

## Reduction of HOFFMEISTER'S visual estimates of RZ Tauri, by *P. Th. Oosterhoff*.

In *B. A. N.* 190 an investigation on this variable of the *W Ursae Majoris* type was published by the writer of this note. From a series of photographic observations a new period was determined, since it was apparent that neither the period given by HOFFMEISTER in *A. N.* 4985 nor the period derived by SCHILT in *B. A. N.* 83 gave a fair representation of these observations. The final elements as given in *B. A. N.* 190 were deduced from both SCHILT'S and the author's observations, but the visual estimates of HOFFMEISTER were not used. These estimates have not yet been published in detail, though a number of epochs of maximum derived from these observations are given in *A. N.* 4985. As these maxima show a systematic deviation from my elements, it will be of interest to investigate whether the new period will need some correction. This has been made possible by the courtesy of Prof. HOFFMEISTER, who placed his individual observations at my disposal.

Though there will be now practically no doubt about the question which period is the correct one, I nevertheless examined which period gives the best representation of the observed minima among these estimates. For this purpose 35 observations have been selected which are believed to be made near minimum on account of the low estimate of the star's brightness, and phases have been calculated with the three periods mentioned above. The reciprocal period used in the computation and the mean dispersion in phase are given below for each case separately.

HOFFMEISTER	SCHILT	OOSTERHOFF
$5^{\text{d}^{-1}} \cdot 81169$	$5^{\text{d}^{-1}} \cdot 81389771$	$4^{\text{d}^{-1}} \cdot 811502$
$\pm \text{P} \cdot 117$	$\pm \text{P} \cdot 158$	$\pm \text{P} \cdot 085$

Hence it is evident that the new period gives at least as good a representation of the observed minima as HOFFMEISTER'S period.

Then phases have been calculated for all observations by the formula:

phase =  $4^{\text{d}^{-1}} \cdot 811502$  (J. D. Hel. M. T. Gr. - 2420000)

and the observations were arranged according to phase. The mean error of one estimate, which has been computed from the differences in brightness between observations following each other in phase, was found to be:  $\pm 1^{\text{s}} \cdot 35$ , the total range of the lightvariation  $4^{\text{s}} \cdot 2$ .

The observations have been divided in groups of 16 (17) and a mean lightcurve was formed, which is shown in figure 1. The number of observations, the mean phase and the mean brightness of each group are given in Table I.

This mean lightcurve does not show any pronoun-

FIGURE 1.

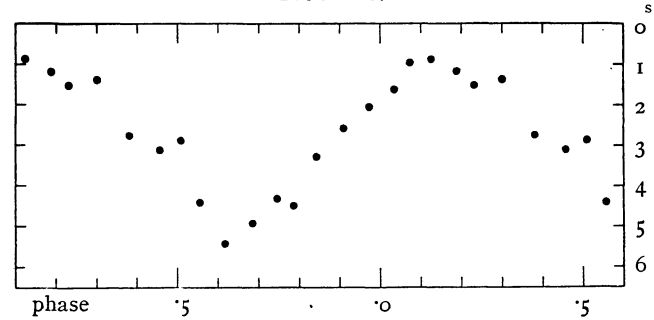


TABLE I.

number of observations	mean phase	mean brightness	number of observations	mean phase		mean brightness	
				P	s	P	s
16	036	162	16	556	443	16	443
16	075	96	16	617	543	16	494
16	124	88	16	687	433	16	450
16	188	119	16	747	329	16	259
16	231	153	16	787	206	16	288
16	301	139	16	843		17	
16	381	276	17	911		17	
16	457	312		973			
16	509	288					

ced asymmetry, whereas the mean lightcurve derived by HOFFMEISTER in *A. N.* 4985, seems to be asymmetrical, the ascending branch being steeper than the descending one. The mean phase of minimum, derived from the mean lightcurve, is  $\text{P} \cdot 658$  and the corresponding mean epoch of minimum J. D. 24211103930, the residual ( $O-C$ ), computed with the elements of *B. A. N.* 190, being  $-^{\text{d}} \cdot 0010$ . This small residual proves that my elements are in full accordance with the observations of HOFFMEISTER. Improved elements have been computed by least squares from the mean epoch of minimum derived here and from the epochs given in *B. A. N.* 190, 198. The elements of minimum are now:

$$\text{J. D. } 2424031^{\text{d}} \cdot 9348 + ^{\text{d}} \cdot 20783536 E \text{ (apparent period)} \\ \pm 0005 \pm 00000005 \text{ (m. e.)}$$

The epochs used, the number of periods elapsed and the residuals ( $O-C$ ) are:

J. D.	$E$	$(O-C)$
$2421110^{\text{d}} \cdot 3930$	0	- 0002
40319351	14057	+ 0003
59724927	23394	- 0008
60113600	23581	+ 0013
60163454	23605	- 0013
60173864	23610	+ 0005