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## Strategies for braiding and ground state preparation in digital quantum hardware

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# Stellingen

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*Strategies for braiding and ground state preparation  
in digital quantum hardware*

1. For the non-Abelian braiding of chiral edge modes in a topological superconductor one must inject Abrikosov vortices instead of Majorana fermions.  
Chapter 2
2. The linked cluster theorem from many-body perturbation theory has an analogue in digital quantum circuits.  
Chapter 5
3. A single qubit can simulate the cooling effect of a thermal bath.  
Chapter 6
4. Measurement-driven preparation of entangled states can be accelerated with active decision-making by a factor that grows with system size.  
Chapter 7
5. A non-diagonalizable electronic transfer matrix is an indication for a topological phase that disappears in the thermodynamic limit.
6. The Harrow-Hassidim-Lloyd quantum algorithm does not deliver an exponential speed-up when applied to conservative differential equations, due to the infra-red divergence of the inverted time derivative operator.
7. The conjecture of SciPost Phys. 6, 029 (2019), that the quantum Ising chain ground state can be prepared with a circuit depth equal to system size, no longer holds if the Hamiltonian contains terms that break the mapping to free Majorana fermions.
8. The Clifford expansion technique introduced in arXiv:2011.09927 for variational ground state preparation can be extended beyond the mean-field regime.
9. Throughout history, most people and organizations fail to notice how their pursuit for objective truth serves to veil and assist their struggle for social power.

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