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Carbon Nanotube Thin Film Transistors Using Carbon Nanotube Electrodes NARAE KANG, BIDDUT K. SARKER, SAIFUL I. KHONDAKER, Nanoscience Technology Center and Department of Physics, University of Central Florida — Carbon nanotubes (CNTs) have attracted a significant attention in recent years due to their exceptional electronics, optical and mechanical properties. In particular, CNT thin film transistors (TFTs) are considered as promising active components in the next-generation flexible, transparent, and invisible electronics. Due to lack of transparency and flexibility, metal electrodes are not suitable for CNT TFTs in their transparent and flexible electronic applications. In this talk, we will discuss the high-performance CNT TFTs where densely aligned array of metallic single walled carbon nanotubes (SWNTs) were used as source and drain electrodes while semiconducting enriched aligned SWNTs (s-SWNT) were used as a channel material. The both metallic SWNTs in the electrodes and s-SWNTs in the channel are aligned via dielectrophoresis using a high quality surfactant-free solution. We show that the performance of the s-SWNT devices with metallic SWNT electrodes is significantly improved than that of the devices with Pd electrodes. In order to find the information about injection barrier between s-SWNT and metallic SWNT interface, we carry out low temperature electron transport measurement of our devices. We will discuss the detailed analysis of the low temperature data.

Narae Kang
Nanoscience Technology Center and Department of Physics,
University of Central Florida

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