Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Significantly enhanced giant Rashba splitting in a thin film of binary alloy. SHU-JUNG TANG, Department of Physics, National Tsing Hua University, WEI-CHUAN CHEN, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, TAY-RONG CHANG, SUN-TING TSAI, JE-MING KUO, Department of Physics, National Tsing Hua University, SH. YAMAMOTO, Institute for Solid State Physics, the University of Tokyo, CHENG-MAW CHENG, KU-DING TSUEI, National Synchrotron Radiation Research Center, Hsinchu, Taiwan , KOICHIRO YAJI, Institute for Solid State Physics, the University of Tokyo, HSIN LIN, Graphene Research Centre and Department of Physics, National University of Singapore, HORNG-TAY JENG, CHUNG-YU MOU, Department of Physics, National Tsing Hua University, IWAO MATSUDA, Institute for Solid State Physics, the University of Tokyo — Dirac cones in a 2D environment have attracted much attention not only because of the massless Dirac fermions but also due to their capability to lock the spin direction with the momentum. Here we demonstrate that the Rashba effect within a single layer of a binary alloy composed of heavy atoms, Pb and Au, can be driven by and even tweaked with the adjacent top and bottom layers to yield cones-like structures and further enhance the Rashba coupling strength. Two cones are observed at the surface zone center $\bar{\Gamma}$with giant Rashba parameters 1.53 and 4.45 eV; an anisotropic giant Rashba splitting at the surface zone boundary$\bar{M}$has a great value, 6.26 eV, inferring the critical role of *p*-*d*hybridization between Pb and Au. Our results reveal not only an interesting natural phenomenon but also a feasible method of tweaking the Rashba effect of a 2D system.

Shu-Jung Tang
Department of Physics, National Tsing Hua University

Date submitted: 06 Nov 2015 Electronic form version 1.4