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Dynamical Conductivity of AA-Stacked Bilayer Graphene
CALVIN TABERT, ELISABETH NICOL, University of Guelph — Motivated by the potential availability of AA-stacked bilayer graphene samples[1,2], we investigate the optical conductivity of this stacking variation[3]. We find the band structure to be made of bonding and antibonding orbitals which are linear at low energy and decoupled for the longitudinal response; this causes the conductivity to behave as the sum of an electron-doped and hole-doped monolayer graphene system. We find a low energy Drude response at charge neutrality and two step features which can be tuned by varying the chemical potential. We find that the interlayer hopping energy plays an important role in determining the onset of these steps. We compute the partial optical sum and find that the Drude weight also depends on the value of chemical potential relative to the interlayer hopping parameter.

[1] J. K. Lee et al. J. Chem. Phys. 129 234709 (2008) [2] W. Norimatsu et al. Phys. Rev. B 81 161410 (2010) [3] C. J. Tabert et al. Phys. Rev. B 86 075439 (2012).

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