NOTES FROM OBSERVATORIES

On the Variability of IM Monocerotis

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The eclipsing variable IM Monocerotis has been observed extensively with B,V filters at the Uttar Pradesh State Observatory by Sanyal, Mahra and Sanwal[1] on about 30 nights; on more than 15 of these nights the star was observed for about 7 hr. The period of the eclipsing system has been deduced to be $1^d.190243$.

The light curve of the system is asymmetrical, a fact also reported previously by Gum[2]. In addition, an examination of the light curves on individual nights shows that there occur stillstands in the ascending branches after both the minima. Also, in two curves there are suggestions of bumps in the descending branches. These features are well seen in Figs. 1 (*a*) and (*b*) and 2 (*a*) and (*b*) which depict the light curves in B on a few nights. The stillstands in the ascending branches occur at mean phases 0·079 and 0·581, while the bumps in the descending branches occur at phases 0·220 and 0·820.

In trying to explain the above observations, we find that the hypothesis of one of the components being intrinsically variable with a period almost half that of the eclipsing system explains the phenomenon well. When the stars are emerging out of the eclipses (*i.e.* along the ascending branches) the intrinsically variable component has a minimum which subtracts from the increase of luminosity caused by emergence out of eclipse. The maximum of the intrinsically variable component would similarly cause a bump in the descending branches. On the basis of our observations, the epoch and the period of the intrinsically variable star are given by

$$E = \text{JD (hel) } 2438048{\cdot}317 + n\,(0^d{\cdot}59513 \pm 0^d{\cdot}00002 \text{ (p.e.)})$$

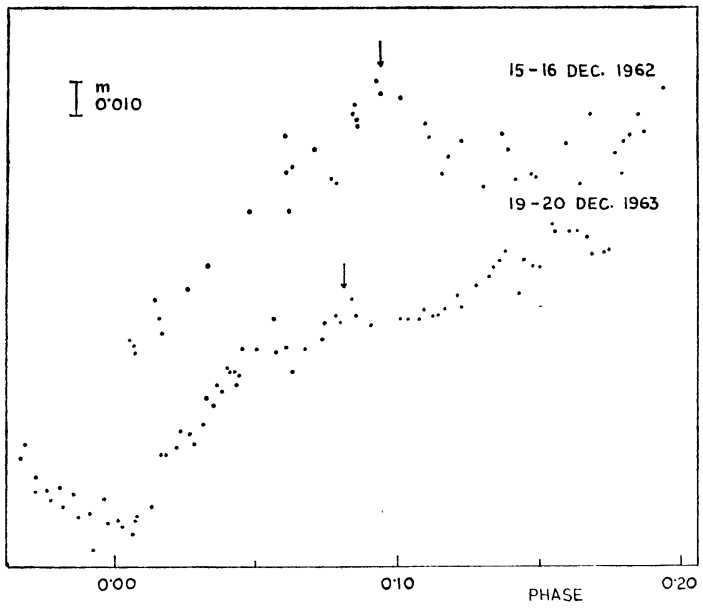
A further examination of the light curves makes us suspect that it is the fainter component of the system that is variable, though we are not in a position to confirm this on the rather meagre observations that we have on some of the phases, particularly in the descending branches.

It has been pointed out by Gum[2] that the asymmetry of the light curve of IM Monocerotis cannot be explained by a "periastron effect". Assuming the intrinsically variable component to have an asymmetric light curve, the asymmetry of the light curve of the eclipsing system can also be accounted for.

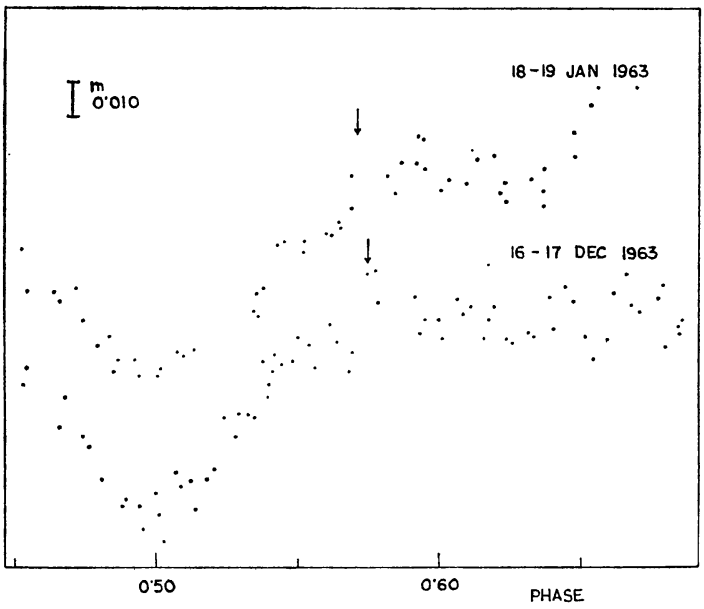
1964 April 25.

References

(1) A. Sanyal, H. S. Mahra and N. B. Sanwal, 1964 (in press).
(2) C. S. Gum, *M.N.*, **111**, 634, 1951.



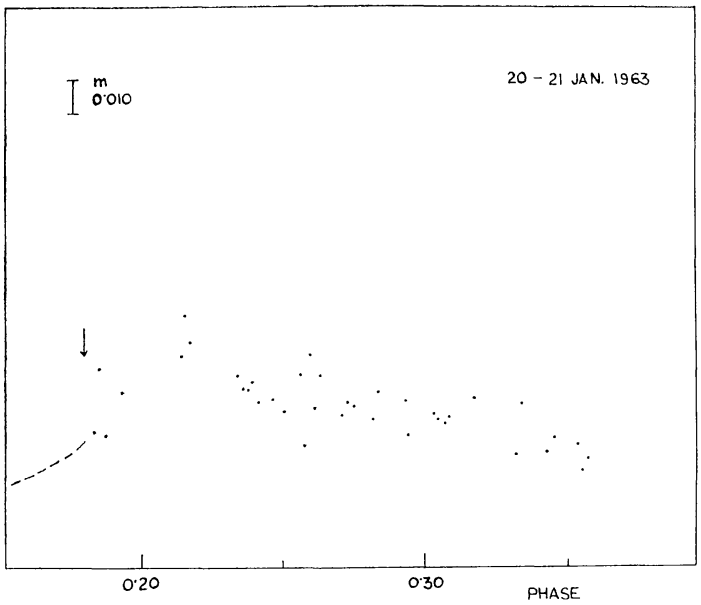
(*a*)



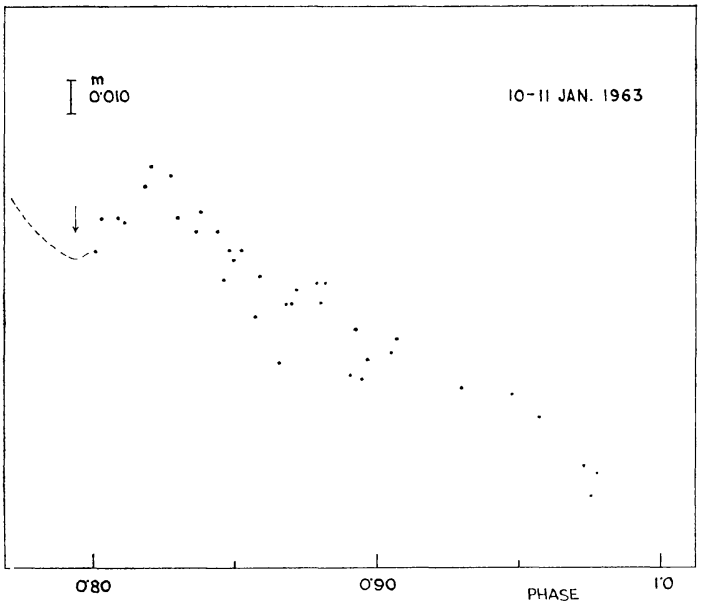
(*b*)

FIG. 1

Light curves of IM Mon on the ascending branches of the curve; (*a*) after the primary minimum and (*b*) after the secondary minimum, showing the stillstands to right of the arrow marks.



(*a*)



(*b*)

FIG. 2

Light curves of IM Mon on the descending branches of the curve; (*a*) near the phase 0.20 and (*b*) near the phase 0.80, showing the bumps.

Dotted lines show the trend of the descending branches.