Calculation of energy states of excitons in square quantum wells

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The ground and excited energy states of excitons in single square GaAs-based quantum wells are found by the numerical solution of the three-dimensional Schrödinger equation.This equation is obtained within the envelope-function formalism from the exciton energy operator using the spherical approximation of the Luttinger Hamiltonian. Precise results for the exciton states are achieved by the finite-difference method. The radiative decay rates of the calculated states are also determined.