

Abstract Submitted
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Magnetoelectric effect in porous bulk ferromagnetic/piezoelectric composites M. I. BICHURIN, V. M. PETROV, D. S. TUSKOV, Novgorod State Univ., Russia, G. SRINIVASAN, Oakland Univ., Rochester, MI — Bulk and layered composites of piezoelectric and magnetostrictive phases show magnetoelectric (ME) properties. Bulk composites are desirable over layered samples due to superior mechanical strength. Here we discuss a model that considers the influence of porosity on ME interactions in a bulk composite. The composite is assumed to consist of piezoelectric, magnetostrictive and void (pores) subsystems. We solved combined elastostatic, electrostatic and magnetostatic equations to obtain effective composite parameters (piezoelectric modules, magnetostriction factors, compliances, ME coefficients). Expressions for longitudinal and transverse low-frequency ME voltage coefficients have been obtained for 3-0-0 and 0-3-0 connectivity types. The dependence for ME voltage coefficient on volume fractions of the two phases are shown to be dependent on connectivity type. The strength of ME interaction depends on porosity. The calculated ME coefficients are in good agreement with data in Ref.1.

1. G. Srinivasan, C. P. DeVreugd, C. S. Flattery, V. M. Laletsin and N. Paddubnaya. *Appl. Phys. Lett.*, **85**, 2550 (2004).

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