Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

N-type Organic Field Effect Transistor Using Densely Aligned Carbon Nanotube Array Electrodes[1] EDWARDS G. JIMENEZ, School of Electrical Engineering and Computer Science, and Nanoscience Technology Center, University of Central Florida, BIDDUT K. SARKER, Nanoscience Technology Center, and Department of Physics, University of Central Florida, SAIFUL I. KHONDAKER, Nanoscience Technology Center, Department of Physics, and School of Electrical Engineering and Computer Science, University of Central Florida — We present fabrication of n-type organic field effect transistors (OFETs) using densely aligned array carbon nanotube (CNT) electrodes. The CNTs were aligned with a high linear density via dielectrophorosis (DEP) from an aqueous solution. In order to fabricate the CNT electrodes, aligned CNTs were cut by electron beam lithography (EBL) and precise oxygen plasma etching. The OFETs were fabricated in a bottom-contact configuration by depositing a thin film of C60 molecules between the CNT source and drain electrodes, and compared against a controlled OFET with gold electrodes. The room temperature electron transport measurements of the OFETs using CNT electrodes show better transistor characteristics compare to OFETs using gold electrodes due to improved charge injection from densely aligned and open-ended nanotube tips.

[1]This work is partially supported by U.S. National Science Foundation under Grant ECCS 1102228.

Biddut Sarker
Nanoscience Technology Center, and Department of Physics,
University of Central Florida

Date submitted: 28 Nov 2011 Electronic form version 1.4