

## Real-Code Genetic Algorithm for Ground State Energies of Hydrogenic Donors in GaAs-(Ga,Al)As Quantum Dots

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**Abstract:** We present a global optimization method, called the real-code genetic algorithm (RGA), to the ground state energies. The proposed method does not require partial derivatives with respect to each variational parameter or solving an eigenequation, so the present method overcomes the major difficulties of the variational method. RGAs also do not require coding and encoding procedures, so the computation time and complexity are reduced. The ground state energies of hydrogenic donors in GaAs-(Ga,Al)As quantum dots have been calculated for a range of the radius of the quantum dot radii of practical interest. They are compared with those obtained by the variational method. The results obtained demonstrate the proposed method is simple, accurate, and easy implement.

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Key words: ground state energy, quantum dots, real-code genetic algorithms

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