The effect of side quantum dots on conductance through four-quantum-dot combinations: study by non-equilibrium Greens function method

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Abstract

Electronic transport has been investigated in four-quantum-dot combination coupled to metal electrodes using the non-equilibrium Green’s function method, and curves I-V and conductance (dI/dV) were analyzed for special combination. We have showed that the emergence of negative differential conductivity is due to asymmetric distribution of quantum dots in the central region, existence of non-coupled dots (side quantum dots), and the interference effect. We found that more side quantum dots lead to more negative differential conductance.

Keywords: negative conductance, non-equilibrium Greens function, quantum dots, transport

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