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Design and characterization of $Pb(Zr,Ti)O_3$ /$CoFe_2O_4$ Multilayer epitaxial thin films NORA ORTEGA, ASHOK KUMAR, RAM KATIYAR, University of Puerto Rico — Mutiferroics are a novel class of next generation multifunctional materials. Intensive research is being pursued towards the development of materials with high magnetoelectric (ME) coupling. We have fabricated epitaxial $Pb(Zr,Ti)O_3$–$CoFe_2O_4$ (PZT-CFO) multilayer (ML) thin films using pulsed laser deposition on (001) oriented lattice matched $SrRuO_3/SrTiO_3$ (SRO/STO) substrates. X-ray diffraction and Raman analysis revealed that PZT and CFO were in the perovskite and spinel phases respectively, in the multilayer thin films having high crystalline quality. The TEM and STEM line scan of the multilayer thin films showed that the layered structure was maintained. Magnetic hysteresis loop showed the ferromagnetic behavior of ML structure, which is independent of the ML configuration. Ferroelectric properties and temperature dependence magnetization will be discussed.

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