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# Pressure dependent optical properties of quantum dot with spin orbit interaction and magnetic field

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## ABSTRACT

In this paper, a detailed investigation of the effects of the interplay of temperature, hydrostatic pressure, Rashba spin orbit interaction, and external magnetic field on the optical properties for quantum dot is presented. We obtained the exact wavefunctions and energy levels of a harmonic potential quantum dots taking Rashba spin orbit interaction into account. We have obtained the linear and nonlinear absorption coefficients and relative refractive index change for varying incident photon energies using density matrix theory. Counter intuitive red shift in the absorption coefficient peaks with increase in hydrostatic pressure is demonstrated. The role of temperature and hydrostatic pressure on variation of effective charge carrier mass is investigated.

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