

Abstract Submitted  
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**Effect of environmental coupling on tunneling of quasiparticles in Josephson junctions**<sup>1</sup> MOHAMMAD ANSARI, University of Waterloo, FRANK WILHELM, Saarland University, URBASI SINHA, Raman Research Institute, ANINDA SINHA, Indian Institute of Science — We study quasiparticle tunneling in Josephson tunnel junctions embedded in an electromagnetic environment. We identify tunneling processes that transfer electrical charge and couple to the environment in a way similar to that of normal electrons, and processes that mix electrons and holes and are thus creating charge superpositions. The latter are sensitive for the phase difference between the superconductor and are thus limited by phase diffusion even at zero temperature. We show that that term is suppressed in many environments, thus leading to lower quasiparticle decay rates and thus better qubit coherence than previously expected.

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Mohammad Ansari  
University of Waterloo

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