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Eccentric orbit binary black hole inspirals: Informing the post-Newtonian expansion through black hole perturbation theory CHRISTOPHER MUNNA, University of North Carolina at Chapel Hill, ERIK FORSETH, Graham Capital Management, CHARLES EVANS, University of North Carolina at Chapel Hill, SETH HOPPER, Earlham College — We use high precision comparisons between perturbation theory and the post-Newtonian expansion to extract new information on eccentric orbit EMRIs. Fluxes are calculated by combining the MST formalism with spectral source integration (SSI) for a multitude of orbits, whose parameters are then fit to the PN form. This fit is performed on each LMN mode individually, allowing us to exploit the patterns contained therein. The outcome is an ability to fit for combinations of transcendental numbers that far exceeds that of prior work, yielding new analytic coefficients to 9PN order on a Schwarzschild background. Full results for the energy and angular momentum lost to infinity are detailed. In addition, preliminary work expanding perturbative source terms directly is discussed, along with an extension to generic orbits on a Kerr background. We conclude with expectations and outlook.

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