Abstract Submitted
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Experimental Probe of Antiferromagnetic Ordering of ^{6}Li in an Optical Lattice[1] J.H. HITCHCOCK, P.M. DUARTE, T.A. CORCOVILOS, R.G. HULET, Department of Physics and Astronomy and Rice Quantum Institute, Rice University, Houston, TX 77005 — We have developed an apparatus to probe magnetic ordering in ^{6}Li using a spin mixture of magnetic sub-levels from the lowest hyperfine state. The degenerate Fermi gas is prepared all optically by loading and evaporative cooling in a high-power optical trap. Our primary goal is the observation of antiferromagnetic (AFM) ordering predicted for an equal spin mixture in a three dimensional lattice with one fermion per site. To identify the AFM phase we will use a near resonant laser to Bragg scatter from the $(1/2\ 1/2\ 1/2)$ lattice plane. A robust control system has been established to vary parameters such as spin polarization, atomic interaction, and lattice depth to extend this system in the future to different lattice geometries.

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