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Effect of Temperature on Exciton Binding Energy in ZnSe/ Zn_{1-x}Mg_xSe Quantum Well with Poschl-Teller Potential

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Abstract : Exciton binding energies with temperature in a quantum well with Poschl-Teller Potential formed by ZnSe/Zn_{1-x}Mg_xSe are calculated theoretically. Using the temperature dependent value of the effective mass and barrier height, the sub-band energies of the electron, heavy hole and light hole are calculated by variational method. Binding Energy of light hole exciton and heavy hole exciton are calculated as a function of the wellwidth for different temperatures. We have obtained the result that the binding energy of exciton decreases with enhancing the temperature and increases with reducing the wellwidth upto 12 nm for heavy hole exciton and 10 nm for light hole exciton, beyond this wellwidth the exciton binding energy decreases.

Keywords : Quantum well, Exciton, Binding energy, Poschl-Teller Potential, Temperature.

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