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Transport through Luttinger liquids with impurities

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We study the conductance through an interacting nanowire containing impurities and coupled to non-interacting leads. Our recently developed functional renormalization group (fRG) method starts from the microscopical model and arrives at an effective low-energy model showing Luttinger-liquid behavior. For a double barrier enclosing a dot region the conductance is determined over several decades of the temperature and for arbitrary impurity strength. Depending on the parameters of the dot we find temperature regimes in which the conductance follows power laws with universal exponents as well as non-universal behavior.

Keywords : functional renormalization group, Luttinger liquid, impurities