

Optomechanical analogues of spacetime superpositions

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We develop of an experimental proposal to simulate the model for spacetime superpositions proposed by Foo, Arabaci, Zych, and Mann in Phys. Rev. Lett. 129, 181301 (2022) , using an optomechanical experiment. The idea is to create a superposition of boundary conditions, which is the core feature of the proposed quantum gravitational model, in a laboratory experiment. This project will in particular explore what scenarios can be implemented by preparing one mirror of an optical cavity in a spatial superposition referred to as an optomechanical cat-state - that would in turn create a superposition of cavity sizes.

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