

Abstract Submitted
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Detecting the single photon recoil using trapped ions¹ CORNELIUS HEMPEL, BENJAMIN P. LANYON, PETAR JURCEVIC, FLORIAN ZAEHRINGER, Institute for Quantum Optics and Quantum Information (IQOQI), Innsbruck & University of Innsbruck, Austria, RENE GERRITSMA, Institute of Physics, University of Mainz, RAINER BLATT, CHRISTIAN F. ROOS, Institute for Quantum Optics and Quantum Information (IQOQI), Innsbruck & University of Innsbruck, Austria — I will report on our current work to measure the recoil due to a single photon scattering from a single ion. For this experiment two ions are loaded into a linear ion trap: one well characterized “measurement” ion and one “spectroscopy ion” on which the photon scattering event is to be detected. The photon recoil energy excites the common vibrational mode shared by both ions. In order to detect this extremely small vibration, we make use of a very sensitive highly non-classical motional state. Our technique could have interesting applications in performing spectroscopy of atoms or molecules at the single photon / single atom level.

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