

Abstract Submitted  
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**Biomolecular Recognition with Functionalized Silicon Nanowires**

YU CHEN, Department of Physics, Boston University, Boston, MA 02215, AGNES KALINOWSKI, Department of Biomedical Engineering, Boston University, Boston, MA 02215, SHYAM ERRAMILI, Department of Physics and Department of Biomedical Engineering, Boston University, Boston, MA 02215, PRITIRAJ MOHANTY, Department of Physics, Boston University, Boston, MA 02215 — Nanotechnology has the potential to lead to novel techniques for ultra-sensitive biomolecular recognition. We report preliminary results on biomolecular recognition by the measurement of conductance change of bio-functionalized nanowires. The change is primarily due to the contribution of surface states to the conductance, which for larger sensors is dominated by volume effects. The fractional change is greatest for the smallest sensors, due to the increased surface-to-volume ratio. Our silicon nanowires are fabricated from SOI wafer by electron beam lithography, which provides highly controllable nanowire sensors in comparison to other nanoelectronic approaches. We detect ultra-sensitive conductance change at nanoampere-level currents in functionalized nanowires with APTES-modified surface. This work is supported by Department of Defense (CDMRP).

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