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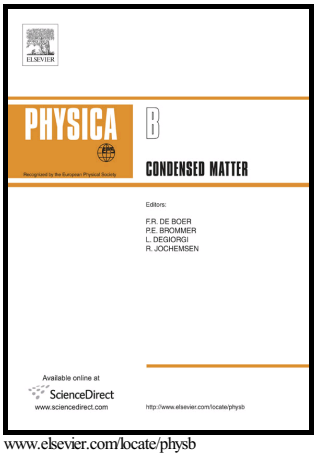

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Intense laser field effects on the third-harmonic generation in a quantum pseudodot system

S. Sakiroglu[a,*], D. Gul Kilic[b], U. Yesilgul[c], F. Ungan[c], E. Kasapoglu[d], H. Sari[e], I. Sokmen[a]

[a] *Physics Department, Faculty of Science, Dokuz Eylül University, 35390 Izmir, Turkey*
[b] *Physics Department, Graduate School of Natural and Applied Sciences, Dokuz Eylül University, 35390 Izmir, Turkey*
[c] *Department of Optical Engineering, Faculty of Technology, Cumhuriyet University, 58140 Sivas, Turkey*
[d] *Physics Department, Faculty of Science, Cumhuriyet University, 58140 Sivas, Turkey*
[e] *Department of Mathematical and Natural Science Education, Faculty of Education, Cumhuriyet University, 58140 Sivas, Turkey*

Abstract

In this research, we present the effects of high-frequency intense laser field on the third-harmonic generation associated with intersubband transitions in a two-dimensional quantum pseudodot system subjected to an uniform external magnetic field. Non-resonant monochromatic laser radiation with circular polarization is considered within the framework of high-frequency Floquet approach. On the basis of the compact-density matrix approach and an iterative method, the third-harmonic generation coefficient is calculated. The results presented for a GaAs quantum dot show that: (i) the position and magnitude of the resonant peak of third-harmonic generation depend strongly on magnetic field, the chemical potential and zero-point of pseudoharmonic potential; (ii) the strength of intense laser field modifies the confinement potential which results in considerable changes in the nonlinear optical response of the system.

Keywords: quantum dot, intense laser field, nonlinear optics

1. Introduction

On the ground of having a tremendous potential for device applications, electronic and optical properties of semiconductor low-dimensional heterostructures are extensively studied by many theoretical and experimental researchers in condensed matter physics and applied sciences [1].

*Corresponding Author.
Email address: serpil.sakiroglu@deu.edu.tr (S. Sakiroglu)