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Thermoelectric transport in the vicinity of a superconductor-metal quantum phase transition in nanowires ADRIAN DEL MAESTRO, BERND ROSENOW, SUBIR SACHDEV, Harvard University — We consider a model of a zero temperature phase transition between superconducting and diffusive metallic states in very thin wires due to a Cooper pair breaking mechanism, e.g. a magnetic field in the wire direction or disorder in an unconventional superconductor. The critical theory contains current reducing fluctuations in the guise of both quantum and thermally activated phase slips. In a large-N limit, we calculate the universal dependence of the electrical and thermal conductivity on both pair breaking strength and temperature. We find that the conductivity has a non-monotonic temperature dependence on the metallic side of the transition and that the Wiedemann-Franz law is obeyed at low temperatures. In the quantum critical region, we study the dynamics of a two-component order parameter field via the Langevin equation formalism and compare with the large-N result.

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