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Dynamical Evolution of Globular Clusters with White Dwarfs, Neutron Stars and Black Holes using GPU Supercomputer

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We present some results from the DRAGON simulations, a set of four direct N-body simulations of globular clusters (GCs) with a million stars and five percent initial (primordial) binaries. These simulations were undertaken with the NBODY6++GPU code, which allowed us to follow dynamical and stellar evolution of individual stars and binaries, formation and evolution of white dwarfs, neutron stars, and black holes, and the effect of a galactic tidal field. The simulations are the largest existing models of a realistic globular cluster over its full lifetime of 12 billion years. In particular we will show here an investigation of the population of binaries including compact objects (such as white dwarfs - cataclysmic variables and merging black hole binaries in the model as counterparts of LIGO/Virgo sources); their distribution in the cluster and evolution with time.

Field of work

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