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Ultrafast Carrier Relaxation Measurements of SWCNT-Doped Polymer Thin Films[1] ELAINE LALANNE, BRENITRA MOSLEY, ANTHONY JOHNSON, Center for Advanced Studies in Photonics Research (CASPR), University of Maryland Baltimore County — The primary application of interest of single-walled carbon nanotube (SWCNT) -doped polymer thin films is to serve as a replacement of gold active regions on integrated optic surface enhanced biosensors and as potential transparent conducting polymers. In addition, the ultrafast nonlinear optical switching properties are of particular interest. We report femtosecond time-resolved measurements on SWCNT -doped polymer thin films. These films were made by spin-coating the monomer-SWCNTs suspension onto glass substrates and UV curing to initiate polymerization. The SWCNTs are predominately semiconducting. The thin film contains $\sim$ 0.4 wt % of SWCNTs, with an average thickness of 7 μm. Non-degenerate pump-probe transmission experiments were performed using λ_{pump}at 400 nm and white light continuum as the probe beam generated by a modelocked Ti:Sapphire laser (τ_p=160 fs, rep. rate 250 kHz). Preliminary results indicated two lifetimes: the fast decay of 1.4 ps and a longer relaxation time of 18 ps. Experiments are underway to study the carrier dynamics and determine the magnitude of the nonlinearity.

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Anthony Johnson
University of Maryland Baltimore County

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