## Abstract Submitted for the DAMOP15 Meeting of The American Physical Society

Towards Laser Cooling Trapped Ions with Telecom Light<sup>1</sup> KRISTINA DUNGAN, PATRICK BECKER, LIZ DONOGHUE, JACKIE LIU, STEVEN OLMSCHENK, Denison University — Quantum information has many potential applications in communication, atomic clocks, and the precision measurement of fundamental constants. Trapped ions are excellent candidates for applications in quantum information because of their isolation from external perturbations, and the precise control afforded by laser cooling and manipulation of the quantum state. For many applications in quantum communication, it would be advantageous to interface ions with telecom light. We present progress towards laser cooling and trapping of doubly-ionized lanthanum, which should require only infrared, telecom-compatible light. Additionally, we present progress on optimization of a second-harmonic generation cavity for laser cooling and trapping barium ions, for future sympathetic cooling experiments.

<sup>1</sup>This research is supported by the Army Research Office, Research Corporation for Science Advancement, and Denison University.

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Date submitted: 29 Jan 2015 Electronic form version 1.4