

Abstract Submitted
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Structural Phase Diagram and Size-Dependent Electrical Polarization in Freestanding SrTiO₃ Nanoparticles HAN ZHANG, SIZHAN LIU, New Jersey Inst of Tech, MEGAN SCOFIELD, STANISLAUS WONG, State University of New York at Stony Brook, XINGUO HONG, Stony Brook University, VITALI PRAKAPENKA, ERAN GREENBERG, Center for Advanced Radiation Sources, University of Chicago, TREVOR TYSON, New Jersey Inst of Tech — The bulk phase of the classic perovskite SrTiO₃ (STO) is paraelectric and exhibits a structural phase transition at a pressure $P \sim 6$ GPa at room temperature. Understanding the structural phase diagram of nano scale STO has important implications on the basic physics and applications of the general class of oxide perovskites. Previous research indicated a stable polar state in STO over a wide pressure range with small particle size. We have established a size-dependent phase diagram of STO. Meanwhile, we have further investigated polarization properties with freestanding STO nanoparticles with experimental methods and modeling. This work is supported by DOE Grant DE-FG02-07ER46402.

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