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Switching domain dynamics in ferroelectric thin films. ALEXEI GRIGORIEV, University of Wisconsin-Madison, DAL-HYUN DO, REBECCA SICHEL, PAUL EVANS, University of Wisconsin-Madison, BERNHARD ADAMS, ERIC DUFRESNE, Argonne National Laboratory — Polarization switching in ferroelectric materials is governed by the microscopic details of the nucleation and growth of polarization domains. The electric-field dependence of the density of domain nucleation and the domain wall velocity are largely unknown. Using time-resolved x-ray microdiffraction, we have explored the switching dynamics of thin ferroelectric films over a wide range of applied electric fields, starting from the coercive field and ranging up to the maximum field allowed by the thin film capacitors. By separating dynamics of nucleation and domain wall motion we can study the relationship between these two phenomena and their relative contributions to the polarization switching process.

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