Abstract Submitted
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Polarization Coupling in Ferroelectric Multilayers as a Function of Interface Charge Concentration[1] MAHMUT OKATAN, Institute of Materials Science, University of Connecticut, CT, 06269, JOSEPH MANTESE, United Technologies Research Center, East Hartford, CT, 06108, PAMIR ALPAY, Institute of Materials Science, University of Connecticut, CT, 06269 — Intriguing properties of multilayered and graded ferroelectrics follow from the electrostatic and electromechanical interactions. The strength of the interlayer coupling depends on the concentration of interfacial defects with short-range local electrostatic fields. Defects may locally relax polarization differences and thus reduce the commensurate bound charge concentration at the interlayer interfaces. In this talk, we develop a theoretical analysis based on non-linear thermodynamics coupled with basic electrostatic relations to understand the role of charge compensation at the interlayer interfaces. The results show multilayered ferroelectrics with systematic variations in the composition may display a colossal dielectric response depending upon the interlayer electrostatic interactions. It is expected that other properties such as the pyroelectric and piezoelectric response will yield concomitant increases through the dielectric permittivity.

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