

Theory and Modeling of Polarization Switching in Ferroelectrics

E. Klotins, J. Hlinka* and J. Kaupužs**

Institute of Solid State Physics, 8 Kengaraga Str., LV 1063 Riga, Latvia, E-mail klotins@cfi.lu.lv

**Institute of Physics ASCR, Praha, Na Slovance 2, 18221 Praha 8, Czech Republic*

***Institute of Mathematics and Computer Science, University of Latvia, Raina bulv. 29, LV 1459, Riga, Latvia, E-mail kaupuzs@latnet.lv*

Abstract. Thermodynamic approach of ferroelectrics is reconsidered in recourse to thermal activated nature of polarization switching under arbitrary driving voltage. This analysis heavily relies on transformation of the problem to imaginary time Schrödinger equation and its integration by means adopted from pure quantum problems. It turns out that this nonadiabatic treatment reveals non-equilibrium properties directly relevant to essential application-grade performance specifications like hysteresis and spatial inhomogeneity.