Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Investigation into the Dipole-Dipole Interaction between Two Localized Groups of Rydberg Atoms[1] PETER D. MAENNER, Bryn Mawr College, THOMAS J. CARROLL, Swarthmore College, MICHAEL W. NOEL, Bryn Mawr College — Atoms in a highly excited, ultracold sample are coupled through the dipole-dipole interaction. The interactions in such a sample are complicated, and an effort has been made to understand and control them. In our experiment, we have investigated how the spatial arrangement of highly excited atoms affects the dipole-dipole interaction strength. Two tunable dye-lasers were focused into a magneto-optical trap, producing a sample consisting of two localized groups of Rydberg atoms. Each group was excited to a different state, such that the only interactions possible were between the different groups of atoms. The dipole-dipole interaction was tuned into resonance with a static electric field. Varying the beam separation, we measured the number of interacting atoms and width of the field tuned resonance peaks.

[1]This work is supported by NSF gant #0134676.

Peter D. Maenner
Bryn Mawr College

Date submitted: 05 Feb 2007 Electronic form version 1.4