

QUANTUM PHASE TRANSITIONS IN THE SPIN-ORBIT-COUPLED EXTENDED BOSE-HUBBARD MODEL

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The Bose-Hubbard model has a variety of intriguing ground states and exhibits quantum phase transitions between them, most notably the Mott-insulator–superfluid phase transition. The extended Bose-Hubbard model, which also takes into account nearest-neighbour interactions in addition to the on-site interaction, exhibits even more exotic phases such as super-solid and density-wave states. In the other hand, including a spin-orbit coupling in the (two-component) spinor Bose-Hubbard model gives rise to a twisted superfluid order parameter. In this talk we present phase diagrams and quantum phase transitions in the spin-orbit-coupled extended Bose-Hubbard model, obtained via perturbative and numerical mean-field theory.

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