# Computational Microelectronics [HW-11]

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## 1. Simulation explanation

In this report, we consider BTE simulator in a 30 nm long structure. It's potential is 0 from 0 nm to 10 nm, V increases linearly from 10 nm to 20 nm, $\mathrm{V} = V_D > 0$ from 20 nm to 30 nm. We are only treating $f_0$ & $f_1$, whose relation is shown below.

$$\nu \frac{\partial}{\partial \mathrm{x}} \frac{1}{c_1} f_0(x,H)\gamma_{0,1,1} = -\frac{f_1(x,H)}{\tau}$$

$$\frac{1}{c_1} = \sqrt{\frac{1}{\pi}}$$

| Elementary charge, [C] | 1.602192e-19 |
|---|---|

| | |
|---|---|
| Vacuum permittivity, [F/m] | 8.854187817e-12 |
| Boltzmann constant, [J/K] | 1.380662e-23 |
| Temperature, [K] | 300.0 |
| Relaxation time [s] | 1e-12 |
| Electron mass [Kg] | 9.109534e-31 |
| Drain voltage [V] | 0.01 |

**Table.1: Simulation parameters**

# 2. Result and discussion

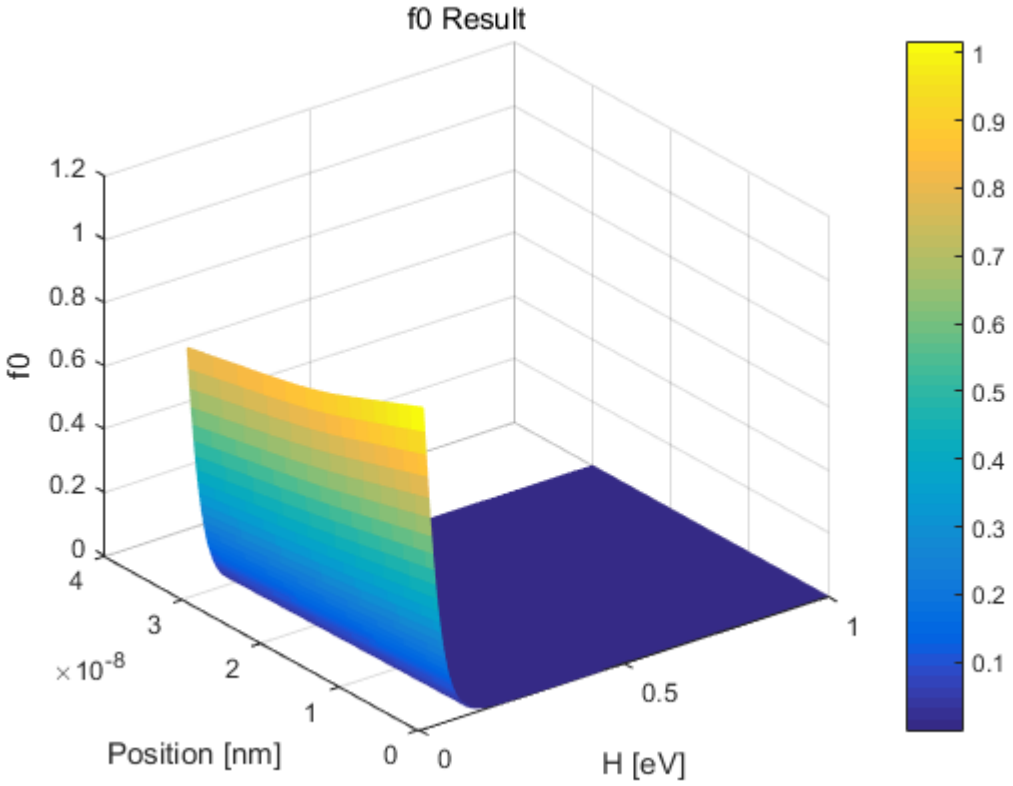


**Figure 1 f0 variation in terms of H(Energy) and x-position**

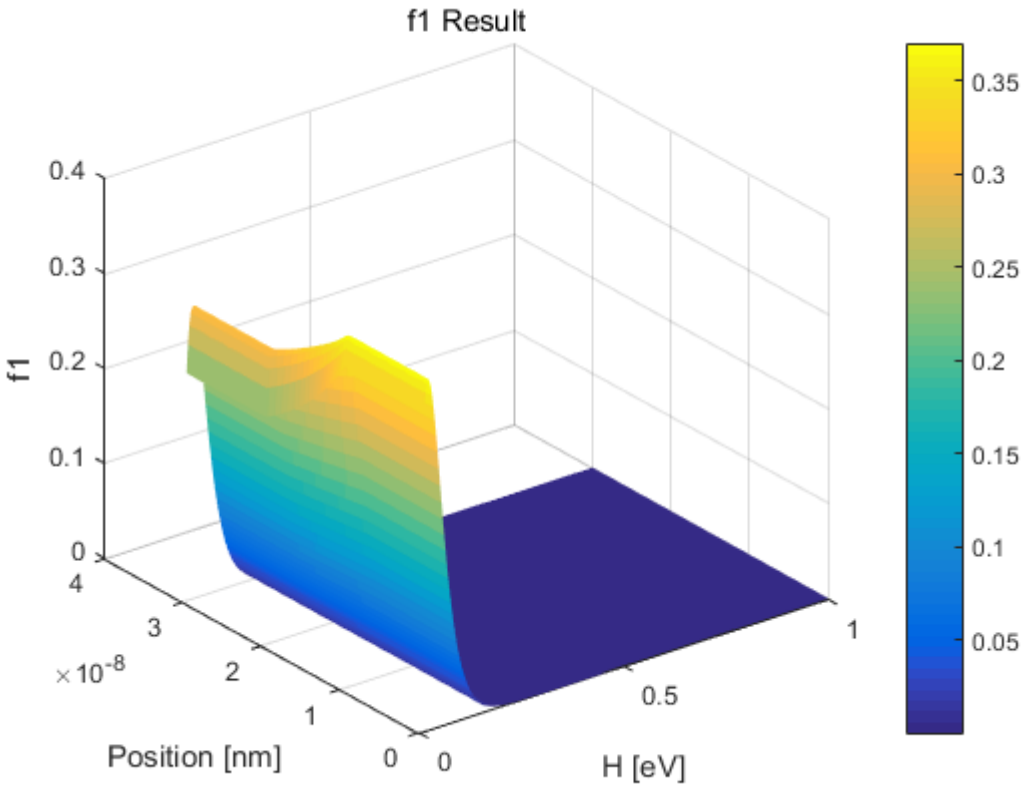


**Figure 2 f1 variation in terms of H(Energy) and x-position**