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Terahertz Frequency Dynamics of Ferroelectric Nanowires[1] RYAN HERCHIG, University of South Florida, KIMBERLY SCHULTZ, Carthage College, KEVIN MCCASH, INNA PONOMAREVA, University of South Florida — A thorough understanding of ferroelectric nanostructures is imperative considering their utility in creating nanoscale devices for the technology of the future. One such ferroelectric nanostructure which may prove useful in the design of nanosensors is the nanowire. We report our study on ferroelectric nanowires of $Pb(Zr_{0.4}Ti_{0.6})O_3$ alloy done using classic molecular dynamics with first-principle-based effective Hamiltonian[1] and Evans-Hoover thermostat. We found that 1) the polarization of such nanowires can be reversed and 2) that the nanowires temperature can be controlled by the application of a terahertz electric field pulse. The dependence of these properties on the frequency, width, and amplitude of the pulse is explored and discussed in addition to a possible energy dissipation mechanism.

[1] L. Bellaiche *et al*, Phys. Rev. Lett. **8**, 5427 (2000).

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