

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Three perimeter effects in ferroelectric nanostructures ANDREAS RUEDIGER, FRANK PETER, RAINER WASER, Center of Nanoelectronic Systems for Information Technology, Research Center Juelich, Germany, HYS-TERETIC OXIDES TEAM — As the lateral size of ferroelectric nanoislands is now well below 50 nm, the question of size effects becomes increasingly relevant. Three independent techniques provided data of pronounced ferroelectric features along the perimeter: impedance spectroscopy [1], piezoelectric force microscopy [2] and pyroelectric current sensing [3]. However, as we can show, all three observations are related to the measurement technique that interferes with the lateral confinement and still there is no direct evidence of a lateral size effect in ferroelectric nanostructures. We discuss some scenarios of further downscaling and possible consequences. [1]M.Dawber, D.J. Jung, J.F. Scott, Perimeter effect in very small ferroelectrics, *Appl. Phys. Lett.* 82, 436 (2003) [2]F. Peter, A. Ruediger, R. Dittmann, R. Waser, K. Szot, B. Reichenberg, K. Prume, Analysis of shape effects on the piezoresponse in ferroelectric nanograins with and without adsorbates, *Applied Physics Letters*, 87, 082901 (2005) [3] B.W. Peterson, S. Ducharme, V.M. Fridkin, Mapping surface Polarization in thin films of the ferroelectric polymer P(VDF-TrFE), *Ferroelectrics*, 304, 51 (2004)

Andreas Ruediger
Center of Nanoelectronic Systems for Information Technology, Research Center Juelich, Germany

Date submitted: 30 Nov 2005

Electronic form version 1.4