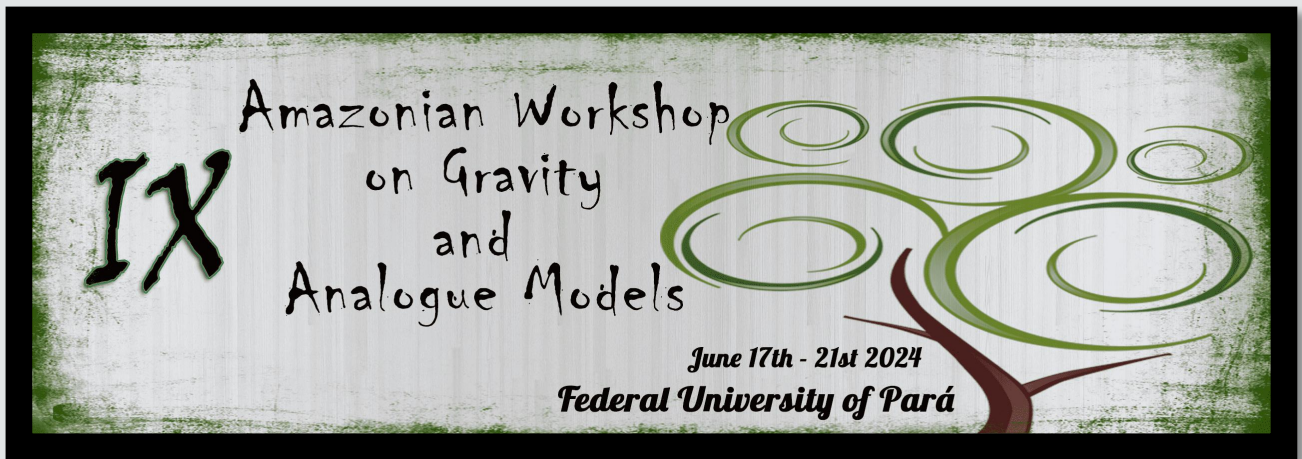




MASSLESS SCALAR ABSORPTION BY DIRTY WORMHOLES

Leonardo K. S. Furuta¹, Renan B. Magalhães¹, Haroldo C. D. Lima Junior², Luís C. B. Crispino¹

1 Programa de Pós-Graduação em Física, Universidade Federal do Pará, 66075-110, Belém, Pará, Brazil.

2 Departamento de Física - CCET, Universidade Federal do Maranhão, Campus Universitário do Bacanga, 65080-805, São Luís, Maranhão, Brazil.

Astrophysical objects like black holes are surrounded by matter in the form of accretion disks or layers of matter. These astrophysical scenarios are expected to introduce new phenomenology in the scattering of particles and fields. Wormholes are candidates for exotic compact objects that can mimic some black hole properties. Hence, it is natural to argue what would happen if the central astrophysical object were a wormhole, instead of a black hole. We investigate the astrophysical environment effect on the absorption of the massless scalar field by a dirty wormhole surrounded by a thick shell of matter. Remarkably, although heavy and dense distributions of matter are considered surrounding the wormhole, the position of most of the spectral lines in the absorption bands is preserved, indicating that the thick shell cannot hide some “fingerprints” of the central object.

Keywords: Dirty wormholes, spectral lines, quasibound states.