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IMPROVED ELEMENTS OF 5 ECLIPSING BINARIES WITH ORBITAL ECCENTRICITY, BY P. TH. OOSTERHOFF AND C. J. VAN HOUTEN

In this note improved elements have been derived for the eclipsing binaries KT Centauri, UW Crucis, LZ Centauri, AY Muscae and AO Velorum. The eccentricity in the orbit of LZ Centauri, discovered by UITTERDIJK, has not been confirmed. In the case of AO Velorum there is an indication that the line of apsides moves with a period of about 50 years and that the orbital eccentricity is .12.

Observations of eclipsing binaries with orbital eccentricity are of special interest on account of the expected movement of the line of apsides. In this note new observations are discussed of 5 variables of this type which had been previously investigated on Franklin-Adams plates. Since the publication of the original results new material has accumulated, which has been used here and which provided improved ephemerides. The estimates were made by Mr VAN HOUTEN in the usual manner; the brightness of the comparison stars, used by the former authors, has been adhered to.

KT Centauri

This variable has been discussed by UITTERDIJK¹. Eight new observations were found in the first minimum (phase = .15 in his paper) and 5 in the second. Combined with UITTERDIJK's epochs they gave the following elements:

$$\text{Min. 1} = \text{J. D. } 2426010.459 + 4.130403 E, \\ \pm 11 \pm 20 \text{ (m.e.)}$$

$$\text{Min. 2} = \text{J. D. } 2426120.446 + 4.130424 E, \\ \pm 9 \pm 30 \text{ (m.e.)}$$

$$\text{J. D. } 2426087.401 + A^{d.086} + B^{2d.605} + 4.130435 E, \\ \pm 4 \pm 3 \pm 6 \pm 7 \text{ (m.e.)}$$

where A equals -1 for a descending and $+1$ for a rising branch and 0 for the minima, whereas B equals zero for the second minimum and -1 for the first minimum.

UW Crucis

This variable has been discovered and investigated by BRUNA²). The period has been determined from

¹) B. A. N. No. 237, 245, 1932.

²) B. A. N. No. 207, 45, star s, 1930.

The epochs used and their residuals are:

Min. 1			Min. 2		
J. D. Hel. -2420000	E	$O-C$	J. D. Hel. -2420000	E	$O-C$
^d 4292.201	- 416	- .010	^d 4918.494	- 291	+ .001
.225	- 416	+ 13	.518	- 291	+ 25
96.369	- 415	+ 27	533.499	- 191	- 36
6010.424	0	- 35	.523	- 191	- 12
.446	0	- 13	60.448	- 184	0
8641.515	+ 637	- 11	.472	- 184	+ 24
.536	+ 637	+ 10	85.228	- 178	- 3
95.195	+ 650	- 27	5418.272	- 170	- 2
.217	+ 650	- 5	6087.369	- 8	- 34
.286	+ 650	+ 64	.391	- 8	- 12
99.296	+ 651	- 56	6120.432	0	- 14
.303	+ 651	+ 11	7603.287	+ 359	+ 19
.385	+ 651	+ 33	.309	+ 359	+ 41
			.354	+ 359	+ 86
			8272.367	+ 521	- 30
			8743.211	+ 635	- 54

The mean weighted value of the period is: $4^d.130409 \pm d.000017$. Finally a least-squares solution of the period has been made from all observations on the descending and rising branches of both minima reduced to brightness $6^m.5$. The minima were assumed to be equally broad. The resulting elements are:

primary and secondary minimum separately. The elements derived are:

primary min.:

$$\text{J. D. } 2425362.155 + 6^d.35457 E, \\ \pm 12 \pm 11 \text{ (m.e.)}$$

secondary min.:

$$\text{J. D. } 2426471.250 + 6^d.35451 E, \\ \pm 17 \pm 7 \text{ (m.e.)}$$