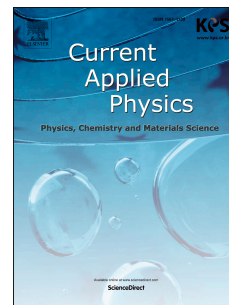


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# Electric-field-induced Evolution of Domain Shapes in Polarization Reversal of BiFeO<sub>3</sub> (111) Capacitors

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## Abstract

Relying on an external electric field, the shape of propagating domains evolves in polarization switching of ferroelectric BiFeO<sub>3</sub> (111) capacitors. With an increasing negative switching bias, it is shown that the domain pattern during ferroelectric domain growth evolves from a circular shape to a dendrite-like shape. Electrical current measurements for different poling states reveal that holes are easily injected through the BiFeO<sub>3</sub>/SrRuO<sub>3</sub> interface under a negative voltage bias. It is found that holes injected by large negative-switching-pulse fields facilitate domain nucleation in BiFeO<sub>3</sub> (111) films and thereby, the promoted domain nucleation drives the shape of switched domains to be dendrite-like.

Keywords: Ferroelectrics, Polarization switching dynamics, Charge injection, Piezoresponse force microscopy, BiFeO<sub>3</sub>

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