$$\frac{\partial n}{\partial x} = J_n(x) \cdot \frac{1}{eD_n} - n(x) \cdot F(x) \cdot \frac{\mu_n}{D_n}$$

$$\frac{\partial p}{\partial x} = p(x) \cdot F(x) \cdot \frac{\mu_p}{D_p} - J_n(x) \cdot \frac{1}{eD_p}$$

$$\frac{\partial J_n}{\partial x} = -eG$$

$$\frac{\partial J_p}{\partial x} = eG$$

$$\frac{\partial \Phi}{\partial x} = F(x)$$

$$\frac{\partial F}{\partial x} = -\frac{e}{\varepsilon_0}(p(x) - n(x))$$

- $\frac{\mu_n}{D_n} = \frac{\mu_p}{D_p}$
- $D_n = \frac{\mu_n k_B T}{e}$
- $\mu_p = 3 \cdot 10^{-8}$
- $\mu_n = 2.5 \cdot 10^{-7}$
- $k_B = 1.38 \cdot 10^{-23}$
- $T = 300$
- $G = 2.7 \cdot 10^{27}$
- Boundary conditions: $n_1 = 2.5 \cdot 10^{25} = p_2$; $n_2 = 4.11 \cdot 10^{8} = p_1$;

$$\Phi_1 = \frac{V_{bi} - V}{2};\ \Phi_2 = \frac{V - V_{bi}}{2};\ V_{bi} = 1$$

- $n = yw[0];\ p = yw[1];\ J_n = yw[2];\ J_p = yw[3];\ F = yw[4];\ \Phi = yw[5]$
  $\frac{1}{eD_n} = 9.33 \cdot 10^{26} = pw[0];$
  $\frac{1}{eD_p} = 8.05 \cdot 10^{27} = pw[1];$
  $\frac{\mu_n}{D_n} = 2.41 \cdot 10^{20} = pw[2];$
  $eG = 4.32 \cdot 10^{8} = pw[3];$
  $\frac{e}{\varepsilon_0} = 5.33 \cdot 10^{-8} = pw[4].$