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PHOTOELECTRIC UBV PHOTOMETRY OF NORTHERN CEPHEIDS, II

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ABSTRACT

New UBV photoelectric observational data on 42 northern Cepheids with periods of 5-10 days are presented. The period changes and the variations in the light curve of the observed Cepheids are investigated. No secular light curve variation has been discovered.

The O-C diagrams of CV Mon and RS Ori show a period jump and a subsequent rejump to the earlier value of the period. These two Cepheids as well as the shorter period ones with a re-jumping period are probably members of binary systems. Another effect can be pointed out in AW Per and DD Cas which are also members of binary systems: the apparent period changes due to the orbital motion around the common centre of gravity can be seen. Both the orbital period and the value of $a \cdot \sin i$ can be determined for these latter two stars. The combined effect (i.e. the effect of the orbital motion and the rejumping period) can be seen in the O-C diagram of the short period Cepheid SU Cygni.

INTRODUCTION

This paper is the second part of a series dealing with the new UBV photometry of northern Cepheids performed at the Konkoly Observatory, and it contains the observational data and O-C diagrams of Cepheids with periods longer than 5 days but shorter than 10 days. The first part of this Cepheid survey included Cepheids with periods shorter than 5 days (*Szabados* 1977, hereinafter this paper is referred to as Paper I). The third part will cover the longest period Cepheids (P > 10 days).

The original purposes outlined in Paper I were as follows:

1. To search for double-mode Cepheids in the northern sky;
2. To investigate period changes;
3. To examine secular variations of the light curves provided that they can be determined;
4. To obtain photoelectric light curves of those Cepheids which have not previously been observed photoelectrically.

Since the existence of the beat phenomenon in the case of Cepheids with periods longer than five days is improbable, the first item may hardly be a real aim when observing Cepheids with periods as long as 5 days or more.

Item 4 also has less importance because the overwhelming majority of the stars dealt with in this programme has been observed photoelectrically; however, photoelectric photometry of several faint Cepheids was carried out for the first time as recently as in the seventies (*Pel* 1976, *Wachmann* 1976). The major contribution of the present photoelectric observations towards developing our knowledge about the light curves of the Cepheids is that the observational points are well spread in phase on the normal light curves. There are at least a dozen Cepheids in this sample the periods of which are almost equal to an integer (e.g. VW Cas: $P=5^{d}.994$; BK Aur: $P=8^{d}.002$), thus it is impossible to obtain a complete light curve of these variables at a given geographical longitude during one observational season. The present photometry carried out between 1974 and 1978 yielded reliable photoelectric light curves for this rather arbitrary group too.

After having revealed the existence of period rejumps in Paper I, the investigation of period changes is the most important purpose. The term rejump was introduced in Paper I.

During the course of this present part of the work 42 Cepheids and one star which subsequently proved to be non-variable were observed. Of these 43 stars, 19 were observed in three colours of the UBV system, the other 24 in B and V lights only.

THE OBSERVATIONS

The stars dealt with in this programme were selected from the General Catalogue of Variable Stars (*Kukarkin* et al. 1969-1970) and from the current astronomical literature, with the restrictions that their declination should be north of 0^{o} and B magnitude (or m_{pg} for lack of photoelectric observations) at light minimum brighter than $12^{m}.5$. This sample contains Cepheids of both populations with a period $5^{d}<P<10^{d}$.

The stars investigated are listed in Table 1. The number of observations on each star, the colours, serial numbers of the pages where the individual observations and the O-C diagram with additional remarks on the given star can be found are indicated in the successive columns. The total number of observations is 804. The star V 1165 Aql is not a Cepheid variable. Judging by present photometry this star is a non-variable, but very small amplitude light variations cannot be ruled out. The observational data and a detailed analysis on V 1165 Aql are published

Table 1 The programme

Star	N	Col.	Page obs.	Page rem.	Star	N	Col.	Page obs.	Page rem.
FM Aql	20	UBV	10	54	GH Cyg	19	BV	18	87
FN Aql	18	UBV	10	108	MW Cyg	18	BV	19	49
KL Aql	18	BV	10	52	V 386 Cyg	18	BV	19	29
V 336 Aql	18	BV	11	81	V 538 Cyg	19	BV	20	55
V 600 Aql	18	BV	11	80	V 924 Cyg	18	BV	20	46
V 733 Aql	19	BV	11	58	TX Del	20	UBV	20	56
V 1165 Aql	9	BV	—	4	W Gem	17	UBV	21	93
η Aql	20	UBV	12	73	RZ Gem	19	BV	21	44
AO Aur	16	BV	13	72	BB Her	20	BV	22	83
BK Aur	18	UBV	13	99	X Lac	19	UBV	22	42
RX Cam	23	UBV	14	91	RR Lac	19	UBV	23	66
RS Cas	19	BV	14	62	BG Lac	17	UBV	23	30
SW Cas	21	BV	14	40	CS Mon	20	BV	24	71
VV Cas	17	BV	15	59	CV Mon	18	BV	24	39
VW Cas	18	BV	15	50	RS Ori	23	UBV	25	85
DD Cas	19	BV	16	109	GQ Ori	23	UBV	25	105
DL Cas	13	UBV	16	98	AW Per	23	UBV	25	68
FM Cas	17	BV	16	47	HR 690(Per)	18	UBV	26	84
IX Cas	19	BV	17	106	S Sge	20	UBV	26	101
CR Cep	19	BV	17	61	U Vul	20	UBV	27	95
δ Cep	19	UBV	17	32	X Vul	21	UBV	28	64
VY Cyg	17	BV	18	89					

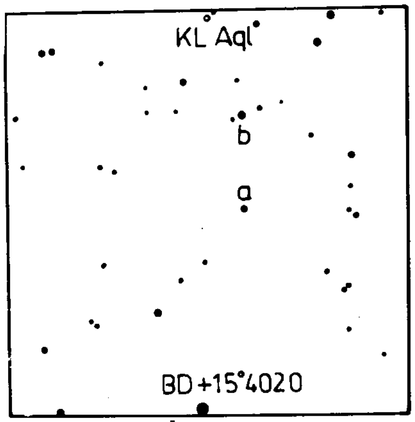

Fig. 1a KL Aql

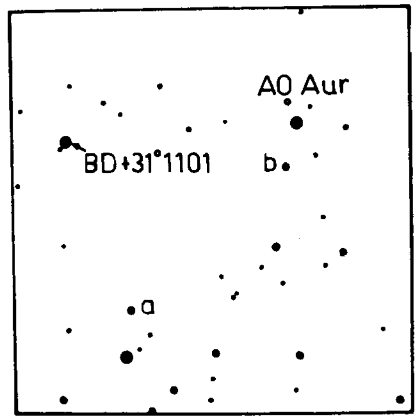

Fig. 1b AO Aur

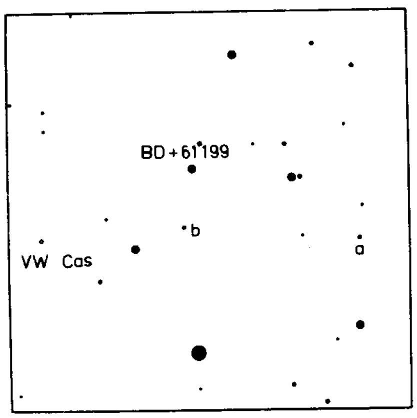

Fig. 1c VW Cas

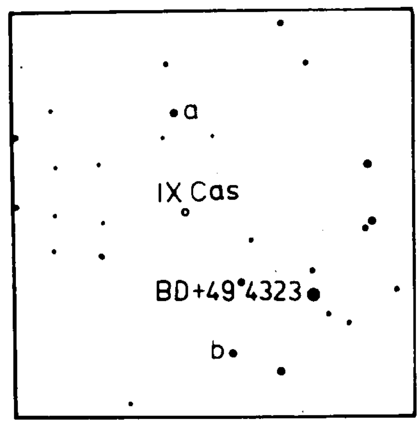

Fig. 1d IX Cas

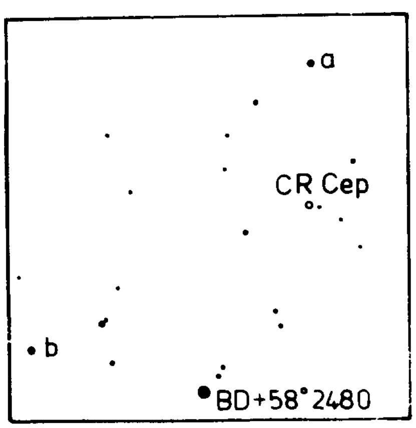

Fig. 1e CR Cep

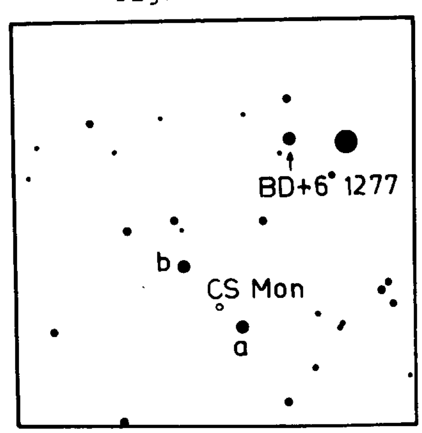

Fig. 1f CS Mon

Figure 1a-f Identification charts

elsewhere (*Szabados* 1979).

A full description of the observational technique, the telescopes and filters used can be found in Paper I (p. 6). The V magnitudes and colour indices of the comparison and check stars are listed in Table 2. The tie in observations were made with the aid of UBV standard stars taken from the catalogue of *Blanco* et al. (1968). An asterisk instead of the name of the star in Table 2 denotes that the star is not in the Bonner Durchmusterung, in which case the identification charts in Fig. 1a-f should be consulted. In these charts the letter *a* denotes the comparison star and the star marked *b* is the check one. The size of the charts is about 25'x25' except for VW Cas (40'x40'); north is at the top.

The comparison between the present photometric system (UBV_{sz}) and *Schaltenbrand* and *Tammann*'s (1971) standard one (UBV_{scht}) gives the following transformation formulae:

$V_{sz} = 0.997V_{scht} + 0.026$ (38 common stars)
$B_{sz} = 0.993B_{scht} + 0.083$ (38 common stars)
$U_{sz} = 1.002U_{scht} - 0.021$ (17 common stars)

Table 3 contains the observations in alphabetical order of the constellations. The observations made with the 20" telescope are marked with asterisks in the column of the Julian Date. Some unpublished observations made by Prof. L. Detre in 1953 and by Dr. J. Abaffy in 1967 are also listed in Table 3. Unfortunately, since the comparison stars used by them are unknown in several cases these two sets of observations have not been transformed to the standard system, and only the magnitude differences are given in the instrumental system.

THE LIGHT CURVES AND PERIOD CHANGES OF THE INDIVIDUAL VARIABLES

This section contains the light curves, the tables and the graphs of the O-C values and some remarks on the observed Cepheids. It was not my intention to give the full history of the variables which would have increased considerably the volume of this paper. The variables were arranged according to the length of their period as in Paper I.

The light and colour curves are constructed from the obser-

Table 2

Variable	Comp.	V	B-V	U-B	Check	V	B-V	U-B	Remark
FM Aql	+10° 3813	$7^m.09$	$1^m.42$	$1^m.09$	+10° 3801	$7^m.13$	$1^m.92$	$2^m.03$	
FN Aql	+ 3° 3938	9.31	1.26	1.21	+ 4° 4009	variable			1
KL Aql	*	10.04	1.47		+15° 4019	9.72	0.34		2
V 336 Aql	+ 0° 4078	10.03	0.78		+ 0° 4081	10.57	0.71		
V 600 Aql	+ 8° 4050	10.41	0.71		+ 8° 4049	10.60	0.72		
V 733 Aql	+10° 4111	10.41	0.64		+10° 4110	9.55	0.55		
η Aql	+ 6° 4357	3.71	0.86	0.49	+ 2° 3879	3.36	0.33	0.04	
AO Aur	*	11.10	0.78		*	11.03	1.23		
BK Aur	+49° 1310	9.43	0.40	0.08	+49° 1319	9.74	0.43	0.06	
RX Cam	+58° 687	8.14	1.36	0.95	+58° 672	8.31	0.64	0.20	
RS Cas	+61° 2481	9.91	1.12		+61° 2492	9.20	0.16		3
SW Cas	+57° 2694	9.75	0.60		+57° 2689	8.39	0.34		3
VV Cas	+59° 327	10.40	0.71		+59° 325	9.60	0.33		
VW Cas	+60° 145	10.12	1.23		*	10.58	0.55		
DD Cas	+61° 2577	10.06	1.12		+61° 2576	9.82	0.37		3
DL Cas	+59° 67	8.88	0.97	0.64	+59° 72	8.92	0.25	0.18	
FM Cas	+55° 29	9.16	1.67		+55° 28	9.18	0.30		
IX Cas	*	10.69	0.41		*	10.75	1.26		
CR Cep	*	10.26	1.18		*	10.34	0.69		
δ Cep	+57° 2475	3.32	1.51	1.79					
VY Cyg	+39° 4425	10.74	1.01		+39° 4426	possible varies			4
GH Cyg	+29° 3835	9.72	1.10		+28° 3565	10.39	0.58		
MW Cyg	+32° 3738	9.33	1.14		+32° 3739	9.31	0.33		

Table 2 (cont.)

Variable	Comp.	V	B-V	U-B	Check	V	B-V	U-B	Remark
V 386 Cyg	+41° 4062	8ᵐ63	1ᵐ63		+40° 4455	10ᵐ23	0ᵐ22		
V 538 Cyg	+50° 3397	9.88	1.21		+50° 3395	9.98	1.02		
V 924 Cyg	+32° 3498	9.77	0.31		+32° 3499	10.46	0.20		
TX Del	+ 2° 4257	9.27	0.20	0ᵐ15	+ 2° 4256	8.86	0.07	0ᵐ15	
W Gem	+15° 1230	7.17	0.69	0.29	+15° 1255	7.36	0.25	0.10	
RZ Gem	+22° 1141	10.31	0.47		+22° 1148	9.65	0.52		
BB Her	+12° 3652	9.66	0.65		+12° 3640	10.22	0.23		
X Lac	+55° 2830	7.37	0.56	0.11	+55° 2827	8.45	0.21	0.15	
RR Lac	+55° 2792	8.71	0.24	-0.06	+55° 2791	8.79	1.05	0.83	
BG Lac	+42° 4273	8.64	0.68	0.39	+42° 4275	9.14	0.59	0.06	
CS Mon	*	10.70	0.19		*	10.72	0.28		
CV Mon	+ 3° 1319	10.10	1.55		+ 3° 1317	10.21	1.88		
RS Ori	+14° 1260	8.32	0.69	0.22	+15° 1176	8.06	0.29	-0.46	
GQ Ori	+ 9° 1117	8.85	0.37	0.21	+ 9° 1121	9.79	0.32	0.18	
AW Per	+37° 968	7.77	1.30	1.03	+36° 948	6.73	1.14	1.03	
HR 690	+55° 598	5.18	0.37	-0.11	+54° 539	7.58	0.10	-0.15	
S Sge	+16° 4121	5.79	0.62	0.12	+16° 4081	6.02	0.02	-0.15	
U Vul	+20° 4210	6.48	1.08	0.98	+20° 4218	6.54	0.42	-0.48	
X Vul	+26° 3739	8.87	0.30	0.17	+26° 3746	9.55	0.16	0.08	

Remarks:
1 The star BD +4° 4009 is a new Cepheid variable (*Kovács* and *Szabados* 1979).
2 The check star has a faint companion within the edge of the diaphragm.
3 The comparison star has a faint companion within the edge of the diaphragm.
4 The check star is a suspected variable. The available observations do not allow to determine the type of the variability.

Table 3 The observations

FM Aquilae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2229.521	8.63	1.45	0.92	2673.294	8.15	1.25	0.88
2277.419	8.39	1.46	0.94	2708.258	8.14	1.31	0.76
2297.338	8.64	1.48	1.06:	2900.514	8.30	1.46	0.92
2304.375	8.41	1.36	0.78	2939.526	8.64	1.47:	0.98:
2308.315	8.49	1.45	0.86	2971.395	8.06	1.22	
2591.433	8.54	1.45	0.78:	2976.399	8.63	1.41	0.93
2620.459	8.50	1.44	0.95	3287.553	8.68	1.43	0.98
2623.449	7.96	1.13	0.74	3340.389	8.24	1.39	0.83
2642.338	8.04	1.26	0.68:	3363.461	7.96	1.17	0.71
2669.333	8.50	1.54	0.86	3705.366	7.89	1.16	0.71

FN Aquilae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2277.376	8.39	1.23	0.97	2673.318	8.26	1.07	
2297.316	8.53	1.33		2708.247	8.64	1.31	
2304.320	8.22	1.16	0.83:	2871.597	8.37	1.13	0.98
2308.297	8.74	1.38	1.13	2900.567	8.26	1.09	0.92
2523.581	8.31	1.28	0.98	2960.468	8.40	1.30	
2589.444	8.31	1.13		3287.531	8.53	1.23	
2620.385	8.62	1.34	1.11	3337.519	8.22	1.14	
2623.434	8.61	1.21:	1.09:	3390.380	8.74	1.40	1.11
2669.317	8.75	1.39	1.09	3705.378	8.47	1.20	

KL Aquilae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2904.556	9.97	0.90		3275.539	10.52	1.13:	
2960.519	9.95:	0.84:		3337.413	10.46	1.08	
2990.415	9.85	0.82		3340.467	10.18	1.01	
3016.368	10.12	1.05:		3342.464	10.52	1.17	
3075.239	10.16	0.95		3363.429	9.84	0.82	
3078.250	10.22	1.08		3382.345	9.98	0.86	

Table 3 (cont.)

(KL Aql)

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
3390.368	10.35	1.11		3761.315	9.98:	1.06:	
3476.189	10.42	1.15		3795.309	10.47:	1.21:	
3722.511	10.29	0.95:		3800.250	10.55:	1.17:	

V 336 Aquilae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2276.367*	9.72	1.31		3075.212	10.29:	1.46:	
2299.287*	9.98	1.44		3092.202	9.50	1.23:	
2302.298*	9.84	1.30		3342.436	9.77	1.30	
2548.503*	10.09	1.42:		3350.412	9.81	1.41	
2712.205*	9.51	1.15		3351.493	10.01	1.51	
2976.387	9.69	1.22		3390.303	10.00	1.44:	
2990.364	9.56	1.20		3425.240	10.18	1.55	
3046.270	10.25	1.39:		3763.326	9.74	1.29	
3064.246	9.79	1.21		3800.228	9.60	1.09:	

V 600 Aquilae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2276.382*	9.97	1.52		2976.363	9.73	1.37:	
2299.415*	10.20	1.65:		2990.343	9.92	1.37	
2302.314*	10.13	1.53:		3046.286	10.34	1.66	
2623.403	9.90	1.55		3064.259	9.87	1.45	
2634.429	10.37	1.60		3304.515	10.05	1.50:	
2636.474	9.73	1.32:		3342.449	10.30	1.64	
2900.532	10.25	1.60		3390.326	9.95	1.50	
2904.538	9.78	1.37		3401.336	10.40	1.68	
2960.504	10.33	1.54		3435.224	10.12	1.61	

V 733 Aquilae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2276.396*	9.73	0.85		2277.464	9.84	1.01	

Table 3 (cont.)

(V 733 Aql)

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2278.469	9.96	1.03		2669.297	10.17	1.06	
2289.358	9.87:	0.84:		2712.243*	10.16	1.04	
2291.330	10.10	1.01		2715.231	9.74	0.86	
2299.454*	10.00	0.92		2904.521	10.04:	1.12:	
2302.398*	9.90	1.04		3075.228	9.92	1.03	
2304.341	10.09	1.09		3078.234	9.97	0.90	
2356.232	9.72	0.80		3388.374	9.75	0.85	
2522.582	9.80	0.86		3403.286	10.06	1.02	
2543.535	9.94	0.99					

η Aquilae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2277.442	3.78	0.72	0.39	2708.272	3.60	0.61	0.34
2289.377	4.18	0.94	0.84:	2720.212	4.22	0.99	0.75
2591.487	4.30	0.97	0.79	2960.423	3.61	0.63	0.37
2620.507	4.30	0.99	0.72	2990.376	3.80	0.80	0.54
2622.495	3.58:	0.59:	0.31:	3030.341	4.13	0.86	0.54
2623.482	3.67	0.71	0.45	3046.301	3.59	0.66:	
2642.369	4.27	0.97	0.69	3350.426	4.02	0.89	0.67
2645.405	3.78	0.74	0.47	3363.362	3.82	0.77	0.53
2669.305	4.07	0.93	0.70	3382.306	3.96	0.78	0.47
2675.310	3.85	0.84	0.51	3386.300	4.00	0.90	0.53:

Observations in 1953

J.D.hel. 2430000+	V	B-V	U-B	J.D.hel. 2430000+	V	B-V	U-B
4581.561	4.35	1.01		4605.319	3.91:	0.82:	0.42:
4583.412	4.13	0.84	0.59	4606.366	3.59	0.66	0.35
4584.428	3.58	0.60	0.45	4608.349	3.79	0.82	0.62
4585.434	3.69	0.71	0.48	4609.419	4.09	1.00	0.58
4588.447	4.26	0.98	0.72	4614.417	3.71	0.79	0.45
4600.371	3.79	0.81	0.60	4619.354	4.04	0.85	0.53
4601.543	3.73	0.91	0.57	4621.415	3.72	0.74	0.45
4602.348	4.20	0.90	0.71	4622.393	3.92	0.93	0.72

Table 3 (cont.)

(η Aql)

J.D.hel. 2430000+	V	B-V	U-B	J.D.hel. 2430000+	V	B-V	U-B
4623.378	3.95:	1.00:	0.51:	4642.308	3.56	0.68	0.44
4624.438	4.35:	0.90:	0.77:	4653.316	4.29	1.08	
4625.376	4.47:	0.95:	0.87:	4654.382	4.40	0.99	0.63
4626.370	4.24	0.86	0.67	4656.296	3.61	0.60	0.39
4627.363	3.84:	0.69:	0.35:	4660.313	4.19	0.99	0.73
4628.408	3.64	0.73	0.29	4663.277	3.54	0.65	0.46
4629.323	3.80	0.83	0.47	4664.276	3.77	0.77	0.41
4630.378	3.89	0.87	0.63				

AO Aurigae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2424.407*	10.57	0.98		2775.336*	10.37:	0.88:	
2453.457	10.95	1.13		2776.370*	10.65	1.02	
2473.259	10.90	1.12		2816.264	10.55:	0.83:	
2711.553*	11.21	1.28:		3124.470	11.19	1.29	
2712.522*	11.30	1.28		3192.369	11.31	1.24	
2715.594	10.75	1.05		3214.302	10.70	0.83	
2743.488*	10.82	1.08		3423.544	10.94	1.09	
2756.532	10.83	1.06		3789.499	10.44	0.83	

BK Aurigae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2404.597	9.54	1.15	0.76	2794.233	9.25	0.95	0.66
2443.408	9.27	1.03	0.52:	2816.242	9.58	1.04	0.68
2448.489	9.41	1.00	0.55	2829.266	9.62	1.15:	0.85:
2450.431	9.27	1.00	0.63	2831.253	9.78	1.26:	0.88:
2453.493	9.68	1.20	0.74:	3163.212	9.29	1.01	0.65
2454.363	9.82	1.23	0.92	3524.224	9.41	1.12	0.75
2455.463	9.73	1.17	0.84	3560.257	9.66	1.11	0.75
2465.278	9.13	0.92	0.60	3598.282	9.75	1.26	
2468.251	9.50	1.15	0.64:	3849.470	9.21	0.92	0.59:

Table 3 (cont.)

RX Camelopardalis

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2369.467	7.90	1.32	0.97	2767.339	7.44	1.17	0.75
2404.567	7.44	1.22	0.85	2777.455*	7.69	1.33	0.99
2424.357*	8.02	1.44	1.02	2794.427	7.82	1.40	
2443.388	7.48	1.22	0.81	2831.303	7.50	1.20	0.84
2450.412	7.34	1.10	0.73	2850.277	7.95	1.43	
2453.477	7.72	1.36	1.01	3217.278	7.38	1.11	0.78
2455.442	8.02	1.44	1.13	3219.280	7.47	1.20	0.78
2460.315	7.46	1.20	0.73:	3390.548	7.73	1.27	0.93
2465.305	7.51	1.20	0.74:	3437.348	7.98	1.39	1.00
2473.384	7.45	1.13	0.75	3481.298	7.55	1.29	0.92
2676.497	7.97	1.45	1.11	3490.353	7.78	1.33:	
2756.465	8.01	1.48	1.13:				

RS Cassiopeiae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2299.567*	10.33	1.63		2776.405*	10.04	1.60	
2424.233*	10.17	1.61		2777.336*	10.24	1.62	
2426.222*	10.09	1.49		3163.255	9.83	1.38	
2710.416*	9.57	1.27		3340.496	9.58	1.33	
2711.496*	9.74	1.42		3342.479	9.98	1.59:	
2712.389*	9.94	1.51		3388.399	10.36:	1.56:	
2715.466	10.22:	1.59:		3390.563	9.56	1.28	
2738.406	10.03	1.54		3425.529	10.21	1.66:	
2743.301*	9.80	1.43		3490.389	10.01	1.46	
2756.219	9.95:	1.48:					

SW Cassiopeiae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2364.330	9.43	1.03		2645.525	9.96	1.22	
2397.263	9.48	1.08		2712.293*	9.36	1.03	
2407.340	9.35	0.96		2715.447	9.87:	1.29:	

Table 3 (cont.)

(SW Cas)

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2720.414	9.83	1.25		3340.403	9.79	1.23	
2738.295	9.88	1.13		3342.492	9.67	1.10	
2990.556	9.52	1.08		3363.499	9.98	1.24	
3045.330	9.58	1.13		3437.486	9.67	1.17	
3045.572	9.63	1.19		3476.235	9.77	1.26	
3140.228	9.98	1.27		3481.262	9.74	1.25	
3163.238	9.52	1.02		3490.218	9.34	1.01	
3337.537	9.44	0.94					

<u>VV Cassiopeiae</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2424.268*	10.98	1.28		2816.299	10.98:	1.39:	
2710.489*	11.08	1.30:		3078.365	10.66	1.12	
2711.536*	11.12	1.33		3124.449	10.72	1.27	
2715.569	10.84	1.33		3140.197	10.91	1.23	
2743.449*	10.39	1.01		3375.538	11.18	1.27:	
2775.295*	10.37	1.06		3390.456	10.62:	1.12:	
2776.387*	10.64	1.22		3437.367	11.17	1.33	
2777.337*	10.79	1.26		3483.265	10.45	1.14	
2787.250	10.28	0.94					

<u>VW Cassiopeiae</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2424.283*	10.79	1.16		2776.211*	11.00	1.27	
2426.253*	10.59	1.15		2777.194*	11.04	1.36:	
2710.474*	10.99	1.31		2990.502	10.74	1.13	
2711.524*	10.97	1.27		3045.601	10.96	1.25	
2712.486*	10.45	1.06		3048.457	10.37	1.06	
2715.548	10.88	1.22		3124.431	11.05	1.32	
2738.445	10.70	1.14		3390.441	10.42	1.07	
2743.430*	10.44	1.13		3425.510	10.58	1.05	
2756.192	10.71	1.11:		3524.295	10.70	1.19	

Table 3 (cont.)

DD Cassiopeiae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2407.320	9.63	1.11		2776.423*	10.18	1.34	
2424.328*	9.97	1.23		3045.547	9.59	1.10	
2685.526	9.88	1.42		3162.287	9.70	1.11	
2710.458*	9.80	1.14		3337.526	9.92	1.24:	
2712.433*	9.64	1.14		3363.487	10.02	1.45	
2715.509	9.97	1.41		3390.427	9.70	1.24	
2743.375*	9.77	1.29		3425.427	9.98	1.19	
2756.417	10.11	1.39		3426.317	9.83	1.14	
2767.247	10.07	1.28		3772.468	9.70:	1.23:	
2775.277*	10.16:	1.41:					

DL Cassiopeiae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2308.580	8.69	1.05	0.78	2777.420*	9.26	1.30	0.80:
2685.558	8.84	1.11	0.78	2787.217	8.97:	1.05:	0.69:
2712.473*	9.15	1.31	0.77	2990.515	8.85	1.14	0.83
2715.527	8.79	1.07	0.83:	3490.201	9.22	1.28	
2738.421	9.11	1.29	0.74	3560.239	9.11	1.28	0.79
2743.410*	9.01	1.25	0.78	3830.210	8.84	1.09	0.72
2756.262	8.72	1.05	0.70				

FM Cassiopeiae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2397.283	9.44	1.19		2794.256	8.91	0.89	
2407.357	9.19	1.12		2816.277	9.44	1.15	
2685.541	9.11	1.05		3140.242	9.31	1.16	
2712.447*	9.12	0.96		3364.564	9.00	0.89:	
2743.390*	9.15:	0.98:		3375.500	8.83	0.85	
2756.438	9.23	1.14		3390.354	9.34	1.19	
2767.263	9.12	1.12		3438.285	9.21	1.06	
2775.255*	9.48	1.11:		3546.232	9.22	1.12	
2777.399*	8.92	0.91					

Table 3 (cont.)

IX Cassiopeiae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2276.568*	11.24	0.61		3050.496	11.69	0.75	
2299.586*	11.72	0.86		3075.271	11.36	0.79	
2424.250*	11.27	0.67		3162.304	11.34:	0.68:	
2426.236*	11.55	0.78		3163.271	11.22	0.63	
2710.436*	11.65	0.86		3382.402	11.32	0.60	
2711.515*	11.69	0.77		3385.373	11.33:	0.53:	
2712.403*	11.65	0.76		3390.576	11.56	0.68	
2743.551*	11.19	0.59		3403.443	11.19:	0.61:	
2777.374*	11.59:	0.68:		3426.479	11.69	0.71	
3048.585	11.50	0.85					

CR Cephei

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2318.428	9.53	1.45		2756.315	9.53	1.39	
2350.420	9.48	1.36		2775.316*	9.57	1.40	
2623.503	9.68:	1.45:		2777.291*	9.74	1.50	
2685.476	9.72	1.53		2990.542	9.78	1.54	
2712.378*	9.45	1.38		3075.256	9.54:	1.47:	
2715.316	9.76	1.54		3163.223	9.67	1.56	
2720.319	9.66	1.46:		3375.440	9.70	1.60:	
2728.291*	9.81	1.53		3382.537	9.79	1.48	
2738.276	9.53	1.50		3403.378	9.46	1.34	
2743.281*	9.45	1.35					

δ Cephei

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2318.384	4.02	0.78	0.52	2645.432	3.91	0.72	0.52
2365.323	3.63	0.57	0.40	2646.365	4.13	0.78	0.63
2591.498	3.84	0.69	0.48	2669.370	4.33	0.84	0.64
2620.418	4.27	0.85	0.63	2675.383	3.88	0.65	0.39
2622.546	3.51	0.50	0.33	2676.413	3.58	0.51	0.39

Table 3 (cont.)

(δ Cep)

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2756.293	3.50	0.46	0.36	3340.416	4.20	0.78	0.54
2767.209	3.53:	0.42:	0.34:	3342.509	3.73	0.67:	
2787.230	4.32	0.86	0.68	3390.540	3.69	0.59	0.37:
3045.480	3.99	0.63:	0.47:	3403.365	4.17	0.79	0.64
3048.471	4.03	0.79	0.53				

Observations in 1967

J.D.hel. 2430000+	Δv	Δ(b-v)	Δ(u-b)	J.D.hel. 2430000+	Δv	Δ(b-v)	Δ(u-b)
9787.385	+0.916	-0.566	-1.030	9808.428	+0.854	-0.550	-1.058
9791.462	+0.651	-0.566	-1.126	9809.431	+0.814	-0.625	-1.196
9795.320	+0.337	-0.772	-1.226	9810.266	+0.028	-0.909	-1.359
9796.506	+0.562	-0.597	-1.106	9812.305	+0.537	-0.662	-1.128
9799.335	+0.159	-0.864	-1.385	9821.285	0.000	-0.884	-1.356
9806.331	+0.389	-0.724	-1.219				

<u>VY Cygni</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2307.424	9.32	1.12		3287.466	9.80	1.43	
2634.498	9.96	1.46		3363.442	9.62:	1.36:	
2685.411	9.46	1.11		3375.549	9.25	1.06	
2712.318*	9.89	1.43		3382.436	9.58	1.16	
2714.318	9.56:	1.29:		3425.280	9.43:	1.24:	
2715.291	9.20:	1.09:		3524.198	9.36	1.07	
2743.262*	9.77	1.40		3716.500	9.74:	1.28:	
3050.509	9.92	1.44		3724.471	9.63:	1.32:	
3275.507	9.43	1.16		3761.326	9.46	1.08	

<u>GH Cygni</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2276.421*	9.65	1.21		2636.504	9.76	1.19	
2302.462*	10.11	1.44		2639.491	10.31	1.37	
2634.536	9.61:	1.11:		2712.257*	9.51	1.10	

Table 3 (cont.)

(GH Cyg)

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2715.253	9.90	1.30		3342.529	10.18	1.42	
2728.243*	9.50	1.11		3375.413	10.22	1.24	
2743.187*	9.62	1.16		3385.488	9.68	1.07	
2927.493	10.12	1.35		3388.385	10.05	1.29	
2960.438	10.29	1.34		3401.351	9.64	1.15	
3227.620	9.86	1.17		3438.296	10.12	1.12:	
3340.449	9.81	1.22					

MW Cygni

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2634.461	9.52	1.45		2927.477	9.82	1.52	
2639.537	9.44	1.34		3046.316	9.69:	1.49:	
2685.393	9.23	1.20		3227.608	9.16	1.20	
2712.301*	9.60	1.50		3275.524	9.17	1.22	
2720.263	9.77	1.46		3342.541	9.49	1.38	
2728.259*	9.27	1.32		3385.473	9.72	1.47	
2743.222*	9.81	1.56		3401.435	9.33	1.33	
2777.209*	9.49	1.45		3435.244	9.51	1.32	
2904.477	9.77:	1.63:		3490.179	9.25	1.23	

V 386 Cygni

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2307.446	9.98:	1.68:		2776.237*	9.77	1.63	
2634.516	9.65	1.57		2777.251*	9.26	1.42	
2636.537	9.52	1.65		2928.417	9.87	1.76	
2685.428	9.84	1.69		3078.390	9.57	1.63	
2714.335	9.31	1.40		3363.376	9.81	1.65	
2720.285	9.45	1.55		3420.446	9.67	1.61	
2728.276*	9.89	1.76		3426.285	9.77	1.66	
2738.261	9.90	1.71		3476.205	9.31	1.38	
2767.224	9.31:	1.50:		3481.213	9.48	1.47	

Table 3 (cont.)

V 538 Cygni

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2276.530*	10.40	1.25		2776.259*	10.61	1.47	
2299.533*	10.71	1.46		2948.438	10.75	1.42	
2302.410*	10.29	1.23		3075.431	10.64:	1.30:	
2424.198*	10.21	1.18		3078.348	10.35	1.18	
2426.194*	10.45	1.39		3337.357	10.41	1.34	
2634.556	10.55	1.31:		3340.530	10.71	1.39	
2636.555	10.71	1.46		3363.391	10.63	1.43	
2639.521	10.42:	1.25:		3403.431	10.25	1.15:	
2666.341	10.60:	1.55:		3426.349	10.60	1.32	
2712.342*	10.27	1.25					

V 924 Cygni

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2276.408*	10.63	0.86		3227.591	10.59	0.76	
2299.518*	10.76	0.94:		3275.491	10.77:	0.99:	
2302.447*	10.54:	0.82:		3287.414	10.78	0.87	
2712.270*	10.73	0.94		3304.406	10.82:	0.81:	
2715.271	10.56	0.83		3375.483	10.89:	0.86:	
2900.550	10.69	0.91		3390.398	10.62	0.88	
2927.461	10.58	0.80		3401.321	10.63	0.84	
2948.424	10.65	0.83		3437.309	10.85	0.90	
3064.275	10.80	0.88		3438.309	10.70	0.84	

TX Delphini

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2277.486	9.29	0.84	0.76	2379.187	8.94	0.59	0.52
2297.430	9.45:	0.97:	0.79:	2591.530	9.18	0.78	
2299.468*	8.89	0.54	0.45	2623.466	9.42	0.91	0.74:
2304.356	9.29	0.77	0.69	2634.395	9.11	0.74	0.77:
2307.387	9.07	0.75	0.67	2666.300	9.37	0.86	
2343.261	8.94	0.55:	0.47:	2960.536	9.00	0.70	0.65

Table 3 (cont.)

(TX Del)

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2990.402	8.88	0.55	0.51	3426.299	9.49	0.88	0.94
3351.517	9.49	0.94	0.97:	3481.242	9.53	0.95	0.89
3386.338	9.05	0.74	0.59	3743.438	9.02	0.64	0.56
3390.316	9.00	0.62	0.57	3772.307	9.17	0.65	0.61

W Geminorum

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2404.497	7.34	1.15	0.92	2756.505	6.81	0.84	0.67:
2429.452	7.15	1.02	0.65	2767.475	7.17	1.14	0.80:
2432.425	6.72	0.89	0.63	2794.405	6.73	0.69:	0.53:
2443.448	7.22	1.15	0.95:	2841.338	6.94	0.93	0.59
2450.377	7.10	1.06	0.81	3138.502	7.06	1.05	0.79
2454.428	6.54	0.75	0.52	3224.270	6.74	0.88	0.63
2455.403	6.74	0.83	0.59	3483.548	6.59	0.74	0.59
2460.350	7.34	1.13	0.89	3489.497	7.27	1.08	0.85
2473.319	7.00	1.00	0.72				

Observations in 1967

J.D.hel. 2430000+	Δv	Δ(b-v)	Δ(u-b)	J.D.hel. 2430000+	Δv	Δ(b-v)	Δ(u-b)
9777.538	+0.092	0.808	0.764	9786.570	-0.268	0.636	0.564
9780.604	-0.552	0.568	0.477	9796.555	-0.520	0.575	0.504
9781.533	-0.572	0.580	0.492	9812.594	-0.492	0.590	0.499
9782.521	-0.345	0.688	0.586	9819.575	-0.720	0.504	0.403
9783.557	-0.170	0.788		9825.617	-0.006	0.747	0.733
9784.574	+0.026	0.818	0.817				

RZ Geminorum

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2369.576	10.21	1.23		2448.469	10.45	1.20	
2404.473	10.37	1.17		2450.392	9.69	1.06	
2429.433	10.04	1.19		2453.428	10.35	1.25	
2443.463	10.15	1.05		2455.424	9.61	0.90	

Table 3 (cont.)

(RZ Gem)

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2460.379	9.58	0.90		3219.310	9.82	1.09	
2473.300	9.89	1.14:		3227.274	10.28:	1.26:	
2714.551	9.88	0.94		3483.515	9.49	0.86	
2715.612	9.68	0.95		3490.482	9.93	1.10	
2756.399	10.15	1.21		3598.305	10.49:	1.19:	
2816.320	10.05	1.14					

<u>BB Herculis</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2202.506	10.18	1.19		2640.330	10.40:	0.93:	
2206.462	9.81	0.89		2646.323	10.40	1.25	
2255.444	10.30	1.22		2927.510	9.86	0.89	
2277.397	10.21	1.10		2949.374	9.79	0.89	
2471.611	10.02	1.07		3304.426	9.95	1.00	
2522.526	9.95	0.95		3375.471	10.36	1.18:	
2543.473	10.02	0.88		3388.305	10.18	1.07	
2591.385	10.01	0.95		3679.395	9.96	0.92	
2620.473	9.93	0.95		3714.398	10.07	0.97	
2639.326	10.44	1.14:		3722.424	9.91	0.84	

<u>X Lacertae</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2365.298	8.54	1.02	0.70	2738.327	8.17	0.86	0.56
2407.297	8.28	0.96	0.54:	2939.500	8.22	0.83	0.51
2620.522	8.44	0.95	0.70	3075.353	8.23	0.82	0.56
2642.425	8.46	0.96	0.73	3337.501	8.23	0.81	0.63:
2646.418	8.22	0.91	0.54	3340.522	8.58	1.06	0.78
2675.479	8.48	1.03	0.67	3390.341	8.49	0.98	0.73
2676.449	8.53	1.04	0.72	3423.518	8.34	0.89	0.62
2685.512	8.41	0.94	0.74:	3425.267	8.27	0.90	0.63
2715.420	8.43	0.94	0.65	3438.245	8.56	1.03	0.73
2720.336	8.54	1.00	0.73				

Table 3 (cont.)

(X Lac)

Observations in 1967

J.D.hel. 2430000+	Δv	Δ(b-v)	Δ(u-b)	J.D.hel. 2430000+	Δv	Δ(b-v)	Δ(u-b)
9720.506	-0.684	0.409	0.879	9737.455	-0.911	0.294	0.865
9724.495	-0.537	0.472	1.007	9739.514	-0.717	0.392	0.988
9726.458	-0.882	0.301	0.810	9756.601	-0.611	0.436	0.988
9727.456	-0.916	0.326	0.894	9757.317	-0.583	0.499	1.062
9731.478	-0.688	0.345	0.961	9763.562	-0.579	0.451	0.965
9732.428	-0.953	0.296	0.839	9770.327	-0.960	0.293	0.848
9733.522	-0.835	0.361	0.896	9779.588	-0.524	0.418	0.967

RR Lacertae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2289.494	8.51	0.74	0.45	2756.348	9.03	1.00	0.61
2318.452	9.17	1.10	0.70	2767.282	9.13	1.01	0.74
2407.233	8.96	0.97		2776.325*	8.54	0.78	0.48
2646.403	9.25	1.05:	0.83:	2960.401	9.15	1.12	0.78
2672.526	9.14	1.10	0.66	3045.521	8.75	0.83	0.49
2675.464	8.74	0.91		3375.452	8.86	0.95	0.59
2676.351	8.90	0.94	0.74:	3424.547	8.46	0.75	0.47
2714.350	8.80	0.93	0.55:	3425.493	8.61	0.78	0.51
2728.329*	8.99	1.03		3464.354	8.64	0.86	0.59
2738.342	8.44	0.73	0.44				

BG Lacertae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2278.492	8.56	0.84	0.44:	2676.366	9.06	1.08	0.69:
2289.468	8.56	0.84	0.55:	2685.458	8.79	1.03	0.73
2297.457	9.03	1.01:	0.70:	2712.364*	8.85	1.05	0.69
2314.331	9.21:	1.03:	0.79:	2720.301	8.99	0.98	0.61
2318.408	8.97	1.09	0.68	2743.358*	8.65	0.93	0.61
2365.278	8.76	0.97	0.70	2939.423	8.63	0.89	0.50
2407.193	8.59	0.86	0.55	2960.483	8.83	0.88	0.66:
2591.444	9.14	1.06	0.80	3050.472	9.09:	1.06:	0.72:
2675.365	8.88	1.11	0.75				

Table 3 (cont.)

(BG Lac)

Observations in 1967

J.D.hel. 2430000+	Δv	Δ(b-v)	Δ(u-b)	J.D.hel. 2430000+	Δv	Δ(b-v)	Δ(u-b)
9738.499	+0.525	0.383	0.359	9780.488	+0.381	0.344	0.401
9760.564	+0.562	0.367	0.449	9782.500	+0.236	0.238	0.144
9762.527	-0.016	0.158	0.134	9783.386	-0.114	0.142	0.111
9763.472	+0.180	0.262	0.272	9787.478	+0.514	0.365	0.367
9769.468	+0.291	0.313	0.306	9788.502	-0.080	0.119	0.046
9777.354	+0.133	0.212	0.138				

<u>CS Monocerotis</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2404.546	10.71	1.11		2454.286	11.08	1.25	
2424.390*	10.71	1.07		2455.325	11.22	1.25	
2429.412	11.21	1.20		2473.278	10.89	1.23	
2432.440	10.86	1.20		2743.507*	11.00	1.24	
2443.370	11.04	1.21		2775.472*	10.78	1.23:	
2448.369	11.20	1.26		2837.289	11.02:	1.21:	
2449.248	11.28	1.25		2841.267	10.79	1.12	
2450.321	10.94	1.21		2869.323*	10.75	1.14	
2451.319	10.71	1.12		3217.266	11.11:	1.26:	
2453.343	10.93	1.20		3437.602	11.15	1.26	

<u>CV Monocerotis</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2424.424*	10.04	1.34		2743.525*	10.36	1.46:	
2448.389	10.54	1.42		2775.491*	10.33	1.48:	
2449.263	10.52	1.36:		2816.355	9.94	1.20	
2450.341	9.98	1.15		2831.322	10.51	1.35	
2453.357	10.46:	1.40:		2841.284	10.57	1.42	
2454.305	10.55	1.44		2869.305*	10.23	1.37:	
2455.344	10.11	1.24		3162.418	10.30	1.43	
2473.290	10.13:	1.41:		3424.621	10.03	1.32:	
2715.632	10.25	1.41		3483.530	9.99	1.21	

Table 3 (cont.)

RS Orionis

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2404.448	8.05	0.82	0.51	2767.402	8.12	0.86	0.53
2443.428	8.21	0.92	0.55	2816.336	8.55	1.05	0.77
2448.454	8.75	1.10	0.74	2837.304	8.26	0.95	0.66
2450.362	8.08	0.82	0.53	2850.295	8.33	0.93	0.58
2453.413	8.61	1.11	0.75	3140.373	8.27	0.99	0.54
2455.379	8.86	1.18	0.85	3209.281	8.37	0.97	0.60
2460.364	8.45	1.04	0.76:	3214.317	8.02	0.81	0.50
2467.314	8.24:	1.01:	0.58:	3219.295	8.79:	1.19:	0.82:
2471.334	8.66	1.08	0.61	3228.284	8.56	1.05	0.58
2473.417	8.17	0.90	0.52	3483.637	8.76	1.20	0.90:
2522.306	8.72	1.19	0.75	3560.402	8.86	1.16	0.95:
2756.515	8.65	1.13	0.73				

GQ Orionis

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2404.426	8.74	0.90	0.67	2777.476*	9.16	1.20	0.88
2424.437*	9.19	1.17	0.94	2794.386	9.16	1.12	
2448.411	8.95	1.06	0.72	2816.371	8.71	0.89	0.62
2451.335	9.27	1.18	0.74:	2831.271	9.13	1.05	0.68
2453.378	8.70	0.81	0.61	2841.301	8.65	0.81	0.61
2454.329	8.66	0.85	0.62	2850.262	8.69	0.85	0.60
2460.397	9.30:	1.04:	0.90:	2869.342*	8.74	0.91	
2711.619*	8.73	0.90	0.65	3124.553	9.00	0.99	0.59:
2743.569*	9.27	1.22	0.73:	3228.274	8.90	0.87	0.69
2756.489	8.76	0.90	0.74	3437.591	8.80	0.94	0.75
2767.529	8.96	1.03:		3490.421	8.82	0.98	0.88:
2776.455*	9.01	1.14	0.76				

AW Persei

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2404.520	7.52	1.08	0.59	2424.370*	7.12	0.95	

Table 3 (cont.)

(AW Per)

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2432.301	7.27	1.03	0.61	2743.469*	7.37	1.12	0.79:
2448.432	7.81	1.21	0.79	2756.377	7.36	1.18:	0.70:
2451.352	7.22	0.98	0.65	2767.361	7.06	0.91	0.66
2453.397	7.56	1.19	0.75	2777.317*	7.70	1.23	0.85:
2454.345	7.77	1.25	0.75	2829.336	7.74	1.23	0.83
2455.361	7.84	1.22	0.74	2831.286	7.39	1.01	0.65
2460.332	7.66	1.21	0.76	2837.271	7.67	1.13	0.79:
2465.252	7.40	1.10	0.68	2869.283*	7.82	1.18	0.77
2471.317	7.36	1.04	0.68	2871.278	7.16	1.00	0.58
2685.584	7.43	1.16	0.65:	3426.457	7.06	0.92	0.51:
2711.631*	7.46	1.15	0.77				

<u>HR 690</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
3162.361	6.26	0.90	0.52:	3489.357	6.23	0.87	0.68
3178.234	6.29	0.87	0.56	3546.260	6.25	0.88	0.63
3202.294	6.26	0.79:	0.64:	3560.283	6.20	0.86	0.60
3385.549	6.18	0.84	0.67	3737.465	6.30	0.86	0.62
3420.487	6.31	0.88	0.66	3777.394	6.22	0.82	0.72
3424.448	6.24	0.85		3788.540	6.22	0.85	0.63
3425.472	6.25	0.90	0.63	3789.391	6.28	0.85	0.56
3437.417	6.22	0.85	0.56	3803.313	6.26	0.83	0.68
3483.346	6.22	0.84	0.64	3830.263	6.22	0.86	0.71

<u>S Sagittae</u>

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2289.398	5.84	0.98	0.82:	2620.433	5.32	0.63	0.42
2297.406	5.79	0.98	0.72	2622.521	5.44	0.75	0.47
2343.276	5.33	0.61	0.39	2623.494	5.67	0.91	0.64
2543.570	5.65	0.82	0.49	2635.329	5.85	0.85	0.58
2591.468	5.89	1.00	0.80	2642.356	5.97	1.03	0.80
2613.428	5.38	0.75	0.41	2646.337	5.43	0.77	0.43

Table 3 (cont.)

(S Sge)

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2673.362	5.56	0.91:	0.56:	3351.505	5.39	0.72	0.50
2676.324	6.02	1.01	0.76	3403.404	5.76	0.90	0.72
2904.508	5.45	0.69	0.39	3724.500	5.97	0.97	0.70
2948.470	5.41	0.74	0.45	3743.299	5.35:	0.62:	0.35:

Observations in 1953

J.D.hel. 2430000+	Δv	Δ(b-v)	J.D.hel. 2430000+	Δv	Δ(b-v)
4584.510	+0.115	1.068	4623.463	-0.173	0.691
4585.517	+0.357	1.273	4624.486	-0.055	0.761
4590.550	-0.192	0.876	4627.483	+0.240	1.026
4597.522	+0.139	0.941	4628.482	+0.451	1.127
4622.450	+0.211	0.940	4630.401	+0.370	1.015

U Vulpeculae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2202.531	7.26:	1.45:	1.20:	2543.499	6.90	1.26	0.96
2206.483	6.81	1.15	0.80	2589.420	7.03	1.25	0.89
2229.506	7.19	1.33	0.94	2601.535	7.28	1.38	1.16
2289.420	7.15	1.36	0.98	2622.375	6.79	1.14	0.87
2307.406	7.44	1.51	1.20	2640.346	6.96	1.32	0.85:
2308.334	7.42	1.51	1.16	2645.449	6.99	1.22	0.82
2343.244	6.85	1.21	0.90	2871.580	6.93	1.28	0.98
2522.549	7.32:	1.55:	1.20:	2928.404	7.05	1.33	0.93
2523.522	7.50	1.44:		2939.407	7.48	1.44	
2532.552	7.36	1.44	1.09	2948.457	7.27	1.32	0.98

Observations in 1953

J.D.hel. 2430000+	Δv	Δ(b-v)	J.D.hel. 2430000+	Δv	Δ(b-v)
4584.468	0.447	0.186	4597.482	1.052	0.398
4585.456	0.479	0.267	4598.443	0.737	0.264
4590.513	0.709	0.292			

Table 3 (cont.)

X Vulpeculae

J.D.hel. 2440000+	V	B-V	U-B	J.D.hel. 2440000+	V	B-V	U-B
2202.473	9.18	1.61	1.11	2646.433	8.71	1.33	0.94
2206.441	8.81	1.48	1.07	2666.310	8.49	1.33	1.05
2266.369	9.16	1.61	1.13	2669.356	9.08	1.63	1.22
2289.444	8.88:	1.53:	1.24:	2673.346	8.65	1.39	1.12
2471.633	8.80	1.42	1.08	2675.326	9.02	1.55	1.05:
2532.534	8.78	1.38	1.07	2949.389	8.91	1.44	
2563.548	9.17	1.41:	1.19:	2960.450	9.12	1.60	1.35:
2591.402	8.70	1.39	1.15	2990.386	8.83	1.50	1.00:
2622.533	8.55	1.37	0.99	3363.474	8.90	1.53	1.24
2639.343	9.16	1.50:	1.16:	3386.372	8.52:	1.26:	1.02:
2640.400	8.47	1.28	1.01				

vations listed in Table 3 using the actual periods available after constructing the O-C diagrams. The value of the actual period is indicated for each light curve. It is the B light curve that is shown in the figures instead of the V one because the determination of the normal maxima was made with the help of the B light curves.

The method of using the other published observational data in constructing the O-C diagrams is the same as described in Paper I (p. 32). The O-C values determined on the basis of visual, photographic and photoelectric observations are marked with open circles, filled circles and triangles, respectively. The size of these marks denotes the weight of the O-C values to be found in the figures of this section.

The columns in the tables of the O-C residuals for each variable contain the following data:

1. The moment of normal maximum (or that of median brightness)
2. The corresponding epoch
3. The O-C residual in days
4. The type of observation (vis for visual, pg for photographic and pe for photoelectric observations)
5. The weight of the O-C residual depending on the type, number and quality of the observations

6. The source of the observational data. When the name of the observer is not identical with the name (or one of the names) given in the reference the observer's name is indicated in the footnote to the table.

The determination of the O-C curves was by a weighted least squares fitting procedure. The O-C residuals with zero weight are not plotted in the diagrams, those with 0.5 weight are plotted but were usually omitted in the curve fitting procedure (otherwise the use of the O-C residuals with 0.5 weight is indicated in the remarks relating to the given variable).

The formula by which the O-C residuals have been calculated is indicated at each variable. These formulae usually refer to maximum light. If O-C diagrams for both maximum and median brightnesses are presented, the two different calculated ephemerides are marked with C_{max} and C_{med} , respectively. O-C diagrams for the median brightness are published here only if they are fairly complete.

V 386 Cygni

The light and colour curves of this Cepheid which has a blue

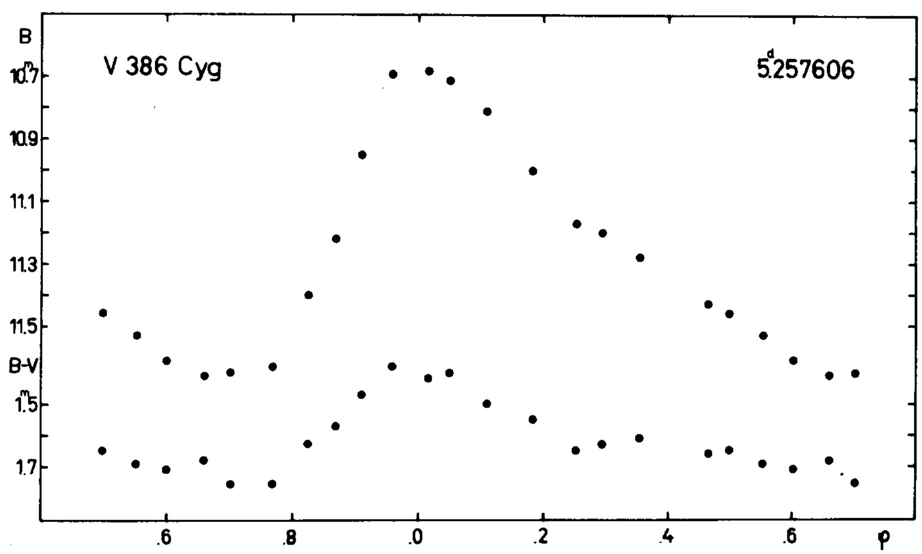

Figure 2 B and B-V curves of V 386 Cyg

photometric companion of spectral type B9 (*Madore* 1977) are shown in Fig. 2. The available observational material is not too rich. This is the reason for also using the 0.5 weight points in determining the correct value of the period.

The O-C residuals have been computed by the formula:

$$C = 2442777.118 + 5\overset{d}{.}257606 \times E \quad .$$

The period of this Cepheid has remained constant since the discovery of its light variation (see Fig. 3).

Table 3 O-C residuals for V 386 Cyg

Obs.Max.J.D.	E	O-C	Type	w	Reference
2416347.178	-5027	+0.045	pg	0.5	Parenago (1940)
2427977.09	-2815	+0.13	vis	0.5	Selivanov (1936)
2428045.352	-2802	+0.046	vis	0.5	Szafraniec[1] (1961)
2428555.275	-2705	-0.019	pg	0.5	Parenago (1940)
2429144.169	-2593	+0.023	pg	0.5	Ishchenko (1948)
2429454.348	-2534	+0.004	pg	0.5	Ishchenko (1948)
2429827.585	-2463	-0.049	pg	0.5	Ishchenko (1948)
2434149.248	-1641	-0.139	pg	1	Shteiman (1958)
2435689.768	-1348	-0.097	pg	1	Shteiman (1958)
2436094.879	-1271	+0.178	pg	0.5	Korovkina (1958)
2436762.403	-1144	-0.014	pe	3	Weaver et al. (1960)
2436804.456	-1136	-0.022	pe	3	Oosterhoff (1960)
2437251.385	-1051	+0.011	pe	2	Mitchell et al. (1964)
2438224.025	-866	-0.006	pg	1	Dultsev (1967)
2442777.160	0	+0.042	pe	3	present paper

Remark: [1] Observer: Piegza

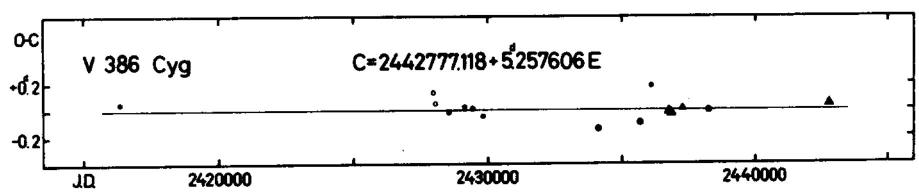

Figure 3 O-C diagram of V 386 Cyg

BG Lacertae

There is a faint NW companion within the edge of the diaphragm. The present amplitudes in B and U bands are smaller than those given by *Schaltenbrand* and *Tammann* (1971), which can be attributed to the effect of this optical companion (see Fig. 4). According to *Madore* (1977) BG Lac has a B8 type photometric companion. This physical companion is obviously not identical with the optical companion star.

The O-C residuals plotted in Fig. 5 have been computed with the formula:

$$C = 2442673.222 + 5\overset{d}{.}331932 \times E \quad .$$

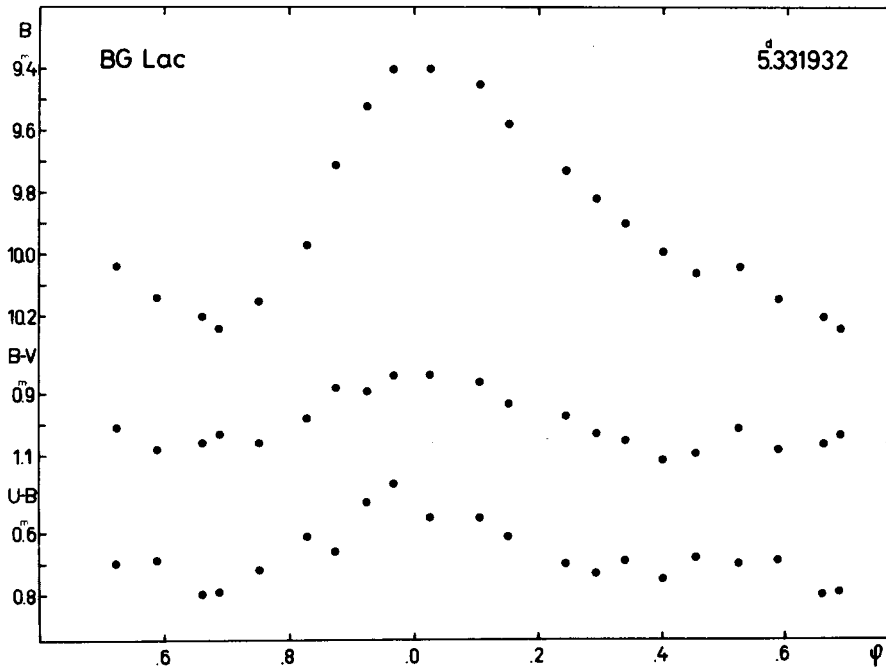

Figure 4 B, B-V and U-B curves of BG Lac

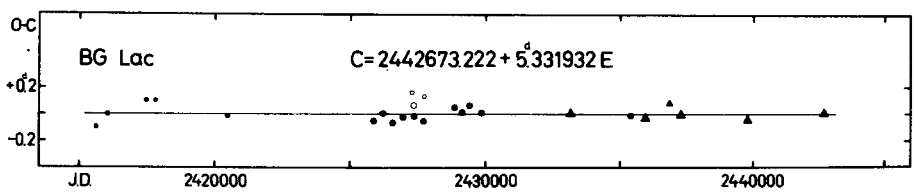

Figure 5 O-C diagram of BG Lac

The O-C diagram can be approximated by a straight line which shows the constancy of the period.

Table 5 O-C residuals for BG Lac

Obs.Max.J.D.	E	O-C	Type	w	Reference
2414899.7	-5209	$+0\overset{d}{.}5$	pg	0	Parenago (1934a)
2415256.1	-5142	-0.3	pg	0	Parenago (1934a)
2415613.6	-5075	-0.1	pg	0.5	Parenago (1934a)
2416024.2	-4998	0.0	pg	0.5	Parenago (1934a)
2417469.3	-4727	+0.1	pg	0.5	Parenago (1934a)
2417826.5	-4660	+0.1	pg	0.5	Parenago (1934a)
2420455.051	-4167	-0.010	pg	0.5	Robinson (1933)
2425850.928	-3155	-0.049	pg	1	Wachmann (1935)
2426192.223	-3091	+0.003	pg	1	Wachmann (1935)

Table 5 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2426560.056	-3022	$-0.^{d}068$	pg	1	Wachmann (1935)
2426928.005	-2953	-0.022	pg	1	Wachmann (1935)
2427258.761	-2891	+0.154	vis	0.5	Iwanowska et al. (1938)
2427295.998	-2884	+0.068	vis	1	Florya et al. (1953)
2427333.241	-2877	-0.013	pg	1	Gesundheit (1938)
2427695.773	-2809	-0.052	pg	1	Gesundheit (1938)
2427727.949	-2803	+0.132	vis	0.5	Iwanowska et al. (1938)
2428826.250	-2597	+0.055	pg	1	Ishchenko (1948)
2429114.135	-2543	+0.016	pg	1	Ishchenko (1948)
2429439.435	-2482	+0.068	pg	1	Ishchenko (1948)
2429844.602	-2406	+0.008	pg	1	Ishchenko (1948)
2433129.068	-1790	+0.004	pe	3	Eggen (1951)
2435389.791	-1366	-0.012	pg	1	Mashnauskas (1960)
2435938.962	-1263	-0.030	pe	3	Bahner et al. (1977)
2436834.834	-1095	+0.078	pe	2	Bahner et al. (1962)
2437261.307	-1015	-0.004	pe	3	Mitchell et al. (1964)
2439772.614	-544	-0.037	pe	3	present paper[1]
2442673.231	0	+0.009	pe	3	present paper

Remark: [1] Observer: Abaffy

δ Cephei

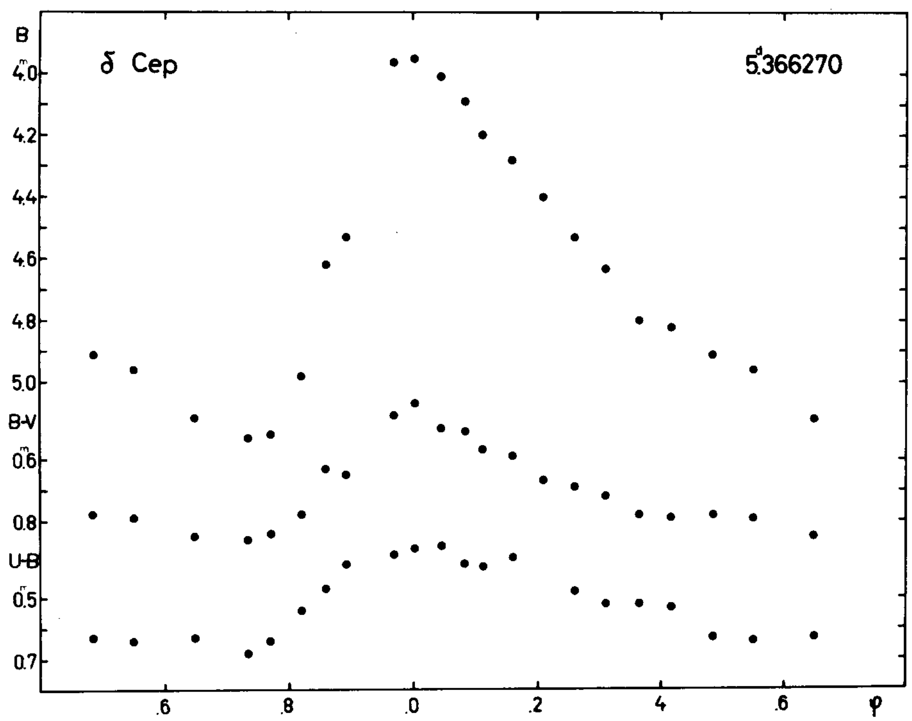

Figure 6 B, B-V and U-B curves of δ Cep

This star is one of the most frequently observed Cepheid variables. Its light and colour curves are plotted in Fig. 6. The large number of the photoelectric observational series made it possible to construct the O-C diagram not only for the maximum brightness but also for the median brightness.

The O-C residuals for this star have been obtained by the formulae:

$$C_{max} = 2442756.490 + 5^{d}.366270 \times E \quad ,$$
$$C_{med} = 2442755.850 + 5^{d}.366270 \times E \quad .$$

Although several sudden period changes have been reported (e.g. *Kukarkin* et al. 1969-1970) the O-C diagram in Fig. 7 can be approximated by a parabolic curve better than by three (or more)

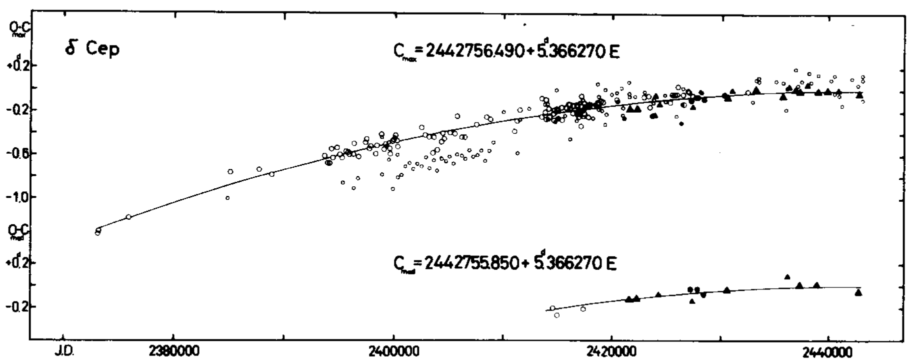

Figure 7 O-C diagram of δ Cep

straight lines. The equation of the parabolic curve for the maximum brightness is as follows:

$$C_{par} = 2442756.490 + 5.366270 \times E - 7.6 \times 10^{-9} \times E^{2} \quad .$$

Table 6 O-C residuals for δ Cep

(maximum brightness)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2373090.249	-12982	$-1^{d}.324$	vis	1	Goodricke (1786)
2373101.003	-12980	-1.302	vis	1	{Goodricke[1] (1786) Pigott (1786)
2375870.126	-12464	-1.175	vis	1	Nielsen[2] (1933)
2384874.9	-10786	-1.0	vis	0.5	Müller et al.[3] (1918-1920)
2385105.889	-10743	-0.762	vis	1	Westphal (1817, 1818)
2387670.994	-10265	-0.734	vis	1	Müller[4] (1925)
2388862.263	-10043	-0.777	vis	1	Müller[4] (1925)
2393606.216	-9159	-0.607	vis	1	Argelander (1869)
2393842.265	-9115	-0.674	vis	1	Hagen[5] (1903)
2394008.616	-9084	-0.677	vis	1	Argelander (1869)
2394201.933	-9048	-0.546	vis	1	Hagen[5] (1903)

Table 6 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2394389.669	-9013	$-0^{d}.629$	vis	1	Argelander (1869)
2394711.741	-8953	-0.534	vis	1	Argelander (1869)
2394958.528	-8907	-0.595	vis	1	Hagen[5] (1903)
2395173.145	-8867	-0.629	vis	1	Argelander (1869)
2395258.781	-8851	-0.853	vis	0.5	Schmidt (1857b)
2395522.016	-8802	-0.565	vis	1	Argelander (1869)
2395752.752	-8759	-0.579	vis	1	Hagen[5] (1903)
2395860.058	-8739	-0.598	vis	1	Argelander (1869)
2396235.803	-8669	-0.492	vis	1	Argelander (1869)
2396240.757	-8668	-0.905	vis	0.5	Schmidt (1857b)
2396241.068	-8668	-0.594	vis	1	Hagen[5] (1903)
2396611.115	-8599	-0.819	vis	0.5	Schmidt (1857b)
2396729.378	-8577	-0.614	vis	1	Hagen[5] (1903)
2397287.837	-8473	-0.247	vis	0	Hagen[5] (1903)
2397319.799	-8467	-0.483	vis	1	Argelander (1869)
2397400.321	-8452	-0.455	vis	1	Johnson (1853)
2397690.007	-8398	-0.548	vis	1	Argelander (1869)
2397738.331	-8389	-0.520	vis	1	Hagen[5] (1903)
2398248.058	-8294	-0.589	vis	1	Hagen[5] (1903)
2398328.628	-8279	-0.513	vis	1	Argelander (1869)
2398763.398	-8198	-0.411	vis	1	Argelander (1869)
2398800.942	-8191	-0.430	vis	0.5	Schönfeld (1861)
2398848.890	-8182	-0.779	vis	0.5	Schmidt (1857b)
2398999.378	-8154	-0.546	vis	1	Hagen[5] (1903)
2399171.144	-8122	-0.501	vis	1	Argelander (1869)
2399197.960	-8117	-0.516	vis	0.5	Schönfeld (1861)
2399455.415	-8069	-0.642	vis	0.5	Schmidt (1858a)
2399487.769	-8063	-0.486	vis	0.5	Schönfeld (1861)
2399509.180	-8059	-0.540	vis	1	Argelander (1869)
2399589.627	-8044	-0.587	vis	1	Zinner et al.[6] (1931)
2399739.997	-8016	-0.473	vis	1	Müller[4] (1925)
2399841.969	-7997	-0.460	vis	1	Argelander (1869)
2399852.250	-7995	-0.911	vis	0.5	Schmidt (1859)
2399976.139	-7972	-0.447	vis	0.5	Auwers (1859)
2400088.858	-7951	-0.419	vis	1	Hagen[5] (1903)
2400180.032	-7934	-0.472	vis	1	Argelander (1869)
2400206.736	-7929	-0.599	vis	0.5	Schönfeld (1869)
2400228.275	-7925	-0.525	vis	1	Zinner et al.[6] (1931)
2400270.922	-7917	-0.808	vis	0.5	Schmidt (1860b)
2400609.023	-7854	-0.782	vis	0.5	Schmidt (1861)
2400957.910	-7789	-0.703	vis	0.5	Schmidt (1862)
2401322.843	-7721	-0.676	vis	0.5	Schmidt (1863)
2401698.433	-7651	-0.725	vis	0.5	Schmidt (1864)
2402063.387	-7583	-0.678	vis	0.5	Schmidt (1865)
2402407.160	-7519	-0.346	vis	1	Valentiner[7] (1900)
2402449.731	-7511	-0.705	vis	0.5	Schmidt (1866)
2402739.798	-7457	-0.417	vis	1	Valentiner[7] (1900)
2402803.996	-7445	-0.614	vis	0.5	Schmidt (1867)
2403110.059	-7388	-0.428	vis	1	Valentiner[7] (1900)
2403152.700	-7380	-0.717	vis	0.5	Schmidt (1868)
2403458.716	-7323	-0.579	vis	1	Valentiner[7] (1900)
2403533.775	-7309	-0.648	vis	0.5	Schmidt (1869)
2403539.356	-7308	-0.433	vis	1	Zinner et al.[6] (1931)
2403871.758	-7246	-0.740	vis	0.5	Schmidt (1870)
2403893.411	-7242	-0.552	vis	1	Valentiner[7] (1900)

Table 6 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2404242.293	-7177	-0.477 (d)	vis	1	Valentiner[7] (1900)
2404268.974	-7172	-0.628	vis	0.5	Schmidt (1871)
2404392.631	-7149	-0.395	vis	1	Zinner et al.[6] (1931)
2404601.859	-7110	-0.451	vis	1	Valentiner[7] (1900)
2404628.487	-7105	-0.655	vis	0.5	Schmidt (1872)
2404998.802	-7036	-0.612	vis	0.5	Schmidt (1873)
2405020.493	-7032	-0.386	vis	1	Valentiner[7] (1900)
2405352.911	-6970	-0.677	vis	0.5	Schmidt (1874)
2405417.586	-6958	-0.397	vis	1	Valentiner[7] (1900)
2405701.804	-6905	-0.592	vis	0.5	Schmidt (1875)
2405712.890	-6903	-0.238	vis	1	Valentiner[7] (1900)
2406087.955	-6833	-0.812	vis	0	Chandler (1877)
2406114.996	-6828	-0.602	vis	0.5	Schmidt (1876)
2406136.633	-6824	-0.431	vis	1	Valentiner[7] (1900)
2406372.746	-6780	-0.433	vis	1	Belyavsky[8] (1910)
2406436.939	-6768	-0.636	vis	0.5	Schmidt (1877)
2406812.658	-6698	-0.556	vis	0.5	Schmidt (1878)
2407193.609	-6627	-0.610	vis	0.5	Schmidt (1879)
2407198.766	-6626	-0.819	vis	0	Schwab (1879)
2407499.780	-6570	-0.316	vis	1	Schur (1895)
2407563.892	-6558	-0.599	vis	0.5	Schmidt (1880)
2407907.375	-6494	-0.558	vis	0.5	Schmidt (1881)
2408277.556	-6425	-0.649	vis	0.5	Schmidt (1882)
2408412.117	-6400	-0.245	vis	1	Wilsing (1897)
2408637.187	-6358	-0.558	vis	0.5	Schmidt (1883)
2408766.269	-6334	-0.267	vis	1	Schur (1895)
2409018.272	-6287	-0.479	vis	0.5	Schmidt (1884)
2409957.650	-6112	-0.198	vis	0.5	Hagen (1891)
2410955.596	-5926	-0.378	vis	1	Valentiner[7] (1900)
2411197.178	-5881	-0.278	vis	1	Valentiner[7] (1900)
2411255.897	-5870	-0.588	vis	0.5	Yendell (1890b)
2411395.744	-5844	-0.264	vis	0.5	Porro (1896)
2411481.686	-5828	-0.182	vis	1	Valentiner[7] (1900)
2412275.908	-5680	-0.168	vis	0.5	Hertzsprung[9] (1919)
2413424.210	-5466	-0.248	vis	1	Stratonov (1904)
2413483.411	-5455	-0.076	vis	1	Plassmann (1900)
2413783.874	-5399	-0.124	vis	0.5	Hertzsprung[10] (1919)
2413789.159	-5398	-0.206	vis	1	Plassmann (1900)
2413826.659	-5391	-0.269	vis	1	Stratonov (1904)
2413832.202	-5390	-0.093	vis	1	Pickering (1904)
2413918.031	-5374	-0.124	vis	0.5	Belyavsky (1904)
2413950.090	-5368	-0.263	vis	0.5	Nijland (1923)
2414111.171	-5338	-0.170	vis	1	Plassmann (1900)
2414170.120	-5327	-0.250	vis	1	Stratonov (1904)
2414513.534	-5263	-0.277	vis	1	Plassmann (1900)
2414551.158	-5256	-0.217	vis	1	Stebbins (1908)
2414556.556	-5255	-0.185	vis	1	Luizet (1912)
2414615.484	-5244	-0.286	vis	0.5	Zinner[11] (1932)
2414782.125	-5213	+0.001	vis	0.5	Belyavsky (1904)
2414873.181	-5196	-0.170	vis	1	Luizet (1912)
2414878.531	-5195	-0.186	vis	1	Plassmann (1900)
2414926.748	-5186	-0.266	pg	1	Wirtz (1901)
2415243.464	-5127	-0.160	vis	1	Luizet (1912)
2415307.747	-5115	-0.272	vis	1	Plassmann (1901)
2415560.003	-5068	-0.231	vis	0.5	Belyavsky (1904)

Table 6 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2415608.375	-5059	-0^{d}.155	vis	1	Plassmann (1906)
2415640.568	-5053	-0.160	vis	1	Luizet (1912)
2415930.377	-4999	-0.129	vis	1	Plassmann (1906)
2415989.364	-4988	-0.171	vis	1	Bilt (1924b)
2415994.773	-4987	-0.129	vis	1	Luizet (1912)
2416032.294	-4980	-0.171	vis	0.5	Roy et al. (1905)
2416085.679	-4970	-0.449	vis	0.5	Lau (1903)
2416305.935	-4929	-0.210	vis	1	Plassmann (1906)
2416370.401	-4917	-0.139	vis	1	Luizet (1912)
2416622.474	-4870	-0.281	vis	0.5	Götz (1906)
2416676.288	-4860	-0.130	vis	1	Plassmann (1906)
2416692.311	-4857	-0.206	vis	0.5	Terkán (1905)
2416703.028	-4855	-0.221	vis	1	Bilt (1924b)
2416762.133	-4844	-0.145	vis	1	Luizet (1912)
2416799.644	-4837	-0.198	vis	0.5	Nijland (1923)
2416858.625	-4826	-0.246	vis	1	Tass[12] (1925)
2416912.417	-4816	-0.117	vis	0.5	Schiller (1906)
2416998.171	-4800	-0.223	vis	0.5	Zinner[11] (1932)
2417035.634	-4793	-0.324	vis	1	Plassmann (1906)
2417073.335	-4786	-0.187	pg	1	Meyermann (1907)
2417111.036	-4779	-0.050	vis	1	Luizet (1912)
2417169.937	-4768	-0.178	vis	1	Bilt (1924b)
2417196.860	-4763	-0.086	vis	0.5	Furness[13] (1913)
2417255.729	-4752	-0.246	vis	0.5	Lohnert (1909)
2417336.251	-4737	-0.218	vis	1	Nijland (1923)
2417390.011	-4727	-0.121	vis	1	Plassmann (1906, 1908)
2417481.212	-4710	-0.146	vis	1	Luizet (1912)
2417701.232	-4669	-0.143	pg	1	Jordan (1919)
2417744.061	-4661	-0.245	vis	1	Bilt (1924b)
2417776.361	-4655	-0.142	vis	0.5	Zinner[11] (1932)
2417792.470	-4652	-0.132	vis	1	Plassmann (1908)
2417846.134	-4642	-0.131	vis	1	Luizet (1912)
2418125.055	-4590	-0.256	vis	0.5	Scheller (1912)
2418216.390	-4573	-0.147	vis	1	Luizet (1912)
2418291.535	-4559	-0.130	vis	0.5	Favaro (1909)
2418517.109	-4517	+0.061	vis	0.5	Mündler (1911)
2418586.700	-4504	-0.110	vis	1	Luizet (1912)
2418629.620	-4496	-0.120	vis	1	Bemporad (1910)
2418661.769	-4490	-0.169	vis	0.5	Scheller(1912),Kaiser(1915)
2418661.882	-4490	-0.056	vis	0.5	Olivier (1952)
2418956.993	-4435	-0.090	vis	1	Luizet (1912)
2418983.728	-4430	-0.186	vis	0.5	Padova (1911, 1912)
2419075.037	-4413	-0.103	vis	1	Bemporad (1916)
2419230.769	-4384	+0.007	vis	0.5	Hornig (1915)
2419294.847	-4372	-0.311	vis	0.5	Lau (1913)
2419380.800	-4356	-0.218	vis	0.5	Zinner[11] (1932)
2419685.646	-4299	-1.249	vis	0	Breson (1913)
2419858.581	-4267	-0.035	vis	0.5	Olivier (1952)
2420320.098	-4181	-0.017	vis	0.5	Lazzarino (1915)
2420346.859	-4176	-0.087	vis	1	Bemporad (1915)
2420379.047	-4170	-0.097	vis	0.5	Zinner[11] (1932)
2420722.611	-4106	+0.026	vis	0.5	Olivier (1952)
2420910.17	-4071	-0.23	vis	0.5	Vogelenzang (1921)
2420980.007	-4058	-0.159	vis	0.5	Luyten (1922)
2421001.382	-4054	-0.249	pg	0.5	Robinson (1933)

Table 6 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2421237.822	-4010	+0.075 (d)	vis	0.5	Paci (1918)
2421430.903	-3974	-0.030	vis	0.5	Zinner[11] (1932)
2421457.714	-3969	-0.050	vis	0.5	Luyten (1922)
2421559.551	-3950	-0.173	pe	3	Guthnick (1919)
2421940.673	-3879	-0.056	vis	0.5	Luyten (1922)
2422241.065	-3823	-0.175	pe	3	Guthnick (1923)
2422278.640	-3816	-0.164	vis	0.5	Olivier (1952)
2422852.978	-3709	-0.017	vis	0.5	Zinner[11] (1932)
2422895.866	-3701	-0.059	vis	1	Nielsen (1926)
2423223.218	-3640	-0.049	vis	1	Zverev (1936)
2423335.809	-3619	-0.150	vis	1	Nielsen (1926)
2423620.263	-3566	-0.108	vis	0.5	Parenago (1938a)
2423646.971	-3561	-0.232	pg	1	Henroteau (1924)
2423679.314	-3555	-0.086	vis	0.5	Hopmann (1926)
2423829.432	-3527	-0.224	pe	2	Danjon (1927)
2423904.733	-3513	-0.050	pe	1	Pettit et al. (1933)
2424291.029	-3441	-0.126	pe	2	Danjon (1928)
2424741.882	-3357	-0.040	vis	0.5	Parenago (1938a)
2424774.021	-3351	-0.098	vis	0.5	Kukarkin (1940)
2425235.510	-3265	-0.108	vis	1	Collmann (1930)
2425401.937	-3234	-0.036	vis	1	McLaughlin (1934a)
2425418.030	-3231	-0.042	vis	0.5	Kukarkin (1940)
2425707.813	-3177	-0.037	vis	1	Parenago (1938a)
2425798.842	-3160	-0.235	vis	0.5	Fesenkov (1930)
2425852.704	-3150	-0.036	vis	1	Zverev (1936)
2425965.467	-3129	+0.036	vis	1	McLaughlin (1934a)
2426297.842	-3067	-0.298	pg	0.5	Farnsworth (1933)
2426362.410	-3055	-0.125	vis	0.5	Kukarkin (1940)
2426421.584	-3044	+0.020	vis	0.5	Parenago (1938a)
2426464.461	-3036	-0.033	vis	1	McLaughlin (1934a)
2426507.295	-3028	-0.129	vis	1	Lipinski (1934)
2426888.424	-2957	-0.006	vis	1	Florya et al. (1953)
2426920.616	-2951	-0.011	vis	1	McLaughlin (1934a)
2427221.046	-2895	-0.092	pg	2	Wesselink (1946)
2427301.584	-2880	-0.048	vis	1	Florya et al. (1953)
2427371.242	-2867	-0.152	pe	2	Smart (1935)
2427687.939	-2808	-0.065	vis	1	Florya (1938)
2427843.563	-2779	-0.063	pg	2	Wesselink (1946)
2428031.438	-2744	-0.007	vis	0.5	Parenago (1938a)
2428079.73	-2735	-0.01	vis	0.5	Sures (1937)
2428412.368	-2673	-0.082	pg	2	Wesselink (1946)
2430226.213	-2335	-0.037	pg	1	Wesselink (1946)
2430553.527	-2274	-0.065	pe	3	Stebbins (1945)
2430950.696	-2200	0.000	pe	1	Canavaggia (1949)
2432453.239	-1920	-0.013	vis	1	Petrov (1949)
2432823.4	-1851	-0.1	vis	0.5	Pohl (1951)
2433134.784	-1793	+0.016	pe	3	Eggen (1951)
2433215.36	-1778	+0.10	vis	0.5	Pohl[14] (1951)
2433403.20	-1743	+0.12	vis	0.5	Domke and Pohl[14] (1952)
2433430.00	-1738	+0.09	vis	0.5	Domke and Pohl[15] (1952)
2434476.81	-1543	+0.48	vis	0	Pohl[16] (1955)
2435045.25	-1437	+0.09	vis	0.5	Rudolph[17] (1959)
2435694.56	-1316	+0.08	vis	0.5	Rudolph[18] (1959)
2435715.894	-1312	-0.050	pe	3	Sentsova (1957)
2435978.72	-1263	-0.17	vis	0.5	Rudolph (1959)

Table 6 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2436005.75	-1258	+0ᵈ.03	vis	0.5	Rudolph[18] (1959)
2436139.92	-1233	+0.04	vis	0.5	Rudolph (1959)
2436172.119	-1227	+0.042	pe	2	Oke (1961b)
2436816.2	-1107	+0.2	vis	0.5	Braune et al.[17] (1962)
2436837.497	-1103	+0.003	pe	3	Bahner et al. (1962)
2437025.361	-1068	+0.047	vis	0.5	Azarnova (1962)
2437239.956	-1028	-0.008	pe	3	Mitchell et al. (1964)
2437379.58	-1002	+0.09	vis	0.5	Braune et al.[18] (1967)
2437391.06	-1000	+0.84	vis	0	Braune et al.[19] (1967)
2437937.634	-898	+0.054	pe	1	Williams (1966)
2438055.806	-876	+0.169	vis	0.5	Mayall[20] (1972)
2438232.804	-843	+0.080	vis	0.5	Mayall[21] (1972)
2438930.327	-713	-0.012	pe	3	Wisniewski et al. (1968)
2438968.05	-706	+0.15	vis	0.5	Braune et al. (1967)
2439805.040	-550	-0.002	pe	3	present paper[22]
2440111.0	-493	+0.1	vis	0.5	Braune et al.[23] (1970)
2440470.60	-426	+0.14	vis	0.5	Busch (1977b)
2440475.80	-425	-0.02	vis	0.5	Braune et al.[23] (1972)
2440878.298	-350	+0.003	pe	2	Evans (1976)
2440894.35	-347	-0.04	vis	0.5	Braune et al.[23] (1972)
2441173.31	-295	-0.13	vis	0.5	Braune et al.[24] (1972)
2442058.989	-130	+0.114	vis	0.5	Mosch et al. (1976)
2442686.781	-13	+0.053	vis	0.5	Mosch et al. (1976)
2442756.458	0	-0.032	pe	3	present paper
2443035.679	+52	+0.143	vis	0.5	Busch[25] (1977a)
2443041.003	+53	+0.101	vis	0.5	Busch[26] (1977a)
2443062.286	+57	-0.081	vis	0.5	Busch[27] (1977a)

Remarks: (observers) [1] Pigott; [2] Rittenhouse; [3] Gauss; [4] Schwerd; [5] Heis; [6] Winnecke; [7] Schönfeld; [8] Glasenapp; [9] Knopf; [10] Pannekoek; [11] Hartwig; [12] Terkán; [13] Whitney; [14] Sofronijevitsch; [15] Born; [16] Münster; [17] Pohl; [18] Masuch; [19] Fernandes; [20] Ross; [21] Baldwin; [22] Abaffy; [23] Eckert; [24] Bauer; [25] Bransk; [26] Reichenbächer; [27] Enskonatus.

Table 7 O-C residuals for δ Cep

(median brightness)

Obs.Med.J.D.	E	O-C	Type	w	Reference
2414550.530	-5256	-0ᵈ.205	vis	1	Stebbins (1908)
2414926.104	-5186	-0.270	pg	1	Wirtz (1901)
2417335.618	-4737	-0.211	vis	1	Nijland (1923)
2421558.955	-3950	-0.129	pe	3	Guthnick (1919)
2422240.480	-3823	-0.120	pe	3	Guthnick (1923)
2424290.439	-3441	-0.076	pe	2	Danjon (1928)
2427220.466	-2895	-0.032	pg	2	Wesselink (1946)
2427370.620	-2867	-0.134	pe	2	Smart (1935)
2427842.962	-2779	-0.024	pg	2	Wesselink (1946)
2428411.735	-2673	-0.075	pg	2	Wesselink (1946)
2430552.916	-2274	-0.036	pe	3	Stebbins (1945)
2436171.529	-1227	+0.092	pe	2	Oke (1961b)
2437239.339	-1028	+0.017	pe	3	Mitchell et al. (1964)
2438929.715	-713	+0.016	pe	3	Wisniewski et al. (1968)
2442755.798	0	-0.052	pe	3	present paper

CV Monocerotis

This faint Cepheid has five very faint companions. Earlier CV Mon was thought to be a cluster member (*Arp* 1960). Under the influence of these surrounding stars the V and B-V amplitudes derived from the present photometry (see Fig. 8) are smaller than those given by *Schaltenbrand* and *Tammann* (1971). CV Mon has a physical companion with a spectral type of B7 (*Madore* 1977). It cannot be excluded that this B7 companion is the closest star among the visible companions but none of the photometries have so far been able to separate its photometric influence.

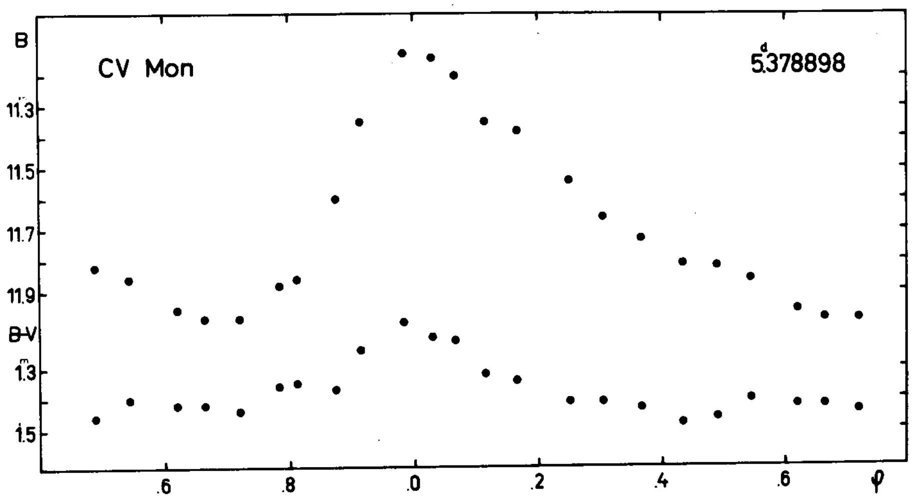

Figure 8 B and B-V curves of CV Mon

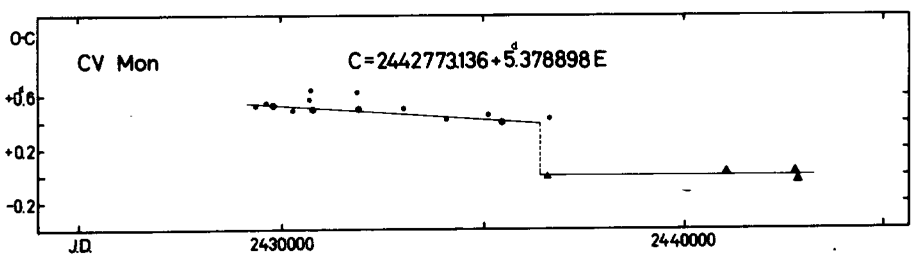

Figure 9 O-C diagram of CV Mon

The O-C residuals given in Table 8 were computed using the formula:

$$C = 2442773.136 + 5\overset{d}{.}378898 \times E$$

The O-C diagram in Fig 9. can be approximated by two almost parallel straight lines representing the phenomenon of the rejumping period (or stepwise O-C diagram). For CV Mon the jump and the subsequent rejump in the period occurred so suddenly that the intermediate period cannot be determined. The values of the period are:

before J.D. 2436000 $P = 5^{d}.378782$,

after J.D. 2436000 $P = 5^{d}.378898$.

Table 8 O-C residuals for CV Mon

Obs.Max.J.D.	E	O-C	Type	w	Reference
2429364.063	-2493	$+0^{d}.520$	pg	0.5	Wachmann (1964b)
2429638.41	-2442	+0.54	pg	0.5	Ahnert (1947)
2429805.142	-2411	+0.529	pg	1	Teplitskaya (1951)
2430289.20	-2321	+0.49	pg	0.5	Ahnert (1947)
2430698.081	-2245	+0.571	pg	0.5	Wachmann (1964b)
2430735.80	-2238	+0.64	pg	0.5	Ahnert (1947)
2430778.688	-2230	+0.495	pg	1	Teplitskaya (1951)
2431876.114	-2026	+0.625	pg	0.5	Wachmann (1964b)
2431908.261	-2020	+0.499	pg	1	Filatov (1961)
2433005.559	-1816	+0.502	pg	0.5	Wachmann (1964b)
2434086.634	-1615	+0.418	pg	0.5	Wachmann (1964b)
2435119.417	-1423	+0.453	pg	0.5	Wachmann (1964b)
2435447.480	-1362	+0.403	pg	1	Filatov (1961)
2436571.256	-1153	-0.011	pe	2	Arp (1960)
2436630.860	-1142	+0.426	pg	0.5	Wachmann (1964b)
2441035.777	-323	+0.025	pe	3	Pel (1976)
2442773.160	0	+0.024	pe	3	present paper
2442837.641	+12	-0.042	pe	3	Turner (1978)

SW Cassiopeiae

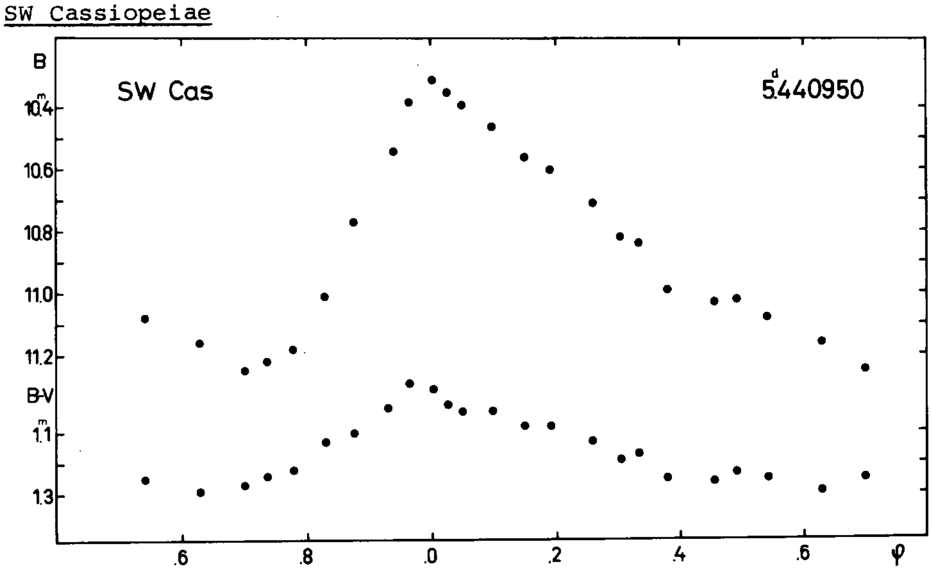

Figure 10 B and B-V curves of SW Cas

The light and colour curves of this variable are plotted in Fig. 10. The O-C diagrams are constructed for both maximum and median brightnesses (Tables 9 and 10, Fig. 11). The O-C residuals have been calculated using the formulae:

$$C_{max} = 2442989.590 + 5\overset{d}{.}440950 \times E \quad ,$$

$$C_{med} = 2442988.808 + 5\overset{d}{.}440950 \times E \quad .$$

The period has remained constant since the discovery of the light variation of SW Cas. The lines fitted to these two O-C diagrams are parallel to each other.

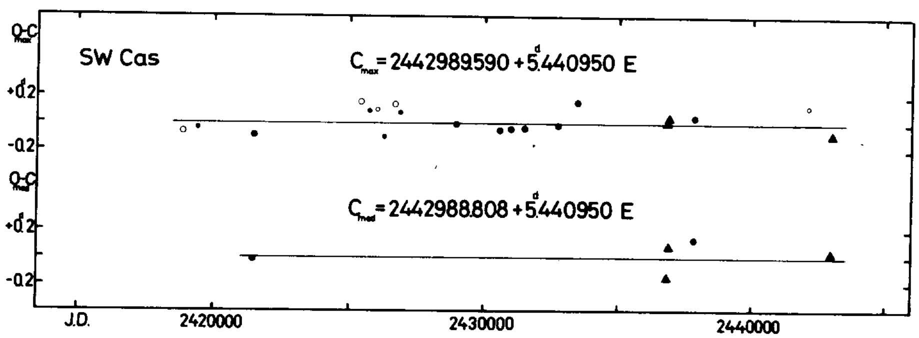

Figure 11 O-C diagram of SW Cas

Table 9 O-C residuals for SW Cas
(maximum brightness)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2418869.792	-4433	$-0\overset{d}{.}067$	vis	1	Enebo (1911)
2419403.033	-4335	-0.039	pg	0.5	Robinson (1933)
2421459.659	-3957	-0.092	pg	2	Jordan (1929)
2425415.478	-3230	+0.157	vis	1	Beyer (1930)
2425747.31	-3169	+0.09	pg	0.5	Kiehl, Hopp (1977)
2426041.129	-3115	+0.098	vis	0.5	Parenago (1938a)
2426269.45	-3073	-0.10	pg	0.5	Kiehl, Hopp (1977)
2426694.076	-2995	+0.131	vis	1	Kukarkin (1940)
2426873.58	-2962	+0.08	pg	0.5	Kiehl, Hopp (1977)
2428962.816	-2578	-0.005	pg	1	Tolmár (1940b)
2430578.733	-2281	-0.050	pg	1	Solov'yov (1954)
2430992.253	-2205	-0.042	pg	1	Solov'yov (1954)
2431498.269	-2112	-0.035	pg	1	Solov'yov (1954)
2432733.383	-1885	-0.016	pg	1	Solov'yov (1954)
2433457.203	-1752	+0.157	pg	1	Solov'yov (1954)
2436803.232	-1137	+0.002	pe	3	Weaver et al. (1960)
2436808.673	-1136	+0.002	pe	3	Oosterhoff (1960)
2436874.002	-1124	+0.040	pe	3	Bahner et al. (1962)
2437837.054	-947	+0.044	pg	2	Golovatyj (1964)
2442086.52	-166	+0.13	vis	0.5	Small (1974)
2442989.509	0	-0.081	pe	3	present paper

Table 10 O-C residuals for SW Cas (median brightness)

Obs.Med.J.D.	E	O-C	Type	w	Reference
2421458.952	-3957	$-0^{d}.017$	pg	2	Jordan (1929)
2436807.737	-1136	-0.152	pe	3	Oosterhoff (1960)
2436873.257	-1124	+0.077	pe	3	Bahner et al. (1962)
2437836.358	-947	+0.130	pg	2	Golovatyj (1964)
2442988.840	0	+0.032	pe	3	present paper

X Lacertae

This star is a small amplitude Cepheid (type Is) but the light curve is not symmetrical (see Fig. 12). The O-C residuals

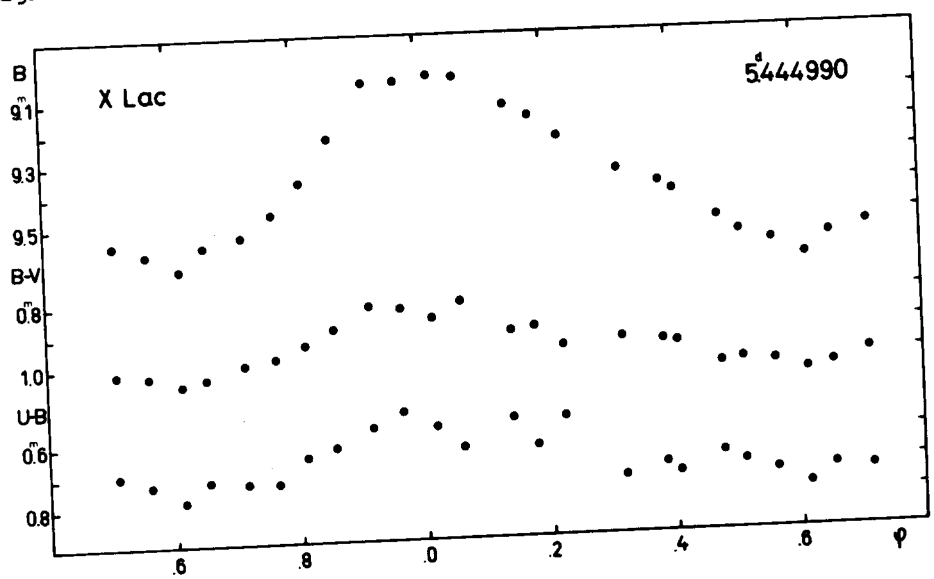

Figure 12 B, B-V and U-B curves of X Lac

have been derived using the formulae:

$$C_{max} = 2442738.132 + 5^{d}.444990 \times E \quad ,$$
$$C_{med} = 2442737.243 + 5^{d}.444990 \times E \quad .$$

The O-C diagram in Fig. 13 shows one change in the period:

before J.D. 2429500 $\qquad P = 5^{d}.444212$

after J.D. 2429500 $\qquad P = 5^{d}.444990$.

Grigorevski and *Motrich* (1973) tried to approximate the O-C diagram of X Lac by a parabolic curve too, but one can see in Fig. 13 that the proper approximation is that using two straight lines.

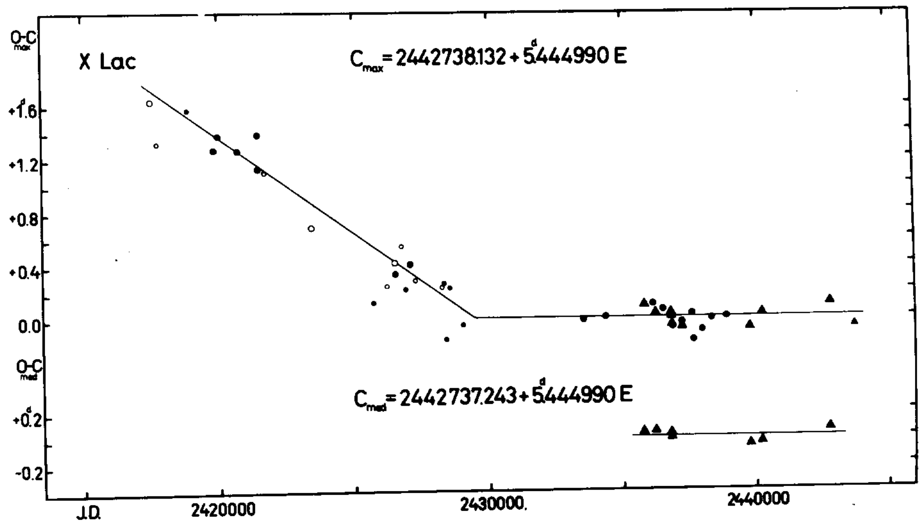

Figure 13 O-C diagram of X Lac

Table 11 O-C residuals for X Lac

(maximum brightness)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2417551.255	-4626	+1^{d}.647	vis	1	Seares (1906, 1907b)
2417768.734	-4586	+1.326	vis	0.5	Zeipel (1908)
2418890.652	-4380	+1.576	pg	0.5	Robinson (1933)
2419870.451	-4200	+1.277	pg	1	Martin, Plummer (1916)
2420012.124	-4174	+1.380	pg	1	Hertzsprung (1922)
2420741.644	-4040	+1.272	pg	1	Martin, Plummer (1916)
2421460.502	-3908	+1.391	pg	1	Hertzsprung (1922)
2421487.466	-3903	+1.130	pg	1	Jordan (1929)
2421737.914	-3857	+1.108	vis	0.5	Doberck (1920b)
2423458.111	-3541	+0.689	vis	1	Doberck (1924c)
2425744.43	-3121	+0.12	pg	0.5	Kiehl, Hopp (1977)
2425837.931	-3104	+1.048	vis	0	Parenago (1938a)
2426234.610	-3031	+0.243	vis	0.5	Terkán (1935)
2426539.709	-2975	+0.422	vis	1	Kukarkin (1940)
2426550.512	-2973	+0.335	pg	1	Zonn (1933)
2426757.627	-2935	+0.541	vis	0.5	Dziewulski et al. (1946)
2426801.263	-2927	+0.617	vis	0	Dziewulski et al. (1946)
2426931.54	-2903	+0.22	pg	0.5	Kiehl, Hopp (1977)
2427105.971	-2871	+0.405	pg	1	Zonn (1933)
2427296.426	-2836	+0.286	vis	0.5	Florya et al. (1953)
2428287.364	-2654	+0.235	vis	0.5	Dziewulski et al. (1946)
2428347.281	-2643	+0.258	pg	0.5	Dziewulski et al. (1946)
2428423.09	-2629	-0.16	pg	0.5	Fu De-Lian (1964)
2428565.052	-2603	+0.229	pg	0.5	Dziewulski et al. (1946)
2429049.37	-2514	-0.05	pg	0.5	Katz (1946)
2433536.080	-1690	-0.019	pg	1	Solov'yov (1952)
2434358.290	-1539	-0.002	pg	1	Romano (1955)
2435757.739	-1282	+0.084	pe	3	Bahner et al. (1971)
2436122.564	-1215	+0.095	pg	1	Makarenko (1969)

Table 11 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2436193.284	-1202	$+0^{d}.030$	pe	3	Bahner et al. (1971)
2436487.341	-1148	+0.058	pg	1	Makarenko (1969)
2436786.788	-1093	+0.030	pe	3	Weaver et al. (1960)
2436797.646	-1091	-0.002	pe	3	Oosterhoff (1960)
2436835.700	-1084	-0.063	pe	3	Bahner et al. (1962)
2436841.134	-1083	-0.074	pg	1	Makarenko (1969)
2437200.536	-1017	-0.041	pg	1	Makarenko (1969)
2437216.833	-1014	-0.079	pe	3	Mitchell et al. (1964)
2437576.301	-948	+0.020	pg	1	Makarenko (1969)
2437635.999	-937	-0.177	pg	1	Golovatyj (1964)
2437946.440	-880	-0.101	pg	1	Makarenko (1969)
2438305.897	-814	-0.013	pg	1	Makarenko (1969)
2438866.747	-711	+0.003	pg	1	Makarenko (1969)
2439743.308	-550	-0.080	pe	3	present paper[1]
2440195.346	-467	+0.024	pe	3	Asteriadis et al. (1977)
2442738.227	0	+0.095	pe	3	present paper
2443696.374	+176	-0.076	pe	2	Henden (1979)

Remark: [1] Observer: Abaffy

Table 12 O-C residuals for X Lac

(median brightness)

Obs.Med.J.D.	E	O-C	Type	w	Reference
2435756.797	-1282	$+0^{d}.031$	pe	3	Bahner et al. (1971)
2436192.407	-1202	+0.042	pe	3	Bahner et al. (1971)
2436785.895	-1093	+0.026	pe	3	Weaver et al. (1960)
2436796.752	-1091	-0.007	pe	3	Oosterhoff (1960)
2439742.437	-550	-0.062	pe	3	present paper[1]
2440194.383	-467	-0.050	pe	3	Asteriadis et al. (1977)
2442737.296	0	+0.053	pe	3	present paper

Remark: [1] Observer: Abaffy

RZ Geminorum

There is a very faint southern companion within the edge of the diaphragm. In spite of this the V and B amplitudes are larger than reported by *Schaltenbrand* and *Tammann* (1971). *Madore* (1977) pointed out that RZ Gem has a B5 photometric companion.

The O-C residuals have been computed with the formula:

$$C = 2442714.970 + 5^{d}.529286 \times E \quad .$$

The O-C diagram can be approximated either by two straight lines (sudden period change), or by a parabolic line (continuous period change). In the former case the values of the period are:

before J.D. 2432400 $\quad P = 5^{d}.529716$,

after J.D. 2432400 $\quad P = 5^{d}.529286$.

If a continuous period change is assumed, the equation of the approximate parabola is as follows:

$$C_{par} = 2442714.920 + 5.529143 \times E - 8.85 \times 10^{-8} \times E^2$$

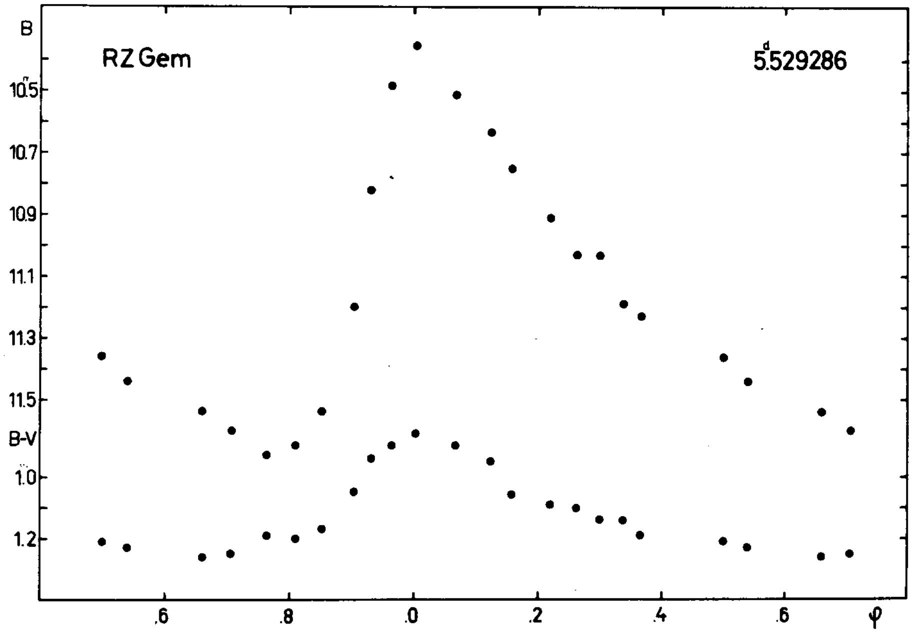

Figure 14 B and B-V curves of RZ Gem

Table 13 O-C residuals for RZ Gem

Obs.Max.J.D.	E	O-C	Type	w	Reference
2415028.54	-5007	$-1^d.29$	pg	0.5	Oosterhoff (1935)
2415791.59	-4869	-1.29	pg	0.5	Oosterhoff (1935)
2416034.80	-4825	-1.36	pg	0.5	Oosterhoff (1935)
2416460.74	-4748	-1.18	pg	0.5	Oosterhoff (1935)
2417339.82	-4589	-1.26	pg	0.5	Oosterhoff (1935)
2418291.142	-4417	-0.972	vis	0.5	Luizet (1909)
2418324.181	-4411	-1.108	vis	1	Enebo (1909)
2418351.55	-4406	-1.39	pg	0.5	Oosterhoff (1935)
2418832.935	-4319	-1.049	vis	1	Enebo (1911)
2419811.52	-4142	-1.15	pg	0.5	Oosterhoff (1935)
2420409.203	-4034	-0.627	pg	0	Robinson (1933)
2420458.75	-4025	-0.84	pg	0.5	Oosterhoff (1935)
2421277.055	-3877	-0.873	pg	1	Jordan (1929)
2421514.86	-3834	-0.83	pg	0.5	Oosterhoff (1935)
2422239.82	-3703	-0.20	pg	0	Oosterhoff (1935)
2424124.71	-3362	-0.80	pg	0.5	Oosterhoff (1935)
2424854.73	-3230	-0.65	pg	0.5	Oosterhoff (1935)
2425153.88	-3176	-0.08	pg	0	Oosterhoff (1935)
2425844.85	-3051	-0.27	pg	0.5	Oosterhoff (1935)
2426375.422	-2955	-0.508	vis	1	Kukarkin (1940)
2426712.86	-2894	-0.36	pg	0.5	Oosterhoff (1935)
2428189.08	-2627	-0.46	pg	0.5	Fu De-Lian (1964)
2428869.451	-2504	-0.187	pg	1	Koshkina (1963)

Table 13 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2429383.624	-2411	$-0^{d}.237$	pg	1	Koshkina (1963)
2429632.453	-2366	-0.226	pg	1	Chudovicheva (1952)
2431556.759	-2018	-0.112	pg	1	Chudovicheva (1952)
2432557.503	-1837	-0.169	pg	1	Chudovicheva (1952)
2433530.659	-1661	-0.167	pg	0.5	Chudovicheva (1952)
2433801.844	-1612	+0.083	pg	1	Koshkina (1963)
2434304.930	-1521	+0.004	pg	1	Koshkina (1963)
2434327.082	-1517	+0.039	pg	1	Rosino, Nobili (1955)
2436831.810	-1064	0.000	pe	3	Weaver et al. (1960)
2437401.48	-961	+0.15	pg	0.5	Ahnert (1962)
2437633.563	-919	+0.007	pe	3	Mitchell et al. (1964)
2439248.161	-627	+0.053	pe	3	Takase (1969)
2442714.927	0	-0.043	pe	3	present paper

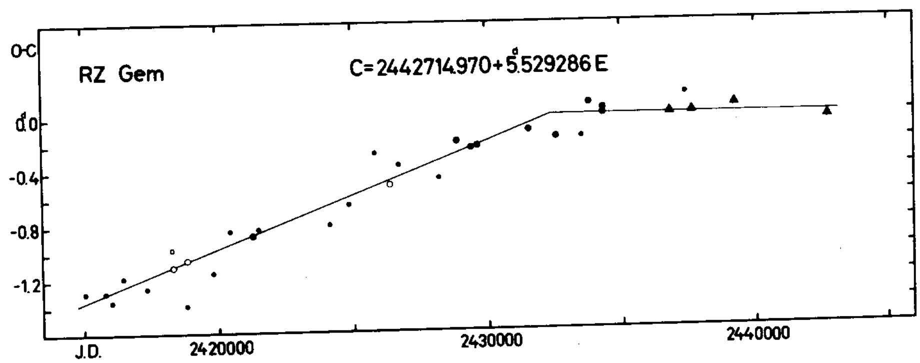

Figure 15 O-C diagram of RZ Gem

V 924 Cygni

Unfortunately, there are very few earlier observational data on this small amplitude Cepheid. The O-C residuals have been

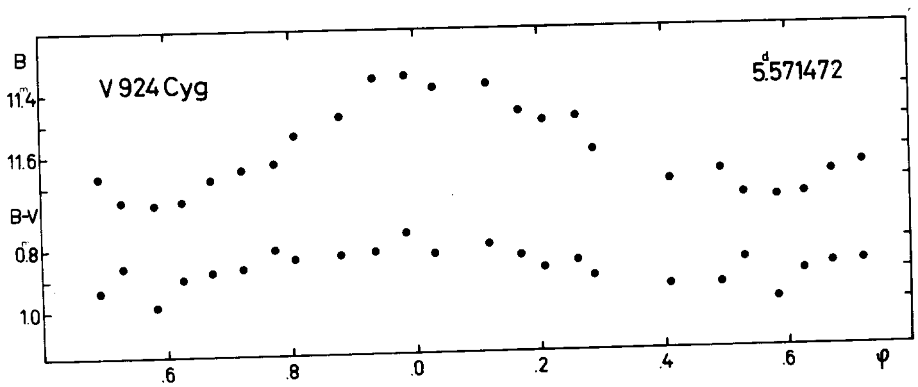

Figure 16 B and B-V curves of V 924 Cyg

calculated with the formula:

$$C = 2443066.075 + 5\overset{d}{.}571472 \times E \quad .$$

The present period seems to be reliable since it is based on three photoelectric observational series but we cannot say anything certain about the behaviour of the period before J.D. 2438000. The systematically larger O-C values before this date may be caused by the earlier points in the O-C diagram (with a weight of 0.5) not being derived on the basis of published observations but rather from the published normal maxima.

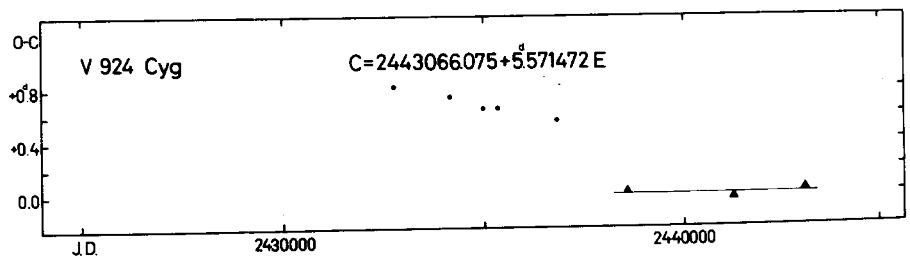

Figure 17 O-C diagram of V 924 Cyg

Table 14 O-C residuals for V 924 Cyg

Obs.Max.J.D.	E	O-C	Type	w	Reference
2432765.24	-1849	$+0\overset{d}{.}82$	pg	0.5	Miller, Wachmann (1961)
2434152.46	-1600	+0.74	pg	0.5	Wachmann (1976)
2434988.09	-1450	+0.65	pg	0.5	Wachmann (1976)
2435344.66	-1386	+0.65	pg	0.5	Wachmann (1976)
2436809.87	-1123	+0.56	pg	0.5	Wachmann (1976)
2438558.778	-809	+0.024	pe	2	Eggen (1969)
2441260.881	-324	-0.037	pe	3	Wachmann (1976)
2443066.098	0	+0.023	pe	3	present paper

FM Cassiopeiae

The light and colour curves of this Cepheid can be seen in Fig. 18. The number of reliable observational series is very small so I was obliged to take into account the O-C residuals with a weight of 0.5 (except the visual observations) when determining the value of the period. Finally, the O-C residuals have been computed with the formula:

$$C = 2442817.713 + 5\overset{d}{.}809284 \times E \quad .$$

The period has remained constant since the discovery of the light variation of FM Cas.

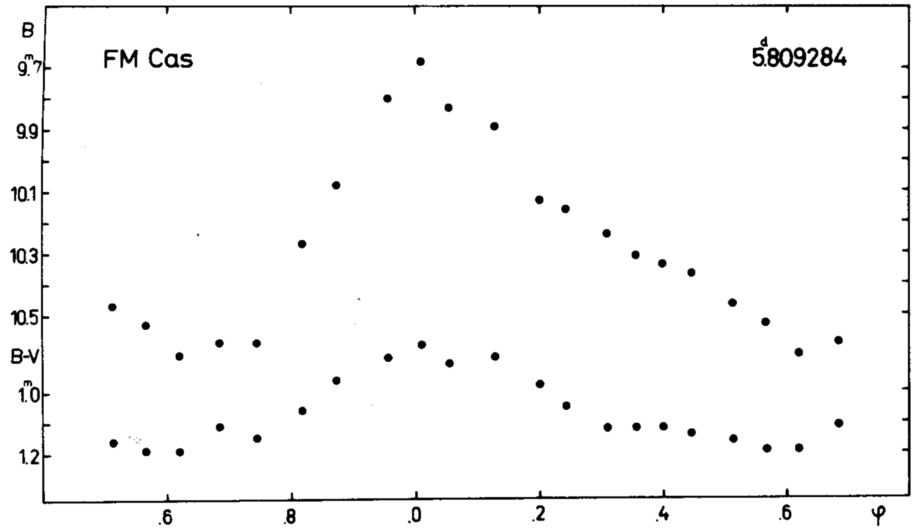

Figure 18 B and B-V curves of FM Cas

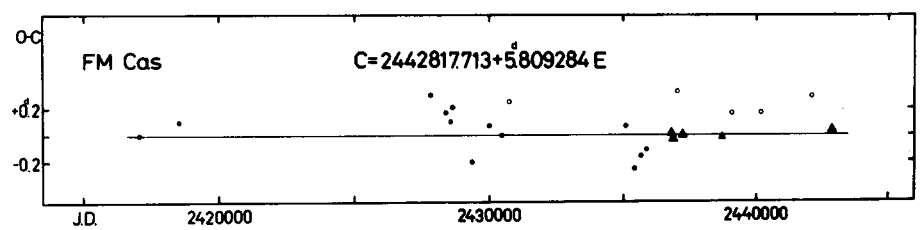

Figure 19 O-C diagram of FM Cas

Table 15 O-C residuals for FM Cas

Obs.Max.J.D.	E	O-C	Type	w	Reference
2415037.0	-4782	$-0^{d}.7$	pg	0	Chernova (1946)
2417065.2	-4433	0.0	pg	0.5	Chernova (1946)
2418529.2	-4181	+0.1	pg	0.5	Chernova (1946)
2426933.83	-2734	-1.30	pg	0	Kiehl, Hopp (1977)
2427812.6	-2583	+0.3	pg	0.5	Chernova (1946)
2427962.90	-2557	-0.47	pg	0	Ahnert et al. (1943)
2428393.43	-2483	+0.17	pg	0.5	Ahnert et al. (1943)
2428556.0	-2455	+0.1	pg	0.5	Chernova (1946)
2428649.08	-2439	+0.21	pg	0.5	Ahnert et al. (1943)
2429084.20	-2364	-0.37	pg	0	Ahnert et al. (1943)
2429351.59	-2318	-0.20	pg	0.5	Ahnert et al. (1943)
2429555.55	-2283	+0.43	pg	0	Ahnert et al. (1943)
2430002.50	-2206	+0.07	pg	0.5	Ahnert et al. (1943)
2430467.2	-2126	0.0	pg	0.5	Chernova[1] (1946)
2430746.273	-2078	+0.252	vis	0.5	Model, Löchel (1964)
2435108.856	-1327	+0.063	pg	0.5	Romano (1959)
2435428.047	-1272	-0.257	pg	0.5	Romano (1959)
2435654.711	-1233	-0.155	pg	0.5	Romano (1959)

Table 15 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2435875.51	-1195	-0.11	pg	0.5	Zonn, Semeniuk (1959)
2436805.114	-1035	+0.010	pe	3	Oosterhoff (1960)
2436863.167	-1025	-0.030	pe	3	Bahner et al. (1962)
2437020.373	-998	+0.325	vis	0.5	Emmrich (1973)
2437217.562	-964	-0.001	pe	3	Mitchell et al. (1964)
2438698.948	-709	-0.017	pe	1	Haug (1970)
2439076.702	-644	+0.168	vis	0.5	Emmrich (1973)
2440151.420	-459	+0.168	vis	0.5	Emmrich (1973)
2442068.60	-129	+0.29	vis	0.5	Small (1974)
2442817.752	0	+0.039	pe	3	present paper

Remark: [1] Observer: Solov'yov

MW Cygni

The light and colour curves of MW Cyg are plotted in Fig. 20. Its period (somewhat less than six days) is the shortest value when the hump appears on the descending branch of the light curve.

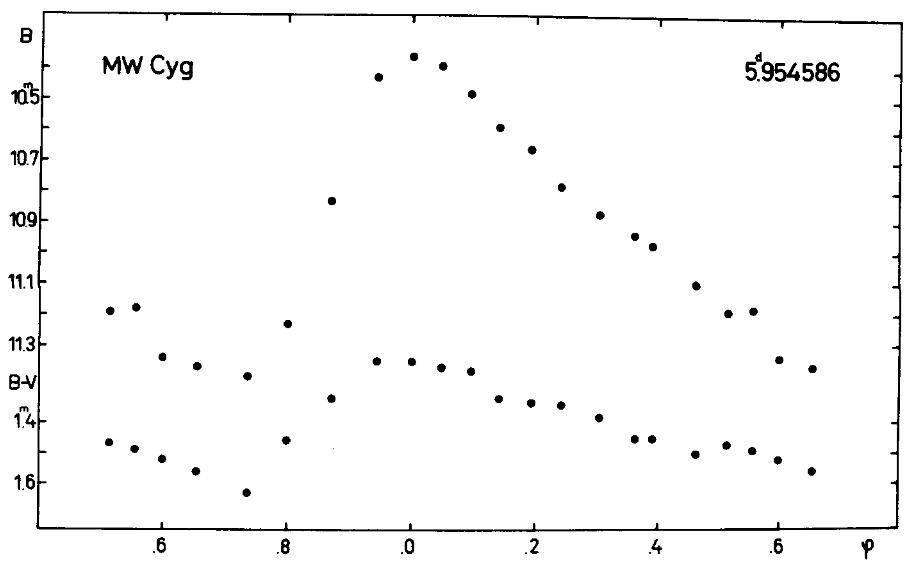

Figure 20 B and B-V curves of MW Cyg

When determining the correct value of the period all normal maxima listed in Table 16 were considered except the visual ones. Finally the O-C residuals have been calculated with the formula:

$$C = 2442923.839 + 5^{d}.954586 \times E$$

There is no sign of period change in the O-C diagram (see Fig. 21), although *Tsarevsky* (1967) included this Cepheid among the Cepheids with changing period.

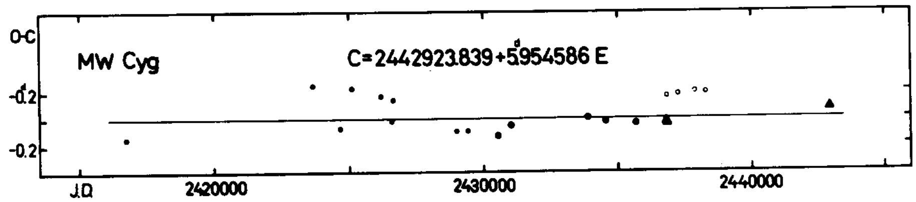

Figure 21 O-C diagram of MW Cyg

Table 16 O-C residuals for MW Cyg

Obs.Max.J.D.	E	O-C	Type	w	Reference
2416729.471	-4399	$-0^{d}.144$	pg	0.5	Parenago (1940)
2423661.00	-3235	+0.25	pg	0.5	Oosterhoff (1935)
2424678.92	-3064	-0.07	pg	0.5	Oosterhoff (1935)
2425113.90	-2991	+0.23	pg	0.5	Oosterhoff (1935)
2425816.69	-2873	+0.38	pg	0	Oosterhoff (1935)
2426179.71	-2812	+0.17	pg	0.5	Oosterhoff (1935)
2426572.53	-2746	-0.02	pg	0.5	Solov'yov[1] (1946a)
2426644.14	-2734	+0.14	pg	0.5	Oosterhoff (1935)
2427043.52	-2667	+0.56	pg	0	Oosterhoff (1935)
2429001.926	-2338	-0.091	pg	0.5	Parenago (1940)
2429418.75	-2268	-0.09	pg	0.5	Starikova et al. (1946)
2430532.222	-2081	-0.124	pg	1	Solov'yov (1946a)
2431038.435	-1996	-0.050	pg	1	Solov'yov (1946a)
2433884.781	-1518	+0.004	pg	1	Shteiman (1958)
2434539.757	-1408	-0.025	pg	1	Shteiman (1958)
2435677.074	-1217	-0.034	pg	1	Shteiman (1958)
2436802.499	-1028	-0.026	pe	3	Oosterhoff (1960)
2436820.339	-1025	-0.049	pe	3	Weaver et al. (1960)
2436844.37	-1021	+0.16	vis	0.5	Häussler (1964b)
2437249.30	-953	+0.18	vis	0.5	Häussler (1964b)
2437886.46	-846	+0.20	vis	0.5	Häussler (1964b)
2438285.41	-779	+0.19	vis	0.5	Häussler (1964b)
2442923.911	0	+0.072	pe	3	present paper

Remark: [1] Observers: Lange and Tsessevich

VW Cassiopeiae

This Cepheid has a faint companion SW. The present B-V amplitude is less than given in the catalogue compiled by *Schaltenbrand* and *Tammann* (1971); this may be an effect caused by this companion.

In the course of determining the correct value of the period the normal maxima with a weight of 0.5 were also used. Finally the O-C residuals have been derived using the formula:

$$C = 2442778.693 + 5\overset{d}{.}993859 \times E$$.

The O-C diagram in Fig. 23 shows the constancy of the period.

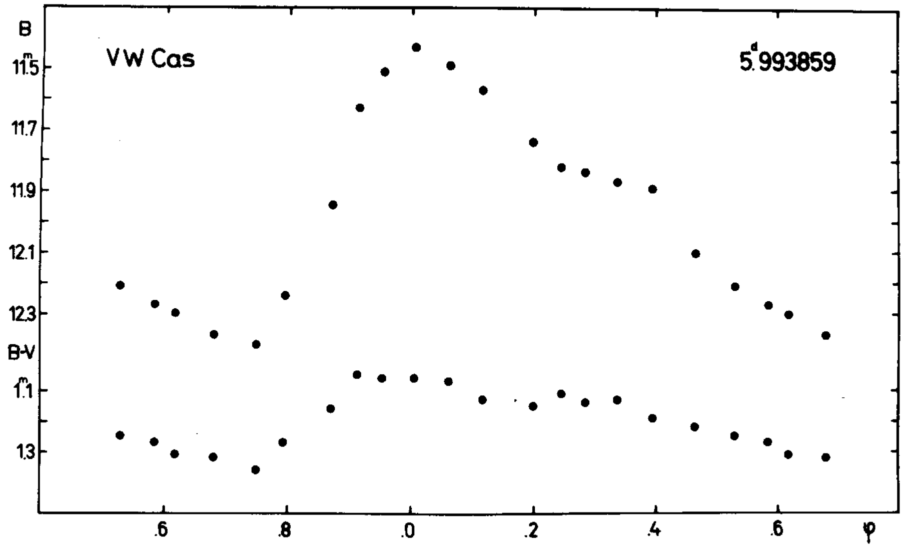

Figure 22 B and B-V curves of VW Cas

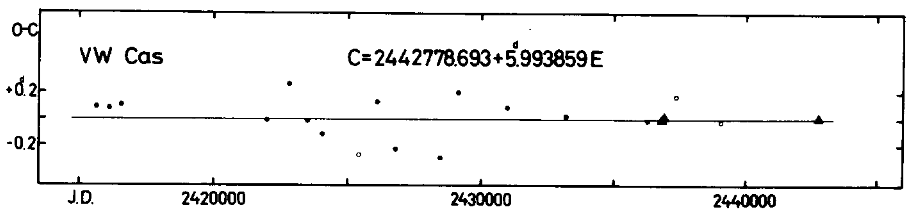

Figure 23 O-C diagram of VW Cas

Table 17 O-C residuals for VW Cas

Obs.Max.J.D.	E	O-C	Type	w	Reference
2412107.55	-5117	$-0\overset{d}{.}57$	pg	0	Oosterhoff (1935)
2413468.57	-4890	-0.15	pg	0.5	Oosterhoff (1935)
2415656.568	-4525	+0.087	pg	0.5	Oosterhoff (1935)
2416124.08	-4447	+0.08	pg	0.5	Tsepova et al. (1948)
2416585.633	-4370	+0.104	pg	0.5	Tsepova et al. (1948)
2418629.84	-4029	+0.41	pg	0	Oosterhoff (1935)
2420751.85	-3675	+0.59	pg	0	Oosterhoff (1935)
2421991.981	-3468	-0.009	pg	0.5	Balanowsky (1924)
2422837.387	-3327	+0.263	pg	0.5	Oosterhoff (1935)
2423472.463	-3221	-0.010	pg	0.5	Balanowsky (1924)
2424065.75	-3122	-0.11	pg	0.5	Oosterhoff (1935)
2425420.21	-2896	-0.27	vis	0.5	Kukarkin (1929)
2426097.911	-2783	+0.128	pg	0.5	Oosterhoff (1935)
2426816.819	-2663	-0.227	pg	0.5	Oosterhoff (1935)

Table 17 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2428465.07	-2388	$-0\overset{d}{.}29$	pg	0.5	Fu De-Lian (1964)
2429142.86	-2275	+0.20	pg	0.5	Tsepova et al. (1948)
2430994.853	-1966	+0.087	pg	0.5	Solov'yov (1954)
2433176.555	-1602	+0.024	pg	0.5	Solov'yov (1954)
2436287.334	-1083	-0.010	pg	0.5	Erleksova (1961)
2436808.793	-996	-0.016	pe	3	Weaver et al. (1960)
2436820.781	-994	-0.016	pe	3	Oosterhoff (1960)
2436880.749	-984	+0.013	pe	3	Bahner et al. (1962)
2437348.429	-906	+0.172	vis	0.5	Berthold (1975)
2439044.497	-623	-0.022	vis	0.5	Berthold (1975)
2442778.699	0	+0.006	pe	3	present paper

KL Aquilae

According to *Madore* (1977) this Cepheid is suspected in having a blue photometric companion. The light and colour curves of KL Aql shown in Fig. 24 are normal for a Population I Cepheid but the 2nd Supplement to the G.C.V.S. (*Kukarkin* et al. 1974) classifies it as a Population II Cepheid.

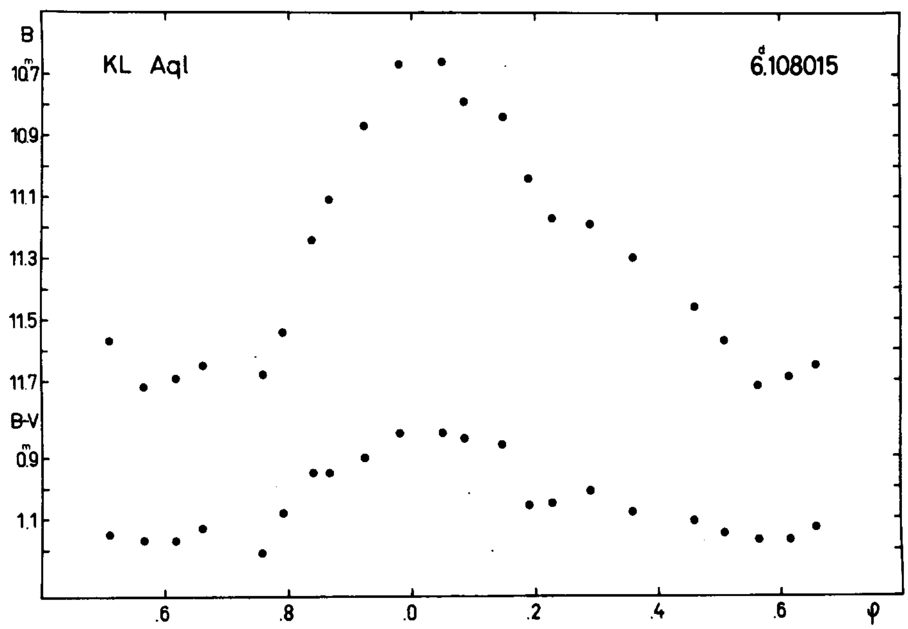

Figure 24 B and B-V curves of KL Aql

The O-C residuals have been computed with the formula:

$$C = 2443338.695 + 6\overset{d}{.}108015 \times E \quad .$$

The period of KL Aql has remained constant since the discovery of its light variation (see Fig. 25).

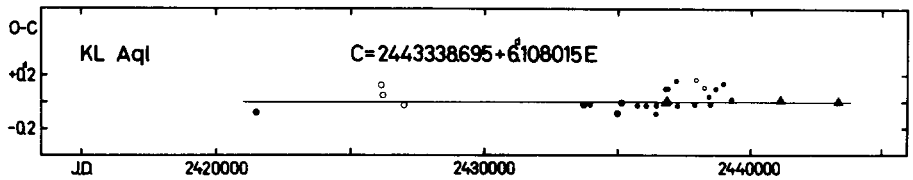

Figure 25 O-C diagram of KL Aql

Table 18 O-C residuals for KL Aql

Obs.Max.J.D.	E	O-C	Type	w	Reference
2421484.137	-3578	$-0^{d}.080$	pg	1	Parenago (1940)
2426126.433	-2818	+0.124	vis	1	Parenago[1] (1940)
2426187.441	-2808	+0.052	vis	1	Parenago[2] (1940)
2426981.409	-2678	-0.022	vis	1	Parenago[2] (1940)
2433645.0	-1587	-0.3	vis	0	Solov'yov (1953)
2433700.226	-1578	-0.021	pg	1	Solov'yov (1958a)
2433950.66	-1537	-0.02	pg	0.5	Tsessevich (1953)
2434982.845	-1368	-0.085	pvis	1	Solov'yov (1958a)
2435129.518	-1344	-0.005	pg	1	Solov'yov (1958a)
2435691.73	-1252	+0.27	pg	0	Huth (1966)
2435721.97	-1247	-0.03	pg	0.5	Vasil'yan. et al. (1970)
2436052.17	-1193	+0.34	pg	0	Huth (1966)
2436057.91	-1192	-0.03	pg	0.5	Vasil'yan. et al. (1970)
2436430.50	-1131	-0.03	pg	0.5	Vasil'yan. et al. (1970)
2436436.55	-1130	-0.09	pg	0.5	Huth (1966)
2436754.35	-1078	+0.09	pg	0.5	Huth (1966)
2436790.898	-1072	-0.005	pe	3	Oosterhoff (1960)
2436815.31	-1068	-0.02	pg	0.5	Vasil'yan. et al. (1970)
2436833.661	-1065	+0.002	pe	3	Weaver et al. (1960)
2436864.30	-1060	+0.10	vis	0.5	Voigtländer (1964)
2437188.08	-1007	+0.16	pg	0.5	Huth (1966)
2437273.41	-993	-0.03	pg	0.5	Vasil'yan. et al. (1970)
2437579.15	-943	+0.31	pg	0	Huth (1966)
2437811.35	-905	+0.41	pg	0	Huth (1966)
2437890.33	-892	-0.02	pg	0.5	Vasil'yan. et al. (1970)
2437939.38	-884	+0.17	vis	0.5	Voigtländer (1964)
2438153.50	-849	+0.51	pvis	0	Beyer (1968)
2438232.50	-836	+0.11	vis	0.5	Voigtländer (1964)
2438257.24	-832	+0.41	pg	0	Huth (1966)
2438421.78	-805	+0.04	pvis	0.5	Beyer (1968)
2438446.16	-801	-0.02	pg	0.5	Vasil'yan. et al. (1970)
2438672.27	-764	+0.10	pvis	0.5	Beyer (1968)
2438965.50	-716	+0.14	pvis	0.5	Beyer (1968)
2439295.21	-662	+0.02	pvis	0.5	Beyer (1968)
2441115.392	-364	+0.014	pe	3	Pel (1976)
2443338.696	0	+0.001	pe	3	present paper

Remarks: [1] Observer: Blazhko

[2] Observer: Nabokov

FM Aquilae

This Cepheid has a blue photometric companion of spectral type B9 (*Madore* 1977). As can be seen from Fig. 26, the U-B amplitude is too small.

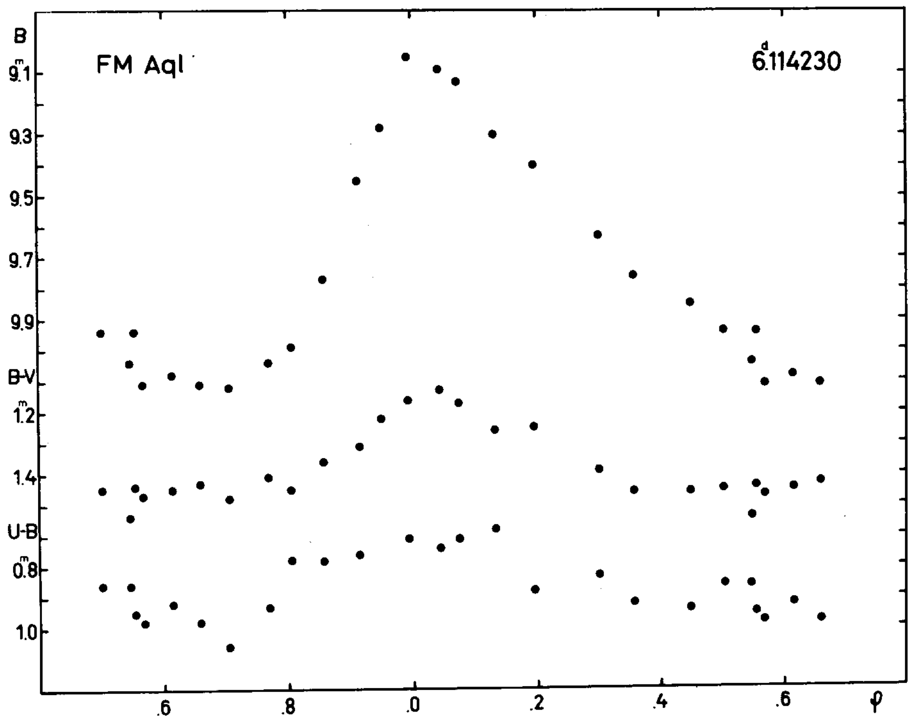

Figure 26 B, B-V and U-B curves of FM Aql

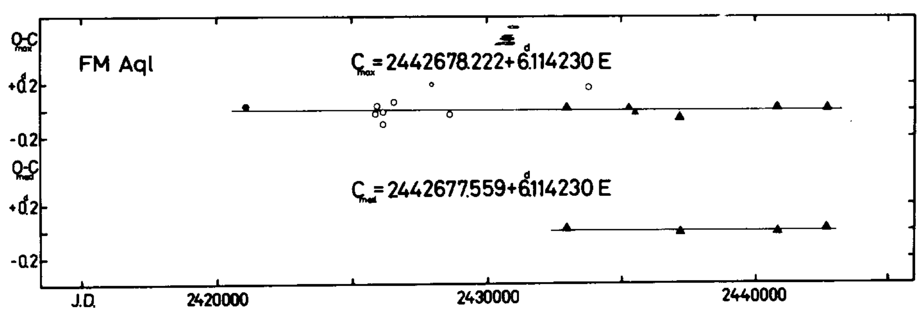

Figure 27 O-C diagram of FM Aql

The O-C residuals have been calculated with the formulae:

$$C_{max} = 2442678.222 + 6\overset{d}{.}114230 \times E$$

$$C_{med} = 2442677.559 + 6\overset{d}{.}114230 \times E$$

The period has been constant since the discovery of its light variation (see Fig. 27).

Table 19 O-C residuals for FM Aql (maximum brightness)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2421095.021	-3530	+0.031 d	pg	1	Kukarkin (1940)
2425894.631	-2745	-0.030	vis	1	Ahnert (1938)
2425919.149	-2741	+0.031	vis	1	Lause (1930)
2426157.469	-2702	-0.104	vis	1	Kukarkin (1940)
2426163.675	-2701	-0.012	vis	1	Ahnert (1938)
2426555.059	-2637	+0.062	vis	1	Ahnert (1938)
2427979.805	-2404	+0.192	vis	0.5	Dziewulski et al. (1956)
2428627.686	-2298	-0.035	vis	1	Ahnert (1938)
2432962.724	-1589	+0.013	pe	3	Eggen (1951)
2433757.732	-1459	+0.172	vis	1	Filin (1952)
2435292.245	-1208	+0.013	pe	2	Irwin (1961)
2435500.086	-1174	-0.030	pe	2	Walraven et al. (1958)
2437108.485	-911	+0.327	pg	0	Huth (1964)
2437187.583	-898	-0.060	pe	3	Mitchell et al. (1964)
2440819.509	-304	+0.013	pe	3	Pel (1976)
2442678.229	0	+0.007	pe	3	present paper

Table 20 O-C residuals for FM Aql (median brightness)

Obs.Med.J.D.	E	O-C	Type	w	Reference
2432962.063	-1589	+0.015 d	pe	3	Eggen (1951)
2437186.959	-898	-0.021	pe	3	Mitchell et al. (1964)
2440818.818	-304	-0.015	pe	3	Pel (1976)
2442677.581	0	+0.022	pe	3	present paper

V 538 Cygni

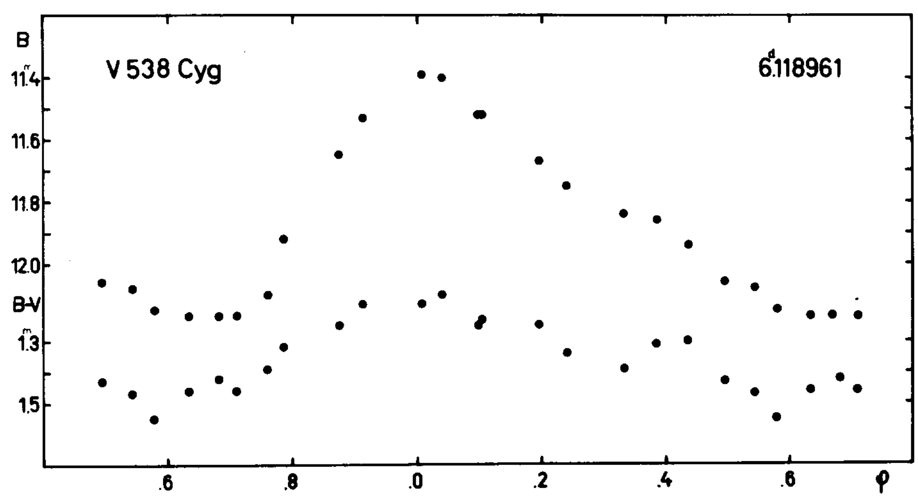

Figure 28 B and B-V curves of V 538 Cyg

The light and colour curves of this variable are shown in Fig. 28. When the correct value of the period was being determined all the normal maxima were considered, i.e. those with low weight too. The O-C residuals have been derived using the formula:

$$C = 2442772.924 + 6\overset{d}{.}118961 \times E \quad .$$

The O-C diagram is based on only four points so it is premature to declare the constancy of the period.

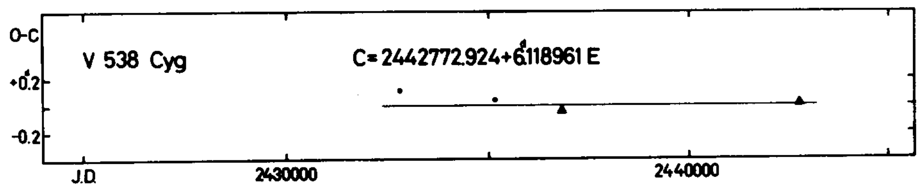

Figure 29 O-C diagram of V 538 Cyg

Table 21 O-C residuals for V 538 Cyg

Obs.Max.J.D.	E	O-C	Type	w	Reference
2432799.13	-1630	$+0\overset{d}{.}11$	pg	0.5	Manova (1950)
2435160.979	-1244	+0.042	pg	0.5	Nikulina (1970)
2436806.898	-975	-0.039	pe	3	Oosterhoff (1960)
2442772.938	0	+0.014	pe	3	present paper

TX Delphini

This Cepheid belongs to Population II (*Kukarkin* et al. 1969-1970), although the light and colour curves in Fig. 30 do not differ from those of Population I Cepheids with the same period.

Table 22 O-C residuals for TX Del

Obs.Max.J.D.	E	O-C	Type	w	Reference
2428067.22	-2413	$-1\overset{d}{.}45$	vis	0	Gur'yev (1935)
2428801.658	-2294	-0.760	pg	0.5	Leibovich (1952)
2429140.805	-2239	-0.738	pg	0.5	Leibovich (1952)
2429461.395	-2187	-0.775	pg	0.5	Leibovich (1952)
2429868.309	-2121	-0.811	pg	0.5	Leibovich (1952)
2429893.07	-2117	-0.71	pg	0.5	Vasil'yan. et al. (1970)
2430195.118	-2068	-0.795	pg	0.5	Leibovich (1952)
2430386.52	-2037	-0.54	pg	0.5	Vasil'yan. et al. (1970)
2430651.865	-1994	-0.325	vis	0	Model, Löchel (1964)
2430978.550	-1941	-0.434	vis	0.5	Model, Löchel (1964)
2431324.166	-1885	-0.108	vis	0	Model, Löchel (1964)
2431373.06	-1877	-0.54	pg	0.5	Vasil'yan. et al. (1970)
2433155.08	-1588	-0.47	pg	0.5	Vasil'yan. et al. (1970)
2433870.53	-1472	-0.26	pg	0.5	Vasil'yan. et al. (1970)
2434234.30	-1413	-0.28	pg	0.5	Vasil'yan. et al. (1970)
2434604.35	-1353	-0.19	pg	0.5	Vasil'yan. et al. (1970)
2434992.85	-1290	-0.14	pg	0.5	Vasil'yan. et al. (1970)

Table 22 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2435363.03	-1230	+0^d.09	pg	0.5	Vasil'yan. et al. (1970)
2435664.972	-1181	-0.101	pe	3	Walraven et al. (1958)
2435720.51	-1172	-0.06	pg	0.5	Vasil'yan. et al. (1970)
2435936.746	-1137	+0.373	pg	0	Nikulina et al. (1959)
2436065.84	-1116	-0.02	pg	0.5	Vasil'yan. et al. (1970)
2436460.50	-1052	+0.03	pg	0.5	Vasil'yan. et al. (1970)
2436818.04	-994	-0.06	pg	0.5	Vasil'yan. et al. (1970)
2437182.12	-935	+0.23	pg	0.5	Vasil'yan. et al. (1970)
2437292.994	-917	+0.122	pe	3	Mitchell et al. (1964)
2437576.53	-871	+0.03	pg	0.5	Vasil'yan. et al. (1970)
2437897.32	-819	+0.19	pg	0.5	Vasil'yan. et al. (1970)
2438273.17	-758	-0.08	pg	0.5	Vasil'yan. et al. (1970)
2438612.34	-703	-0.04	pg	0.5	Vasil'yan. et al. (1970)
2438994.48	-641	-0.18	pg	0.5	Vasil'yan. et al. (1970)
2439099.438	-624	-0.045	pe	3	Takase (1969)
2440819.842	-345	+0.071	pe	3	Pel (1976)
2442947.033	0	+0.024	pe	3	present paper

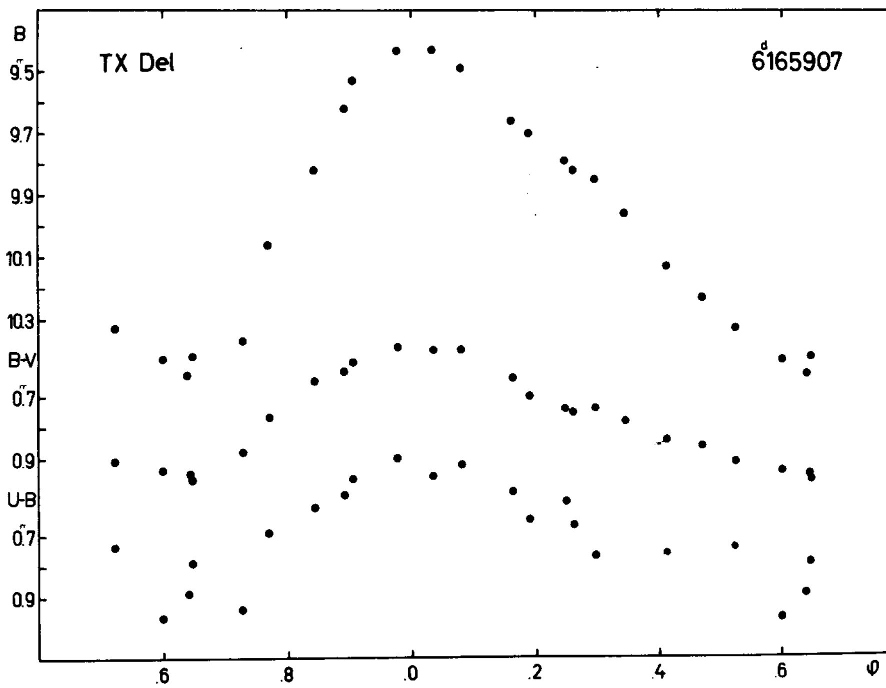

Figure 30 B, B-V and U-B curves of TX Del

When determining the correct value of the period the normal maxima with low weight were also taken into account before the change in the period. The O-C residuals have been computed with the formula:

$$C = 2442947.009 + 6^{d}.165907 \times E \quad .$$

The O-C diagram in Fig. 31 shows one period change:

before J.D. 2436600 $\qquad P = 6^{d}.166585$,

after J.D. 2436600 $\qquad P = 6^{d}.165907$.

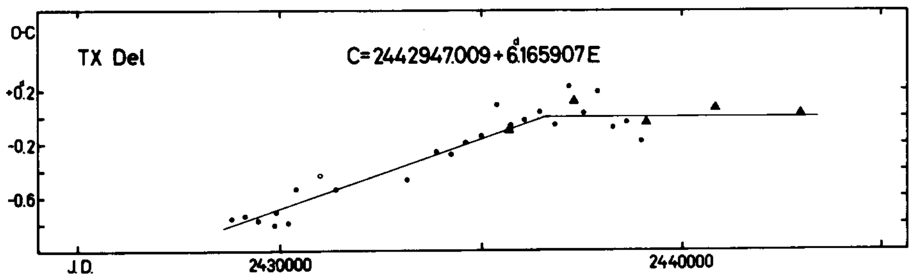

Figure 31 O-C diagram of TX Del

V 733 Aquilae

This Cepheid has not previously been observed photoelectrically. Its light and colour curves are plotted in Fig. 32. The amplitude of the light variation is small but the light curve is not symmetrical.

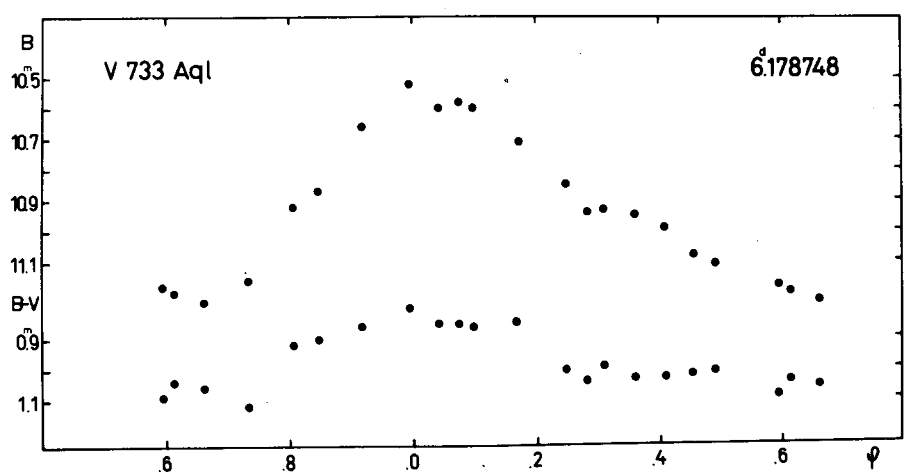

Figure 32 B and B-V curves of V 733 Aql

The O-C residuals have been calculated with the ephemeris:

$$C = 2442597.207 + 6^{d}.178748 \times E \quad .$$

There is no sign of a change in the period (see Fig. 33), although *Satyvaldiev* (1962) reported on a period change at about J.D. 2436000.

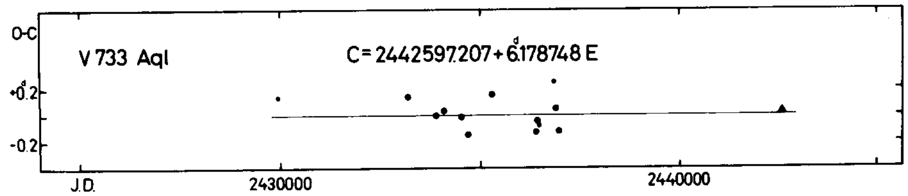

Figure 33 O-C diagram of V 733 Aql

Table 23 O-C residuals for V 733 Aql

Obs.Max.J.D.	E	O-C	Type	w	Reference
2417097.088	-4127	$-0^{d}.426$	pg	0	Satyvaldiev[1] (1962)
2429949.447	-2047	+0.137	pg	0.5	Satyvaldiev[1] (1962)
2433187.112	-1523	+0.138	pg	1	Filatov (1962)
2433872.813	-1412	-0.002	pg	1	Filatov (1962)
2434076.750	-1379	+0.036	pg	1	Satyvaldiev (1962)
2434324.236	-1339	+0.373	pvis	0	Satyvaldiev (1962)
2434521.569	-1307	-0.014	pg	1	Filatov (1962)
2434688.267	-1280	-0.143	pg	1	Satyvaldiev (1962)
2435281.723	-1184	+0.154	pg	1	Filatov (1962)
2435694.50	-1117	-1.05	pg	0	Busch, Wenzel (1960)
2435997.76	-1068	-0.54	pg	0	Busch, Wenzel (1960)
2436374.87	-1007	-0.34	pg	0	Busch, Wenzel (1960)
2436381.259	-1006	-0.128	pg	1	Satyvaldiev[1] (1962)
2436424.598	-999	-0.040	pg	1	Filatov (1962)
2436467.81	-992	-0.08	pg	0.5	Busch, Wenzel (1960)
2436716.043	-952	+1.004	pg	0	Busch, Wenzel (1960)
2436758.612	-945	+0.322	pvis	0	Satyvaldiev (1962)
2436851.221	-930	+0.250	pg	0.5	Busch (1961)
2436875.736	-926	+0.050	pg	1	Dultsev (1963)
2436949.707	-914	-0.124	pg	1	Satyvaldiev[1] (1962)
2437253.276	-865	+0.686	pg	0	Busch (1961)
2442597.232	0	+0.025	pe	3	present paper

Remark: [1] Observer: Tsessevich

VV Cassiopeiae

This variable has a B7 photometric companion (*Madore* 1977). The light and colour curves of VV Cas are plotted in Fig. 34. The normal maxima with weight of 0.5 listed in Table 24 were also taken into account when determining the correct value of the period. The O-C residuals have been derived using the formula:

$$C = 2442836.853 + 6^{d}.207059 \times E \quad .$$

As shown by the O-C diagram (Fig. 35), the period has changed on one occasion:

before J.D. 2432500 $P = 6^{d}.207510$

after J.D. 2432500 $P = 6^{d}.207059$

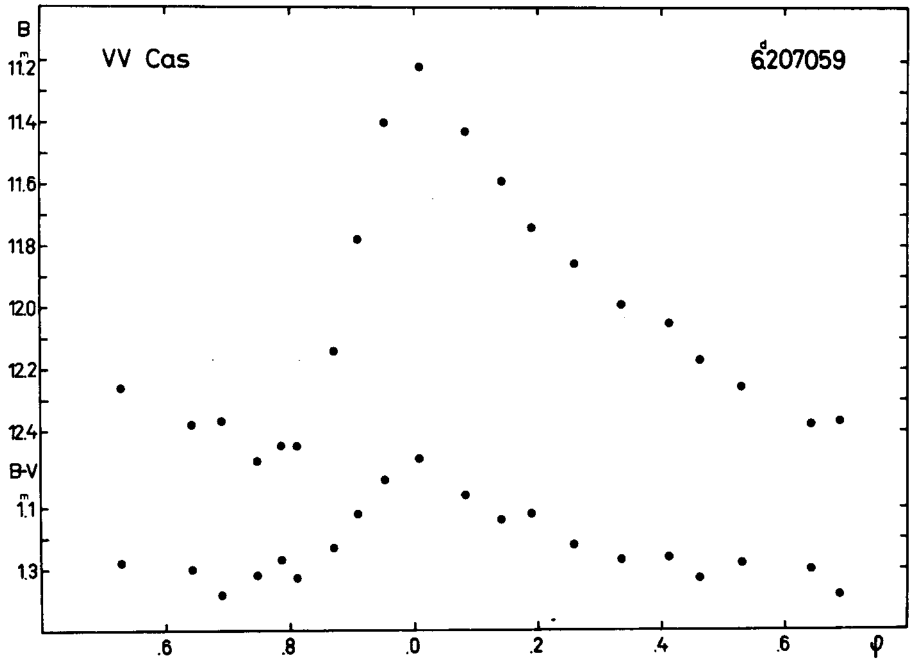

Figure 34 B and B-V curves of VV Cas

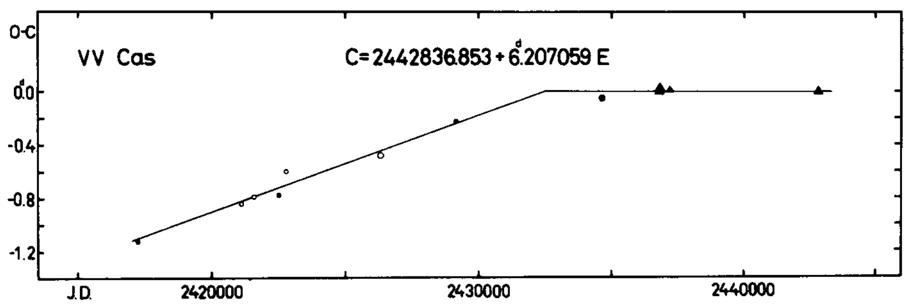

Figure 35 O-C diagram of VV Cas

Table 24 O-C residuals for VV Cas

Obs.Max.J.D.	E	O-C	Type	w	Reference
2417262.646	-4120	$-1^{d}.124$	pg	0.5	Merzlyakov (1957)
2421117.51	-3499	-0.84	vis	0.5	Hoffmeister (1923)
2421576.89	-3425	-0.79	vis	0.5	Hoffmeister (1923)
2422514.159	-3274	-0.783	pg	0.5	Robinson (1933)
2422806.1	-3227	-0.6	vis	0.5	Hoffmeister (1923)
2426319.389	-2661	-0.480	vis	1	Kukarkin (1940)
2428440.00	-2319	-2.68	pg	0	Fu De-Lian (1964)
2429156.266	-2204	-0.229	pg	0.5	Merzlyakov (1957)
2434655.901	-1318	-0.048	pg	1	Merzlyakov (1957)

Table 24 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2436816.001	-970	$-0\overset{d}{.}005$	pe	3	Oosterhoff (1960)
2436822.233	-969	+0.020	pe	3	Weaver et al. (1960)
2436853.252	-964	+0.004	pe	3	Bahner et al. (1962)
2437213.268	-906	+0.010	pe	2	Mitchell et al. (1964)
2442836.847	0	-0.006	pe	3	present paper

CR Cephei

The variable star CR Cep is a small amplitude Cepheid with a non-symmetrical light curve (see Fig. 36). The O-C residuals

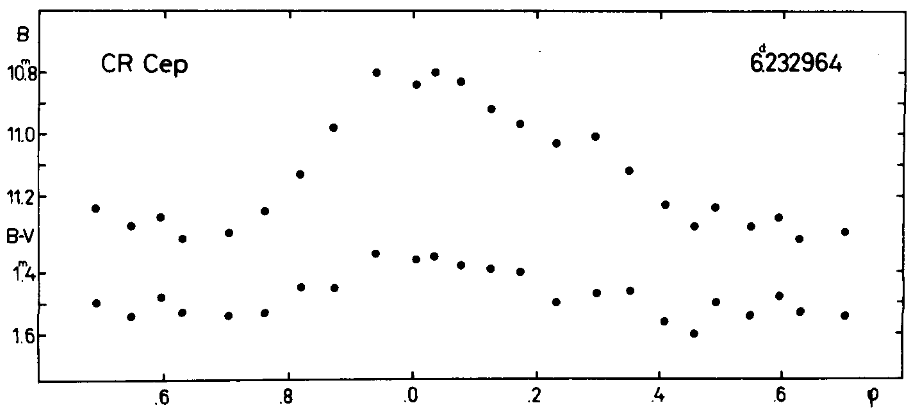

Figure 36 B and B-V curves of CR Cep

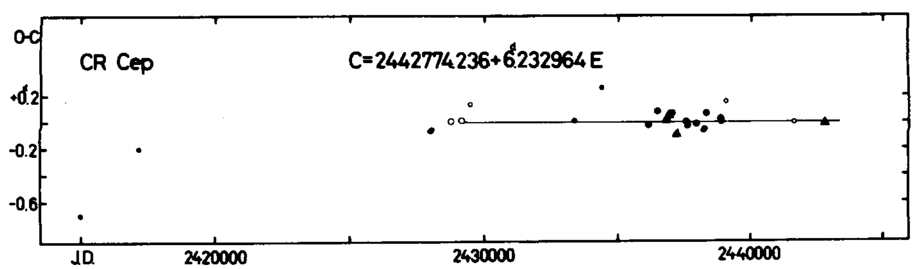

Figure 37 O-C diagram of CR Cep

have been computed with the formula:

$$C = 2442774.236 + 6\overset{d}{.}232964 \times E \quad .$$

The O-C diagram in Fig. 37 shows one period change. Neither the time of the change in the period nor the value of the former period can be determined for lack of sufficient number of points in the O-C diagram. The only certain fact is that the period change occurred before J.D. 2428000.

Table 25 O-C residuals for CR Cep

Obs.Max.J.D.	E	O-C	Type	w	Reference
2415005.7	-4455	$-0^{d}.7$	pg	0.5	Oosterhoff (1960)
2417200.2	-4103	-0.2	pg	0.5	Oosterhoff (1960)
2428045.680	-2363	-0.062	pg	1	Parenago (1938b)
2428750.076	-2250	+0.009	vis	1	Florya (1949)
2429142.758	-2187	+0.014	vis	1	Florya (1949)
2429479.460	-2133	+0.136	vis	0.5	Florya (1949)
2433362.470	-1510	+0.010	pg	0.5	Timofeyeva (1967)
2434366.226	-1349	+0.258	pg	0.5	Romano (1956)
2436123.644	-1067	-0.019	pg	1	Makarenko (1969)
2436479.027	-1010	+0.085	pg	1	Makarenko (1969)
2436809.309	-957	+0.020	pe	3	Oosterhoff (1960)
2436865.432	-948	+0.046	pe	3	Bahner et al. (1962)
2437021.276	-923	+0.066	pg	1	Makarenko (1969)
2437214.339	-892	-0.093	pe	3	Mitchell et al. (1964)
2437544.783	-839	+0.004	pg	1	Girnyak (1969)
2437569.684	-835	-0.027	pg	1	Makarenko (1969)
2437937.440	-776	-0.016	pg	1	Makarenko (1969)
2438267.747	-723	-0.056	pg	1	Girnyak (1969)
2438299.037	-718	+0.069	pg	1	Makarenko (1969)
2438847.501	-630	+0.032	pg	1	Girnyak (1969)
2438859.948	-628	+0.013	pg	1	Makarenko (1969)
2439047.078	-598	+0.154	vis	0.5	Berthold (1975)
2441602.436	-188	-0.003	vis	0.5	Berthold (1975)
2442774.223	0	-0.013	pe	3	present paper

<u>RS Cassiopeiae</u>

The light and colour curves of this variable are shown in

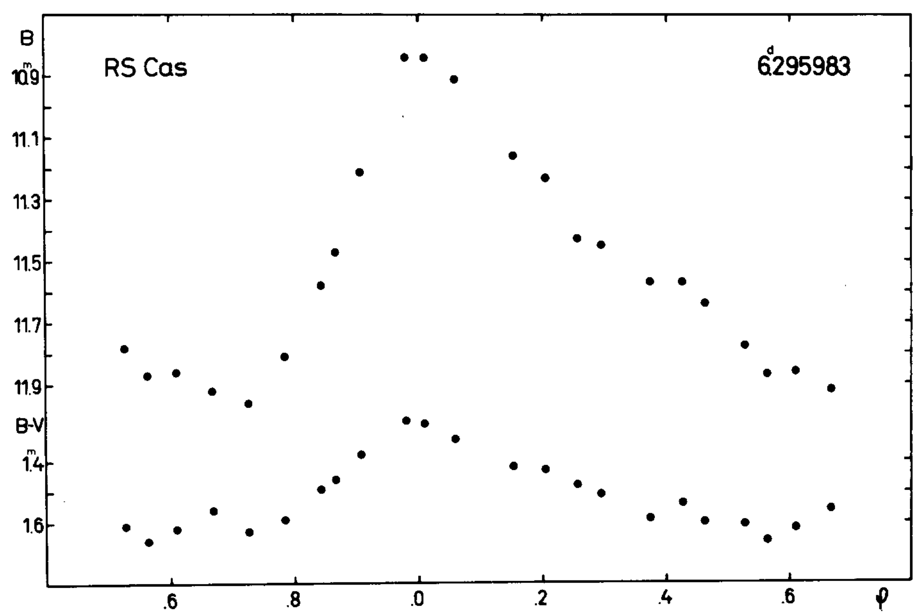

Figure 38 B and B-V curves of RS Cas

Fig. 38. The O-C residuals in Table 26 have been computed with the formula:

$$C = 2442773.487 + 6\overset{d}{.}295983 \times E \quad .$$

As is shown by the O-C diagram in Fig. 39, the period has changed on one occasion:

before J.D. 2434900 $P = 6\overset{d}{.}295623$,

after J.D. 2434900 $P = 6\overset{d}{.}295983$.

If the O-C diagram is approximated by a parabolic line (continuous period change), the equation of the best fitting parabola is:

$$C_{par} = 2442773.461 + 6.295993 \times E + 6.74 \times 10^{-8} \times E^2$$

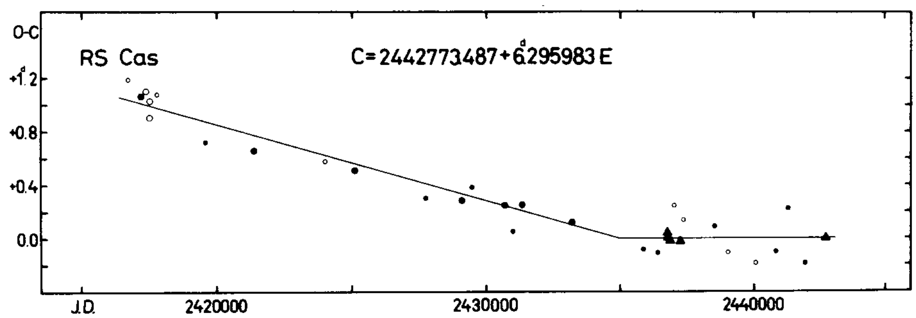

Figure 39 O-C diagram of RS Cas

Table 26 O-C residuals for RS Cas

Obs.Max.J.D.	E	O-C	Type	w	Reference
2416740.786	-4135	$+1\overset{d}{.}189$	vis	0.5	Kandiba et al.[1] (1935)
2417187.679	-4064	+1.067	pg	1	Kandiba et al. (1935)
2417357.706	-4037	+1.102	vis	1	Kandiba et al.[1] (1935)
2417515.036	-4012	+1.033	vis	1	Haynes (1907)
2417521.205	-4011	+0.906	vis	1	{Whitney (1907) Furness[2] (1913)
2417792.103	-3968	+1.077	vis	0.5	Zeipel (1908)
2419617.580	-3678	+0.718	pg	0.5	Robinson (1933)
2421367.807	-3400	+0.662	pg	1	Jordan (1929)
2424043.512	-2975	+0.574	vis	0.5	Kandiba et al.[1] (1935)
2425126.358	-2803	+0.511	pg	1	Schneller (1931)
2427751.571	-2386	+0.299	pg	0.5	Tolmár (1940a)
2429098.898	-2172	+0.286	pg	1	Tolmár (1940a)
2429470.457	-2113	+0.382	pg	0.5	Tolmár (1940a)
2430698.041	-1918	+0.249	pg	1	Solov'yov (1954)
2431012.634	-1868	+0.043	pg	0.5	Vasil'yanovskaya (1948)
2431359.126	-1813	+0.256	pg	1	Solov'yov (1954)
2433184.831	-1523	+0.126	pg	1	Solov'yov (1954)
2435873.005	-1096	-0.085	pg	0.5	Zonn, Semeniuk (1959)
2436401.84	-1012	-0.11	pg	0.5	Rubashevsky (1962)
2436767.158	-954	+0.039	pe	3	Weaver et al. (1960)
2436792.303	-950	0.000	pe	3	Oosterhoff (1960)

Table 26 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2436880.430	-936	$-0^{d}.017$	pe	3	Bahner et al. (1962)
2437025.500	-913	+0.245	vis	0.5	Häussler (1973)
2437220.404	-882	-0.026	pe	3	Mitchell et al. (1964)
2437365.373	-859	+0.135	vis	0.5	Häussler (1973)
2438542.68	-672	+0.09	pg	0.5	Ahnert (1966)
2439046.153	-592	-0.112	vis	0.5	Häussler (1973)
2439436.312	-530	-0.304	vis	0	Häussler (1973)
2440097.502	-425	-0.192	vis	0.5	Häussler (1973)
2440865.701	-303	-0.103	pg	0.5	Rümmler (1977)
2441300.450	-234	+0.223	pg	0.5	Rümmler (1977)
2441615.398	-184	+0.372	pg	0	Rümmler (1977)
2441967.408	-128	-0.193	pg	0.5	Rümmler (1977)
2442314.250	-73	+0.370	pg	0	Rümmler (1977)
2442678.758	-15	-0.289	pg	0	Rümmler (1977)
2442773.489	0	+0.002	pe	3	present paper

Remarks: [1] Observer: Blazhko; [2] Observer: Whitney

X Vulpeculae

The light and colour curves of this variable are shown in

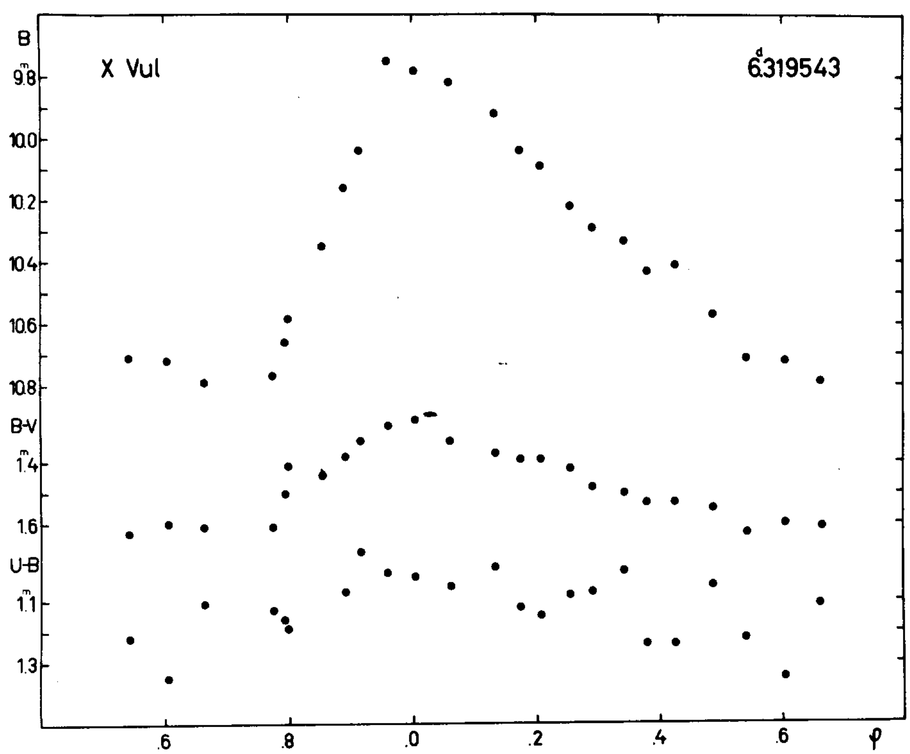

Figure 40 B, B-V and U-B curves of X Vul

Fig. 40. The present U-B amplitude is smaller than expected (*Schaltenbrand* and *Tammann* 1971). The O-C residuals have been calculated using the formula:

$$C = 2442665.932 + 6\overset{d}{.}319543 \times E \quad .$$

The O-C diagram in Fig. 41 shows one period change. Neither the time of the change in the period nor the value of the former period can be determined since the period change occurred before J.D. 2427000 when the reliability of the O-C diagram is not good.

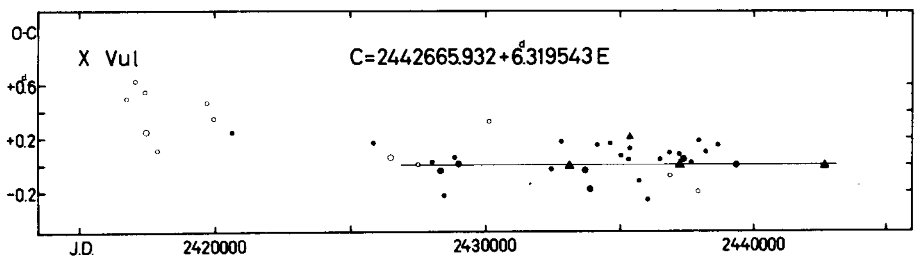

Figure 41 O-C diagram of X Vul

Table 27 O-C residuals for X Vul

Obs.Max.J.D.	E	O-C	Type	w	Reference
2416756.3	-4100	+0$\overset{d}{.}$5	vis	0.5	Dunér et al.[1] (1904)
2417066.09	-4051	+0.63	vis	0.5	Seares (1907a)
2417432.55	-3993	+0.55	vis	0.5	Seares (1907a)
2417470.166	-3987	+0.252	vis	1	Luizet (1907b)
2417893.435	-3920	+0.112	vis	0.5	Zeipel (1908)
2419701.18	-3634	+0.47	vis	0.5	Luizet (1914)
2419972.80	-3591	+0.35	vis	0.5	Luizet (1914)
2420636.248	-3486	+0.243	pg	0.5	Robinson (1933)
2425843.478	-2662	+0.169	pg	0.5	Nassau, Townson (1932)
2426481.643	-2561	+0.061	vis	1	Kukarkin (1940)
2427499.037	-2400	+0.008	vis	0.5	Nassau, Ashbrook (1943)
2428004.616	-2320	+0.024	pg	0.5	Nassau, Ashbrook (1943)
2428314.212	-2271	-0.038	pg	1	Azhusenis (1956)
2428453.05	-2249	-0.23	pg	0.5	Fu De-Lian (1964)
2428857.785	-2185	+0.054	pg	0.5	Nassau, Ashbrook (1943)
2428984.128	-2165	+0.007	pg	1	Azhusenis (1956)
2430128.29	-1984	+0.33	vis	0.5	Ashbrook (1943)
2432421.920	-1621	-0.033	pg	0.5	Davis (1949)
2432794.98	-1562	+0.17	pg	0.5	Wachmann (1964a)
2433117.093	-1511	-0.010	pe	3	Eggen (1951)
2433692.141	-1420	-0.040	pg	1	Chuprina (1954)
2433868.946	-1392	-0.182	pg	1	Chuprina[2] (1954)
2434122.06	-1352	+0.15	pg	0.5	Wachmann (1964a)
2434627.63	-1272	+0.16	pg	0.5	Wachmann (1964a)
2435006.72	-1212	+0.07	pg	0.5	Wachmann (1964a)
2435303.701	-1165	+0.037	pg	0.5	Chuprina (1957)
2435354.434	-1157	+0.213	pe	1	Walraven et al. (1958)
2435360.66	-1156	+0.12	pg	0.5	Wachmann (1964a)

Table 27 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2435695.36	-1103	$-0^{d}.12$	pg	0.5	Huth (1966)
2436023.83	-1051	-0.26	pg	0.5	Huth (1966)
2436485.46	-978	+0.04	pg	0.5	Huth (1966)
2436839.40	-922	+0.09	pg	0.5	Huth (1966)
2436858.191	-919	-0.081	vis	0.5	Busch (1963)
2437174.33	-869	+0.08	pg	0.5	Huth (1966)
2437205.847	-864	0.000	pe	3	Mitchell et al. (1964)
2437357.564	-840	+0.048	pg	1	Boyko (1970)
2437641.90	-795	+0.01	pg	0.5	Huth (1966)
2437919.746	-751	-0.209	vis	0.5	Busch (1963)
2437932.77	-749	+0.18	pg	0.5	Huth (1966)
2438172.84	-711	+0.10	pg	0.5	Huth (1966)
2438640.53	-637	+0.15	pg	0.5	Huth (1966)
2439291.295	-534	-0.001	pg	1	Boyko (1970)
2442665.923	0	-0.009	pe	3	present paper

Remarks: [1] Observer: Blazhko; [2] Observer: Tsessevich

RR Lacertae

The light and colour curves of RR Lac are plotted in Fig. 42.

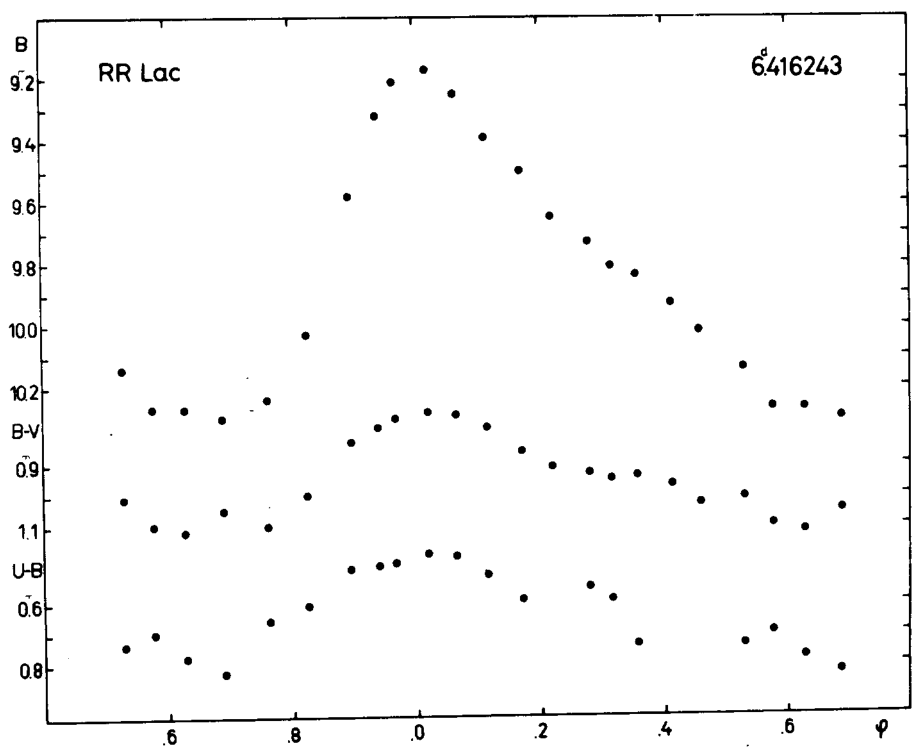

Figure 42 B, B-V and U-B curves of RR Lac

The O-C residuals have been computed with the formulae:

$$C_{max} = 2442776.686 + 6\overset{d}{.}416243 \times E \quad ,$$
$$C_{med} = 2442775.898 + 6\overset{d}{.}416243 \times E \quad .$$

One change in the period can be suspected (see Fig. 43):

before J.D. 2431600 $\quad P = 6\overset{d}{.}416146 \quad ,$

after J.D. 2431600 $\quad P = 6\overset{d}{.}416243 \quad .$

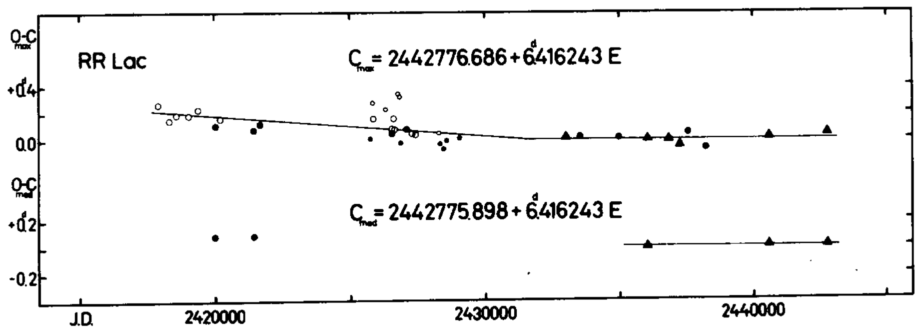

Figure 43 O-C diagram of RR Lac

Table 28 O-C residuals for RR Lac
(maximum brightness)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2417914.015	-3875	$+0\overset{d}{.}271$	vis	1	Enebo (1908)
2418330.952	-3810	+0.152	vis	1	Enebo (1909)
2418555.557	-3775	+0.188	vis	1	Bilt (1926b)
2419011.107	-3704	+0.185	vis	1	Enebo (1912)
2419376.875	-3647	+0.227	vis	1	Bilt (1926b)
2419434.331	-3638	-0.063	pg	0	Robinson (1933)
2420005.552	-3549	+0.112	pg	2	Hertzsprung (1922)
2420217.338	-3516	+0.162	vis	1	Bilt (1926b)
2421429.921	-3327	+0.075	pg	2	Hertzsprung (1922)
2421667.365	-3290	+0.118	pg	1	Jordan (1929)
2424856.5	-2793	+0.4	vis	0	Selivanov (1929)
2425747.99	-2654	+0.01	pg	0.5	Kiehl, Hopp (1977)
2425838.081	-2640	+0.277	vis	0.5	Parenago (1938a)
2425850.797	-2638	+0.160	vis	1	Beyer (1934b)
2426312.834	-2566	+0.228	vis	0.5	Terkán (1935)
2426530.843	-2532	+0.084	vis	1	Kukarkin (1940)
2426537.221	-2531	+0.046	pg	1	Zonn (1933)
2426607.914	-2520	+0.160	vis	1	Beyer (1934b)
2426633.496	-2516	+0.077	vis	1	Lassovszky (1934)
2426762.084	-2496	+0.341	vis	0.5	Dziewulski et al. (1946)
2426806.984	-2489	+0.327	vis	0.5	Dziewulski et al. (1946)
2426870.80	-2479	-0.02	pg	0.5	Kiehl, Hopp (1977)
2427095.468	-2444	+0.080	pg	1	Zonn (1933)
2427294.338	-2413	+0.046	vis	1	Florya et al. (1953)
2427403.406	-2396	+0.038	vis	1	Lassovszky (1934)
2428269.609	-2261	+0.048	vis	0.5	Dziewulski et al. (1946)
2428346.526	-2249	-0.029	pg	0.5	Dziewulski et al. (1946)
2428461.98	-2231	-0.07	pg	0.5	Fu De-Lian (1964)

Table 28 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2428558.287	-2216	$-0^{d}.005$	pg	0.5	Dziewulski et al. (1946)
2428751.422	-2186	+0.643	pg	0	Gur'yev (1938)
2429045.94	-2140	+0.01	pg	0.5	Katz (1946)
2432998.350	-1524	+0.018	pe	3	Eggen (1951)
2433537.316	-1440	+0.020	pg	1	Solov'yov (1952)
2434968.133	-1217	+0.015	pg	1	Azarnova (1957)
2436033.214	-1051	-0.001	pe	3	Bahner et al. (1971)
2436835.238	-926	-0.007	pe	3	Bahner et al. (1962)
2437213.761	-867	-0.042	pe	3	Mitchell et al. (1964)
2437579.580	-810	+0.051	pg	1	Girnyak (1964)
2438240.338	-707	-0.064	pg	1	Girnyak (1964)
2440582.350	-342	+0.019	pe	3	Asteriadis et al. (1977)
2442776.720	0	+0.034	pe	3	present paper

Table 29 O-C residuals for RR Lac

(median brightness)

Obs.Med.J.D.	E	O-C	Type	w	Reference
2420004.737	-3549	$+0^{d}.085$	pg	2	Hertzsprung (1922)
2421429.144	-3327	+0.086	pg	2	Hertzsprung (1922)
2436032.418	-1051	-0.009	pe	3	Bahner et al. (1971)
2440581.548	-342	+0.005	pe	3	Asteriadis et al. (1977)
2442775.905	0	+0.007	pe	3	present paper

AW Persei

The light and colour curves of this Cepheid are shown in Fig. 44. AW Per was reported to be a component of a spectroscopic binary system (*Miller* and *Preston* 1964). On the basis of the available radial velocity measurements *Lloyd Evans* (1968) determined the lowest value of the orbital period to be 1200 days. Using more recent radial velocity measurements *McNamara* and *Chapman* (1977) concluded that the orbital period was longer than 20 years. The presence of the B7 companion can also be pointed out using only photometric data (*Madore* 1977).

The O-C residuals have been calculated with the formula:

$$C = 2442709.059 + 6^{d}.463589 \times E \quad .$$

If the first point in the O-C diagram in Fig. 45 is real, a period change took place before J.D. 2426000. It is even more interesting that a simple eye inspection can reveal a sinusoidal wave in the O-C diagram which is a direct result of the orbital motion of AW Per around the centre of mass of the binary system. The phenomenon is similar to the case of FF Aql (Paper I, p. 94). A search for the period of this long term modulation gave P_{orb}=

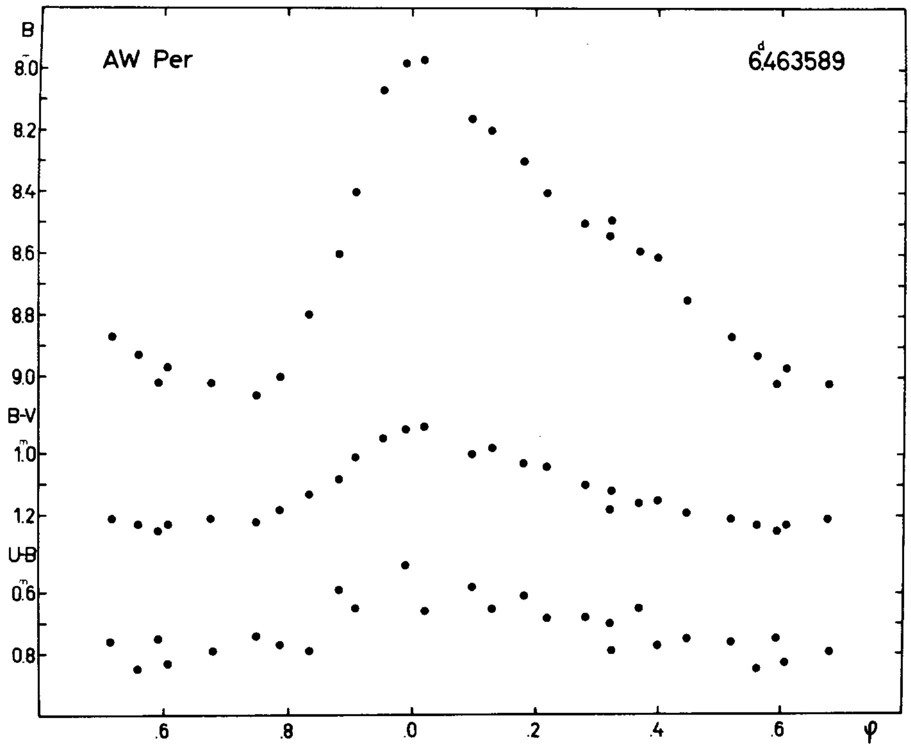

Figure 44 B, B-V and U-B curves of AW Per

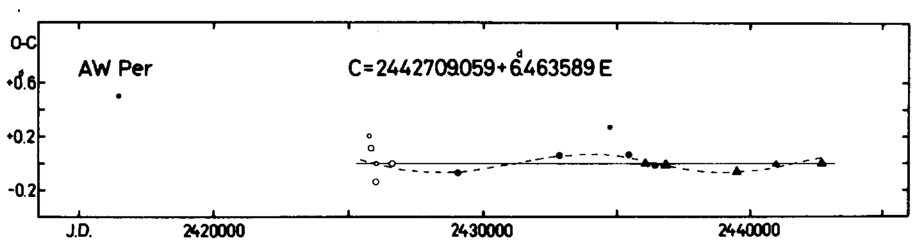

Figure 45 O-C diagram of AW Per

10300±800 days, as the best result. The resulting light-time diagram versus the orbital phase is plotted in Fig. 46. In constructing this diagram the O-C values based on visual observations were averaged into one point. The orbital phases have been computed with the formula:

$$\text{Epoch} + \text{phase} = (\text{J.D.} - 2400000) \times 10300^{-1} \quad .$$

The observed maxima, the corresponding O-C residuals and the orbital phases are listed in Table 31. The value of $a \times \sin i$ can be determined from the amplitude of the O-C variation curve. The result is: $a \times \sin i = 1.6 \times 10^9$ km.

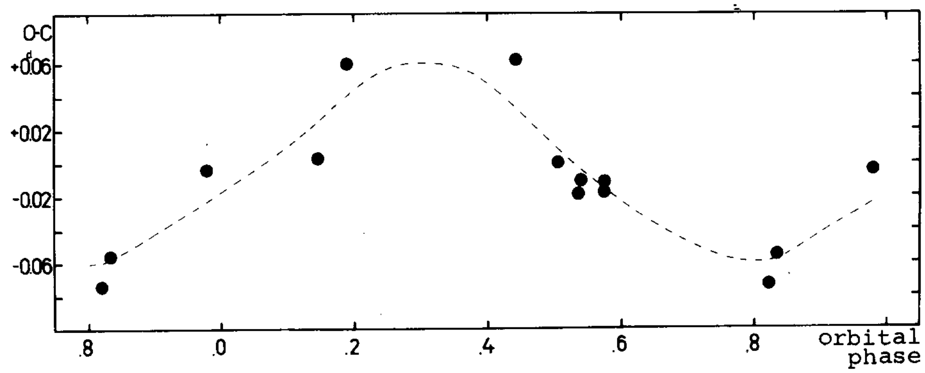

Figure 46 O-C variations due to the orbital motion

Table 30 O-C residuals for AW Per

Obs.Max.J.D.	E	O-C	Type	w	Reference
2416512.64	-4053	$+0^{d}.50$	pg	0.5	Kukarkin (1930)
2425832.8	-2611	+0.2	vis	0.5	Guthnick et al.[1] (1930)
2425845.669	-2609	+0.114	vis	1	Kukarkin (1940)
2426007.145	-2584	0.000	vis	0.5	Jacchia[2] (1930)
2426019.929	-2582	-0.143	vis	1	Jacchia (1930)
2426634.109	-2487	-0.004	vis	1	Kukarkin (1940)
2429070.812	-2110	-0.074	pg	1	Opolski (1948)
2432865.073	-1523	+0.060	pg	1	Erleksova (1961)
2434765.577	-1229	+0.269	pg	0.5	Erleksova (1961)
2435463.438	-1121	+0.062	pg	1	Erleksova (1961)
2436109.735	-1021	0.000	pe	3	Bahner et al. (1977)
2436426.431	-972	-0.019	pg	1	Erleksova (1961)
2436820.711	-911	-0.018	pe	3	Oosterhoff (1960)
2436827.181	-910	-0.012	pe	3	Weaver et al. (1960)
2439503.063	-496	-0.056	pe	3	Wamsteker (1972)
2440996.204	-265	-0.004	pe	2	Evans (1976)
2442709.062	0	+0.003	pe	3	present paper

Remarks: [1] Observer: Kanda; [2] Observer: Dallaporta

Table 31

Obs.Max.J.D.	O-C	phase	Obs.Max.J.D.	O-C	phase
2426168.714	$-0^{d}.011$	.541	2436820.711	$-0^{d}.018$	.575
2429070.812	-0.074	.822	2436827.181	-0.012	.575
2432865.073	+0.060	.191	2439503.063	-0.056	.835
2435463.438	+0.062	.443	2440996.204	-0.004	.980
2436109.735	0.000	.506	2442709.062	+0.003	.147
2436426.431	-0.019	.537			

CS Monocerotis

There is a faint companion NE of the variable. This may be the reason that the B and the B-V amplitudes of the variable (see Fig. 47) are smaller than given in the catalogue compiled by *Schaltenbrand* and *Tammann* (1971).

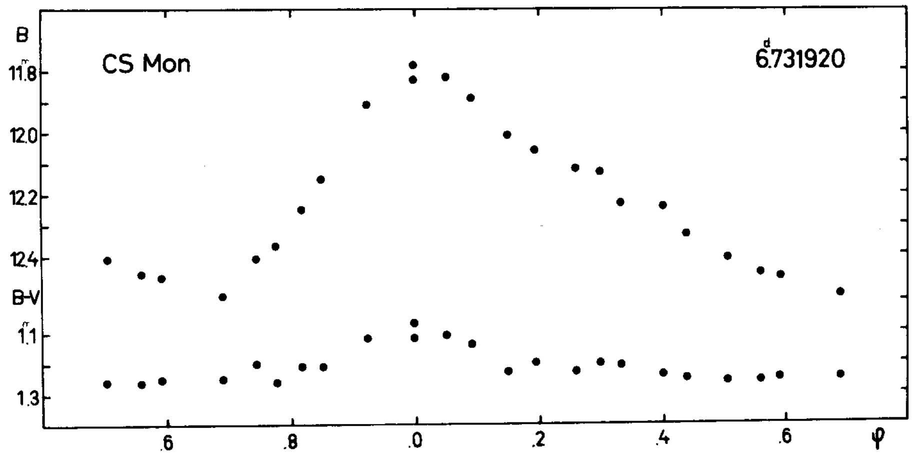

Figure 47 B and B-V curves of CS Mon

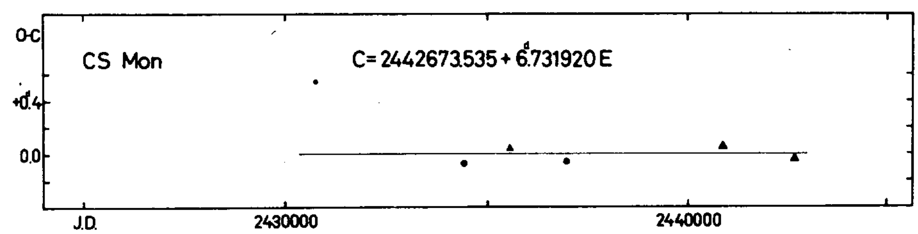

Figure 48 O-C diagram of CS Mon

Table 32 O-C residuals for CS Mon

Obs.Max.J.D.	E	O-C	Type	w	Reference
2430758.58	-1770	$+0^{d}.54$	pg	0.5	Ahnert (1947)
2434406.665	-1228	-0.072	pg	1	Bogdanov (1974)
2435544.469	-1059	+0.037	pe	1	Walraven et al. (1958)
2436964.811	-848	-0.056	pg	1	Bogdanov (1974)
2437914.158	-707	+0.090	pe	1	Eggen (1969)
2440855.969	-270	+0.052	pe	3	Pel (1976)
2442673.488	0	-0.047	pe	3	present paper

The O-C residuals have been derived using the formula:

$$C = 2442673.535 + 6^{d}.731920 \times E$$

The period has been constant since the discovery of the light variation of CS Mon.

AO Aurigae

The light curve plotted in Fig. 49 is the first reliable photoelectric light curve of this faint Cepheid. When determining the correct value of the period the normal maxima with a weight of 0.5 were also used. The O-C residuals have been computed with the formula:

$$C = 2442815.860 + 6^{d}.763006 \times E \quad .$$

The O-C diagram in Fig. 50 can be approximated by a straight line, i.e. the period is constant.

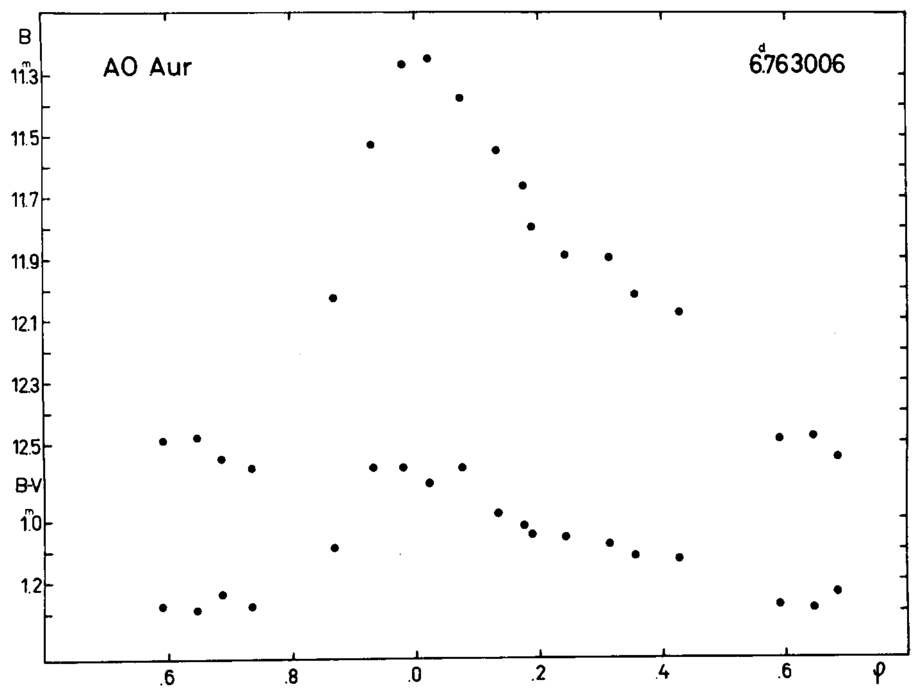

Figure 49 B and B-V curves of AO Aur

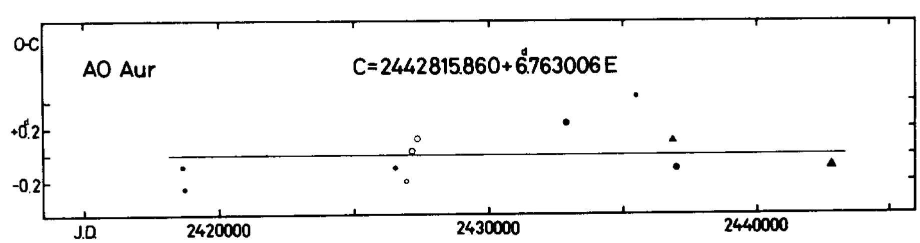

Figure 50 O-C diagram of AO Aur

Table 33 O-C residuals for AO Aur

Obs.Max.J.D.	E	O-C	Type	w	Reference
2418651.555	-3573	$-0^{d}.085$	pg	0.5	Reinmuth (1930)
2418739.308	-3560	-0.251	pg	0.5	Parenago (1934b)
2426523.68	-2409	-0.10	pg	0.5	Rügemer (1935)
2426942.9	-2347	-0.2	vis	0.5	Pedersen (1936)
2427132.476	-2319	+0.027	vis	1	Beyer (1934a)
2427335.463	-2289	+0.124	vis	1	Beyer (1934a)
2432867.714	-1471	+0.236	pg	1	Shakhovskaya (1964)
2435498.721	-1082	+0.433	pg	0.5	Shakhovskaya (1964)
2436850.986	-882	+0.097	pe	1	Weaver et al. (1960)
2436979.279	-863	-0.107	pg	1	Shakhovskaya (1964)
2442815.764	0	-0.096	pe	3	present paper

η Aquilae

The light and colour curves of this very bright Cepheid variable are shown in Fig. 51. The V amplitude derived from the

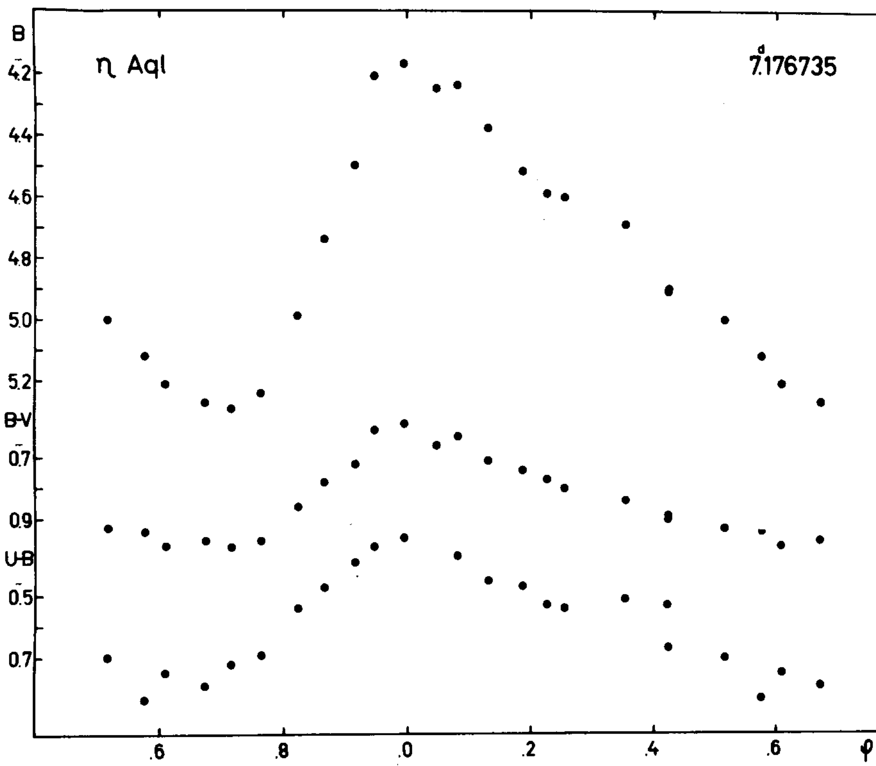

Figure 51 B, B-V and U-B curves of η Aql

present photometry is less whereas the U-B amplitude is greater than the corresponding values taken from the catalogue (*Schal-*

tenbrand and *Tammann* 1971).

The large number of photoelectric observational series has made it possible to construct the O-C diagram not only for the maximum brightness but also for the median brightness. The O-C residuals have been calculated with the formulae:

$$C_{max} = 2442794.773 + 7\overset{d}{.}176735 \times E \quad ,$$

$$C_{med} = 2442793.855 + 7\overset{d}{.}176735 \times E \quad .$$

The O-C diagram in Fig. 52 can well be approximated by a parabolic curve, i.e. the period has been changing continuously since the discovery of the light variation of η Aql. The equation of the parabolic curve for the maximum brightness is:

$$C_{par} = 2442794.773 + 7.176735 \times E + 2.18 \times 10^{-8} \times E^2 \quad .$$

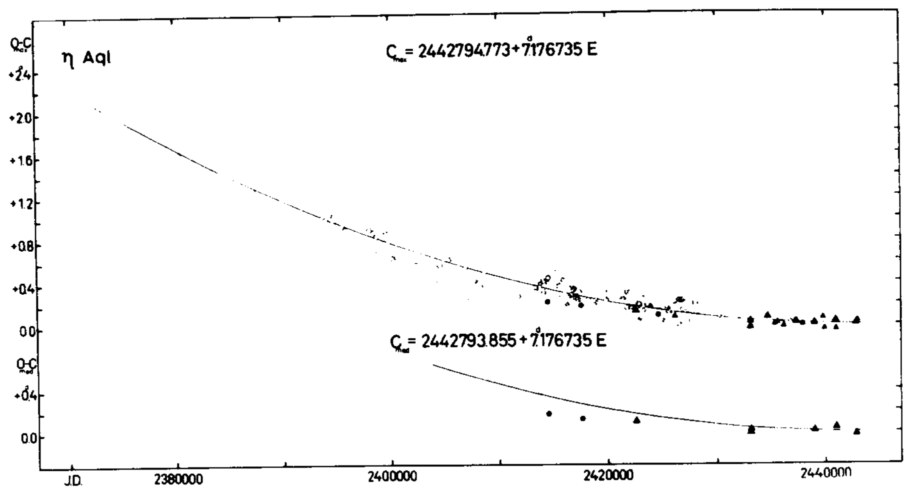

Figure 52 O-C diagram of η Aql

Table 34 O-C residuals for η Aql (maximum brightness)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2372974.375	-9729	$+2\overset{d}{.}057$	vis	1	Pigott (1785, 1786)
2373242.4	-9692	+4.5	vis	0	Dreyer[1] (1918)
2373627.64	-9638	+2.24	vis	0.5	Wurm (1811, 1813)
2374732.96	-9484	+2.34	vis	0.5	Wurm (1811, 1813)
2376161.03	-9285	+2.24	vis	0.5	Wurm (1811, 1813)
2377337.67	-9121	+1.90	vis	0.5	Wurm (1811, 1813)
2379490.69	-8821	+1.90	vis	0.5	Wurm (1811, 1813)
2380559.76	-8672	+1.63	vis	0.5	Wurm (1811, 1813)
2382741.50	-8368	+1.65	vis	0.5	Wurm (1811, 1813)
2385109.938	-8038	+1.761	vis	0.5	Westphal (1818)
2387463.409	-7710	+1.263	vis	1	Müller[2] (1925)
2388805.484	-7523	+1.288	vis	1	Müller[2] (1925)

Table 34 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2393376.905	-6886	+1.^{d}129	vis	1	Argelander (1869)
2393707.131	-6840	+1.225	vis	1	Argelander (1869)
2393821.756	-6824	+1.023	vis	1	Hagen[3] (1903)
2394051.380	-6792	+0.991	vis	1	Argelander (1869)
2394453.322	-6736	+1.036	vis	1	Argelander (1869)
2394611.136	-6714	+0.962	vis	1	Hagen[3] (1903)
2394769.094	-6692	+1.032	vis	1	Argelander (1869)
2395185.296	-6634	+0.983	vis	1	Argelander (1869)
2395200.224	-6632	+1.558	vis	0	Schmidt (1857a)
2395522.878	-6587	+1.258	vis	0.5	Schmidt (1857a)
2395551.255	-6583	+0.929	vis	1	Hagen[3] (1903)
2395551.391	-6583	+1.065	vis	1	Argelander (1869)
2395874.175	-6538	+0.895	vis	1	Argelander (1869)
2396261.541	-6484	+0.718	vis	1	Argelander (1869)
2396283.351	-6481	+0.998	vis	0.5	Schmidt (1857a)
2396396.19	-6465	-0.99	vis	0	Johnson (1856)
2396426.683	-6461	+0.795	vis	1	Hagen[3] (1903)
2396613.685	-6435	+1.202	vis	0.5	Schmidt (1857a)
2396993.874	-6382	+1.024	vis	0.5	Schmidt (1857a)
2397352.656	-6332	+0.969	vis	1	Argelander (1869)
2397395.573	-6326	+0.826	vis	1	Hagen[3] (1903)
2397711.653	-6282	+1.129	vis	0.5	Schmidt (1857a)
2397718.608	-6281	+0.908	vis	1	Argelander (1869)
2398084.609	-6230	+0.895	vis	1	Argelander (1869)
2398106.369	-6227	+1.125	vis	0.5	Schmidt (1857a)
2398414.885	-6184	+1.041	vis	0.5	Schmidt (1857a)
2398421.883	-6183	+0.863	vis	1	Hagen[3] (1903)
2398429.109	-6182	+0.912	vis	1	Argelander (1869)
2398680.075	-6147	+0.692	vis	0.5	Nielsen[4] (1931)
2398780.686	-6133	+0.829	vis	1	Argelander (1869)
2398802.079	-6130	+0.692	vis	0.5	Schmidt (1857a)
2398816.210	-6128	+0.469	vis	0.5	Schönfeld (1861)
2399175.853	-6078	+1.275	vis	0	Schmidt (1858b)
2399196.587	-6075	+0.479	vis	0.5	Schönfeld (1861)
2399196.852	-6075	+0.744	vis	1	Argelander (1869)
2399455.111	-6039	+0.641	vis	1	Hagen[3] (1903)
2399519.614	-6030	+0.553	vis	0.5	Schönfeld (1861)
2399541.797	-6027	+1.206	vis	0	Schmidt (1858b)
2399548.651	-6026	+0.883	vis	1	Argelander (1869)
2399570.167	-6023	+0.869	vis	1	Zinner, Wachmann[5] (1931)
2399900.206	-5977	+0.778	vis	1	Argelander (1869)
2399907.526	-5976	+0.921	vis	0.5	Schmidt (1859)
2399943.175	-5971	+0.687	vis	0.5	Auwers (1859)
2400237.465	-5930	+0.731	vis	1	Argelander (1869)
2400265.899	-5926	+0.458	vis	0.5	Schmidt (1860a)
2400345.043	-5915	+0.658	vis	0.5	Hagen[3] (1903)
2400352.169	-5914	+0.607	vis	1	Zinner, Wachmann[5] (1931)
2400646.369	-5873	+0.561	vis	0.5	Schmidt (1861)
2401026.824	-5820	+0.649	vis	0.5	Schmidt (1862)
2401385.376	-5770	+0.364	vis	0.5	Schmidt (1863)
2401407.30	-5767	+0.76	vis	0.5	Argelander (1869)
2401758.446	-5718	+0.244	vis	0.5	Schmidt (1864)
2402103.076	-5670	+0.390	vis	0.5	Schmidt (1865)
2402447.778	-5622	+0.609	vis	1	Valentiner[6] (1900)
2402476.448	-5618	+0.572	vis	0.5	Schmidt (1866)

Table 34 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2402828.175	-5569	+0^{d}.639	vis	1	Valentiner[6] (1900)
2402842.370	-5567	+0.481	vis	0.5	Schmidt (1867)
2403151.203	-5524	+0.714	vis	1	Valentiner[6] (1900)
2403201.246	-5517	+0.520	vis	0.5	Schmidt (1868)
2403495.761	-5476	+0.789	vis	1	Valentiner[6] (1900)
2403574.122	-5465	+0.206	vis	0.5	Schmidt (1869)
2403581.672	-5464	+0.579	vis	1	Zinner, Wachmann[5] (1931)
2403911.589	-5418	+0.366	vis	0.5	Schmidt (1870)
2403947.745	-5413	+0.639	vis	1	Valentiner[6] (1900)
2404284.954	-5366	+0.541	vis	1	Valentiner[6] (1900)
2404306.298	-5363	+0.355	vis	0.5	Schmidt (1871)
2404320.694	-5361	+0.397	vis	0.5	Hagen[3] (1903)
2404428.631	-5346	+0.683	vis	1	Zinner, Wachmann[5] (1931)
2404664.986	-5313	+0.206	vis	0.5	Schmidt (1872)
2404672.514	-5312	+0.557	vis	1	Valentiner[6] (1900)
2405031.145	-5262	+0.352	vis	0.5	Schmidt (1873)
2405031.354	-5262	+0.561	vis	1	Valentiner[6] (1900)
2405404.072	-5210	+0.088	vis	0	Schmidt (1874)
2405440.472	-5205	+0.605	vis	1	Valentiner[6] (1900)
2405741.913	-5163	+0.623	vis	1	Valentiner[6] (1900)
2405756.388	-5161	+0.744	vis	0.5	Schmidt (1875)
2406086.069	-5115	+0.296	vis	0.5	Chandler (1877)
2406143.432	-5107	+0.245	vis	0.5	Schmidt (1876)
2406143.561	-5107	+0.374	vis	0.5	Valentiner[6] (1900)
2406387.710	-5073	+0.514	vis	1	Belyavsky[7] (1910)
2406487.839	-5059	+0.168	vis	0.5	Schmidt (1877)
2406846.584	-5009	+0.077	vis	0	Schwab (1878)
2406861.175	-5007	+0.314	vis	0.5	Schmidt (1878)
2407019.283	-4985	+0.534	vis	1	Sawyer (1881)
2407212.600	-4958	+0.079	vis	0	Schwab (1879)
2407234.281	-4955	+0.230	vis	0.5	Schmidt (1879)
2407342.340	-4940	+0.638	vis	1	Schur (1895)
2407578.810	-4907	+0.276	vis	0.5	Schmidt (1880)
2407952.132	-4855	+0.407	vis	0.5	Schmidt (1881)
2408102.827	-4834	+0.391	vis	1	Schur (1895)
2408317.990	-4804	+0.252	vis	0.5	Schmidt (1882)
2408339.613	-4801	+0.345	vis	1	Sawyer (1882)
2408662.712	-4756	+0.491	vis	1	Sawyer (1883)
2408691.304	-4752	+0.376	vis	0.5	Schmidt (1883)
2409050.359	-4702	+0.594	vis	0.5	Schmidt (1884)
2409129.065	-4691	+0.356	vis	1	Schur (1895)
2410298.843	-4528	+0.326	vis	0.5	Hagen (1891)
2410873.405	-4448	+0.749	vis	0	Yendell (1889)
2411956.611	-4297	+0.268	vis	0.5	Nielsen[8] (1931)
2412315.431	-4247	+0.252	vis	0.5	Nielsen[9] (1931)
2413420.703	-4093	+0.306	vis	1	Stratonov (1904)
2413442.276	-4090	+0.349	vis	1	Plassmann (1900)
2413449.561	-4089	+0.457	vis	0.5	Sperra (1896)
2413686.167	-4056	+0.231	vis	1	Nijland (1923)
2413772.466	-4044	+0.409	vis	1	Plassmann (1900)
2413801.116	-4040	+0.352	vis	1	Stratonov (1904)
2413822.674	-4037	+0.380	vis	0.5	Sperra (1897b)
2414160.005	-3990	+0.405	vis	1	Stratonov (1904)
2414188.425	-3986	+0.118	vis	0.5	Sperra (1898)
2414188.597	-3986	+0.290	vis	1	Nijland (1923)

Table 34 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2414195.781	-3985	+0.d297	vis	1	Pickering (1904)
2414195.874	-3985	+0.390	vis	1	Plassmann (1900)
2414511.75	-3941	+0.49	vis	0.5	Grouiller[10] (1920)
2414518.830	-3940	+0.393	vis	0.5	Luizet (1903)
2414540.180	-3937	+0.213	pg	2	Schwarzschild (1900)
2414540.396	-3937	+0.429	vis	1	Plassmann (1900)
2414633.699	-3924	+0.434	vis	1	Zinner[11] (1932)
2414877.540	-3890	+0.266	vis	0.5	Luizet (1903)
2414891.843	-3888	+0.216	vis	1	Plassmann (1900)
2415222.205	-3842	+0.448	vis	0.5	Luizet (1903)
2415265.31	-3836	+0.49	vis	0.5	Grouiller[12] (1920)
2415293.886	-3832	+0.362	vis	1	Plassmann (1901)
2415408.985	-3816	+0.633	vis	0.5	Tass (1908)
2415422.993	-3814	+0.287	vis	0.5	Tass[13] (1925)
2415595.527	-3790	+0.580	vis	0.5	Kopff (1902)
2415631.188	-3785	+0.357	vis	1	Plassmann (1905)
2415631.231	-3785	+0.400	vis	0.5	Luizet (1903)
2415638.26	-3784	+0.25	vis	0.5	Grouiller[12] (1920)
2415975.731	-3737	+0.417	vis	0.5	Luizet (1903)
2415982.944	-3736	+0.453	vis	1	Plassmann (1905)
2416018.547	-3731	+0.172	vis	1	Roy, de Roy (1905)
2416169.386	-3710	+0.300	vis	1	Bilt (1924a)
2416348.694	-3685	+0.189	vis	0.5	Plassmann (1905)
2416399.103	-3678	+0.361	vis	1	Götz (1906)
2416499.422	-3664	+0.206	vis	0.5	Nielsen[14] (1931)
2416542.542	-3658	+0.266	vis	0.5	Olivier (1952)
2416671.377	-3640	-0.081	vis	0	Terkán (1905)
2416722.04	-3633	+0.35	vis	0.5	Grouiller[12] (1920)
2416736.319	-3631	+0.271	vis	1	Plassmann (1905)
2416844.019	-3616	+0.320	vis	1	Zinner[11] (1932)
2416937.329	-3603	+0.332	vis	1	Tass[13] (1925)
2416951.604	-3601	+0.254	vis	1	Bilt (1924a)
2416994.742	-3595	+0.331	vis	0.5	Schiller (1906)
2417116.659	-3578	+0.244	vis	1	Plassmann (1905, 1906)
2417123.76	-3577	+0.17	vis	0.5	Grouiller[12] (1920)
2417131.041	-3576	+0.272	vis	0.5	Furness[15] (1913)
2417339.128	-3547	+0.234	vis	1	Lohnert (1909)
2417411.5	-3537	+0.8	vis	0	Gliese[16] (1942)
2417475.556	-3528	+0.304	vis	1	Plassmann (1908)
2417497.014	-3525	+0.232	vis	0.5	Olivier (1952)
2417662.026	-3502	+0.179	pg	2	Kohlschlütter (1910)
2417748.290	-3490	+0.322	vis	1	Bilt (1924a)
2417841.751	-3477	+0.486	vis	0.5	Plassmann (1908)
2418207.341	-3426	+0.062	vis	0.5	Favaro (1909)
2418300.805	-3413	+0.229	vis	1	Lau (1908)
2418387.07	-3401	+0.37	vis	0.5	Hornig (1915)
2418552.224	-3378	+0.462	vis	0.5	Olivier (1952)
2418573.567	-3375	+0.275	vis	1	Mündler (1911)
2418860.55	-3335	+0.19	vis	0.5	Grouiller[12] (1920)
2418896.391	-3330	+0.146	vis	0.5	Becker[9] (1925)
2419004.13	-3315	+0.23	vis	0.5	Grouiller[17] (1920)
2419083.04	-3304	+0.20	vis	0.5	Grouiller[18] (1920)
2419434.858	-3255	+0.357	vis	1	Zinner[11] (1932)
2419636.08	-3227	+0.63	vis	0	Hornig (1915)
2419649.812	-3225	+0.009	vis	0.5	Breson (1913)

Table 34 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2419678.821	-3221	+0ᵈ.311	vis	1	Dziewulski (1930)
2419908.394	-3189	+0.229	vis	1	Hoffmeister (1915)
2420059.118	-3168	+0.241	vis	0.5	Olivier (1952)
2420188.362	-3150	+0.304	vis	1	Zinner[11] (1932)
2420683.572	-3081	+0.320	vis	1	Zinner[11] (1932)
2420726.441	-3075	+0.128	vis	0.5	Becker[9] (1925)
2421020.809	-3034	+0.250	vis	1	Luyten (1922)
2421429.935	-2977	+0.302	vis	1	Zinner[11] (1932)
2421444.228	-2975	+0.242	vis	0.5	Nielsen[19] (1931)
2421480.100	-2970	+0.230	vis	1	Lacchini (1921b)
2421487.176	-2969	+0.129	vis	1	Nijland (1923)
2421752.841	-2932	+0.255	vis	1	Luyten (1922)
2421788.8	-2927	+0.3	vis	0.5	Gliese[20] (1942)
2421824.507	-2922	+0.154	vis	1	Nijland (1923)
2422183.339	-2872	+0.149	vis	1	Nijland (1923)
2422233.583	-2865	+0.156	vis	0.5	Becker[9] (1925)
2422578.119	-2817	+0.209	vis	1	Nijland (1923)
2422585.217	-2816	+0.130	pe	3	Wylie (1922)
2422872.282	-2776	+0.125	vis	1	Zinner[11] (1932)
2422901.053	-2772	+0.189	vis	1	Nielsen[21] (1922)
2422908.345	-2771	+0.305	vis	1	Nijland (1923)
2422915.399	-2770	+0.182	vis	1	Zverev (1936)
2422922.433	-2769	+0.039	vis	0.5	Perepelkin (1925)
2422987.030	-2760	+0.046	vis	0.5	Nielsen[22] (1931)
2423267.112	-2721	+0.235	vis	1	Zverev (1936)
2423331.599	-2712	+0.131	vis	0.5	Becker[9] (1925)
2423331.637	-2712	+0.169	vis	1	Nielsen[21] (1929)
2423403.511	-2702	+0.276	vis	1	Parenago (1938a)
2423618.719	-2672	+0.182	vis	1	Grouiller et al.[17] (1932)
2423661.705	-2666	+0.108	vis	1	Hopmann (1924)
2423991.888	-2620	+0.161	pe	1	Pettit et al. (1933)
2424379.226	-2566	-0.045	vis	0.5	Parenago (1938a)
2424659.251	-2527	+0.087	pg	2	Tiercy (1930)
2424716.700	-2519	+0.122	vis	1	Kukarkin (1940)
2424731.082	-2517	+0.151	vis	1	Lipinski (1933)
2424989.329	-2481	+0.036	vis	1	Grouiller et al.[23] (1932)
2425154.388	-2458	+0.030	vis	0.5	Nielsen[9] (1931)
2425247.743	-2445	+0.087	vis	1	Collmann (1930)
2425448.768	-2417	+0.164	vis	1	Kukarkin (1940)
2425484.637	-2412	+0.149	vis	1	Parenago (1938a)
2425620.964	-2393	+0.118	vis	1	Zverev (1936)
2425663.952	-2387	+0.045	vis	1	Lipinski (1933)
2425750.158	-2375	+0.131	vis	1	McLaughlin (1934b)
2426087.426	-2328	+0.092	vis	1	Grouiller et al.[23] (1932)
2426144.825	-2320	+0.077	pe	2	Bernheimer (1931)
2426180.843	-2315	+0.212	vis	1	McLaughlin (1934b)
2426202.34	-2312	+0.18	vis	0.5	Gliese[9] (1942)
2426503.81	-2270	+0.23	vis	0.5	Gliese (1942)
2426510.767	-2269	+0.006	vis	1	Zverev (1936)
2426525.271	-2267	+0.156	vis	1	McLaughlin (1934b)
2426525.329	-2267	+0.214	vis	1	Kukarkin (1940)
2426596.873	-2257	-0.009	vis	1	Parenago (1938a)
2426747.812	-2236	+0.218	vis	1	Lipinski (1933)
2426912.889	-2213	+0.231	vis	1	McLaughlin (1934b)
2426919.965	-2212	+0.130	vis	1	Florya, Kukarkina (1953)

Table 34 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2426998.99	-2201	+0.d21	vis	0.5	Gliese (1942)
2427293.050	-2160	+0.025	vis	1	Florya, Kukarkina (1953)
2427321.85	-2156	+0.12	vis	0.5	Horn (1934)
2427601.65	-2117	+0.03	vis	0.5	Gliese[9] (1942)
2427623.348	-2114	+0.193	vis	1	Krebs (1935)
2427723.742	-2100	+0.113	vis	1	Florya (1938)
2428010.893	-2060	+0.194	vis	1	Krebs (1937)
2428047.28	-2055	+0.70	vis	0	Sures (1937)
2428297.874	-2020	+0.106	vis	0.5	Nielsen (1940)
2428427.131	-2002	+0.181	vis	1	Krebs (1937)
2429001.21	-1922	+0.12	vis	0.5	Gliese (1942)
2429101.74	-1908	+0.18	vis	0.5	Gliese[9] (1942)
2430249.903	-1748	+0.063	vis	0.5	Kappert (1942)
2430501.072	-1713	+0.046	vis	1	Nielsen (1952)
2432065.59	-1495	+0.04	vis	0.5	Pohl[24] (1951)
2432072.857	-1494	+0.126	vis	0.5	Solov'yov (1949)
2432353.20	-1455	+0.58	vis	0	Pohl[24] (1951)
2432826.427	-1389	+0.139	vis	1	Lacchini (1949)
2432840.57	-1387	-0.07	vis	0.5	Pohl (1951)
2433041.561	-1359	-0.029	pe	3	Eggen (1951)
2433070.318	-1355	+0.021	pe	3	Stebbins et al. (1952)
2433170.95	-1341	+0.18	vis	0.5	Pohl[25] (1951)
2433931.93	-1235	+0.42	vis	0	Domke, Pohl (1952)
2434240.61	-1192	+0.51	vis	0	Pohl[26] (1955)
2434599.96	-1142	+1.02	vis	0	Marks[27] (1959)
2434613.353	-1140	+0.058	pe	3	present paper[28]
2434656.80	-1134	+0.44	vis	0	Pohl (1955)
2435022.70	-1083	+0.33	vis	0	Rudolph[29] (1959)
2435295.084	-1045	-0.001	pe	2	Irwin (1961)
2435574.994	-1006	+0.016	pe	2	Walraven et al. (1958)
2435725.92	-985	+0.23	vis	0.5	Rudolph[30] (1959)
2435976.91	-950	+0.04	vis	0.5	Rudolph (1959)
2436041.619	-941	+0.154	vis	1	Azarnova (1959)
2436084.514	-935	-0.012	vis	1	Vinnik (1958)
2436127.95	-929	+0.36	vis	0	Rudolph (1959)
2436141.921	-927	-0.019	pe	1	Oke (1961a)
2436809.40	-834	+0.02	vis	0.5	Braune et al.[29] (1962)
2436996.019	-808	+0.048	vis	1	Azarnova (1962)
2437153.956	-786	+0.097	vis	1	Mayall[31] (1964, 1966)
2437283.056	-768	+0.015	pe	3	Mitchell et al. (1964)
2437857.173	-688	-0.006	pe	1	Williams (1966)
2438287.635	-628	-0.148	vis	0.5	Romejko (1965)
2438926.521	-539	+0.008	pe	3	Wisniewski et al. (1968)
2439027.37	-525	+0.38	vis	0	Busch (1977b)
2439751.893	-424	+0.056	pe	2	Sudzius (1969)
2439888.148	-405	-0.047	pe	2	Schmidt (1971)
2440469.93	-324	+0.42	vis	0	Busch (1977b)
2440843.15	-272	+0.45	vis	0	Braune et al. (1972)
2440928.854	-260	+0.032	pe	3	Pel (1976)
2440957.482	-256	-0.047	pe	2	Evans (1976)
2441589.7	-168	+0.6	vis	0	Braune et al.[32] (1973)
2442794.781	0	+0.008	pe	3	present paper
2442945.512	+21	+0.028	pe	2	Dean (1977)

Remarks: (observers) [1] Herschel; [2] Schwerd; [3] Heis;

[4] Oudemans; [5] Winnecke; [6] Schönfeld; [7] Glasenapp; [8] Knopf; [9] Plassmann; [10] Guillaume; [11] Hartwig; [12] Markwick; [13] Terkán; [14] Balanowsky; [15] Whitney; [16] Stempell; [17] Moye; [18] Venturi; [19] Selivanov; [20] Jockisch; [21] Johansson; [22] Aurino; [23] Loreta; [24] Auzinger; [25] Menzel; [26] Born; [27] Szczepkowski; [28] Detre; [29] Pohl; [30] Masuch; [31] Evans, Lacchini, Nightingale, Orchiston, Staer, Vodrazka; [32] Pfeiffer

Table 35 O-C residuals for η Aql

(median brightness)

Obs.Med.J.D.	E	O-C	Type	w	Reference
2404284.071	-5366	$+0\overset{d}{.}576$	vis	1	Valentiner[1] (1900)
2413800.226	-4040	+0.380	vis	1	Stratonov (1904)
2414539.219	-3937	+0.170	pg	2	Schwarzschild (1900)
2417661.050	-3502	+0.121	pg	2	Kohlschlütter (1910)
2422584.269	-2816	+0.100	pe	3	Wylie (1922)
2428009.917	-2060	+0.136	vis	1	Krebs (1937)
2430500.103	-1713	-0.005	vis	1	Nielsen (1952)
2433040.657	-1359	-0.015	pe	3	Eggen (1951)
2433069.399	-1355	+0.020	pe	3	Stebbins et al. (1952)
2438925.610	-539	+0.015	pe	3	Wisniewski et al. (1968)
2440927.943	-260	+0.039	pe	3	Pel (1976)
2442793.834	0	-0.021	pe	3	present paper

Remark: [1] Observer: Schönfeld

V 600 Aquilae

The light and colour curves of V 600 Aql are plotted in Fig. 53. The O-C residuals have been computed with the formula:

$$C = 2442904.119 + 7\overset{d}{.}238748 \times E \quad .$$

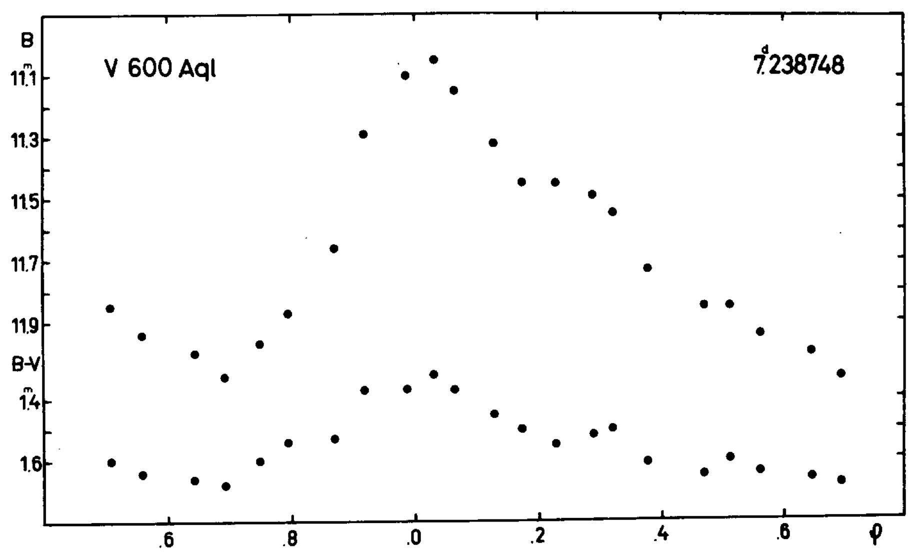

Figure 53 B and B-V curves of V 600 Aql

If the first two points in the O-C diagram (Table 36) are reliable, a period change must have occurred during an epoch before J.D. 2428000. Unfortunately, neither the epoch of the period change nor the former value of the period can be determined.

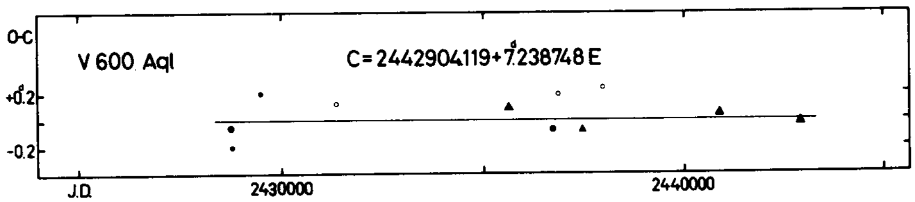

Figure 54 O-C diagram of V 600 Aql

Table 36 O-C residuals for V 600 Aql

Obs.Max.J.D.	E	O-C	Type	w	Reference
2415224.4	-3824	$+1^{d}.3$	pg	0.5	Tsessevich (1946)
2418924.2	-3313	+2.1	pg	0.5	Tsessevich (1946)
2428752.309	-1955	-0.058	pg	1	Kurochkin (1948)
2428773.9	-1952	-0.2	pg	0.5	Tsessevich (1946)
2429490.9	-1853	+0.2	pg	0.5	Tsessevich (1946)
2431336.72	-1598	+0.12	vis	0.5	Tsessevich (1946)
2431670.42	-1552	+0.84	vis	0	Tsessevich (1946)
2435622.024	-1006	+0.085	pe	3	Walraven et al. (1958)
2436707.675	-856	-0.076	pg	1	Chupilko (1961)
2436838.235	-838	+0.187	vis	0.5	Voigtländer (1964)
2437453.264	-753	-0.078	pe	2	Mitchell et al. (1964)
2437960.293	-683	+0.239	vis	0.5	Voigtländer (1964)
2440877.304	-280	+0.034	pe	3	Pel (1976)
2442904.092	0	-0.027	pe	3	present paper

V 336 Aquilae

The B-V amplitude of this Cepheid is smaller (see Fig. 55) than was determined by *Schaltenbrand* and *Tammann* (1971). This is likely to result from the one-sided deviation of the data points from the normal curve (due to the scatter) which tends to decrease the amplitude in this particular case.

Table 37 O-C residuals for V 336 Aql

Obs.Max.J.D.	E	O-C	Type	w	Reference
2414870.38	-3858	$+0^{d}.90$	pg	0	Kurochkin (1958)
2427600.31	-2115	0.00	vis	0.5	Selivanov (1935)
2427651.60	-2108	+0.17	pg	0.5	Harwood (1938)
2427826.901	-2084	+0.171	vis	1	Beyer (1936)
2429842.588	-1808	-0.039	pg	1	Solov'yov (1948)
2429908.428	-1799	+0.065	pg	1	Kapko (1963)
2430777.427	-1680	-0.109	pg	1	Kapko (1963)
2431266.830	-1613	-0.073	pg	1	Solov'yov (1948)
2433078.301	-1365	+0.012	pg	1	Filatov (1961)

Table 37 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2433187.854	-1350	$+0\overset{d}{.}006$	pg	1	Kurochkin (1958)
2433867.048	-1257	-0.070	pg	1	Filatov (1961)
2434400.317	-1184	+0.009	pg	1	Filatov (1961)
2434546.235	-1164	-0.153	pg	1	Kapko (1963)
2435364.444	-1052	+0.011	pe	2	Walraven et al. (1958)
2435525.042	-1030	-0.079	pg	1	Filatov (1961)
2435758.924	-998	+0.076	pe	3	Weaver et al. (1960)
2437285.337	-789	-0.042	pe	2	Mitchell et al. (1964)
2437577.17	-749	-0.37	pg	0	Jetschke (1969)
2437869.46	-709	-0.24	pg	0.5	Jetschke (1969)
2438322.12	-647	-0.42	pg	0	Jetschke (1969)
2438614.43	-607	-0.27	pg	0.5	Jetschke (1969)
2438936.50	-563	+0.42	pg	0	Jetschke (1969)
2439286.33	-515	-0.34	pg	0	Jetschke (1969)
2439593.01	-473	-0.43	pg	0	Jetschke (1969)
2440842.452	-302	+0.037	pe	3	Pel (1976)
2443048.212	0	-0.004	pe	3	present paper

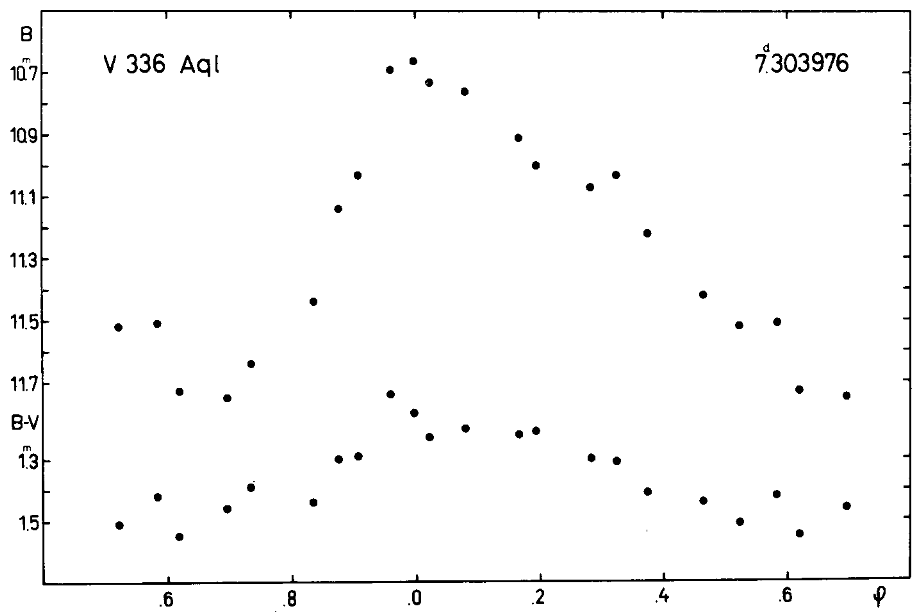

Figure 55 B and B-V curves of V 336 Aql

The O-C residuals have been derived using the formula:

$$C = 2443048.216 + 7\overset{d}{.}303976 \times E \quad .$$

The O-C diagram in Fig. 56 shows a constant period thus the possible period variation reported in the G.C.V.S. (*Kukarkin* et al. 1969-1970) cannot be confirmed.

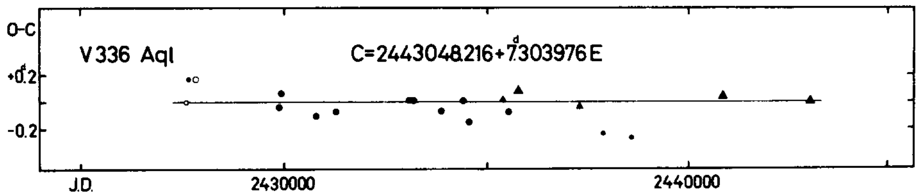

Figure 56 O-C diagram of V 336 Aql

BB Herculis

The classification of this variable is doubtful. The large radial velocity suggests its belonging to Population II (CW group) (2nd Suppl. to the G.C.V.S.; *Kukarkin* et al. 1974), but the light and colour curves (see Fig. 57) are common for a Population I or classical Cepheid. The variable has a faint companion within the edge of the diaphragm.

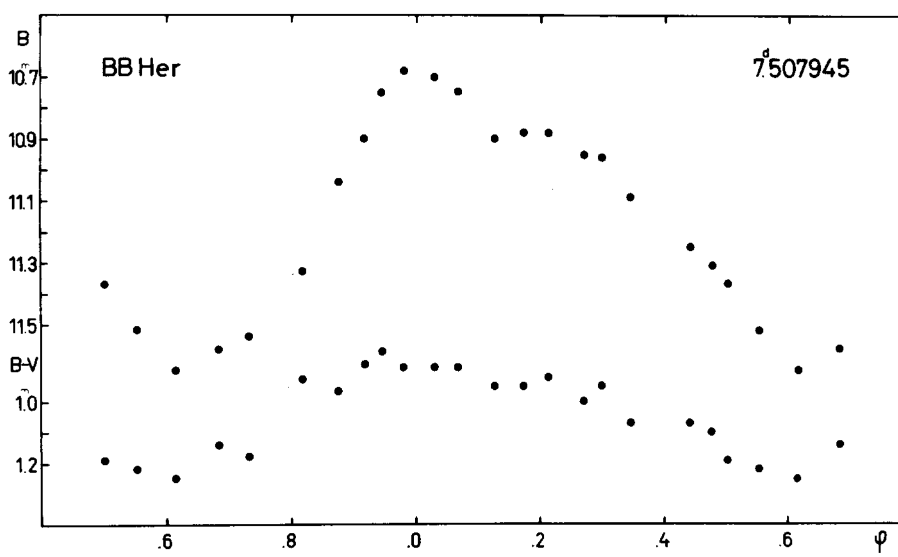

Figure 57 B and B-V curves of BB Her

The O-C residuals have been computed with the formula:

$C = 2442679.289 + 7\overset{d}{.}507945 \times E$.

The O-C diagram in Fig. 58 shows one change in the period:

before J.D. 2430700 $P = 7\overset{d}{.}507696$,

after J.D. 2430700 $P = 7\overset{d}{.}507945$.

Table 38 O-C residuals for BB Her

Obs.Max.J.D.	E	O-C	Type	w	Reference
2418924.548	-3164	+0.^{d}397	pg	1	Parenago (1934a)
2424780.209	-2384	-0.139	pg	0.5	Albitzky (1928)
2425869.158	-2239	+0.158	vis	1	Kukarkin (1940)
2425884.218	-2237	+0.202	vis	1	Jacchia (1930)
2426034.278	-2217	+0.103	pg	1	Lassovszky (1931)
2426184.488	-2197	+0.154	vis	1	Jacchia (1930)
2429818.197	-1713	+0.018	pg	1	Mergentaler (1948)
2430546.475	-1616	+0.025	pg	1	Mergentaler (1948)
2433121.605	-1273	-0.070	pe	3	Eggen et al. (1957)
2433279.360	-1252	+0.018	pg	1	Solov'yov (1957)
2433542.091	-1217	-0.029	pg	1	Fridel' (1961)
2434037.752	-1151	+0.108	pg	1	Koval' (1957)
2434045.140	-1150	-0.012	pg	1	Solov'yov (1957)
2434600.745	-1076	+0.005	pg	1	Solov'yov (1957)
2434961.220	-1028	+0.098	pg	1	Solov'yov (1957)
2435344.023	-977	-0.004	pg	1	Solov'yov (1957)
2435449,141	-963	+0.003	pe	2	Walraven et al. (1958)
2435644.263	-937	-0.082	pg	1	Fridel' (1961)
2435696.87	-930	-0.03	pg	0.5	Vasil'yan. et al. (1970)
2436057.23	-882	-0.05	pg	0.5	Vasil'yan. et al. (1970)
2436417.58	-834	-0.08	pg	0.5	Vasil'yan. et al. (1970)
2436492.614	-824	-0.128	pg	1	Fridel' (1961)
2436793.03	-784	-0.03	pg	0.5	Vasil'yan. et al. (1970)
2437160.81	-735	-0.14	pg	0.5	Vasil'yan. et al. (1970)
2437296.203	-717	+0.111	pe	3	Mitchell et al. (1964)
2437551.38	-683	+0.02	pg	0.5	Vasil'yan. et al. (1970)
2437829.164	-646	+0.007	pe	3	Michal.-Smak et al.(1965)
2437866.66	-641	-0.04	pg	0.5	Vasil'yan. et al. (1970)
2438227.088	-593	+0.010	pe	3	Kwee, Braun (1967)
2438257.20	-589	+0.09	pg	0.5	Vasil'yan. et al. (1970)
2438594.95	-544	-0.02	pg	0.5	Vasil'yan. et al. (1970)
2442679.245	0	-0.044	pe	3	present paper

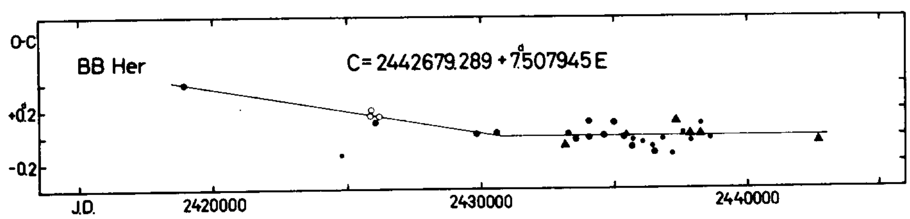

Figure 58 O-C diagram of BB Her

HR 690

This recently discovered Cepheid (*Henriksson* 1977) in constellation Perseus has extremely low amplitudes (see Fig. 59). It would be very important to know whether this variable is a physical member of the h and χ Persei but as far as the photoelectric V magnitudes allow one to draw a conclusion, HR 690 would be overluminous at the distance of the above-mentioned clusters, i.e. its belonging to either cluster is doubtful.

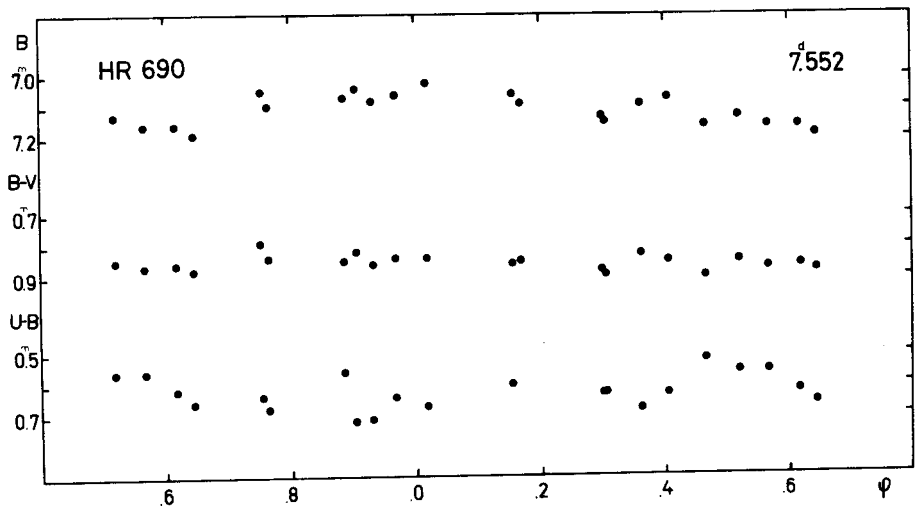

Figure 59 B, B-V and U-B curves of HR 690

The O-C diagram of HR 690 cannot be constructed because no other observations are available. Unfortunately, *Henriksson*'s (1977) observations – which might well be useful in refining the period – have remained unpublished. Using only the present photometric data, however, I determined a slightly shorter period: $7^{d}.552$ instead of the value $7^{d}.572$ given by *Henriksson*.

RS Orionis

The light and colour curves of this Cepheid are shown in Fig. 60. The variable has a B6 photometric companion (*Madore* 1977). The O-C residuals have been computed using the ephemeris:

$$C = 2442820.800 + 7^{d}.566881 \times E \quad .$$

Table 39 O-C residuals for RS Ori

Obs.Max.J.D.	E	O-C	Type	w	Reference
2416533.795	-3474	$+0^{d}.340$	pg	1	Kukarkina (1955)
2418274.055	-3244	+0.217	vis	1	Münch (1909)
2418381.4	-3230	+1.6	vis	0	Luizet (1913)
2419045.912	-3142	+0.252	pg	0.5	Robinson (1933)
2419098.7	-3135	+0.1	vis	0.5	Luizet (1913)
2419514.995	-3080	+0.188	pg	0.5	Hertzsprung (1928)
2419743.4	-3050	+1.6	vis	0	Zinner (1913)
2421936.353	-2760	+0.145	pg	1	Jordan (1929)
2424879.918	-2371	+0.193	vis	1	Rybka (1930)

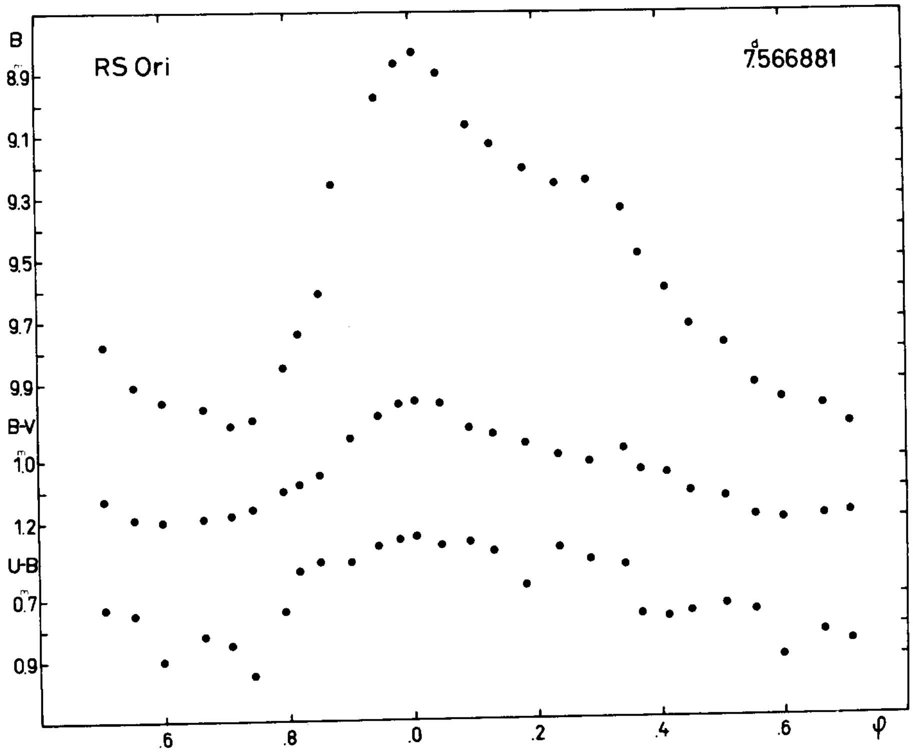

Figure 60 B, B-V and U-B curves of RS Ori

Table 39 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2425235.626	-2324	+0.257	vis	1	Rybka (1930)
2425326.322	-2312	+0.151	pg	1	Puchinskas (1962)
2425522.87	-2286	-0.04	pg	0.5	Martynov (1948)
2426393.242	-2171	+0.141	pg	1	Martynov (1951)
2427233.264	-2060	+0.239	pg	1	Martynov (1951)
2427581.209	-2014	+0.107	pg	1	Puchinskas (1962)
2427982.333	-1961	+0.187	pg	1	Martynov (1951)
2428565.060	-1884	+0.264	pg	1	Martynov (1951)
2429064.379	-1818	+0.169	pg	1	Martynov (1951)
2429306.578	-1786	+0.227	pg	1	Koshkina (1963)
2429798.322	-1721	+0.124	pg	1	Martynov (1951)
2430305.180	-1654	+0.001	vis	0.5	Kukarkina[1] (1955)
2430751.793	-1595	+0.168	pg	1	Martynov (1951)
2431039.385	-1557	+0.219	pg	1	Kukarkina (1955)
2433892.019	-1180	+0.139	pg	1	Koshkina (1963)
2433960.037	-1171	+0.055	pg	1	Solov'yov (1956)
2435178.286	-1010	+0.036	pe	2	Irwin (1961)
2435208.500	-1006	-0.018	pe	2	Walraven et al. (1958)
2436192.193	-876	-0.019	pe	3	Bahner et al. (1977)
2436282.987	-864	-0.028	pg	1	Puchinskas (1962)
2436608.377	-821	-0.014	pg	0.5	Huth (1963)

Table 39 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2436835.395	-791	$-0^{d}.002$	pe	3	Weaver et al. (1960)
2437047.280	-763	+0.010	pe	3	Mitchell et al. (1964)
2437599.63	-690	-0.02	pg	0.5	Ahnert (1964)
2438076.401	-627	+0.035	pg	1	Fridel' (1971)
2440777.748	-270	+0.006	pe	3	Pel (1976)
2442820.794	0	-0.006	pe	3	present paper

Remark: [1] Observer: Lasebnik

The O-C diagram in Fig. 61 can be approximated by two almost parallel lines showing the phenomenon of the rejumping period. Both the period jump and the subsequent rejump occurred between J.D. 2433000 and J.D. 2435000. The values of the period during the other intervals are as follows:

before J.D. 2433000 $P = 7^{d}.566836$,

after J.D. 2435000 $P = 7^{d}.566881$.

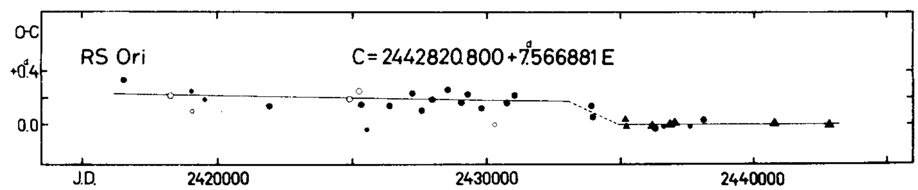

Figure 61 O-C diagram of RS Ori

GH Cygni

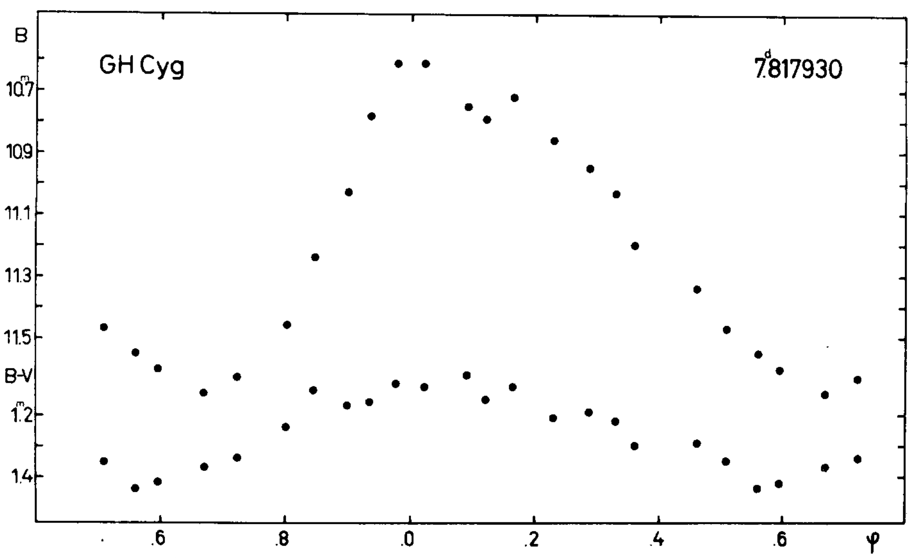

Figure 62 B and B-V curves of GH Cyg

The light and colour curves of this Cepheid variable are shown in Fig. 62. In order to obtain a precise value of the period I was obliged to take into account also the normal maxima with 0.5 weight when fitting a line to the points in the O-C diagram (Fig. 63). The O-C residuals have been computed with the formula:

$$C = 2442743.743 + 7^{d}.817930 \times E \quad .$$

The period has been constant since the discovery of GH Cyg's light variation.

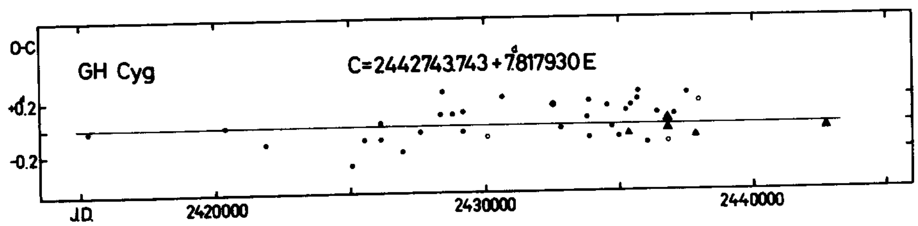

Figure 63 O-C diagram of GH Cyg

Table 40 O-C residuals for GH Cyg

Obs.Max.J.D.	E	O-C	Type	w	Reference
2415310.606	-3509	$-0^{d}.021$	pg	0.5	Parenago (1934b)
2420376.64	-2861	0.00	pg	0.5	Oosterhoff (1935)
2421877.56	-2669	-0.13	pg	0.5	Oosterhoff (1935)
2424755.18	-2301	+0.49	pg	0	Oosterhoff (1935)
2425074.93	-2260	-0.29	pg	0.5	Oosterhoff (1935)
2425528.56	-2202	-0.10	pg	0.5	Oosterhoff (1935)
2425778.30	-2170	-0.53	pg	0	Oosterhoff (1935)
2426130.66	-2125	+0.02	pg	0.5	Nassau, Ashbrook (1942)
2426138.4	-2124	-0.1	pg	0.5	Schneller (1930)
2426231.62	-2112	-0.65	pg	0	Oosterhoff (1935)
2426943.52	-2021	-0.19	pg	0.5	Oosterhoff (1935)
2427600.36	-1937	-0.05	pg	0.5	Nassau, Ashbrook (1942)
2428351.01	-1841	+0.08	pg	0.5	Nassau, Ashbrook (1942)
2428429.36	-1831	+0.25	pg	0.5	Wachmann (1963)
2428804.45	-1783	+0.08	pg	0.5	Wachmann (1963)
2429179.58	-1735	-0.05	pg	0.5	Parenago (1946)
2429195.37	-1733	+0.10	pg	0.5	Wachmann (1963)
2430094.24	-1618	-0.09	vis	0.5	Ashbrook (1943)
2430641.798	-1548	+0.211	pg	0.5	Solov'yov (1944)
2432525.850	-1307	+0.142	pg	1	Duncombe (1949)
2432838.40	-1267	-0.03	pg	0.5	Wachmann (1963)
2433456.435	-1188	+0.393	pg	0	Satyvaldiev (1966)
2433792.262	-1145	+0.049	pg	0.5	Chuprina (1953)
2433878.11	-1134	-0.10	pg	0.5	Wachmann (1963)
2433878.384	-1134	+0.174	pg	0.5	Shteiman (1958)
2434535.052	-1050	+0.136	pg	0.5	Satyvaldiev (1966)
2434714.71	-1027	-0.02	pg	0.5	Wachmann (1963)
2434972.629	-994	-0.092	pg	0.5	Satyvaldiev (1966)
2435222.991	-962	+0.097	pg	0.5	Shteiman (1958)

Table 40 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2435363.542	-944	$-0^{d}.075$	pe	2	Walraven et al. (1958)
2435426.30	-936	+0.14	pg	0.5	Wachmann (1963)
2435676.517	-904	+0.183	pg	0.5	Satyvaldiev (1966)
2435700.03	-901	+0.24	pg	0.5	Huth (1966)
2436051.45	-856	-0.14	pg	0.5	Huth (1966)
2436403.48	-811	+0.08	pg	0.5	Huth (1966)
2436607.157	-785	+0.489	pg	0	Satyvaldiev (1966)
2436802.097	-760	-0.019	pe	3	Oosterhoff (1960)
2436802.152	-760	+0.036	pe	3	Weaver et al. (1960)
2436810.64	-759	+0.71	pg	0	Huth (1966)
2436825.433	-757	-0.137	vis	0.5	Voigtländer (1964)
2437044.54	-729	+0.07	pg	0.5	Huth (1966)
2437513.78	-669	+0.23	pg	0.5	Huth (1966)
2437607.641	-657	+0.278	pg	0	Satyvaldiev (1966)
2437849.630	-626	-0.089	pe	1	Eggen (1969)
2437936.10	-615	+0.38	pg	0	Huth (1966)
2437959.340	-612	+0.170	vis	0.5	Voigtländer (1964)
2438170.72	-585	+0.47	pg	0	Huth (1966)
2438584.27	-532	-0.33	pg	0	Huth (1966)
2442743.705	0	-0.038	pe	3	present paper

<u>VY Cygni</u>

The amplitudes of both the light and the colour variations (see Fig. 64) are smaller than given by *Schaltenbrand* and *Tammann* (1971). Moreover, the descending branch of the light curve

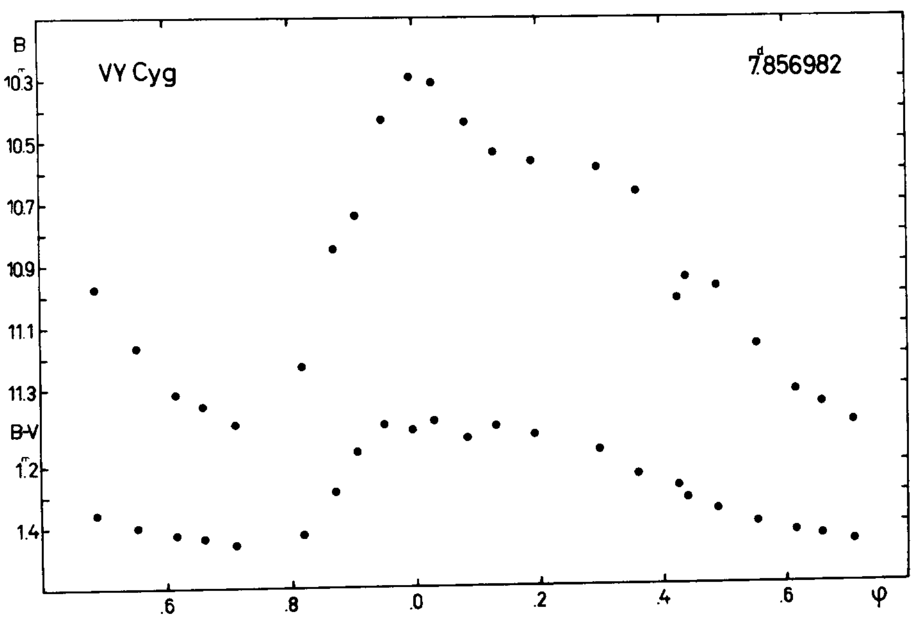

Figure 64 B and B-V curves of VY Cyg

differs from that given by *Nikolov* (1968). The variable has a B7 photometric companion (*Madore* 1977).

The O-C residuals listed in Tables 41 and 42 have been calculated using the formulae:

$$C_{max} = 2443045.282 + 7\overset{d}{.}856982 \times E \quad ,$$
$$C_{med} = 2443044.388 + 7\overset{d}{.}856982 \times E \quad ,$$

for the moments of the maximum and the median brightness, respectively. The O-C diagram in Fig. 65 shows the constancy of the period.

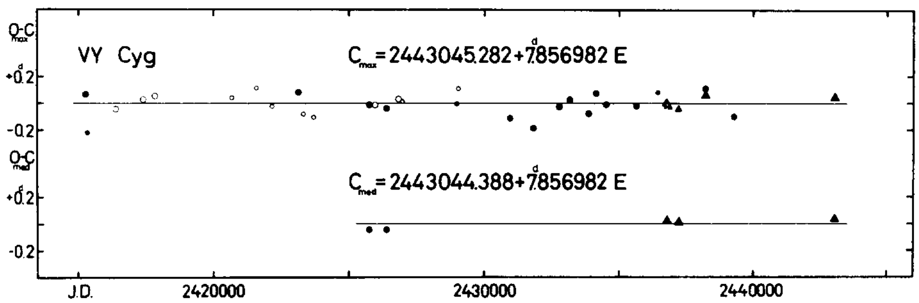

Figure 65 O-C diagram of VY Cyg

Table 41 O-C residuals for VY Cyg (maximum brightness)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2415294.491	-3532	$+0\overset{d}{.}069$	pg	1	Kulikovsky (1932)
2415341.349	-3526	-0.214	pg	0.5	Williams (1904)
2416394.354	-3392	-0.045	vis	1	Williams (1904)
2417400.122	-3264	+0.029	vis	1	Luizet (1907c)
2417424.070	-3261	+0.406	vis	0	Seares (1907a)
2417832.286	-3209	+0.059	vis	1	Zeipel (1908)
2420660.780	-2849	+0.040	vis	0.5	Doberck (1920a)
2421572.265	-2733	+0.115	vis	0.5	Doberck (1920a)
2422169.260	-2657	-0.021	vis	0.5	Doberck (1920a)
2423120.061	-2536	+0.085	pg	1	Henroteau (1924)
2423308.463	-2512	-0.080	vis	0.5	Doberck (1924c)
2423701.287	-2462	-0.105	vis	0.5	Doberck (1924c)
2425759.910	-2200	-0.012	pg	2	Oosterhoff (1933)
2425964.191	-2174	-0.012	vis	1	Lassovszky (1933)
2426396.299	-2119	-0.038	pg	2	Oosterhoff (1933)
2426836.359	-2063	+0.031	vis	1	Lassovszky (1933)
2426946.34	-2049	+0.01	vis	0.5	Miczaika (1936)
2428973.422	-1791	-0.005	pg	0.5	Shnirelman (1940)
2429036.39	-1783	+0.11	vis	0.5	Krebs (1939)
2430953.276	-1539	-0.111	pg	1	Solov'yov (1957)
2431817.470	-1429	-0.185	pg	1	Solov'yov (1957)
2432791.897	-1305	-0.023	pg	1	Solov'yov (1957)
2433169.085	-1257	+0.029	pg	1	Solov'yov (1957)
2433883.966	-1166	-0.075	pg	1	Shteiman (1958)

Table 41 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2434143.395	-1133	+0.074 d	pg	1	Solov'yov (1957)
2434536.164	-1083	-0.006	pg	1	Shteiman (1958)
2435667.557	-939	-0.019	pg	1	Shteiman (1958)
2436092.883	-885	+1.030	pg	0	Korovkina (1958)
2436445.50	-840	+0.08	pg	0.5	Korovkina (1959)
2436775.410	-798	0.000	pe	3	Weaver et al. (1960)
2436806.815	-794	-0.023	pe	3	Oosterhoff (1960)
2437223.217	-741	-0.041	pe	2	Mitchell et al. (1964)
2438229.017	-613	+0.065	pe	3	Kwee, Braun (1967)
2438229.056	-613	+0.104	pg	1	Girnyak (1971)
2439297.405	-477	-0.097	pg	1	Girnyak (1971)
2443045.328	0	+0.046	pe	3	present paper

Table 42 O-C residuals for VY Cyg (median brightness)

Obs.Med.J.D.	E	O-C	Type	w	Reference
2425758.983	-2200	-0.045 d	pg	2	Oosterhoff (1933)
2426395.396	-2119	-0.047	pg	2	Oosterhoff (1933)
2436805.966	-794	+0.022	pe	3	Oosterhoff (1960)
2438228.074	-613	+0.014	pe	3	Kwee, Braun (1967)
2443044.424	0	+0.036	pe	3	present paper

RX Camelopardalis

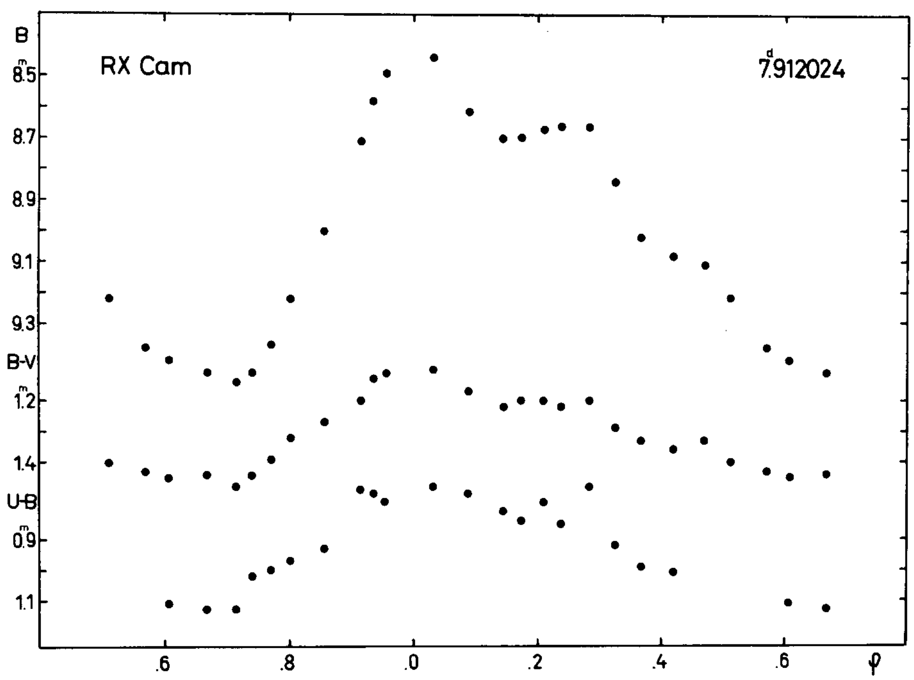

Figure 66 B, B-V and U-B curves of RX Cam

The amplitude of the light curve in the B band plotted in Fig. 66 as well as that of the V light curve is smaller than the corresponding value given by *Schaltenbrand* and *Tammann* (1971). The O-C diagrams could be constructed for both the maximum and the median brightnesses. The O-C residuals have been calculated by the formulae:

$$C_{max} = 2442766.583 + 7\overset{d}{.}912024\times E \quad ,$$
$$C_{med} = 2442765.524 + 7\overset{d}{.}912024\times E \quad .$$

The Cepheid RX Cam has a constant period (see Fig. 67) but a long term wave-like variation can be suspected as if RX Cam were a member of a binary system. In the absence of definite evidence (e.g. spectroscopic or photometric), it cannot be stated that this variable is really a component of a binary system.

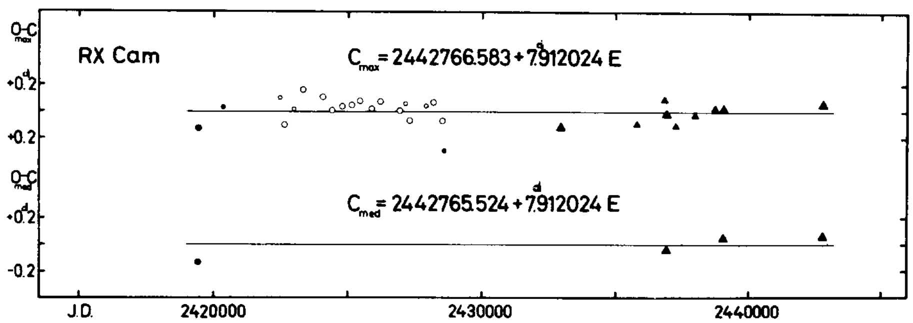

Figure 67 O-C diagram of RX Cam

Table 43 O-C residuals for RX Cam
(maximum brightness)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2419441.807	-2948	$-0\overset{d}{.}129$	pg	1	Hertzsprung (1928)
2420359.763	-2832	+0.032	pg	0.5	Robinson (1933)
2422456.523	-2567	+0.106	vis	0.5	Zakharov (1952)
2422638.293	-2544	-0.101	vis	1	Doberck (1924a)
2422970.715	-2502	+0.016	vis	0.5	Zakharov (1952)
2423311.080	-2459	+0.164	vis	1	Zakharov (1952)
2424054.759	-2365	+0.113	vis	1	Zakharov (1952)
2424394.871	-2322	+0.008	vis	1	Zakharov (1952)
2424774.677	-2274	+0.037	vis	1	Zakharov (1952)
2425138.644	-2228	+0.050	vis	1	Zakharov (1952)
2425431.419	-2191	+0.081	vis	1	Zakharov (1952)
2425874.434	-2135	+0.022	vis	1	Zakharov (1952)
2426198.881	-2094	+0.076	vis	1	Zakharov (1952)
2426926.719	-2002	+0.008	vis	1	Florya, Kukarkina (1953)
2427124.574	-1977	+0.062	vis	0.5	Dziewulski et al. (1946)
2427290.599	-1956	-0.065	vis	1	Florya, Kukarkina (1953)
2427899.933	-1879	+0.043	vis	0.5	Dziewulski (1947)

Table 43 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2428184.795	-1843	+0^d.072	vis	1	Krebs (1937)
2428524.867	-1800	-0.073	vis	1	Krebs (1937)
2428580.028	-1793	-0.296	pg	0.5	Dziewulski et al. (1946)
2432947.647	-1241	-0.114	pe	3	Eggen (1951)
2435795.998	-881	-0.092	pe	2	Prokof'yeva (1961)
2436824.745	-751	+0.092	pe	2	Weaver et al. (1960)
2436903.754	-741	-0.019	pe	3	Bahner et al. (1962)
2437251.794	-697	-0.108	pe	1	Mitchell et al. (1964)
2437963.959	-607	-0.025	pe	1	Williams (1966)
2438739.388	-509	+0.025	pe	1	Haug (1970)
2439040.043	-471	+0.023	pe	3	Wamsteker (1972)
2442766.639	0	+0.056	pe	3	present paper

Table 44 O-C residuals for RX Cam
(median brightness)

Obs.Med.J.D.	E	O-C	Type	w	Reference
2419440.747	-2948	-0^d.130	pg	1	Hertzsprung (1928)
2436902.670	-741	-0.044	pe	3	Bahner et al. (1962)
2439039.006	-471	+0.045	pe	3	Wamsteker (1972)
2442765.587	0	+0.063	pe	3	present paper

W Geminorum

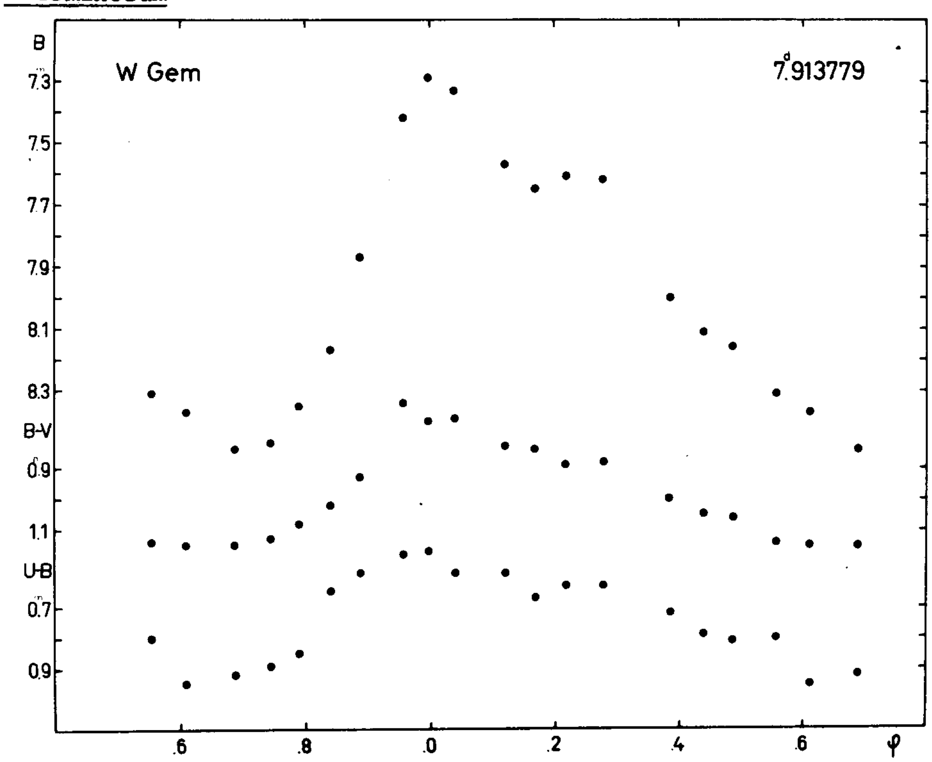

Figure 68 B, B-V and U-B curves of W Gem

The light and colour curves of this Cepheid are shown in Fig. 68. The O-C residuals have been computed with the formula:

$$C = 2442755.191 + 7\overset{d}{.}913779 \times E \quad .$$

The O-C diagram in Fig. 69 shows one change in the period:

before J.D. 2431700 $\quad P = 7\overset{d}{.}914553$,

after J.D. 2431700 $\quad P = 7\overset{d}{.}913779$.

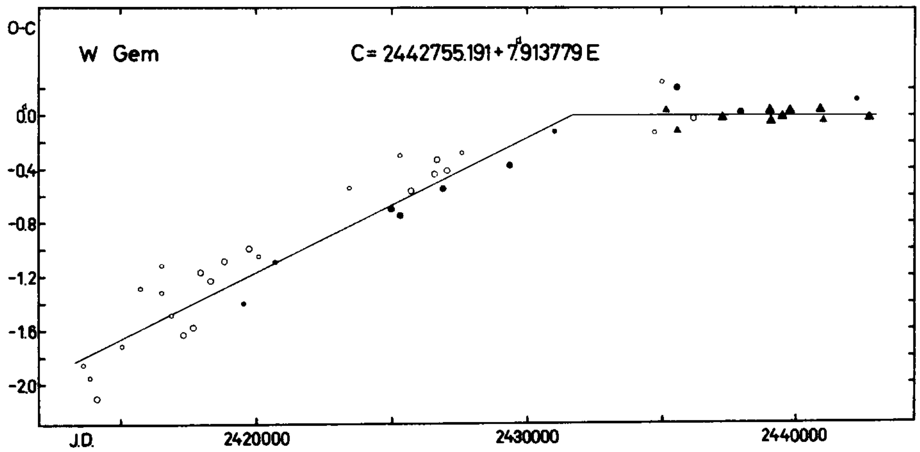

Figure 69 O-C diagram of W Gem

Table 45 O-C residuals for W Gem

Obs.Max.J.D.	E	O-C	Type	w	Reference
2413267.28	-3726	$-1\overset{d}{.}17$	vis	0	Sawyer (1897)
2413630.627	-3680	-1.857	vis	0.5	Luizet (1905b)
2413655.4	-3677	-0.8	vis	0	Yendell (1897a)
2413860.034	-3651	-1.950	vis	0.5	Sperra (1897a)
2414136.862	-3616	-2.104	vis	1	Pickering (1904)
2414738.835	-3540	-1.578	vis	0	Luizet (1905b)
2415047.336	-3501	-1.715	vis	0.5	Luizet (1905b)
2415736.261	-3414	-1.288	vis	0.5	Luizet (1905b)
2415776.092	-3409	-1.026	vis	0	Yendell (1902)
2416155.892	-3361	-1.088	vis	0	Luizet (1905b)
2416503.868	-3317	-1.318	vis	0.5	Luizet (1905b)
2416535.714	-3313	-1.127	vis	0.5	Lau (1906)
2416867.736	-3271	-1.484	vis	0.5	Luizet (1905b)
2417318.675	-3214	-1.630	vis	1	Wendell (1913)
2417659.022	-3171	-1.576	vis	1	Zeipel (1908)
2417944.327	-3135	-1.167	vis	1	Bilt (1926a)
2418324.126	-3087	-1.229	vis	1	Bilt (1926a)
2418807.014	-3026	-1.082	vis	1	Bilt (1926a)
2419518.936	-2936	-1.400	pg	0.5	Hertzsprung (1928)
2419748.851	-2907	-0.984	vis	1	Bilt (1926a)
2420073.25	-2866	-1.05	vis	0.5	Dziewulski (1924)
2420682.567	-2789	-1.094	pg	0.5	Robinson (1933)
2423421.284	-2443	-0.545	vis	0.5	Doberck (1924b)
2424980.146	-2246	-0.697	pg	1	Carrasco (1932)

Table 45 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2425296.648	-2206	$-0^{d}.747$	pg	2	Hellerich (1935)
2425297.250	-2206	-0.145	vis	0	Kukarkin (1940)
2425305.01	-2205	-0.30	vis	0.5	Lause (1937)
2425716.263	-2153	-0.562	vis	1	Zverev (1936)
2426421.135	-2064	-0.016	pg	0	Ahnert (1951)
2426578.991	-2044	-0.436	vis	1	Zverev (1936)
2426666.149	-2033	-0.329	vis	1	Kukarkin (1940)
2426895.429	-2004	-0.549	pg	1	Kox (1935)
2427030.096	-1987	-0.416	vis	1	Florya, Kukarkina (1953)
2427592.11	-1916	-0.28	vis	0.5	Krebs (1940)
2427885.162	-1879	-0.038	pg	0	Ahnert (1951)
2429364.701	-1692	-0.376	pg	1	Koshkina (1963)
2430022.041	-1609	+0.120	pg	0	Ahnert (1951)
2431026.850	-1482	-0.121	pg	0.5	Ahnert (1951)
2433749.628	-1138	+0.318	pg	0	Koshkina (1963)
2434746.32	-1012	-0.13	vis	0.5	Marks (1959)
2435023.68	-977	+0.25	vis	0.5	Marks[1] (1959)
2435165.909	-959	+0.032	pe	1	Irwin (1961)
2435561.781	-909	+0.215	pg	1	Nikulina (1959)
2435569.363	-908	-0.117	pe	2	Walraven et al. (1958)
2436186.729	-830	-0.025	vis	1	Latyshev (1969)
2437270.925	-693	-0.017	pe	3	Mitchell et al. (1964)
2437927.814	-610	+0.028	pg	1	Fridel' (1971)
2439043.666	-469	+0.037	pe	3	Wisniewski et al. (1968)
2439083.150	-464	-0.048	pe	3	Takase (1969)
2439502.615	-411	-0.013	pe	3	Wamsteker (1972)
2439787.563	-375	+0.039	pe	3	present paper[2]
2440927.150	-231	+0.042	pe	3	Pel (1976)
2441006.204	-221	-0.042	pe	2	Evans (1976)
2442296.312	-58	+0.120	pg	0.5	Berdnikov (1977)
2442755.172	0	-0.019	pe	3	present paper

Remarks: [1] Observer: Wroblewski; [2] Observer: Abaffy

U Vulpeculae

The light and colour curves of this variable are plotted in Fig. 70. The period of this Cepheid is very close to eight days, thus a reliable light curve can only be obtained during a time interval longer than one observing season. The lack of the complete light curve was the reason for the epoch of the minimum brightness being given in the G.C.V.S. (*Kukarkin* et al. 1969-1970) instead of that of the light maximum.

The O-C residuals have been derived using the formula:

$$C = 2442526.290 + 7^{d}.990629 \times E \quad .$$

The period of this variable has been constant since the discovery of its light variation.

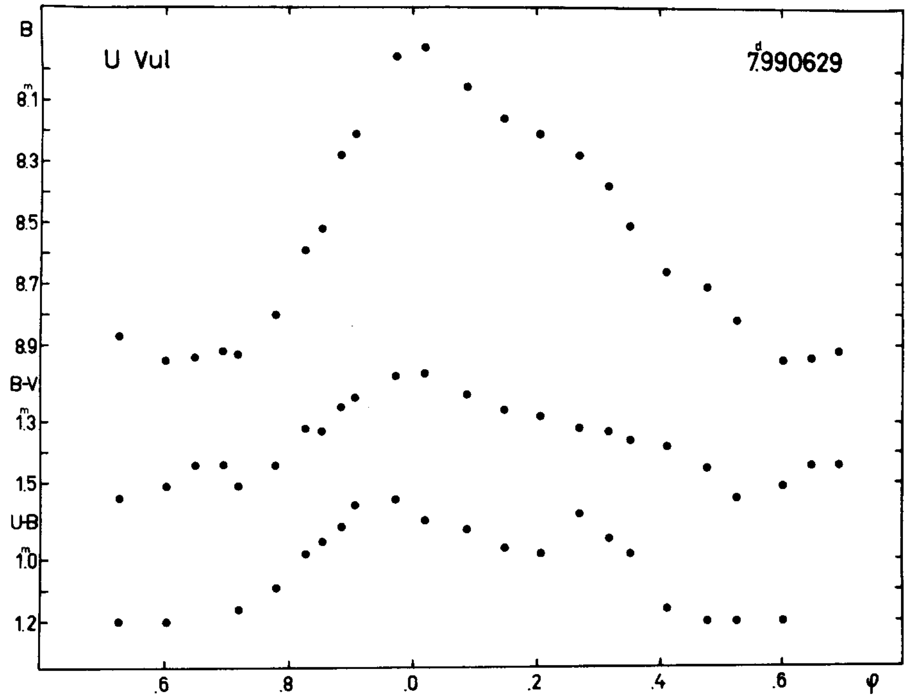

Figure 70 B, B-V and U-B curves of U Vul

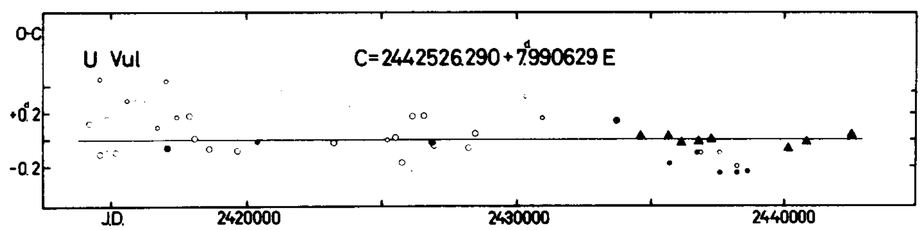

Figure 71 O-C diagram of U Vul

Table 46 O-C residuals for U Vul

Obs.Max.J.D.	E	O-C	Type	w	Reference
2414215.610	-3543	+0.119	vis	1	Müller, Kempf (1898)
2414582.950	-3497	-0.110	vis	1	Wendell (1909)
2414583.509	-3497	+0.449	vis	0.5	Luizet (1899)
2414854.90	-3463	+0.16	vis	0.5	Luizet (1907a)
2414894.60	-3458	-0.09	vis	0.5	Yendell (1901)
2415158.294	-3425	-0.092	vis	1	Zinner[1] (1932)
2415206.95	-3419	+0.62	vis	0	Luizet (1907a)
2415333.31	-3403	-0.87	vis	0	Yendell (1901)
2415574.19	-3373	+0.29	vis	0.5	Luizet (1907a)
2415911.703	-3331	+2.198	vis	0	Prittwitz (1907)
2415940.04	-3327	-1.43	vis	0	Yendell (1904)

Table 46 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2415949.75	-3326	+0.d29	vis	0.5	Luizet (1907a)
2416317.32	-3280	+0.29	vis	0.5	Luizet (1907a)
2416716.65	-3230	+0.09	vis	0.5	Luizet (1907a)
2417036.62	-3190	+0.44	vis	0.5	Luizet (1907a)
2417060.091	-3187	-0.064	pg	1	Wilkens (1906)
2417411.91	-3143	+0.17	vis	0.5	Luizet (1907a)
2417436.36	-3140	+0.65	vis	0	Bemporad (1908)
2417483.1	-3134	-0.6	pg	0	Seares (1907a)
2417883.370	-3084	+0.180	vis	1	Zeipel (1908)
2418082.962	-3059	+0.006	vis	1	Bilt (1926c)
2418610.266	-2993	-0.071	vis	1	Bilt (1926c)
2418954.481	-2950	+0.547	vis	0	Jost (1913)
2419657.029	-2862	-0.081	vis	1	Bilt (1926c)
2420400.228	-2769	-0.010	pg	0.5	Robinson (1933)
2423212.920	-2417	-0.020	vis	1	Doberck (1925)
2425202.6	-2168	0.0	vis	0.5	Lause (1937)
2425498.277	-2131	+0.017	vis	1	Kukarkin (1940)
2425761.777	-2098	-0.173	vis	1	Parenago (1938a)
2426121.709	-2053	+0.180	vis	1	Zverev (1936)
2426553.206	-1999	+0.183	vis	1	Kukarkin (1940)
2426864.635	-1960	-0.022	pg	1	Kox (1935)
2426928.536	-1952	-0.046	vis	1	Florya, Kukarkina (1953)
2428215.011	-1791	-0.062	vis	1	Krebs (1937)
2428454.835	-1761	+0.043	vis	1	Kepinski (1937)
2430308.944	-1529	+0.326	vis	0.5	Model, Löchel (1964)
2430638.38	-1488	+2.15	vis	0	Stein (1944)
2430956.020	-1448	+0.161	vis	0.5	Model, Löchel (1964)
2433480.40	-1132	-0.50	vis	0	Domke, Pohl[2] (1952)
2433704.781	-1104	+0.145	pg	1	Chuprina (1952)
2434591.618	-993	+0.023	pe	3	present paper[3]
2435638.397	-862	+0.029	pe	3	Walraven et al. (1958)
2435694.12	-855	-0.18	pg	0.5	Huth (1966)
2436053.22	-810	-0.66	pg	0	Huth (1966)
2436125.772	-801	-0.024	pe	3	Bahner et al. (1971)
2436436.77	-762	-0.66	pg	0	Huth (1966)
2436724.99	-726	-0.10	pg	0.5	Huth (1966)
2436781.008	-719	-0.020	pe	3	Weaver et al. (1960)
2436812.9	-715	-0.1	vis	0.5	Häussler (1964a)
2437172.15	-670	-0.42	pg	0	Huth (1966)
2437244.483	-661	-0.001	pe	3	Mitchell et al. (1964)
2437579.84	-619	-0.25	pg	0.5	Huth (1966)
2437580.0	-619	-0.1	vis	0.5	Häussler (1964a)
2437827.47	-588	-0.33	pg	0	Huth (1966)
2438235.1	-537	-0.2	vis	0.5	Häussler (1964a)
2438243.06	-536	-0.25	pg	0.5	Huth (1966)
2438642.60	-486	-0.24	pg	0.5	Huth (1966)
2440121.046	-301	-0.065	pe	3	Asteriadis et al. (1977)
2440840.247	-211	-0.020	pe	3	Evans (1976)
2442526.328	0	+0.038	pe	3	present paper

Remarks: [1] Observer: Hartwig
[2] Obs.: Mielke
[3] Obs.: Detre

DL Cassiopeiae

The amplitude of the light and colour curves shown in Fig. 72 are smaller than would be expected from the catalogue compiled by *Schaltenbrand* and *Tammann* (1971). The Cepheid DL Cas is a member of the open cluster NGC 129 (*Arp* et al. 1959).

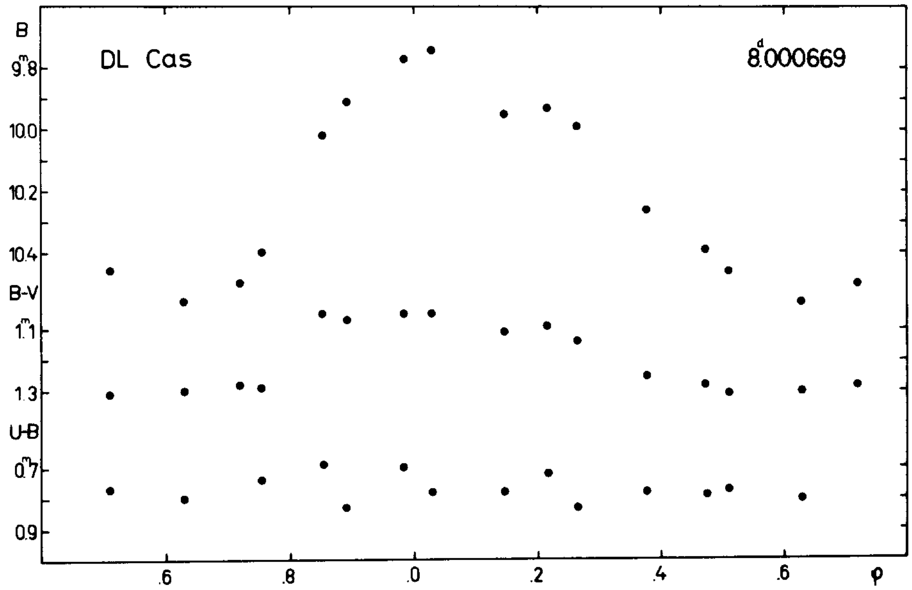

Figure 72 B, B-V and U-B curves of DL Cas

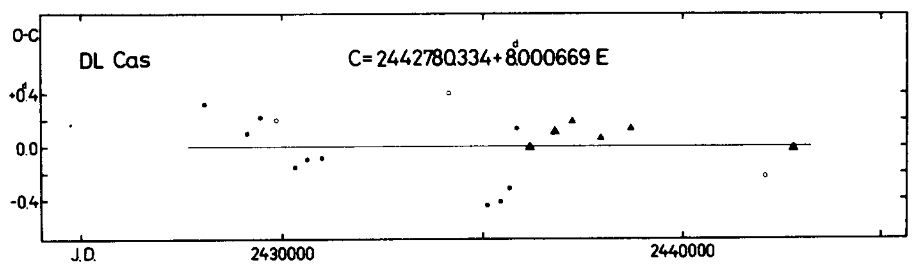

Figure 73 O-C diagram of DL Cas

The O-C residuals have been computed with the ephemeris:

$$C = 2442780.334 + 8\overset{d}{.}000669 \times E \quad .$$

Although DL Cas was reported as having a changing period (*Hoffleit* 1971, *Briggs* 1978), the O-C diagram in Fig. 73 does not confirm the variability in the period.

Table 47 O-C residuals for DL Cas

Obs.Max.J.D.	E	O-C	Type	w	Reference
2426163.82	-2077	$+0^{d}.88$	pg	0	Kiehl, Hopp (1977)
2428059.42	-1840	+0.32	pg	0.5	Ahnert et al. (1943)
2428564.53	-1777	+1.39	pg	0	Ahnert et al. (1943)
2429131.3	-1706	+0.1	pg	0.5	Meshkova (1940)
2429467.44	-1664	+0.22	pg	0.5	Ahnert et al. (1943)
2429851.5	-1616	+0.2	vis	0.5	Loreta (1940)
2430307.13	-1559	-0.16	pg	0.5	Solov'yov (1943)
2430611.22	-1521	-0.10	pg	0.5	Solov'yov (1943)
2430979.26	-1475	-0.09	pg	0.5	Solov'yov (1943)
2434148.0	-1079	+0.4	vis	0.5	Günther (1954)
2435107.24	-959	-0.45	pg	0.5	Romano (1959)
2435435.29	-918	-0.42	pg	0.5	Romano (1959)
2435675.42	-888	-0.32	pg	0.5	Romano (1959)
2435835.880	-868	+0.13	pg	0.5	Zonn, Wroblewska (1964)
2436163.768	-827	-0.013	pe	3	Arp et al. (1959)
2436803.942	-747	+0.108	pe	3	Oosterhoff (1960)
2437220.052	-695	+0.183	pe	2	Mitchell et al. (1964)
2437947.988	-604	+0.058	pe	2	Williams (1966)
2438708.126	-509	+0.133	pe	2	Haug (1970)
2439043.481	-467	-0.541	vis	0	Häussler et al. (1973)
2439411.494	-421	-0.558	vis	0	Häussler et al. (1973)
2440483.510	-287	-0.632	vis	0	Häussler et al. (1973)
2442068.04	-89	-0.23	vis	0.5	Small (1974)
2442780.311	0	-0.023	pe	3	present paper

<u>BK Aurigae</u>

The light and colour curves of this variable are shown in Fig. 74. The O-C residuals have been calculated using the formula:

$$C = 2442825.384 + 8^{d}.002432 \times E .$$

The period of BK Aur has been constant since the discovery of this star's light variation.

Table 48 O-C residuals for BK Aur

Obs.Max.J.D.	E	O-C	Type	w	Reference
2417249.593	-3196	$-0^{d}.018$	pg	1	Kukarkin (1949)
2419002.198	-2977	+0.054	pg	0.5	Ashbrook (1943)
2422699.065	-2515	-0.203	pg	0.5	Ashbrook (1943)
2425499.929	-2165	-0.190	pg	0.5	Ashbrook (1943)
2428396.826	-1803	-0.173	pg	0.5	Ashbrook (1943)
2428525.249	-1787	+0.211	vis	1	Kukarkin (1949)
2428564.95	-1782	-0.10	pg	0.5	Richter (1973)
2428621.20	-1775	+0.13	vis	0.5	Kukarkin[1] (1949)
2428629.154	-1774	+0.084	pg	1	Kukarkin (1949)
2431021.64	-1475	-0.16	pg	0.5	Richter (1973)
2432614.48	-1276	+0.20	pg	0.5	Richter (1973)
2432790.147	-1254	-0.187	pg	1	Shakhovskaya (1964)
2436199.34	-828	-0.03	pg	0.5	Richter (1973)

Table 48 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2436607.456	-777	$-0\overset{d}{.}038$	pg	1	Shakhovskaya (1964)
2436831.503	-749	-0.059	pe	2	Oosterhoff (1960)
2437191.72	-704	+0.05	pg	0.5	Richter (1973)
2437631.762	-649	-0.044	pe	3	Mitchell et al. (1964)
2438087.99	-592	+0.05	pg	0.5	Richter (1973)
2439072.166	-469	-0.077	pe	3	Takase (1969)
2439088.37	-467	+0.12	pg	0.5	Richter (1973)
2439208.368	-452	+0.083	pe	2	Wamsteker (1972)
2440616.78	-276	+0.07	pg	0.5	Richter (1973)
2442825.471	0	+0.087	pe	3	present paper

Remark: [1] Observer: Kanda

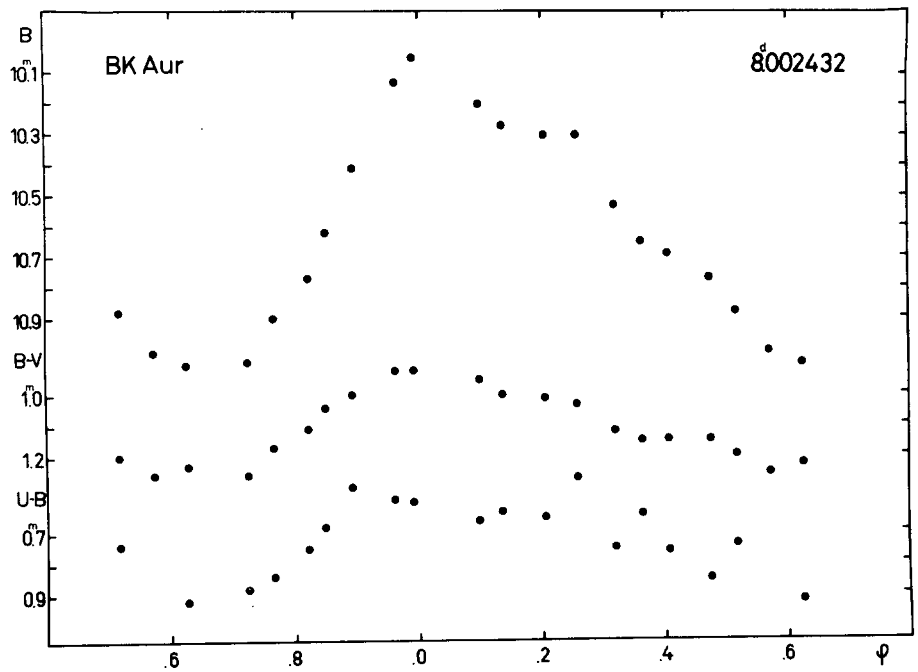

Figure 74 B, B-V and U-B curves of BK Aur

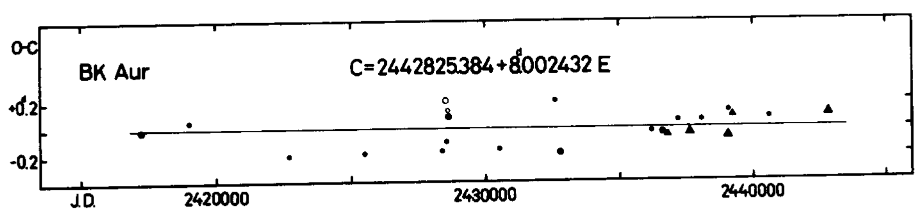

Figure 75 O-C diagram of BK Aur

S Sagittae

The light and colour curves of this Cepheid are plotted in Fig. 76. S Sge is a component of a binary system (*Herbig* and *Moore* 1952) with an orbital period of $676\overset{d}{.}2$.

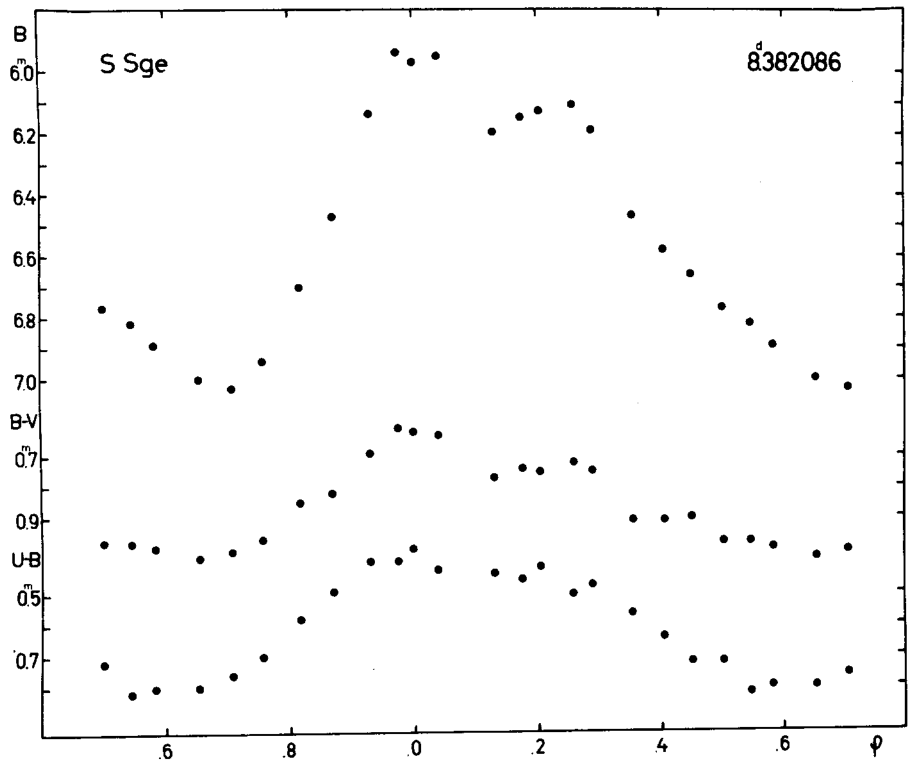

Figure 76 B, B-V and U-B curves of S Sge

The O-C residuals have been computed with the formula:

$$C = 2442678.792 + 8\overset{d}{.}382086 \times E \quad .$$

The O-C diagram in Fig. 77 shows one change in the period:

before J.D. 2418000 $P = 8\overset{d}{.}381968$,

after J.D. 2418000 $P = 8\overset{d}{.}382086$.

Unfortunately, the light-time effect caused by the orbital motion around the common centre of gravity cannot be seen in the O-C diagram. The possible causes of this imperfection are as follows:

- the light-time effect itself has to be small due to the comparatively short orbital period;

- the pulsation period is not short enough to reduce the uncertainty in determining the phase of the individual normal maxima;
- the individual observational series sometimes cover an interval longer than one year. This makes it difficult to point out an effect which has a periodicity with a value shorter than two years.

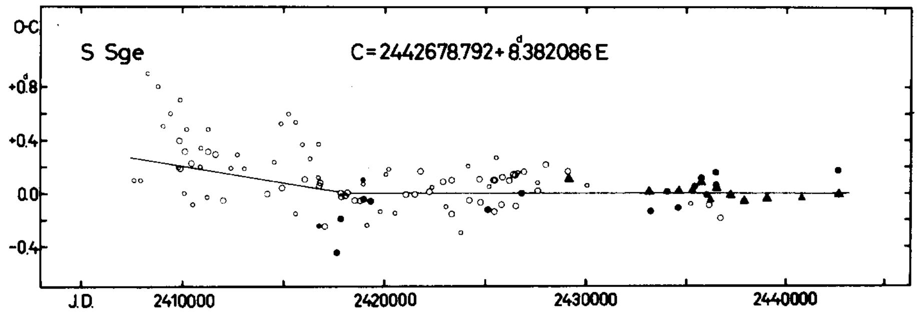

Figure 77 O-C diagram of S Sge

Table 49 O-C residuals for S Sge

Obs.Max.J.D.	E	O-C (d)	Type	w	Reference
2406603.4	-4304	+1.1	vis	0	Chandler (1886)
2407633.4	-4181	+0.1	vis	0.5	Chandler (1886)
2407951.9	-4143	+0.1	vis	0.5	Chandler (1886)
2408313.1	-4100	+0.9	vis	0.5	Chandler (1886)
2408782.4	-4044	+0.8	vis	0.5	Chandler (1886)
2409050.4	-4012	+0.5	vis	0.5	Chandler (1886)
2409444.4	-3965	+0.6	vis	0.5	Chandler (1886)
2409770.925	-3926	+0.203	vis	0.5	Pickering et al. (1890)
2409829.793	-3919	+0.396	vis	1	Gore (1886)
2409888.258	-3912	+0.186	vis	1	Gore[1] (1886)
2409888.74	-3912	+0.7	vis	0.5	Chandler (1886)
2410114.4	-3885	0.0	vis	0.5	Espin (1886)
2410164.999	-3879	+0.319	vis	1	Gore (1887)
2410215.45	-3873	+0.48	vis	0.5	Sawyer (1888)
2410233.6	-3871	+1.8	vis	0	Reed (1888)
2410516.65	-3837	-0.08	vis	0.5	Sawyer (1895)
2410567.248	-3831	+0.227	vis	1	Gore (1888)
2410877.36	-3794	+0.20	vis	0.5	Sawyer (1895)
2410911.55	-3790	+0.86	vis	0	Yendell (1889, 1890a)
2410944.555	-3786	+0.341	vis	0.5	Gore (1889)
2411245.94	-3750	-0.03	vis	0.5	Sawyer (1895)
2411263.052	-3748	+0.318	vis	1	Gore (1890)
2411288.36	-3745	+0.48	vis	0.5	Yendell (1890b)
2411590.73	-3709	+1.10	vis	0	Yendell (1891)
2411615.078	-3706	+0.297	vis	1	Gore (1891)
2411975.160	-3663	-0.051	vis	1	Markwick (1892)
2411976.72	-3663	+1.51	vis	0	Yendell (1892)
2412336.76	-3620	+1.12	vis	0	Yendell (1893)
2412386.12	-3614	+0.19	vis	0.5	Sawyer (1895)

Table 49 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2412680.70	-3579	+1^{d}.39	vis	0	Yendell (1894)
2412713.12	-3575	+0.29	vis	0.5	Sawyer (1895)
2413005.63	-3540	-0.58	vis	0	Yendell (1895)
2413039.92	-3536	+0.18	vis	0.5	Sawyer (1896)
2413786.45	-3447	+0.71	vis	0	Yendell (1897b)
2414196.461	-3398	-0.003	vis	1	Pickering (1904)
2414548.747	-3356	+0.236	vis	0.5	Luizet (1905a)
2414867.554	-3318	+0.523	vis	0.5	Luizet (1905a)
2414868.58	-3318	+1.55	vis	0	Yendell (1900)
2414934.134	-3310	+0.047	vis	1	Prittwitz (1901)
2415228.055	-3275	+0.595	vis	0.5	Luizet (1905a)
2415596.116	-3231	-0.156	vis	0.5	Tass (1925)
2415596.803	-3231	+0.531	vis	0.5	Luizet (1905a)
2415948.687	-3189	+0.367	vis	0.5	Luizet (1905a)
2416082.542	-3173	+0.109	vis	1	Tass (1925)
2416325.776	-3144	+0.262	vis	0.5	Luizet (1905a)
2416711.205	-3098	+0.115	vis	0.5	Terkán (1905)
2416728.221	-3096	+0.367	vis	0.5	Luizet (1905a)
2416761.137	-3092	-0.245	pg	0.5	Lau (1907)
2416761.439	-3092	+0.057	vis	1	Lau (1907)
2416803.375	-3087	+0.082	vis	1	Tass[2] (1925)
2417062.887	-3056	-0.250	vis	1	Wilkens (1906)
2417632.674	-2988	-0.445	pg	1	Jordan (1919)
2417850.862	-2962	-0.191	pg	1	Hertzsprung (1909)
2417851.029	-2962	-0.024	vis	1	Nijland (1923)
2417851.054	-2962	+0.001	vis	1	Zeipel (1908)
2418035.437	-2940	-0.022	vis	1	Tass[3] (1925)
2418152.813	-2926	+0.005	vis	1	Nijland (1923)
2418304.62	-2908	+0.93	vis	0	Severny[4] (1933)
2418521.561	-2882	-0.059	vis	1	Nijland (1923)
2418806.555	-2848	-0.056	vis	1	Nijland (1923)
2418915.683	-2835	+0.105	pg	0.5	Robinson (1933)
2418924.031	-2834	+0.071	vis	0.5	Jost (1913)
2418957.443	-2830	-0.046	pg	2	Hertzsprung (1917)
2419225.47	-2798	-0.24	vis	0.5	Severny[4] (1933)
2419317.859	-2787	-0.059	pg	2	Hertzsprung (1917)
2419770.41	-2733	-0.14	vis	0.5	Severny[4] (1933)
2420064.066	-2698	+0.142	vis	0.5	Hoffmeister (1915)
2420198.22	-2682	+0.18	vis	0.5	Dziewulski (1930)
2420499.64	-2646	-0.15	vis	0.5	Severny[4] (1933)
2421061.385	-2579	-0.007	vis	1	Luyten (1922)
2421237.94	-2558	+0.52	vis	0	Severny[4] (1933)
2421488.867	-2528	-0.012	vis	1	Lacchini (1921a)
2421748.891	-2497	+0.168	vis	1	Luyten (1922)
2422192.987	-2444	+0.013	vis	1	Leiner (1926)
2422327.13	-2428	+0.04	vis	0.5	Severny[4] (1933)
2422897.156	-2360	+0.087	vis	1	{Eaton[5] (1920,1921,1922) Walker[5] (1921,1922)
2423056.23	-2341	-0.10	vis	0.5	Severny[4] (1933)
2423316.013	-2310	-0.160	vis	1	Nielsen (1927)
2423333.038	-2308	+0.100	vis	1	AFOEV (1922, 1923)
2423785.27	-2254	-0.300	vis	0.5	Severny[4] (1933)
2424154.59	-2210	+0.208	vis	0.5	Severny[6] (1933)

Table 49 (cont.)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2424213.006	-2203	$-0^{d}.051$	vis	1	Parenago (1938a)
2424423.12	-2178	+0.51	vis	0	Dziewulski (1930)
2424690.941	-2146	+0.106	vis	1	Leiner (1938)
2424774.587	-2136	-0.069	vis	1	Kukarkin (1940)
2425134.962	-2093	-0.124	pg	1	Hellerich (1935)
2425202.19	-2085	+0.05	vis	0.5	Lause (1937)
2425386.645	-2063	+0.096	vis	1	Leiner (1938)
2425445.085	-2056	-0.138	vis	1	Zverev (1936)
2425453.702	-2055	+0.097	vis	1	Kukarkin (1940)
2425537.692	-2045	+0.266	vis	0.5	Parenago (1938a)
2425797.187	-2014	-0.084	vis	1	Zverev (1936)
2425847.689	-2008	+0.126	vis	1	Leiner (1938)
2426182.943	-1968	+0.096	vis	1	Leiner (1938)
2426384.157	-1944	+0.140	vis	1	Parenago (1938a)
2426451.214	-1936	+0.141	vis	1	Kukarkin (1940)
2426476.126	-1933	-0.094	vis	1	Zverev (1936)
2426585.34	-1920	+0.15	vis	0.5	Miczaika[7] (1937)
2426794.741	-1895	+0.002	pg	1	Kox (1935)
2426920.633	-1880	+0.163	vis	1	Florya, Kukarkina (1953)
2427591.056	-1800	+0.019	vis	1	Krebs (1935)
2427599.498	-1799	+0.079	vis	0.5	Dziewulski (1948)
2428001.975	-1751	+0.216	vis	1	Krebs (1936)
2428052.51	-1745	+0.46	vis	0	Sures (1937)
2429091.599	-1621	+0.168	vis	1	Leiner (1938)
2429141.833	-1615	+0.110	pe	3	Bennett (1939)
2430055.43	-1506	+0.06	vis	0.5	Conceicao-Silva (1948)
2433131.605	-1139	+0.009	pe	3	Eggen (1951)
2433198.520	-1131	-0.133	pg	1	Solov'yov (1959)
2434036.880	-1031	+0.019	pg	1	Solov'yov (1959)
2434598.351	-964	-0.110	pg	1	Solov'yov (1959)
2434615.241	-962	+0.016	pe	3	present paper[8]
2435218.65	-890	-0.08	vis	0.5	Marks (1959)
2435285.815	-882	+0.023	pe	2	Irwin (1961)
2435403.191	-868	+0.050	pg	1	Solov'yov (1959)
2435730.121	-829	+0.078	pe	3	Prokof'yeva (1961)
2435730.154	-829	+0.111	pg	1	Solov'yov (1959)
2436048.551	-791	-0.011	pg	1	Solov'yov (1959)
2436190.964	-774	-0.093	vis	1	Latyshev (1969)
2436207.768	-772	-0.054	pe	1	Svolopoulos (1960)
2436450.962	-743	+0.060	pg	1	Solov'yov (1959)
2436459.445	-742	+0.161	pg	1	Solov'yov (1959)
2436509.621	-736	+0.044	pe	3	Walraven et al. (1958)
2436718.940	-711	-0.189	vis	1	Azarnova (1960)
2437213.656	-652	-0.016	pe	3	Mitchell et al. (1964)
2437917.700	-568	-0.067	pe	3	Walraven et al. (1964)
2439040.928	-434	-0.039	pe	3	Wisniewski et al. (1968)
2440834.696	-220	-0.037	pe	2	Evans (1976)
2442595.144	-10	+0.173	pg	1	Berdnikov (1977)
2442678.783	0	-0.009	pe	3	present paper

Remarks: (observers) [1] Espin; [2] Terkán; [3] Czuczi; [4] Sharbe; [5] Mundt; [6] Vorontsov-Velyaminov; [7] Plassmann; [8] Detre

GQ Orionis

There is a bright NW companion near the variable. The light and colour curves of GQ Ori are plotted in Fig. 78. The value of

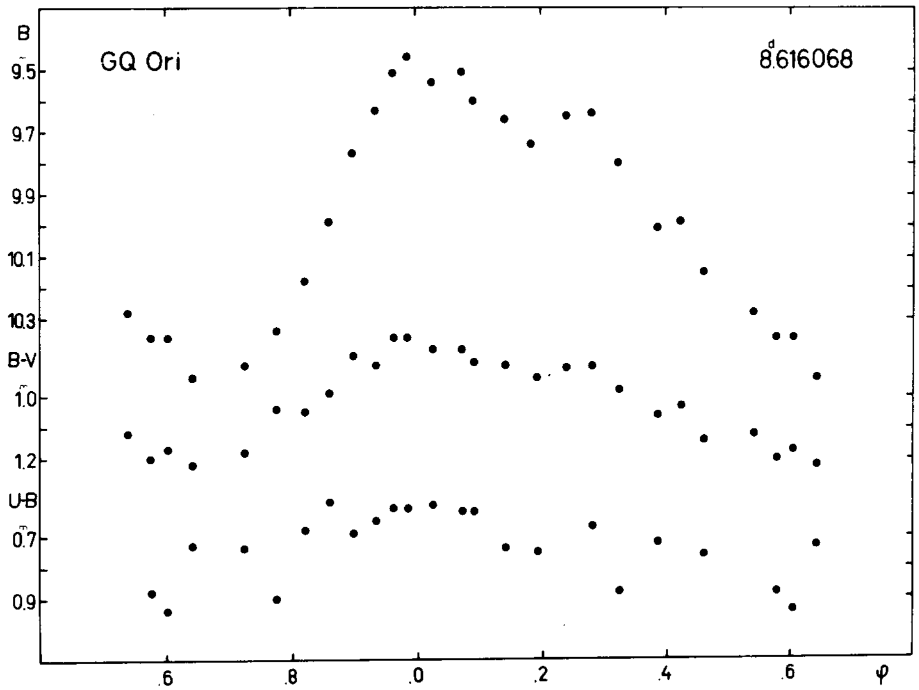

Figure 78 B, B-V and U-B curves of GQ Ori

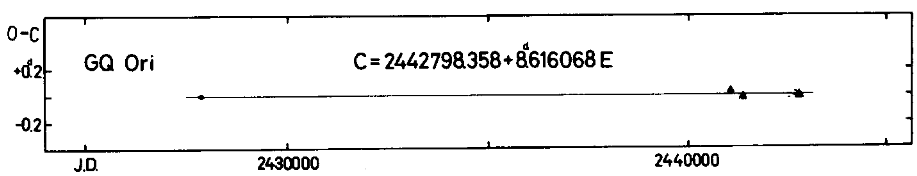

Figure 79 O-C diagram of GQ Ori

the period was determined by a least squares fitting procedure using all the normal maxima in Table 50, i.e. including the early uncertain point with a weight of 0.5 . The O-C residuals have been calculated using the ephemeris:

$$C = 2442798.358 + 8^{d}.616068 \times E \quad .$$

The O-C diagram in Fig. 79 can be approximated by a straight line.

Table 50 O-C residuals for GQ Ori

Obs.Max.J.D.	E	O-C	Type	w	Reference
2427866.7	-1733	$0^{d}.0$	pg	0.5	Kukarkin et al. (1947)
2441066.557	-201	+0.029	pe	2	Pel (1976)
2441368.070	-166	-0.021	pe	3	Wachmann (1976)
2442798.348	0	-0.010	pe	3	present paper

IX Cassiopeiae

According to the G.C.V.S. (*Kukarkin* et al. 1969-1970) this Cepheid belongs to Population II. The light and colour curves of IX Cas are shown in Fig. 80 . The actual value of the period ($P = 9^{d}.1582$) has been determined using the latest photographic

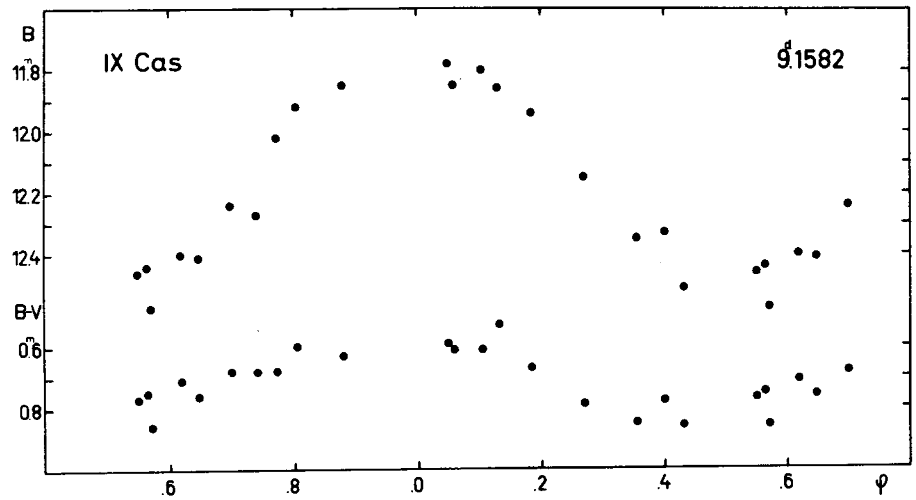

Figure 80 B and B-V curves of IX Cas

and the recent photoelectric observations (see Table 51), but this value is not sufficiently accurate for deriving the O-C residuals. For this reason the O-C residuals have been computed by the formula:

$$C = 2442779.743 + 9^{d}.153375 \times E ,$$

where the value of the period is based only on the photoelectric observations. The O-C diagram in Fig. 81 shows continuous change in the period after J.D. 2428700. Before J.D. 2419000 the epochs of the normal maxima are uncertain because of the unknown trend of the O-C curve between J.D. 2419000 and J.D. 2428000, i.e. during the gap in the observations.

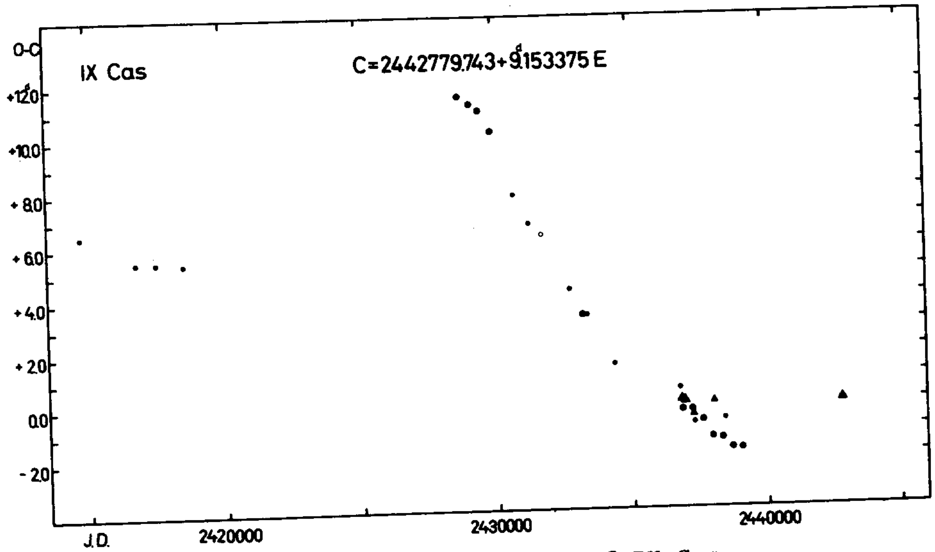

Figure 81 O-C diagram of IX Cas

Table 51 O-C residuals for IX Cas

Obs.Max.J.D.	E	O-C	Type	w	Reference
2414740.3	-3064	+6.5	pg	0.5	Eelsalu[1] (1956)
2416753.0	-2844	+5.5	pg	0.5	Eelsalu[1] (1956)
2417485.3	-2764	+5.5	pg	0.5	Eelsalu[1] (1956)
2418528.7	-2650	+5.4	pg	0.5	Eelsalu[1] (1956)
2428750.013	-1534	+11.547	pg	1	Florya (1949)
2429152.454	-1490	+11.240	pg	1	Florya (1949)
2429481.731	-1454	+10.995	pg	1	Florya (1949)
2429902.019	-1408	+10.228	pg	1	Eelsalu (1956)
2430677.66	-1323	+7.83	pg	0.5	Vasil'yan. et al. (1970)
2431262.38	-1259	+6.74	pg	0.5	Vasil'yan. et al. (1970)
2431701.332	-1211	+6.326	vis	0.5	Tsessevich (1952)
2432733.59	-1098	+4.25	pg	0.5	Vasil'yan. et al. (1970)
2433172.010	-1050	+3.311	pg	1	Eelsalu (1956)
2433355.055	-1030	+3.288	pg	0.5	Vasil'yan. et al. (1970)
2434323.493	-924	+1.469	pg	0.5	Eelsalu (1956)
2436757.32	-658	+0.50	pg	0.5	Vasil'yan. et al. (1970)
2436802.628	-653	+0.039	pe	3	Oosterhoff (1960)
2436838.881	-649	-0.322	pg	1	Makarenko (1969)
2436903.237	-642	-0.039	pe	3	Bahner et al. (1962)
2437195.867	-610	-0.317	pg	1	Makarenko (1969)
2437204.831	-609	-0.507	pe	1	Mitchell et al. (1964)
2437543.22	-572	-0.79	pg	0.5	Vasil'yan. et al. (1970)
2437589.059	-567	-0.720	pg	1	Makarenko (1969)
2437917.951	-531	-1.350	pg	1	Makarenko (1969)
2437974.225	-525	+0.004	pe	1	Williams (1966)
2438293.185	-490	-1.404	pg	1	Makarenko (1969)
2438403.77	-478	-0.66	pg	0.5	Vasil'yan. et al. (1970)
2438677.266	-449	-1.765	pg	1	Makarenko (1969)
2439025.048	-410	-1.811	pg	1	Makarenko (1969)
2442779.743	0	0.000	pe	3	present paper

Remark: [1] Observer: Florya

FN Aquilae

The V and B amplitudes of the light variation in this Cepheid are smaller than given by *Schaltenbrand* and *Tammann* (1971). The O-C residuals have been calculated using the formulae:

$$C_{max} = 2442796.744 + 9\overset{d}{.}481603 \times E \quad ,$$
$$C_{med} = 2442794.772 + 9\overset{d}{.}481603 \times E \quad .$$

The O-C diagram in Fig. 83 shows a constant period in contrast with the period variation reported by *Kukarkin* et al. (1974).

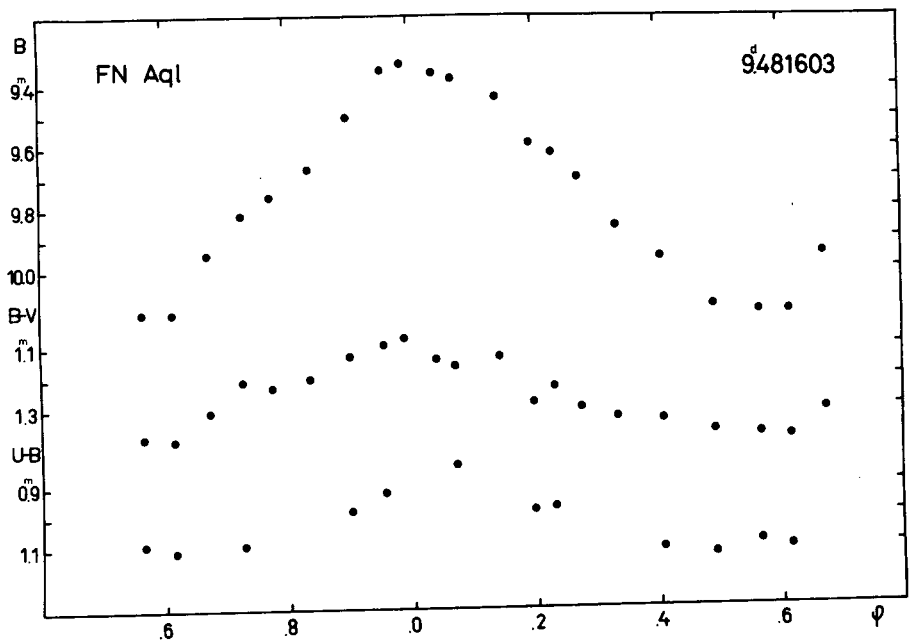

Figure 82 B, B-V and U-B curves of FN Aql

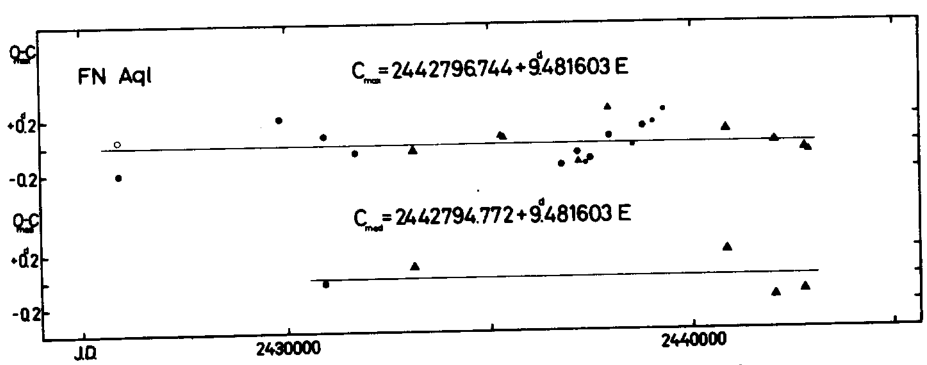

Figure 83 O-C diagram of FN Aql

Table 52 O-C residuals for FN Aql (maximum brightness)

Obs.Max.J.D.	E	O-C	Type	w	Reference
2425910.058	-1781	$+0^{d}.049$	vis	1	Lause (1930)
2425938.250	-1778	-0.204	pg	1	Prager (1931)
2429845.079	-1366	+0.205	pg	1	Solov'yov (1946b)
2430944.810	-1250	+0.070	pg	1	Solov'yov (1946b)
2431712.692	-1169	-0.058	pg	1	Solov'yov (1946b)
2433115.978	-1021	-0.049	pe	3	Eggen (1951)
2435277.891	-793	+0.058	pe	2	Irwin (1961)
2435363.221	-784	+0.054	pe	2	Walraven et al. (1958)
2436794.727	-633	-0.162	pg	1	Makarenko (1969)
2437174.083	-593	-0.070	pg	1	Makarenko (1969)
2437211.945	-589	-0.135	pe	2	Mitchell et al. (1964)
2437354.15	-574	-0.15	pg	0.5	Jetschke (1969)
2437478.031	-561	+0.466	pg	0	Zoj Von Shor (1963)
2437505.895	-558	-0.115	pg	1	Makarenko (1969)
2437885.65	-518	+0.38	pg	0	Jetschke (1969)
2437951.901	-511	+0.256	pe	1	Williams (1966)
2437961.175	-510	+0.049	pg	1	Makarenko (1969)
2438369.20	-467	+0.37	pg	0	Jetschke (1969)
2438558.45	-447	-0.02	pg	0.5	Jetschke (1969)
2438805.113	-421	+0.124	pg	1	Makarenko (1969)
2439051.66	-395	+0.15	pg	0.5	Jetschke (1969)
2439317.24	-367	+0.24	pg	0.5	Jetschke (1969)
2439763.02	-320	+0.39	pg	0	Jetschke (1969)
2440862.589	-204	+0.092	pe	3	Pel (1976)
2442047.698	-79	+0.001	pe	3	Vasil'yanovskaya (1977)
2442796.691	0	-0.053	pe	3	present paper
2442900.967	+11	-0.075	pe	2	Dean (1977)

Table 53 O-C residuals for FN Aql (median brightness)

Obs.Med.J.D.	E	O-C	Type	w	Reference
2430942.800	-1250	$-0^{d}.032$	pg	1	Solov'yov (1946b)
2433114.138	-1021	+0.083	pe	3	Eggen (1951)
2440860.711	-204	+0.186	pe	3	Pel (1976)
2442045.564	-79	-0.161	pe	3	Vasil'yanovskaya (1977)
2442794.652	0	-0.120	pe	3	present paper

DD Cassiopeiae

The light and colour curves of this Cepheid are shown in Fig. 84. There is a B4 photometric companion (*Madore* 1977).

The O-C residuals have been computed using the formula:

$$C = 2442780.493 + 9^{d}.812027 \times E \quad .$$

The O-C diagram in Fig. 85 shows one change in the period:

before J.D. 2418600 $P = 9^{d}.807272$,

after J.D. 2418600 $P = 9^{d}.812027$.

The O-C diagram also shows some sinusoidal variation which is

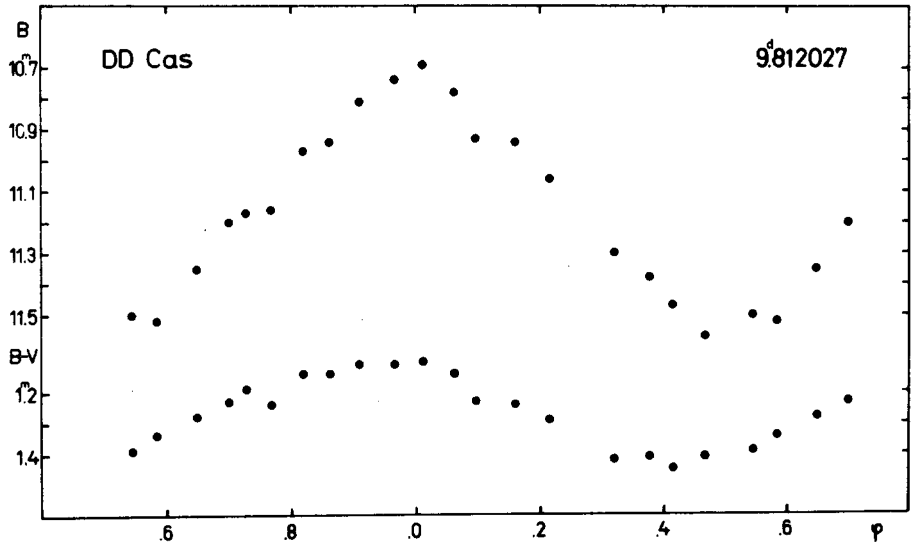

Figure 84 B and B-V curves of DD Cas

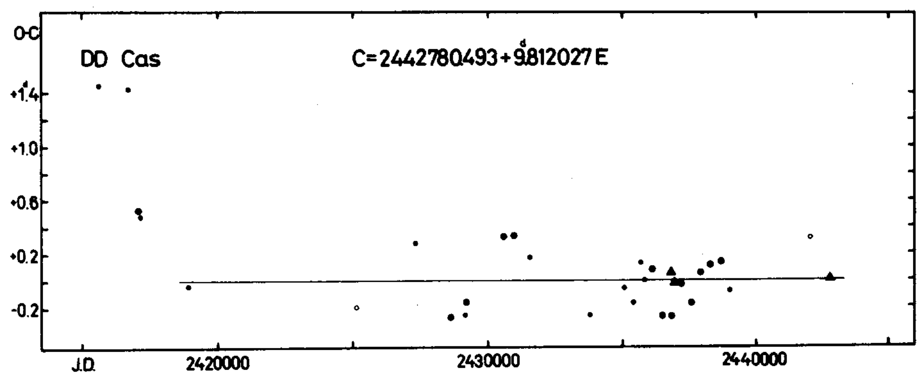

Figure 85 O-C diagram of DD Cas

the result of the light-time effect (orbital motion of DD Cas around the common centre of gravity of the binary system). A search for the orbital period gave the value: $P_{orb} = 8500 \pm 1000$ days which seems to be a reasonable value for a pair consisting of a supergiant and an early type star. The O-C residuals used in determining the orbital period as well as the corresponding orbital phases are listed in Table 55. The arbitrary zero point of the phase calculation is J.D. 2400000. The plot of O-C variation vs. the orbital phase is seen in Fig. 86 . The value of a×*sini* can be determined from the amplitude of this curve:

$a \times sini = 6.5 \times 10^9$ km .

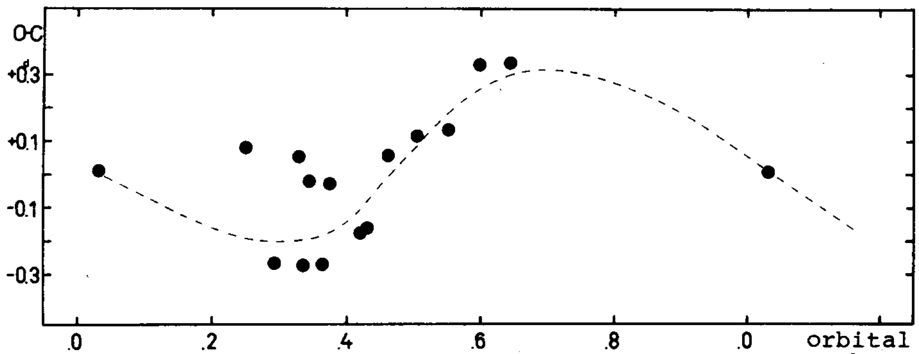

Figure 86 O-C variations due to the orbital motion

Table 54 O-C residuals for DD Cas

Obs.Max.J.D.	E	O-C	Type	w	Reference
2415612.45	-2769	+1ᵈ.46	pg	0.5	Romano (1959)
2416711.37	-2657	+1.43	pg	0.5	Romano (1959)
2417063.699	-2621	+0.529	pg	1	Parenago (1940)
2417151.96	-2612	+0.48	pg	0.5	Romano (1959)
2418927.41	-2431	-0.04	pg	0.5	Romano (1959)
2425128.46	-1799	-0.20	vis	0.5	Stuker (1932)
2427297.39	-1578	+0.28	pg	0.5	Romano (1959)
2427779.22	-1529	+1.32	pg	0	Romano (1959)
2428062.95	-1500	+0.50	pg	0	Romano (1959)
2428583.21	-1447	+0.72	pg	0	Romano (1959)
2428601.841	-1445	-0.273	pg	1	Parenago (1940)
2428740.03	-1431	+0.55	pg	0	Romano (1959)
2429141.51	-1390	-0.26	pg	0.5	Romano (1959)
2429171.047	-1387	-0.165	pg	1	Parenago (1940)
2430584.472	-1243	+0.329	pg	1	Solov'yov (1958b)
2430976.962	-1203	+0.337	pg	1	Solov'yov (1958b)
2431555.704	-1144	+0.170	pg	0.5	Solov'yov (1958b)
2433861.097	-909	-0.263	pg	0.5	Solov'yov (1958b)
2435087.80	-784	-0.06	pg	0.5	Romano (1959)
2435421.30	-750	-0.17	pg	0.5	Romano (1959)
2435686.53	-723	+0.13	pg	0.5	Romano (1959)
2435833.58	-708	0.00	pg	0.5	Zonn, Semeniuk (1959)
2436137.833	-677	+0.080	pg	1	Makarenko (1969)
2436490.716	-641	-0.268	pg	1	Makarenko (1969)
2436805.022	-609	+0.053	pe	3	Oosterhoff (1960)
2436843.942	-605	-0.275	pg	1	Makarenko (1969)
2436932.506	-596	-0.019	pe	3	Bahner et al. (1962)
2437197.423	-569	-0.027	pg	1	Makarenko (1969)
2437579.945	-530	-0.174	pg	1	Makarenko (1969)
2437923.596	-495	+0.056	pg	1	Makarenko (1969)
2438296.512	-457	+0.115	pg	1	Makarenko (1969)
2438689.012	-417	+0.134	pg	1	Makarenko (1969)
2439022.410	-383	-0.077	pg	0.5	Makarenko (1969)
2442064.53	-73	+0.32	vis	0.5	Small (1974)
2442780.502	0	+0.009	pe	3	present paper

Table 55

Obs.Max.J.D.	O-C	phase	Obs.Max.J.D.	O-C	phase
2428601.841	$-0^d.273$	.365	2436932.506	$-0^d.019$	.345
2429171.047	-0.165	.432	2437197.423	-0.027	.376
2430584.472	+0.329	.598	2437579.945	-0.174	.421
2430976.962	+0.337	.644	2437923.596	+0.056	.462
2436137.833	+0.080	.252	2438296.512	+0.115	.505
2436490.716	-0.268	.293	2438689.012	+0.134	.552
2436805.022	+0.053	.330	2442780.502	+0.009	.038
2436843.942	-0.275	.335			

GENERAL REMARKS

Period changes

The investigation of period changes of Cepheids within the period interval 5 - 10 days is of great importance because a comprehensive study of their period changes has not been made so far. The most authentic paper in this field (*Parenago* 1956) contains only seven Cepheids within this period range; four of these seven are investigated in the present paper too. The stability of the period of the remaining more than thirty Cepheids in this sample has not, to all intents and purposes, previously been analysed.

From among the 42 Cepheids in this sample 19 stars showed variability in their period. Two of them (η Aql and δ Cep) have a parabolic O-C graph. This kind of period change may be attributed to the evolution of the stars across the instability strip. The period changes are sudden in most cases as was the case for the short period Cepheids too (Paper I).

The Cepheids showing "stepwise" O-C variations (i.e. rejumping period) can be included with this group. There are two variables in this sample showing this phenomenon, viz. CV Mon (see Fig. 9) and RS Ori (see Fig. 61). It is most interesting that both CV Mon and RS Ori were reported to have a photometric companion (*Madore* 1977). Moreover, three stars from Paper I which belong to the group of Cepheids with a rejumping period (SU Cyg, V 532 Cyg, SZ Tau) are also members of binaries according to *Madore*. The only Cepheid with a rejumping period that is not included in *Madore*'s list is DT Cyg. *Lloyd Evans* (1968), however, pointed out that a change of -3 km/s in normal radial velocity occurred in DT Cyg. Further spectroscopic observations would be highly desirable to reveal any periodic variation in the radial velocity of DT Cyg.

The above mentioned items of evidence make it possible to conclude that any Cepheid showing a rejumping period is a member of a binary system. If the orbital plane of a binary system is nearly parallel to the line of sight, the binary nature can be discovered on the basis of the periodic variation of the radial velocities. The binary motion, however, can also cause apparent period changes due to the simple light-time effect. The numerical treatment of this effect on period changes in RR Lyrae stars was published by *Coutts* (1971).

The apparent period changes in Cepheids caused by the binary motion were first studied in Paper I (FF Aql). The present sample of Cepheids contains two known spectroscopic binaries (AW Per and S Sge). Unfortunately, the apparent period changes in S Sge cannot be detected, partly because the value of the orbital period is too short (less than two years). The value of the orbital period of the system containing AW Per was not known earlier. The periodic O-C variations made it possible to determine the orbital period: P_{orb} = 10300 days (see Figs. 45 and 46). This method is, of course, less accurate than the usual method of determining the orbital period on the basis of radial velocity measurements. Nevertheless, the "O-C variation method" is very useful if there are not enough spectroscopic data as is the case for DD Cas. The binary nature of this Cepheid has not been detected spectroscopically but it can be realized photometrically (*Madore* 1977). The O-C diagram constructed on the basis of the available normal maxima shows a periodicity with P_{orb} = 8500 days (see Figs. 85 and 86). Some long period fluctuation can also be suspected in the O-C diagram of RX Cam (see Fig. 67), but there is no evidence as to its binary nature.

The apparent period change in a periodic variable which is a component of a binary system can only be detected if the inclination of the orbit differs significantly from 0°, otherwise the binary nature can only be discovered photometrically (if the companion has an early spectral type – *Madore* 1977). Since the Cepheids with a rejumping period are thought to be members of binary systems, it may be that one can detect both the apparent period changes due to the orbital motion and the stepwise period changes (rejumping period) in the same system. A check inspection of the O-C diagram for SU Cyg (Paper I, p. 77) was able to reveal a strict periodicity in the O-C variations after the re-jump of the period. The orbital period for SU Cyg is P_{orb} = 3250 ±100 days. The normal maxima, the corresponding O-C residuals and orbital phases (with an arbitrary zero point) are collected in Table 56. The moments of maxima and the O-C values are taken from Table 27 in Paper I, supplemented with several more recent data (*Evans*, 1976; *Fernie*, 1979; *Szabados* unpublished). The value of a×*sin*i can be determined from the amplitude of the O-C variation (see Fig. 87): a×*sin*i=1.5×10^9km. Unfortunately, SU Cyg is exceptional. In other Cepheid-binaries we can only see either the rejumping period or the wave-like apparent period variation, and there are a lot of Cepheids listed by *Madore* (1977) as binaries but their O-C diagrams are incomplete and we are thus unable to prove the binary nature.

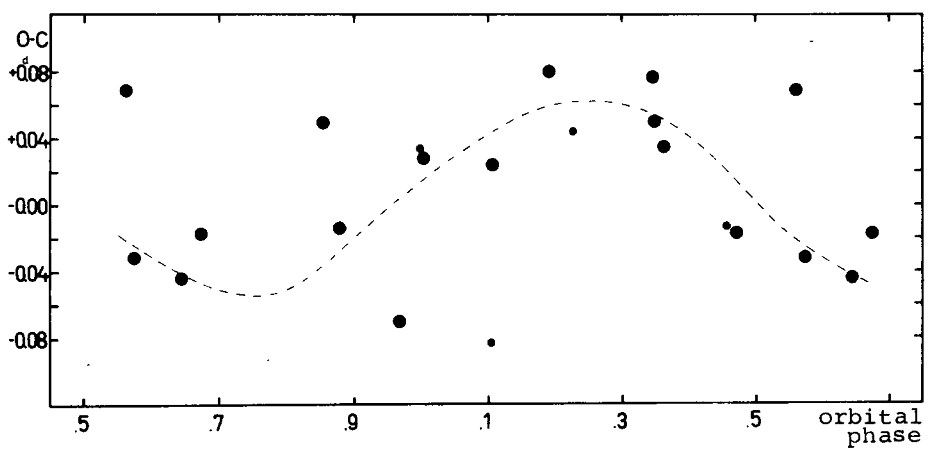

Figure 87 O-C variations of SU Cyg due to the orbital motion

In the light of the above mentioned results, one of the conclusions drawn in Paper I has to be changed. In Paper I the stepwise O-C diagram was declared to be observational evidence supporting the hypothesis on the evolution of Cepheids along the lines of constant period. The real state of affairs is that the period of Cepheids in binary systems tends to be constant, but a phase jump in the light variation of the Cepheid (i.e. a jump in the period and a subsequent rejump) may sometimes occur, which is certainly caused by the influence of the companion star.

Table 56

Obs.Max.J.D.	O-C	phase	Obs.Max.J.D.	O-C	phase
2433126.659	$+0^{d}.081$	.193	2438994.833	$+0^{d}.034$	.999
2433680.364	+0.035	.363	2439014.054	+0.028	.005
2434368.640	-0.032	.575	2439344.655	-0.083	.106
2434591.666	-0.044	.644	2439740.868	+0.044	.228
2435356.949	-0.014	.879	2440482.991	-0.013	.457
2435645.305	-0.070	.968	2440825.321	+0.069	.562
2436099.119	+0.024	.108	2441778.985	+0.050	.855
2437287.383	-0.017	.473	2443378.737	+0.077	.348
2437941.117	-0.017	.674	2443382.554	+0.050	.349

The instability of the period

The quantity $\Delta E \times |\Delta P|/P$, first suggested by *Parenago* (1956) as being a measure of the instability of the period, has also been computed as was done in Paper I (p. 109). Here ΔE is the number of epochs during which the period remained constant. Neither the sudden period jumps in CV Mon and RS Ori nor the apparent period changes due to the orbital motion of the binary Cepheids have been taken into consideration in these computations. Table 57 gives a short summary on the instability of the period for different groups of Cepheids. The successive columns contain the following data:

1. Name of the group
2. Average value of $\Delta E \times |\Delta P|/P$
3. Average value of ΔE
4. Average value of the period of Cepheids on which basis the preceding parameters are derived
5. Number of investigated Cepheids in this group
6. Abbreviation of the name of the group in Table 58

Table 57

Group	$\overline{\Delta E \times \vert\Delta P\vert/P}$	$\overline{\Delta E}$	$\overline{P}$	n	Abbrev.
classical Cepheids with large amplitude	0.12	4040	$6^{d}.90$	34	I
classical Cepheids with small amplitude	0.21	3500	5.86	4	Is
W Vir type variables	1.24*	2370	7.61*	3*	II

The asterisks in Table 57 denote that if the data concerning

Table 58 Summary

Name	Period	*log* P	Norm.Max. Hel.J.D.2440000+	Norm.Med.	(Max.-Med.)/P	Type
FM Aql	6ᵈ114230	0.7863	2678.229	2677.581	0.106	I
FN Aql	9.481603	0.9769	2796.691	2794.652	0.215	I
KL Aql	6.108015	0.7859	3338.696	3337.804	0.146	I?
V 336 Aql	7.303976	0.8636	3048.212	3047.270	0.129	I
V 600 Aql	7.238748	0.8597	2904.092	2903.187	0.125	I
V 733 Aql	6.178748	0.7909	2597.232	2596.225	0.163	Is*
η Aql	7.176735	0.8559	2794.781	2793.834	0.132	I
AO Aur	6.763006	0.8301	2815.764	2814.945	0.121	I
BK Aur	8.002432	0.9032	2825.471	2824.382	0.136	I
RX Cam	7.912024	0.8983	2766.639	2765.587	0.133	I
RS Cas	6.295983	0.7991	2773.489	2772.746	0.118	I
SW Cas	5.440950	0.7357	2989.509	2988.840	0.123	I
VV Cas	6.207059	0.7929	2836.847	2836.220	0.101	I
VW Cas	5.993859	0.7777	2778.699	2777.961	0.123	I
DD Cas	9.812027	0.9918	2780.502	2778.128	0.242	I
DL Cas	8.000669	0.9031	2780.311	2778.935	0.172	I
FM Cas	5.809284	0.7641	2817.752	2816.881	0.150	I
IX Cas	9.1582	0.9618	2779.743	2777.380	0.258	II
CR Cep	6.232964	0.7947	2774.223	2773.263	0.154	Is*
δ Cep	5.366270	0.7297	2756.458	2755.798	0.123	I
VY Cyg	7.856982	0.8953	3045.328	3044.424	0.115	I
GH Cyg	7.817930	0.8931	2743.705	2742.688	0.130	I
MW Cyg	5.954586	0.7749	2923.911	2923.078	0.140	I
V 386 Cyg	5.257606	0.7208	2777.160	2776.508	0.124	I
V 538 Cyg	6.118961	0.7867	2772.938	2771.965	0.159	I
V 924 Cyg	5.571472	0.7460	3066.098	3065.056	0.187	Is
TX Del	6.165907	0.7900	2947.033	2945.862	0.190	II
W Gem	7.913779	0.8984	2755.172	2754.293	0.111	I
RZ Gem	5.529286	0.7427	2714.927	2714.484	0.080	I
BB Her	7.507945	0.8755	2679.245	2678.104	0.152	II?
X Lac	5.444990	0.7360	2738.227	2737.296	0.171	Is*
RR Lac	6.416243	0.8073	2776.720	2775.905	0.127	I
BG Lac	5.331932	0.7269	2673.231	2672.490	0.139	I
CS Mon	6.731920	0.8281	2673.488	2672.445	0.155	I
CV Mon	5.378898	0.7307	2773.160	2772.520	0.119	I
RS Ori	7.566881	0.8789	2820.794	2819.879	0.121	I
GQ Ori	8.616068	0.9353	2798.348	2797.167	0.137	I
AW Per	6.463589	0.8104	2709.062	2708.363	0.108	I
HR 690(Per)	7.552	0.878	3483.394	3481.604	0.237	Is
S Sge	8.382086	0.9234	2678.783	2677.701	0.129	I
U Vul	7.990629	0.9026	2526.328	2525.281	0.131	I
X Vul	6.319543	0.8007	2665.923	2665.101	0.130	I

* Small amplitude, but non-sinusoidal light curve

of the observations

V_{max}	V_{min}	A_V	B_{max}	B_{min}	A_B	U_{max}	U_{min}	A_U	Name
$7^m.89$	$8^m.66$	$0^m.77$	$9^m.05$	$10^m.13$	$1^m.08$	$9^m.75$	$11^m.15$	$1^m.40$	FM Aql
8.22	8.75	0.53	9.34	10.15	0.81	10.23:	11.26	1.03:	FN
9.84	10.56	0.72	10.66	11.71	1.05				KL
9.50	10.27	0.77	10.67	11.74	1.07				V 336
9.73	10.40	0.67	11.08	12.04	0.96				V 600
9.73	10.16	0.43	10.53	11.23	0.70				V 733
3.57	4.30	0.73	4.17	5.29	1.12	4.49	6.05	1.56	η
10.38	11.30	0.92	11.24	12.57	1.33				AO Aur
9.12	9.83	0.71	10.04	11.07	1.03	10.66	11.96	1.30	BK
7.31	8.03	0.72	8.40	9.49	1.09	9.13	10.61	1.48	RX Cam
9.56	10.36	0.80	10.83	11.95	1.12				RS Cas
9.34	9.98	0.64	10.31	11.24	0.93				SW
10.28	11.18	0.90	11.21	12.49	1.28				VV
10.36	11.05	0.69	11.43	12.39	0.96				VW
9.59	10.16	0.57	10.69	11.56	0.87				DD
8.69	9.26	0.57	9.74	10.56	0.82	10.47	11.41:	0.94:	DL
8.85	9.47	0.62	9.71	10.61	0.90				FM
11.19	11.71	0.52	11.79	12.50	0.71				IX
9.45	9.81	0.36	10.79	11.35	0.56				CR Cep
3.50	4.33	0.83	3.95	5.18	1.23	4.30	5.85	1.55	δ
9.20	9.99	0.79	10.29	11.44	1.15				VY Cyg
9.50	10.33	0.80	10.61	11.68	1.07				GH
9.16	9.84	0.68	10.36	11.41	1.05				MW
9.27	9.94	0.67	10.67	11.67	1.00				V 386
10.22	10.73	0.51	11.39	12.17	0.78				V 538
10.57	10.85	0.28	11.36	11.75	0.39				V 924
8.88	9.51	0.63	9.42	10.46	1.04	9.91	11.35	1.44	TX Del
6.55	7.34	0.79	7.29	8.49	1.20	7.81	9.41	1.60	W Gem
9.49	10.46	0.97	10.38	11.67	1.29				RZ
9.80	10.43	0.63	10.69	11.63	0.94				BB Her
8.20	8.57	0.37	9.03	9.62	0.59	9.57	10.36	0.79	X Lac
8.43	9.23	0.80	9.16	10.30	1.14	9.59	11.09	1.50	RR
8.55	9.15	0.60	9.39	10.24	0.85	9.89	10.99	1.10	BG
10.71	11.28	0.57	11.80	12.53	0.73				CS Mon
9.95	10.57	0.62	11.13	11.99	0.86				CV
8.02	8.86	0.84	8.83	10.03	1.20	9.33	10.89	1.56	RS Ori
8.66	9.30	0.64	9.47	10.50	1.03	10.08	11.30	1.22	GQ
7.06	7.84	0.78	7.97	9.06	1.09	8.55	9.82	1.27	AW Per
6.19	6.30	0.11	7.04	7.17	0.13	7.66	7.80	0.14	HR 690
5.31	6.01	0.70	5.92	7.03	1.11	6.32	7.80	1.48	S Sge
6.79	7.50	0.71	7.92	8.95	1.03	8.76	10.17	1.41	U Vul
8.47	9.20	0.73	9.75	10.81	1.06	10.76	12.12	1.36	X

IX Cas are omitted from the statistics the corresponding data in the last line would be: $\overline{\Delta E \times |\Delta P|/P} = 0.19$, $\overline{P} = 6^{d}.84$. This difference shows that the data on W Vir type variables are not to be taken seriously since the number of Population II Cepheids in this sample is too small. The measure of the instability of the period for the small amplitude Cepheids is somewhat smaller than for their shorter period group in Paper I. This means that the instability of the period of the small amplitude Cepheids does not increase with the increase in the value of the period. This evidence supports the hypothesis that the small amplitude Cepheids must be separated from their counterparts with normal amplitude (see Paper I, p. 108). The increasing instability with the increase in the period can be seen in the case of the normal amplitude Cepheids when comparing the corresponding data from the present Table 57 and Table 44 in Paper I: at an average period of $4^{d}.1$ the measure of the instability is 0.03 , and for $\overline{P} = 6^{d}.9$ the instability is 0.12 . All these data, however, are affected by the rather uncertain value of $\overline{\Delta E}$. In most cases the value of ΔE is only a lower limit and its certainly larger real value can only be determined if more period changes are observed.

Summary of the observations

The fundamental parameters of the light variations of the observed Cepheids are summarized in Table 58. The successive columns contain the following data:

1. Name of the Cepheid
2. Period of light variation
3. Decimal logarithm of the period

4-5. The moments of the normal maximum and normal median brightnesses derived from the observations listed in Table 3

6. Fractional period between the moment of median brightness and that of the subsequent light maximum (a measure of the asymmetry of the light curve)

7-9. The maximum and minimum magnitudes and the amplitude in V

10-12. The corresponding quantities for B as under 7-9

13-15. The corresponding quantities for U as under 7-9

16. Type of Cepheid
17. Name of Cepheid

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