

Seminar

08. Dezember 2010 15:30h HS 44-482



zu folgendem Vortrag wird herzlich eingeladen:

High temperature stress-induced phase transitions in lead-free ferroelectrics

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Lead-free polycrystalline bismuth-based ferroelectrics were tested under uniaxial mechanical compression at various temperatures in the vicinity of the polar tetragonal to nonpolar tetragonal phase boundary. They are shown to display double loop-like stress-strain behavior, marked by a closed ferroelastic hysteresis loop. Thus, it forms a mechanical analog to the polarization-electric field hysteresis behavior of barium titanate above the Curie temperature. As temperature is increased there is an apparent loss of macroscopically observable ferroelasticity, despite the persistence of tetragonality. Macroscopic experimental results are discussed in conjunction with temperature-dependent and stress-dependent high-energy x-ray diffraction data as well as additional mechanical experiments that were performed on polycrystalline barium titanate. This reveals a potential ferroelastic-paraelastic phase transition below the Curie temperature in bismuth-based samples, marked by a discontinuous change in lattice parameters and octahedral tilting during compressive mechanical loading.



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