Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sorting Category: 11.3 (E)

Dissipation-Induced Quantum Phase Transition in a Resonant Level[1] HENOK MEBRAHTU, IVAN BORZENETS, DONG E. LIU, HUAIXIU ZHENG, YURI BOMZE, Duke University, ALEX SMIRNOV, North Carolina State University, HAROLD BARANGER, GLEB FINKELSTEIN, Duke University — We measure conductance through a resonant level coupled to a dissipative environment, which suppresses tunneling rate at low energies. Our sample consists of a single-walled carbon nanotube quantum dot contacted by resistive metal leads that serve as the dissipative environment. We study the shape of the resonant conductance peak, with the expectation that its width and height, both dependent on the tunneling rate, will be suppressed at low temperatures. However, we observe distinct regimes, including a case where the resonant tunneling conductance reaches the unitary limit, despite the presence of dissipation. We discuss the implication of these findings for a dissipation-induced quantum phase transition and extract the scaling exponents.

[1]Work supported by U.S. DOE

[X] Prefer Oral Session
[ ] Prefer Poster Session

Henok Mebrahtu
htm@phy.duke.edu
Duke University

Date submitted: 26 Jan 2012 Electronic form version 1.4