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Constructing a lattice model for traid anyons

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Traid anyons are indistinguishable particles in one dimension with topological exchange statistics that arise from quantizing the configuration space of indistinguishable particles in one dimension with three-body coincidences removed. For abelian traid anyons, when adjacent particles are exchanged, the state transforms as though they were either bosons or fermions. However, the Yang-Baxter relation does not hold, and the transformation induced by the exchange of non-adjacent particles depends on the path taken by the exchange. Traid statistics can be engineered into bosons hopping on a lattice with Peierls-type phases. We show how the lattice model simulates these unconventional statistics by engineering fluxes through loops in discrete configuration space that mimic the topology of the continuum model. Satisfyingly, the continuum limit of the lattice traid model corresponds to bosons with contact interactions that depend on the relative position of the particles and the specific choice of abelian traid representation being simulated.

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