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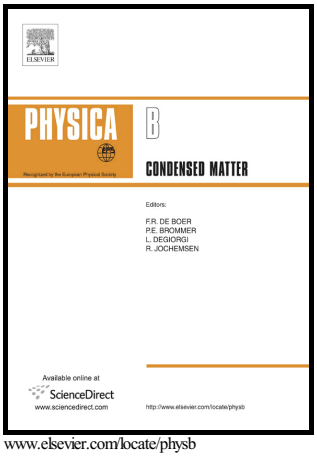

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Dipole moment and polarizability of impurity doped quantum dots driven by noise: Influence of hydrostatic pressure and temperature

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Abstract

Present study examines the pattern of variation of electric dipole moment (μ) and polarizability (α_p) of impurity doped $GaAs$ quantum dots (QDs) under combined presence of hydrostatic pressure and temperature and in presence of noise. Noise term carries a Gaussian white character and it has been introduced to the system via two different pathways; additive and multiplicative. Profiles of μ and α_p have been monitored against the variations of hydrostatic pressure (HP), temperature and the noise strength. Under a given condition of HP and temperature, application of noise prominently influences the above two properties. However, the extent of influence depends on the noise strength and the pathway through which noise is introduced. The findings divulge feasible routes to control the dipole moment and polarizability of doped QD system through the interplay between HP, temperature and noise.

Keywords: quantum dot; impurity; dipole moment; polarizability; Gaussian white noise, hydrostatic pressure; temperature

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