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Electrically Tunable Y-type Hexaferrite-Piezoelectric Microwave Resonator ALEXANDER TATARENKO, G. SRINIVASAN, Oakland University — An electrically tunable Y-type hexaferrite-piezoelectric resonator has been designed and characterized. Such Y-type hexagonal ferrites have large in-plane anisotropy that would facilitate the observation of ferromagnetic resonance (FMR) over 5-25 GHz with external bias fields of 0-5 kOe. In a ferrite-piezoelectric bilayer the FMR could be tuned with an electric field E applied to the piezoelectric layer. The piezoelectric deformation manifests as an internal magnetic field in the ferrite and will lead to a shift in FMR. Single crystal ferrites of the composition $Ba_2Zn_2Fe_{12}O_{22}$ (Zn_2Y) were used. The crystals were grown by the floating zone technique. The resonator consisted of a 100 micron thick 1 mm x 3 mm Zn_2Y bonded to 10 mm diameter ,200 micron thick lead zirconate titanate (PZT). The resonator was placed in a micorstripline and excited with 1 mW of microwaves. The reflected or transmitted power was measured with a a vector network analyzer. Reflected power versus frequency profiles at 5-25 GHz for a series of in-plane bias magnetic field H showed an increase in the FMR frequency by 60 MHz for E = 7 kV/cm. These resonators can be used as filters or phase shifters. – work supported by grants from ARO and ONR.

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