MESOSCOPIC THERMAL TRANSPORT THROUGH A WEAK LINK

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We calculate the rate of thermal energy flow between two macroscopic dielectrics, each held in thermodynamic equilibrium at a different temperature, and joined by a weak mechanical link.[1] To leading order in the strength of the weak link, the thermal current is determined by a product of the local vibrational density-of-states of the two bodies at the points of connection. Our general expression for the thermal current can be regarded as a thermal analog of the well-known formula for the electrical current through a resistive barrier. It is also related to the *thermal* Landauer formula in the weak-phonon-"tunneling" limit. Implications for mesoscopic thermal transport in nanostructures are discussed.