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Variational Quantum Eigensolver for (2+1)-Dimensional QED at Finite Density

In this talk, we present an implementation of multiple fermion flavors in both the Kogut-Susskind and Wilson formulations for quantum simulations of (2+1)-dimensional Quantum Electrodynamics (QED). Our numerical results show a particular type of level crossing with one flavor of fermions at zero density for Wilson fermions, as expected from analytical Chern number calculations. Moving forward, we explore the multi-flavor system at finite density by including a chemical potential. Finally, we present results from inference runs executed on real quantum hardware.

Secondary track

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