

# Nanocomposites and nanomaterials

## Asymmetric Self Assembled Quantum Dots

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We consider a low dimensional structure made of two ellipsoidal quantum dots (QDs) caps made with InAs embedded in a wetting layer InAs and surrounded by GaAs. Using the strain dependent  $\mathbf{k} \cdot \mathbf{p}$  theory, the energy of the two lowest states

of a single electron/hole which is confined within the coupled QD structure has been calculated. The dependence of dephasing rates on an external magnetic field, the interdot distance, and the lattice temperature is presented.

[1] *Stavrou V.N.* Electronic structure of asymmetric vertically coupled InAs/GaAs quantum dots // *Physica B* **407** (2012) 1157–1160.

[2] *Stavrou V. N.* Polarized light in quantum dot qubit under an applied external magnetic field // *Physical Review B* **80**, 153308, 2009.

[3] *Stavrou V. N.* Suppression of electron relaxation and dephasing rates in quantum dots caused by external magnetic fields // *J. Phys.: Condens. Matter* **19** (2007) 186224.