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**Carbon Nanotube FETs as Chemical Sensors** JIAN ZHANG, ANTHONY BOYD, ALEXANDER TSELEV, MAKARAND PARANJAPE, PAOLA BARBARA, Department of Physics, Georgetown University, Washington, DC 20057, USA — Exposure to chemical molecules can greatly change the conductance of carbon nanotube FETs (CNFETs). The underlying sensing mechanisms may involve changes in the properties of the interface between nanotube and electrode [1], as well as the nanotube bulk response to chemical molecules [2]. We fabricate CNFETs by standard photolithographic techniques, both for catalyst and contact patterning [3], and characterize their response, i.e. changes in the threshold voltage and saturated conductance, upon exposure of the whole device to chemical molecules, such as nitrogen dioxide and ammonia. We find that nitrogen dioxide only changes the threshold voltage, whereas ammonia changes both the threshold voltage and the saturated conductance. We plan to protect the carbon-nanotube/electrode interfaces and expose only the carbon nanotube to the same concentration of chemical molecules, to measure the contribution to the response due only to the bulk of the nanotube and distinguish between different sensing mechanisms. This work is supported by the ACS (PRF-39152-G5M) and the NSF (DMR-0239721). [1] V.Derycke, R. Martel, J. Appenzeller and Ph. Avouris, Appl.Phys.Lett., 80, 2773 (2002). [2] J. Kong, etc., Science 287, 622 (2000). [3] A. Tselev, K. Hatton, M. S. Fuhrer, M. Paranjape and P. Barbara, Nanotechnology 15, 1475 (2004).

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