

Developing a theory of macroscopic resonant tunneling of flux in a double-well potential in the presence of realistic flux noise - a pen & paper exercise

Wednesday, 30 August 2023 10:00 (30 minutes)

Superconducting qubits based on different forms of quantum dynamics of magnetic flux in SQUIDs continue demonstrating steady progress. Nevertheless, the low-frequency flux noise in SQUID structures remains the major obstacle to their further development to the level necessary for quantum computing applications. Because of this noise, quantum coherence is essentially reduced to the states with the same qubit value of either 0 or 1 (characterized by the same average value of flux). Only minimal coherence exists between states 0 and 1. We will develop a theory of macroscopic resonant tunneling of flux in a double-well potential in the presence of realistic flux noise with a significant low-frequency component.

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