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FMO complex: exciton transfer and interaction with vibronic modes LEV MOUROKH, Physics Department, Queens College of CUNY, ANATOLY SMIRNOV, FRANCO NORI, Frontier Research System, RIKEN, Japan and Physics Department, The University of Michigan — We examine transport of excitons trough Fenna-Matthews-Olson (FMO) complex from a receiving antenna to a reaction center, using methods of condensed matter and statistical physics. Writing equation of motion for creation/annihilation operators, we are able to describe the exciton dynamics in the regime when the reorganization energy is of the order of the intra-system couplings. Well-known quantum oscillations of the site populations are obtained, in particular. We determine the exciton transfer efficiency and its dependencies of the system parameters. While the majority of vibronic modes are treated as a heat bath, we address the situation when specific modes are strongly coupled to excitons and examine the effects of these modes on the quantum oscillations and the energy transfer efficiency.

Lev Mourokh
Physics Department, Queens College of CUNY

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