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Field-induced Resistive Switching in Ge-Se Based ReRAM

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Resistance-change Random Access Memory (ReRAM), which utilizes electrochemical control of nanoscale quantities of metal in thin films of solid electrolyte, shows great promise as a future solid state memory. The technology utilizes the electrochemical formation and removal of metallic pathways in thin films of solid electrolyte. Key attributes are low voltage and current operation, excellent scalability, and a simple fabrication sequence. In this study, we investigated the nature of thin films formed by photo doping of Ag⁺ ions into chalcogenide materials for use in solid electrolyte of programmable metallization cell devices. We measured the I-V characteristics by field-effect of the device. The results imply that a Ag-rich phase separates owing to the reaction of Ag with free atoms from chalcogenide materials.

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