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Direct deposition of 2D boron nitride on epitaxial graphene surfaces JAMES GIGLIOTTI, Georgia Tech, XIN LI, SURESH SUNDARAM, GT-Lorraine; UMI 2958, JEAN-PHILIPPE TURMAUD, DOGUKAN DENIZ, YIRAN HU, YUE HU, Georgia Tech, VLADIMIR PRUDKOVSKYI, Institut Nel, CNRS-Universit Grenoble Alpes, CLAIRE BERGER, Institut Nel, CNRS-Universit Grenoble Alpes; Georgia Tech, ABDALLAH OUGAZZADEN, GT-Lorraine; UMI 2958, WALT DEHEER, Georgia Tech — Despite much interest in epitaxial graphene for nanoelectronics, integrated dielectrics remain challenging. Boron nitride (BN) is a 2D layered dielectric isomorph of graphene which greatly reduces substrate and gate induced scattering in graphene devices. While epitaxial graphene does not suffer from substrate effects, graphene, in general, is sensitive to environmental contamination and requires integrated gates to explore transport phenomenon and develop nanoelectronic devices. However, direct deposition of BN, as well as other 2D semiconductors, onto epitaxial graphene is difficult as growth tends to fall into the Stranski-Krastanov regime. Here, we present evidence of 2D BN layers deposited directly onto epitaxial graphene surfaces via a metalorganic vapor phase epitaxy (MOVPE) process utilizing triethylborane (TEB) and ammonia as the boron and nitrogen sources, respectively. The BN layer exhibits a pleated morphology, indicative of biaxial strain in a 2D van der Waals solid. HR-XRD indicates a highly ordered film and pure sp2 bonding throughout the BN layer was confirmed via XPS. The underlying graphene was probed with Raman spectroscopy and LEED which show no structural change compared to before BN deposition.

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