

Abstract Submitted  
for the DAMOP06 Meeting of  
The American Physical Society

**Coherent population transfer by multiphoton adiabatic rapid passage** H. MAEDA, J.H. GURIAN, D.V.L. NORUM, T.F. GALLAGHER, Department of Physics, University of Virginia, Charlottesville, VA 22904 — Coherent population transfer in an atom through a range of states using a sequence of adiabatic rapid passage by single-photon resonances is well known, and it requires the frequency sweep match the changing the frequencies of the atomic transition [1]. The same population transfer can be effected via single multiphoton adiabatic rapid passage, which requires only a small frequency sweep if it is possible to select desired multiphoton transition from the many possible other transitions. In the present study we report observation of population transfer between Rydberg states of atomic Li in the range of  $n = 70 \sim 90$  by high order ( $\geq 11$ ) multiphoton adiabatic rapid passage using a frequency chirped microwave pulse. This work has been supported by the NSF. [1] H. Maeda, D.V.L. Norum, and T.F. Gallagher, *Science* **307**, 1757 (2005).

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Date submitted: 27 Jan 2006

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