



Contribution ID: 66

Type: Oral presentation

Computing EMRI using canonical perturbation theory

We compute the extreme mass ratio inspiral in a system of a Schwarzschild black hole perturbed by an additional matter located far in the equatorial plane. First the geodesic equation is solved using an approximate transformation of our hamiltonian to the action-angle coordinates. The approximate solution is then expressed as a Fourier-like expansion which is subsequently inserted to the quadrupole formulas for gravitational wave fluxes. This allows us to adiabatically evolve the energy and angular momentum of the smaller body and extract the corresponding gravitational waveform.

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