Synthetic Color-Magnitude Diagrams for ω Centauri and other Massive Globular Clusters with Multiple Populations

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We have constructed synthetic color-magnitude diagrams (CMDs) for ω Cen and other massive globular clusters with apparently peculiar CMD morphology. Our population models, which adopt the most up-to-date input physics and parameters, show that the observed CMD of ω Cen can be reproduced by adopting multimodal metallicity distribution function (MDF) as derived from the observed color distribution of RGB stars and a mild internal age-metallicity relation among the populations therein. Similar results were obtained for other massive globular clusters with bimodal horizontal-branches (HBs). In particular, we found that the peculiar CMD morphology (broad RGB, bimodal HB) and properties of RR Lyrae stars observed in NGC 6388 and NGC 6441 can be reproduced by the composite of two distinct populations with mild internal age-metallicity relations. This suggests that these clusters, as well as ω Cen, may represent the relicts of disrupted dwarf galaxies.