
LETTERS TO THE EDITOR

**THE EFFECT OF COLOUR ON THE
VISUAL OBSERVATION OF LONG-
PERIOD VARIABLE STARS**

THE part played by colour in the errors involved in the visual observation of long-period variables was pointed out by Ford.¹ In order to verify the linear relationship between colour and mean deviation as derived by him, a study of twenty stars of varying colour was made utilising the same methods of analysis. The observational data were taken from the A.A.V.S.O. Reports in *Harvard Annals*, Vol. 107, Nos. 7 and 8, and Vol. 110, Nos. 1, 5, 6, 7 and 8. The deviations for each individual

observer were calculated for each night and a standard deviation σ_m for each star was computed by adopting the formula

$$\sigma_m = \sqrt{\frac{\sum \delta^2}{N}}, \quad (1)$$

where $\sum \delta^2$ is the sum of the squares of the deviations, and N the total number of observations made. Due to the uncertainty of the colour indices of long-period variables the Orthoff colour scale² used on A.A.V.S.O. charts was employed.

In Table I, the results are given.

TABLE I

No.	Design	Name of Star	Colour	σ_m
1	053005a	T. Orj.	0.0	0.36
2	123307	R. Vir	1.3	0.18
3	103769	R. Uma	1.6	0.27
4	115158	Z. Uma	2.0	0.24
5	123160	T. Uma	2.0	0.23
6	1811.6	W. Lyr	3.0	0.32
7	12.961	S. Uma	3.2	0.30
8	142539a	V. Boo	3.6	0.22
9	233815	R. Acr	4.3	0.27
10	0.4356	W. Per	4.9	0.30
11	021403	O Cet	5.0	0.27
12	021558	S. Per	5.0	0.22
13	193449	R. Cyg	6.0	0.29
14	162119	U. Her	6.5	0.29
15	162112	V. Oph	6.6	0.24
16	094211	R. Leo	6.9	0.28
17	054 20a	U. Ori	7.0	0.32
18	001755	T. Cas	7.3	0.32
19	201647	U. Cyg	8.4	0.32
20	200938	RS. Cyg	10.0	0.31

Fig. 1 shows the correlation between colour and σ_m for which a relation

$$\sigma_m = 0.0124 C + 0.2157 \quad (2)$$

was derived.

Ford's relation

$$\sigma_m = 0.0205 C + 0.176 \quad (3)$$

can be seen to differ considerably from the new relations derived. The notation σ_m in equation (2) indicates a standard deviation in magnitudes, and C is the colour on the Orthoff scale.

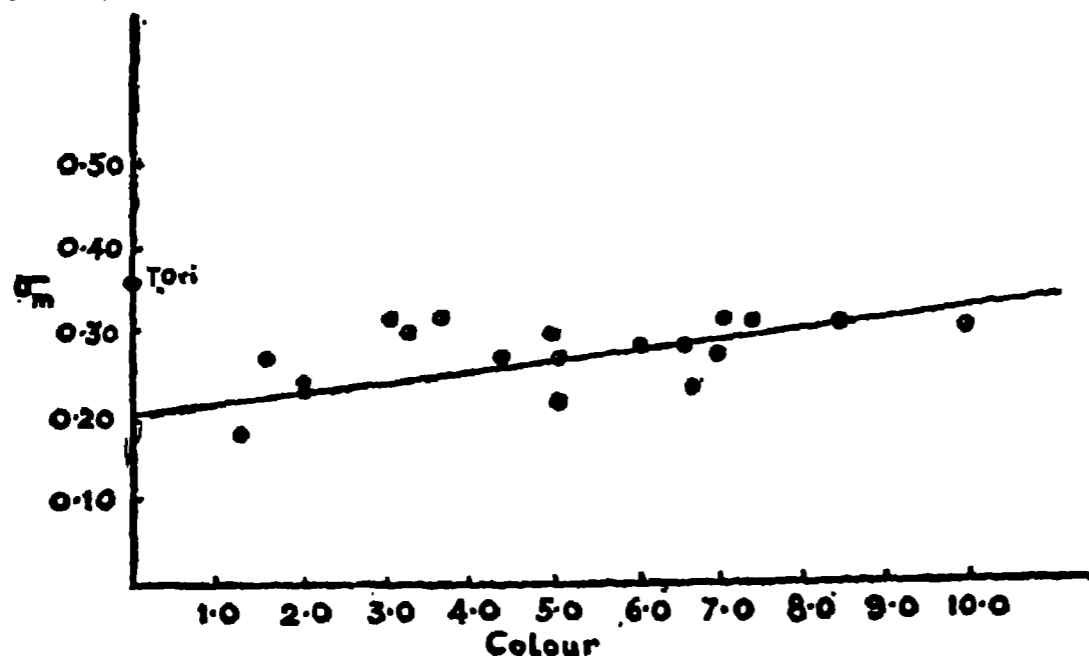


FIG. 1.

It can be seen from Fig. 1, that T. Orionis 053005 a has an unusually high error which

can be explained as due to the Dove effect.³

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1. *Pop. Astr.*, 48, 9. 2. *A. N.*, 1900, 153, 141
1912, 192, p. 85. 3. Furness, *Introduction to the study
of Variable Stars.*