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The impact of IMBHs on properties of binary black holes originating from Globular Clusters

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Stellar mass binary black holes are the most important sources of gravitational waves for current LIGO-Virgo-Kagra detectors. We analyze about a thousand globular cluster (GC) models simulated using the MOCCA Monte Carlo code for star cluster evolution to study black hole - black hole interactions in these dense stellar systems that can lead to gravitational wave emission. We extracted information for all coalescing binary black holes (BBHs) that merge via gravitational radiation from these GC models and for those BHs that collide due to 2-body, 3-body and 4-body
dynamical interactions. By obtaining results from a substantial number of realistic star clusters evolution model, that cover different initial parameters (masses, metallicities, densities etc) we have an extremely large statistical sample of two black holes which merge or collide within a Hubble time. The existence of Intermediate Mass Black Hole, with masses 100-1000 solar masses, strongly infuences the results. We study also properties of BBHs escaping from globular clusters. Some of them contain IMBH. We discuss the importance of BBH originating from GC for gravitational waves observations.

Reference to paper (DOI or arXiv)

Your gender (free text)

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