

Ground State Transitions in Vertically Coupled Four-Layer Single Electron Quantum Dots

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Abstract: We study a four-electron system in a vertically coupled four-layer quantum dot under a magnetic field by the exact diagonalization of the Hamiltonian matrix. We find that discontinuous ground-state energy transitions are induced by an external magnetic field. We find that dot-dot distance and electron-electron interaction strongly affect the low-lying states of the coupled quantum dots. The inter-dot correlation leads to some sequences of possible disappearances of ground state transitions, which are present for uncoupled dots.

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