ON THE NUMBER RATIO OF HORIZONTAL BRANCH STARS TO RED GIANT STARS IN GLOBULAR CLUSTERS

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The number ratios of horizontal branch stars to red giant stars were obtained for globular clusters and Draco dwarf galaxy and the helium abundance was estimated using model results without semiconvection zone (SCZ) and with fully developed one. The analysis was confined to the four clusters (M4, M5, M13, and 47 Tuc) and the Draco galaxy, for which fairly precise star counts had been carried out. The effect of the difference in radial distribution between horizontal and red giant branch stars were taken into account, if necessary. The statistically significant difference in R exists among these objects. The cause may be the difference in the helium abundance and/or in the development of the SCZ. In the case of the fully developed SCZ, the helium abundance for M5 and Draco is appreciably smaller than the value given by the big-bang cosmology. It may be taken as an evidence against the full development of the SCZ for the horizontal branch stars in these objects.

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