

## Macroscopic quantum tunneling in quartic and sextic potentials: application to a phase qubit

Wed, 2012-03-21 21:25 - [Lukas Hanschke](#) [1] **Date:** 2011-10-28

**Author(s):**

N. Didier, F. W. J. Hekking

**Reference:**

arXiv:1110.6311

**URL:**

<http://arxiv.org/abs/1110.6311> [2]

Macroscopic quantum tunneling of the phase is a fundamental phenomenon in the quantum dynamics of superconducting nanocircuits. The tunneling rate can be controlled in such circuits, where the potential landscape for the phase can be tuned with different external bias parameters. Precise theoretical knowledge of the macroscopic quantum tunneling rate is required in order to simulate and understand the experiments. We present a derivation, based on the instanton technique, of an analytical expression of the escape rate in general quartic and symmetric sextic potentials comprising two escape paths. These new potentials were recently realized when creating a noise-insensitive phase qubit in the camel-back potential of a dc SQUID.

- [SOLID](#) [3]

**Source URL:**

<http://qurope.eu/db/publications/macroscopic-quantum-tunneling-quartic-and-sextic-potentials-application-phase-qubit>

**Links:**

[1] <http://qurope.eu/users/lhanschke>

[2] <http://arxiv.org/abs/1110.6311>

[3] <http://qurope.eu/category/projects/ips/solid>