

# Non-Abelian geometric phases in ground-state Josephson devices

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We present a superconducting circuit in which non-Abelian geometric transformations can be realized using an adiabatic parameter cycle. In contrast to previous proposals, we employ quantum evolution in the ground state. We propose an experiment in which the transition from non-Abelian to Abelian cycles can be observed by measuring the pumped charge as a function of the period of the cycle. Alternatively, the non-Abelian phase can be detected using a single-electron transistor working as a charge sensor.

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