

MOCCA Survey Database: Extra Galactic Globular Clusters. Method and first results

Over the last few decades, exhaustive surveys of extra Galactic globular clusters (EGGCs) have become feasible. Only recently, kinematical information of globular clusters (GCs) were available through Gaia DR2 spectroscopy and also proper motions. On the other hand, simulations of GCs can provide detailed information about the dynamical evolution of the system. We present a preliminary study of EGGCs' properties for different dynamical evolutionary stages. We apply this study to 12 Gyr-old GCs simulated as part of the MOCCA Survey Database. Mimicking observational limits, we consider only a subsample of the models in the database, showing that it is possible to represent observed Galactic GCs. In order to distinguish between different dynamical states of EGGCs, at least three structural parameters are necessary. The best distinction is achieved by considering the central parameters, those being observational core radius, central surface brightness, ratio between central and half-mass velocity dispersion, or similarly considering the central color, the central V magnitude and the ratio between central and half-mass radius velocity dispersion, although such properties could be prohibitive with current technologies. A similar but less solid result is obtained considering the average properties at the half-light radius, perhaps accessible presently in the Local Group. Additionally, we mention that the color spread in EGGCs due to internal dynamical models, at fixed metallicity, could be just as important due to the spread in metallicity.

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