Monte Carlo approach to quantum transport

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I will describe the recently developed diagrammatic Monte Carlo method for non-equilibrium systems [1] which is based on a stochastic sampling of a diagrammatic expansion on the Keldysh contour. The usefulness of this approach will be demonstrated with an application to the problem of transport through an interacting quantum dot. Results for interaction and voltage quenches will be discussed and compared to perturbative calculations [2].

[1] P. Werner, T. Oka and A. J. Millis, Phys. Rev. B 79, 035320 (2009).

[2] T. Fujii and K. Ueda, Phys. Rev. B 68, 155310 (2003).