

Abstract Submitted
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Field Enhancement inside Carbon Nanotubes HONG ZHANG, Sichuan University, China, YOSHIYUKI MIYAMOTO, Nano Electronics Res. Labs., NEC, Japan — There are many investigations on photo-excitations with polarization vector parallel to tube axis (parallel-polarization), compared to it, few studies on those with polarization vector perpendicular to tube axis (cross-polarization) are reported because of early theoretical consideration on electric-field-depolarization effect of nanotubes with cross-polarization [1]. Using dynamical consideration and TDDFT analysis, we herein present the influence of external electric field perpendicular to the axis of semiconductor carbon nanotube (CNT). By adjusting frequency of applied E-field in corresponding wavelength of light from 800nm to 591 nm, the total E-field inside carbon nanotubes has been found to show great change depending on the frequency; incomplete screening and strong enhancement even without including the excitonic effect [2]. The enhancement comes from increase of oscillating amplitude of electron cloud with resonant frequency given by the applied E-field. Also the numerical stability and the satisfaction of energy conservation rule with application of dynamical E-field were numerically checked [3]. This finding should be taken into account in interpreting a measurement of optical response of molecules being encapsulated in CNTs. [1]. H. Ajiki and T. Ando, *Physica B* **201**, 349 (1994) [2]. S. Uryu and T. Ando, *Phys. Rev. B* **76**, 115420 (2007) [3]. Y. Miyamoto and H. Zhang, *Phys. Rev. B* **77**, 165123 (2008)

Hong Zhang
Sichuan University, China

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