

Abstract Submitted
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Twisting and Interlayer Coupling of Few Layer Graphene¹

MINGHU PAN, XIAOTING JIA, VINCENT MEUNIER, MILDRED S. DRESSELHAUS, JING KONG — Few layer graphene (FLG) can be synthesized by chemical vapor deposition methods. Considering a graphene bilayer with a small angle rotation between the layers—a stacking defect was observed by high resolution scanning tunneling microscopy. Low-energy Van Hove singularities in twisted graphene layers are identified as two sharp peaks in the density of states by low temperature scanning tunneling spectroscopy. Electronic instabilities at the crossing of the Fermi energy with a Van Hove singularity in the density of states often lead to new phases of matter such as charge/spin density waves. We here observe the coexistence of a charge density wave (CDW) phase and a normal phase on the top graphene layer. By analyzing the Moiré pattern in a normal region, a twisting between the two layers by a relative large angle about 3.9° is identified. This implies that the interlayer coupling for twisted layers is playing a role in the formation of different electronic phases in FLG.

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