

Abstract Submitted
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Do external tidal perturbations induce chaos in EMRIs? DAVID BRONICKI, LEO STEIN, University of Mississippi, ALEJANDRO CRDENAS-AVENDAO, University of Illinois — One of the important classes of targets for the LISA is extreme mass ratio inspirals (EMRIs), where long and accurate waveform modeling is necessary for detection and characterization. In particular, in modeling the dynamics of an EMRI, even small effects may need to be included, such as an external tidal field. The effects of such perturbations may manifest themselves as chaotic behavior at resonances. In this talk, we use a Newtonian analogue of a Kerr black hole to study the effect of an external tidal field on the dynamics and the gravitational waveform. We have developed a numerical framework that takes advantage of the separability of the system to evolve it with a symplectic splitting integrator that produces kludge waveforms to estimate the time scale over which the perturbation affects the dynamics. We compare this time scale with the inspiral time to gauge whether or not tidal effects will be relevant to the modeling of EMRI gravitational waves.

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