

Abstract Submitted  
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**Phase Transitions and Domain Structure in Mixed Tetragonal-Rhombohedral BiFeO<sub>3</sub> thin films using Raman Spectroscopy and Non-linear Optics** E. VLAHOS, A. KUMAR, S. DENEV, A. MELVILLE, C. ADAMO, J.F. IHLEFELD, G. SHENG, The Pennsylvania State University, R.J. ZECHES, J.X. ZHANG, Q. HE, C.H. YANG, University of California, Berkeley, R. ERNI, M.D. ROSSELL, Lawrence Berkeley National Lab, A.J. HATT, University of California, Santa Barbara, Y.-H. CHU, C.H. WANG, National Chiao Tung University, C. EDERER, Trinity College, V. GOPALAN, L.Q. CHEN, D.G. SCHLOM, The Pennsylvania State University, N.A. SPALDIN, University of California, Santa Barbara, L.W. MARTIN, University of Illinois, Urbana-Champaign, R. RAMESH, University of California, Berkeley, DMITRI TENNE, Boise State University — We have shown that biaxially strained BiFeO<sub>3</sub> thin films can undergo an isosymmetric phase transition from a rhombohedral-like to a tetragonal-like phase. This talk discusses the evolution of the tetragonal and the mixed phases in BiFeO<sub>3</sub>/YAlO<sub>3</sub> thin films with varying film thickness using optical second harmonic generation (SHG) and Raman spectroscopy. 25nm, 75nm, and 225 nm thick films were studied; thinner films are dominated by the tetragonal phase, whereas thicker films exhibit both tetragonal and rhombohedral phases. The evolution of these phases as function of film thickness and temperature was experimentally determined.

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