

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Angle resolved photoemission studies of the Rashba states in ferroelectric GeTe BEOMYOUNG KIM, WONSHIK KYUNG, GARAM HAN, Institute of Physics and Applied physics, Yonsei University, 134 Shinchon-Dong, Seodaemun-Gu, Seoul 120-749, Republic of Korea, YEONGKWAN KIM, JONATHAN DENLINGER, Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA., IN CHUNG, Graduate School of Nanoscience and Technology, KAIST, 291 Daehak-ro, Yuseoung-gu, Daejeon 305-701, Republic of Korea, CHANGYOUNG KIM, Institute of Physics and Applied physics, Yonsei University, 134 Shinchon-Dong, Seodaemun-Gu, Seoul 120-749, Republic of Korea — There has been significant increase in the research of spin orbit coupling (SOC) induced exotic phenomena. The Rashba effect, theoretically predicted to exist, is one of the SOC related phenomena. The phenomenon was later experimentally observed in the surface states of metals and topological insulators as well as interfaces of hetero structures that have inversion symmetry breaking (ISB). Even bulk states with intrinsic ISB such as BiTe is found to have Rashba split bands. It was very recently proposed that ferroelectric GeTe has Rashba effect in the bulk. This is a unique situation where ISB is provided not by the structure ISB but by an electrical polarization. We have performed angle-resolved photoemission spectroscopy (ARPES) on GeTe single crystals to investigate the unique bulk Rashba state. Our results indeed show the existence of a Rashba-type band splitting as theoretically predicted. We discuss various aspect of the Rashba state in GeTe.

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Date submitted: 14 Nov 2014

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