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Scanning Tunneling Microscopy Study of Mechanically-Stacked Double Layer Graphene HONGWOO BAEK, Seoul National University, JEONGHOON HA, National Institute for Standards and Technology, BEOMYONG HWANG, JEONGHOON KWON, Seoul National University, JOSEPH STROSCIO, National Institute for Standards and Technology, YOUNG KUK, Seoul National University — Bilayer graphene has drawn considerable attention due to deviation from Dirac Fermion picture such as anomalous quantum hall effect and a tunable band gap in their spectrum. While a pristine Bernal (AB) stacked bilayer graphene can be synthesized by mechanical exfoliation, growth on a SiC single crystal and epitaxial growth on metal substrates, separate control of the top and the bottom layers has seldom been performed. In this study, artificially modified 2D layers were demonstrated with individually stacked double layer graphene. Large-area graphene was grown on a Cu foil by chemical vapor deposition (CVD). CVD-grown graphene layers were transferred successively onto several insulating substrates with minimum chemical process for realizing bilayer graphene. Mechanically-stacked double layer graphene was mainly investigated using scanning tunneling microscopy and spectroscopy. The artificial bilayer graphene showed Moire patterns as determined by misalignment angle. In spatially resolved spectrums of local density of states, dependence on separation distance between two graphene layers and their corrugation was measured. In addition, we confirmed less charging effects of graphene on BN thin film than on SiO2 or SiN.

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