Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Influence of Spatial Inhomogeneity on Electronic and Magneto Transport in Graphene.[1] BERNARD MATIS, BRIAN HOUSTON, JEFFREY BALDWIN, Naval Research Laboratory — We discuss room temperature electronic and magnetotransport measurements of polycrystalline graphene, grown by chemical vapor deposition, on a SiO_2 dielectric. The measured graphene devices are intentionally spatially inhomogeneous such that the length of the sample is much greater (>1000 times) than the average grain size. At magnetic field $B = 0$ T the electronic transport is well described by a diffusive transport model with contributions from grain boundary scattering significantly larger in the high charge carrier density limit. We find the largest percent change in the magnetoresistivity occurs at the film's Dirac point where the magnetotransport is largely dependent upon charge disorder. Away from the Dirac point we find a modified expression for the charge carrier density dependence of the magnetoresistivity with respect to the case of single-crystal graphene.

[1]This work was supported by the Office of Naval Research.

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Date submitted: 03 Nov 2015 Electronic form version 1.4