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PHOTOMETRY OF THE SHORT PERIOD ECLIPSING BINARY  
 FR ORIONIS

FR Ori (=282.1934=HD 248406;  $m=11.0-11.9$ ; Sp:A7) was discovered photographically by Hoffmeister (1934) to be a short period variable. Soloviev (1937), having used his visual observations, determined a period of the binary with high accuracy. The star was observed visually by Szafraniec (1974) and photographically by Gaposchkin (1954). The following ephemeris of FR Ori is given in the GCVS:

$$\text{Min I} = \text{HJD } 2427862.159 + 0^d 88316217 \times E$$

Our observations of the binary were obtained with the 0.6m telescope at Mt. Maidanak in 1989/92. The star BD+9°972 ( $V=9^m 46$ ;  $U-B=0^m 069$ ;  $B-V=0^m 32$ ,  $V-R=0^m 18$ ; Sp:F2) was chosen as a comparison one. The total number of the observations are 144 in U, 181 in B, 183 in V and 176 in R. Having used all published times of minima we improved the ephemeris of the binary by the method of the least squares:

$$\text{Min I} = \text{HJD } 2432508.4774 + 0^d 88316188 \times E \\
\pm 0.0002 \pm 0.00000004$$

The O-C residuals are given in Table 1 and shown in Figure 1. The light curves of FR Ori are shown in Figure 2. In Table 2 we list the main characteristics of the curves.

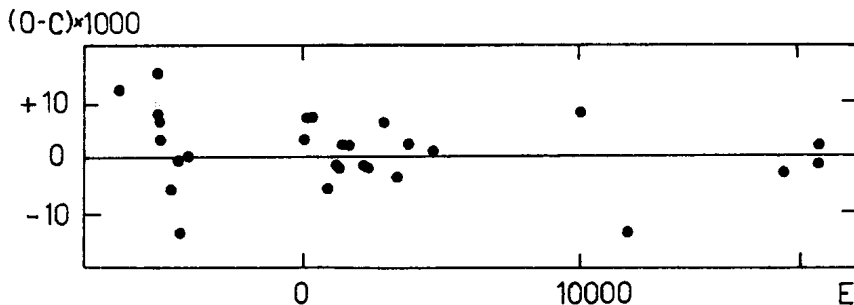


Figure 1. O-C diagram for FR Ori.

Table 1. O–C residuals for FR Ori.

Observers	Type	HJD 2400000	E	O–C		
Soloviev (1937, 1951)	pg	24845.289	–8677	0.012		
		v	27846.277	–5279	0.015	
	v	27862.165	–5261	0.006		
		27869.231	–5253	0.007		
		27892.190	–5227	0.003		
		28155.363	–4929	–0.006		
		28488.320	–4552	–0.001		
		28510.386	–4527	–0.014		
		28824.806	–4171	0.000		
		32508.479	0	0.003		
Szafraniec (1974)	v	32615.345	121	0.007		
		32894.424	437	0.007		
		33265.339	857	–0.006		
		33596.529	1232	–0.002		
		33681.312	1328	–0.002		
		33689.265	1337	0.002		
		34043.413	1738	0.002		
		34452.313	2201	–0.002		
		34685.468	2465	–0.002		
		35071.418	2902	0.006		
Klimek (1972)	v	35473.247	3357	–0.004		
		35904.236	3845	0.002		
		36629.311	4666	0.001		
		41368.366	10032	0.008		
		Kreiner, Mirtzcka (1980)	v	42812.314	11667	–0.014
				47868.429	17392	–0.003
		Dedoch (1992)	v	48572.311	18189	–0.001
present paper	pe	48926.458	18590	–0.002		
		48927.345	18591	0.002		

Table 2. Photometric parameters of FR Ori.

	V	U–B	B–V	V–R
Max	10.71	+0.18	0.37	0.34
Min I	11.70	0.20	0.41	0.43
Min II	10.84	0.17	0.34	0.31

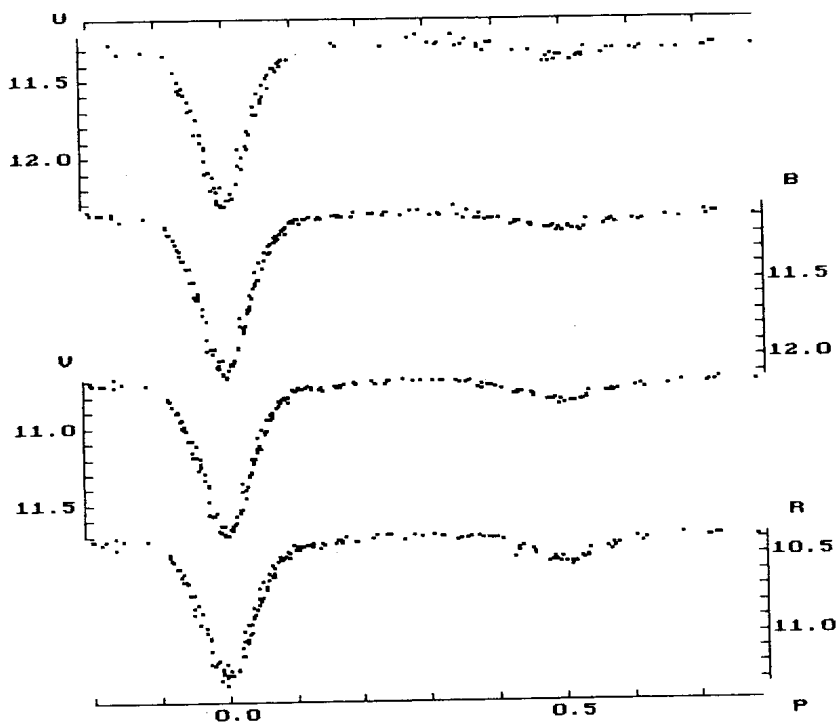


Figure 2. The light curves of FR Ori.

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References:

- Dedoch, A., 1992, *Brno Obs. and Plan. Contr.*, **30**, 19  
 Gaposhkin, S., 1954, *Harv. Ann.*, **113**, 69  
 Hoffmeister, C., 1934, *Astron. Nachr.*, **253**, 195  
 Klimek, Z., 1972, *IBVS*, No. 637, 1  
 Kreiner, J. M., Mirtzcka, A., 1980, *Astron. Nachr.*, **301**, 327  
 Soloviev, A. V., 1937, *Tadjik Obs. Circ.*, No. 25, 3  
 Soloviev, A. V., 1951, *Peremen. Zvezdy*, **8**, 50  
 Szafraniec, R., 1974, *Acta Astron.*, **24**, 89