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Phase field modeling of domain structures in nano-composite ferroelectric multilayers JULIA SLUTSKER, NIST, ANDREI ARTEMEV, Carleton University, ALEXANDER ROYTBURD, University of Maryland — The formation of domain structures in differently patterned multilayers with a nano-composite structure containing ferroelectric structure components has been studied by using a phase field method based on the microelasticity theory and the Fourier spectral analysis of electrostatic interactions. The effects of the depolarizing electric field, the thickness of the film, and the misfit between a film and a substrate on the domain pattern and switching properties have been analyzed. The effect of a relative strength of elastic interactions in the multilayer on the dielectric response and effective piezo coefficients has been studied. A correlation between the results of the phase field modeling and the existing results of first principle calculations has been demonstrated, thus allowing us to describe ferroelectric films on different scale levels.

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