Non-equilibrium transport through nanostructures in magnetic field

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Abstract

In a recent publication (Gezzi,Pruschke and Meden PRB 2007), we introduced a non-equilibrium extension of the functional renormalization group approach to quantum many-particle systems based on the Keldysh formalism. As specific example we presented stationary transport through a quantum dot at finite Bias voltage and at T=0 In this contribution we study the effect of an external magnetic field on the transport properties of a quantum dot in a stationary non-equilibrium situation. We discuss in particular the influence of the different energy scales of the dot and the magnetic field on non-equilibrium current and conductance. Other interesting quantities we have analyzed are the individual contributions of spin up and down electrons, split by the presence of the magnetic field, to the transport parameters. Interesting is also the behaviour close to the linear response regime (Karrasch et. al PRB 2006)