

# Full-counting statistics of information content

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We consider a bipartite quantum conductor and discuss the joint probability distribution of particle number in a subsystem and the self-information associated to the reduced density matrix of the subsystem [1]. By extending the multi-contour Keldysh Green function technique [2], we calculate the Rényi entropy of a positive integer order  $M$  subjected to the particle number constraint, from which we derive the joint probability distribution. For energy independent transmission, the time dependence of the accessible entanglement entropy, or the conditional entropy, is derived. The properties of the joint probability for energy dependent transmission probability at the steady state are analyzed around the coherent resonant tunneling and the incoherent sequential tunneling conditions. We discuss the distribution of the efficiency, which measures the information content transferred by a single election.

- [1] Y. Utsumi: "Full-counting statistics of information content in the presence of Coulomb interaction" Phys. Rev. B 92, 165312 (2015); "Full counting statistics of information content and particle number" arXiv:1704.02679
- [2] Yu. V. Nazarov, Phys. Rev. B 84, 205437 (2011); M. H. Ansari and Yu. V. Nazarov, Phys. Rev. B 91, 104303 (2015); Phys. Rev. B 91, 174307 (2015); ZhETF 149, 453 (2016)