

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Nanopositioning of Individual Vertical Aligned Carbon Nanotubes on Interconnects**<sup>1</sup> REGINALD C. FARROW, AMIT GOYAL, SHENG LIU, ZAFAR IQBAL, GORDON A. THOMAS, New Jersey Institute of Technology, LINUS A. FETTER, Bell Laboratories — Electrophoresis has been used to deposit single wall carbon nanotubes in arrays of sub-100 nm windows in insulating thin films over metal interconnects. The number of nanotubes that are deposited depends on the electric field and the geometry of the windows and nanotubes. Surface charge on the insulator causes the windows to become nanoscopic electrostatic lenses. Under certain readily achievable conditions *only one nanotube will be deposited* at the base of a window since each deposited nanotube modifies the electric field. This discovery enables the process integration of vertical aligned carbon-based electronics with more traditional technologies such as complementary metal oxide semiconductor (CMOS) using the *current generation of lithography and process technology*. Devices such as vertical field effect transistors and interconnected nanoprobe arrays may now be fabricated in the metal levels of CMOS integrated circuits to facilitate three-dimensional polyolithic circuit architectures.

<sup>1</sup>Work supported by DARPA and AFOSR.

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Date submitted: 04 Dec 2007

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