APPLIED MATHEMATICS COLLOQUIUM

RESONANT ENERGY TRANSFER AND SELECTION OF THE GROUND STATE

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ABSTRACT:

Typical solutions of the time-dependent linear Schrödinger equation with a multi-bound state potential evolve toward a state which is quasi-periodic in time. However solutions of the nonlinear Schrödinger equation (NLS) with multi-bound state potential (Gross Pitaevskii equation), in the regime of weak nonlinearity, behave very differently. Instead, one observes solutions approaching a time-periodic nonlinear ground state. Nonlinear resonance is responsible for energy transfer from the excited state to the ground state and radiation modes. We derive a lower dimensional reduction governing this energy transfer. Applications to nonlinear optical pulse propagation in inhomogeneous structures and to stationary propagation in photonic lattices are discussed.

MONDAY, FEBRUARY 7, 2005
4:15 PM
Building 4, Room 231

Refreshments at 3:30 PM in Building 2, Room 349.

Applied Math Colloquium: http://www-math.mit.edu/amc/spring05
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