

Abstract Submitted
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Tidal heating and torquing of a Kerr black hole¹ KATERINA CHATZIOANNOU, Montana State University, ERIC POISSON, University of Guelph, NICOLAS YUNES, Montana State University — Astrophysical black holes in binaries are immersed in a sea of gravitational perturbations caused by their companions. These vacuum perturbations will result in the spacetime geometry deviating from the vacuum Kerr solution and in fluxes of mass and angular momentum across the black hole horizon. These effects can alter the frequency evolution of gravitational waves emitted, a detailed modeling of which may be important in detection and crucial in parameter estimation. This talk describes a perturbative analytic calculation of these fluxes, assuming the tidal deformations are small and due to a slowly-varying external universe. This work extends previous results to next-to-leading order in the ratio of the unperturbed black hole mass to the radius of curvature of the external universe.

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