Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Spin-polarized energy gap opening in asymmetric bilayer graphene nanoribbons GYUBONG KIM, Korea Institute of Science and Technology, SEUNG-HOON JHI, Pohang University of Science and Technology — Electronic and magnetic properties of bilayer zigzag graphene nanoribbon (bZGNR) are studied with the use of pseudopotential density functional method. The edge atoms in the top and bottom layers of bZGNR make a weak hybridization, which leads to band dispersion and magnetization different from monolayer ZGNR. For asymmetric bZGNR, where the top and bottom layers have different width, one edge is pinched by the interlayer bonding and the other edge sustains anti-ferromagnetic spin polarization. A small amount of charge transfer occurs from narrower to wider layer, and the band structure for each spin near the Fermi level exhibits an asymmetry. External electric field perpendicular to asymmetric bZGNR produces different energy-gap opening for each spin component, inducing half- metallicity.

Gyubong Kim
Korea Institute of Science and Technology

Date submitted: 17 Nov 2010 Electronic form version 1.4