

# Tidal resonance in extreme mass-ratio inspirals

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We show the existence of a new type of resonance in extreme mass-ratio inspirals (EMRIs): tidal resonance, which is induced by the tidal gravitational field of nearby stars or stellar-mass black holes. Tidal resonance can be viewed as a general relativistic extension of the Kozai-Lidov resonances in Newtonian systems and is distinct from the transient resonance known for EMRI systems. Tidal resonances will generically occur for EMRIs. By probing their influence on the phase of the EMRI waveform, we can in principle extract information about the environmental tidal field of the EMRI system, albeit at the cost of a more complicated EMRI waveform model.