Contribution ID : **51** Type : **Oral**

Thermal rectification through a nonlinear quantum resonator

martedì 12 ottobre 2021 12:35 (25)

We present a systematic study of thermal rectification, R, in a nonlinear resonator. In the strongly anharmonic regime and weak system-bath coupling we derive general upper bounds on R. Beyond the weak-coupling regime we employ different methods: (i) including cotunneling processes, using (ii) nonequilibrium Green's function formalism and (iii) Feynman-Vernon path integral approach. We find that the weak coupling bounds are violated for strong coupling, providing signatures of high-order coherent processes. For weaker anharmonicity heat rectification is calculated with the equation of motion method and in mean-field approximation. We find that the former method predicts, for small or intermediate anharmonicity larger R.

B. Bhandari, P. A. Erdman, R. Fazio, E. Paladino and F. Taddei Phys. Rev. B 103, 155434 (2021)

Primary author(s) : Dr. BHANDARI, Bibek (NEST, SNS and Istituto di Nanoscienze CNR); Dr. ERDMAN, Paolo (NEST, Scuola Normale Superiore and Istituto Nanoscienze-CNR); FAZIO, Rosario; Prof. PALADINO, Elisabetta (Dipartimento di Fisica e Astronomia, Università di Catania); Dr. TADDEI, Fabio (NEST, Istituto Nanoscienze-CNR and Scuola Normale Superiore)

Presenter(s) : Prof. PALADINO, Elisabetta (Dipartimento di Fisica e Astronomia, Università di Catania)

Session Classification : Session 4