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Title: Methods to simulate fermions on quantum computers with hardware limitations
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Propositions

1. It is possible to store fermionic data in arbitrary tree structures.
   Chapter 2

2. On a two-dimensional square lattice the auxiliary qubit mapping is computationally more efficient than the Jordan-Wigner transformation.
   Chapter 3

3. Locality-preserving mappings of fermions onto qubits increase the number of Hamiltonian terms for many-body operators.
   Chapter 3

4. In a uniform quantum dot array the surface code can be run in constant time using a crossbar network.
   Chapter 4

5. The improvements proposed by Hastings *et al.* to minimize the gate count in an implementation of the Trotter formula for time evolution lead in general to a larger discretization error.
   M. B. Hastings, D. Wecker, B. Bauer, and M. Troyer, Quantum Inf. Comp. ***15****, 1 (2015).*

6. The exact preparation of Slater determinants is possible even without Givens rotations.
   D. Wecker, M. B. Hastings, N. Wiebe, B. K. Clark, C. Nayak and M. Troyer, Phys. Rev. A ***92****, 062318 (2015).*

7. The quantum algorithm of Poulin *et al.* for spectral measurement with a lower gate count needs three-qubit (Toffoli) gates.
   D. Poulin, A. Kitaev, D. S. Steiger, M. B. Hastings, and M. Troyer, Phys. Rev. Lett. ***121****, 010501 (2018).*

8. The reduction of qubit requirements by the elimination of $\mathbb{Z}_2$-symmetries proposed by Bravyi *et al.* may need repeated runs of the simulation to be effective.
   S. Bravyi, J. M. Gambetta, A. Mezzacapo, and K. Temme, arXiv:1701.08213