Magnetoelectric effect in magnetostrictionpiezoelectric multiferroics

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Abstract: Present studies of magnetoelectric (ME) composite multiferroics are analyzed. In such materials the ME effect arises from magnetostriction and piezoelectric properties of components. The elastic mechanical interaction between magnetostriction and piezoelectric phases results in a giant magnetoelectric response in magnetoelectric composite materials. In the vicinity of electromechanical resonance the ME effect is enhanced more than by a factor of 100. Interest in possible construction of integrated devices has been provoked by recent nanostructural composites of ferroelectric and magnetic oxides prepared in the film-onsubstrate form. The ME interaction between ferroelectric and magnetic oxides of nanometers size is the same as that in common composite materials. Like bulk ME composites, the ME effect in nanocomposites may be applied in converters sensors, transducers, and in a variety of reproducing-recording devices.

Author Keywords: Electromechanical resonance; Magnetic resonance; Magnetoelectric effect; Magnetostrictionpiezoelectric multiferroics

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