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Resistance drift of metastable amorphous and crystalline *fcc* GeSbTe memory devices

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Phase-change memory is an emerging technology that utilizes the electrical resistivity contrast between the amorphous and crystalline phases of chalcogenide glasses to store data. The most commonly used material for PCM has been GeSbTe (GST), which has metastable amorphous and crystalline *fcc* phases and a stable crystalline *hcp* phase [1]. One difficulty with the implementation of PCM is the upward resistance drift of the metastable amorphous and crystalline *fcc* phases. We are using electrical characterization together with transmission electron microscopy and finite-element electrothermal simulations [2] to study the physical mechanisms that give rise to the electrical resistance drift of GST cells.

[1] F. Dirisaglik, G. Bakan, Z. Jurado, S. Muneer, M. Akbulut, J. Rarey, L. Sullivan, M. Wennberg, A. King, L. Zhang, R. Nowak, C. Lam, H. Silva and A. Gokirmak, Nanoscale 7, 16625-16630 (2015).
[2] J. Scoggin, R. Khan, H. Silva, and A. Gokirmak, Appl. Phys. Lett. 112 (19), 193502 (2018).

This work was supported by NSF under award DMR-1710468. The devices were fabricated at IBM Watson Research Center. The TEM analysis is performed at the CINT, a DOE User Facility operated by Los Alamos and Sandia National Laboratories (DE-AC52-06NA25396 and DE-NA-0003525).