

MA T H E M A T I C A L PH Y S I C S SE M I N A R

Rutgers University
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A Mechanical Model for Fourier's Law of Heat Conduction

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Abstract

Nonequilibrium statistical mechanics close to equilibrium is a physically satisfactory theory centered on the linear response formula of Green-Kubo. This formula results from a formal first order perturbation calculation without rigorous justification. A rigorous derivation of Fourier's law for heat conduction from the laws of mechanics remains thus a major unsolved problem. In this talk we present a deterministic mechanical model of a heat-conducting chain with nontrivial interactions, where kinetic energy fluctuations at the nodes of the chain are removed. In this model the derivation of Fourier's law can proceed rigorously.