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Recent progress in the effective source approach to the self-force problem with a time domain code¹ PETER DIENER, Louisiana State University, BARRY WARDELL, NIELS WARBURTON, University College Dublin, ANNA HEFFERNAN, University of Florida, ADRIAN OTTEWILL, University College Dublin — The effective source approach to the self-force problem have proven to be a very valuable tool in the effort to simulate Extreme Mass Ratio In-spiral (EMRI) systems consisting of a compact object in orbit around a super massive black hole at the center of a galaxy. Such systems are expected to be one of the primary sources for gravitational waves to be observed by LISA. In this talk, I will present a progress report on the development of a very accurate time domain code based on the Discontinuous Galerkin method for solving hyperbolic partial differential equations. In this code the small compact object (or particle) is described by an effective source. This ensures that, near the particle, only the regular part of the field is evolved. Thus, as the singular piece of the field is not present at the particle location, there is no need for mode sum regularization, allowing for simple extraction of the self-force. The ultimate goal of this project is to be able to evolve, in a self-consistent manner, both the fields and the orbit of an EMRI system.

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