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New diagrammatic approach to the steady-state transport: nonlinear thermoelectric effects in interacting systems[1] JONG HAN, RYAN HEARY, State University of New York at Buffalo — Steady-state nonequilibrium described by a Gibbsian ensemble $e^{-\beta(H-Y)}$ with the boundary condition operator Y is shown to be equivalent to the Keldysh formulation, through an explicit perturbation calculation of Anderson impurity model. We also show that the diagrammatics can be significantly simplified in the steady-state problems with a single real-time contour, in contrast to the double-contour Keldysh method. We apply this method to a quantum dot system in the Anderson impurity model with finite chemical potential bias and finite temperature gradient across the source-drain leads. We discuss the nonlinear nonequilibrium behavior of the Kondo resonance caused by strong potential and temperature bias.

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