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Dissipation Stabilized Superconductivity in Quantum Wires
HENRY FU, University of California, Berkeley, ALEXANDER SEIDEL, Lawrence Berkeley National Laboratory, JOHN CLARKE, DUNG-HAI LEE, University of California, Berkeley — We present a theory of a superconducting wire dissipatively coupled to an environment. We show that due to the finite extent of the wire, in the absence of dissipation quantum phase slips always destroy superconductivity, even at zero temperature. Dissipation stabilizes the superconducting phase. We apply this theory to understand the "anti-proximity effect" recently seen by Tian et. al. [Phys. Rev. Lett. 95, 076802 (2005)] in Zinc nanowires.

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