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Electronic Deexcitations in Semiconducting Carbon Nanotubes
CHIH-WEI CHIU, J.-H. HO, Physics Department, National Cheng-Kung University, C.-P. CHANG, Center for Gereral Education, Tainan Woman's Colledge of Art and Technology, R.-B. CHEN, Center for Gereral Education, National Kaohsiung Marine University, F.-L. SHYU, Physics Department, Chinese Military Academy, M.-F. LIN, Physics Department, National Cheng Kung University — The excited conduction electrons in semiconducting carbon nanotubes can effectively decay by the electron-electron Coulomb interactions. The main deexcitation mechanisms are the intraband excitations, but not the interband excitations. The decay rates strongly depend on the wavevector, the energy subbands, the temperature, and the nanotube radius. The calculated results could essentially explain the experimental measurements from the time-resolved photoemission spectroscopy.

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