Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Temperature-Induced Electronic Structure Evolution of ZrTe5 Revealed by High resolution & Laser Angle-Resolved Photoemission Spectroscopy (ARPES) YAN ZHANG, CHENLU WANG, GUODONG LIU, GENFU CHEN, LI YU, SHAOLONG HE, LIN ZHAO, Institute of Physics, Chinese Academy of Science, CHUANGTIAN CHEN, ZUYAN XU, Technical Institute of Physics and Chemistry, Chinese Academy of Science, XINGJIANG ZHOU, Institute of Physics, Chinese Academy of Science — The transition metal pentatellurides ZrTe5 have attracted consideration attention since the 70s, due to the unusual transport properties like resistivity peak at ˜140K and the sign change of the Hall coefficient and thermopower. The origin of the most peculiar resistivity peak remains controversial. In this talk we will present high resolution angle-resolved photoemission (ARPES) study on the Fermi surface and band structure of ZrTe5, by using our high resolution ARPES system equipped with the VUV laser and the time-of-flight (TOF) electron energy analyzer. Upon cooling down, we found a gradual transition from hole-like band into electron-like band around the Brillouin zone center. Such an electron state transition forms the underlying physics for the abnormal transport properties. We will also comment on the possibility of a Dirac semimetal in ZrTe5.

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Date submitted: 05 Nov 2015 Electronic form version 1.4