

Abstract Submitted
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Modeling of Magneto-
electric Effect in Ferromagnetic-Piezoelectric Porous Composites

GOPALAN SRINIVASAN, V.M. PETROV, U. LALETSIN, Oakland University, Rochester, MI, M.I. BICHURIN, D.S. TUSKOV, Novgorod State University, Russia — One of the important factors that influence the magnetoelectric (ME) properties is the porosity in bulk ferromagnetic-piezoelectric composites. Bulk composites have the advantage of superior mechanical strength over layered samples. Here we provide a systematic experimental investigations and modeling of porous bulk composites. Samples of ferrite and piezoelectric composites have been synthesized with porosity ranging from 5 to 40%. Studies reveal a 60-90% reduction in the ME voltage coefficient α_E as the porosity p is increased from 5 to 40%. We also discuss a model that considers the influence of porosity on ME interactions in a bulk composite. Expressions for ME voltage coefficients have been obtained for low frequencies and at electromechanical resonance. The calculated ME coefficients are in very good agreement with the data. The research was supported by a grant from the NSF (DMR-0606153).

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