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Nonvolatile Ferroelectric Manipulation of Electronic Structure at LAO/STO Heterointerface JHIH-WEI CHEN, Department of Physics, National Cheng Kung University, Tainan, Taiwan, TRA-VU THANH, JIUNN-YUAN LIN, Institute of Physics, National Chiao-Tung University, Hsinchu, Taiwan, YING-HAO CHU, Department of Material Science and Engineering, National Chiao-Tung University, Hsinchu, Taiwan, YI-CHUN CHEN, CHUNG-LIN WU, Department of Physics, National Cheng Kung University, Tainan, Taiwan — Hetero-interfaces between different oxide insulators have attracted a lot of interests. One of the most important system is the 2D electron gas at LaAlO_3 (LAO) and SrTiO_3 (STO), which had been reported to possess metallic conduction and superconductivity. In this study, the top-patterned $\text{Pb}(\text{Zr}_{0.2}\text{Ti}_{0.8})\text{O}_3$ ferroelectric layer epitaxially grown on LAO/STO was proposed as a nonvolatile electronic modulation, and the interface band deformation was investigated using photoelectron spectroscopy (PES). Result showed different thickness and polarization state of top PZT significantly affected the band structure and its corresponding valence band offset at the LAO/STO hetero-interface. The transport data indicated that the as-grown PZT would deplete the conducting interface of LAO/STO, while switching the polarization of PZT would enhance the interface conduction.

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