Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Long-range repulsive interaction induced Cs superlattices on graphene/SiC[1] XU-CUN MA, CAN-LI SONG, YI-LIN WANG, YE-PING JIANG, LI-LI WANG, KE HE, Institute of Physics, Chinese Academy of Sciences, XI CHEN, JIN-FENG JIA, QI-KUN XUE, Tsinghua University — The adsorption behavior of Cs on graphenes formed on 6H-SiC(0001) substrate has been investigated by low-temperature scanning tunneling microscopy. At low coverages (<0.032 nm^{-2}), individual Cs atoms absorb preferentially on distinct sites of the morié pattern, which is formed by the first carbon buffer layer and underlying SiC substrate. At higher coverages (>0.33 nm^{-2}), short-range ordered structures are presented. Specially, when the coverage is appropriate, Cs atoms can spontaneously form two hexagonal superlattices with a lattice constant of 1.86 nm and 3.24 nm, respectively. By analyzing the coverage-dependent Cs-Cs interatom distance distributions, a long-range repulsive electrostatic interaction between Cs atoms is revealed. The occurrence of Cs superlattices results from the inhomogeneous surface potential on the few layer graphene and electrostatic repulsion between Cs atoms.

[1]This work was supported by National Science Foundation and Ministry of Science and Technology of China.

Xu-Cun Ma
Institute of Physics, Chinese Academy of Sciences

Date submitted: 17 Dec 2009 Electronic form version 1.4