

Abstract Submitted
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Progress on adiabatic preparation of an anti-ferromagnetic state of bosons in an optical lattice¹ R. BROWN, R. WYLLIE, S. KOLLER, D. NORRIS, E. GOLDSCHMIDT, J.V. PORTO, JQI, NIST & UMD — We present progress towards the adiabatic preparation of an anti-ferromagnetic (AF) state of bosons in an optical lattice [1]. Starting from a unit filled Mott insulator, we apply a staggered effective Zeeman field on every other lattice site. Microwave addressing of the Zeeman-split sub-lattices [2] creates AF order in a staggered optical lattice. We then remove the staggered field over different time scales and monitor the resulting dynamics of the spin and site populations. Our choice of initial spin flip allows us to prepare either the ground or highest energy spin state within the Mott-insulating manifold. We explore the role of holes and edge state imperfections on potential super-exchange driven dynamics.

[1] Phys. Rev. A, **81**, 61603 (2010)

[2] Phys. Rev. Lett., **99**, 20402 (2007)

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