Abstract Submitted
for the APR14 Meeting of
The American Physical Society

Self–force gravitational waveforms for extreme and intermediate mass ratio inspirals: importance of spin–orbit coupling GAURAV KHANNA, University of Massachusetts Dartmouth, LIOR M. BURKO, Alabama A&M University — We consider the importance of spin–orbit coupling for gravitational-wave dephasing for an extreme or intermediate mass ratio system moving along a quasi-circular Schwarzschild orbit. For the first-order self force we use the fully relativistic force in the Lorenz gauge for eternally circular geodesics. The second-order self force is modeled with its 3.5 post Newtonian counterpart, and spin–orbit coupling is calculated with the Papapetrou equations. We evolve the system using the osculating orbits method, and obtain the gravitational waveforms, whose phase includes all the terms —within our approximation (and using the self force along circular geodesics)— that are independent of the system's mass ratio. We find the partial dephasing due to the following terms, all of which contribute at the same order in the mass ratio (i.e., at order unity): the first-order conservative self force, the second-order dissipative self force, and spin–orbit coupling. We discuss the relative importance of each of these effects.

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Date submitted: 10 Jan 2014 Electronic form version 1.4