

عنوان مقاله:

Characteristics of 2D nanodot-array single electron device acting as a single electron transistor using SIMON simulator

محل انتشار:

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خلاصه مقاله:

in this paper, we present a 2D nanodot-array single electron device (NASED) model based on the orthodox theory and solving the master equation. Using SIMON simulator, we investigate the electrical characteristics of single-electron transistors (SETs) based on 2D nanodot-array of islands and show the temperature dependence of the Coulomb oscillation of the SET with one to 900 islands as a function of gate voltage V_g in the temperature range from $T = 5$ to 50 K and discuss electrical properties of 2D-NASED using diamond characteristics and stability diagram. Values of current tend to increase proportionally with temperature. For a high drain voltage, the 2D-NASED behaved as a single-island device. This is probably because the multiple islands were electrically enlarged and merged into a single island owing to the high applied drain voltage. Finally, we compare the advantages of 2D-NASED face to .single-island SETs with identical dimensions of islands

کلمات کلیدی:

single-electron tunneling device, multiple islands SET, Orthodox theory, Coulomb oscillation ,SIMON

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