Supplemental information

Electrical switching properties and structural characteristics of GeSe-GeTe films

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Figure S1. (a) Densities of states (DOS) and projected COHP analysis for Ge-Te bonds in rhombohedral GeTe. The band gap for GeTe and GeSe are 0.27 eV and 0.95 eV, respectively. The left and right part of -$p$COHP indicates the destabilization interaction (antibonding) and stabilization interaction (bonding), respectively. (b) DOS and projected COHP analysis for Ge-Se bonds in orthorhombic GeSe. Same COHP analysis as GeTe, but for GeSe. (c) The partial DOS of Ge, Te, and Se atoms in rhombohedral GeTe, Ge$_{50}$Se$_{13}$Te$_{37}$ and orthorhombic GeSe, projected onto their outmost s and p orbits. (d) DOS of GeTe and Ge$_{50}$Se$_{13}$Te$_{37}$ near Fermi level ($\epsilon_F$). Band-tail states exists in Ge$_{50}$Se$_{13}$Te$_{37}$, which narrows the band gap.