Computational Microelectronics

Assignment #5

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1. Electrostatic potential as a function of N^+

Equation :

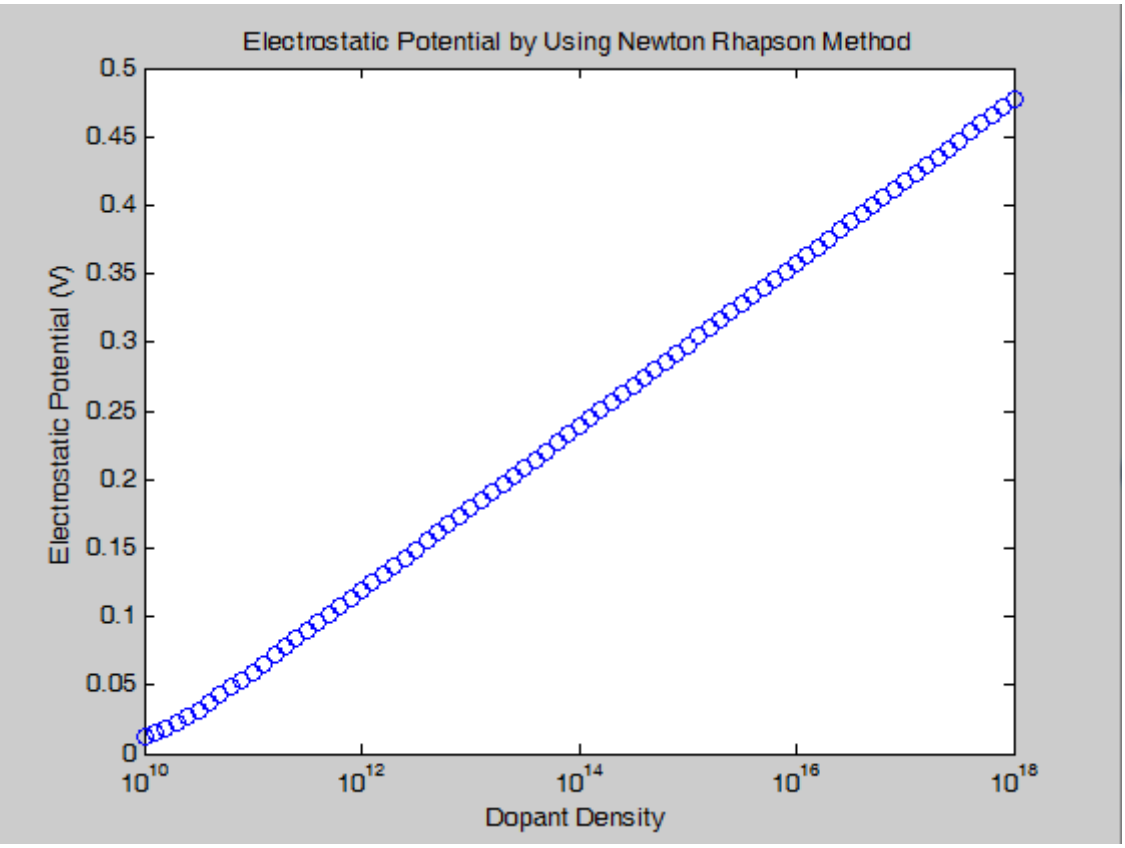
$$f(\Phi + \delta\Phi) = 0$$

$$f + \frac{\partial f}{\partial \Phi}\delta\Phi = 0$$

$$\delta\Phi = (-f)/\frac{\partial f}{\partial \Phi}$$

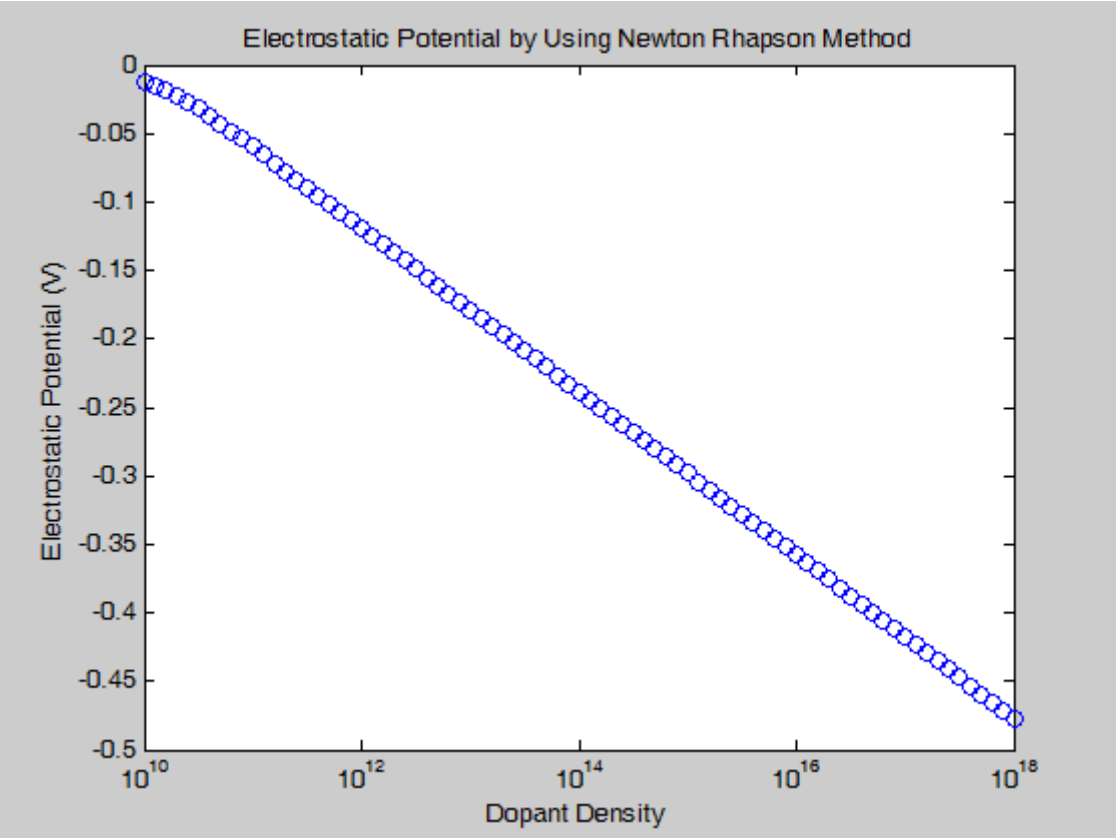
Jacobian = - nint/V_T*exp(-phi/V_T) - nint/V_T*exp(phi/V_T)
Res =-(N^+ + nint*exp(-phi/V_T) - nint*exp(phi/V_T))

① Electrostatic Potential w/ variable N^+(10^{10}~10^{18})



Phi starts from 2, 1000 times approximation

② Electrostatic Potential w/ variable $N^{+}(-10^{10}\sim -10^{18})$



Phi starts from -22, 1000 times approximation