

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Electron transport and light absorption/emission in molecular complexes MIGUEL MARTINEZ, Bronx High School of Science, LEV MOUROKH, Physics Department, Queens College of CUNY — In this work, we address photon-assisted electron transport in molecular triads and tetrads connected to the leads. Donor-bridge-acceptor triads are promising candidates for efficient organic solar cells, as the photon absorption makes it possible to transfer electrons against the applied voltage. Deriving and solving numerically the equations of motion for electron creation/annihilation operators, we obtain the parameters of molecular complexes which are optimal for a maximal efficiency of the light harvesting. For donor-bridge-bridge-acceptor tetrads, we determine the conditions for another phenomenon, *optical up-conversion*. Electron transport along the applied voltage and the photon absorption at one of the bridges facilitates the photon emission at another bridge with higher frequency. Using the same equations of motion approach, we obtain the emitted electromagnetic energy and its dependence on the system parameters.

Lev Mourokh
Physics Department, Queens College of CUNY

Date submitted: 14 Nov 2014

Electronic form version 1.4