Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Electric Dipole Transitions at Magnetoacoustic Resonance M.I. BICHURIN, V.M. PETROV, O.V. RYABKOV, A.V. FILIPPOV, A.A. IVANOV, Novgorod State University, Russia, G. SRINIVASAN, Oakland University — Ferromagnetic-ferroelectric composites show giant magnetoelectric (ME) effects that are facilitated by the sample response to electric, magnetic, and elastic forces. Composites consisting of magnetostrictive ferrites and piezoelectric lead zirconate titanate (PZT) or lead magnesium niobate-lead titanate (PMN-PT) are found to show strong ME coupling. Such materials also provide us with unique opportunities for theoretical and experimental studies on ME coupling when the magnetic and/or electric subsystems show resonance behavior. Two types of resonances are of importance: electromechanical resonance (EMR) for the piezoelectric component and ferromagnetic resonance (FMR) for the magnetic component. At the coincidence of EMR and FMR, i.e., at the magneto-acoustic resonance (MAR) ME interaction becomes stronger [1]. This work focuses on electric dipole transitions in multilayer ferromagnetic-ferroelectric composites, such as yttrium iron garnet (YIG) and PZT, at MAR. Expressions have been obtained for ME susceptibility and the ME coefficient. The results indicate the potential for novel microwave devices based on ME interactions at MAR. Supported by grants from the ARO, ONR and NSF.
[1] M.I. Bichurin, V.M. Petrov, O.V. Ryabkov, S.V. Averkin and G. Srinivasan, *Phys. Rev. B.* **72**, 060408(R) (2005).

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Date submitted: 19 Dec 2005 Electronic form version 1.4