Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Twisted bilayer graphene with interlayer potential asymmetry[1]
PILKYUNG MOON, New York University Shanghai, YOUNG-WOO SON, Korea Institute for Advanced Study, MIKITO KOSHINO, Tohoku University — A twisted stack of two graphene layers (twisted bilayer graphene) exhibits an extremely long potential period arising from the moiré interference between the layers [2] [3] [4]. We investigate the band structure and optical absorption spectrum of twisted bilayer graphenes with changing interlayer bias and Fermi energy simultaneously [5]. We show that the interlayer bias lifts the degeneracy of the superlattice Dirac point, while the amount of the Dirac point shift is significantly suppressed in small rotation angles, and even becomes opposite to the applied bias, by the interlayer interaction. In addition, we show that the spectroscopic features are highly sensitive to the interlayer bias and the Fermi energy, and widely tunable by the external field effect.

[1]P.M. acknowledges the support of NYU Shanghai and the NYU-ECNU Institute of Physics at NYU Shanghai. Y.-W.S. was supported by the NRF of Korea grant funded by the MSIP. M.K. was funded by JSPS Grantin-Aid for Scientific Research.
[2]C. Berger et al., Science 312, 1191 (2006).
[3]P. Moon and M. Koshino, Phys. Rev. B 85, 195458 (2012).
[4]P. Moon and M. Koshino, Phys. Rev. B 87, 205404 (2013).
[5]P. Moon, Y.-W. Son, and M. Koshino, Phys. Rev. B 90, 155427 (2014).

Pilkyung Moon
New York University Shanghai

Date submitted: 06 Nov 2015 Electronic form version 1.4