

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Confirmation of the resonance energy transfer between Rare Earth-DNA-Carbon Nanotube complex** TETYANA IGNATOVA, Lehigh University, Department of Physics, Bethlehem, PA, HIKMAT NAJAFOV, Rutgers University, Department of Physics and Astronomy, NJ, SLAVA V. ROTKIN, Lehigh University, Department of Physics; CAMN, Bethlehem, PA — We used the resonance excitation spectroscopy combined with the time-resolved study of the excited states following the 20ps laser excitation to investigate the energy transfer between rare earth (RE) ions and single wall nanotubes (SWNT). Selectively excited  $Tb^{3+}$  and  $Eu^{3+}$  ions in water solution containing a high concentration of DNA-wrapped SWNT showed a small systematic energy transfer from RE to SWNT. The measured value of the resonant energy transfer is consistent with our theoretical estimation based on the spectral overlap of the corresponding absorption and emission spectra of energy acceptors and donors. We performed additional characterization to prove the ionization states of the RE ions using the high-resolution X-ray Photoelectron Spectroscopy. The observed shift of the 4d – line of Tb is a signature of  $Tb^{2+}$  state which corroborates our assumption of Tb chemical bonding with the DNA-SWNT complex.

Tetyana Ignatova  
Lehigh University, Department of Physics, Bethlehem, PA

Date submitted: 09 Dec 2009

Electronic form version 1.4