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The hole energy spectrum of an open spherical quantum dot within the multiband model

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Abstract

An open spherical quantum dot (OSQD) has been studied. The theory for calculation of the quasistationary hole states in the OSQD has been presented. The condition under which a OSQD turns into a closed spherical quantum dot (CSQD) is determined. Obtained results for the OSQD within the multiband model were compared with those of the single band model. The presented theory can be used to determine the decay time and line widths of the quasistationary hole states. Also it can be the basis to determine the acceptor states in the OSQD. © 2019 Elsevier B.V.

Author keywords

Boundary conditions; Energy spectrum; Multiband hole model; Quasistationary states

Indexed keywords

Engineering controlled terms

Boundary conditions; Nanocrystals; Spectroscopy; Spheres

Engineering uncontrolled terms

Acceptor state; Energy spectra; Multiband; Multiband model; Quasi-stationary; Quasi-stationary state; Single band models; Spherical quantum dot

Engineering main heading

Semiconductor quantum dots

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