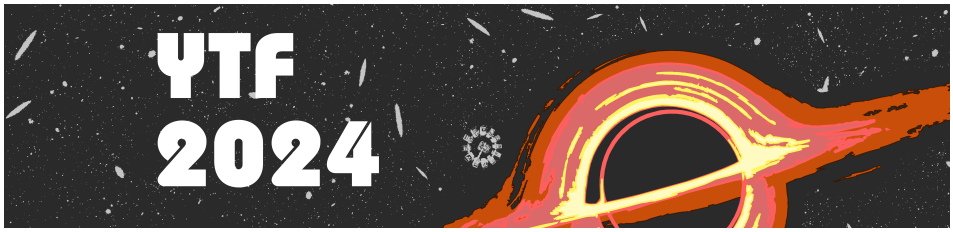

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Quantum black-to-white holes: Covariant non-perturbative corrections

Wednesday, 18 December 2024 14:20 (10 minutes)

Holonomy corrections, which are integral to loop quantum gravity (LQG), have recently been consistently incorporated for the classical Schwarzschild black hole using a novel framework that lets one incorporate non-perturbative quantum geometry corrections in a generally covariant manner. The vacuum spherically symmetric solutions, solved in different gauges, are shown to describe the same physical spacetime. The global structure is that of a non-singular wormhole region connecting the black hole to a white hole. Our result is valid for an arbitrary scale-dependent holonomy parameter which demonstrates the robustness of LQG black holes with respect to quantization ambiguities. The semiclassical analysis of a scalar field on such quantum black hole backgrounds shows that the Hawking thermal distribution is regained, and the LQG corrections enter through the sub-leading greybody factors.

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