Abstract Submitted
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Solution Processed Polymeric Semiconductors for Carbon Nanotube-Enabled, Vertical, Organic Field Effect Transistors[1] ALEXANDER SCHACHTNER[2], Dept. of Physics, University of Oregon, NICHOLAS S. CUNNINGHAM, CHRISTOPHER C. SAMOUCE, MAXIME G. LEMAITRE, ANDREW G. RINZLER, Dept. of Physics, University of Florida — Carbon nanotube-enabled, vertical, organic field effect transistors (CN-VFETs) based on the small molecule dinaphtho[2,3-b:2',3'-f]thieno[3,2-b]thiophene (DNTT) have demonstrated high current, low-power operation suitable for driving active matix organic light emitting diode (AMOLED) displays [1]. This performance is achieved without the need for costly high-resolution patterning, despite the low mobility of the organic semiconductor, by employing sub-micron channel widths, defined in the vertical devices by the thickness of the semiconducting layer. Replacing the thermally evaporated small molecule semiconductor with a solution-processed polymer would possibly further simplify the fabrication process and reduce manufacturing cost. Here we investigate several polymer systems as wide bandgap semiconducting channel layers for potentially air stable and transparent CN-VFETs. The field effect mobility and optical transparency of the polymer layers are determined, and the performance and air stability of CN-VFET devices are measured. 1. M. A. McCarthy et al. Science 2011 332, 570

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