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Magnetoelectric properties of compositionally graded laminates at zero bias field S.K. MANDAL, G. SREENIVASULU, Oakland University, V.M. PETROV, V.V. ZIBTSEV , Novgorod State University, G. SRINIVASAN, Oakland University — This investigation focuses on magnetoelectric (ME) properties of compositionally graded magnetostrictive and piezoelectric trilayers. We studied magnetically induced electric field in a sample of nickel zinc ferrite (NZFO) with the grading axis perpendicular to the sample plane and lead zirconate titanate (PZT). Trilayers with two PZT layers with opposite poling direction and the ferrite in the middle were used to eliminate the standard ME effect stipulated by longitudinal deformations so that one measures ME output due to flexural deformation caused by grading effect. The data obtained for the dc and ac magnetic fields parallel to the sample plane showed a strong ME coupling even for zero external bias field. Theoretical modeling showed that this unconventional ME response can be accounted for by flexural deformation which arises from magnetic interaction between external ac magnetic field and internal dc magnetic field in the magnetic layer due to grading. The modeling results agree well with the data. – work supported by grants from DARPA and NSF.

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