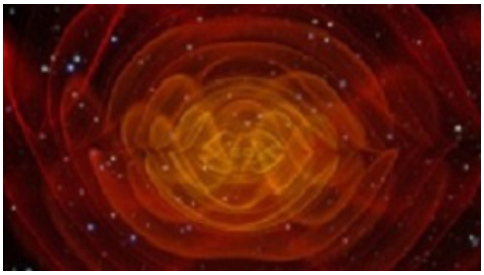

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Towards the self-consistent evolution of a scalar charge around a Schwarzschild black hole.

Tuesday, 20 June 2017 15:00 (25)

Using the effective source approach and the Discontinuous Galerkin method we have developed a very accurate time domain code for the evolution of a scalar charge in orbit around a Schwarzschild black hole. In the first incarnation of the code, only geodesic motion could be handled, but we have now added the ability to handle arbitrarily accelerated orbits.

In this talk I will present code tests based on comparisons with frequency domain results for constant accelerated circular orbits and accelerated eccentric orbits that are periodic. Finally I will present new results for a case that can not be handled in the frequency domain: the case of a particle on a circular geodesic that experiences a short acceleration event (at constant radius) before returning to circular geodesic motion.

I will also discuss the prospect of using this code for self-consistent evolutions where the field and the particle orbit are evolved together.

Primary author(s) : DIENER, Peter (Louisiana State University)

Co-author(s) : OTTEWILL, Adrian (University College Dublin); Dr. HEFFERNAN, Anna (University of Florida); WARDELL, Barry (University College Dublin); WARBURTON, Niels (University College Dublin)

Presenter(s) : DIENER, Peter (Louisiana State University)