

Abstract Submitted
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Robust distant-entanglement generation using coherent multi-photon scattering¹ CHING-KIT CHAN, ITAMP, Harvard University, L. J. SHAM, University of California San Diego — The generation and controllability of entanglement between distant quantum states have been the heart of quantum computation and quantum information processing. Existing schemes for solid state qubit entanglement are based on the single-photon spectroscopy that has the merit of a high fidelity entanglement creation, but with a very limited efficiency. This severely restricts the scalability for a qubit network system. Here, we describe a new distant entanglement protocol using coherent multiphoton scattering. The scheme makes use of the postselection of large and distinguishable photon signals, and has both a high success probability and a high entanglement fidelity. Our result shows that the entanglement generation is robust against photon fluctuations, and has an average entanglement duration within the decoherence time in various qubit systems, based on existing experimental parameters.

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Ching-Kit Chan
ITAMP, Harvard University

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