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A Signature of Spatial Correlations between rare earth ions and single-wall nanotubes wrapped with DNA in their mixed solution TETYANA IGNATOVA, SLAVA V. ROTKIN, Lehigh University, Physics Department — We propose that the fluorescence resonance energy transfer (FRET) between the rare earth ions (REI) and single-wall nanotubes (SWNT) can be used to measure their Coulomb correlation in solution. As a calibration experiment the FRET between two different REIs, being the energy donor and the acceptor, in their mixed solution has been used. From the photoluminescence decay time we were able to extract the characteristic distance between unlike REIs. Our study revealed negative correlation (the repulsion) for Tb-Eu solution. In the case of the solution containing the REI and the SWNTs wrapped with DNA we observed a significant positive correlation (the attraction and the complex formation). The data is in a good agreement with the theoretical estimates and allows to propose REIs and their FRET as a sensitive tool for detecting kinetics of interaction of SWNTs in aqueous solutions.

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