Microwave spectroscopy of Schmid transition

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Résumé

In 1983, Schmid predicted that a shunted Josephson junction displays a quantum phase transition, and becomes insulating, upon the shunt impedance reaching a critical value. So far, the experimental observation of the Schmid transition remained elusive. Modern attempts to find Schmid transition rely on finite-frequency measurements of a superconducting quantum circuit. As it is typical for a quantum impurity problem, at finite frequencies the transition is broadened to a crossover. We develop the theory of the finite-frequency response functions needed for the interpretation of experimental data. The universal scaling that we unveil will contribute to identifying the Schmid transition unambiguously.