

### 4.1.3 MOSFET-EMBEDDED MICROCANTILEVERS

G. Shekhawat, S.-H. Tark, V. P. Dravid, "An All- Electronic Label- and Optics-Free Signal Transduction Paradigm for Biomolecular Sensing," *Science*, **2006**, in press.

NU-NSEC researchers have introduced an all-electronic label- and optics-free detection paradigm for biomolecular binding events on metal-oxide semiconductor field-effect transistor (MOSFET)-embedded microcantilevers. It was demonstrated that microcantilevers bending as little as ~5 nm, lead to a measurable and reproducible change in the MOSFET drain current, which forms the basis for the microelectronics-based detection of bio-chem binding events. MOSFET-embedded microcantilevers are able to detect diverse probe-target binding events, ranging from DNA hybridization to protein-protein binding, at high sensitivity and reproducibility.

Such a label- and optics-free all-electronic MOSFET detection approach will bridge the current gap between integration of nano-bio nanostructures with microelectronics platforms and promises a universal and widely deployable biochemical diagnosis platform, compatible with all the advantages of established CMOS technology for a wide variety of biomolecular and chemical detection and diagnosis.

