Abstract Submitted
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Optical Dipole Trapping of Holmium[1] CHRISTOPHER YIP, DONALD BOOTH, HUAXIA ZHOU, University of Wisconsin-Madison, JEFFREY COLLETT[2], Lawrence University, JAMES HOSTETTER[3], Honeywell, MARK SAFFMAN[4], University of Wisconsin-Madison — Neutral Holmiums 128 ground hyperfine states, the most of any non-radioactive element, is a testbed for quantum control of a very high dimensional Hilbert space, and offers a promising platform for quantum computing. Previously we have cooled Holmium atoms in a MOT on a 410.5 nm transition and characterized its Rydberg spectra. We report here on the first optical dipole trapping of Holmium with a 532 nm wavelength trap laser. The trap lifetime is close to 1 sec., limited by photon scattering from nearby transitions. The trapped atoms are used to measure the dynamic scalar and tensor polarizabilities which are compared with calculations based on measured oscillator strengths. We also report progress towards narrow line cooling and magnetic trapping of single atoms.

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