

Lattice 2024



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## Towards quantum simulation of lower-dimensional supersymmetric lattice models

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Supersymmetric models are built upon a hypothetical symmetry between bosonic and fermionic particles. Lattice studies of their non-perturbative features such as spontaneous supersymmetry breaking and real-time evolution are limited by the sign-problem. The sign-problem can be avoided by working in the Hamiltonian formalism, but it requires an amount of classical resources that grows exponentially with the number of lattice sites and bosonic modes. The use of a quantum hardware instead makes the study feasible because it requires a polynomial growing amount of quantum resources. In this talk, we discuss how to encode supersymmetric models on qubits and briefly present ongoing efforts and challenges of running some lower-dimensional systems on noisy IBM gate-based quantum hardware.

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