Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

a universal regulation for the angle resolved transport properties of Dirac cones and beyond ZHENZHU LI, ZHIRONG LIU, Peking Univ — A universal regulation for the angle resolved transport properties of two-dimensional (2D) Dirac cones, such as graphene, graphynes or even beyond, was established for the first time. The anisotropy and isotropy properties of 2D Dirac cones were investigated theoretically combining with first-principles calculation. It was found the moving direction of Dirac cones (θ_{move}) varies with the strain orientation (θ_{q}) can be approximately described by a linear law. Moreover, θ_{move} is related the hopping (S_{12}) between two bases with respective to the strain. The coefficients, a_x, a_y, $a_{\gamma,}$ in the taylor expansion formula of S_{12} and strain were determined with DFT calculations. Graphene and graphynes were calculated to check the universality of the theory, which turns out to be working well. This new regulation could also be recommended into semiconductive systems to predict their transport behaviors, such as phosphorene or MoS_2, whose angle resolved transport properties have been widely investigated experimentally for comparison.

Zhenzhu Li
Peking Univ

Date submitted: 06 Nov 2015 Electronic form version 1.4