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Oxygen octahedral rotation mapping in calcium titanate/strontium titanate superlattices by transmission electron microscopy GREG STONE, Department of Materials Science and Engineering, Pennsylvania State University, JIM CISTON, University of California Berkeley, Lawrence Berkeley National Lab, National Center for Electron Microscopy, RYAN HAISLMAIER, BRIAN VANLEEUWEN, NASIM ALEM, Department of Materials Science and Engineering, Pennsylvania State University, DARRELL SCHLOM, Department of Materials Science and Engineering, Cornell University, VENKATRAMAN GOPALAN, Department of Materials Science and Engineering, Pennsylvania State University — We report the investigation of oxygen octahedral rotation mapping in calcium titanate/barium titanate superlattices epitaxially grown on LSAT (001) with transmission electron microscopy. Analysis of the images shows induced antiphase rotations of the oxygen octahedral the strontium titanate layers that is absent in the bulk material at room temperature. These rotations play a key role in breaking the centrosymmetry of the material leading to polar properties as seen by second harmonic generation. We also map the local position of the cations to provide a complete picture of any relative local displacements and the oxygen-cation-oxygen bond angles.

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