

Abstract Submitted
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All-optical methods for cooling ${}^6\text{Li}$ to quantum degeneracy¹ P.M. DUARTE, J.M. HITCHCOCK, T.A. CORCOVILOS, R.G. HULET, Department of Physics and Astronomy and Rice Quantum Institute, Rice University, Houston, TX 77005 — We present an all-optical production of a degenerate Fermi gas of ${}^6\text{Li}$. The sample is produced by evaporating a spin mixture of the two lowest ground state magnetic sublevels at unitarity in a 1064 nm optical dipole trap. We have modeled new methods for enhancing the evaporation rate and lowering the final temperature by tilting the optical trapping potential with the addition of an off-axis beam. The degenerate spin mixture will be loaded into a 3D simple cubic lattice with the purpose of studying the phase boundary of the antiferromagnetic ground state as a function of interactions and nearest neighbor tunneling.

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