

Abstract Submitted  
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**Towards single atoms in an optical dipole trap using Rydberg blockade**<sup>1</sup> X.L. ZHANG, A.T. GILL, M. GIBBONS, L. ZHANG, L. ISENHOWER, T.G. WALKER, M. SAFFMAN, University of Wisconsin — We present experimental studies of preparation of single atom occupancy of optical dipole traps using Rydberg blockade of few atom samples. Starting with  $N$  atoms in the  $F = 2$  state of  $^{87}\text{Rb}$  we perform stimulated Raman transfers to  $F = 1$  via a highly excited Rydberg state. Single atom occupancy is obtained with better than 50% probability. The results are compared with a numerical model accounting for the atomic interactions which predicts the possibility of  $\sim 80\%$  single atom loading starting from samples with  $N \sim 10$  atoms.

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Mark Saffman  
University of Wisconsin

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