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LIGO I

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We perform scalar self-force calculations for inclined, eccentric orbits of a small, compact body in Kerr space-time. To implement these calculations with arbitrary numerical precision, we generalize spectral source integration (SSI) techniques by introducing the Mino time parameter and extending mode decompositions to include a polar frequency for inclined motion. Calculations are conducted using a Mathematica code that implements these SSI techniques along with the Mano, Suzuki, and Takasugi (MST) formalism to determine the inhomogeneous wave function solutions to the Teukolsky equation. This allows us to improve the accuracy of previous calculations in the literature. We also probe the extended parameter space for various orbital inclinations. Further extension to the gravitational case is also considered.

Presenter(s) :   ZIMMERMAN, Aaron