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Title: Probing thermal effects on static black holes with Unruh-DeWitt detectors

Abstract: Experiments on black hole spacetimes can be carried out, theoretically, by Unruh-DeWitt detectors. In recent years, particle detectors have been used to tackle problems ranging from the conceptualization of the experimental detection of Unruh/Hawking effects to probing the quantum nature of the gravitational field itself through entanglement harvesting. Markedly, by providing a new perspective and new operational tools, this approach has also disclosed new thermal, quantum effects such as the anti-Unruh/Hawking effects, which are rather puzzling. In this talk, I will give a general overview of how we can probe thermal, quantum effects on static black holes within the particle detector framework. I will outline the main ingredients for the establishment of a free, scalar quantum field theory on static, curved, not necessarily globally hyperbolic spacetimes and for the computation of the transition rate of a static detector modelled as a two-level system and interacting for an infinite proper time with the quantum field. Then, I will highlight some of its applications, focusing on topological black holes and having in mind the works I have developed in collaboration with C. Dappiaggi, J.Pitelli and D. Sina [physletb.2021.136198, PhysRevD.103.025021, PhysRevD.104.085020, PhysRevD.104.105008].