Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Scattering properties of extended structural defects in graphene[1]
DANIEL GUNLYCKE, CARTER WHITE, Naval Research Laboratory — A challenge preventing widespread use of graphene in nanoelectronic devices is the absence of a band gap at the Fermi level. Without a practical band gap, other ways to make electronic transport switchable are needed. One promising possibility is to use parallel graphene transport barriers to generate a transport gap. This approach requires transport barriers that are penetrable and fairly reflective. Such barriers could be formed by extended structural defects such as grain boundaries or line defects. Herein, we present scattering properties in the specular regime of a generic transport barrier described by an effective barrier coupling, an effective barrier potential, and an asymmetry parameter. We also show that these scattering properties could be probed without the need for lateral transport measurements. Instead, we suggest the use of scanning probe techniques measuring the undulations in the local density of states. That the transmissivity could be probed in equilibrium when no current flows through the barrier is a manifestation of quantum interference at the barrier.

[1]This work was supported by the Office of Naval Research, directly and through the Naval Research Laboratory.

Daniel Gunlycke
Naval Research Laboratory

Date submitted: 11 Nov 2014 Electronic form version 1.4