

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Electronic properties at the interface in oxide BiFeO₃/Nb-doped SrTiO₃ semiconductor YU-TING CHEN, YA-PING CHIU, MIN-CHUAN SHIH, Department of Physics, National Sun Yat-sen University, Kaohsiung, 804, Taiwan, ROC, JAN-CHI YANG, Department of Materials Science and Engineering, National Chiao Tung University, HsinChu, 300, Taiwan, ROC, YI-CHUN CHEN, Department of Physics, National Cheng Kung University, Tainan 70101, Taiwan, ROC, YING-HAO CHU, Department of Materials Science and Engineering, National Chiao Tung University, HsinChu, 300, Taiwan, ROC — In oxide systems, the interface of the heterojunctions had attracted much attention due to the interesting properties of the low-dimensional electron confinement. In this work, by using cross-sectional scanning tunneling microscopy, the direct and local information of structural and electronic properties across the $p-n$ heterojunction in the multiferroic BiFeO₃ films grown on Nb-doped SrTiO₃ substrate was investigated. Spectroscopy analysis of the point-to-point electronic properties allows us to realize how the asymmetrically electronic band alignment is formed at the interface. Further analysis of the evolution of the potential field across the interface also reveals that surface charge states, spontaneous polarization, and the $p-n$ contact contribute to the formation of the build-in field pointing from BiFeO₃ films to Nb-SrTiO₃ semiconductors.

Yu-Ting Chen
Department of Physics, National Sun Yat-sen University,
Kaohsiung, 804, Taiwan, ROC

Date submitted: 24 Nov 2010

Electronic form version 1.4