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Time domain calculations of scalar self-force and radiation from an orbiting point charge in Schwarzschild spacetime KARNA MOREY, North Carolina School of Science and Mathematics, ZACH NASIPAK, CHARLES R. EVANS, University of North Carolina-Chapel Hill, JONATHAN BENNETT, North Carolina School of Science and Mathematics — Gravitational wave astronomy is a new window on violent mergers of black holes and neutron stars, and promises to eventually provide observations of supernovae, extreme-mass-ratio inspirals (EMRIs) into supermassive black holes, and fluctuations in the Big Bang. We focus on time domain calculations eventually relevant to understanding EMRIs but studying the scalar self-force model problem. In these calculations, scalar radiation is emitted by a point scalar-charged particle in orbit about a more massive Schwarzschild black hole. The time domain calculations use a discontinuous internal boundary condition representation for the point charge. We are implementing hyperboloidal slicing and compactification to improve the treatment of distant and horizon boundaries. Results are compared to earlier frequency domain calculations of Warburton and Barack, and to another more recently developed frequency domain code.

Jonathan Bennett
North Carolina School of Science and Mathematics

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