INFLUENCE OF THERMALLY INDUCED STRAINS ON THE FORMATION ENERGIES OF $1s$- AND $2s$-EXCITONS IN A STRESSED ZnSe/ZnS QUANTUM WELL

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S u m m a r y

In the framework of the deformation potential model, the formation energies of $1s$- and $2s$-excitons in a ZnSe/ZnS quantum well have been calculated taking into account both the mechanical strain appearing in the heterostructure owing to the lattice mismatch between two contacting layers ($f = \Delta a/a \approx 4.5\%$) and the thermally induced strain caused by their different coefficients of thermal expansion ($\Delta\alpha_T/\alpha_T \approx 17\%$). The thermally induced strain component, appearing in the ZnSe/ZnS heterostructure that was grown within the temperature interval 500—700 K and is exploited at 4.2, 77, and 300 K, has been demonstrated to increase the formation energies of $1s$- and $2s$-excitons by about 10 meV.