

XV Black Holes Workshop



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We explore the problem of a scalar charge orbiting inside a cavity within Schwarzschild spacetime. This problem is relevant to study stellar binaries in AdS as well as in theories with massive degrees of freedom. We show that the charge suffers a non-trivial self-force that would alter its orbit. However, for appropriate initial configurations of the field this effect vanishes over an orbital period. We explore the consequences of this on the orbital trajectory by considering a simpler Hamiltonian model. We conclude that the initial field configuration can impact the characteristics of the motion. Despite this back-reaction, we estimate the scale for which we are able to find eternal binaries.

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