Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Rydberg excitation blockade effects in strongly magnetized atom clouds E. PARADIS, C. HEMPEL, B. KNUFFMAN, R. MHASKAR, M. SHAH, G. RAITHEL, University of Michigan, FOCUS center — We present progress on work towards characterizing the Rydberg blockade mechanism within a strong magnetic field (B = 3T). Either permanent quadrupole moments or induced dipole moments could provide a strong interaction between neighboring Rydberg atoms, leading to a blockade. These interactions cause deviations of the spatial Rydberg atom distribution from random ordering that can be detected in a spatially-resolved read-out of Rydberg excitations. The high magnetic field setup offers several key advantages in realizing such a measurement: Diamagnetic Rydberg states are well suited for this research because they are non-degenerate and have large oscillator strengths for photo-excitation. Further, electron imaging in strong magnetic fields lends itself to straightforward realization of imaging with considerable magnification. In this poster, we will present experimental and theoretical progress on this project.

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Date submitted: 04 Feb 2008 Electronic form version 1.4