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Title:	Geometric phase assisted observation of noninertial cavity-QED effects
Authors:	Navdeep, Arya (/jspui/browse?type=author&value=Navdeep%2C+Arya) Vikash, Mittal (/jspui/browse?type=author&value=Vikash%2C+Mittal) Lochan, Kinjalk (/jspui/browse?type=author&value=Lochan%2C+Kinjalk) Goyal, Sandeep K. (/jspui/browse?type=author&value=Goyal%2C+Sandeep+K.)
Keywords:	Geometric phase assisted observation noninertial cavity
Issue Date:	2022
Publisher:	American Physical Society
Citation:	Physical Review D, 106(4), 45011.
Abstract:	The state of a quantum system acquires a phase factor, called the geometric phase, when taken around a closed trajectory in the parameter space, which depends only on the geometry of the parameter space. Because of its sensitive nature, the geometric phase is instrumental in capturing weak effects such as the acceleration-induced noninertial quantum field theoretic effects. In this paper, we study the geometric phase response of a circularly rotating detector inside an electromagnetic cavity. Using the cavity, the noninertial contribution to the geometric phase can be isolated from or strengthened relative to the inertial contribution. We show that the accumulative nature of the geometric phase may facilitate the experimental observation of the resulting, otherwise feeble, noninertial contribution to the modified field correlations inside the cavity. Specifically, we show that the atom acquires an experimentally detectable geometric phase at accelerations of the order of $\sim 10^7 \text{ m/s}^2$ which is experimentally feasible.
Description:	Only IISER Mohali authors are available in the record.
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