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Effect of substrate induced strains on the magnetic and ferroelectric properties of epitaxial bilayer thin films of lead zirconate titanate and cobalt ferrite¹ DEVAJYOTI MUKHERJEE, TARA DHAKAL, ROBERT HYDE, PRITISH MUKHERJEE, HARIHARAN SRIKANTH, SARATH WITANACHCHI, University of South Florida — Epitaxial bilayer thin films of cobalt ferrite (CFO) and lead zirconium titanate (PZT) were deposited on MgO (100) and SrTiO₃ (STO) (100) substrates by pulsed laser deposition. The structural properties were characterized using X-ray diffraction and atomic force microscopy. The magnetic properties were measured at 10 K and 300 K in both parallel and perpendicular magnetic fields. The CFO-PZT bilayers showed enhanced or reduced magnetization compared to the single layer CFO films depending on the substrate of deposition. The ferroelectric properties of the CFO-PZT bilayers showed enhanced polarization compared to PZT single layer films on both types of substrates. A strain compression-relaxation mechanism was proposed in order to explain the structure-property relationships in the CFO-PZT bilayers.

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