Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Focused Laser Induced Spatially Controllable p-n junction in Graphene Field-Effect Transistor YOUNG DUCK KIM[1], Department of Physics and Astronomy, Seoul National University, MYUNG-HO BAE, Korea Research Institute of Standards and Science, JUNG-TAK SHU, Department of Physics, Sungkyunkwan University, YOUNG SEUNG KIM, Department of Physics, Graphene Research Institute, Sejong University, JOUNG REAL AHN, Department of Physics, Sungkyunkwan University, SEUNG-HYUN CHUN, Department of Physics, Graphene Research Institute, Sejong University, YUN DANIEL PARK, Department of Physics and Astronomy, Seoul National University — Tunable local doping on graphene is an important issue for future graphene-based electronics. Here we investigate a local doping effect by a focused laser irradiation and demonstrate a spatially controllable p-n junction in graphene field-effect transistor. Scanning photocurrent microscopy with varying back-gate voltages reveals the local charge trap in gate oxide near the laser-irradiated region. This is manifested by itself as double peaks in resistance as a function of gate voltage in graphene device, where the region between the double peaks corresponds to the p-n junction. Irradiation of a focused laser on graphene device suggests a new pave to spatially control the doping level, position and size of doped segment on graphene channel in a nondestructive way without high electrical bias, local gate electrode and chemical process.

[1]Korea Research Institute of Standards and Science

Young Duck Kim
Department of Physics and Astronomy, Seoul National University

Date submitted: 08 Nov 2012 Electronic form version 1.4