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Dynamical Evolution of Open Star Clusters of Varying Initial Mass Functions in STARLAB NICHOLAS MILLER, ANN BRAGG, CAVENDISH MCKAY, Marietta College — N-body simulations are widely used to model the dynamical evolution of a variety of systems, among them star clusters. Much of our understanding of star cluster evolution rests on the results of N-body simulations, providing insight in the structural evolution of these systems, as well as a detailed study of mass segregation. Observations show that the more massive members of a star cluster aggregate toward the center, while less massive members tend to move farther away from the center. Using the N-body code STARLAB/KIRA we construct a large number of open star cluster models with various initial mass functions: a Saltpeter mass function (power law with exponent $\alpha = -2.35$), a series of additional power law functions with each exponent increasing by 0.2 from the last ($\alpha = -2.15, -1.95, -1.75$) and a Miller-Scalo mass function. For each mass function, we simulate an "ensemble" of 160 individual clusters each containing 2600 stars. We compare the time evolution within these simulations to models that begin with mass segregation by combining two different simulated clusters. With a "hybrid" of the two dynamical models we perform a comparison to determine what effect joining together simulations has on cluster evolution and our ability to replicate observational data.

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