

Abstract Submitted
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Edge contact to BN encapsulated graphene – towards contamination-free 2D system LEI WANG, Columbia University, CORY DEAN, The City University of New York, INANC MERIC, PHILIP KIM, KEN SHEPARD, JAMES HONE, Columbia University — Since the first discovery in 2004, graphene has been electrically contacted by metal layers deposited on its surface. In the process, this single atomic layer sheet experiences polymers and solvents contaminations and thermal annealing. Our recent progress shows that we can metallize only the one-dimensional (1D) edge of a graphene layer in a BN/G/BN structure. In addition to outperforming conventional surface contacts, the edge contact geometry allows a complete separation of the layer assembly and contact metallization processes. For the first time, the graphene surface has never contacted any polymer or solvent contaminations, and thermal annealing is found to be unnecessary. Over 1000 μm^2 bubble free BN/G/BN stack is achieved and carrier mean free path on these devices are found to be over 20 μm . 1 000 000 cm^2/Vs carrier mobility is for the first time observed at carrier density as high as $3 \times 10^{12}/\text{cm}^2$.

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