

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Critical thickness for memory in thin ferroelectric films A.M. BRATKOVSKY, Hewlett-Packard Laboratories, A.P. LEVANYUK, U. Autonoma Madrid, Spain — The finite screening length by real metallic electrodes, albeit very small ($< 1\text{\AA}$), results in finite depolarizing field that tends to split the film into domains. We prove that, as a result, a critical thickness for ferroelectric memory is a few times larger than the critical thickness for ferroelectricity itself, especially in cubic perovskite films. For instance, the critical thickness of strained BaTiO₃ films on SrRuO₃/SrTiO₃ substrate for onset of (meta)stable memory should be in excess of 4.5 nm compared with critical thickness of 1.6 nm for existence of ferroelectric domains.

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Date submitted: 27 Nov 2007

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