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Controlling strain anisotropy in iron-palladium thin films using perovskite-oxide substrates RENEE HARTON, VLADIMIR STOICA, ROY CLARKE, University of Michigan — In this study, iron-palladium (FePd) thin films were deposited on (100) barium-titanate ($BaTiO_3$) and (100) strontium-titanate ($SrTiO_3$) substrates. Both $BaTiO_3$ and $SrTiO_3$ have a perovskite crystal structure and exhibit similar structural phases, such as tetragonal and cubic, at various temperatures. In contrast to $SrTiO_3$, $BaTiO_3$ exhibits ferroelectric and piezoelectric behavior in all of its structural phases except the cubic phase. In the tetragonal phase, the strain anisotropy of $BaTiO_3$ is two-fold about the in-plane c-axis, while in the cubic phase the epitaxial strain in the substrate plane is four-fold. In this investigation, the effect of strain on the magnetism and structure of FePd/$SrTiO_3$ and FePd/$BaTiO_3$ heterostructures was studied using the Magneto-Optic Kerr Effect (MOKE), Atomic Force Microscopy (AFM) and X-Ray diffraction (XRD) analysis to investigate the correlation between the magnetic anisotropy, morphology and structure of the FePd films.

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