

Abstract Submitted
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The effective source approach to the self-force problem PETER DIENER, Louisiana State University — Extreme Mass Ratio In-spirals of compact objects into super massive black holes are expected to be a very important source of gravitational waves for LISA. Perturbation techniques have traditionally been employed Here the small compact object is treated as a point particle moving on a perturbed geodesic in an exact black hole spacetime. Gravitational waves are emitted due to the particle motion which are then back scattered off the curvature of the background space-time and interact with the particle itself at a later point in the orbit: The so called self-force problem. Traditionally, to solve this problem, the field equations have been evolved with a singular delta-source, yielding a singular field at the location of the particle. To calculate the self-force the singular field then has to be carefully subtracted. I will present results for the calculation of the self-force for a scalar point charge moving in circular orbits around a non-rotating black hole using a new technique where the singularity of the point particle is subtracted from the source before the evolution is done, resulting in a regular field at the particle location from which the self-force can easily be calculated.

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