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Title: Keldysh-ETH quantum computation algorithm

Abstract: We develop an efficient and fast quantum computational scheme to determine the equilibrium fermionic Green's functions at finite temperature without requiring any adiabatic state preparation steps. The approach works for generic models that obey the eigenstate thermalization hypothesis and one can show the short-time behavior of the Green's functions is produced exactly by this method. We also describe cooling schemes that could be invoked to reach lower temperatures than what can be reached by simple interaction-strength ramping. The approach requires one qbit per orbital degree of freedom plus one additional global ancilla qbit. Cooling requires additional ancilla qbits, with more qbits providing additional cooling power. We end with a discussion on how this algorithm can be implemented now on currently available quantum computers like the IBM 5 qbit machine.