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Out-of-equilibrium conductivity and current noise at quantum critical points ANDREW BERRIDGE, London Centre for Nanotechnology, M.J. BHASEEN, Cavendish Laboratory, Cambridge, A.G. GREEN, London Centre for Nanotechnology — Quantum critical points display universal behaviour across a wide range of physical systems. These effects appear in both thermodynamics and transport. Such behaviour should also be present out-of-equilibrium where, for example, the current and current noise should follow scaling laws as a function of applied field. These expectations have been borne out in calculations for out-of-equilibrium transport at the Superfluid-Mott Insulator quantum critical point of the Bose-Hubbard model [**?**, **?**]. These analyses extend the quantum Boltzmann description [**?**] of equilibrium transport using a trick of the 1/N expansion. Here we use an epsilon expansion to obtain similar results. This approach has the advantage of making the physical constraints of the results more transparent. We also present preliminary analysis of the evolution to the non-equilibrium steady state after the electric field is applied.

References

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