

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Permanent ferroelectric retention of BiFeO₃ mesocrystal¹ QING HE, Univ of Durham, YING-HUI HSIEH, National Chiao Tung University, QIAN ZHAN, University of Science and Technology Beijing, CHUN-GANG DUAN, East China Normal University, LONG-QING CHEN, Pennsylvania State University, YING-HAO CHU, National Chiao Tung University — Non-volatile electronic devices based on magnetoelectric multiferroics have triggered new possibilities of outperforming conventional devices for applications. However, ferroelectric reliability issues, such as imprint, retention and fatigue, must be solved before the realization of practical devices. In this study, everlasting ferroelectric retention in the heteroepitaxially constrained multiferroic mesocrystal is reported, suggesting a new approach to overcome the failure of ferroelectric retention. Studied by scanning probe microscopy and transmission electron microscopy, and supported via the phase-field simulations, the key to the success of ferroelectric retention is to prevent the crystal from ferroelastic deformation during the relaxation of the spontaneous polarization in a ferroelectric nanocrystal.

¹The work is supported by Engineering and Physical Sciences Research Council with Grant No. EP/N016718/1

Qing He
Univ of Durham

Date submitted: 11 Nov 2016

Electronic form version 1.4