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Nanotube enabled thin film transistors utilizing low mobility organic semiconductors. BO LIU, Dept. of Physics, University of Florida, MITCHELL MCCARTHY, Dept. of Materials Sci. & Engineering, University of Florida, YOUNGKI YOON, Dept. of Elect. Engr., University of Florida, DOYOUNG KIM, Dept. of Materials Science and Engineering, University of Florida, ZHUANGCHUN WU, Dept. of Physics, University of Florida, FRANKY SO, PAUL H. HOLLOWAY, Dept. of Materials Science and Engineering, University of Florida, JOHN R. REYNOLDS, Dept. of Chem., University of Florida, JING GUO, Dept. of Elec. Engr., University of Florida, ANDREW G. RINZLER, Dept. of Physics, University of Florida — We describe a novel organic thin film transistor architecture enabled by single walled carbon nanotubes. Initial devices exhibit 2 orders of magnitude current modulation at useful currents despite the use of low mobility organic semiconductors (that exhibit no detectable current in a conventional TFT architecture). Modeling shows that the present devices function principally via Shottky barrier modulation, however as the source drain distance is reduced bulk modulation should also occur, with corresponding improvements in performance.

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