

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Ultrafast decay of E_{22} subband excitons in semiconducting SWNTs TOBIAS HERTEL, JARED J. CROCHET, ZIPENG ZHU, Vanderbilt University — We use CW and time-resolved spectroscopy for an investigation of intra- and interband relaxation of excited states in micelle suspended SWNTs. We observe that the dynamics of E_{22} subband exciton decay in SWNTs is surprisingly similar to the dynamics of photoexcited carriers in bulk graphite. Moreover we find a clear correlation of the E_{22} exciton decay rate with the excited state energy. We compare these results with earlier theoretical studies of quasi-particle decay in graphite and discuss the role of electron-electron and electron-phonon coupling for the dynamics of higher excited states.

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Date submitted: 23 Nov 2005

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