

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Possible nano-spintronics devices with graphene as electron wave guides KOICHI KUSAKABE, Graduate School of Engineering Science, Osaka University — Another application of graphene to semiconductor spintronics devices is proposed theoretically. We have designed possible methods for fabrication of nano-scale device structures utilizing graphene as electron wave guides. Important techniques should be 1) formation of strong covalent bonding between a part of substrate and graphene, 2) creation of nano-sized superstructure with sharp edges inducing the graphene edge states[1] by controlling interface between external electrodes and graphene, and 3) creation of nano-sized quantum structures based on the spinodal nano-decomposition. Several test simulations on the electronic states of proposed structures and theoretical estimation of functionality of graphene as an electron wave guide for semiconductor spintronics devices are presented. [1] M. Fujita, K. Wakabayashi, K. Nakada and K. Kusakabe, J. Phys. Soc. Jpn. 65, 1920 (1996).

Koichi Kusakabe
Graduate School of Engineering Science, Osaka University

Date submitted: 03 Dec 2008

Electronic form version 1.4