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Title:	Probing noncommutative theories with quantum optical experiments
Authors:	Dey, Sanjib (/jspui/browse?type=author&value=Dey%2C+Sanjib)
Keywords:	Noncommutative quantum quantum gravity
Issue Date:	2017
Publisher:	Science Direct
Citation:	Nuclear Physics B, 924
Abstract:	One of the major difficulties of modern science underlies at the unification of general relativity and quantum mechanics. Different approaches towards such theory have been proposed. Noncommutative theories serve as the root of almost all such approaches. However, the identification of the appropriate passage to quantum gravity is suffering from the inadequacy of experimental techniques. It is beyond our ability to test the effects of quantum gravity thorough the available scattering experiments, as it is unattainable to probe such high energy scale at which the effects of quantum gravity appear. Here we propose an elegant alternative scheme to test such theories by detecting the deformations emerging from the noncommutative structures. Our protocol relies on the novelty of an opto-mechanical experimental setup where the information of the noncommutative oscillator is exchanged via the interaction with an optical pulse inside an optical cavity. We also demonstrate that our proposal is within the reach of current technology and, thus, it could uncover a feasible route towards the realization of quantum gravitational phenomena thorough a simple table-top experiment.
Description:	Only IISERM authors are available in the record.
URI:	<a href="https://www.sciencedirect.com/science/article/pii/S055032131730319X">https://www.sciencedirect.com/science/article/pii/S055032131730319X</a> ( <a href="https://www.sciencedirect.com/science/article/pii/S055032131730319X">https://www.sciencedirect.com/science/article/pii/S055032131730319X</a> ) <a href="http://hdl.handle.net/123456789/1772">http://hdl.handle.net/123456789/1772</a> ( <a href="http://hdl.handle.net/123456789/1772">http://hdl.handle.net/123456789/1772</a> )
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