Thermodynamics of superconducting quantum circuits

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I will present our work on thermodynamics of mesoscopic electronic circuits. In the first part of the talk I discuss stochastic thermodynamics in circuits where single electrons can be controlled and detected. This set-up forms a platform for studies of non-equilibrium fluctuation relations, and has allowed us to realize and investigate two types of Maxwell's demons [1-3]. In the second part of the talk I introduce superconducting qubits as a working substance for experiments on quantum heat transport, refrigerators and heat engines [4-6], and I present our efforts towards measuring quantum trajectories by a calorimetric method [7].

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