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Quantum error mitigation by BBGKY-informed sampling

The phase diagram of QCD at finite densities remains numerically inaccessible by classical computations. Quantum computers, with their potential for exponential speedup, could overcome this challenge. However, their current physical implementations are affected by quantum noise. In this contribution, I will introduce a novel quantum error mitigation technique based on a general BBGKY-like hierarchy. This mitigation scheme is applicable to any arbitrary N-qubits time-dependent quantum simulation. The core idea of our method is to draw connected BBGKY equations from the hierarchy and use them to constrain a random sampling of possible mitigations. Our preliminary results indicate that this scheme significantly improves the quality of the (1+1)-Schwinger model simulations, in particular when observing the chiral magnetic effect.

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