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Mixture of bosonic and spin-polarized fermionic atoms in an optical lattice LODE POLLET, ETH Zurich, Switzerland, CORINNA KOLLATH, Universite de Genève, Switzerland, ULRICH SCHOLLWÖCK, RWTH Aachen University, Germany, MATTHIAS TROYER, ETH Zurich, Switzerland — We investigate the properties of Bose-Fermi mixtures for experimentally relevant parameters in one dimension using numerical methods. The effect of the fermions on the bosons is not only to deepen the parabolic trapping potential, but also to reduce the bosonic repulsion in higher order. This reduction would theoretically lead to an increase in the bosonic visibility. The opposite was observed however in the experimental $^{87}\text{Rb} - ^{40}\text{K}$ systems, most likely due to a sharp rise in temperature. We discuss the features which could be observed experimentally if temperature remains low, such as a bosonic Mott insulator transition driven by the fermionic concentration, and the formation of various composite particles.

Lode Pollet
ETH Zurich, Switzerland

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