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High mobility Single Layer Epitaxial Graphene on 4H-SiC (000-1)

YIKE HU, ZELEI GUO, MING RUAN, JOHN HANKINSON, JAMES PALMER, BAIQIAN ZHANG, RUI DONG, JAN KUNC, CLAIRE BERGER, WALT DE-HEER, Georgia Institute of Technology — Multi-layer Epitaxial Graphene on 4H-SiC (000-1) has demonstrated very high mobility up to$\sim$27,000 cm^2/Vs [1]. Recently single layer graphene grown by the Confinement Control Growth method [2] exhibits mobility up to $\sim$ 25,000$cm^2/V{\cdot}s$ at 4K and 13,000 $cm^2/V{\cdot}s$ at 300K with p=3 x 10^{12} cm^{-2} The relation between Raman G peak features (FWHM and position) and carrier density of Epitaxial Graphene on carbon face is revealed. Quantum Hall Effect [3] is observed both for p and n type carriers on top gated sample. This indicates that top gated single layer graphene can be produced on the Carbon face with high quality and high carrier mobility.

[1] Science **312**, 1191 (2006)
[2] PNAS **108** (41) 16900 (2011)
[3] APL **95**, 223108 (2009)

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