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CONCERNING VARIABLE STAR 3 OF M13

In 1915 Shapley (1915, Mt. Wilson Contr. No. 116) gave a list of seven stars in the globular cluster M13 that he considered to definitely vary in brightness. Subsequent investigations have since shown five of these to indeed be variables, but the remaining two stars have not been studied in detail and the question of the variability is still unanswered. In this note we report the results of a study of one of the two stars, that denoted Variable 3 of the cluster (Sawyer Hogg 1972, The Third Catalogue of Variable Stars in Globular Clusters).

For the realization of our investigation we had available 54 plates of the cluster taken in the years 1967 - 1969 with the 1.5m reflector of the U.S. Naval Observatory. The brightness of Variable 3 was measured in relation to five nearby comparison stars using a Becker type iris photometer. As a control, the non-variable star Arp III-10 (Arp 1955, Astr. J. 60, 317) and the confirmed variable No. 8, which are in the same region, were also measured and reduced in the same manner as for Variable 3. A quick look at the magnitudes derived for Variable 3 showed that they were nearly all the same and hence the variations, if any, are of very small amplitude. Calculation of the standard deviation of the measures with respect to the mean gave a value of ± 0.06 mag., equal to that found from the measures of the non-variable control star. Furthermore, in both cases the histogram of the distribution of the measures closely approximates the Gaussian curve for the above sigma, indicating that the small differences in the derived magnitudes can be entirely attributed to random measuring errors. A histogram of the earlier measures of this star by Kollnig-Schattschneider (1942, Astr. Nach. 273, 145) also gives a Gaussian distribution. In contrast, histograms of measures from the same plates of known variable stars, both Variable 8 that we measured and the low amplitude Variable 7 measured by Ibañez and Osborn (1973, IBVS No. 769) show distinctly non-Gaussian shapes. We conclude that Variable 3 is most likely not variable.

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