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Two Timescale Approximation Applied to Gravitational Waves from Eccentric EMRIs JORDAN MOXON, EANNA FLANAGAN, Cornell University, TANJA HINDERER, University of Maryland, College Park, ADAM POUND, University of Southampton — Gravitational-wave driven inspirals of compact objects into massive black holes (Extreme Mass Ratio Inspirals - EMRIs) form an interesting, long-lived signal for future space-based gravitational wave detectors. Accurate signal predictions will be necessary to take full advantage of matched filtering techniques, motivating the development of a calculational technique for deriving the gravitational wave signal to good approximation throughout the inspiral. We report on recent work on developing the two-timescale technique with the goal of predicting waveforms from eccentric equatorial systems to subleading (post-adiabatic) order in the phase, building on recent work by Pound in the scalar case. The computation requires us to understand the dissipative component of the second-order self force. It also demands careful consideration of how the two timescale (near-zone) approximation should match with the post-Minkowski approximation of the gravitational waves at great distances.

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