

Biexciton binding energy in spherical quantum dots with Γ_8 valence band

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The biexciton binding energy in spherical CdSe/ZnSe quantum dots is calculated variationally in the framework of kp -perturbation theory. Smooth and abrupt confining potentials with the same localization area of carriers are compared for two limiting cases of light hole to heavy hole mass ratio $\beta = m_{lh}/m_{hh}$: $\beta = 1$ and $\beta = 0$. Accounting for correlations between carriers results in their polarized configuration and significantly increases the biexciton binding energy in comparison with the first order perturbation theory. For $\beta = 0$ in smooth confining potentials there are three nearby biexciton states separated by small energy gap between $1S_{3/2}$ and $1P_{3/2}$ hole states.

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