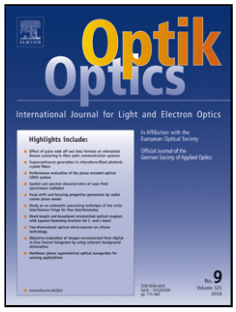

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Modeling of ZnSe/$Zn_{1-x}Mg_xSe$ quantum well laser properties

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Abstract

The present work deals with the study of the properties of a laser diode based on ZnSe/$Zn_{1-x}Mg_xSe$ quantum well at room temperature. A low magnesium composition (x=0.08) is considered to ensure exciton lasing and to reduce the ternary alloy fluctuations. Optical gain has been calculated. The influence of the carriers' density and the quantum well width on the optical gain and its maximum value has been examined and discussed. Furthermore the emission wavelength is also determined as a function of the quantum well width. The information derived from this study shows that our system is of possible emission in the blue region of the electromagnetic spectrum. Besides, the maximum of the optical gain is enhanced by increasing both the carriers' density and the quantum well width. It is also found that the emitted wavelength is shifted towards higher values as the quantum well width is increased.

Keywords: Quantum wells; Laser diode properties; Optical properties; Ternary alloys.

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