KINETIC LIMIT FOR A WAVE EQUATION IN A WEAKLY PERTURBED MEDIUM

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This talk will present a convergence result for the scalar wave equation

$$\frac{\partial^2}{\partial t^2} u(x,t) = c(x)^2 \Delta u(x,t)$$

with a position-dependent, randomly perturbed speed of wave propagation $c(x)$. Its fluctuations are of order $\sqrt{\varepsilon}$ with $\mathcal{O}(1)$ correlation length. The method of graph expansions is used to analyze the $\varepsilon \to 0$ limit behavior of the averaged Wigner function. It is shown that on macroscopic ($\mathcal{O}\left(\varepsilon^{-1}\right)$) space and time scales the disorder-averaged Wigner function converges to the solution of a linear Boltzmann equation.