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of Percolation Model Magnetoelectric Effects in Ferrite/Piezoelectric Bulk Composite V.M. PETROV, M.I. BICHURIN, D.S. TUSKOV, Novgorod State University, Russia, G. SRINI-VASAN, Oakland University — A bulk composite consisting of ferrite-ferroelectric phases shows magnetoelectric (ME) effects that are product properties of the magnetostrictive deformation and piezoelectric charge generation. Bulk composites with strong ME effects are desirable over layered samples due to superior mechanical strength. Here we discuss a percolation approach for modeling the ME effect in bulk composite [1]. We calculated percolation threshold corresponding to structural phase transition of bulk composites from the state with ME interactions to a state with no ME interactions. Expressions for longitudinal and transverse low-frequency ME voltage coefficients have been obtained. Volume fractions corresponding to peak ME voltage coefficients are given. We obtained a piezoelectric volume fraction of 0.45 for maximum ME effect in bulk samples of lead zirconate titanate and nickelcobalt ferrite. These estimates are in excellent agreement with data. supported by a grant from the NSF.

 V. M. Petrov, M. I. Bichurin, V. M. Laletin, N. Paddubnaya, 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.65-70.

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