

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Subwavelength localization of a single atom via resonance fluorescence photon statistics M. AL-AMRI, The National Center for Mathematics and Physics, KACST, P.O. Box 6086, Riyadh 11442, Saudi Arabia, SHUAI YANG, M. SUHAIL ZUBAIRY, Institute for Quantum Studies and Department of Physics, Texas A&M University, College Station, Texas 77843, USA — A subwavelength localization scheme of a single atom is investigated. The localization is based on the interaction of the two-level atom with a standing wave laser field. The photon statistics of resonant fluorescence depends on the Rabi frequency of the driving laser field and thus the position of the atom inside the standing wave. We show that this dependence can be used to localize the atom to a subwavelength accuracy.

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Date submitted: 27 Nov 2010

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