Abstract Submitted
for the APR16 Meeting of
The American Physical Society

Highly eccentric inspirals into a Schwarzschild black hole using self-force calculations THOMAS OSBURN, Univ of NC - Chapel Hill, NIELS WARBURTON, MIT, CHARLES EVANS, Univ of NC - Chapel Hill — Eccentric-orbit inspirals into a massive black hole are calculated using the gravitational self-force. Both extreme-mass-ratio inspirals (EMRIs) and intermediate-mass-ratio inspirals (IMRIs) are modeled. These calculations include all dissipative and conservative first-order-in-the-mass-ratio effects for inspirals into a Schwarzschild black hole. We compute systems with initial eccentricities as high as e = 0.8 and initial separations as large as 100 M. In the case of EMRIs, the calculations follow the decay through many thousands of orbits up to the onset of the plunge. Inspirals are computed using an osculating-orbits scheme that is driven by self-force data from a hybridized self-force code. A Lorenz gauge self-force code is combined with highly accurate flux data from a Regge-Wheeler-Zerilli code, allowing the hybrid self-force model to track orbital phase in the inspirals to within 0.1 radians or better. Extensions of the method to include other physical effects are considered.

Thomas Osburn
Univ of NC - Chapel Hill

Date submitted: 06 Jan 2016 Electronic form version 1.4