

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Dark excitons in single-walled carbon nanotubes investigated by electroabsorption spectroscopy HIDEO KISHIDA, Y. NAGASAWA, S. IMA-MURA, A. NAKAMURA, Department of Applied Physics, Nagoya University, Japan — We report electroabsorption (EA) spectra in micelle-wrapped single walled carbon nanotubes (SWNT). By applying the high electric field (up to 85kV/cm), the absorption spectra of semiconducting SWNTs show field-induced change in the region of E_{11} and E_{22} transitions. The EA spectra are essentially reproduced by the second derivative curves of the absorption spectra. Such spectral features indicate that the bright (one-photon allowed) exciton and dark (two-photon allowed) exciton for each chiral index are nearly degenerate. The closer scrutiny of the EA spectra reveals that the dark excitons for several chiral indices are located on the higher energy side of the bright states.

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Date submitted: 22 Nov 2007

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