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Creep-free ac hysteretic dynamics in epitaxial ferroelectric $BiFeO_3$ films[1] YEONGJAE SHIN, BYUNG CHUL JEON, SANG MO YANG, CCES-IBS, Dept of Physics & Astronomy, Seoul N. Univ., Seoul, Republic of Korea, INROK HWANG, EMRC, KIST, Seoul, Republic of Korea, MYUNG RAE CHO, Dept of Physics & Astronomy, Seoul N. Univ., Seoul, Republic of Korea, DANIEL SANDO, SEUNG RAN LEE, CCES-IBS, Dept of Physics & Astronomy, Seoul N. Univ., Seoul, Republic of Korea, JONG-GUL YOON, Dept. of Physics, Univ. of Suwon, Hawseong, Gyunggi-do, Republic of Korea, TAE WON NOH, CCES-IBS, Dept of Physics & Astronomy, Seoul N. Univ., Seoul, Republic of Korea
— Dynamics of domain wall (DW) in ferroelectric (FE) films principally governs their switching properties under applied electric field (E). At finite temperature (T), the DW motion and their FE switching characteristics can be understood only by introducing the creep motion. Despite this importance, there have been little studies on creep motion of FE films under *ac*-driven force. In this work, we investigate *ac*-driven hysteretic dynamics of FE domains in epitaxial $BiFeO_3$ (BFO) films through polarization-electric field hysteresis loops with varying frequency and other switching characters. All BFO films were grown at the optimized growth condition, by employing different bottom electrodes of $La_{0.67}Sr_{0.33}MnO_3$ (LSMO) and $SrRuO_3$ (SRO); only BFO/SRO shows nearly creep-free hysteretic dynamics. We argue that inhomogeneous internal E plays a significant role in such distinctive FE dynamics of BFO domains, which are affected by surface morphologies of bottom electrodes. Our results highlight that growth-mode-induced interfacial structure between an FE film and a bottom electrode result in engineering domain dynamics of FE switching characteristics.

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