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High-energy corrections to the CGHS model: a systematic procedure

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The knowledge of what entered them is completely lost as black holes evaporate. This contradicts the unitarity principle of quantum mechanics and is referred to as the information loss paradox. Understanding the end stages of black hole evaporation is key to resolving this paradox. As a first step, we need to have exact models that can mimic 4-D black holes in General relativity in classical limit and have a systematic way to include high-energy corrections. While there are various models in the literature, there is no systematic procedure by which one can study high-energy corrections. In this talk, we obtain Callan, Giddings, Harvey, and Strominger (CGHS) — a (1+1)-D — model from 4-D scalar-tensor theory action. We then show that 4-D Horndeski action — the most general scalar-tensor theory that does not lead to Ostrogradsky ghosts — can systematically provide a route to include terms relevant at the end stages of black hole evaporation. We discuss some of the interesting features of the corrected CGHS model and obtain Hawking flux. We compare our results with other works.

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