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COMMUNICATIONS FROM THE OBSERVATORY AT LEIDEN.

Provisional elements of the eclipsing variable star C P. D. −23°3476,

by *A. J. Wesselink.*

The variability of C. P. D. −23°3476 = Cord. −23°6106, $8^h9^m13^s.47$ −23°39′4″.6 (1900) was found by Prof. E. HERTZSPRUNG with the blink-microscope of the Union Observatory at Johannesburg. The star proved to be of the eclipsing type; I estimated the variable with the naked eye on 324 plates taken by H. VAN GENT with the Franklin-Adams instrument. The 5 comparison stars given in Table 1 were used.

TABLE 1.

star	C. P. D. number	spect. H. D.	magnitude C. P. D.	C. P. D. mag. reduced to int. scale	step value	Δm = mag. diff. from star *a*
	°		m	m		m m
var.	−23 3476	Ao	7·5	7·3		·27−3·67
a	3472	Fo	7·5	7·3	0·0	·00
b	3466	A3	7·6	7·4	1·5	·43
c	3527	Ao	7·8	7·7	4·9	1·29
d	3493	Ao	8·4	8·6	8·4	2·58
e	3480		8·8	9·2	11·5	3·63

The differences in magnitude between the comparison stars were determined photometrically by the aid of 3 plates taken with a grating in front of the objective. The relation between magnitude and step is nearly rectilinear, 1^s being equal to $^m.32$. However, the reduction from steps to magnitudes was made graphically without assuming a linear connection. A serious discrepancy exists between the C. P. D. magnitudes reduced to the international scale and my scale of magnitudes, 1^m on the first scale being equal to $1^m.9$ on the latter.

With regard to this question some additional rough tests were made which confirmed my scale. In the following the latter is adopted. A provisional period was calculated by least squares from observed minima. As the sharpest determination of epochs of minimum is obtained from observations on the ascending or descending branch of the lightcurve, I made separate solutions for the two branches of the lightcurve by the aid of observations of intermediate brightness. The provisional period enabled me to decide whether the observed point belonged to the ascending or the descending branch. The observed epoch of such an intermediate brightness was then reduced to that corresponding to a brightness of 8^s of the same branch with the aid of the shape of the branches as derived from observations made on a single night. The weighted mean result of the three periods

$2^d.192332 \pm .000076$ (m. e.) (minima)
$2^d.192316 \pm .000056$ „ (descending branch)
$2^d.192291 \pm .000046$ „ (ascending branch)

is $2^d.192306 \pm ^d.000032$ (m. e.).

The phases were computed according the formula

phase = $^{d-1}.4561407$ (J. D. Hel. M. Astr. T. Grw. − 2420000)

The observations were then arranged according to phase and means of 5 (in one case 4) were formed. Table 2

TABLE 2.

phase	Δm	phase	Δm	phase	Δm
	m		m		m
·013	·23	·323	·28	·676	·25
·029	·31	·341	·42	·689	·27
·042	·23	·352	·35	·707	·23
·063	·27	·372	·37	·721	·32
·102	·19	·388	·25	·740	·29
·143	·35	·397	·31	·757	·32
·157	·27	·408	·20	·768	·46
·167	·16	·419	·24	·781	·68
·178	·28	·429	·28	·796	1·03
·193	·31	·451	·28	·810	1·55
·206	·32	·475	·28	·822	2·00
·213	·26	·486	·20	·839	2·78
·219	·23	·495	·21	·856	3·57
·228	·23	·515	·23	·872	2·49
·241	·32	·546	·27	·882	2·10
·251	·24	·573	·32	·898	1·45
·262	·25	·595	·18	·918	·77
·277	·25	·605	·25	·932	·66
·288	·31	·616	·23	·950	·39
·295	·36	·634	·18	·973	·21
·303	·25	·642	·23	·990	·35
·310	·34	·655	·29		