

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Theory of electromechanical resonance in magnetostrictive - piezoelectric multilayer composites** D.A. FILIPPOV, V.M. PETROV, M.I. BICHURIN, Novgorod State University, Russia, C.W. NAN, Tsinghua University, China, G. SRINIVASAN, Oakland University, Rochester, MI — The theory of electromechanical resonance in multilayer magnetostrictive - piezoelectric composites is developed. The theory is based on the use of initial (not effective) parameters of magnetostrictive and piezoelectric phases. Equations of motion were used to obtain an expression for the frequency-dependence of magnetoelectric response in a multilayer composite [1,2]. The enhanced magnetoelectric response at the electromechanical resonance is dependent on the interface coupling. The calculations predict a peak in the magnetoelectric voltage coefficient at electromechanical resonance, with a two-order of magnitude increase relative to low-frequency values. These predictions are in agreement with data for ferrite-lead zirconate titanate (PZT) bilayers and metal-PZT-metal trilayers. 1. M. I. Bichurin, D.A. Filippov, V. M. Petrov, V. M. Laletin, N. Paddubnaya, and G. Srinivasan, *Phys. Rev.*, B **68**, 132408 (2003). 2. D. A. Fillipov, M. I. Bichurin, V. M. Petrov, V. M. Laletsin, N. N. Puddubnaya, and G. Srinivasan, *Magnetoelectric Interaction Phenomena in Crystals*-NATO Science Series II. Vol. 164, Eds. M. Fiebig, V. V. Eremenko, and I. E. Chupis (Kluwer Academic Publishers, London, 2004), p.71-80. - supported by grants from the Russian Ministry of Education (02-3.4-278), the Universities of Russia Foundation (UNR 01.01.026) and the National Science Foundation (DMR-0302254).

Gopalan Srinivasan  
Oakland University

Date submitted: 23 Nov 2004

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