PERTURBATION OF DISORDERED HARMONIC CHAINS BY ANHARMONIC INTERACTIONS

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I will consider the thermal conductivity of an everywhere pinned, one-dimensional, disordered harmonic chain. This system is known to be a perfect insulator due to Anderson localization of the eigenmodes. However, if some anharmonic interaction, or some energy-preserving stochastic noise, is added, localization gets possibly destroyed, allowing energy to dissipate into the chain. In this talk, I will discuss some recent rigorous results on the behavior of the conductivity of the chain in the regime of a weak perturbation by these non-integrable interactions. We will see that some effect of localization definitely persist in this new setup. No mathematical knowledge on localization will be assumed. The talk will mostly be based on [arXiv:1203.3587] and [arXiv:1111.6383]; joint work with Cédric Bernardin.