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Influence of binding energy on dipole moment, polarizability and self-polarization effect of impurity doped quantum dots: Role of noise

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Abstract

Present study inspects the profiles of electric dipole moment (DPM), polarizability (α_p) and self-polarization effect (SPE) of doped *GaAs* quantum dots (QDs) in presence of noise. Special stress has been given on understanding the role of binding energy (BE). Noise term maintains a Gaussian white character and it has been introduced to the system additively and multiplicatively. Application of noise affects the above properties noticeably with conspicuous dependence on the pathway of application. The findings reveal feasible routes to tune the above aspects of doped QD system through expedient adjustment of BE, particularly in presence of noise.

Keywords: quantum dot; impurity; binding energy; dipole moment; polarizability; self-polarization effect; Gaussian white noise

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