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Light-Induced Electron Paramagnetic Resonance Studies of the Phase Change Material a-$Ge_2Sb_2Te_5$ DAVID BAKER, P. CRAIG TAYLOR, Colorado School of Mines, TINING SU, United Solar Ovonic, BRIAN SIMONDS, YOUN GU, Colorado School of Mines — Understanding the microscopic mechanisms for the reversible phase changes in chalcogenide phase-change memories is one of the most important tasks in improving the performance of these devices. In particular, understanding whether the defects in the amorphous phase possess a strong electron-lattice interaction is critical. Studies of as-deposited amorphous $Ge_2Sb_2Te_5$ (GST) by light-induced electron paramagnetic resonance (LESR) are presented. RF sputtered GST films were grown to thicknesses of roughly 1.0 micrometer. The sample was then powdered to maximize the volume as detected by the ESR spectrometer. *In-situ* measurements of the GST sample by ESR while exposing the sample with bandgap light to induce paramagnetic defects, and subsequent exposure to sub-bandgap light to bleach these defects were performed. Bleaching experiments as a function of excitation energy suggest the presence of so-called "negative U" centers, which must be considered in any models of the phase change process.

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