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Durability of Long Equipartition Times In Anharmonic Oscillator Chains CHRISTOPHER WATENPOOL, DONALD PRIOUR, Youngstown State University — Vibrational modes, completely decoupled in the case of a purely harmonic chain do not interact, thereby preventing an even spread of energy over both low and high frequency states. The distribution of energy beyond a small set of initially excited modes, known as equipartition, proceeds over finite time scales with the admixture of an anharmonic term. However, in many cases ($e.g\ V(x) = \alpha x^2 + \beta x^4$), the transfer of energy from low to high frequency modes is hampered for an isolated chain, with equipartition times diverging with increasing system size. Using Molecular Dynamics simulations we relax the isolation condition, gradually coupling the ends of the chain to a thermal bath. Calculating equipartition times for various coupling strengths, we seek to determine if: (i) The bulk limit divergence persists for any coupling strength, (ii) Bulk equipartition times are finite beyond a coupling threshold, or (iii) Coupling to a thermal bath has a singular effect and yields finite equipartition times for any nonzero coupling strength.

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