

R71a Stellar mass-function of globular clusters

Holger Baumgardt (Tokyo University)

We report results of a large set of N-body calculations of the evolution of multi-mass star clusters in external tidal fields made on the GRAPE6 boards of Tokyo University. Our clusters start with similar mass-functions, but varying particle numbers, orbital types and density profiles. Our main focus is to study how the mass-function of star clusters changes under the combined effects of stellar evolution, two-body relaxation and external tidal shocks. We find that the lifetimes of star clusters scale flatter than with the relaxation time and that a significant fraction of galactic globular clusters will be destroyed within the next Hubble time. During the evolution, low-mass stars are preferentially depleted from the clusters and we find that the resulting change in the mass-function is rather insensitive to the initial condition. Instead, it can be characterised as a function of a single variable alone, as e.g. the time spent until total cluster dissolution. This makes direct comparison of our results with observations of galactic globular clusters feasible. For a sample of globular clusters with well observed parameters, we find a correlation between the observed slope of the mass-function and the lifetimes predicted by us. From our calculations, we can draw some conclusions on the possible form of the IMF of stars in globular clusters.