

Abstract Submitted
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Decoherence and Decay of Two-level Systems due to Non-equilibrium Quasiparticles¹ SEBASTIAN ZANKER, MICHAEL MARTHALER, GERD SCHN, Karlsruhe Institute of Technology, INSTITUT FR THEORETISCHE FESTKRPERPHYSIK TEAM — It is frequently observed that even at very low temperatures the number of quasiparticles in superconducting materials is higher than predicted by standard BCS-theory. These quasiparticles can interact with two-level systems, such as superconducting qubits or two-level systems (TLS) in the amorphous oxide layer of a Josephson junction. This interaction leads to decay and decoherence of the TLS, with specific results, such as the time dependence, depending on the distribution of quasiparticles and the form of the interaction. We study the resulting decay laws for different experimentally relevant protocols.

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