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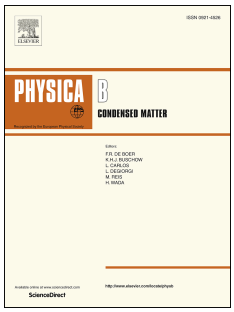

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Magneto-optical properties of semi-parabolic plus semi-inverse squared quantum wells

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Abstract

We theoretically study the optical absorption in a quantum well with the semi-parabolic potential plus the semi-inverse squared potential (SPSIS) in the presence of a static magnetic field in which both one- and two-photon absorption processes have been taken into account. The expression of the magneto-optical absorption coefficient (MOAC) is expressed by the second-order golden rule approximation including the electron–LO phonon interaction. We also use the profile method to obtain the full width at half maximum (FWHM) of the absorption peaks. Our numerical results show that either MOAC or FWHM strongly depends on the confinement frequency, temperature, and magnetic field but their dependence on the parameter β is very weak. The temperature dependence of FWHM is consistent with the previous theoretical and experimental works.

Key words: Magneto-optical properties, Electron-phonon interaction, Nonlinear optics, Transport properties, Quantum wells, FWHM.

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