THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS COLLOQUIUM

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Metastability of the Nonlinear Wave Equation

THURSDAY, November 9, 2017, at 5:00 PM
Jones 226, 5747 South Ellis Avenue

ABSTRACT

I will discuss the long-time dynamics of infinite energy solutions to a wave equation with nonlinear forcing. Of particular interest is when these solutions display metastability in the sense that they spend long periods of time in disjoint regions of phase-space and only rarely transition between them. This phenomenon is quantified by calculating exactly via Transition State Theory the mean frequency at which the solutions of the nonlinear wave equation with initial conditions drawn from its invariant measure cross a dividing surface lying in between the metastable sets. Numerical results suggest a regime for which the dynamics are not fundamentally different from that observed in the stochastic counterpart in which random noise and damping terms are added to the equation, as well as a regime for which successive transitions between the metastable sets are correlated and the coarse-graining to a Markov chain fails.

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