Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Effect of Single Bacterium Cell and DNA Attachment on the Electrical Properties of Chemically Modified Graphene Sheets NIHAR MOHANTY, VIKAS BERRY, Kansas State University — Chemically modified graphene (CMG) sheets are expected to have a considerably different electrical sensitivity to molecular attachment than the pristine graphene sheets. Here we present the electrical-interfacing properties of (a) CMG's hybrids with single bacterial cells, (b) CMG with DNA (single and double stranded) tethered on graphene-surface and (c) CMG with polyelectrolyte-layer assembled on surface. These hybrids function as: (a) single bacterium devices, (b) DNA hybridization sensor and (c) charge polarity sensitive chemical-detector, respectively. A single bacterium attachment leads to generation of $\sim$1400 holes on a CMG while hybridization of $\sim$4 DNA molecules on graphene-DNA-carpets lead to generation of one hole. Further explanation of the attachment-potential, system-reversibility and sensitivity will also be presented.

Vikas Berry
Kansas State Univerisity

Date submitted: 28 Nov 2008 Electronic form version 1.4