MAR13-2012-020350
Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

Nanopore Graphene-based Electronic Devices[1]

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Graphene is an exceptional material for high-speed electronics, as well as a revolutionary membrane material due to its strength and atomic thickness. Nanopores in suspended graphene membranes are currently regarded as candidates for ultrafast DNA sequencing. When a single DNA molecule passes through a nanopore, it blocks the field-driven ions passing through the pore and is detected by measuring the ion current reduction. Due to the thin nature of graphene membranes and reduced pore resistance, we observe larger current signals than in the case of traditional solid-state nanopores. Use of graphene as a membrane material opens the door to a new class of nanopore devices in which electronic sensing and control are performed directly at the pore.

[1]We acknowledge support from NIH Grants R21HG004767 and R21HG006313.