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A PERIOD-LUMINOSITY RELATION FOR SHORT PERIOD MIRA VARIABLES

The validity of the period-luminosity relation of Mira type variables, published previously by the present author (Ferrari, 1973), was limited to stars with periods nearly equal to, or longer than 160 days. Now, another formula has been established for short period variables of the same type. On the assumption that the latter ones are undergoing overtone pulsations, a formal similarity between the period-luminosity relations of both groups, and a numerator of about 100 (instead of 200) days for the shorter periods were theoretically reasonable. The expected slope of the function wanted, the constant part of denominator, and the zero point - by chance reducing the additional constant itself to zero - could be derived from observational data (Osvalds&Risley, 1961; Clayton&Feast, 1969).

Hence, M_m being the visual absolute magnitude of mean maxima of any Mira type variable with mean period P days, it has been found that

$$M_m = - \frac{100}{P - 67} ; 100^d \leq P \leq 158^d.$$

The upper limit of validity was suggested by a pronounced frequency gap, while typical Mira variables with periods shorter than 100 days are lacking at all, and therefore the extrapolation beyond the lower limit by no means could be warranted. But within the limits specified here, slight changes of the numerator might be compensated by suitable adjustments of the constant part of the denominator and an additional constant restoring the zero point, without significant deviations from the results of the preceding two-parametric formula.

A detailed discussion of the problem will be published elsewhere.

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