

New results from second-order black hole perturbation theory

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Developing accurate waveform models for extreme mass-ratio inspirals has necessitated pushing black hole perturbation theory beyond linear order. In this talk I will overview our second-order in the mass-ratio calculation and present new results for the second-order gravitational wave flux from quasi-circular, non-spinning binaries. As a check on our results we compare them with the post-Newtonian expansion and find good agreement. We also find good agreement with numerical relativity simulations suggesting that second-order calculations can be used to cover much of the intermediate mass-ratio inspiral parameter space.