Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Mechanism of discrete breather excitation in driven micro-mechanical cantilever arrays PANAGIOTIS MANIADIS, Theoretical Division and Center for Nonlinear Studies,Los Alamos National Laboratory, Los Alamos, New Mexico 87545. , SERGEJ FLACH, Max-Planck-Institut fur Physik Komplexer Systeme, Dresden, Germany. — We study the pathway of generating discrete breathers (also known as intrinsic localized modes "ILMs") in damped and driven micro-mechanical cantilever arrays. Using the concept of the nonlinear response manifold we provide a systematic way to find the optimal parameter regime in damped and driven lattices where discrete breathers exist. Our results show that discrete breathers appear via a new instability of the manifold, different from the anticipated modulational instability known for conservative systems. We present several ways of exciting breathers, and compare also to experimental studies in anti-ferromagnetic layered systems.

Panagiotis Maniadis
Theoretical Division and Center for Nonlinear Studies,
Los Alamos National Laboratory, Los Alamos, New Mexico 87545.

Date submitted: 02 Dec 2006 Electronic form version 1.4