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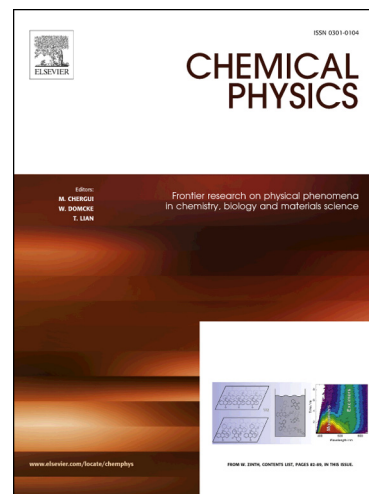
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Exciton states and optical absorption in core/shell/shell spherical quantum dot

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Abstract

The exciton states in core/shell/shell spherical quantum dot with three-dimensional Winternitz–Smorodinsky confinement potential are considered. The problem is discussed in the framework of adiabatic approximation when the heavy hole is situated in the effective potential well caused by the electron. The interband optical transitions caused by incident light polarized in z-direction have been considered in such systems. The oscillator strengths and selection rules for the quantum transitions have been obtained. The ensemble of quantum dots and their size dispersion have been taken into account in the calculations. The Gaussian distribution has been chosen to describe the size dispersion of the core/shell/shell quantum dots thickness. The dependence of the absorption coefficient and photoluminescence spectra on the energy of incident light of interband transitions have been obtained.

Keywords: core/shell/shell spherical quantum dot, interband light absorption, photoluminescence spectra

Introduction

The theoretical investigation of the optical properties of semiconductor nanostructures continues to play an important role in nanophysics [1,2]. One of the interesting nanostructures is

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