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Local enhancement of magnetoelectric coupling observed using magnetic force microscopy MASSIMO GHIDINI, NEIL D. MATHUR, Dept. of Materials Science University of Cambridge, DEVICE MATERIALS TEAM — Poled multilayer capacitors (MLCs) show strain-mediated magnetoelectric coupling [1,2], but the microscopic details are unknown. By recording magnetic force microscopy (MFM) images at a polished surface in zero electric field, we show that the magnetic domain configuration of the Ni-based electrodes may be switched by electric-field history. By contrast, electric-field history has nominally no effect on the macroscopic magnetization measured in zero electric field. This suggests that miniaturized systems could show non-volatile converse magnetoelectric effects even if bulk data are not promising, thus extending the range of candidate materials systems for electric-write magnetic-read data storage.

[1] C. Israel, N. D. Mathur and J. F. Scott, *Nature Materials* **7** (2008) 93
[2] C. Israel, S. Kar-Narayan and N. D. Mathur, *Appl. Phys. Lett.* **93** (2008) 173501

Massimo Ghidini
Dept. of Materials Science University of Cambridge

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