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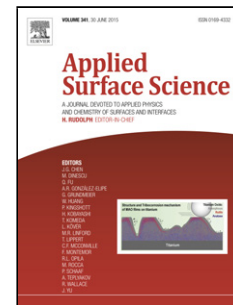
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Optical studies on a single GaAs laterally coupled quantum dot in comparison with an uncoupled quantum dot

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Highlights

- Direct comparisons between a single laterally coupled quantum dot (CQD) and a regular quantum dot (QD) are reported in terms of the optical coupling states.
- The exciton dipole-dipole interaction is mainly determined by the separation distance of dipoles and the two dipole elements, which rely on the relative orientation between the two dipoles.
- The optical coupling states were investigated in terms of the integrated photoluminescence intensities and redshift of the emission energies with increasing excitation power.
- The exciton photoluminescence decay time of two exciton states is clearly shorter for the lateral CQD than for the single QD as a consequence of extended wavefunction overlaps via optical coupling.

Abstract

We performed spectroscopy studies on a single GaAs laterally coupled quantum dot and an uncoupled quantum dot. Photoluminescence spectra confirmed the presence of optical coupling in the coupled quantum dot through dipole-dipole interactions. The optical coupling was investigated in terms of the integrated photoluminescence intensities and redshift of emission energies as the

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