Adiabatic manipluations of Josephson qubits for quantum computing

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It is well-known that there are two typical appraoches to implement quantum computing; one is the gate-based quantum computing (i.e., implemented by a series of logic gates), and the other is adiabatic computing (i.e., adiabatically manipulating the system from a known initial state to the desirable state enconded the solution of the problem).
The former scheme is usually evolution-time sensitive, as the gates are usually implemented by the pulses with well-controlled durations. The latter is obvious evolution-time insensitive but seems lack the generality, as each problem formally requires a specifical adiabatic manipulations.

Here, we propose an hybrid approach to realize the quantum computation by implementing the desirable logic gates via a series of adiabatic evolutions. The present scheme is general, since it is formed by a series of logic gates. The present scheme is also evoultion-time insensitive, as all the relevant logic gates are implemented by adiabatic manipulations without defined durations. Specifically, our proposal could be conveniently demonstrated with experimentally-existing systems, such as Josephson phase/flux qubits and electrons on Helium, wherein the broken parity symmetries of the bound statesprovide an efficient approach to design the required adiabatic pulses.