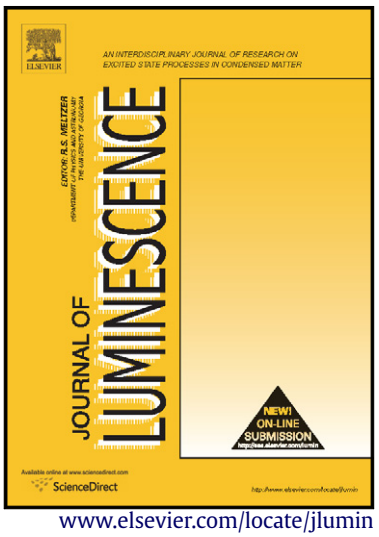

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Exciton effects on dipole-allowed optical absorptions in a two-dimensional parabolic quantum dot

Jian-Hui Yuan[a],* Yan Zhang[a], Daizheng Huang[a], Jianjun Zhang[b], and Xin Zhang[c]

[a]*The department of Physics, Guangxi medical university, Nanning, Guangxi, 530021, China*

[b]*School of Physics, Huazhong University of Science and Technology, Wuhan 430074, China*

[c]*The 34th Institute of China Electronics and Technology*

Group Corporation, Guilin Guangxi 541004, China

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Abstract

Abstract: Exciton effects on the linear and nonlinear optical absorptions (the transition from the S state $(L = 0)$ to the P state $(L = 1)$) in two-dimensional quantum dots are theoretically studied by using the configuration-integration methods (CI) and the compact density-matrix approach. The results show that the optical absorption coefficient, which can be controlled by the confinement potential strength and the incident optical intensity, is enhanced obviously when the exciton effect is taken into account. We find that both a trapped electron-hole pair and the incident optical intensity can bleach the exciton absorption and the appearance of the new absorption may be due to biexciton.

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