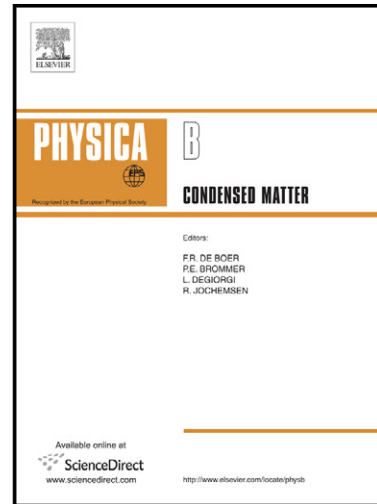


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The effect of thermal bias on the spin-state manipulation in a quantum dot

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Abstract

The control of the single electronic state in a quantum dot (QD) by magnetic field in the presence of thermal bias was investigated with master equation method. Results show that the qubits for information processing can be realized by tuning the magnitude and direction of the magnetic field. In addition, the temperature difference between the source (S) and drain (D) leads, thermal-spin effect, which is inevitable in practical devices, can also be counteracted with magnetic field. Our results have important implications for quantum information processing.

Keywords: Quantum dot; Thermal bias; Spin-state manipulation.

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