

عنوان مقاله:

Quantum Simulation Study of Single Halo Schottky Barrier CNTFETs

محل انتشار:

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خلاصه مقاله:

In this paper, we performed a comprehensive scaling study of a schottky barrier carbon nanotube field-effect transistor (SB_CNTFET) with halo doping (HD) using self-consistent and atomistic scale simulations. Our simulation results demonstrate that drain induced barrier lowering (DIBL) diminishes in the HD-SB_CNTFET due to a step in the potential of the CNT at the interface of p-doped and undoped regions in the channel. Also, the hot carrier effect minimizes with reduction of the peak of the electric field at the drain side of the HD SB_CNTFET. Moreover, the features of the HD_SB_CNTFET can be controlled by the length and concentration engineering of the HD region. Leakage current and on/off current ratio improve with an increase of the length and concentration of the HD region, due to the increment of the threshold voltage and the barrier height of the p_n junction near the source. Therefore, this work can provide an incentive for further experimental exploration

کلمات کلیدی:

Schottky Barrier CNTFET, Single Halo, Quantum Simulation

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