

Abstract Submitted
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The Influence of Hydrogenation on the Hall Effect in Exfoliated Mono- and Multi-layer Graphene Y. MO, J.D. JONES, P.E. ECTON, M. MANESHIAN, W.D. HOFFMAN, A.V. JESSEPH, N. SHEPHERD, G.F. VERBECK, J.M. PEREZ, University of North Texas, Z. YE, G. ZHAO, Southern University and A&M College — Graphene samples exfoliated from highly ordered pyrolytic graphite are deposited using the standard scotch-tape method on 300nm thick SiO₂ covered and slightly conductive Si substrates. Devices with 4 silver electrode pads on the graphene samples for Hall effect measurements are made with simple evaporation procedures by using transmission electron microscopy grids as masks. At room temperature, we measure the Hall effect of mono- and multi-layer graphene before and after plasma hydrogenation. During plasma hydrogenation, the sample substrates are biased at +150 V to attract electrons in the plasma for hydrogenation and push away ions in the plasma avoiding possible damage to the graphene. We also measure the Hall effect after annealing the samples at 200 °C and vacuum of 10⁻⁶ torr for an hour. Micro-Raman is employed to monitor the quality and change of the graphene at each process step. We compare the Hall effect results for pristine, hydrogenated, and annealed mono- and multi- layer graphene samples.

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