

Abstract Submitted
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Electric Field Effects on Diffuse Scattering of PZN-PT BENJAMIN FRANDSEN, Brigham Young University, BRANTON CAMPBELL, Brigham Young University — Relaxor ferroelectrics like $\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3$ in solid solution with PbTiO_3 are of pressing applied interest due to their remarkable piezoelectric properties. X-ray single-crystal diffuse-scattering techniques have been shown to provide insight into the origin of PZN-PT's extreme piezoelectric response. We will present results of a synchrotron experiment in which we have mapped out large high-resolution volumes of reciprocal space to examine the effects of a strong electric field on the diffuse scattering of the material. By reconstructing regions of diffuse scattering in three dimensions, we can quantitatively determine the effect of the electric field. We will discuss a novel theoretical model that accurately reproduces the diffuse scattering both with and without an applied electric field and provides a framework for interpreting the field-induced changes in the context of the physical properties of PZN-PT.

Benjamin Frandsen
Brigham Young University

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