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Excitonic Effect on the Nonlinear Optical Properties of 3D Quantum Dots JEFFERSON FLOREZ-GUTIERREZ, ANGELA CAMACHO-BELTRAN, Universidad de los Andes — The excitonic effect on the optical nonlinearities of quantum dots is studied considering both the confinement potential of the electron-hole pair and the Coulomb interaction between them. The exciton is confined in a 3D quantum dot by means of a spherical harmonic potential. First, we obtain numerically the exciton states and then calculate the nonlinear optical coefficients such as the optical rectification and the second harmonic generation susceptibilities and the nonlinear absorption coefficient. We observe that the nonlinear optical properties are modified, compared with the results obtained just taken into account the non-interacting electron-hole pair. We also study the effect of an asymmetric confinement potential on the nonlinear optical properties of quantum dots. The asymmetric harmonic potential is set by restricting the azimuthal angle to values between 0 and $\pi/2$. Our results show that this asymmetry increases the nonlinear optical coefficients.

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