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Nonlinear Targeted Energy Transfer in Dynamical Systems

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We study nonlinear targeted energy transfer (TET) from linear discrete or continuous oscillators to lightweight essentially nonlinear attachments acting, in essence, as nonlinear energy sinks. We discuss the dynamics of TET, i.e., fundamental or subharmonic transient resonance captures, and study conditions for optimal TET by performing slow/fast partition of the strongly nonlinear dynamics. Applications to instability suppression, and to shock and vibration isolation are discussed.

Key Words: Essential nonlinearity, targeted energy transfer