01 May 2015

Erratum: "Impact of Symmetry on the Ferroelectric Properties of $CaTiO_3$ Thin Films" (Applied Physics Letters 106:162904 (2015))

Michael D. Biegalski

Liang Qiao

Yijia Gu
Missouri University of Science and Technology, guyij@mst.edu

Apurva Mehta

et. al. For a complete list of authors, see https://scholarsmine.mst.edu/matsci_eng_facwork/2474

Recommended Citation

M. D. Biegalski et al., "Erratum: "Impact of Symmetry on the Ferroelectric Properties of $CaTiO_3$ Thin Films" (Applied Physics Letters 106:162904 (2015))," *Applied Physics Letters*, vol. 106, no. 21, American Institute of Physics (AIP), May 2015.
The definitive version is available at https://doi.org/10.1063/1.4921711

Erratum: "Impact of symmetry on the ferroelectric properties of $CaTiO_3$ thin films" [Appl. Phys. Lett. 106, 162904 (2015)]

Michael D. Biegalski,[1] Liang Qiao,[1,a)] Yijia Gu,[2] Apurva Mehta,[3] Qian He,[4] Yayoi Takamura,[5,b)] Albina Borisevich,[4] and Long-Qing Chen[2]
[1]*Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA*
[2]*Department of Materials Science and Engineering, Pennsylvania State University, University Park, Pennsylvania 16802, USA*
[3]*Stanford Synchrotron Light Source, SLAC National Accelerator Laboratory, Menlo Park, California 94025, USA*
[4]*Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA*
[5]*Department of Chemical Engineering and Materials Science, University of California-Davis, Davis, California 95616, USA*

(Received 8 May 2015; accepted 12 May 2015; published online 26 May 2015)

[http://dx.doi.org/10.1063/1.4921711]

There is a typo of the space group. All the *Pnmb* should be *Pbnm* (or *Pnma*). So the Glazer notation should be changed to $(a^-a^-c^+)$ for *Pbnm* space group on page 4 of the article.[1] We have also noticed that the thermodynamic analysis of $CaTiO_3$ thin film is not correct. The films are $(001)_{PC}$-oriented or (101)-oriented. Therefore, there is no need to rotate the coordinate system (on page 4 of the article[1]). By applying the thin film boundary condition, i.e., $\varepsilon_{11} = \varepsilon_{22} = \varepsilon_s$, $\varepsilon_{21} = \varepsilon_{12} = 0$, $\sigma_{13} = \sigma_{23} = \sigma_{33} = \sigma_{31} = \sigma_{32} = 0$, and minimizing the total free energy with respect to epitaxial strain, ε_s, a temperature-strain phase diagram is determined. All the strain and stress components should be in the original coordinate system. The corrected phase diagrams are shown in the figures below. For LSAT phase diagrams (Figs. 5(a) and 5(b)), the ferroelectric transition is better described using the *Fmm2* phase because the calculated phase boundary is much closer to the experimental value than using the *Aba2* phase. The NGO phase diagram, as shown in Fig. 5(c), is essentially the same as Gu's orthorhombic *Pbnm* $CaTiO_3$ film calculation,[2] which is also $(001)_{PC}$-oriented. All the other analysis and conclusions in the article[1] are not affected. We apologize to the readers for the confusion that might have been caused. The authors would like to thank Ryan Haislmaier for pointing out the mistake.

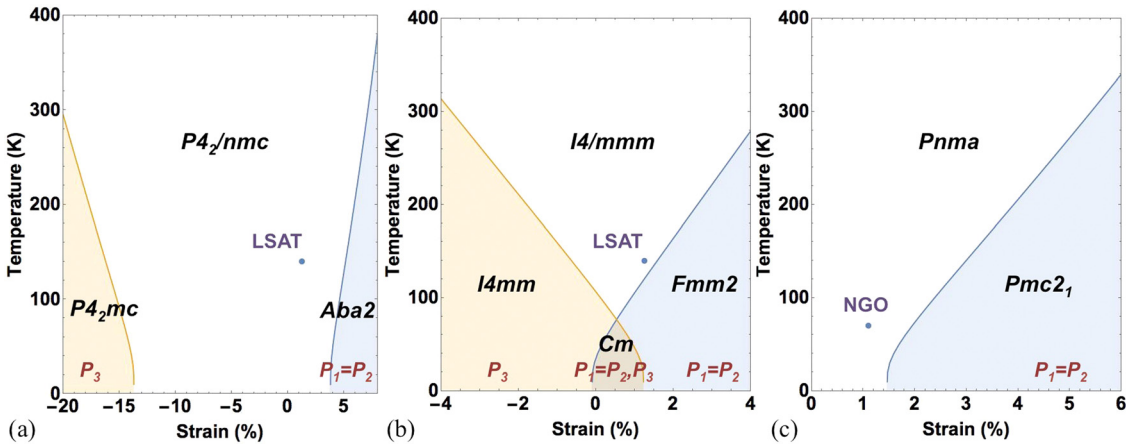

FIG. 5. The calculated temperature-strain phase diagram for $CaTiO_3$ films grown on (a) and (b) LSAT and (c) NGO substrates. The corresponding measured experimental transition temperatures are indicated on the phase diagrams. P_1 and P_2 are in-plane polarization component and P_3 is out-of-plane component. The polarization component not shown for a specific phase is zero.

[1]M. D. Biegalski, L. Qiao, Y. Gu, A. Mehta, Q. He, Y. Takamura, A. Borisevich, and L.-Q. Chen, Appl. Phys. Lett. **106**, 162904 (2015).
[2]Y. Gu, K. Rabe, E. Bousquet, V. Gopalan, and L.-Q. Chen, Phys. Rev. B **85**, 064117 (2012).

[a)]Present address: School of Materials, The University of Manchester, Manchester M13 9PL, United Kingdom.
[b)]ytakamura@ucdavis.edu

