PERIOD AND LIGHT-CURVE OF THE CLOSE ECLIPSING Binary FZ ORIONIS

FZ Orionis ($\alpha_{1950} = 5^h 38^m 45^s$, $\delta_{1950} = 2^o 35.0'$) was discovered by Hoffmeister (1934). The General Catalogue of Variable Stars (Kukarkin et al., 1969) gives the following information: type EW?, photographic magnitude range 10.0 to 11.0, period 1.597 day (?), spectral type GO. The W UMa-type light-curve was suspected by Soloviev (1945). The period of 1.597 day is given by Kippenhahn (1953) (type B Lyrae).

Analysing 1229 visual estimates of FZ Ori made by GEOS, Figer (1983) has shown that it is a W UMa-type eclipsing binary (EW) with a period about 0.4 day. Figer's work leads to the ephemeris:

$$\text{Mín I} = \text{Hel. J.D. } 2444\text{D24.4583} + 0.3999866 \times \frac{\text{E}}{28} \pm 18$$

![Figure 1](image_url)

V and B-V light-curve of FZ Ori
In order to check this result and to obtain BV light-curves (Johnson and Morgan system), FZ Ori was measured with a photoelectric photometer attached to the 1m telescope at Pic du Midi Observatory (France). FZ Ori was observed during 4 nights from 1983 December 4 to 7. These measurements alone confirm the period given by Figer (1983) and the EW nature of FZ Ori (typical V light curve and constant B-V; Figure 1). The photoelectric measurements also confirm the discrimination between primary minimum and secondary minimum as made by Figer (1983). Table I gives dates and O-C's for the 3 individual photoelectric minima obtained from 1983 December 4 to 7. The O-C values are referred to Figer's ephemeris.

Table I

<table>
<thead>
<tr>
<th>UT</th>
<th>HJD</th>
<th>O-C</th>
<th>type of minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983 Dec 5 21h14</td>
<td>2445673.598</td>
<td>-0.005 d</td>
<td>I</td>
</tr>
<tr>
<td>1983 Dec 6 21h14</td>
<td>674.598</td>
<td>-0.005 d</td>
<td>II</td>
</tr>
<tr>
<td>1983 Dec 7 21h25</td>
<td>676.398</td>
<td>-0.005 d</td>
<td>I</td>
</tr>
</tbody>
</table>

Since the star was observed during 4 successive nights only, no precise ephemeris can be computed from the photoelectric measurements alone. Lumping the 44 GEOS visual minima (weight 1) and the 3 photoelectric minima (weight 3), one obtains the following ephemeris (95% level of confidence for the error bands):

Min I = Hel. J.D. 2444024.4580 ± 0.3999860 E

+25  
+12

Figure 1 shows the V and B-V light curve of FZ Ori using the latter ephemeris. V magnitudes range from 10.61 to 11.02 (Min. I) and 10.95 (Min II). The mean B-V is equal to 0.51. These values are consistent with an EW type. Although no correction for interstellar extinction was made, this B-V value is in good agreement with Eggen's period-colour relation for contact binaries (1961, 1967).

J.F. LE BORGNE*, A. FIGER§, M. DUMONT§

*Observatoire du Pic du Midi et de Toulouse
14 Avenue Edouard Belin
F-31400 TOULOUSE

§GEOS

References:

Figer, A., 1983, GEOS Circular on Eclipsing Binaries n° 8
Hoffmeister, C., 1934, Astron.Nachr., 253, 195
Soloviev, A., 1945, Astr.Tsirk. (Kazan), 41, 8