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Microwave Magnetoelectric Interactions in Ferrite-Piezoelectric Bilayers[1] ALEXANDER TATARENKO, Oakland University, VIKAS MATHE, Pune University, GOPALAN SRINIVASAN — The measurement of the strength of microwave magnetoelectric (ME) interactions through ferromagnetic resonance (FMR) in bilayers of single crystal ferrite-piezoelectric oxides is reported. An electric field E produces a mechanical deformation in the piezoelectric phase, resulting in a shift in the resonance frequency for the ferrite. The strength of ME coupling is obtained from data on frequency shift vs E. Studies were performed on bilayers with single crystal yttrium iron garnet (YIG) films or single crystal nickel zinc ferrite and single crystal lead zirconium niobate-lead titanate (PZN-PT) or polycrystalline lead zirconate titanate (PZT). The samples were positioned in a microstripline-alumina ground plane structure. Resonance profiles were with a vector network analyzer obtained for E = 0-8 kV/cm for in-plane magnetic fields H. Important results are as follows. (i) The ME coupling in the bilayers is stronger in bilayers with PZT than for PZN-PT. (ii) The coupling is a factor of 2 stronger in samples with nickel zinc ferrite than for YIG. The bilayers are potentially useful for E-tunable microwave resonators, filters and phase shifters.

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