

Abstract Submitted  
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**Coherent control of entangled states of atomic ensembles** SCOTT B. PAPP, KYUNG S. CHOI, HUI DENG, H. JEFF KIMBLE, Norman Bridge Laboratory of Physics, California Institute of Technology — The realization of quantum communication protocols over a scalable quantum network depends on precise control of entangled states. Recent experimental progress toward a scalable quantum network has included the demonstration of heralded entanglement creation and the distribution of entanglement amongst the nodes of a network. In our system quantum nodes are realized with a pair of atomic ensembles of laser cooled Cs atoms. We will discuss recent developments including the storage and retrieval of entanglement into and out of a quantum memory [1] and an investigation of the processes by which entanglement decays in our system [2]. [1] K. S. Choi, H. Deng, J. Laurat, and H. J. Kimble, arXiv:0712.3571v2 (2008). [2] J. Laurat, K. S. Choi, H. Deng, C.-W. Chou, and H. J. Kimble, Phys. Rev. Lett. **99**, 180504 (2007).

Scott Papp  
California Institute of Technology

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