

Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Progress towards a dual species atomic quantum repeater node using a high-finesse fiber resonator¹ GARRETT HICKMAN, MATTHEW EBERT, TRENT GRAHAM, XIAOYU JIANG, SUDHEER VANGA, CECILIA VOLLBRECHT, RANDALL GOLDSMITH, MARK SAFFMAN, University of Wisconsin-Madison — We present work towards a quantum repeater node based on the use of a high-finesse fiber cavity with atoms of two atomic species. Excellent coupling between the cavity and propagating light modes, and entanglement swapping between Rb and Cs atoms within the cavity, will allow the repeater to be operated with high efficiency and long memory lifetimes. In an intermediate implementation, ensembles of Rb atoms will be transported into the cavity and used for studies of the effects of surface charges on Rydberg excitation fidelities. Here we report on our progress in the use of an optical conveyor to transport atoms from a magneto-optical trap into the field mode of a high-finesse fiber cavity.

¹This research was supported by the US Army Research Laboratory Center for Distributed Quantum Information through Cooperative Agreement No. W911NF-15-2-0061.

Garrett Hickman
University of Wisconsin-Madison

Date submitted: 31 Jan 2019

Electronic form version 1.4