Title:	A new bound on polymer quantization via an opto-mechanical setup /639/624 /639/766 /132/124 article
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Abstract:	The existence of a minimal measurable length as a characteristic length in the Planck scale is one of the main features of quantum gravity and has been widely explored in the context. Various different deformations of spacetime have been employed successfully for the purpose. However, polymer quantization approach is a relatively new and dynamic field towards the quantum gravity phenomenology, which emerges from the symmetric sector of the loop quantum gravity. In this article, we extend the standard ideas of polymer quantization to find a new and tighter bound on the polymer deformation parameter. Our protocol relies on an opto-mechanical experimental setup that was originally proposed to explore some interesting phenomena by embedding the minimal length into the standard canonical commutation relation. We extend this scheme to probe the polymer length deformed canonical commutation relation of the center of mass mode of a mechanical oscillator with a mass around the Planck scale. The method utilizes the novelty of exchanging the relevant mechanical information with a high intensity optical pulse inside an optical cavity. We also demonstrate that our proposal is within the reach of the current technologies and, thus, it could uncover a decent realization of quantum gravitational phenomena thorough a simple table-top experiment.
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