the 20 inch Cassegrain reflector at the Piszkéstető Mountain Station of the Konkoly Observatory during the winters of 1972-73 and 1973-74.

The comparison and check stars were BD +55° 596 and BD +55°587, respectively. The magnitude and colours of the check star were taken from the Photoelectric Catalogue of Blanco et al. (3). The comparison star BD +55° 596 was tied-in to the UBV system on four nights. The adopted magnitudes and colours of the comparison and the check stars are listed below :

	V	B-V	U-B
BD +55°587	$8^m.57$	$+0^m.26$	$-0^m.56$
BD +55°596	9.46	+0.34	+0.08

It is worthy of note that the variable is also included in this catalogue (No 2450) because at the time of its compilation there was no information about the variability of HD 14605.

The spectral type of the variable published in the Henry Draper Catalogue, in the Photoelectric Catalogue and in the paper of Schild (4) is O5e, B 0.5 V p and B 1.5 III, respectively, ie.this variable cannot be a cepheid!

In order to study the true behaviour of this variable I observed the star on 53 nights. The observations are listed in the Table. Some nights at the beginning of the first observational season two observations were obtained, which did not reveal any rapid variations in the light of V 361 Per. It could also be seen if a period existed at all it should have been longer than several days. The further observations, however, showed that the variable star V 361 Per was an irregular variable. From the light and colour curve plotted in the Figure it can be seen that the B-V curve is almost the mirror image of that of the V curve, but with smaller amplitude, and the U-B colour curve resembles to the V curve. This is a well known feature of the late type irregular and long period variables. But this variable has an early type spectrum.

According to Schild (4) V 361 Per=HD 14605 is just in the core contraction phase and is a member of h and χ Per. Lavdovsky's proper motion data (5), however, do not confirm the membership.

The complicate behaviour of this variable makes it an attractive object for further photometric and spectroscopic observations.

I wish to express thanks to Dr.B.Szeidl for helpful discussions.

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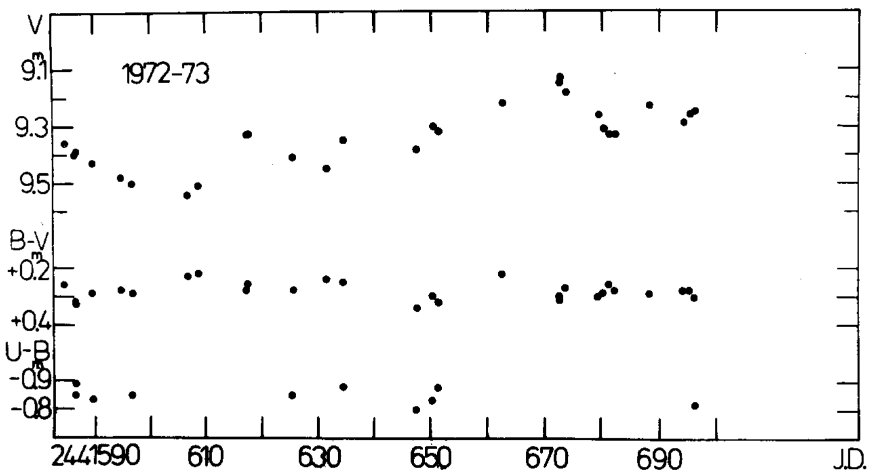
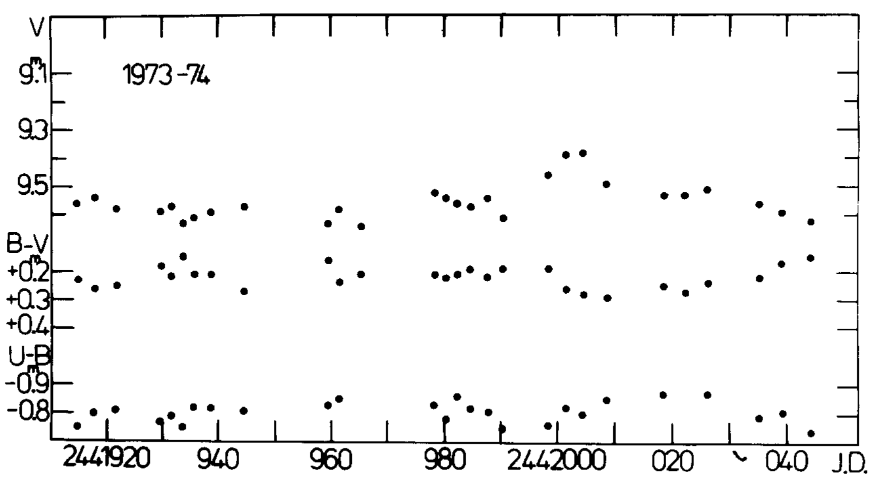
References:

1 Weber R. IBVS, No 230, 1967
2 Kukarkin B.W. et al. First Suppl. to the Third Edition of the GCVS, 1971.
3 Blanco V.M. et al., Publ.of the US Naval Obs.II S.Vol 21, 1968.
4 Schild R.E., Ap.J., 146, 142, 1966.
5 Lavdovsky V.V., Pulkovo Trudy II S., 73, 76, 1961.


V
9.1
1972-73
9.3
9.5
B-V
+0.2
+0.4
U-B
-0.9
-0.8
2441590
610
630
650
670
690
J.D.


V
9.1
1973-74
9.3
9.5
B-V
+0.2
+0.3
+0.4
U-B
-0.9
-0.8
2441920
940
960
980
2442000
020
040
J.D.

Observations

JD 2441000+	V	B-V	U-B	JD 2440000+	V	B-V	U-B
584.395	$9^{m}.36$	$+0^{m}.26$		1914.588	$9^{m}.56$	$+0^{m}.23$:	$-0^{m}.75$:
586.467	.40	.32	$-0^{m}.85$	1917.503	.54	.26	.80
.550	.39	.33	.89	1921.504	.58	.25	.79
589.568	.43	.29	.83	1929.574	.59	.18	.77
594.537	.48	.28		1931.518	.57	.22	.79
596.495	.50	.29	.85	1933.492	.63	.15	.75
606.506	.54	.23		1935.478	.61	.21	.82
608.503	.51	.22		1938.536	.59	.21	.82
617.333	.33	.28		1944.407	.57	.27	.81
.392	.33	.26		1959.433	.63	.16	.83
625.401	.41	.28	.85	1961.347	.58	.24	.85
631.426	.45	.24		1965.317	.64	.21	
634.405	.35	.25	.88	1978.319	.52	.21	.83
647.413	.38	.34:	.80:	1980.351	.54	.22	.78
650.285	.30	.30	.83	1982.365	.56	.21	.86
651.286	.32	.32	.88	1984.406	.57	.19	.82:
662.301	.22	.22		1987.657	.54	.22	.81:
672.249	.15	.30		1990.358	.61	.19	.75:
.360	.13	.31		1998.242	.46	.19	.76:
673.260	.18	.27		2001.397	.39	.26	.82
679.246	.26	.30:		2004.281	.38	.28	.80
680.249	.31	.29:		2008.543	.49	.29	.85
681.279	.33	.26		2018.483	.53	.25	.87
682.279	.33	.28:		2022.239	.53	.27:	
688.306	.23	.29		2026.244	.51	.24:	.87:
694.340	.29	.28		2035.331	.56	.22	.79
695.315	.26	.28:		2039.307	.59	.17	.81
696.246	.25	.30	.82	2044.237	.62	.15	.74:

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ON THE PERIOD OF U CEPHEI

In a recent issue of this Bulletin Hall (IBVS No.847,1973) pointed out that U Cephei would have suffered a very large increase of its period, $\Delta P/P = 6\times10^{-4}$. if one of our observations made in August 1969 (Bakos and Tremko, Bull.Astr.Inst.Czech.24,298, 1973) is correct. He also showed that with the exclusion of this particular observation all the other photoelectric epochs of minima satisfy a quadratic formula for the ephemeris of U Cep. As an explanation of the discrepancy, among other possibilities, it was suggested that the epoch of our observation could have been in error by 0.01 days.

In order to satisfy ourselves that no error has crept in our observations we re-checked every step of the reduction procedure starting from the original strip-chart records. We also made a new determination of the epoch of minimum of August 6/7, 1969 and of its internal mean error. The result is the following:

Primary minimum = J.D. hel. 2440440.51946 $\pm$ 0.00006,
the same as originally published.

It is, therefore, our conclusion that the observed increase of the period of U Cep at that particular time is real and we also do agree with the suggestion made by Batten (private communication) that the increase in the period is related to the distortion of the light curve at the time in question and to his observation of the emission in the spectrum of the star just a few weeks after our observation.

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Budapest
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1973 PHOTOMETRY OF V725 Sgr

The unique variable V725 Sgr was discovered by Swope (HA 105,499,1936) and re-observed in 1968 and 1969 by Demers (RASC Journ.67,19,1973). In 1926 the variable exhibited a 12-day periodicity which increased by approximately one day per year, reaching a maximum period of 21 days in 1935. Since 1935, however, V725 Sgr has only shown non-periodic variations of low amplitude.

V725 Sgr was observed during 1973 to determine whether the star is slowly becoming systematically brighter,as suggested by the 1968 and 1969 observations. The variable was observed seven times by visiting and resident astronomers using the 24" (60 cm) reflector of the University of Toronto at the Las Campanas Observatory of the Carnegie Institute of Washington. The observations are given in Table I, where $\Delta V = V(725) - V(1)$. Photoelectric measures were made during regular observing sessions. Photographic plates (103a-D+RG495 and 103a-O+GG385) were calibrated by the sequence of Demers.

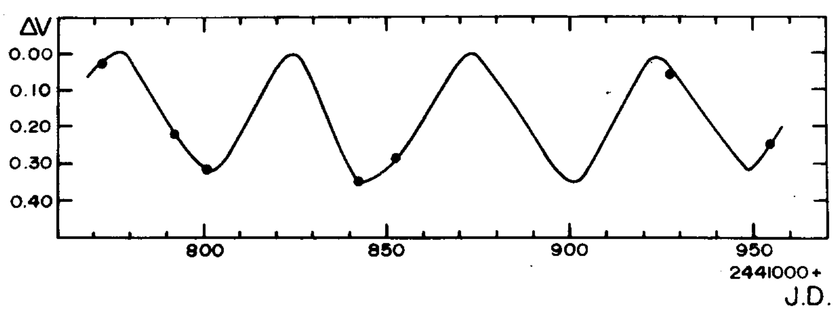
Table I. 1973 Observations of V725 Sgr.

J.D. 2441000+	V	ΔV	B-V	
771.89	12.28	0.03	1.25	p.e.
791.78	12.45	0.22	1.32	p.g.
800.820	12.55	0.32	1.45	p.e.
842.85	12.58	0.35	1.49	p.g.
852.557	12.52	0.29	1.33	p.g.
927.589	12.31	0.06	1.34	p.e.
954.508	12.48	0.25	1.34	p.g.

In 1973, V725 Sgr achived new maxima relative to recent years. Although only seven observations are available, the data are not inconsistent with a period of 50 days and an amplitude of 0.40 magnitudes (see Figure 1). The mean brightness may also be increasing as indicated by the averages for the last three observing sessions, but the data are few and the secular increase is small with respect to the short-term amplitude. However, if the present behaviour is similar to variations at the end of the 19th century, the variable should continue to increase its brightness in the coming decades.

Averages

	V	B-V	n
1968	12.59	1.36	19
1969	12.52	1.32	19
1973	12.45	1.36	7



We wish to thank Derrick Salmon and Chris Smith, resident astronomers at Las Campanas, for making some of the observations reported here.

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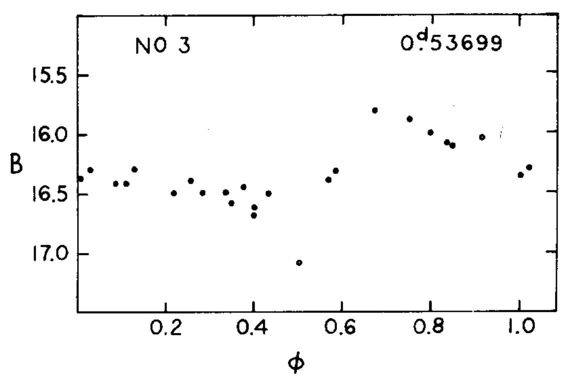
OBSERVATIONS AND PRELIMINARY PERIODS FOR VARIABLE STARS IN NGC 1261

Two series of B(103aO + GG 385) plates of the globular cluster NGC 1261 were taken in December 1971 and November 1972 with the 24-inch (60 cm) telescope of the University of Toronto at Las Campanas, Chile. In addition, the authors were lent two plates of the same cluster taken with the same telescope in September 1971 by W. Harris of the University of Toronto. The plates were measured with the Becker iris photometer of the University of Western Ontario and the magnitudes determined using the photoelectric sequence of Alcaino and Contreras (Astr. Astroph.,11,14,1971) are listed in Table I.

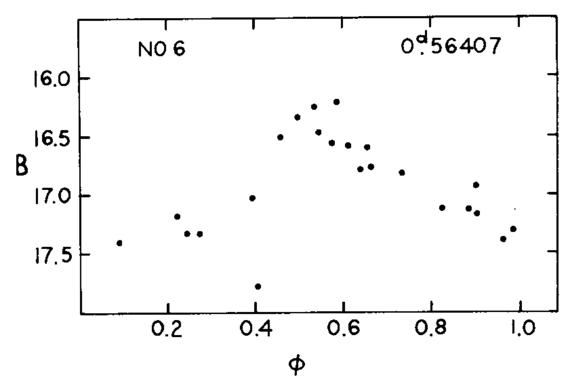
Combining these magnitudes with those published by Bartolini, Grilli and Morisi (IBVS 662,1972) preliminary periods were determined for seven of the variables. Light curves are shown in Figure 1. Because there were so few observations from which to determine the periods it is possible that the periods given here may later require adjustments.

The value $\overline{P}_{ab}$ determined from the six ab-type variables is 0.569 days which would place the cluster in the Oosterhoff type I category and since the ratio n_c/n_{ab} as determined by Bartolini et al. seems to be small, NGC 1261 seems to be an AI type globular cluster using the classification of Castellani et al. (Aph.Space Sc.9,418,1970).

The authors plan to take additional plates of this cluster which they hope will verify these periods and allow the determination of periods for the other variables in the cluster. They would like to express their gratitude to Mr. Harris for the loan of his plates and to Dr. D. A. MacRae for allowing us to use the University of Toronto telescope at Las Campanas. We also wish to thank the National Research Council of Canada for its support of this program.



NO 3
0.d53699
15.5
16.0
16.5
17.0
B
0.2
0.4
0.6
0.8
1.0
ϕ



NO 6
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17.0
17.5
B
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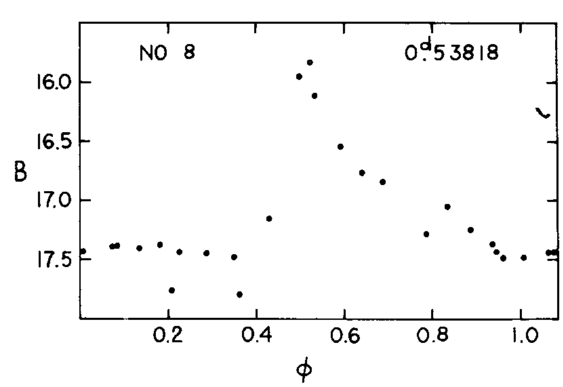
0.4
0.6
0.8
1.0
ϕ



NO 8
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17.5
B
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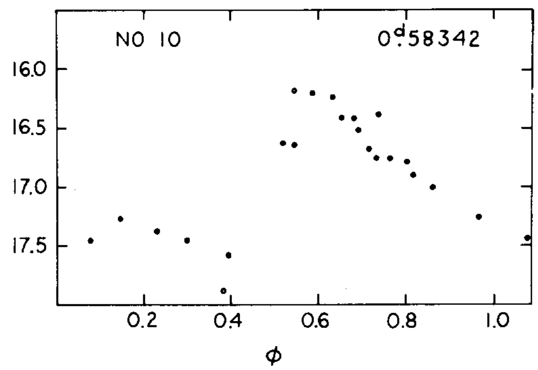
0.6
0.8
1.0
ϕ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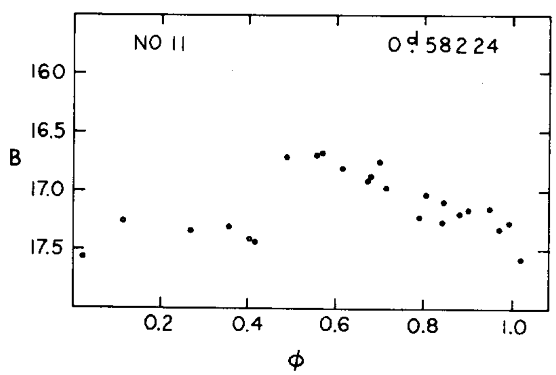
17.5
0.2
0.4
0.6
0.8
1.0
φ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B
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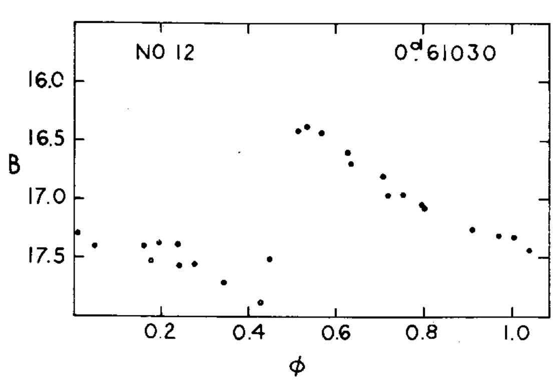
0.8
1.0
φ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17.0
17.5
B
0.2
0.4
0.6
0.8
1.0
φ

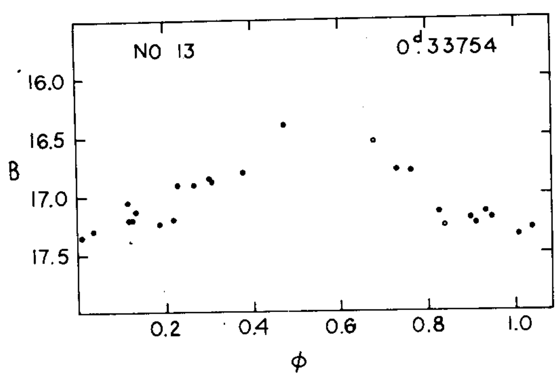

Table I

Hel. J.D. 2441000	1	2	3	4	5	6	7	8
207.851	17.6	16.70	17.1 :	-	-	16.25	16.55	17.05
209.787	17.0	17.05	16.42	-	-	17.32	17.3	17.15
299.543	17.24	16.90	16.38	16.16	16.1	17.40	-	17.70
300.550	17.17	16.48	16.30	15.5	16.1	17.12	16.70	17.4
301.551	17.32	15.98	16.38	15.18	16.6	16.58	16.76	17.4
302.543	17.5 :	17.5 :	16.1	15.6	16.25	17.8 :	17.3 :	17.3 :
304.543	17.3	16.98	16.42	15.4	16.22	17.4	17.07	15.95
305.545	17.4	16.72	16.5	15.30	16.10	16.80	16.70	17.8
625.852	17.6 :	17.2 :	16.0 :	16.0 :	16.2 :	16.2	16.4 :	15.8 :
626.796	17.3	16.02	15.72	16.4	15.44	17.3	16.67	17.4
627.694	17.22	17.08	16.58	16.5	16.5 :	17.16	17.4	17.5
627.723	17.6	17.18	16.60	16.21	15.96	16.91	17.00	17.44

Hel. J.D. 2441000	9	10	11	12	13	14	15
207.851	17.25	17.45	16.70	17.6	16.87	17.35	14.84
209.787	16.48	17.6	17.02	17.50	17.30	16.22	15.1
299.543	16.38	17.40	17.30	16.40	17.21	17.21	15.38
300.550	16.92	17.23	16.72	17.4	17.15	16.50	15.32
301.551	16.20	16.38	17.4	17.04	17.21	17.38	15.35
302.543	16.5	17.9 :	17.2 :	17.9 :	17.3 :	17.3 :	15.4
304.543	16.09	16.73	16.80	16.77	16.80	16.36	15.48
305.545	16.85	16.59	17.3	17.7	16.80	17.7	15.30
625.852	16.4 :	16.2 :	17.4 :	17.5 :	16.6 :	17.2 :	15.43
626.796	16.66	17.3	17.6	16.93	16.42	17.4	15.44
627.694	16.50	16.48	16.77	17.35	17.1	16.38	15.45
627.723	16.66	16.33	16.80	17.56	17.20	16.30	15.41

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A POSSIBLE ECLIPSE IN HD 82191

Heard and Hurkens (J.Roy.Ast.Soc. Canada 67,306,1973) have given an analysis of the double-lined spectroscopic binary HD 82191. This star is of interest because one of the components is an Am star, and the minimum masses derived spectroscopically are so large that there is a reasonable probabilyty that the system is an eclipsing one.

On the basis of their spectroscopic results, Heard and Hurkens supplied me with a list of predicted eclipse epochs, and the unusual coincidence of one of these with a photometric night on February 7, 1974 allowed a search for an eclipse. One does appear to have been observed, a primary eclipse, lasting approximately three hours, but only 0.03 mag. deep in V. Details of these observations will be published elsewhere, but clearly so shallow an eclipse needs to be verified, and I am therefore drawing the attention of other photometrists to this system. Although the eclipse is too shallow to be useful in determining radii, etc., the mere knowledge that an eclipse is present at all will suffice to determine the masses.

HD 82191 has m_V=6.6 and coordinates $\alpha_{1975} = 9^h\ 29^m.8$, $\delta_{1975} = +27^\circ\ 30'$. HD 81940, an A star of m_V= 8.4 and 23' due west of HD 82191, was used as a comparison star.

Forthcoming epochs of eclipse predicted by Heard and Hukens are as follows:

JD 2442113.601	JD 2442158.660
22.613	67.672
31.625	76.684
40.637	85.696
49.649	94.708

February 14, 1974.

J.D. FERNIE
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NUMBER 873

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COORDINATED CAMPAIGN FOR OBSERVATIONS OF X-RAY BINARIES
I.A.U. COMMISSION 42 IN COORDINATION WITH COMMISSION 44

The Committee for Coordinated Observing Programs (Chairman, K. Gyldenkerne) of the IAU Commission 42, in collaboration with its Committee for Astronomical Observations from Outside the Earth's Atmosphere (Chairman, Y. Kondo), announces its sponsorship of a coordinated campaign to observe X-ray binaries. The campaign is also being coordinated with the IAU Commission 44 (President, A. D. Code).

The objects selected for this campaign include in the first place 3U1653+35 (=Her X-1 = HZ Her), 3U1956+35 (=Cyg X-1 = HDE226868), 3U0900-40 (= HD77581), and 3U1700-37 (=HD153919). In addition to these, the following objects, for which possible optical identifications have been made or proposed, will be treated in the campaign communications and will perhaps be included in this campaign: 3U1118-60 (=Cen X-3 = the star suggested by Krzeminski in IAU Circular No. 2162), 3U0115-73 (=SMC X-1 = Sanduleak 160), 3U0352+30 (= X Per), Cep X-4 (= HD 206267, a 7th magnitude O6 spectroscopic binary, P = 3.7 days), 3U0032+24 (= ζ And, P=$17^d.8$ days, an elliptical variable?), 3U0918-55 (= κ Vel, variable radial velocity), 3U0527-05 (= θ^2 Ori A, a 5th magnitude O9.5 V spectroscopic binary, P = 21.0 days, massive invisible companion, within the error box of the X-ray source), and 3U1820-30 (= Variable Star No. 14 of the globular cluster NGC 6624, within the error box of the X-ray source). This additional list of objects are based primarily on the suggestions kindly offered by Dr. W. Liller. Other objects may be added subject to future optical identification. For additional information on these binaries selected for the campaign the reader is referred to the recent issues of the IAU Circulars (published by Smithsonian Astrophysical Observatory), I. B. V. S. and the Astrophysical Journal (especially Part II), among other publications. 3U numbers refer to those given in the third Uhuru Catalogue of X-ray sources, which is soon to be published.

Sometime after the end of March 1974, the University College London X-ray experiment on the Copernicus satellite is scheduled to observe Her X-1 in the energy range 3-1 kev. The exact schedule is expected to be available about 10 days prior to the onset of the observing period. Active participants in the campaign will be informed of these dates as soon as they are determined. Most X-ray experimenters on the UK5, ANS and OSO-I satellites have already expressed their interests in participating in the Campaign. The UK5 satellite is currently scheduled for launch in June 1974, while the ANS is slated to be launched in August, 1974. OSO-I is planned for launch in March, 1975. Dr. S. S. Holt, the NASA project scientist for the UK5, states that preliminary observing schedules for it will be established a few months in advance although the actual observing plans may not be finalized until a few weeks prior to the execution. According to Dr. H. Gursky, the principal investigator for the ANS hard X-ray experiment, the ANS observing plans are expected to be established a few months in advance.

If you are involved in X-ray binary research and interested in participating in this campaign, you are invited to write to the coordinator briefly describing your current and near future plans. Although we shall be primarily concerned with space and ground observations, those interested in theoretical interpretation are also encouraged to participate in this campaign through suggestions to observers. The status of the reported ongoing research activities will be contained in the forthcoming issues of the campaign circulars. X-ray satellite observing plans will also be announced and kept current in the Circular Letters and/or Special Bulletins.

Communications to the coordinator should be addressed to:

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KJELD GYLDENKERNE
Chairman
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IAU Commission 42

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Coordinator
Coordinated Campaign for Observations of X-Ray Binaries
IAU Commissions 42 and 44

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
1974 March 4

CONTINUOUS PHOTOELECTRIC OBSERVATIONS OF EV Lac DURING THE 1973 INTERNATIONAL PATROL

The flare star EV Lac was observed photoelectrically with the 30 cm Cassegrain reflector at Oslo Solar Observatory, ($\lambda=0^h43^m02^s$, $\phi=+60^o12'30''$, h=585 m) which is operated by the Institute of Theoretical Astrophysics, University of Oslo. The observing session lasted August 22 - September 4, 1973, in accordance with the program of the IAU Working Group on Flare Stars (1).

The monitoring was performed in the B-band as described in (2), and included the light from both components of the system. A detailed presentation of the monitoring intervals is found in Table 1, noting all interruptions exceeding one minute. The third column contains weighted mean values with respect to time of σ/I_o. A total coverage of 21.83 hours resulted in 2 observed flares, the physical characteristics of which are presented in Table 2.

Values in the instrumental system are denoted with b. The transformation to the standard Johnson system was performed with mean transformation and extinction coefficients (3). The colours needed for this computation are taken from the three-colour observations of flare no.2 at September 3, UT 20^h23^m. The value of L(B) needed for calculation of W(B) is taken from (4).

Flare no. 2 started at UT $20^h18^m15^s$, and the rise phase was measured untill amplitude Δm_b = 0.64 magnitude was reached. By accident a sky measurement was performed for the next 30 seconds. Thus we lost the first maximum, which from our observations occurred at UT $20^h19^m05^s \pm 13^s$.

30 seconds after ending the sky measurement a secondary maximum appeared. The values in Table 2 refer to this maximum. 10 seconds before UT 20^h21^m a very slight rise was noticed, and

at UT 20^h23^m a definite rise set in. This rise is also indicated by the U measurements performed in 1 minutes intervals from UT $20^h23^m10^s$ and lasting 5 - 8 seconds. In the V band measurements it started at UT $20^h23^m30^s$ and lasted for 10 - 15 seconds with intervals of about 1 minute. There are no significant rise in the V band at the time of the last light increase. Due to U and V measurements the last rise was not fully monitored.

At UT 20^h42^m the star had not yet completely reached its pre-flare intensity level.

When computing the energy released in flare no. 2, the gaps in the light curve were bridged by linear interpolation. The energy values given are therefore lower limits.

A reduction to one component may be obtained by using the relation given by (5).

The light curves were constructed from 5 seconds means. The smoothed curves in the instrumental b-colour are presented in the figures.

We are indebted to observator R. Brahde for giving us the opportunity to use the equipment at the observatory.

Oslo, February 18, 1974.

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Table 1

Coverage of EV Lac

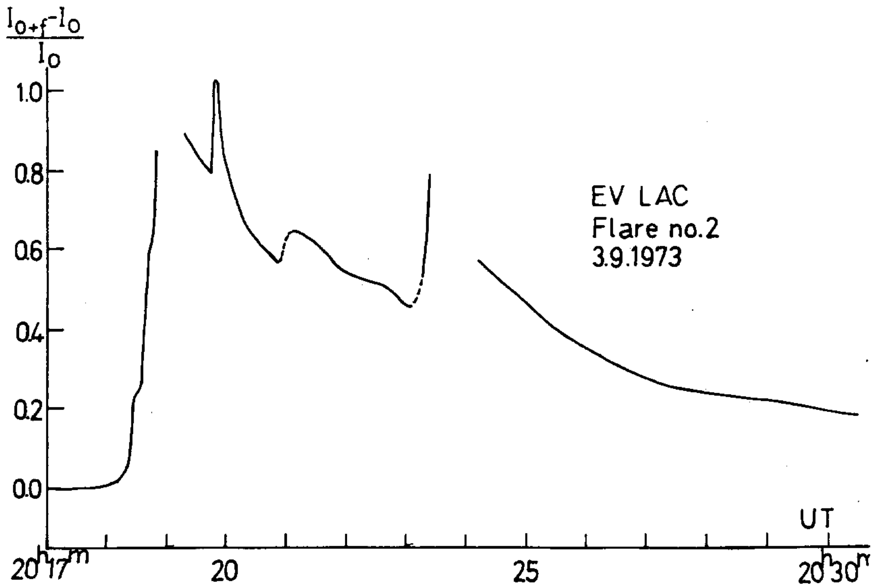
1973	Detailed Coverage (UT)	$\left\langle \frac{\sigma}{I_o} \right\rangle$	Time
Aug. 21.	21^h40^m–22^h20^m,2237-2255,2258-2339,2348-2400	0.07	111^m
22	0001-0018,0020-0030,0112-0123,0138-0147, 0149-0157.	0.08	55
23	2037-2048,2050-2110,2127-2131,2135-2210, 2212-2344,2351-2400.	0.07	171
24	0100-0122,0124-0130,0132-0145.	0.09	41
	2103-2117,2119-2311,2314-2326,2338-2400.	0.06	160
25	0001-0031,0046-0140,0142-0200.	0.06	102
	2105-2126,2128-2141,2144-2220,2222-2306, 2309-2336,2342-2400.	0.06	159
26	0000-0108,0122-0144,0146-0200.	0.06	104
27	2029-2052,2057-2120,2127-2135,2232-2306, 2332-2336.	0.11	92
28	0024-0033,0045-0052,0103-0119,0135-0212.	0.09	69
Sep. 3	2006-2032,2033-2049,2102-2204,2210-2226, 2321-2333.	0.06	131
4	0016-0020,0033-0037,0042-0103,0108-0205, 0211-0221,0223-0236,0237-0243.	0.07	115

Total coverage: 21^h50^m

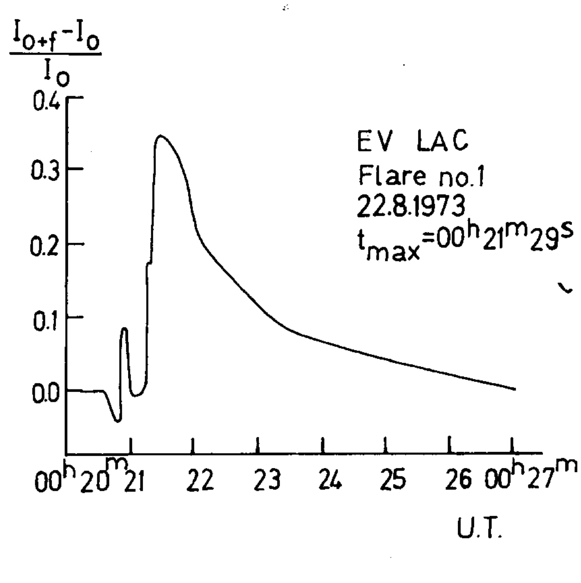
Table 2.

Physical Characteristics of the Observed Flares

Flare No.	Date 1973	t_{max} UT	Duration (min.) τ_b	τ_a	Max. intensity $\frac{I_{o+f}-I_o}{I_o}$	Δm(B) (mag)	$\frac{\sigma}{I_o}$(b)	P (min)	Air mass X	W(B) (10^{32} erg)
1	Aug. 22	$00^h21^m29^s$	0.2	5.5	b:0.35		0.07	b:0.55	1.041	
					B:0.40	0.37		B:0.74		2.2
2	Sept. 3	20 19 50	-	~23	b:1.03		0.08	b:7.40	1.168	
					B:1.38	0.94		B:10.00		3.0



$\frac{I_{o+f}-I_o}{I_o}$
1.0
0.8
0.6
0.4
0.2
0.0
EV LAC
Flare no.2
3.9.1973
UT
20^h17^m
20
25
20^h30^m



$\frac{I_{o+f}-I_o}{I_o}$
0.4
0.3
0.2
0.1
0.0
EV LAC
Flare no.1
22.8.1973
$t_{max}=00^h21^m29^s$
00^h20^m
21
22
23
24
25
26
00^h27^m
U.T.

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Budapest
1974 March 14

UBV PHOTOELECTRIC PHOTOMETRY FOR FLARE STARS IN THE PLEIADES CLUSTER

Seventeen stars in the Pleiades cluster were observed in the UBV system of Johnson and Morgan (1953). The observations were made with the 1 m telescope of the Lunar and Planetary Laboratory on Mount Lemmon. The stars observed were t :ken from two lists of flare stars given to the author in advance of publication by Dr. G. Haro. He has recognized these stars as members of the Pleiades cluster, with the exception of HII 2591 and HII 3065. Most of the stars in this work have been observed previously by Johnson and Mitchell (1958). Initially at least two observations for each star were planned in order that the new list have the same weight as the one published earlier (Iriarte 1967). This was not accomplished in every case.

The observations are listed in Table 1. Column 1 gives the original flare star numbers as given in Haro's list. The meaning of the letters preceding the numbers is as follows: T (Tonantzintla), A (Asiago), B (Byurakan), K (Konkoly). Column 2 gives the Hertzsprung (1947) number of the star; Columns 3, 4, and 5, the V magnitudes and the B-V and U-B colors, respectively; Column 6, the number of observations; Column 7, the spectral types. The classification of the spectral type of HII 1100 is by Wilson (1963), the remaining by Kraft and Greenstein (1969).

Great care was exercised in the standardization of the region. A considerable amount of observing time was expended on standard stars. HII 1084, a reddened AoV star member of the Pleiades cluster was used as a secondary standard. An analysis of the data will be published at an early date.

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Table 1

Original flare star number	Star	V	B-V	U-B	n	Spectral type
T56b	HII 97	12.65	1.08	0.87	3	
A90	HII 324*	13.12	1.02	0.79	4	
T160	HII 347	14.04	1.41	-	2	K7Ve
T45	HII 590	14.34	1.37	-	2	
T13	HII 686	13.38	1.27	-	1	
B212	HII 1029	14.21	1.52	-	1	
A148	HII 1039	13.07	1.23	0.79	2	
T43b	HII 1100	12.13	1.17	0.86	2	dK3e
T58b	HII 1553	12.35	1.13	0.76	1	
T48b	HII 1883*	12.64	1.07	0.75	3	
T9b	HII 2034*	12.51	1.04	-	2	
T88	HII 2193	14.18	1.47	-	1	K6Ve
K23	HII 2368	14.02	1.34	-	1	
B294	HII 2591	13.28	1.23	0.92	1	
T109	HII 2927	13.80	1.34	-	1	K4Ve
B295	HII 3065	12.97	1.39	-	2	
T59b	HII 3197	12.04	1.15	0.73	2	

Notes to Table 1

324 observed twice in U

1883 observed twice in U

2034 U was observed on two different nights. The values are consistent but they appear bright: U-B = 0.38 and U-B = 0.33.

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INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
1974 March 15

PHOTOELECTRIC OBSERVATIONS OF THE FLARE STAR YZ CMi

Photoelectric monitoring of the flare star YZ CMi was carried out at Okayama Station of the Tokyo Astronomical Observatory during the period of 18 to 24 January, 1974. The observations were made with the simultaneous three-color photometer attached to the 91cm reflector.

The observational results are summarized in the Table. Some more details will be published in the Tokyo Astronomical Bulletin.

1974 Jan.	Time of monitoring (UT)	Filter	Time of max. (UT)	$\frac{I_{0+f}-I_0}{I_0}$	Max. Δm	P	d_b	d_a	σ	Weather*
					mag	min	min	min	mag	
18	$11^h19^m-13^h16^m$									1
	17 13 -19 08	U	$18^h03^m.6$ (U, B)	9.91	2.59	42.4	11.7	32.0	0.24	
		B		1.65	1.05	4.5	11.7	26.5	0.04	1
		V	18 03.7	0.37	0.36	2.1	12.1	28.0	0.02	
19	10 47 -12 15	U		1.57	1.02	3.9	4.3	3.5	0.21	
		B	12 05.3	0.33	0.31	0.8	3.7	3.5	0.05	1
		V		0.07	0.07	0.3	3.5	3.5	0.02	
	12 30 -13 58	U		10.71	2.68	11.0	0.7	20.0	0.16	
		B	12 44.5	1.79	1.11	3.1	0.7	20.0	0.04	0
		V		0.61	0.52	1.8	0.7	20.0	0.02	
		U		3.03	1.53		1.3	20.0		
		B	13 21.4	0.73	0.60		1.3	19.0		0
		V		0.19	0.19		1.3	19.0		
		U	13 23.3	1.76	1.10	U 10.9			U 0.16	
		B	13 23.4 (B, V)	0.42	0.38	B 2.8			B 0.04	0
		V		0.13	0.13	V 1.1			V 0.02	
		U	13 24.1	3.27	1.58					
		B	13 24.0	0.66	0.53					0
		V	13 23.9	0.22	0.22					
	14 49 -16 45								U 0.15	
									B 0.05	1
									V 0.02	
21	16 51 -18 30	U		5.67	2.06	5.6	0.5	5.3	0.17	
		B	17 01.6	0.81	0.64	0.6	0.4	3.5	0.04	0
		V		0.17	0.17	0.1	0.4	2.0	0.01	

(continued)

1974 Jan.	Time of monitoring (UT)	Fil-ter	Time of max. (UT)	$\frac{I_o+I-I_o}{I_o}$	Max. Δm	P	d_b	d_a	σ	Wea-ther*
22	10^h57^m-11^h44^m									
	13 23 -14 12								U 0.17 B 0.04 V 0.02	1~2
	14 22 -14 35									
					mag	min	min	min	mag	
	14 55 -16 57	U		7.55	2.32	37.6	1.3	32.0	0.09	
		B	$15^h03^m.4$	1.04	0.77	5.2	1.3	28.0	0.04	0
		V		0.25	0.24	1.1	0.8	27.0	0.02	
		U	16 18.1	1.58	1.03		0.2	2.4		
		B		0.33	0.31		0.2	2.4		1
		V	-	-	-	U 0.8			U 0.16	
						B 0.2			B 0.05	
		U	16 18.6	1.43	0.97	V -			V 0.02	
		B		0.22	0.22					1
		V	-	-	-					
23	10 31 -13 25								U 0.18 B 0.07 V 0.02	1~2
24	10 15 -12 08								U 0.21 B 0.03 V 0.02	1~2

*Weather ; 0 = very clear, 1 = clear, 2 = some thin clouds, 3 = extended thin clouds, 4 = some clouds.

Tokyo Astronomical Observatory
February 27, 1974

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K. OKIDA
M. YUTANI
H. KOYANO

COMMISSION 27 OF THE I. A. U.
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NUMBER 877

Konkoly Observatory
Budapest
1974 March 18

A PROBABLE PERIODICITY IN THE LIGHT VARIATION OF THE LMC SUPERGIANT HD 33579

Summary. Photometry of the brightest supergiant of the LMC HD 33579 in 1971, 1972, 1973 and 1974 shows evidence for a periodicity of around 90 days. The nature is probably pulsation.

1. Introduction

In connection with the earlier and very recent investigations on the theory of stellar evolution of very massive stars (Ledoux, 1941; Schwartschild and Härm, 1959; Simon and Stothers, 1970; Ziebarth, 1970; Appenzeller, 1970 a,b; Talbot,1971 a, b; Larson and Starfield, 1971, Barbaro, Bartelli, Chiosi and Nasi, 1973) it is of extreme interest to know whether such stars show any long or short term light variation and whether these variations are periodic. Rosendahl and Snowden (1971) carried out a photometric program on five LMC supergiants amongst others HD 33579 (V_J = 9.1, A3 Ia-O (Feast, Thackeray and Wesselink,1960)) and detected for all of them light variations of less than 0.1mag, probably caused by pulsation. The first observers to discover that HD 33579 was slightly variable were Walraven and Walraven (1966, 1971). Przybylski (1968) and Aller, Ross and Wares (1968) analyzed the spectrum and Walraven and Walraven (1971) obtained some atmospheric parameters with the same five-colour photometer with which the observations presented here have been made. Wolf (1972) made an extensive fine analysis of the atmosphere. Until the present work there has been no evidence of periodicity in the light variation.

2. The Observations

The observations have been made with the Walraven five-colour simultaneous photometer, attached to the 90-cm light-collector of the Leiden Southern Station (at the SAAO- Annexe,formely the Republic Observatory Annexe) Hartebeestpoortdam,South Africa. A description of the photometer and the photometric system is given by Walraven and Walraven (1960) and Rijf, Tinbergen and

Walraven (1969). The comparison star was HD 33486 (8.1,B9). To check its constancy a second comparison star was often used,viz. HD 33117 (8.7, G5). Generally the variable was observed ten times on the average, alternated by the comparison star. The average of the brightness differences revealed one normal point. The integration time for one observation was 0.5 or 1 min. The figure shows these normal points (in log intensity) in the Walraven V (5590 A) and (U 3620 A) bands, plotted against the calendar date.The error bars indicate roughly the maximum mean error in one normal point. Points connected with a line indicate normal points obtained in the same night. In the near future the final reductions in all five pass-bands will be published.

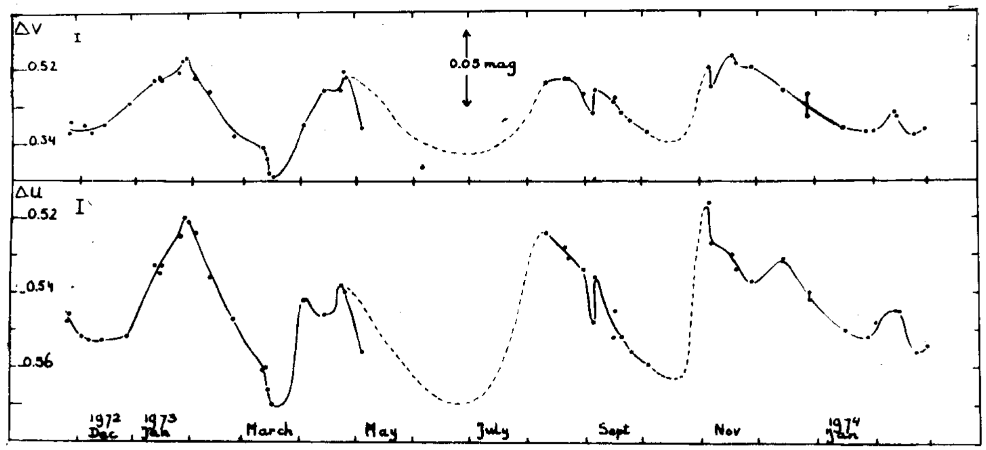
3. Discussion of light-curves and period

The figure shows at least four cycles. Unobserved parts have been dashed. The amplitudes are roughly 0.09 mag in V and 0.15 in U. The B (4260 A) and L (3900) curves, which are not shown, have a range of roughly 0.11 and 0.12 mag. There is certainly no strict periodicity, but there seems to be some kind of regularity, with an average period somewhere near 90 days. Some observations made in October and November 1971 fit rather well when we extrapolate the average light-curve with a period of 95 days.

It is likely that the light variation is mainly caused by pulsation. This can be concluded by the general shape of the light-and colour curves and the fact that the star is blue at maximum.,a conclusion already reached by Rosendahl and Snowden.However the light-curves are highly variable from cycle to cycle and sudden drops or rises are present. These sudden changes are often much more pronounced in U or sometimes seem to be only present in the U band. Probably emission lines mainly active in this band, caused by special atmospheric phenomena are here of account.In the first cycle the rise in V and B started much earlier than in U and also but less pronounced in L. However the U rise is generally much more violent and reaches the maxima sometimes many days earlier than that in V.

Acknowledgements.

I am indebted to Dr.Th. Walraven and Dr.M.W. Feast for reading and commenting on the manuscript.



The brightnesses HD 33579 minus comparison star (in log intensity) plotted against the calender date for the Walraven V (5590 A) and U (3620 A) bands.

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Konkoly Observatory
Budapest
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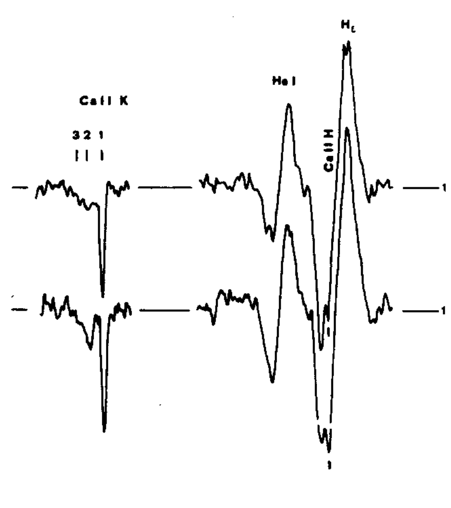
ON THE SPECTRAL VARIATIONS OF P CYGNI IN 1973

Irregular spectral variations of P Cyg in the last 30 years have been reported by Luud (Soviet Astr.11,211,1967), Astafyev, Hollandsky and Kopylov (Izv.Krym. 40,46,1969), and de Groot (BAN 20,225,1969). These variations are in general of rather small amplitude, but recently Stephenson (IAU Circ.2562,1973) claimed a remarkable weakening of the violet-displaced P Cyg-absorption lines, as well as of the circumstellar H and K lines of CaII:his observations are based on a 130 A mm^{-1} spectrogram obtained on July 17, 1973. A blue spectrum of P Cyg (W5752) was taken on March 23, 1973 at the Coudé focus of the 193 cm telescope of the Observatoire de Haute-Provence with a reciprocal dispersion of 9.7 A mm^{-1}. After Stephenson's communication a second plate of the star (W5837) was secured with the same equipment on September 11 of the same year. The Figure reproduces the intensity spectrum of P Cyg, normalized to the continuum, near λλ3933 and 3970. Small intensity variations of the hydrogen lines and of the H_8+HeI 3888 blend have



been observed. We have measured on the tracings the differences $V_E - V_A$ of the radial velocities of the emission and absorption components for the lines given in Table 1.

Line	V_E-V_A (km s^{-1}) W5752	W5837	Line	V_E-V_A (km s^{-1}) W5752	W5837
H_{11}	175	120	HeI 3819	90	135
H_{10}	200	115	3964	110	120
H_9	185	125	4026	120	130
H_8+HeI	185	150	4388	85:	115:
H_ϵ	195	185	4471	125	120
H_δ	180	180	N II 3995	80	95
H_γ	185	170	FeIII 4395	100	90
CaII K			4419	100	90
a_1-a_2	105	95			
a_1-a_3	180:	180			

Only for H_{11} to H_8 we have observed a remarkable variation of the radial velocities.

The CaII K-line displays two absorption components: a sharp interstellar line and a broad and shallow violet-displaced feature (Figure). The latter one is originated in the outermost parts of the expanding envelope of P Cyg and is probably formed by two or more distinct components of variable intensities. The presence of multiple components of this line has been noticed by Underhill (The Early Type Stars, p,220, 1966), and a similar feature is also shown by the NaI yellow boublet (Beals, Publ.Victoria 9,1,1950).

In conclusion, the large spectral change of P Cyg reported by Stephenson is not confirmed by our spectra, unless it lasted for less than 2 months. The observed spectral variations are of rather small amplitude and take origin in the external parts of the star's atmosphere.

March 14, 1974

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FLARES OF UV CETI, 1970

Continuous U-band photoelectric photometry of UV Ceti was obtained between October 27th and November 3rd, 1970, with the 60 cm reflector of the Cerro Tololo Interamerican Observatory. In 29.06 hours of monitoring a total of 233 events were recorded against a detection limit (Kunkel 1973) equal to or better than U_{lim}= 17.0.

The procedure for processing the data are identical to those used on earlier occasions (Kunkel 1968, 1970a, 1970b, 1973). The phenomena identified on the chart records are listed in Table 2. The table heading gives some pertinent stellar data, as well as the monitoring intervals with no interruptions exceeding a duration of one minute. In the main body of the table are given the date (column 1) and U.T. (column 2) of each event, as well as the air-mass (column 3), the U-magnitude at peak light, referred to comparison stars (column 4), the durations T_q at fractions q of peak light (columns 5 - 8), and the logarithms of the decay rate in magnitudes per minute, measured at one and at three magnitudes below peak light (columns 9, 10). Uncertainties greater than 10 percent or 0.1 magnitudes are denoted with the letter U following an entry. The letter C is used to denote complex events of possibly multiple peaks or other difficulty, for which the measured parameter could not be determined with the normally anticipated confidence.

The data are judged to be at least 95 percent complete in a region bounded by the detection limit (Kunkel 1973) U_{det}= 15.7 and $T_{0.5}$>0.03 minutes. The 178 events lying within this region have been used to determine the event rate coefficients in

$$R(U) = \exp\left[a\,(U-U_o)\right] \text{ events hr}^{-1}$$
$$a = 1.14 \pm 0.09$$
$$U_o = 14.11 \pm 0.08$$

Compared with results of earlier epochs we find no compelling evidence for change in the level of activity, thus confirming a result of Oskanian and Terebizh (1971). A rise in the activity of UV Ceti reported earlier (Kunkel 1973) appears to be at most part of fluctuation generally present in flare activity. At present the data are still too sparse to exclude cyclic activity or a slow trend, however.

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References:

Kunkel, W.E. 1968, I.B.V.S., No. 315.
1970a, I.B.V.S., No. 442.
1970b, I.B.V.S., No. 462.
1973, Ap.J.Suppl., 25, 1.
Oskanian, V.S. and Terebizh, V. Yu. 1971, Astrofizika 7, 83.

MONITORING TIMES (U.T.)

DATE	INTERVALS		
70 10 27	02 38.1 - 04 02.7	04 29.2 - 05 14.5	06 04.8 - 06 03.0
70 10 28	01 58.8 - 08 04.5	. - .	. - .
70 10 29	00 51.8 - 07 55.6	. - .	. - .
70 10 30	02 55.3 - 06 51.0	. - .	. - .
70 11 01	06 47.3 - 07 45.0	. - .	. - .
70 11 02	02 43.9 - 06 45.7	. - .	. - .
70 11 03	04 46.6 - 07 37.3	. - .	. - .

TOTAL SAMPLE DURATION (HRS) 29.06

FLARES OBSERVED

DATE	U.T.	AIRMASS	U	DURATIONS				DECAY RATE	
			(PEAK)	T(.5)	T(.2)	T(.1)	T(.05)	J=1	J=3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
70 10 27	02 38.07	1.076	15.20	0.050	0.16U				
	02 48.24	1.070	15.91	0.3 U					
	02 54.13	1.062	16.16	0.650					
	02 59.70	1.057	14.51	0.65	3.2	4.8		0.29	
	03 12.52	1.044	13.74	0.06	0.13	0.8		1.11	-.7 U
	03 24.68	1.035	15.68	0.27					
	03 26.01	1.033	15.78	0.45					
	03 30.94	1.031	15.19U	0.17					
	03 33.36	1.030	15.45U	0.7	2.0				
	03 38.83	1.027	15.78U	4.					
	03 51.85	1.024	14.96	0.7	3.0			0.1	
	04 02.40	1.022	14.26	0.17	0.33	0.65	3. U	1.22	
	04 22.93	1.025	15.33	0.08	0.14U				
	04 31.61	1.029	14.13	0.09	0.2	0.42	0.8 U	1.56	
	04 36.56	1.031	15.48	0.25					
	05 03.44	1.052	14.82	0.40	1.2 U				
	05 04.37	1.054	14.27	0.20	0.35	0.5 U		0.65	
	06 49.34	1.297	15.46	0.17					
	07 04.22	1.360	15.13	0.04	0.4 U				
	07 25.10	1.410	14.27	0.06	0.13			1.06	
	07 38.27	1.555	13.70	0.13	0.27	0.5	2.4 U	1.35	
	07 50.03	1.654	13.04	0.24	0.75	1.9	3.3	0.40	-.030
70 10 28	02 05.62	1.138	14.74U	0.13	0.9	2.6 U			
	02 20.30	1.108	14.39	0.05	0.55	2.2	3.3		
	02 27.00	1.100	16.62	1.0					
	02 28.54	1.094	15.17	0.2	0.7	2.2			
	02 52.63	1.061	15.82	1.7	3.6				
	03 02.19	1.050	15.54	0.7	2.8				
	03 06.31	1.046	15.84	0.23	1.0				
	03 12.98	1.040	16.25	0.2					
	03 17.26	1.037	14.85	0.04	0.35	1.1			
	03 25.91	1.031	13.53	0.7	0.18	0.8 U	1.5	1.49	-.34

DATE (1)	U.T. (2)	AIRMASS (3)	U (PEAK) (4)	DURATIONS T(.5) (5)	T(.2) (6)	T(.1) (7)	T(.05) (8)	DECAY RATE J=1 (9)	J=3 (10)
	03 38.33	1.026	15.27	0.07	0.2	0.7 U			
	03 52.92	1.023	14.54	0.15	0.73	1.3 U		0.63	
	03 55.74	1.023	14.92	0.07	0.1 U				
	03 57.38	1.022	15.36	0.10	0.7 U				
	03 59.59	1.022	14.83	0.24					
	04 07.04	1.023	15.62	0.14					
	04 20.93	1.026	16.26	1.2					
	04 34.71	1.032	15.55	0.13					
	05 02.07	1.055	12.89	0.13	0.37	0.52	1.7	0.57	-.11U
	05 07.64	1.061	14.15	0.05					
	05 28.14	1.089	15.87	0.35					
	05 41.60	1.119	13.54	0.08	0.25	0.78	1.75	1.49	
	06 02.26	1.157	13.54	0.28	0.47	0.60	0.87	0.57	0.36U
	06 13.19	1.185	15.95	9.2					
	06 26.04	1.224	15.75U	0.24U					
	07 05.55	1.389	13.38	0.26	2.15	2.70	3.86U	0.85	
	07 21.43	1.471	15.25	0.27U	0.47U				
	07 29.60	1.521	15.61	0.12U					
	07 50.64	1.679	14.81	0.15	0.50U				
	07 57.65	1.741	14.87	0.13U					
	07 59.38	1.760	13.85	0.18U	0.88U	1.95U		0.3	
•	08 02.77	1.790	14.78	0.07U	0.20U				
70 10 29	01 23.20	1.247	14.82	0.20	0.70U			0.34U	
	01 28.09	1.230	15.60	0.20U	0.30U				
	01 32.44	1.217	15.50	0.28U	0.50U				
	01 36.98	1.205	15.45	0.30U	0.70U			0.39	
	01 49.74	1.167	15.34	0.11U	0.31U				
	01 52.20	1.159	15.21	0.06U	0.26U				
	01 57.77	1.147	14.33	0.06	0.15U			0.61	
	02 12.23	1.115	14.12	0.10	0.42U	1.05U		0.85	
	02 26.93	1.091	15.68	0.07U					
	02 31.81	1.083	15.53	0.15U					
	02 44.29	1.066	15.20	0.09	0.40U	0.90U			
	02 54.47	1.054	15.64C	0.09C					
	02 59.42	1.049	14.44	0.11	0.35	0.50U	0.70U	0.63	0.71U
	03 09.32	1.039	16.16	.64	.96	1.1 U			
	03 24.10	1.031	15.96	0.10	0.11U			1.29	
	03 28.40	1.029	15.74	0.07	0.16U			0.26U	
	03 30.22	1.028	15.21	0.10U	0.19U			1.01U	
	03 31.23	1.028	14.72	.06	.42	.80		60	
	03 32.62	1.027	14.71C	0.18C	0.48	0.77U			
	03 34.84	1.026	15.77	.14U	.15U				
	03 35.74	1.026	15.42	.18	.60			.29	
	03 49.00	1.027	16.90U	4. U					
	03 50.42	1.027	15.42	0.20U	0.44U			.52	
	04 26.32	1.030	13.46	0.12	0.19	0.30	0.48U	0.27	
	04 35.43	1.036	15.96	.20U	.42U				
	04 37.81	1.037	16.18	.30	.55U				
	04 41.45	1.040	15.65	.07	.12U	.16U		5.6 U	
	04 44.26	1.042	14.33	0.04	0.16U	0.38U		0.49	
	04 45.63	1.043	16.08	.08U	.35U	.55U		.71U	
	04 53.34	1.050	14.42	.11	.64U	1.20	1.54	.92U	
	05 00.14	1.058	15.70	0.15U	0.46U				
	05 03.57	1.061	15.42	.21	.52	.76U		.57U	

DATE	U.T.	AIRMASS	U (PEAK)	DURATIONS T(.5)	T(.2)	T(.1)	T(.05)	DECAY RATE J=1	J=3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	05 12.15	1.071	15.31	0.12	0.37U	0.49U		0.50	
	05 28.86	1.097	15.20	0.11	.30U	.43U		.79	
	05 34.16	1.106	15.56	0.16U					
	05 35.14	1.108	14.23	0.10	0.22	0.25U	0.27U	0.94	
	05 37.53	1.113	15.42	.23U	.33U				
	05 39.01	1.115	14.64	0.08U	0.23U	0.50U		0.84U	
	05 39.83	1.117	13.32	0.03	0.09	0.20U	0.36	1.71	0.65U
	05 55.57	1.154	12.12	0.40	1.20			0.21	
	06 04.39	1.174	13.10	0.80	2.59U			0.42	
	06 18.11	1.214	14.55	0.10U	.38C			1.37	
	06 18.52	1.214	14.87	.56	1.74			.09	
	06 26.23	1.237	16.00	.20	.30U			.94U	
	06 39.25	1.283	15.87U	.12	.26U				
	06 44.55	1.307	16.16	.16U	.30U				
	06 50.79	1.333	15.01	0.10	0.16			1.85U	
	07 14.15	1.454	15.12U	.28U	.66U				
	07 27.93	1.535	14.59	0.02	0.05	0.07		2.04U	
	07 30.61	1.555	14.46	0.04C	0.30C	0.55C			
	07 32.57	1.569	15.27	.25	.57U			0.45U	
	07 37.78	1.606	15.75	0.07U					
	07 38.85	1.614	15.74	0.06U	0.18U			0.04	
	07 43.55	1.654	15.07U	.40C					
	07 48.70	1.696	15.01	0.11	0.25U			0.11	
70 10 30	03 00.53	1.044	15.36	0.08	0.13U				
	03 05.59	1.040	15.47	.14	.30U	.46U		.79U	
	03 07.82	1.038	13.79	0.16	0.47U	1.04U	1.56U	1.26	
	03 13.18	1.035	15.91	.10U	.26U				
	03 15.24	1.034	15.36	0.05	0.1			3.58	
	03 32.54	1.025	15.23U	.20	.70U				
	03 42.65	1.023	15.19	.27U	.56U			.55	
	03 46.10	1.023	13.65	0.06	0.26U	0.75U	1.16U	1.53	
	03 48.10	1.023	14.74	.41	1.07	1.48U		.27	
	03 51.32	1.022	14.54	.30	1.44U	2.05U			
	03 54.10	1.022	15.04	0.27U	0.9 U				
	04 01.06	1.023	15.12	.10	.32U	0.47U		0.66	
	04 05.59	1.024	15.46	.13U	.25U				
	04 28.48	1.034	15.14	0.18	0.4 U			0.69	
	04 38.71	1.041	10.62	0.66	2.00U			0.18	
	04 47.71	1.049	13.51	2.11				0.38	
	04 52.94	1.054	14.74	.06	.17				
	04 55.38	1.057	15.00	.11	.18U				
	05 10.80	1.074	15.82	0.12U					
	05 16.86	1.083	15.19	0.07U	0.15U				
	05 20.44	1.090	15.08	0.75	1.43U			0.18U	
	05 27.51	1.102	14.89	0.06	0.28U				
	05 29.17	1.104	14.72	.80	2.5 U			0.15	
	05 41.15	1.127	14.88	0.04	0.07U				
	05 41.90	1.129	14.90	.20	.52	.70	.83U	0.69	
	05 47.11	1.140	15.24	0.06	0.16			0.04	
	05 48.65	1.145	14.80	0.04	0.06			1.62	
	05 50.69	1.149	14.93	.23	0.6	0.78U	0.88U	0.35	
	05 54.11	1.157	15.21	.07	.17U				
	05 57.42	1.167	14.71	0.12	0.53U	0.8 U		0.5	
	05 59.85	1.172	13.06	.08U	.16U				

DATE	U.T.	AIRMASS	U	DURATIONS				DECAY RATE	
			(PEAK)	T(.5)	T(.2)	T(.1)	T(.05)	J=1	J=3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	06 02.31	1.179	15.43	0.1 U	0.15U				
	06 10.15	1.202	15.22	.34	.86U			0.25	
	06 12.68	1.208	15.36C	.65U	.60U				
	06 13.08	1.244	15.30U	.04	.08U				
	06 16.49	1.220	15.50	.08	.10	.12		1.79	
	06 21.27	1.223	15.65	.24	.32	.33U		1.01	
	06 34.79	1.283	15.34	.23U	.74U	1.05U			
	06 47.64	1.337	15.59	.23U	.37U	0.39U		0.64	
70 11 1	06 49.32	1.384	15.39	.10	.23U				
	06 59.58	1.436	15.46	.06	.15U			1.86	
	07 03.61	1.459	15.52	.08U	.18U				
	07 04.80	1.465	15.49	.11U	.24U				
	07 07.83	1.483	15.33	.08U	.18U			1.06	
	07 19.34	1.562	16.09	.08U	.16U				
	07 21.12	1.576	15.20	0.05	0.13U	0.22U		1.1	
	07 24.13	1.595	14.85	0.03	0.04	0.05U		1.53	
	07 25.09	1.606	15.38	0.22	0.42	0.54U		0.53	
	07 27.58	1.621	15.71	.09U	.26	.34U			
	07 39.59	1.722	14.71	0.05	0.18U	0.29U		0.92	
70 11 2	02 48.68	1.045	16.18	0.12	0.14U				
	02 51.78	1.042	15.66	0.03	0.1 U				
	03 04.02	1.034	15.83	0.07	0.12	0.13			
	03 16.06	1.027	15.46	.06	.19U				
	03 17.58	1.027	15.66	0.07	0.1	0.14U			
	03 23.14	1.025	16.02	.14	.34				
	03 39.09	1.022	16.02	.05U	.17U			1.26	
	03 40.39	1.022	13.62	0.11	0.27	0.47	0.67	1.15	0.58U
	03 41.76	1.022	15.52	0.05	0.13				
	03 48.43	1.023	13.26	0.31	0.45	0.7	1.00	0.72	0.43
	03 54.91	1.024	15.92	0.07	0.19U				
	03 55.99	1.025	14.03	.32	1.16	1.67	2.02	0.79	0.26
	04 00.67	1.026	14.18	0.13	0.40	0.80U	1.04U	0.82	
	04 02.74	1.026	16.40	.60	.80U				
	04 09.43	1.029	15.52	.10	.18U	.26U		1.26	
	04 12.97	1.031	13.96	0.11	0.33	0.70U	1.04U	0.64	0.36U
	04 22.92	1.038	16.18	.15	.21U				
	04 30.12	1.043	14.81	0.04	0.11	0.2		1.63	
	04 37.70	1.049	15.10	0.05	0.38			1.04	
	04 49.68	1.062	15.80	0.08	0.18U				
	05 04.68	1.084	16.06	.16	.24	0.27U		1.9	
	05 12.12	1.095	16.03	0.12	0.24				
	05 16.22	1.102	15.82	.16	.25	0.29U			
	05 18.34	1.106	15.82	.07	.13				
	05 28.00	1.125	15.88	0.03	0.07	0.11			
	05 36.77	1.143	15.86	0.16U	0.3 U			1.06	
	05 40.28	1.152	14.75	.20	.75	1.00	1.16	0.42U	
	05 44.26	1.161	15.84	0.13U	0.35U				
	05 42.42	1.169	14.55	.20	.30	0.33U	0.35U	1.90	
	05 47.27	1.169	15.59	0.06	0.06				
	05 51.07	1.180	15.75	0.15U	0.45U			0.8	
	05 55.61	1.194	15.48	0.06	0.15U				
	05 56.90	1.196	15.64	.09	0.13U	0.14U		1.66	
	05 59.47	1.208	15.31	0.24	0.35U	0.66U		0.76	

DATE (1)	U.T. (2)	AIRMASS (3)	U (PEAK) (4)	DURATIONS T(.5) (5)	T(.2) (6)	T(.1) (7)	T(.05) (8)	DECAY RATE J=1 (9)	J=3 (10)
	06 04.93	1.227	14.72	0.15	0.28				
	06 08.01	1.237	15.52	0.1 U	0.16U				
	06 08.82	1.240	14.40	0.06	0.13	0.16		1.42	
	06 11.44	1.247	14.52	.25	.82	1.17U	1.36U	0.1	
	06 12.72	1.250	15.64	0.15	0.20				
	06 13.45	1.254	15.52	0.10	0.2				
	06 25.61	1.295	15.57	1.72	2.00				
	06 29.18	1.307	15.41	.16	.38U			1.15	
	06 32.86	1.324	15.36	.14	0.3	0.42		0.92	
	06 34.82	1.332	15.14	0.11	0.16			1.59	
70 11 3	04 47.83	1.066	12.50	0.11	0.28	0.35	0.38	1.15	1.18
	04 55.68	1.077	15.97	.07	0.14				
	05 02.25	1.086	15.73	.44	.80U				
	05 06.86	1.094	15.65	.24	.40U	.46U			
	05 09.34	1.097	15.87	.20U	0.30				
	05 28.44	1.136	16.18	.14	.30U				
	05 37.52	1.157	15.64	0.17	0.47	0.62U			
	05 39.73	1.161	13.52	0.14	0.53	1.43	2.	1.40	
	05 45.78	1.177	15.99	.20	.40U				
	05 54.15	1.199	12.36U	0.37U	1.62U				
	06 00.34	1.220	15.85	.10	.28				
	06 06.83	1.240	14.76	0.1	0.3	0.45		0.8	
	06 10.37	1.250	15.64	0.05	0.1	0.11U			
	06 13.53	1.261	16.41	.84	1.04U				
	06 13.91	1.310	12.59	.13U					
	06 26.06	1.311	12.83	0.24	0.4 U			0.71	
	06 38.23	1.360	15.31	0.06	0.08				
	06 42.62	1.379	15.63	0.04	0.08				
	06 47.65	1.415	14.40	0.02	0.08U	0.15U			
	06 51.49	1.431	14.71	0.05	0.11			1.12	
	06 51.67	1.431	15.76	0.16	0.17				
	06 52.00	1.436	15.11	0.1	0.12				
	07 03.86	1.508	15.42	0.12	0.23				
	07 04.31	1.515	14.87	0.20	0.33				
	07 10.12	1.548	15.70	0.09	0.1				
	07 14.97	1.584	15.81	0.09	0.11				
	07 15.55	1.591	15.98	0.1	0.13U				
	07 20.67	1.629	15.50	0.04	0.08U				
	07 34.01	1.741	15.69	0.08	0.1 U				
	07 34.01	1.741	15.69	0.08	0.1 U				
	07 34.52	1.750	15.94	0.08U	0.12U				
	07 36.64	1.769	15.93	0.09	0.12U				

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
1974 April 5

CD -44° 3318: AN EMISSION-LINE STAR INVOLVED IN A DARK NEBULA

We recently noticed that CD $-44^{\circ}3318$ = CSV 1025 = BV 464 (IBVS 66), $\alpha = 7^h16^m\!.4$, $\delta = -44^{\circ}24'$ (1900), $\ell = 256^{\circ}\!.2$, $b = -14^{\circ}\!.1$, is an Hα emission-line star discovered by Henize (HEN 32) and consequently is listed in the catalog of Wackerling (Mem. R.A.S., 73, 153, 1970). Inspection of this region on a Whiteoak Atlas print discloses that this star is associated with a sharply bounded dark nebula having approximate dimensions of 10′ x 5′. The star lies on the eatern boundary of the dark material and appears to cause the illumination of a small portion of the nabula. This bright rim was previously noted by Lü (A.J. 76, 775, 1971) who provides an identification chart. The spectral type of CD-$44^{\circ}3318$ is not known but one might suspect that the star is related to the class of Be and Ae stars in nebulae studied by Herbig (Ap.J. Suppl. 4, 337, 1960).

N. SANDULEAK
Warner and Swasey
Observatory

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 881

Konkoly Observatory
Budapest
1974 April 6

ANNOUNCEMENT

IAU Colloquium No. 29, the sixth in the Bamberg-Budapest series, will be held in Budapest on 1 - 5 September 1975, with the theme "Multiple Periodic Variable Stars". The meetings will be held at the Hungarian Academy of Sciences, which will also act as hosts for the Colloquium.

The announcement is being sent to members of IAU Commissions 27 and 42, and to a number of other individuals and institutions. We anticipate that the scientific program will consist of about 15 invited review papers and about 30 additional invited contributions. In view of the limited number of presentations, and also of the limited facilities available, we encourage applications for two types of invitations - first those who wish to attend and participate in the discussions, and second, those who wish to present a contribution pertinent to the theme of the Colloquium.

Applications for either type of invitation should be sent to Dr. W. S. Fitch, Steward Observatory, University of Arizona, Tucson, Arizona 85721, U.S.A. In addition, applicants for invitations to contribute papers should include a title and an abstract of their proposed contribution. Applications should be received in Tucson prior to 1 January 1975, so that they may be reviewed and selected by the organizing committee, and a list of invited participants who will require visas placed in the hands of the Hungarian authorities by 1 April 1975. The Chairman of the Local Organizing Committee is Professor L. Detre, 1121 Budapest, Konkoly Thege M. ut 13/17, Hungary.

The preliminary program is as follows:

1. β Canis Majoris Stars
2. Cepheids
3. Mira Variables
4. White Dwarfs and Novae
5. Magnetic-Variables
6. RR Lyrae Stars
7. δ Scuti and RRs Stars
8. Eclipsing Variables

In general, each topic will be introduced by two invited speakers, one for theory and one for observation. Contributed papers may be either theoretical or observational. The proceedings of the Colloquium will be published by the Reidel Publishing Company. Further details will be sent to participants later.

The Scientific Organizing Committee

M. W. Feast
W. S. Fitch (Chairman)
B. V. Kukarkin
P. Ledoux
J. Smak
R. S. Stobie
B. Szeidl
B. Warner
S. C. Wolff

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Konkoly Observatory
Budapest
1974 April 11

DK Sge

DK Sge = GR 41 was discovered by Romano in 1958 (Romano,G.,Oss. "Ariel" Pubbl.No.14). The elements given by discoverer (First Supplement GCVS 1960) are as following:

Min.= JD. 2435630.400+$0^d.310896$·E ($11^m.9$-$12^m.7$ EW).

I examined this star on sky patrol plates (n=220, JD. 2436810.-41570.). It turned out that the period should be doubled.

The improved elements are:

Min.= JD. 2435630.400+$0^d.6218188$·E (EB)

($12^m.1$ - $13^m.7$ / $13^m.5$)

Observed minima:

Min. (hel.) 24.....	Epoch	O - C	Min. (hel.) 24.....	Epoch	O - C
35630.400	0	0.000	37932.375	+3702	+ 2
36817.474	+1909	+22	933.314	3703,5	+ 8
819.347	1912	+29	956.334	3740,5	+21
833.306	1934,5	- 2	960.368	3747	+13
841.393	1947,5	+ 1	961.295	3748,5	+ 7
842.320	1949	- 5	38255.423	4221,5	+15
847.314	1957	+15	322.267	4329	+0,014
875.273	2002	- 8	614,493	4799	-15
899.249	2040,5	+28	652.448	4860	+ 9
37192.396	2512	-13	671.405	4890,5	0
543.408	3076,5	-18	39027.379	5463	-17
576.384	3129,5	+ 2	033.303	5472,5	0
582.307	3139	+18	056.291	5509,5	-19
913.426	3671,5	+18	41570.329	9552,5	+ 5
927.378	3694	-20			

Details will be published in "Mitteilungen der Bruno - H. - Bürgel - Sternwarte Hartha ", Heft 7.

KLAUS HÄUSSLER
Bruno -H. - Bürgel - Sternwarte
Hartha

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 883

Konkoly Observatory
Budapest
1974 April 17

PHOTOELECTRIC PHOTOMETRY OF THE ECLIPSING BINARIES RZ Cas AND AR Lac

For the past two seasons this investigator has been engaged in photometric studies of the eclipsing binaries RZ Cas and AR Lac. All observations have been made with the 18" Cassegrain reflector and photoelectric photometer of the Kutztown State College Observatory. Thus far about 1400 observations in U,B,V have been obtained on RZ Cas and about 1650 on AR Lacertae. Detailed studies of both RZ Cas and AR Lac will be published after these investigations have been completed.

RZ Cassiopeiae is a 6th msgnitude eclipsing binary of the semi-detached type, the components of which are of spectral types A2V and KOIV. As a comparison the A2 star HR 791, a star previously used by several investigators, has been chosen. This investigation yields values of V = 5.91, B-V = +0.11, and U-B = +0.12 for HR 791.

RZ Cas has long been known to have a variable period, and a vast number of times of minimum light, chiefly visual, have been obtained over the years. The following table lists the recent photoelectric times of minimum light which have been obtained for this star including five which have been obtained by this investigator.

Hel. JD	E	O - C	Ref.
2439025.3008	0	$-0^d.0017$	IBVS No.148
32.4730	6	-0.0010	148
62.3562	31	+0.0010	148
68.3316	36	+0.0001	148
784.2876	635	+0.0015	322
877.514	713	-0.0016	285
40054.4168	861	+0.0042	456
127.3742	922	+0.0044	456
274.3375	1045	-0.0011	501
519.3669	1250	+0.0021	530
746.4607	1440	-0.0016	530
758.4125	1450	-0.0023	530
819.3702	1501	-0.0023	530
1162.406	1788	-0.0032	647
1199.4583	1819	-0.0037	647
1708.6392	2245	+0.0008	-
1726.5680	2260	+0.0008	-
1732.5442	2265	+0.0008	-
1990.7188	2481	+0.0014	-
2094.7056	2568	+0.0015	-

A least squares solution with all data given equal weight yields the following ephemeris:

Hel. Min I = JD 2439025.3025 + $1\overset{d}{.}1952499 \cdot E$
± 6 ± 4 p.e.

For RZ Cas the following magnitudes and colors have been obtained.

	V	B-V	U-B
maximum	6.18	+0.14	+0.08
primary	7.72	+0.22	+0.14
secondary	6.26	+0.12	+0.07

The depths of the minima are as follows:

	V	B	U
minimum I	$1\overset{m}{.}54$	$1\overset{m}{.}62$	$1\overset{m}{.}68$
minimum II	0.08	0.06	0.05

Although the primary minimum of RZ Cas has been suspected of being a complete occultation, these data prove that the eclipses cannot be complete. The values of B-V and U-B at primary minimum are completely incompatible with those of a K-type subgiant.

AR Lacertae is a 6th magnitude eclipsing binary system, consisting of a G2 subgiant and a KO subgiant. As a comparison star the investigator has used the F8 star HD 210731, whose magnitudes and colors he has determined as V = 7.37, B - V = +0.57, and U - B = +0.07.

AR Lacertae is also known to have a variable period. The following table lists the recent photoelectric times of minimum light which have been obtained for this star including five which have been obtained by this investigator.

Hel. JD	E	O - C	Ref.
2439376.4926	0	$-0\overset{d}{.}0029$	IBVS No.201
383.4386	3.5	+0.0019	201
876.268	252	+0.0065	456
2440932.3168	784.5	+0.0020	817
1592.7219	1117.5	+0.0019	-
1593.7124	1118	+0.0008	-
1604.6224	1123.5	+0.0032	-
1936.8022	1291	-0.0028	-
1938.7874	1292	-0.0008	-

A least squares solution, in which the time of the primary minima were given double the weight of the shallower secondaries, yielded the following ephemeris:

Hel Min. I = JD 2439376.4955 + $1\overset{d}{.}9831987 \cdot E$
± 15 ± 15 p.e.

One thing that is apparent from the residuals is that those for primary minimum tend to be negative while those for secondary tend to be positive. Excluding the evidently imprecise results for JD 2439876, the times of primary minimum have an average residual of $-0^{d}.0014$ while the times of secondary have an average of $+0^{d}.0022$. This difference of $0^{d}.0036$ implies that secondary minimum occurs 5.2 minutes after 0.50 phase or at a phase of 0.5018. A small orbital eccentricity is indicated.

For AR Lacertae the following magnitudes and colors have been obtained.

	V	B-V	U-B
maximum	6.11	+0.72	+0.26
primary	6.77	+0.83	+0.50
secondary	6.43	+0.71	+0.22

The depths of the minima are as follows:

	V	B-V	U-B
minimum I	$0^{m}.66$	$0^{m}.77$	$1^{m}.01$
minimum II	0.32	0.31	0.27

AR Lacertae has complete eclipses, the primary being an occulation and the secondary a transit. The primary eclipse is total for 129 minutes, and during that time only the KO component is visible. The values of B-V and U-B obtained for primary minimum are normal for a star of this type.

AR Lacertae has recently been discovered to be a source of radio outbursts. The observations of this investigator, however, do not indicate substantial short-term light fluctuations.

Kutztown Sate College
Kutztown, Penna., USA
April 5, 1974

CARLSON R. CHAMBLISS

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Konkoly Observatory
Budapest
1974 April 29

POLARIMETRIC OBSERVATIONS OF AW UMa

The variable AW UMa (BD +30°2163) was discovered by Paczynski (AJ 69,124,1964) in 1963 and was classified as an eclipsing variable of type W UMa.

The polarimetric observations of this close binary were carried out during 5 nights in March - May 1972. The same polarimeter was used as in Oshchepkov, IBVS 782, 1973 . The observational technique is described in Oshchepkov, Abast.Bull. 45,51, 1974 .

Our observational material is given in Table 1. The first column represents the heliocentric epochs of the observations, the polarization degrees and the position angles in equatorial frame of references are given in column two and three, respectively.

Table 1. Polarimetric Observations of AW UMa

2441000+	P%	θ°	2441000+	P%	θ°	2441000+	P%	θ°
392.4015	0.14	47	392.4833	0.18	175	393.2343	.18	97
.4043	.12	94	.4870	.08	168	.2368	.10	86
.4078	.14	108	.4897	.18	135	.2394	.12	115
.4113	.11	120	.4921	.16	161	.2427	.17	140
.4147	.18	123	.4951	.20	189	.2468	.24	154
.4175	.06	74	.4988	.26	189	.2505	.20	137
.4215	.05	168	.5024	.14	194	.2546	.31	152
.4251	.11	116	.5064	.16	169	.2582	.23	150
.4288	.02	118	.5099	.07	157	.2615	.43	157
.4323	.07	118	.5134	.10	149	.2655	.31	134
.4356	.13	123	.5166	.12	156	.2686	.17	131
.4395	.09	156	.5205	.13	146	.2718	.23	142
.4432	.16	122	.5238	.13	152	.2756	.25	150
.4467	.09	122	.5268	.18	131	.2794	.27	157
.4509	.06	154	.5307	.17	148	.2828	.33	150
.4548	.12	178	.5344	.16	155	.2868	.33	150
.4585	.18	142	.5384	.18	156	.3710	.38	143
.4627	.10	141	.5425	.14	134	.3752	.27	157
.4661	.14	130	.5460	.15	163	.3783	.33	141
.4689	.12	126	.5494	.17	185	.3813	.22	132
.4724	.14	133	.5536	.12	156	.3852	.29	126
.4759	.17	162	.5575	.09	152	.3891	.27	130
.4798	.20	162	393.2309	.29	160	.3931	.25	142

Table 1 (continued)

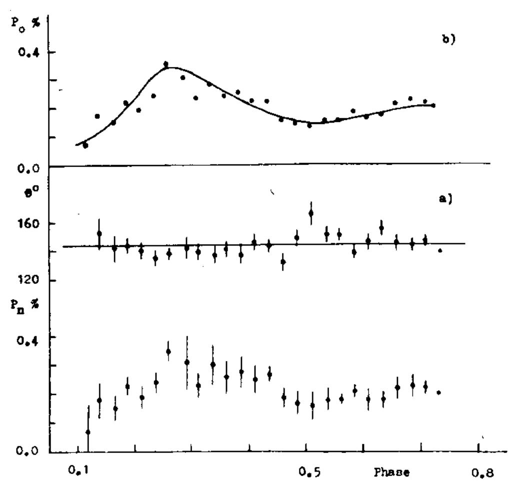
2441000+	P%	θ°	2441000+	P%	θ°	2441000+	P%	θ°
393.3970	0.28	138	418.2830	0.12	107	443.3291	0.37	144
.4040	.25	150	.2850	.20	117	.3316	.38	133
.4079	.26	141	.2875	.24	126	.3348	.41	143
.4116	.21	147	.2902	.18	109	.3373	.25	135
.4154	.21	140	.2933	.15	90	.3395	.31	123
.4191	.21	148	.2959	.17	117	.3421	.45	129
.4224	.39	151	.2985	.29	125	.3453	.52	132
.4257	.31	154	.3012	.31	129	.3478	.54	143
.4295	.21	146	.3034	.16	141	.3500	.59	147
.4333	.20	152	443.2706	.09	71	.3525	.48	137
.4372	.23	137	.2734	.14	125	.3554	.49	130
.4409	.27	131	.2764	.18	137	.3585	.33	121
.4443	.28	139	.2800	.14	143	.3610	.35	126
.4480	.25	161	.2830	.30	135	.3636	.50	138
.4513	.18	133	.2850	.34	122	.3668	.45	137
.4545	.33	131	.2874	.28	123	.3699	.46	134
.4587	.31	148	.2905	.25	123	.3723	.31	119
.4627	.23	153	.2935	.21	121	.3748	.42	131
.4660	.28	151	.2959	.21	118	.3781	.40	145
.4693	.18	155	.2985	.22	137	.3813	.34	149
.4731	.21	140	.3015	.32	140	.3840	.41	151
.4771	.29	142	.3046	.40	137	.3868	.39	144
.4811	.20	142	.3071	.41	135	.3896	.38	143
.4845	.25	133	.3094	.39	138	.3921	.37	142
.4875	.27	150	.3123	.40	132	468.2832	.10	144
.4917	.25	147	.3149	.46	140	.2871	.26	135
.4954	.23	140	.3177	.42	145	.2897	.35	167
.4993	.18	153	.3202	.49	141	.2926	.31	166
.5023	.20	139	.3233	.65	143	.2951	.31	163
418.2798	.22	75	.3264	.49	145	.2986	.30	165
						.3016	.54	167

As the observational data are rather extensive, the values of the polarization parameters were averaged through the phases with a step $0^P.25$. The normal points obtained in this way are given in Table 2 together with the r.m.s. errors and with the number of observations for each normal point.

Table 2. Normal Points of AW UMa

Phase	P% ± σ_p		θ° ± σ_θ		n	Phase	P% ± σ_p		θ° ± σ_θ		n
0.117	0.07 ±	0.09	128 ±	38	3	0.438	0.27 ±	0.03	142 ±	4	9
.138	.18	.06	152	9	3	.462	.19	.04	132	6	6
.166	.15	.05	142	9	5	.487	.17	.04	149	6	6
.189	.23	.04	144	5	11	.513	.16	.05	166	9	6
.213	.19	.04	140	6	14	.539	.18	.04	151	6	6
.237	.24	.04	135	4	10	.563	.18	.02	151	4	6
.260	.35	.04	138	3	6	.587	.21	.02	139	3	6
.291	.31	.09	142	9	6	.612	.18	.04	146	6	6
.313	.24	.05	139	5	7	.638	.18	.03	156	5	6
.338	.30	.07	137	5	7	.662	.22	.04	145	4	3
.362	.26	.06	141	7	7	.688	.23	.04	142	4	3
.387	.28	.06	137	6	7	.713	.22	.02	146	3	3
.413	.25	.05	146	6	7	.729	.20		139		1

The dependence of the observed polarization degree P_n and that of the position angle Θ on phase are shown in Figure 1a.



The variability of polarization indicates the presence of intrinsic polarization, even if an interstellar component may occur, although the high galactic latitude of the star ($b=+72^{\circ}$) makes any large amount of interstellar polarization very unlikely.

The change of the position angle is insignificant and within the limits of errors it can be considered as constant.

Figure 1b gives the dependence of the quantity of polarization $P_o = P_n(f) \cdot l(f)$ on phase, where $l(f)$ is the light loss computed from the observations carried out by Paczynski.

A peculiarity of this dependence is the maximum at phase $0^{P}.26$, qualitatively it resembles the polarization curve of YY Eri.

Kalish obtained the light curve for AW UMa and pointed out its peculiarity, that the maximum at phase $0^{P}.75$ is brighter than at phase $0^{P}.25$.

From spectral observations at phase $0^{P}.733$ Paczynski suggested that either the two stars are in touch with each other with a slight limb darkening or both of the stars have a common atmosphere, where the hydrogen lines are formed, as these lines are obviously not double in the spectrograms.

Taking into account the peculiarities of the light curve and spectral features mentioned above our polarimetric observations may be qualitatively explained either 1) by gaseous streams emerging from the component which is ahead in the primary minimum or 2) by the existence of a common atmosphere for both of the stars, but of irregular shape, more prolongated from the phase $0^{P}.25$.

Both spectral and photometric observations are necessary reveal as much as possible concerning the peculiarities of the system and the variability of the period.

February 1974.

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Konkoly Observatory
Budapest
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AY Mus: A TRIPLE SYSTEM?

The eclipsing binary AY Mus was observed photographically in 1924-1931 (Refs.1,2) and was found to have equal minima about 0.3 magnitudes deep. The secondary minimum fell at phase 0.48, thus the orbit is eccentric with e≥0.03. In January 1973 however, photoelectric UBV-observations with ESO's 50 cm telescope at La Silla failed to show any eclipses deeper than 0.02 magnitudes. A closer examination of the records possibly shows the primary minimum near the expected phase, giving the improved ephemeris

$$JD_{pr} = \underset{\pm .01}{2441683.80} + \underset{\pm .00001}{3^{d}.20555} E$$

The secondary minimum could not be found in these observations: it may be (if observable) anywhere in the phase-interval 0.45-0.55. In Fig.1. are shown the present B light-curve and the old photographic one. The present observations were made relative to the comparison stars in Table 1; no variations greater than 0.01 magnitude were found for them.

Table 1. Measured UBV-values

	CPD	HD (E)	Sp (HD)	V	B-V	U-B
AY Mus	$-64^{\circ}1669$	310592	B9	10.31	0.18	-0.14
Comp 1	$-64^{\circ}1677$	100638	A0	7.16	0.10	-0.35
Comp 2	$-64^{\circ}1682$	101174	B8	7.41	0.09	-0.44

The only tenable explanation of the present absence of eclipses is a third body in the system, causing nodal regression and consequently changed inclination to the plane of the sky for the eclipsing pair. Reasonable assumptions about the dynamics of the system leads to an expected period for the third body in the interval $100^{d} < P_3 < 900^{d}$.

A more detailed discussion of the observations and their interpretation is to be published elsewhere. Meanwhile, further observations of AY Mus are of course desirable: photometric to study changes in the depths of minima; spectroscopic in order to possibly reveal the third star, either by its spectrum or by its influence on the bary-

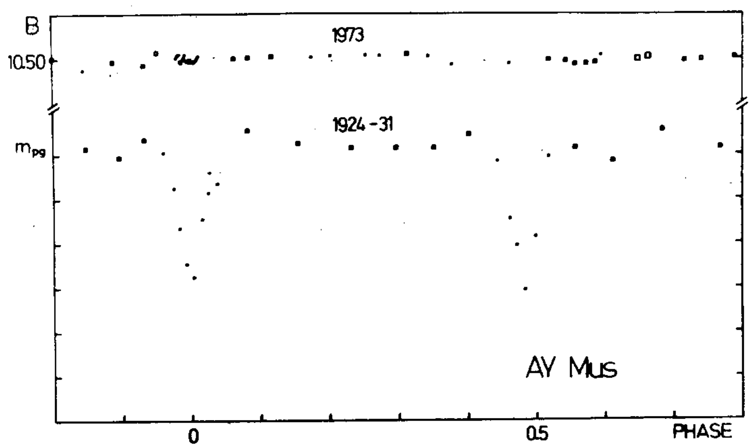

Figure 1. The light-curve of AY Mus from photographic estimates compared to the new photoelectric observations. Ordinate unit 0.1 magnitudes. Sizes of symbols proportional to their weight.

centric velocity of the close pair (the velocity amplitude may be about 10 km/s). Also, any old photographic plates taken near minimum light would be valuable in tracing the development of the light-curve.

STAFFAN SÖDERHJELM
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References:

1) Utterdijk J., 1932, BAN 6, 295.
2) Oosterhoff P.Th., and van Houten, C.J., 1949, BAN 11, 63.

COMMISSION 27 OF THE I. A. U.
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NUMBER 886

Konkoly Observatory
Budapest
1974 May 7

GL TAURI

The star GL Tauri has been classified in the G.C.V.S. (B.V. Kukarkin et al. 1970) as an irregular variable connected with an emission nebula, showing rapid light variations (Ins?).The range of the photographic magnitudes, as determined by W. Götz(MVS 361, 1958), is from 15.7 to 17.5.

Fourteen plates obtained in B (103a-O + GG 13) and five in infrared (1N + RG 5) during the period between JD 2439763 and 2439860 with the 65/90/210 cm Schmidt telescope of the Asiago Astrophysical Observatory were wxamined for a study of the interconnection between the star and the nebula.

At minimum in blue GL Tauri appears as a star-like object fainter than determined by Götz. During the period covered by the present observations its brightness fluctuated between 18.6 and <19.0. The small nebula (17" diameter) in which the star is embedded showed also variations of blue brightness in some points of its surface, particularly in the northern part. Its appearance was therefore changing, but apparently without connection with the variations of the star-like object.

The star is invisible in infrared, except for one plate where it is barely visible, near the plate limit. The nebulosity does not appear in infrared.

Photographs of the same region obtained in blue light with the short focus 40/50/100 cm Schmidt telescope of Asiago show that the integrated blue magnitude of the nebula is about 17.6. For this reason we think that the minimum observed by Götz was mostly due to the brigthness of the nebula rather than to the star.

The small emission nebulosity surrounding the star-like nucleus suggests that the variable object GL Tauri may be in an intermediate stage between Herbig-Haro objects and T Tauri variables.

We are indebted to Prof.P.Maffei for the use of the plates for this variable.

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dell'Università di Padova

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Konkoly Observatory
Budapest
1974 May 15

OBSERVATIONS OF 2 CSV-STARS ON SKY PATROL PLATES

CSV 188

CSV 188 = 245.1937 = DO 25181 (M6) = SVS 783 was discovered by P.P. Parenago (Perem. Zvezdy, Tom.5.158.1938) in 1937. The observed amplitude was $1^m.4$ ($10^m.8$ - $12^m.2$ ph).
On 88 plates obtained with the Hartha Sky Patrol Camera (JD 2439024--2442036) I examined the star. Its brightness varies in long waves unperiodically. Temporary quick fluctuations are present. So I classify it as Lb - type. My observed amplitude is $1^m.0$ ($10^m.8$ - $11^m.8$ ph). CSV 188 is a very red star.

CSV 5990

CSV 5990 = GR 75 was discovered by Romano, G. (Oss.priv.Treviso Pubbl. No. 20. 1960). The discoverer classified the star as an eclipsing binary ($10^m.1$ - $11^m.1$ ph) and published 2 minima. Weber, R. confirmed the light-variations (Oss. priv. Treviso Pubbl. No.23 1960) and published observations containing 2 minima, too.
I examined the star on 103 sky patrol plates of the Hartha Observatory (JD.2439024-2442036). It turned out CSV 5990 was, in fact, a bright eclipsing binary with EW-type. The elements are:

Min. (hel.) = JD. 2439026.542 + $0^d.909026 \cdot E$ (EW)
($10^m.43$ - $11^m.13$/ $11^m.02$ ph)

Observed Minima

JD.(hel.)24...	Epoch	O - C	m	Observer
32477.40	-7204.5	- $0^d.06$	11.0	Weber,R. (Min.II)
503.39	-7176	+ 02	11.0	"
38843.33	- 201.5	- 04	11.2	Romano,G.(Min.II)
950.26	- 84	+ 08	10.8	"
39026.537	0	- 005	11.25	Busch,H.
027.451	+ 1	000	11.1	"
053.364	29.5	+ 005	11.2	" (Min.II)
057.457	34	+ 007	11.25	"
058.354	35	- 005	11.1	"
088.364	68	+ 007	11.2	"
41595.458	2826	+ 008	11.2	"
596.354	2827	- 006	11.1	"
602.274	2833.5	+ 002	11.1	" (Min.II)
42036.312	3311	- 014	11.2	"

Further particulars will be published in "Mitt. der Bruno-H.-Bürgel-Sternwarte" Hartha, Heft 7.

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Hartha

OBSERVATIONS OF 6 CSV-STARS ON SKY PATROL PLATES

CSV 4390

CSV 4390 = SVS 866 was discovered by Fadeeva, S. (Perem. Zvezdy, Tom 5. 206.1938) in 1937, who found slow variations with amplitude $0^m.8$ ($11^m.7$ - $12^m.5$ ph).
I examined the star on 93 sky patrol plates of Hartha Observatory (JD.2438882-2441570) and confirmed Fadeeva's observations. The star is showing slow light-variations between $11^m.8$ - $12^m.6$ ph. The comparison stars utilized by Fadeeva were taken over.

CSV 5848

CSV 5848 = BV 293 = BD 51°0042 (9.2) = HD 1519 (Ma) was discovered by Strohmeier and Knigge in 1960; $10^m.5$ - $11^m.0$ ph. (Veröff. Sternw. Bamberg Bd.5).
On 173 sky patrol plates of Hartha Observatory I examined the light-variations (JD. 2436985 - 2442036). CSV 5848 is a star of Lb-type. The light-variations are between $10^m.50$ and $11^m.40$ ph.

CSV 5849

CSV 5849 = GR 28 was discovered by Romano, G. in 1958; $11^m.7$-$12^m.3$ ph. (Oss. priv. Treviso Pubbl. No.14, 1958).
I examined the star on 171 sky patrol plates (JD 2436985-2442036). Unperiodical light-variations were observed. The star is not noticeable coloured. The type is probably Isa.

CSV 5867

CSV 5867 = Wr 16 is a variable star discovered by Weber, R. in 1957; $10^m.8$ - $12^m.0$ ph. (J. Observateurs Vol. 41 No.4.74; 1958). The discoverer found EA-type.

I examined this star on 231 sky patrol plates (JD.2439024-2442036).

CSV 5867 is an EW-star with the following elements:

$$\text{Min.(hel.)} = \text{JD } 2439029.461 + 0^{d}.23368912 \cdot E \quad \text{(EW)}$$

$$11^{m}.20 - 11^{m}.94 / 11^{m}.94 \text{ ph}$$

Observed Minima

Min. hel. 24 ...	Epoch	O - C	
39029.465	0	$0^{d}.000$	
052.364	98	+0.001	
056.346	115	+ 008	
.455	115,5	000	Min.II
057.386	119.5	- 001	Min.II
061.369	136.5	+ 007	Min.II
088.363	252	+ 009	
387.599	1532.5	+ 006	Min.II
388.416	1536	+ 006	
436.316	1741	- 001	
40483.477	6222	- 001	
41159.429	9114.5	+ 006	Min.II.
249.285	9499	+ 007	
.398	9499.5	+ 004	Min.II
251.264	9507.5	+ 001	Min.II
.382	9508	+ 002	
595.369	10980	- 002	
596.303	10984	- 002	
598.289	10992.5	- 003	Min.II
.417	10993	+ 009	
.521	10993.5	- 004	Min.II
599.348	10997	+ 005	
602.266	11009.5	+ 002	Min.II
959.342	12537.5	+ 002	Min.II
960.279	12541.5	+ 003	Min.II
973.367	12597.5	+ 004	Min.II
42036.346	12867	+ 004	

CSV 5887

CSV 5887 = GR 88 was discovered 1962 by Romano, G. (Oss. priv. Treviso Pubbl. No.29,1962). Weber, R. confirmed the light-variation (Comm. 27. I.A.U. Inf.Bull.Var. Stars No.3, 1962).

On 139 sky patrol plates (Hartha Observatory) I examined this star (JD. 2436895-2442036). The variations are between the limits $11^{m}.60$ and $12^{m}.75$ ph. The light variations are quick with standstills in minimum light. My series of observations yielded the same unperiodical light fluctuations as obtained by Romano.

CSV 5887 is not coloured. It belongs to the Isa-type.

CSV 5904

CSV 5904 = BD 60°201 = Wr 54 was discovered by Weber, R. in 1958 (J. Observateurs Vol. 41 No.4.74. 1958). The discoverer found E-type ($9^{m}.0$ - $9^{m}.0$ ph).

I examined this star on 135 sky patrol plates (JD. 2436895-2441598). CSV 5904 is coloured. Variations are irregular between $9^{m}.44$ and $10^{m}.01$ ph. The star is an Isb-type variable.

Further particulars will be published in "Mitt. der Bruno-H.-Bürgel-Sternwarte" Hartha, Heft 7.

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COMMISSION 27 OF THE I. A. U.
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Konkoly Observatory
Budapest
1974 May 16

UZ OCTANTIS

The variability of UZ Oct (BV 421 = CoD $-85^{\circ}47$ = CPD $-85^{\circ}55$) was announced by Strohmeier (IBVS 51, 1964), who also gave the first photographic light elements (IBVS 54, 1964); Köhler and Schöffel (IBVS 91, 1965) proved the star to be a W UMa system instead of an RRc type variable as previously believed; also they published times of minimum light and the corresponding light elements. In this note we present times of minimum derived from 431 photoelectric UBV observations made at the Bosque Alegre station of Córdoba Observatory with the 1.54 m reflecting telescope. Individual minima are listed in Table I together with the older photographic ones; they were used to determine the following least square linear ephemeris:

$$\text{Min. I} = \text{JD hel. } 2440223.1560 + 1^{d}_{.}1493709 \cdot E$$
$$\pm.0084 \qquad \pm.0000053$$

Weights (W) in Table I were given according to the quality and number of the observations for each color; weight unity was assigned to the photographic observations.

Using only the photoelectric minima we found:

$$\text{Min. I} = \text{JD hel. } 2442064.44803 + 1^{d}_{.}1493549 \cdot E$$
$$\pm.00022 \qquad \pm.0000055$$

the primed values in Table I correspond to these elements.

The observations of the system will be completed in the next observing season; the 431 complete UBV observations at present cover well the primary minimum ($\sim$12 observations per normal point), however, secondary minimum and the maxima are not so well covered. The following depths were found in relation to the comparison star (CoD $-85^{\circ}49$)

Primary minimum: $\Delta V=+0^{m}_{.}065$, $\Delta B=+0^{m}_{.}110$, $\Delta U=+0^{m}_{.}295$

Secondary minimum: $\Delta V=+0^{m}_{.}005$, $\Delta B=+0^{m}_{.}035$, $\Delta U=+0^{m}_{.}225$

and the light at maxima: $\Delta V=-0^{m}_{.}460$, $\Delta B=-0^{m}_{.}445$, $\Delta U=-0^{m}_{.}250$

Secondary minimum shows constant light during an interval of about 90 minutes indicating it to be an occultation, while primary minimum shows the effects of a slightly curved transit.

Times of minimum

Color	JD hel. 2400000+	E	W	(O - C)	E'	W'	(O - C)'
Pg	38316.323	-1659.0	1	-0.027			
	38374.356	-1608.5	1	-0.037			
	38374.401	-1608.5	1	+0.008			
	38408.324	-1579.0	1	+0.025			
	38427.279	-1562.5	1	+0.015			
	38435.314	-1555.5	1	+0.004			
	38439.312	-1552.0	1	-0.020			
	38439.356	-1552.0	1	+0.024			
	38440.449	-1551.0	1	+0.033			
	38443.353	-1548.5	1	-0.002			
Pg	38443.398	-1548.5	1	+0.043			
V	42005.8333	+1551.0	2	+0.0031	-51.0	1	+0.0024
B	42005.8326	+1551.0	2	+0.0024	-51.0	1	+0.0017
U	42005.8326	+1551.0	2	+0.0024	-51.0	1	+0.0017
V	42011.5775	+1556.0	2	+0.0004	-46.0	1	-0.0002
B	42011.5779	+1556.0	2	+0.0008	-46.0	1	+0.0002
U	42011.5777	+1556.0	2	+0.0006	-46.0	1	0.0000
V	42012.7270	+1557.0	3	+0.0005	-45.0	2	-0.0001
B	42012.7269	+1557.0	3	+0.0004	-45.0	2	-0.0002
U	42012.7262	+1557.0	3	-0.0003	-45.0	2	-0.0009
V	42066.7461	+1604.0	3	-0.0008	+ 2.0	2	-0.0006
B	42066.7462	+1604.0	3	-0.0007	+ 2.0	2	-0.0005
U	42066.7469	+1604.0	3	0.0000	+ 2.0	2	+0.0002
V	42067.8942	+1605.0	2	-0.0021	+ 3.0	1	-0.0019
B	42067.8942	+1605.0	2	-0.0021	+ 3.0	1	-0.0019
U	42067.8942	+1605.0	2	-0.0021	+ 3.0	1	-0.0019
V	42123.6396	+1653.5	3	-0.0012	+51.5	2	-0.0002
B	42123.6412	+1653.5	3	+0.0004	+51.5	2	+0.0014
U	42123.6407	+1653.5	3	-0.0001	+51.5	2	+0.0009

Córdoba, 7 May 1974.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
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Konkoly Observatory
Budapest
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ECLIPSE TIMINGS OF CATACLYSMIC VARIABLES

The following heliocentric times of mid-eclipse of the cataclysmic variables T Aur, EM Cyg, U Gem, DQ Her, V Sge, and WZ Sge have been obtained from observations made at Kitt Peak National Observatory. A more detailed discussion of these results will be published elsewhere.

I) T Aur

JD hel. 2441000 +	O - C
978.918	-.007
980.758	-.006
980.962	-.007
981.984	-.006

O - C values are with respect to the elements given by Mumford (Publ.Astron.Soc. Pacific 79, 283,1967).

II) EM Cyg

JD hel. 2441000 +	O - C
980.6051	-.0046
982.6432	-.0029

O - C values are with respect to the elements given by Mumford (In Mass Loss from Stars, M.Hack ed., Dordrecht: D.Reidel Pub.Co., 204, 1969)

III) U Gem

JD hel. 2441000 +	O - C
978.8655	.0058
979.9269	.0057
980.9887	.0061
981.8731	.0060

O - C values are with respect to the elements given by Krzeminski (Astrophys. J. 142, 1051, 1965).

IV) DQ Her

JD hel. 2441000 +	O - C
979.7034	.0060
980.6710	.0055
981.6394	.0058

O - C values are with respect to the elements given by Walker (Astrophys. J. 134,171, 1961).

V) V Sge

JD hel.	O - C
2441978.8020	.0080

The residual is with respect to the elements given by Herbig,Preston, Smak, and Paczynski (Astrophys, J. 141, 617, 1965).

VI) WZ Sge

JD hel. 2441000 +	O - C
980.7182	.0001
981.6819	.0001
982.5889	.0001

O - C values are with respect to the elements given by Krzeminski and Smak (Acta Astronom. 21, 133. 1971).

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COMMISSION 27 OF THE I. A. U.
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Konkoly Observatory
Budapest
1974 May 18

NOTES ON THE Be-STAR HR 1508 AND THE ECLIPSING BINARIES AA CETI AND BT ERI

The following observations have been obtained with the Copenhagen 50cm telescope and a four-channel ubvy-photometer at Cerro La Silla, Chile.

HR 1508 (= K3Π 6131).

This star was found to be variable from observations made on six nights in November 1973, when it was used together with HR 1545 as a comparison star for RZ Eri.

HJD	V*	b-y
42000.79-.83	5.800	+.013
001.74-.80	5.765	+.023
002.67-.82	5.794	+.024
003.75	5.780	+.017
004.67	5.760	+.023
005.76	5.792	+.015

* derived from differences to HR 1545 with V=6.261 for this star.

Afterwarde it was found that the star is included in the Second Catalogue of Suspected Variables Stars (1965) as No.6131, with a range in V from 5.9 to 5.99. It is classified as B5ne. The brightness difference between the new observations and the values V=5.92 and B-V=-.10 given in the Bright Star Catalogue seems to be significant only in the V-band and absent in B.

AA CETI

A secondary minimum was observed on Feb. 14, 1972. The lightcurve shows a constant phase of about 50 minutes duration ($0^{p}.07$). From the b-lightcurve the following time of mid-eclipse was derived:

Min II: HJD 41330.6166
± 10 m.e. (estimated)

which is in good agreement with the ephemeris given by Bloomer, O-C = $0^{d}.0017$ (1972).
A diaphragm of 30 seconds of arc was used, so that the light of the secondary component (m_V=7.7, distance 8".5) was included in the measurements.

Reference:
Bloomer, R.H., 1972: IBVS No.745.

BT ERI

A minimum was observed on Nov.5,1973 giving the following time as the mean for all four colors:

Min I: HJD 41991.60389
± 10 m.e.

Combined with the photographic times of minima given by Deurinck and Goossens (IBVS No.792, 1973), this leads to an improved period of 2.112269 ± .000010 days.

On the previous night a few observations were obtained at phase $0^p.55$ and $0^p.58$ without any indication of an eclipse. Assuming these observations to represent maximum light, the amplitudes are .92,.92, .90 and .89 in u,v,b and y resp. Transforming y to V we obtain V=9.56 in maximum and V=10.45 in Min I. The duartion of the primary minimum was observed to be longer than $0^p.08$.

Cerro La Silla,
May 4, 1974.

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HD 271227, A NEW β LYRAE TYPE STAR JUST OUTSIDE THE ERROR BOX OF LMC X-2

Photo-electric observations have been made of two stars viz. HD 271213 (12 mag, B31) which is the only LMC member within the error box of LMC X-2 (or 3U 0521-72, Giacconi et al. 1973,preprint) and HD 271227 (10.8 mag, A3), a galactic foreground star (Fehrenbach, Duflot and Petit, 1970, Astron.Astrophys. Special Suppl, Ser. No.1), which is only a few minutes of arc outside the error box.

Feast (private communication) suggested to make photometric observations of the first star and the second was taken as the comparison star. Soon it was evident that the last one was strongly variable. A new comparison star was taken for both objects viz.HD 35434 (9.6 mag, A3).

The observations were made with the Walraven simultaneous five-colour photometer (Walraven and Walraven, 1960 Bull.Astron.Inst.Netherl. 15, 67; Rijf, Tinbergen and Walraven 1969, Bull.Astron,Inst.Netherl. 20, 279) attached to the 90 cm light-collector of the Leiden Southern Station at the SAAO annexe in South-Africa, from December 1973 to March 1974. A preliminary reduction showed that the LMC member HD 271213 stayed constant during these months and that the foreground star HD 271227 is an eclipsing binary of the β Lyrae type with a period of $0^d.7765 \pm .0002$ e.e. and a primary minimum of 0.65 mag. deep. The figure shows the log intensity differences variable minus comparison star for the Walraven B band (4260 A). The phases have been computed with the formula:

$$(JD - 2442050.3042) \times 0.7765^{-1} .$$

There is an indication that the primary minimum is slightly asymmetric and that the maxima are unequal. If real, it would mean that a small extra light source is present in the system. Further observations are however urgently needed to confirm this.

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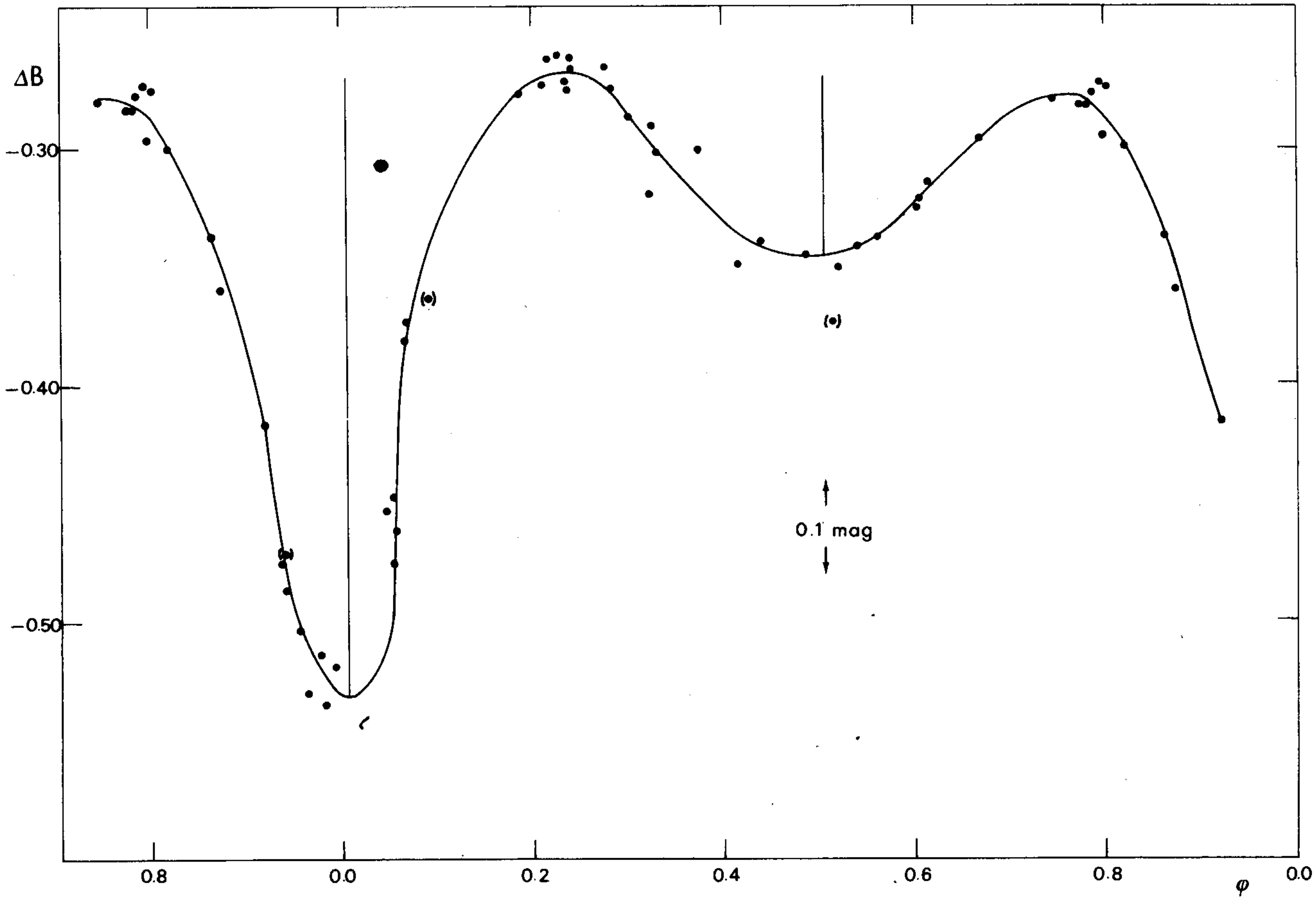
ΔB
−0.30
−0.40
−0.50
0.1 mag
0.8
0.0
0.2
0.4
0.6
0.8
0.0
φ

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Budapest
1974 May 27

UBV OBSERVATIONS OF 31 CYGNI DURING THE 1972 ECLIPSE

On eight nights between May and July, 1972, photoelectric observations of 31 Cygni were made at the Fernbank Science Center Observatory using the 91 cm reflector. An unrefrigerated EMI 6256 photomultiplier tube was used with standard UBV filters. All observations of 31 Cygni were made differentially with respect to 26 Cygni, and have been transformed to the standard UBV system. Each table entry is an average of four separate observations.

JD (Hel) 2441000+	ΔV	ΔB	ΔU	JD (Hel) 2441000+	ΔV	ΔB	ΔU
442.7128	-1.208	-0.799	-0.187	501.7581	-1.253	-1.020	-1.109
.7495	-1.212	-0.785	-0.148	502.6217	-1.266	-1.090	-1.379
.7879	-1.212	-0.766	-0.118	.6431	-1.267	-1.084	-1.376
.8065	-1.207	-0.760	-0.114	.6638	-1.257	-1.079	-1.394
442.8279	-1.197	-0.744	-0.102	502.6753	-1.243	-1.065	-1.404
490.6643	-1.184	-0.729	-0.045	504.6261	-1.243	-1.042	-1.554
.7446	-1.195	-0.738	-0.049	.6477	-1.230	-1.068	-1.554
.7933	-1.184	-0.747	-0.052	504.6587	-1.225	-1.055	-1.546
490.8143	-1.185	-0.751	-0.067	510.7091	-1.257	-1.145	-1.743
491.6071	-1.167	-0.735	-0.071	.7381	-1.255	-1.138	-1.758
.6463	-1.195	-0.748	-0.075	.7657	-1.259	-1.146	-1.771
.6878	-1.190	-0.767	-0.073	510.8049	-1.261	-1.154	-1.775
.7491	-1.199	-0.747	-0.058	519.7415	-1.257	-1.131	-1.785
491.7785	-1.180	-0.728	-0.039	.7688	-1.243	-1.116	-1.758
501.6569	-1.269	-1.041	-1.052	.7953	-1.243	-1.116	-1.752
.6820	-1.261	-1.013	-1.058	519.8163	-1.239	-1.102	-1.760
.7214	-1.253	-1.015	-1.091				

It is noted that during the total phase of the eclipse (JD 2441490 and 491) and also outside of eclipse, variations as large as 0.03 were found in the ultraviolet. This variation is significantly greater than observational scatter would indicate, and has been previously reported by others (Lovell and Hall, PASP 85, 131, 1973; Bloomer and Wood, PASP 85, 348, 1973).

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LONG SERIES OF OBSERVATIONS ON GL, KP, AND V343 Cyg

The plates on a Cygnus region of the Milky Way taken at the Maria Mitchell Observatory and spanning more than fifty years are suitable for testing the accuracy and constancy of variable star periods. For this purpose Bonnie Buratti, a student summer assistant from the Massachusetts Institute of Technology, in 1973 examined the three variable stars in Tables I-III, but she did not have time to complete all of the necessary analyses.

Table I. GL Cyg

Reference	$JD_{\odot}$	Period	Time Span
Olmsted 1951	31997.746	3.37053	1926-1948
Kukarkina 1955	25512.341	3.37066	JD 13836-34477
Romano 1969	25512.420	3.370683	37468-37889
NEW		3.37070	22906-42187

The new period (reciprocal 0.2966743) representing 600 Nantucket plates also satisfies the previously published $JD_{\odot}$ as well as the observations published by Kukarkina and Romano.

Table II. KP Cyg

GCVS	34536.813	0.855940	
Whitney 1956		0.855933	JD 33617-35299
Romano 1969		0.855940	37189-39061
NEW		0.855936	22609-41963

The General Catalogue of Variable Stars refers to Whitney's paper but the periods differ slightly. The reciprocals of the periods are respectively 1.168316 (Whitney) and 1.168306 (GCVS). The new period (reciprocal used, 1.168311) fits the 1040 Nantucket observations and also the data published by both Whitney and Romano. Moreover, the scatter of observations on the ascending branch of the light curve is smaller than for either of the previously published periods.

Table III. V343 Cyg

Baade 1928	24080.43	11.9290	
Olmsted 1951	31236.737	11.9275	1926-1948
Romano		"	JD 37189-39061
NEW		"	22609-42187

V343 Cyg
A is BD+38°3884

In this instance the period derived by Olmsted on the basis of less than sixty plates, and verified by Romano, holds equally well without correction for the 670 Nantucket observations.

For none of the three stars investigated is there any indication of changing period in the course of 50 to 60 years.

May 1974

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References:

Baade, W. 1928, A.N. No. 5548.
Kukarkina, N.P. 1955, Russian Var. Stars, Vol. 10, p.96.
Olmsted, M. 1951, Harvard Bull. No. 920.
Romano, G. 1969, Padua Pub. No. 156.
Whitney, B.S. 1956, P.A.S.P., Vol.68, p.269.

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THE LIGHT VARIATIONS OF HD 34626

HD 34626 (B 1.5 IV np, mv $8^m_.2$) is one of several stars described by Petrie and Pearce (1962) as having spectral lines which vary in width,but not in a way which is explicable in terms of two spectra.These stars were examined photometrically by Percy (1970) in the hope that some of them might be β Canis Majoris stars; however, most of them did not vary in light. HD 34626 was an exception; it varied by nearly $0^m_.1$ on a time scale $\geq$ 8 hours.

Further observations of this star were obtained at Kitt Peak National Observatory in October 1970, using a 41 cm reflector with refrigerated 1P21 photomultiplier tube. Observations were made through a standard B filter, relative to BD +36°1086, and were corrected for differential extinction and reduced to the sun.

The star varies in brightness by about $0^m_.1$ on a time scale of 12 hours (the time required for the star to complete half a cycle).However, the variation is not strictly periodic - the range varies from $0^m_.02$ to $0^m_.10$.

The spectral type of HD 34626 is B 1.5 IV np according to Walborn (1971). According to Walker and Hodge (1966), the absolute magnitude is -3.7 (consistent with the spectral type) and the projected rotational velocity is 570 km-sec^{-1}. If the latter figure is correct, the inclination must be almost 90°; otherwise the star would be rotationally disrupted.

There is no simple explanation for the light variations. The observed time scale is much greater than the longest radial pulsation period for a star of absolute magnitude -3.7. The star might possibly be an ellipsoidal variable with an orbital period of 24 hours, although the observed range in radial velocity is only 23 km-sec^{-1}, Finally,the star might be rotating with a period of 12 hours. If the radius is 7 $R_\odot$, and the rotational velocity is 570 km-sec^{-1}, then the rotation period would be 14 hours. In this case, the variation in brightness might be due to the rotation of a non-uniform star. Further spectroscopic observations would be valuable.

This research was supported by the National Research Council of Canada.

Photometric Observations of HD 34626 Relative to BD +36°1086

JD hel. 2440000+	ΔB	J.D.hel. 2440000+	ΔB	J.D.hel. 2440000+	ΔB
881.809	0.677	884.994	0.683	886.882	0.712
883.803	0.670	885.027	0.709	.935	0.718
.850	0.659	.767	0.711	.983	0.716
.896	0.659	.839	0.759	887.770	0.677
.962	0.658	.917	0.758	.825	0.671
884.793	0.689	.962	0.740	.877	0.692
.857	0.668	886.007	0.703	.965	0.666
.912	0.660	.778	0.679		
.950	0.661	.827	0.694		

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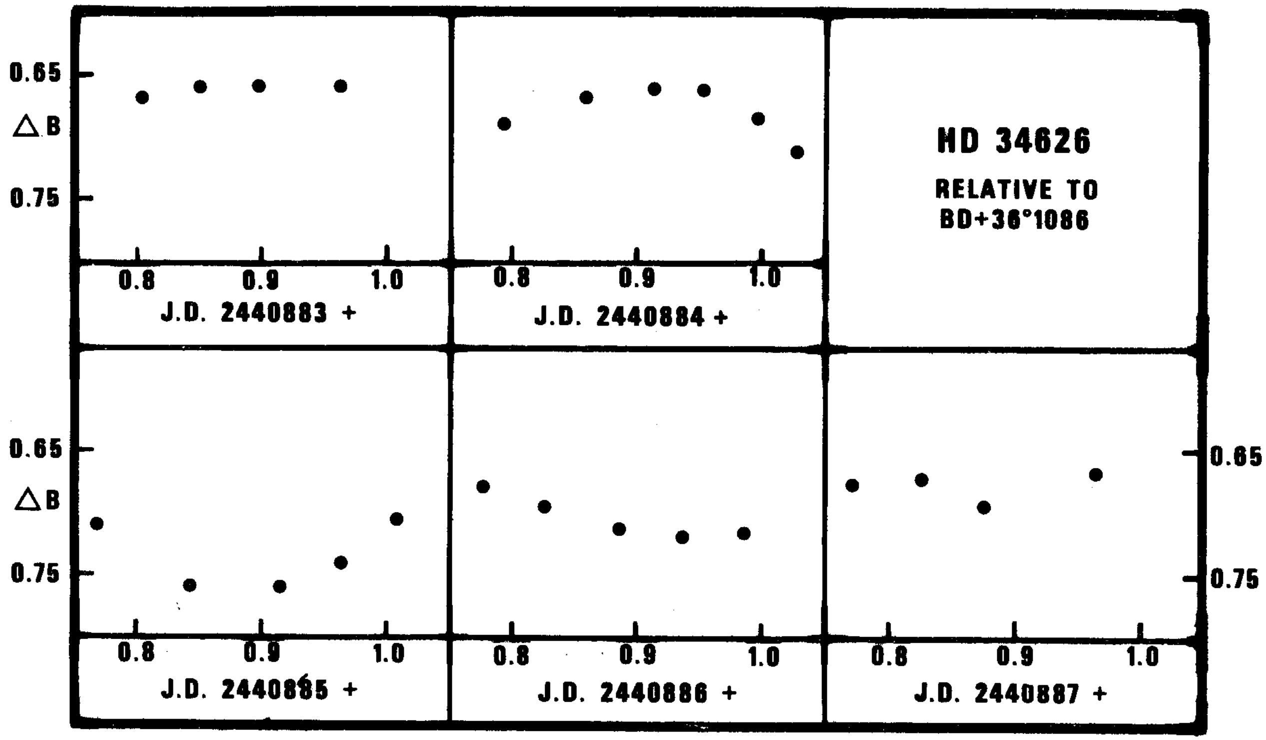

0.65
ΔB
0.75
0.8
0.9
1.0
J.D. 2440883 +
J.D. 2440884 +
HD 34626
RELATIVE TO
BD+36°1086
J.D. 2440885 +
J.D. 2440886 +
J.D. 2440887 +

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 895

Konkoly Observatory
Budapest
1974 June 11

PERIOD AND LIGHTCURVE OF V 1 IN THE GLOBULAR CLUSTER NGC 6752

Of the three known variables in the globular clusters NGC 6752, V 1 and V 2 are given in Hogg's recent Catalogue (Hogg, 1973). V 3, discovered by Cannon and Stobie 1973 , is on the giant branch and has a small amplitude. Little is known about V 2 as crowding makes photometry difficult.

We present the period, lightcurve and ephemeris of V 1. The material consists of 21 blue and 15 yellow plates obtained with the 74 in. Radcliffe reflector (Pretoria, South Africa) and 10 blue plates taken with the "blue" camera of the 20 in. Yale-Columbia refractor (El Leoncito, Argentina). The brightness of V 1 was determined by examining the plates with an eyepiece using the step method. The blue amplitude is of the order of a magnitude; the yellow amplitude is estimated 0.6 magnitude.

All the Radcliffe plates were taken within the interval JD 2433539-2438291. The South American plates were exposed between JD 2440828 and JD 2440858.

The South American plates, covering no more than a month, led to a rough determination of the period. This period was subsequently improved by the Radcliffe material.

Phases were computed according to the formula:

$$\text{phase} = 0.72562\ (\text{JD} - 2430000)$$

Figure 1 shows the blue and yellow lightcurves over 1 1/2 period. Results from both telescopes are shown, it was assumed that systematic differences between the two series could be neglected.

The following ephemeris was found:

$$\text{JD of maximum} = 2438000^{d}.428 + 1^{d}.37813\ E$$

Cannon and Stobie give V = 13.0, B-V = +0.4 for the mean of their measures of V 1. Considering the horizontal branch at V = 13.5, they presumed V 1 to be a Population II Cepheid, a surmise now proven by our period and lightcurve.

Wesselink 1974 drew attention to the close similarity that seems to exist between the globular clusters NGC 6752 and M 13.

The establishment of V 1 - NGC 6752 as a short period Cepheid makes the resemblance with M13, which has three known short period Cepheids, even closer.

V 1, NGC 6752 is yet another example of Wallerstein's rule that globular clusters with Cepheid variables possess a strong blue horizontal branch.

Variables like V 1, NGC 6752 are considered to belong to the group of supra-horizontal branch (SHB) stars, which are roughly a magnitude brighter than the horizontal branch.

The SHB stars are considered (Sweigart, Mengel and Demarque, 1973) to evolve from the blue horizontal branch, which could not happen in the absence of that branch; hence Wallerstein's rule. For further details on the interesting consequences of modern evolutionary theories we refer to the literature.

I am very grateful to Dr. A. D. Thackeray and the Radcliffe Observatory staff for sending me all their plates of NGC 6752 for measurement of V 1. My thanks are due to Mr. Samuels and to Mr. Gibson for the South American plates. I am indebted to Dr. Demarque, Dr. Sweigart, Dr. Norris and Dr. Zinn of the Yale astronomy department for comments and discussion on the theoretical implications.

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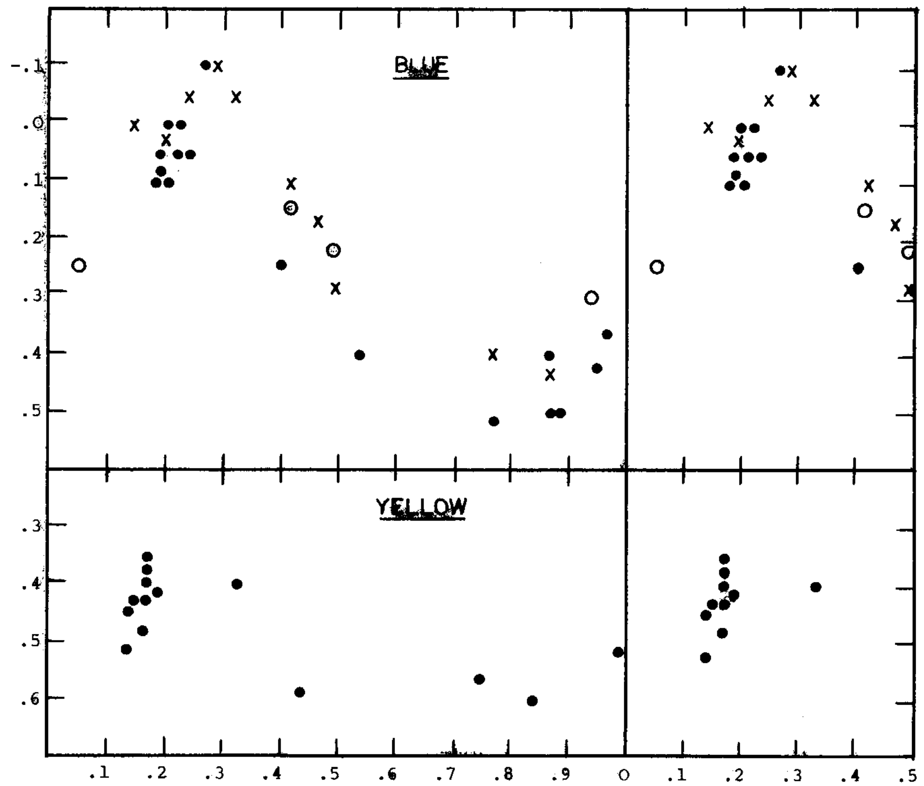

Blue and yellow lightcurves of V 1, NGC 6752. Solid dots: Full weight Radcliffe results. Open circles: Half weight Radcliffe results. Crosses: South American data.

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INFORMATION BULLETIN ON VARIABLE STARS
Number 896

Konkoly Observatory
Budapest
1974 June 12

POSSIBLE BEATS IN TWO DELTA SCUTI STARS

Observations of two Delta Scuti suspects were obtained using a 40 cm. reflector and a dry ice cooled 1P21. An OG-4 (4mm) filter approximates the V magnitude. Observations were made differentially between variable and comparison stars.

Percy (J.,1973, R.A.S.C.J.67,139) has reported 18 UMa (HR 3662) as a possible Delta Scuti star with a period of about 3 hours and an amplitude of about 0.03 magnitude. This star has been observed on four nights using 25 UMa (HR 3775) and 26 UMa (HR 3799) as comparison stars. On two nights the star was found to be variable with amplitude and period in agreement with Percy's results. On the remaining two nights no variation in 18 UMa was evident; the standard deviation of the variable minus comparison magnitude differences was about 0.003 magnitude which is about the same as the standard deviation of the comparison minus comparison magnitude differences. Thus the star was practically constant for 2.5 hours on one night and 5.0 hours on another night.

Percy also reports that either 24 Cnc (HR 3312/3) or 28 Cnc (HR 3329) is variable with an amplitude of about 0.02 magnitude, and a period of about 2.5 hours. Observations of both stars with 19 Cnc (HR 3268) as a comparison star were obtained on four nights. From these observations it is clear that 28 Cnc is the variable with a period of about 2.3 hours and an amplitude which ranged from 0.025 magnitude to a few thousandths of a magnitude. The star 24 Cnc shows some scatter but does not appear to have been variable with an amplitude greater than 0.005 magnitude on any of the four nights.

Both 18 UMa and 28 Cnc are Delta Scuti stars. Both stars show variations in amplitude that make the beat phenomenon a possibility. Further observations of high quality are needed.

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COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 897

Konkoly Observatory
Budapest
1974 June 15

PHOTOELECTRIC OBSERVATIONS OF THE FLARE ACTIVITY OF RED DWARFS

In 1969-1973 photoelectric observations have been carried out at the Crimean Astrophysical Observatory for a number of dM and dMe stars. Before there were no exhaustive informations on the flare activity of these stars. The patrol photoelectric observations at the 64 cm meniscus telescope are in a photometric system close to B, and those at the 70 cm reflector to U. Results of the observations are given in the Table. In the columns of this Table are inserted: 1) Serial number of the star from catalogue (1); 2) designations from other catalogues; 3) apparent magnitudes; 4) absolute magnitudes; 5) spectral types; 6) durations of the photoelectric patrol (hours) in B; 7) numbers of flares recorded in B; 8) duration of the photoelectric patrol hours in U; 9) numbers of flares recorded in U.

The periods of the photoelectric patrol of the stars are shown in Fig. 1. Open rectangulars note periods of observations in B, the solid rectangulars those in U. The triangles mark the moments of the registered flares.

	1	2	3	4	5	6	7	8	9
	N(1)		V	M_V		T_B	n_B	T_U	n_U
a	29.1	FF And	$10^m,38$	$8^m,7$	dM0e	$5^h,8$	0	$10^h,3$	1
b	182		9,6	8,8	dMIe	28,5	0	6,3	1
c	207.1	V 371 Ori	11,68	10,8	dM3e	15,3	0		
d	447		11,10	13,50	dM5	29,7	0		
e	526	BD+15°2620	8,50	10,02	dM4Ye	27,1	0		
f	644A	V1054 Oph	9,76	10,79	dM4,5e	36,0	4		
	B		9,8	10,8	dM4,5e				
g	905		12,29	14,80	dM6e	17,0	0		

The light curves of the observed flares in relative intensities, $i= \frac{I_f-I_o}{I_o}$ versus UT are shown in Fig.2, I_o is the intensity deflection due to the normal flux from a quiescent star, I_f is that during the flare. For each flare the following data, according to (2), are given: $P= \int$ idt, the equivalent duration of the flare in minutes, and σ/I_o, where σ is the standard deviation in I_o.

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Crimean Astrophysical Observatory

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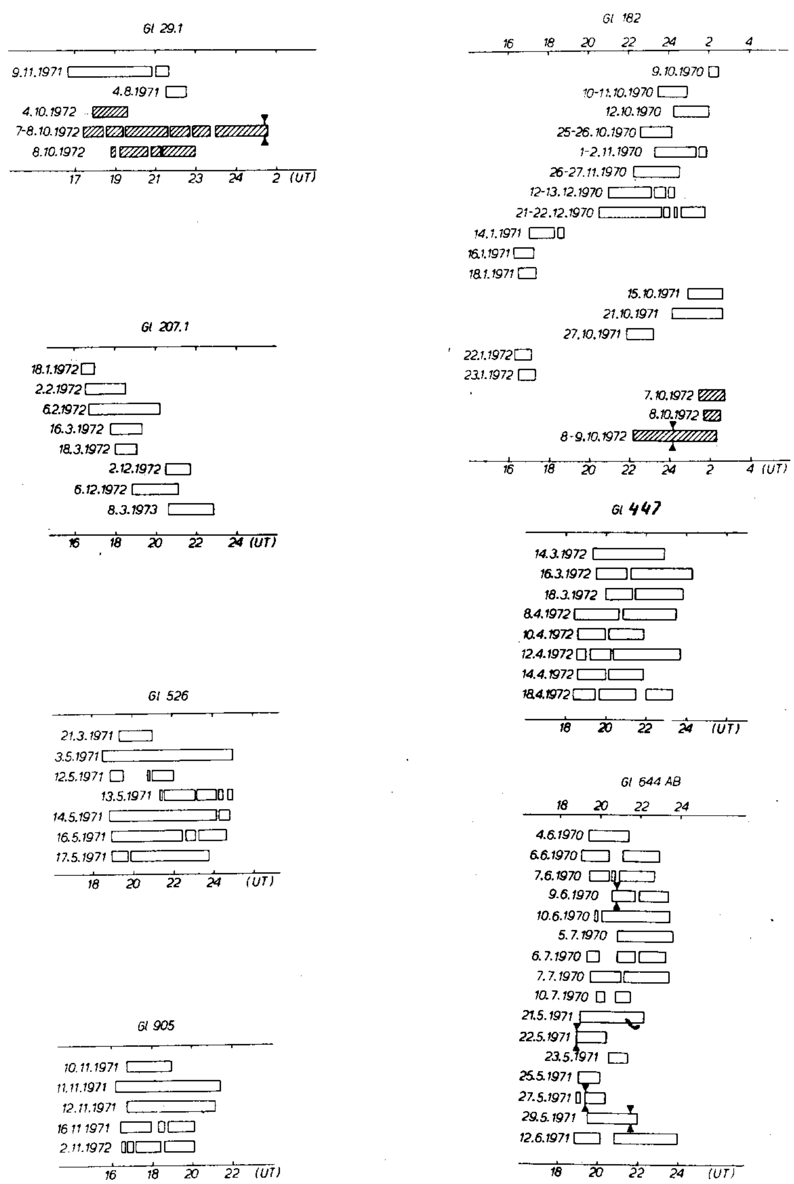
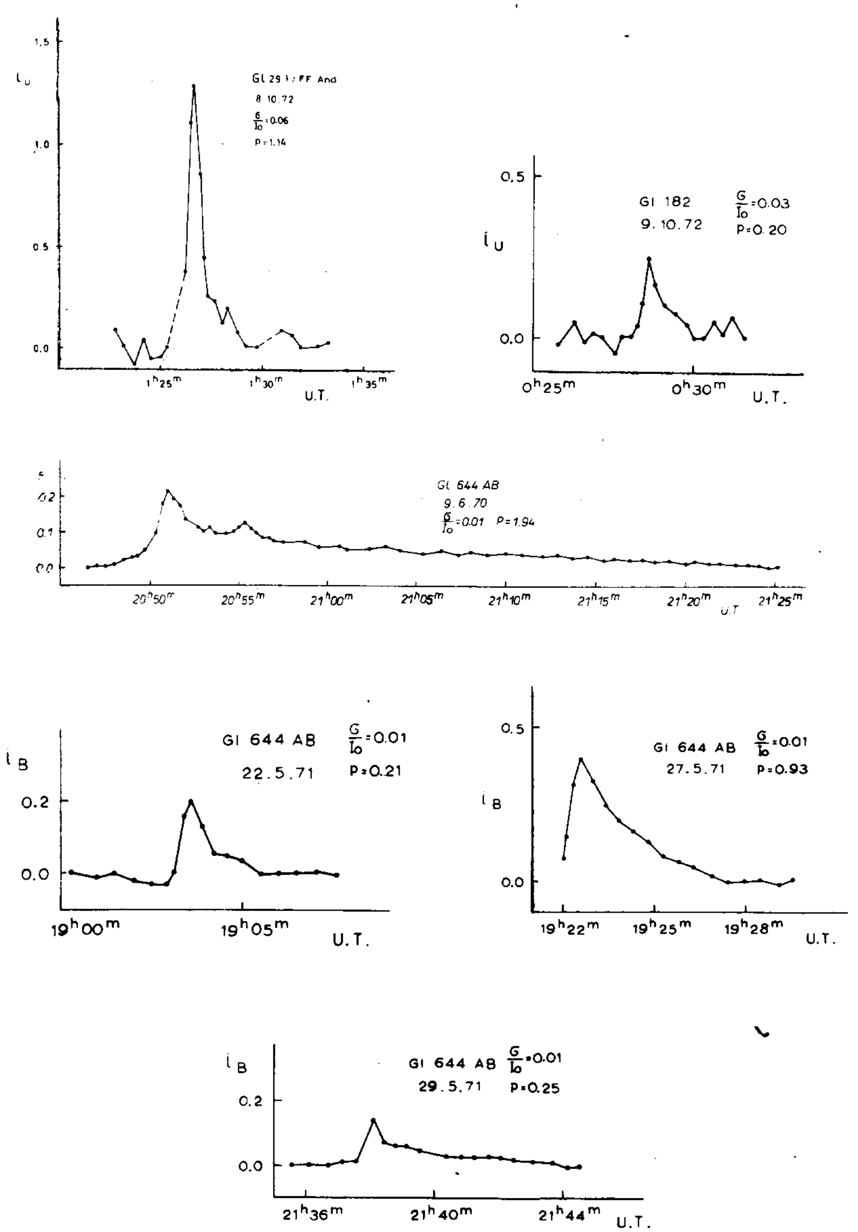

Gl 29.1
9.11.1971
4.8.1971
4.10.1972
7-8.10.1972
8.10.1972
17 19 21 23 24 2 (UT)
Gl 207.1
18.1.1972
2.2.1972
6.2.1972
16.3.1972
18.3.1972
2.12.1972
6.12.1972
8.3.1973
16 18 20 22 24 (UT)
Gl 526
21.3.1971
3.5.1971
12.5.1971
13.5.1971
14.5.1971
16.5.1971
17.5.1971
18 20 22 24 (UT)
Gl 905
10.11.1971
11.11.1971
12.11.1971
16.11.1971
2.11.1972
16 18 20 22 (UT)
Gl 182
16 18 20 22 24 2 4
9.10.1970
10-11.10.1970
12.10.1970
25-26.10.1970
1-2.11.1970
26-27.11.1970
12-13.12.1970
21-22.12.1970
14.1.1971
16.1.1971
18.1.1971
15.10.1971
21.10.1971
27.10.1971
22.1.1972
23.1.1972
7.10.1972
8.10.1972
8-9.10.1972
16 18 20 22 24 2 4 (UT)
Gl 447
14.3.1972
16.3.1972
18.3.1972
8.4.1972
10.4.1972
12.4.1972
14.4.1972
18.4.1972
18 20 22 24 (UT)
Gl 644 AB
18 20 22 24
4.6.1970
6.6.1970
7.6.1970
9.6.1970
10.6.1970
5.7.1970
6.7.1970
7.7.1970
10.7.1970
21.5.1971
22.5.1971
23.5.1971
25.5.1971
27.5.1971
29.5.1971
12.6.1971
18 20 22 24 (UT)

Fig.1.



1.5
i_U
1.0
0.5
0.0
FF And
8 10.72
G/Io = 0.06
P = 1.14
1^h25^m
1^h30^m
1^h35^m
U.T.
0.5
Gl 182
9.10.72
G/Io = 0.03
P = 0.20
i_U
0.0
0^h25^m
0^h30^m
U.T.
0.2
0.1
0.0
Gl 644 AB
9.6.70
G/Io = 0.01
P = 1.94
20^h50^m
20^h55^m
21^h00^m
21^h05^m
21^h10^m
21^h15^m
21^h20^m
21^h25^m
U.T
i_B
Gl 644 AB
22.5.71
G/Io = 0.01
P = 0.21
0.2
0.0
19^h00^m
19^h05^m
U.T.
0.5
Gl 644 AB
27.5.71
G/Io = 0.01
P = 0.93
i_B
0.0
19^h22^m
19^h25^m
19^h28^m
U.T.
i_B
Gl 644 AB
G/Io = 0.01
29.5.71
P = 0.25
0.2
0.0
21^h36^m
21^h40^m
21^h44^m
U.T.

Fig.2.

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Konkoly Observatory
Budapest
1974 June 16

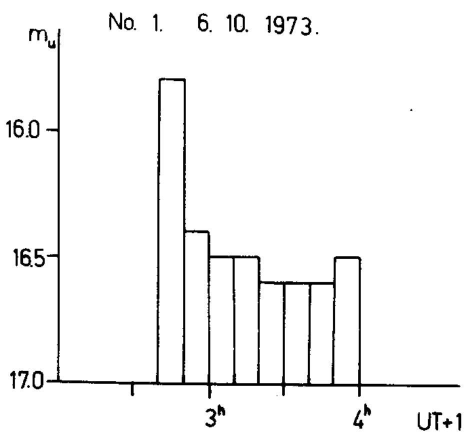
SOME NEW FLARES IN THE PLEIADES REGION

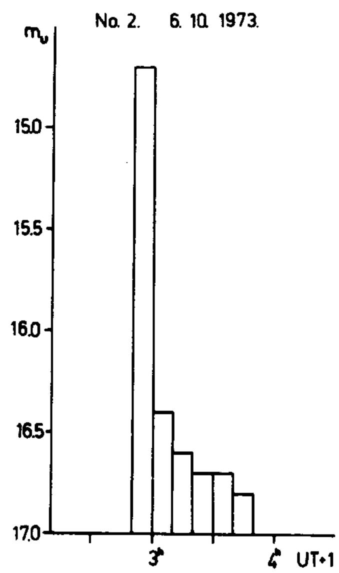
In course of searching flares in the Pleiades seven flares were observed in 12 hours of effective observational time in the period from September 14, 1973 to March 16, 1974. All the stars flared up are newly discovered flare stars. The observations were made with a 60/90/180 cm Schmidt-telescope on 103a-O plates through a UG_1 - 2 mm thick filter. The exposure time was 10 minutes on each plate. The informations about our flares are summarized in the table. Figures Nos.1-7 show the brigthnesses of the flares in course of the time.

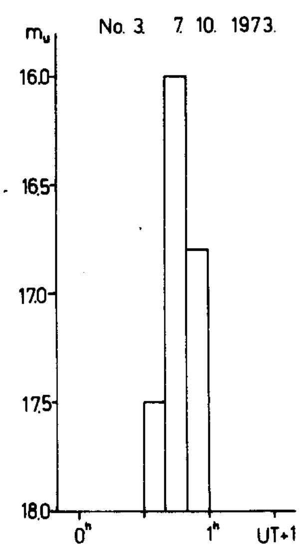
No	Design.	RA 1900	D 1900	Δm_U	$m_{U_{min}}$	Date
1	K24	$3^h43^m.2$	$+22^\circ35'$	0.8	16.6	Oct. 6, 1973
2	K25	3 40.9	23 31	3.1	17.8	Oct. 6, 1973
3	K26	3 43.5	24 39	2.4	18.4	Oct. 7, 1973
4	K27	3 46.9	24 45	1.0	17.8	Oct. 7, 1973
5	K28	3 42.5	23 09	1.5	17.9	Oct. 7, 1973
6	K29	3 48.1	25 05	0.8	17.5	Oct. 7, 1973
7	K30	3 39.3	22 48	2.0	16.6	Oct. 7, 1973

Konkoly Observatory
Budapest
Hungary

G. SZÉCSÉNYI - NAGY


No. 1. 6. 10. 1973.
m_u
16.0
16.5
17.0
3^h
4^h
UT+1


No. 2. 6. 10. 1973.
m_u
15.0
15.5
16.0
16.5
17.0
3^h
4^h
UT+1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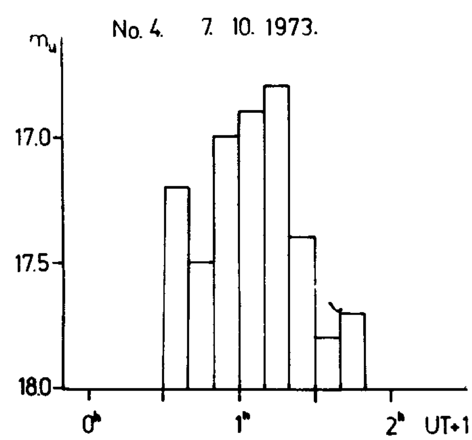
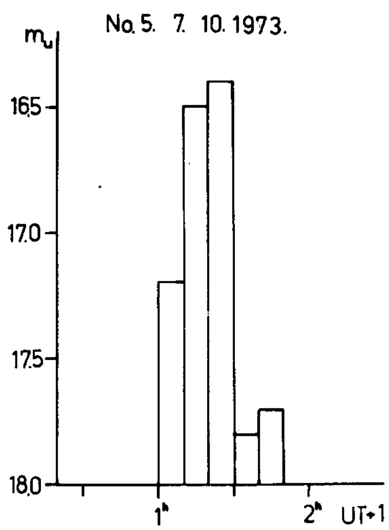
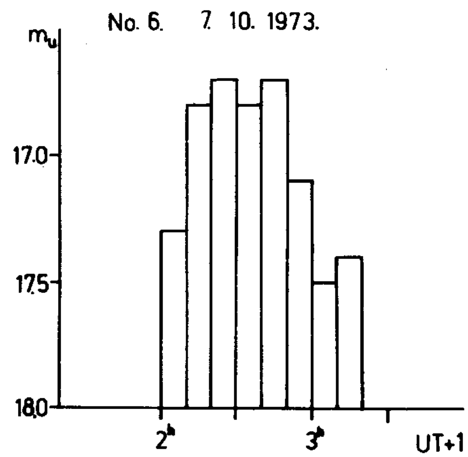
m_u
16.0
16.5
17.0
17.5
18.0
0^h
1^h
UT+1


No. 4. 7. 10. 1973.
m_u
17.0
17.5
18.0
0^h
1^h
2^h
UT+1


No. 5. 7. 10. 1973.
m_u
16.5
17.0
17.5
18.0
1h
2h
UT+1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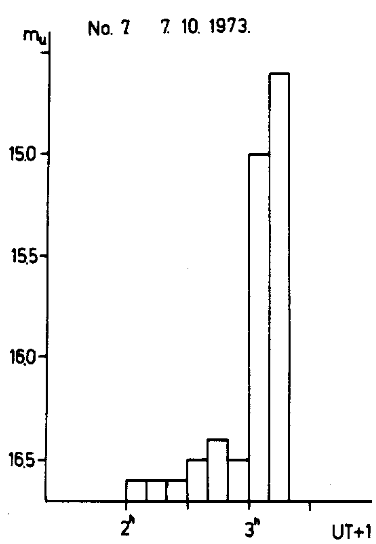
m_u
17.0
17.5
18.0
2h
3h
UT+1


No. 7 7. 10. 1973.
m_u
15.0
15.5
16.0
16.5
2h
3h
UT+1

COMMISSION 27 OF THE I. A. U.
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Number 899

Konkoly Observatory
Budapest
1974 June 19

PHOTOELECTRIC OBSERVATIONS OF 44 TAU

Three-colour photoelectric observations of the star 44 Tau (δ Scuti type) were accomplished during November - December 1973 on the 40 cm telescope of the Byurakan observatory. Because of rather poor weather conditions we could not effectuate more than six observational series. 42 Tau was taken as comparison star.

The results of our observations are presented in the Table. The Δv, Δb, and Δu values (var.-comp.) are the corresponding differences (44-42) of the instrumental v,b,u magnitudes of 44 Tau and 42 Tau. The system of ubv magnitudes is close to the international UBV system. The mean error of the presented data is of the order of $\pm$ 0$^m_.$005 - $\pm$ 0$^m_.$007 .

In Figure 1 the Δb values are plotted against JD hel. The obtained curves seem to indicate the existence of a period of about three hours (Desikachary, Astr.Astroph.27,No.3.,1973). A more detailed analysis of the light variation of this star has not been made because of the relatively small number of data. Further observations of the star 44 Tau are planned.

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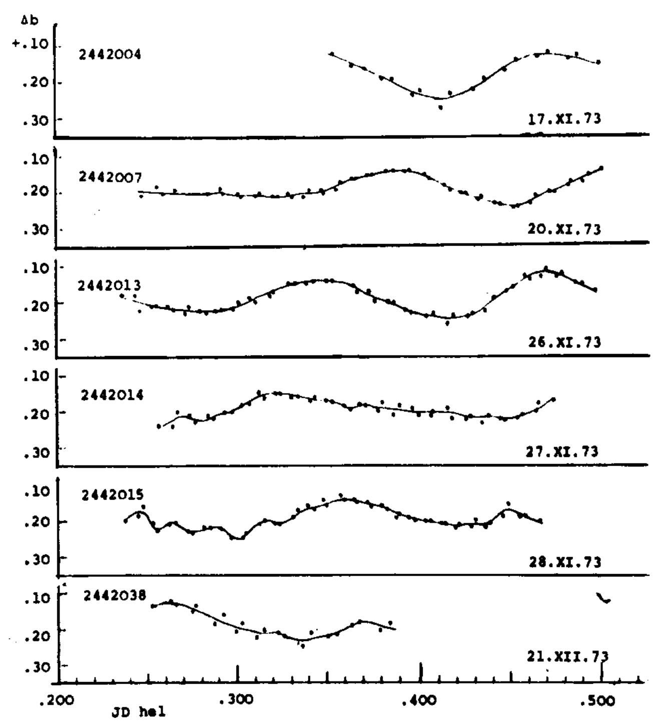
Date 1973	JD hel 24420..	Δv +	Δb +	Δu +
XI-17	04.35352	.15	.12	.30
	.36533	.17	.15	.37
	.37019	.17	.16	.30
	.38130	.18	.19	.33
	.38685	.20	.19	.37
	.39797	.22	.23	.41
	.40283	.22	.22	.43
	.41394	.26	.27	.43
	.41949	.22	.23	.39
	.43199	.22	.22	.39
	.43755	.19	.19	.32
	.44866	.17	.17	.34
	.45422	.16	.14	.28
	.46602	.15	.13	.28
	.47227	.16	.12	.29
	.48338	.17	.14	.31
	.48894	.16	.13	.28
	.50074	.17	.15	.28
XI-20	07.24735	.19	.21	.41
	.25638	.18	.18	.33
	.25916	.19	.20	.33
	.26610	.19	.19	.35
	.28416	.19	.20	.35
	.29110	.19	.19	.34
	.29318	.22	.20	.43
	.30013	.20	.20	.36
	.30291	.20	.21	.37
	.31055	.20	.21	.37
	.31332	.20	.20	.36
	.32027	.21	.21	.36
	.32305	.21	.21	.38
	.32930	.20	.20	.36
	.33138	.20	.21	.36
	.33832	.21	.21	.36
	.34041	.21	.19	.36
	.34666	.20	.19	.35
	.34874	.21	.20	.35
	.35568	.21	.19	.35
	.35777	.18	.17	.32
	.36402	.17	.16	.32
	.36680	.18	.16	.31
	.37374	.16	.15	.30
	.37582	.17	.15	.31
	.38346	.16	.14	.31
	.38624	.16	.14	.30
	.39318	.17	.14	.30
	.39666	.16	.14	.30
	.40430	.16	.15	.30
	.40638	.18	.16	.31
	.41541	.19	.18	.32
	.41818	.20	.19	.35
	.42443	.20	.20	.35
	.42652	.22	.20	.37
	.43346	.22	.22	.39

Date 1973	JD hel 24420..	Δv +	Δb +	Δu +
XI-20	07.43624	.21	.21	.35
	.44318	.22	.23	.38
	.44596	.23	.23	.37
	.45291	.22	.24	.37
	.45568	.23	.24	.38
	.46263	.22	.23	.36
	.46541	.21	.21	.35
	.47235	.20	.20	.35
	.47513	.20	.20	.32
	.48277	.19	.18	.32
	.48485	.19	.17	.32
	.49180	.17	.17	.32
	.49457	.17	.15	.30
	.50152	.16	.14	.30
XI-26	13.23703	.17	.18	.37
	.24398	.17	.18	.34
	.24606	.22	.22	.37
	.25231	.20	.21	.38
	.25509	.21	.21	.40
	.26203	.20	.21	.38
	.26412	.20	.22	.37
	.27106	.21	.23	.38
	.27384	.21	.21	.38
	.28009	.22	.22	.38
	.28217	.23	.23	.39
	.28912	.23	.22	.37
	.29120	.21	.22	.39
	.29884	.21	.22	.37
	.30092	.19	.20	.36
	.30787	.19	.19	.55
	.31065	.21	.20	.36
	.31899	.20	.18	.33
	.32176	.15	.17	.31
	.32870	.15	.15	.31
	.33217	.17	.15	.32
	.33912	.16	.15	.31
	.34259	.14	.14	.29
	.35231	.16	.14	.29
	.35578	.15	.14	.31
	.36412	.15	.15	.29
	.36690	.15	.17	.31
	.37384	.16	.17	.32
	.37731	.21	.20	.38
	.38426	.21	.20	.38
	.38703	.20	.20	.37
	.39398	.22	.22	.37
	.39745	.22	.23	.37
	.40509	.23	.24	.37
	.40856	.22	.23	.37
	.41690	.25	.26	.40
	.42017	.22	.24	.38
	.42802	.24	.24	.38
	.43078	.23	.23	.38
	.43773	.20	.23	.36

Date 1973	JD hel 24420..	Δv +	Δb +	Δu +
XI-26	13.44120	.21	.19	.34
	.44884	.19	.17	.33
	.45231	.18	.16	.27
	.45926	.16	.13	.27
	.46203	.16	.14	.28
	.46828	.15	.13	.30
	.47037	.14	.11	.26
	.47731	.14	.13	.27
	.48009	.15	.12	.28
	.48773	.17	.15	.30
	.49120	.16	.15	.30
	.49815	.18	.17	.34
XI-27	14.25648	.18	.24	.41
	.26412	.18	.24	.43
	.26620	.18	.20	.39
	.27315	.20	.21	.39
	.27662	.21	.23	.38
	.28356	.21	.21	.35
	.28634	.20	.22	.38
	.29328	.18	.20	.36
	.29606	.19	.20	.33
	.30301	.18	.18	.32
	.30578	.20	.18	.30
	.31203	.16	.14	.29
	.31481	.15	.16	.31
	.32176	.15	.15	.29
	.32384	.16	.15	.31
	.33078	.18	.16	.30
	.33356	.16	.16	.32
	.34051	.17	.17	.31
	.34259	.18	.16	.31
	.34953	.19	.17	.31
	.35162	.19	.17	.31
	.35995	.19	.18	.33
	.36203	.19	.19	.31
	.36898	.18	.18	.33
	.37176	.18	.18	.33
	.37870	.19	.20	.35
	.38078	.17	.17	.31
	.38773	.20	.21	.34
	.39051	.18	.18	.35
	.39745	.19	.19	.35
	.40023	.23	.21	.35
	.40717	.21	.21	.34
	.40995	.21	.20	.36
	.41690	.21	.19	.36
	.41967	.23	.22	.38
	.42731	.22	.22	.37
	.42940	.22	.21	.36
	.43634	.23	.33	.37
	.43912	.21	.21	.36
	.44606	.22	.22	.39
	.44884	.22	.22	.37
	.45578	.22	.22	.38

Date 1973	JD hel 24420..	Δv +	Δb +	Δu +
XI-27	14.45856	.22	.21	.36
	.46551	.20	.20	.36
	.46759	.19	.18	.33
	.47592	.18	.17	.33
XI-28	15.23773	.17	.20	.32
	.24467	.20	.19	.33
	.24676	.18	.16	.34
	.25370	.21	.21	.34
	.25578	.22	.23	.37
	.26273	.20	.21	.34
	.26551	.19	.21	.35
	.27245	.22	.23	.37
	.27523	.21	.23	.37
	.28148	.20	.22	.37
	.28426	.22	.22	.37
	.29120	.23	.22	.37
	.29606	.24	.25	.39
	.30231	.23	.25	.37
	.30509	.21	.23	.34
	.31273	.19	.21	.37
	.31481	.19	.20	.37
	.32106	.20	.21	.37
	.32384	.21	.21	.36
	.33148	.20	.19	.32
	.33356	.17	.17	.32
	.33912	.16	.16	.32
	.34259	.19	.17	.41
	.34815	.15	.14	.29
	.35023	.16	.16	.29
	.35717	.15	.13	.27
	.35926	.17	.14	.30
	.36481	.16	.14	.31
	.36690	.17	.15	.32
	.37245	.16	.15	.30
	.37453	.18	.16	.31
	.38078	.18	.16	.32
	.38287	.18	.17	.32
	.38842	.19	.19	.34
	.39051	.18	.18	.37
	.39606	.19	.19	.34
	.39884	.20	.20	.35
	.40509	.20	.20	.30
	.40717	.20	.20	.34
	.41342	.20	.21	.35
	.41551	.19	.21	.35
	.42176	.20	.22	.35
	.42384	.20	.21	.37
	.43009	.21	.22	.39
	.43217	.21	.20	.35
	.43842	.33	.22	.37
	.44120	.22	.21	.36
	.44745	.19	.19	.36
	.45023	.18	.15	.34
	.45717	.19	.19	.38

Date 1973	JD hel 24420..	Δv +	Δb +	Δu +
XI-28	15.45926	.19	.19	.34
	.46828	.19	.20	.36
XII-21	38.25203	.15	.14	
	.26314	.14	.12	
	.26592	.14	.13	
	.27425	.15	.15	
	.27703	.15	.13	
	.28744	.20	.19	
	.29161	.16	.16	
	.29994	.20	.21	
	.30272	.18	.18	
	.31105	.21	.22	
XII-21	38.31453	.20	.20	
	.32286	.20	.21	
	.32633	.21	.22	
	.33675	.24	.25	
	.34092	.21	.21	
	.35064	.21	.22	
	.35480	.20	.21	
	.36381	.19	.19	
	.36730	.19	.18	
	.37980	.20	.20	
	.38467	.18	.18	



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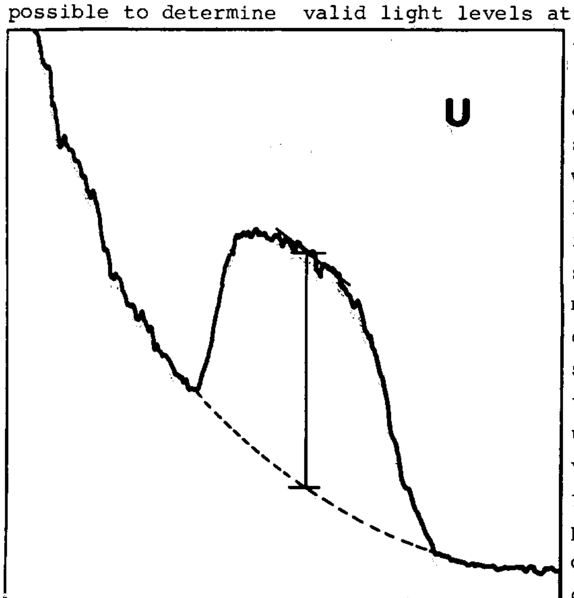
FIELD-SCANNING PHOTOELECTRIC OBSERVATIONS OF THE ECLIPSING VARIABLE YY Gem

Photoelectric observations of the 10th magnitude eclipsing variable YY Gem (Castor C) taking into account scattered background light from the nearby star Castor A (α Gem) have been carried out in UBV using the 36-inch reflectors of the Dodaira Station of Tokyo Astronomical Observatory and the Okayama Astrophysical Observatory on five nights during the winter of 1973-74. BD+31^{o}1627 was used as the primary comparison star, with occasional light constancy checks provided by observing BD+31^{o}1611.

Difficulties in measurement are due to the strong scattered light of α Gem wich is 73" distant from the variable studied. Scattered light may amount to roughly 8%, 25% and 50% of the system light in V,B and U respectively. However, by careful scanning of the background sky in the vicinity of the variable it has been possible to determine valid light levels at various observation times.



The accompanying diagram shows a typical scan in U light from which a representative light level of the variable may be found. The scan is carried out by moving the telescope in declination starting from some point distant from the Castor system, moving until the star under investigation (YY Gem) is in the centre of the diaphragm, and proceeding onward in the direction of α Gem so that the character of the sky background increase can be examined.The telescope may be continuously moved in the same direction past the vicinity of the bright stars until the sky background again subsides to a normal value. In this way the symmetrical distribution of the scattered light may be checked and provide a verification of the sky background level during the scan of the variable.

The scanning direction of declination was chosen so that the scattered background light would show a monotonic increase as indicated in the diagram. In the right-ascension mode this pattern of variation is not so clear, due to the northerly position angle of the bright star (α Gem) with respect to the variable studied (YY Gem).

This approach has not been carried out before. In Kron's study of the system (Ap.J.,115,301,1952)the problem of the scattered light was not clarified. We therefore expect to obtain definite improvements over earlier observations of the system as our results so far suggest.

It has been established that primary and secondary eclipses of almost equal depths (= $0^{m}.50$ in V) occur, with eclipses lasting for about 2 hours. The eclipse may be slightly deeper in B and U light. From the present observations, the mean out-of-eclipse magnitude in V light is V=$9^{m}.27$, while B-V = $1^{m}.46$ and U-B = $1^{m}.4$. It is hoped to continue observations of the system in the coming winter.

On the nights of Jan. 9-10, 11-12, 12-13 of 1974 continuous photoelectric monitoring was also carried out with the synchronous UBV photometer attached to the same telescope at Okayama to find any flare-like phenomenon as reported by Moffett and Bopp (Ap.J., 168: Letter 117, 1971). However, no flare-like phenomenon could be detected during these three nights.

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