Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Applications of Nanoribbon Devices THUSHARI JAYASEKERA, JOHN W. MINTMIRE, Oklahoma State University, Stillwater, OK, USA. — Modern experiments allow us to grow ultra-thin epitaxial graphene which shows two-dimensional electron gas (2DEG) behavior. Electron transport in these 2DEG systems can be further confined in lateral directions using micro-electronics lithography methods (nano-patterned epitaxial graphene, NPEG). We study the properties of the NPEG multi-terminal devices made at a crossing of a zig-zag and armchair nanoribbons, in particular, plus junction and T-junction devices. We investigate the effect of size, shape, and, chirality on the transport properties of the device. We also discuss the effect of defects in the junction region on the electron transport of the device. Our results find that the properties of nanoribbon junctions are highly sensitive to the details of the junction region, thus we can engineer different properties by changing those details of the device. This work was supported by the DoD HPCMO CHSSI program through the Naval Research Laboratory.

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Date submitted: 20 Nov 2006 Electronic form version 1.4