Nonlinear thermoelectric transport in mesoscopic systems
JONATHAN MEAIR, PHILIPPE JACQUOD, University of Arizona — We construct a scattering theory of weakly nonlinear thermoelectric transport through mesoscopic conductors. To preserve gauge invariance interaction induced potentials within the conductor must be self-consistently determined. We describe how to do this and apply our theory to calculating the leading nonlinear contribution to both electrical and heat currents. We present sum rules for our nonlinear response coefficients that must hold for current conservation and gauge invariance to be satisfied. We illustrate the method by investigating the thermoelectric response of a quantum point contact and a resonant tunneling barrier.

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