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Energy Transport in 1-Dimensional Oscillator Arrays With Hysteretic Damping

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Energy transport in 1-dimensional oscillator arrays has been extensively studied to date in the conservative case, as well as under weak viscous damping. When driven at one end by a sinusoidal force, such arrays are known to exhibit the phenomenon of *supratransmission* [1], i.e. a sudden energy surge above a critical driving amplitude. In this work [2], we study 1-dimensional oscillator chains in the presence of *hysteretic damping* [3], and include nonlinear stiffness forces that are important for many materials at high energies. We first employ Reid's model of *local* hysteretic damping [4], and then study a new model of *nearest neighbor dependent* hysteretic damping to compare their supratransmission and wave packet spreading properties in a deterministic as well as stochastic setting. The results have important quantitative differences, which should be helpful when comparing the merits of the two models in specific engineering applications.

References

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