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Effective equilibrium theory of non-equilibrium quantum transport PRASENJIT DUTT, Yale University, New Haven, CT., JENS KOCH, Northwestern University, Evanston, IL., JONG HAN, SUNY Buffalo, Buffalo, NY., KARYN LE HUR, Yale University, New Haven, CT. — We establish a rigorous theoretical foundation for an effective equilibrium description of electronic transport through quantum impurity models out of equilibrium. An imaginary time framework involving the Lippmann-Schwinger operators of the system is proposed and expounded. This forms the basis for the implementation of standard equilibrium many body techniques, effectively avoiding the complexities of the Keldysh contour, and is used to compute transport observables. We present a novel perturbative scheme for treating interactions, which we use to study the Anderson impurity model out of equilibrium. Generalizations to non-perturbative methods are also explored. We use this formalism to investigate the effect of voltage bias, temperature and a magnetic field on the fate of the Abrikosov-Suhl resonance and make a comparison with numerics and experimental results.

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