Finding Fields and Self-Force in a Gauge Appropriate to Separable Wave Equations TOBIAS KEIDL, University of Wisconsin–Washington County, JOHN FRIEDMAN, University of Wisconsin–Milwaukee, DONG-HOON KIM, Caltech, LARRY PRICE, ABHAY SHAH, University of Wisconsin–Milwaukee — Gravitational waves from the inspiral of a stellar-size black hole to a supermassive black hole can be accurately approximated by a point particle moving in a Kerr background. A procedure for finding the renormalized self-force from the Tuekolsky equation [1] has been outlined in the separate paper [2]. This talk focuses on analytic work developed in this formalism and incorporating the $l = 0$ and $l = 1$ parts of the self-force. The self-force is calculated from either the renormalized spin $+2$ or the spin -2 Weyl scalar (ψ_0 or ψ_4). The self-force is can then be calculated algebraically from either renormalized Weyl scalar.

[1]Teukolsky, S. A., Astrophys. J., **185**, 635-647, (1973)
[2]T. S. Keidl, J. L. Friedman, A. G. Wiseman, Phys. Rev. D, in press; gr-qc0611072

Tobias Keidl
University of Wisconsin–Washington County