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Study of field-dependent coupling of mixed phases in highly-strained BFO by impedance spectrum JHIH-WEI CHEN, Dept. of Physics, National Cheng Kung University, YI-CHUN CHEN, H.J. CHEN, W.I. LIANG, YING-HAO CHU — In this study, we investigated the dielectric mechanism of highly-strained BFO epitaxial films with Tetragonal (T)-like and rhombohedral (R)-like monoclinic phases. The ratio of R-like BFO to T-like BFO is controllable by varying the film thickness through the relaxation of substrate stress. The impedance spectrum of T-like and R-like samples showed conducting-system dispersive (CSD) peaks at 20 kHz and 6.7 MHz, respectively. By contrast, the T+R-BFO had an additional dielectric-system dispersive (DSD) mechanism at relatively low frequency of 4.2 kHz. Moreover, the distribution range of relaxation time for this mechanism depended on the switching history, implying that the mechanism is related to the ferroelastic interaction between the two monoclinic phases. This result suggested intermediate states through phase transformation will reduce energy barrier for polarization switching. The effect of interfacial capacitance between sample and electrode was also discussed.

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