

Abstract Submitted
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Interaction effects of interconvertible two-component bosons in a state-dependent optical lattice¹ BRYCE GADWAY, DANIEL PERTOT, RENÉ REIMANN², DOMINIK SCHNEBLE, Stony Brook University — Mixtures of bosonic species in optical lattices are promising for the study of a number of topics, including spin-boson systems, the two-component Bose-Hubbard model, and quantum magnetism. We have implemented the two-component Bose-Hubbard model using two hyperfine states of ^{87}Rb in a three-dimensional optical lattice with state-dependence along one axis. With optimal overlap of our quasi-stable, homonuclear mixture, we observe significant interspecies effects on the visibility. We have examined their dependence on the relative populations of the two species and the respective state-dependent lattice depths. Possible mechanisms for the observed many-body effects will be discussed.

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