

Abstract Submitted
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Spontaneous Magnetization of Harmonically Trapped Ultracold Fermions in an Optical Lattice¹ R.C. BROWN, L.D. CARR, Physics Department, Colorado School of Mines, Golden, Colorado 80401, USA, I. DANSHITA, J.E. WILLIAMS, CHARLES W. CLARK, Electron and Optical Physics Division, National Institute of Standards and Technology, Gaithersburg, Maryland 20899, USA — We use a single-band Fermi Hubbard Hamiltonian to study the ground states of a system of ultracold fermions in a one dimensional optical lattice with an external harmonic trap. We perform simulations using exact diagonalization for small systems with one to five wells and we employ Vidal's algorithm (Time Evolving Block Decimation) for larger systems with up to a hundred wells. As the trapping frequency increases we observe spontaneous transverse magnetization at the edges of the trap. We present a theoretical interpretation of this intriguing result, and discuss how it can be observed in experiments.

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