

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Gate-induced interlayer asymmetry in ABA-stacked trilayer graphene¹ EDWARD MCCANN, Lancaster University, MIKITO KOSHINO, Tokyo Institute of Technology, Japan — We model the electronic band structure and conductivity of ABA- stacked trilayer graphene in the presence of external gates, self-consistently calculating the electric potential of the three layers. We show that a gate field perpendicular to the layers breaks mirror reflection symmetry with respect to the central layer, leading to hybridization of the linear and parabolic low-energy bands. For large gate fields, we derive an effective two-component Hamiltonian describing chiral electrons in two low-energy bands that exhibit an anti-crossing with a small hybridization gap. The magnitude of the gap is largely independent of the gate field, but the momentum at the anti- crossing and the typical band velocity both increase with it. Using the self-consistent Born approximation, we find that the density of states and the minimal conductivity in the presence of disorder generally increase as the gate field increases, in sharp contrast with bilayer graphene.

¹Supported by EPSRC First Grant EP/E063519/1 and the Daiwa Anglo-Japanese Foundation.

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Date submitted: 21 Nov 2008

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