Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Quantum Hall Effect in Black Phosphorus/hBN Heterostructures

FANGYUAN YANG, LIKAI LI, Fudan University, Collaborative Innovation Center of Advanced Microstructures, Nanjing, GUO JUN YE, University of Science and Technology of China, Collaborative Innovation Center of Advanced Microstructures, Nanjing, ZUOCHENG ZHANG, Tsinghua University, ZENGWEI ZHU, Wuhan National High Magnetic Field Center and School of Physics, Huazhong University of Science and Technology, WEN KAI LOU, Chinese Academy of Sciences, University of Science and Technology of China, LIANG LI, Wuhan National High Magnetic Field Center and School of Physics, Huazhong University of Science and Technology, KENJI WATANABE, TAKASHI TANIGUCHI, Advanced Materials Laboratory, National Institute for Materials Science, KAI CHANG, Chinese Academy of Sciences, University of Science and Technology of China, YAYU WANG, Tsinghua University, XIAN HUI CHEN, University of Science and Technology of China, Collaborative Innovation Center of Advanced Microstructures, Nanjing, YUANBO ZHANG, Fudan University, Collaborative Innovation Center of Advanced Microstructures, Nanjing — Black phosphorus field effect transistors have emerged as a new two-dimensional electron system (2DES) with high mobility. We achieved high mobilities by placing black phosphorus thin flakes on atomically flat hBN substrates. The mobility is further improved by placing a graphite back gate very close to the 2DES, which screens charged impurities. In this talk, we will present our observation of the integer quantum Hall effect in high mobility black phosphorus 2DEG. Temperature and angular dependent measurements reveal a wealth of information on the charge carriers in this new 2DES.

Fangyuan Yang
Fudan University, Collaborative Innovation Center of Advanced Microstructures, Nanjing

Date submitted: 23 Nov 2015 Electronic form version 1.4