

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Near-infrared photoresponse in single walled carbon nanotube/polymer composite films BIDDUT K. SARKER, Department of Physics & Nanoscience Technology Center, University of Central Florida, Orlando, Florida 32826, USA., M. ARIF, Nanoscience Technology Center, University of Central Florida, Orlando, Florida 32826, USA., SAIFUL I. KHONDAKER, Department of Physics & Nanoscience Technology Center, University of Central Florida, Orlando, Florida 32826, USA., DR. KHONDAKER GROUP TEAM — We present a near-infrared photoresponse study of single-walled carbon nanotube/poly(3-hexylthiophene)-block-polystyrene polymer (SWCNT/P3HT-b-PS) composite films for different loading ratios of SWCNT in the polymer matrix. Compared to the pure SWCNT film, the photoresponse $[(\text{light current} - \text{dark current})/\text{dark current}]$ is much larger in the SWCNT/polymer composite films. The photoresponse is up to 157% when SWCNTs are embedded in P3HT-b-PS while for a pure SWCNT film it is only 40%. We also show that the photocurrent strongly depends on the position of the laser spot with maximum photocurrent occurring at the metal–film interface. We explain the photoresponse due to exciton dissociations and charge carrier separation caused by a Schottky barrier at the metallic electrode - SWCNT interface

Biddut K. Sarker
Department of Physics & Nanoscience Technology Center,
University of Central Florida, Orlando, Florida 32826, USA.

Date submitted: 28 Nov 2009

Electronic form version 1.4