Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Discrete Breathers in magnetic metamaterials in one and two dimensions. GIORGOS TSIRONIS, MARIA ELEFTHERIOU, NIKOS LAZARIDES, Physics Department, University of Crete, and IESL, Foundation of Research and Technology, P. O. Box 2208, 71003, Heraklion, Greece — We study the formation, stability as well as mobility of discrete breathers (DBs) in magnetic metamaterials in one and two dimensions. Magnetic metamaterials consisted by split ring resonators (SRRs) exhibit large magnetic response at Terahertz and optical frequencies. We use nonlinear arrays of SRRs where DBs arise as a result of the nonlinearity and discreteness. We consider different geometries of SRRs in both dimensions and find several different types of Hamiltonian nonlinear excitations such as dark, single-site and multibreathers. We also consider the dissipative version of the problem where DBs are formed as well. In the latter case, DBs locally alter the paramagnetic character of MMs to a diamagnetic.

Maria Eleftheriou
Physics Dept., University of Crete, and IESL, Foundation of Research and Technology, P. O. Box 2208, 71003, Heraklion, Greece

Date submitted: 23 Nov 2007 Electronic form version 1.4