

Abstract Submitted
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Long-range entanglement and Z_2 topological order of hardcore lattice bosons in the strong-interaction limit WEI WANG, Univ of Oklahoma, BARBARA CAPOGROSSO-SANSONE, Clark University — We investigate long-range entanglement properties of a generic class of hardcore lattice boson models governed by two-body interactions. We propose a scenario to explain how Z_2 topological order rises in the strong-interacting limit. We use a local unitary transformation which maps ground states of the original Hamiltonian to ground states of an exactly solvable model. The existence of Z_2 topological order in the exactly solvable model is closely related to topological properties of a surface code. We study the topological ground state degeneracy and locally indistinguishability of ground states in the solvable model and demonstrate a relationship between the Z_2 topological order of the original two-body interacting model and that of a four- or higher-than-four-body interacting model.

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