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Microstructure and temperature stability of highly strained tetragonal-like BiFeO₃ thin films

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Highlights

- A highly strained tetragonal (T)-like BiFeO₃ (BFO) phase interspersed between two rhombohedral (R)-like phase regions in BFO films grown on LaAlO₃ substrates was confirmed.
- A lattice misalignment of 3.8° between adjacent R- and T-like phases was observed.
- Superlattice reflection spots were observed along the [110] direction in the R-like phase, which were attributed to the antiphase tilting of oxygen octahedra about the pseudocubic [111] axis of the R-like phase.
- A structural phase transition from the T-like phase to the R-like one at around 435 °C was observed by TEM.

Abstract

A highly strained tetragonal (T)-like BiFeO₃ (BFO) phase interspersed between two rhombohedral (R)-like phase regions in BFO films grown on LaAlO₃ substrates was confirmed by transmission electron microscopy (TEM). The typical width of the T-like

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