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Variation in phase diagrams of strained (011) epitaxial BaTiO<sub>3</sub> thin films

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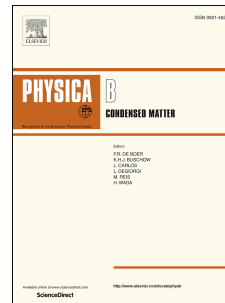
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**Variation in Phase Diagrams of Strained (011) Epitaxial BaTiO<sub>3</sub> Thin Films**Fei Wang and Wenhui Ma<sup>a)</sup>*Department of Physics, Shantou University, Shantou, Guangdong 515063  
People's Republic of China***Abstract**

Phenomenological theory based on sixth-order and eighth-order potentials are used to investigate the effect of variation in free energy coefficients and material constants on phase stability of single-domain (011)-oriented epitaxial BaTiO<sub>3</sub> subject to both biaxial and uniaxial substrate constraints. Relative size of a variety of ferroelectric regions in the computed misfit strain phase diagrams is systematically examined. The computed Curie phase transition and subsequent polarization rotation and formation of low-symmetry monoclinic structures are dependent on the selection of potentials and variation in electrostrictive and elastic constants, and such dependence is found to be closely associated with in-plane strain anisotropy.

**Keywords:** phenomenological theory, ferroelectric thin films, phase transition, epitaxial strain

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