Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Ramsey Spectroscopy Using a Tilted 2D MOT[1] ERIN KNUTSON, St. Mary's College of Maryland, RAGHAV SIMHA, Naval Air Systems Command, JONATHAN M. KWOLEK, University of Connecticut, FRANK A. NARDUCCI, Naval Air Systems Command — We study Ramsey spectroscopy using a 2D tilted MOT. We use a tilted two-dimensional magneto-optical trap (2D MOT) to form a cold and continuous beam of Rubidium 85 atoms. The beam emerges from a pinhole where it passes through an on-resonance state preparation laser beam and then through a pair of co-propagating laser beams tuned to drive stimulated Raman transitions in the atoms. Finally, the beam passes through an on-resonance readout beam. We show that, by controlling the intensity of the Raman beams, we can make the product of the Rabi frequency and the transit time of the atoms through the laser beam equal to π or $\pi/2$ as desired. We find a multi-peak Raman spectrum. We compare the width of the clock transition to the reciprocal of the atoms' transit time through the Raman fields. Finally, we study Ramsey spectroscopy using our system.

[1]Supported by a NavAir Section 219 grant.

Frank A. Narducci
Naval Air Systems Command

Date submitted: 29 Jan 2015 Electronic form version 1.4