



ЛАБОРАТОРИЯ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ

Wednesday, 18 September 2019, at 15.00
Room 310

Gusev Alexander Alexandrovich

Finite element method for investigation of the quantum systems of several particles

The thesis developed an algorithmic approach to the construction of schemes of the finite element method of high accuracy and the Kantorovich method - reduction to a system of ordinary differential equations for solving multidimensional boundary-value problems for Schrodinger equation and investigation the quantum system of several particles. The operability of the constructed computing schemes, the created numerical and symbolic computer-algebraic algorithms and problem-oriented complexes of programs realizing them is confirmed by a numerical analysis of exact solvable and reference tasks with the known solutions and also physically interesting configurations and resonant processes possible in the quantum systems of several particles: photo-absorbtion in ensembles of the axial and symmetric quantum dotes, a Coulomb scattering of an electron in the homogeneous magnetic field and a photo-ionization of atom of Hydrogen, scattering of a diatomic molecule on atom or a potential barrier, tunneling of an cluster from several identical quantum particles through potential barriers or wells.