

Energy Spectra of Excitons Bound to a Neutral Acceptor in Quantum Dots

XIE Wen-Fang

Department of Physics, Guangzhou University, Guangzhou 510405, China

Department of Physics, Shanxi University, Taiyuan 030006, China

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Abstract: The energy spectra of the ground state for an exciton (X) trapped by a neutral acceptor (A^0) in a quantum dot with a parabolic confinement have been calculated as a function of the electron-to-hole mass ratio σ by using the hyperspherical coordinates. We find that the (A^0, X) complex confined in a quantum dot has in general a larger binding energy than those in a two-dimensional quantum well and a three-dimensional bulk semiconductor, and the binding energy decreases with the increase of the electron-to-hole mass ratio.

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