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2D-Simulation of Quantum Effects in Silicon Nanowire Transistors

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Abstract : A 2D-simulation using a quantum model of silicon nanowire (SiNW) field-effect transistors (FETs) have been performed by the effective mass theory. We have investigated very close for real device analysis, so we used to the non-equilibrium Green's function (NEGF) and the density gradient of quantum model. We investigated I-V characteristics curve and C-V characteristics curve of the channel thickness from 5nm to 200nm. As a result of simulation, even higher drain current in SiNW using a quantum model was observed than in SiNW using a non-quantum model. The reason of higher drain current can be explained by the quantum confinement effect.

Key Words : Simulation, SiNW, nanowire, NEGF, Quantum confinement

감사의 글

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