

Abstract Submitted  
for the MAR13 Meeting of  
The American Physical Society

**The effects of the layer number in optical excitations of AA-stacked graphenes** YUAN-CHENG HUANG, Center for General Education, Kao Yuan University, 821 Kaohsiung, Taiwan, CHIH-WEI CHIU, MING-FA LIN, Department of Physics, National Cheng Kung University, 701 Tainan, Taiwan — The band structures and the optical properties of AA-stacked multilayer graphenes are calculated by the tight-binding mode and the gradient approximation. For monolayer graphene, there are one pair of linear bands intersecting at Fermi level, and one pair of saddle points at  $\pm\alpha_0$ . As for the AA-stacked systems,  $n_L$ -layer graphenes own the  $n_L$ -pair energy bands. The energy dispersions of each pair are similar to those of the monolayer graphene, but shift upwards or downwards. The spacing of the conduction and valence bands in the same pair are slightly different among the different pairs. The threshold energy of the single-particle excitations ( $\omega_s$ ) of the odd-layer graphene is much lower than those for the even-layer graphene, since there is one intersecting point much close to Fermi level only for the odd-layer graphene. When the layer number increases to 80, the effects of the odd-even layers vanish. Furthermore, the features of the loss spectra of the multilayer graphene close to those of bulk graphite when  $n_L$  increases more than 50 gradually.

Yuan-Cheng Huang  
Center for General Education, Kao Yuan University, 821 Kaohsiung, Taiwan

Date submitted: 08 Nov 2012

Electronic form version 1.4