

**Название публикации:**

Regularization of One-Electron Quasi-Steady States in Ideal Quantum Dots in the Electric Field

**Авторы:**

Mandel', A.M.a, Oshurko, V.B.a, Solomakho, G.I.a, Solomakho, K.G.a, Veretin, V.S.b

a. Moscow State Technological University STANKIN, Moscow, Russian Federation

b. Plekhanov Russian University of Economics, Moscow, Russian Federation

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**Аннотация:**

One-electron states localized on ideal quantum dots, i.e., zero-dimensional heterostructures capable of keeping only one electron, in the external electric field are discussed. A technique for regularization of the Gamow wave function of such states in which the electric field strength is supplemented by an infinitely small imaginary addition is proposed. It is found that, starting with a certain threshold, physically important calculated data become independent of this addition; in this case, integrals in a weak field converge to the saddle-point estimates. Using this technique, the binding energy and the probability of ejection of an electron localized on an ideal quantum dot by the electric field have been calculated. It is demonstrated that the main difference between the obtained results and the well-studied delta-potential approximation is that the contribution to the integrals is made by two saddle points rather than one.

**Ключевые слова:**

Binding energy, Electric fields, Electrons, Nanocrystals, Quantum theory, Wave functions, Delta-potentials, Electric field strength, External electric field, One-electron state, Quasi-steady state, Saddle point, Zero-dimensional, Semiconductor quantum dots