

Abstract Submitted
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Electric-field dependent measurements of 3D x-ray diffuse scattering in piezoelectric materials BENJAMIN FRANDSEN, Physics & Astronomy, Brigham Young University, STACEY SMITH, Chemistry & Biochemistry, Brigham Young University, BRANTON J. CAMPBELL, Physics & Astronomy, Brigham Young University, MATTHEW J. GARDNER, KEVIN D. SEPPI, Computer Science, Brigham Young University — Polar nano-regions (PNR) in relaxor materials $\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3$ and $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ are of pressing applied interest due to their influence on the remarkable piezoelectric properties of their solid solutions with ferroelectric PbTiO_3 . X-ray single-crystal diffuse-scattering techniques have recently been shown to provide qualitative insight into the local atomic structures of these materials. But in order to differentiate among the PNR models that have arisen, quantitative analyses are also needed, which require mapping out large high-precision volumes of reciprocal space as a function of electric field. In August of this year, we conducted a synchrotron x-ray diffuse scattering experiment at the Advanced Photon Source at Argonne National Laboratory to determine the effect of a strong electric field on the local atomic structure of a PNR. I will describe the preliminary results of this experiment.

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