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Low Frequency Magnetoelectric Coupling in Bilayers of Lead Zirconate Titanate and Sol-gel Derived Lanthanum Strontium Manganite
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— Layered composites of ferromagnetic-piezoelectric oxides show a giant magnetoelectric effect (ME) at low frequencies [1]. This work is on ME coupling in bilayers of lead zirconate titanate (PZT) and $La_{0.7}Sr_{0.3}MnO_3$ (LSMO). Discs of LSMO were made by hot-pressing and sintering of powder obtained by sol-gel techniques. The bilayers were made by bonding LSMO and PZT discs. The ME voltage coefficient $\alpha_E = \delta E/\delta H$ were estimated from the measured induced electric field δE in the presence of an ac field δH and a bias field H. Key results are as follows. (i) The maximum α_E of 50-60 mV/cm Oe at room temperature is obtained for transverse fields and for LSMO sintered at 1600 K. (ii) α_E is found to be temperature independent. (iii) The ME coupling for longitudinal fields is an order of magnitude smaller than for transverse fields. (iv) Theoretical estimates based on a model for bilayers are in qualitative agreement with the data [2]. 1. G. Srinivasan, E. T. Rasmussen, J. Gallegos, R. Srinivasan, Yu. I. Bokhan, and V. M. Laletin, Phys. Rev. B **64**, 214408 (2001). 2. G. Srinivasan, E. T. Rasmussen, B. J. Levin, and R. Hayes, Phys. Rev.B **65**, 134402 (2002).

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