

MAPPING THE STELLAR DISTRIBUTION IN GLOBULAR CLUSTERS: AN APPLICATION TO NGC 6809 = M55

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Abstract. The principal aim of this work is to map the stellar distribution of a large sample of galactic globular clusters from the central regions to the outer envelope (beyond the tidal radius for an estimate of the foreground/background contamination) with a good statistical sampling of stars in the different branches of the color–magnitude diagram and with different masses. These new data will be used to investigate the dynamical evolution of stellar systems embedded in the gravitational field of our Galaxy, and, eventually, to set constraints on the mass distribution of the Milky Way. In this context, star counts have been carried out on V and I CCD frames of the rich, low concentration galactic globular cluster M55. The frames cover 35% of the cluster, from the center to 1.3 times the tidal radius (with total coverage inside $1r_c$). From $V=14$ (*i.e.* the horizontal branch level) to a limiting magnitude $V=22$ ($M_V = 7.9$), a total of 36800 stars have been measured. A population of blue stragglers (BS) has been identified, but, at variance with other clusters of similar core concentration, the BS of M55 are only marginally more concentrated toward the center. No population gradient has been identified in M55. A luminosity function down to $V = 21.3$ has been obtained, after applying completeness and field star contamination correction to the star counts. The mass function is very flat ($x_{global} \leq -0.5$), as it was expected for this cluster located close to the galactic center and to the galactic disk. A single mass King model fitted to the radial star counts gives a core radius $r_c = 143''$ and a tidal radius $r_t = 970''$, $\sim 10\%$ greater than previously estimated.

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