

EMRIs in ultralight bosonic environments

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New ultralight fields are an exciting candidate for dark matter and can solve some of the small-scale tension between the standard CDM paradigm and observations. With the upcoming space-based LISA mission there is the prospect of detecting compact binaries in galactic centers, where dark matter structures are expected to be present. In this talk, we will present the first fully relativistic framework to study inspirals in non-vacuum environments and apply it to extreme-mass-ratio inspirals evolving inside a boson star composed of these putative fields. We confirm and correct previous results obtained in the Newtonian regime and discuss consequences for gravitational-wave astronomy.

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