Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Electrical Activation of Dark Excitonic States in Carbon Nanotubes[1] TAKUSHI UDA, MASAHIRO YOSHIDA, AKIHIRO ISHII, YUICHIRO K. KATO, The University of Tokyo — Electrical activation of optical transitions to parity-forbidden dark excitonic states in individual carbon nanotubes is reported. We examine electric field effects on various excitonic states by simultaneously measuring both photocurrent and photoluminescence. As the applied field increases, we observe an emergence of new absorption peaks in the excitation spectra. From the diameter dependence of the energy separation between the new peaks and the ground state of E_{11} excitons, we attribute the peaks to the dark excited states which became optically active due to the applied field. A simple field-induced exciton dissociation model is introduced to explain the photocurrent threshold fields, and the edge of the E_{11} continuum states have been identified using this model.

[1]Work supported by JSPS (KAKENHI 24340066, 26610080), MEXT (Photon Frontier Network Program, Nanotechnology Platform), Canon Foundation, and Asahi Glass Foundation.

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Date submitted: 03 Nov 2015 Electronic form version 1.4