Pressure effects on neutral and charged excitons in self-assembled (In, Ga)As/GaAs quantum dots

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. X^0 ( ), X^- X^+ ( ), XX^0 ( ) $_{0.6}$ $_{0.4}$. () X^0 X^+ X^-, XX^0 . () X^0, X^- X^+, XX^0. () J. () $J^{(hh)} > J^{(eh)} > J^{(ee)}$.

10.1103/ .72.041307 () 71.35, 74.62.

$\mathcal{E}^{(e)}$ $\mathcal{E}^{(h)}$ (e) e

$$\Delta(X^0) = [\mathcal{E}_0^{(e)} - \mathcal{E}_0^{(h)}] - E(X^0),$$

$$\Delta(X^-) = [\mathcal{E}_0^{(e)} + E(X^0)] - E(X^-),$$

$$\Delta(X^+) = [-\mathcal{E}_0^{(h)} + E(X^0)] - E(X^+), \tag{5}$$

$$\Delta(XX^0) = 2E(X^0) - E(XX^0).$$

... $K_{00,00}^{(eh)}$ (... μ),[17] ...

$$\Delta(X^0) = J_{00}^{(eh)},$$

$$\Delta(X^-) = J_{00}^{(eh)} - J_{00}^{(ee)},$$

$$\Delta(X^+) = J_{00}^{(eh)} - J_{00}^{(hh)}, \tag{6}$$

$$\Delta(XX^0) = 2J_{00}^{(eh)} - [J_{00}^{(ee)} + J_{00}^{(hh)}] = \Delta(X^-) + \Delta(X^+).$$

... $\delta(\chi^q)$ ... (5) ... (6),

$$\Delta(\chi^q) = \Delta(\chi^q)$$

$\delta(\chi^q)$. m $\Delta a / a_0 = (a - a_0) / a_0$,
w a a_0 m -
m m , . -
w . 1( ) -
m 22

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. 2

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$\int_0^R$ $\mathbf{r}|\psi_0^{(s)}(\mathbf{r}+\mathbf{R}_c)|^2$ ($\mathbf{R}_c$

R, $s=e,h$)