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The importance of gauge choices in the EOB conservative dynamics

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The effective one-body (EOB) approach is a proven technique for generating fast and accurate models for the motion and radiation of coalescing compact binaries. At its core, it consists of a specific resummation strategy that takes as input the results of the perturbative schemes used to tackle the two-body problem, notably the post-Newtonian (PN) expansion, the post-Minkowskian (PM) expansion, and Gravitational Self Force. While the main aspects of the EOB method are fixed and well established, its application to a given source of perturbative information is always subject to arbitrary gauge choices that have non-negligible impact on the final model. On this note, I will devote my talk to the discussion of recent work on the effect that gauge choices have in the conservative dynamics of EOB models, specifically addressing the gauge freedom in (i) the spin-orbit component of the PN-based EOB Hamiltonian and (ii) in the definition of alternative PM-rooted iterations of the EOB dynamics.

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