Abstract Submitted
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Correlating structural and resistive changes in Ti:NiO resistive memory elements[1] AMANDA PETFORD-LONG, Argonne National Laboratory, OLLE HEINONEN, MARKUS SIEGERT, ANDREAS ROELOFS, Seagate Technology, MARTIN HOLT, WEI LI, Argonne National Laboratory — Structural and resistive changes in Ti-doped NiO resistive random access memory structures that occur upon electroforming have been investigated using hard X-ray microscopy with a spatial resolution of 50 nm. Analysis of 2D scans of the NiO (111) diffraction intensity across a 10 μm $\times$ 10 μm patterned Pt/NiO:Ti/Pt structure show that electroforming leads to structural changes in regions of size up to about one micrometer, which is much larger than the grain size of the structure (of the order of 15 nm). Such changes are consistent with a migration of ionic species or defects during electroforming over regions containing many crystalline grains.

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