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 ($< 1\text{Å}$), 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 BaTiO$_3$ films on SrRuO$_3$/SrTiO$_3$ 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.