

Phenomenology: Multiscale dynamics of eccentric and precessing binary black holes

Monday, September 4, 2023 3:00 PM (15 minutes)

Understanding the dynamics of binary black holes is crucial to extract information from gravitational-wave data. By now, a consistent amount of effort has been put into exploring the phenomenology of black-hole binaries in the Post-Newtonian regime that evolve on quasi-circular orbits and undergo spin precession. We present substantial advances in this area using a multi-timescale approach to the binary dynamics. In particular, this includes a reparametrization of spin precession that is regular across the entire parameter space, an innovative numerical implementation that is orders of magnitude faster, and an initial exploration of the interplay between spin precession and eccentricity.

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