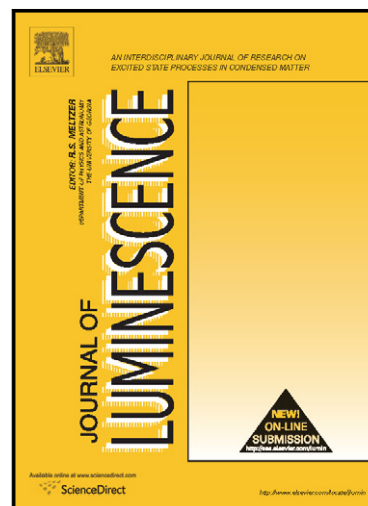


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Effect of intense high-frequency laser field on the linear and nonlinear intersubband optical absorption coefficients and refractive index changes in a parabolic quantum well under the applied electric field

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Abstract

The effect of the intense high-frequency laser field on the optical absorption coefficients and the refractive index changes in a GaAs/GaAlAs parabolic quantum well under the applied electric field have investigated theoretically. The electron energy levels and the envelope wave functions of the parabolic quantum well are calculated within the effective mass approximation. The analytical expressions for optical properties are obtained using the compact density-matrix approach. The numerical results show that the intense high-frequency laser field has a great effect on the optical characteristics of these structures. Also we can observe that the refractive index and absorption coefficient changes are very sensitive to the electric field in large well dimension. Thus, this result gives a new degree of freedom in the optoelectronic device applications.

Keywords: Parabolic quantum well, Nonlinear optical property, Intense laser field, Electric field.

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