

Abstract Submitted
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Electron with position-dependent mass confined in a two-dimensional infinite square well MARTIN MOLINAR-TABARES, Organismo de Cuenca Noroeste, Comision Nacional del Agua, CARLOS RUVALCABA-CORNEJO, Departamento de Matematicas, Unidad Regional Centro, Universidad de Sonora — In order to have a case of study for introduce the concept of position-dependent mass, we propose to analyze the following case. Creating a rectangular crystal structure from the two-dimensional deposit of GaAs and $\text{Al}_{0.35}\text{Ga}_{0.65}\text{As}$ on a substrate, we study the confinement of an electron with position-dependent effective mass. Knowing how the electron mass of the electron and its potential energy varies with the concentration of the semiconductor, we solve the time-independent Schrödinger equation using a linear combination of wave functions of a particle enclosed inside a two-dimensional square well with infinite potential walls. The ground state energy and the energies of some excited states with the probability density of these states are found. Making a two-dimensional growth of the structure we analyze if appears sub-bands energy and if the Bloch theorem manifests. We compare our results with those that we would obtain if we consider and constant effective mass inside the crystal.

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