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Calculation of Green's Functions using quantum computers for small superfluid systems

Quantum many-body problems, such as the study of nuclear structure, are difficult to treat with classical computers due to exponential complexity. One way to overcome this limitation would be to use quantum computers, which allow to reduce computational cost. In this context, it is important to test quantum algorithms on simple, yet nontrivial models, with the goal of assessing their efficiency and benchmarking them. Focusing on the pairing Hamiltonian, this work addresses the computation of odd systems and Green's functions. Hybrid quantum-classical computations are compared to exact results and standard BCS techniques.

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