Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Temperature-Induced Lifshitz Transition in Weak Topological Insulator Candidates $ZrTe_5$ and $HfTe_5$ YAN ZHANG, CHENLU WANG, GUODONG LIU, JIANWEI HUANG, GENFU CHEN, LI YU, SHAOLONG HE, LIN ZHAO, CHUANGTIAN CHEN, ZUYAN XU, XINGJIANG ZHOU, Chinese Academy of Sciences (CAS), INSTITUTE OF PHYSICS COLLABORATION, TECHNICAL INSTITUTE OF PHYSICS AND CHEMISTRY COLLABORATION — The transition metal pentatellurides $ZrTe_5$ and $HfTe_5$ have attracted consideration attention since the 70s, due to their unusual transport properties like resistivity peak at ˜135K/˜65K and the sign change of the Hall coefficient and thermopower. The origin of the most peculiar transport properties remains controversial. Lately, $ZrTe_5$ and $HfTe_5$ have ignited renewed interest because it is predicted that single-layer $ZrTe_5$ and $HfTe_5$ are two-dimensional topological insulators and there is possibly a topological phase transition in bulk $ZrTe_5$ and $HfTe_5$. In this talk we will present temperature dependent Fermi surface and band structure of $ZrTe_5$ and $HfTe_5$, by using our super-high resolution angle-resolved photoemission 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 discuss on the topological nature of $ZrTe_5$ and $HfTe_5$

Yan Zhang
Chinese Academy of Sciences (CAS)

Date submitted: 10 Nov 2016 Electronic form version 1.4