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THE LUMINOSITY OF THE ECLIPSING BINARY HV12714 AND ITS MEMBERSHIP IN THE LMC

The 13th magnitude eclipsing system HV12714 has been previously studied by Gaposhkin (1972). In Table 10 of his study the system was assigned an absolute photographic magnitude of -5.0 which puts it at the same distance as the LMC, and suggests membership in that system. It is important to confirm these results since they imply that HV12714 is one of the most luminous eclipsing systems known, and further detailed investigation would be warranted. In what follows the intrinsic brightness of HV12714 is investigated using spectral classification.

If HV12714 is indeed a member of the LMC, and hence intrinsically luminous, then both the 1.4 day period and the lack of interaction effects in the light curve preclude a system with significantly evolved components. The absolute V magnitude calibration of Humphreys and McElroy (1984) for luminosity class V then indicates that the primary would be an O star. On the other hand, if HV12714 were a Galactic foreground system it would be substantially closer than the LMC so its intrinsic luminosity would be correspondingly lower. Therefore, unless the primary was a subdwarf, its spectral type would be later than O or early B despite the fact that the evolutionary status of the components could not be accurately deduced from the light curve in this case.

A classification spectrum of HV12714 was obtained on Dec. 19, 1985 with the '2-D Frutti' detector on the 1.0 metre telescope at CTIO. The spectrum shows strong Balmer lines and prominent Ca K absorption. A large Balmer discontinuity is also seen. Comparison with standards observed on the night of observation along with those of Jacoby et. al. (1984) indicate that the spectrum of HV12714 is that of an early A dwarf. The absolute B magnitude of such a star would be approximately +1.0 (Allen 1973). Therefore the luminosity given by Gaposhkin (1972) appears to be in error and the system seems not to be a member of the LMC.

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