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Polarization Reversal in Ferroelectric Nanowires using Terahertz Pulses[1] RYAN HERCHIG, KEVIN MCCASH, INNA PONOMAREVA, University of South Florida — Ferroelectric nanowires are very attractive for potential applications in nanodevices, nanosensors or ferroelectric computer memory, since they posses reversible polarization at the nanoscale. Here we report the possibility to remotely control the polarization direction in ferroelectric nanowires by the application of a small biased field in combination with a terahertz Gaussian-shaped pulse. Our study is carried out on $Pb(Zr_{0.4}Ti_{0.6})O_3$ nanowires using classical molecular dynamics with first-principle-based effective Hamiltonian[1]. The conditions for which the polarization reversal in the nanowire can be achieved by the coupled effect of a biased field with the application of a terahertz pulse are investigated. In particular, we will report computational data on the polarization reversal by application of THz pulses of different amplitude, frequency and width. Furthermore the dependence of the polarization reversal on the temperature is considered.

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