

Colloquium Notice

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*Nonlinear optical detection of mixed tetragonal and
rhombohedral phases in ferroelectric
BaZr_{0.2}Ti_{0.8}O₃ films*

Recently, BaZr_{0.2}Ti_{0.8}O₃ (BZT) based ferroelectric films have exhibited high energy storage densities (up to 166 joules per cubic centimeter) and recycling efficiencies (up to 96 percent). Here, I will introduce you our new investigation of heterophase polydomain structures in BZT films by optical second harmonic generation (SHG) and photo-induced acoustic waves. We analyzed the spatial distribution of SHG intensities and GHz acoustic phonon oscillations. A rhombohedral symmetry is revealed to grow with increasing film thickness as tetragonal domains relax away from the film-substrate interface. The presence of phase segregated tetragonal and rhombohedral structures is further confirmed through TEM and XRD measurements. The high energy performance of the films is explained by ultra-adaptive nanodomains which can effectively accommodate the competing elastic and electrical stress fields during charge-discharge cycles.

Monday

March 26, 2018

Starts at 12:15 PM

Physics Conference Room, SB B326