MAR12-2011-002655

Abstract for an Invited Paper
for the MAR12 Meeting of
the American Physical Society

High-order counting statistics and interactions

CHRISTIAN FLINDT, University of Geneva

Full counting statistics concerns the stochastic transport of electrons in mesoscopic structures [1]. Recently it has been shown that the charge transport statistics for noninteracting electrons in a two-terminal system is always generalized binomial: it can be decomposed into independent single-particle events, and the zeros of the generating function are real and negative [2]. In this talk I show how the zeros of the generating function move into the complex plane due to interactions and demonstrate how the positions of the zeros can be detected using high-order factorial cumulants [3]. As an illustrative example I discuss electron transport through a Coulomb blockade quantum dot for which the interactions on the quantum dot are clearly visible in the high-order factorial cumulants. These findings are important for understanding the influence of interactions on counting statistics, and the characterization in terms of zeros of the generating function provides a simple interpretation of recent experiments, where high-order statistics have been measured [4].

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