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THE ECLIPSING BINARY BD+16°516

We have observed the eclipsing binary, BD+16°516, of which one component is a white dwarf, during the 1970-71 and 1971-72 seasons, and present here our solution for the heliocentric light elements:

$$\text{Min.} = \text{JD } 2440896.715678 + 0^{d}.52118372 \cdot E$$
$$\pm 26 \qquad\qquad \pm 5 \text{ (s.e.)}$$

These elements are based upon 16 primary minima for which both the beginning and the end of each eclipse were observed. The observations were made with the 40 cm reflector at the Morgan-Monroe station of the Goethe Link Observatory, near Bloomington, Indiana, and with the similar telescope at the Joseph R. Grundy Observatory in Lancaster, Pennsylvania. The star was always observed through a filter similar to the V filter of Johnson's UBV system; the eclipse phases were measured on stripchart recordings with time marks obtained from radio time signals. We define the time of minimum as $\frac{1}{2}(t_1 + t_2)$, where t_1 is that time between first and second contact when the brightness is midway between the brightnesses before and after the partial phase; similarly t_2 is the time of mid-brightness occurring between third and fourth contact. We estimate that the times of minimum determined in this way are accurate to 5^{s} for most minima. The time interval $t_2 - t_1$ appears to be practically constant at $40^{m}08^{s} \pm {}^{s}$. On the other hand, the duration and slope of the partial phases definitely seem to be variable; we expect to study this variation further.

As can be seen in the following table, the residuals are mostly consistent with the accuracy estimate quoted above, and we conclude that no period changes are indicated by the present material. We note, however, that these elements disagree somewhat with those of Nelson and Young (PASP 82, 699, 1970); the discrepancy amounts to 51^s at their zero epoch.

E	O-C sec	Remarks	E	O-C sec	Remarks
0	2	B	689	-4	B
4	0	B	752	0	L
21	2	B	769	-14	L
29	-4	B	773	6	L
228	-3	B	783	8	B 1
253	6	B	817	2	L
276	-10	B 1	823	2	L
278	-1	B 1	842	-10	L 1
599	9	B	888	3	L
614	13	B 1	894	2	B 1
618	2	B	917	-3	B 1
645	1	B			

Remarks:

B observed at Bloomington

L observed at Lancaster

1 only one partial phase observed, minimum time calculated assuming $t_2 - t_1 = 48^m08^s$. Not included in the solution for the elements.

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