

Abstract Submitted  
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**Computational studies of dipole-dipole interactions among Stark manifold states**<sup>1</sup> THOMAS CARROLL, ALEXANDER R. MELLUS, Ursinus College, ALEXANDER M. CHARTRAND, DONALD P. FAHEY, MICHAEL W. NOEL, Bryn Mawr College — In our experiment, we excite ultra-cold atoms in a magneto-optical trap to Rydberg states in a Stark manifold ( $n \sim 35$ ). An external electric field tunes the states such that a pair of atoms can resonantly exchange energy. One atom transitions to the  $(n + 1)$  manifold and the other to the  $(n - 1)$  manifold. We present the results of a computational model of this interaction which includes as many as 6 atoms. We examine many-body effects and redistribution of initial atomic population among the densely packed manifold states.

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Thomas Carroll  
Ursinus College

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