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The effective source approach to the self-force problem PETER DIENER, Louisiana State University, IAN VEGA, University of Guelph, BARRY WARDELL, Albert-Einstein-Institute — 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. Traditionally perturbation techniques have been employed to analyze such sources. 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. In these approaches 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. Recently a new approach have been proposed 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. I will report on the progress on a numerical implementation of this approach applied to a scalar charge moving in orbit around a Schwarzschild black hole.

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