1. Errata

Chapter 2

P.44: In **Section 2.9** the first equation should be

$$\frac{I_{nE}}{I_{pE}} = \frac{D_{n,B}}{D_{p,E}} \frac{L_{p,E}}{L_{n,B}} \frac{N_{D,E}}{N_{A,B}} \frac{N_{c,B} N_{v,B}}{N_{c,E} N_{v,E}} \exp\left(\frac{E_{g,E} - E_{g,B}}{k_B T}\right)$$

P.44: The last equation should be:

$$B = \frac{\tau_n}{\tau_{TR} + \tau_n}$$

P.23: In the 9th line from the top replace "Table 2.10" by "Table 2.4".

P.46: In the 11th line from the bottom replace "Tables 2.3 and 2.10" by "Tables 2.3 and 2.4".

Chapter 3

P.96: In Problem 3.7 replace "given by Equations (3.42) and (3.42)" by "given by Equations (3.41) and (3.42)"

Chapter 4

P.147: In Problem 4.5 the "barrier voltage" is the voltage in V (not eV) applied across the superlattice.

Chapter 5

P.171: On line 4 and 10 from the top, replace $F(\mathbf{q}_\perp)$ by $F_{\mathbf{q}_\perp}$.

Chapter 6

Section 6.3.4

P.183: On the 2nd line from the bottom replace $\exp\left(\frac{E_0 t}{\hbar}\right)$ by $\exp\left(-i\frac{E_0 t}{\hbar}\right)$

P.185: Replace E_{0x} by E_{1x} in the $f_1(n, E_{1x}(\pm\mathbf{q}_\perp), q_x)$ in Equations 6.15 and 6.16.

P.196: Replace k by i to get

$$S_{ji} = \left. \frac{v_i^{1/2} B_i}{v_j^{1/2} B_j} \right|_{A_{i \neq j}=0}$$

P.204 Correct Equation 6.34 by removing incorrect square root exponent and add missing L_x term in the denominator:

$$H_{AC\pm} = \frac{m^*}{2\pi\hbar^2 L_x} \frac{2\hbar\Xi^2 \ k_B T_0}{\rho v_s^2}$$

The reader is referred to Prob. 6.4 (b) for a derivation of Equation 6.34. Note that after summation over q_x with the help of Equ. 6.36 acoustic phonon scattering is easily verified to become a *quasi-elastic local* scattering process with a coupling coefficient for combined phonon emission/absorption obtained by replacing L_x by a.

P.219: Replace k by i to get

$$S_{ij} = \left. \frac{v_i^{1/2} B_i}{v_j^{1/2} B_j} \right|_{A_{i \neq j}=0}$$

Chapter 8

P.285 The hint provided in Prob. 8.2 (c) is not correct. The partial derivatives of the threshold/pinchoff voltage should be evaluated relatively to W_e. Also a corrective factor of 2 should be used so that the areal doping concentrations yield the same pinchoff voltage:

$$N_{Dp} W_p \simeq \frac{1}{2} N_D W_e$$

This result holds in the limit of narrow pulsed regions. The general solution is provided in the homework solution.

Chapter 9

P. 288 Replace $f(\mathbf{v}, \mathbf{r}, t)$ by $f(\mathbf{r}, \mathbf{v}, t)$

P. 296 inverse the ratio T_e/T_0 on the right argument of the 2nd equation to get:

$$\frac{3}{2} k_B \frac{(T_e - T_0)}{\alpha \sqrt{\frac{T_e}{T_0}}} = q\mu_n(T_0) \sqrt{\frac{T_0}{T_e}} F^2$$

P. 308 Correct the signs in the right side of the 3rd equation from the bottom to get

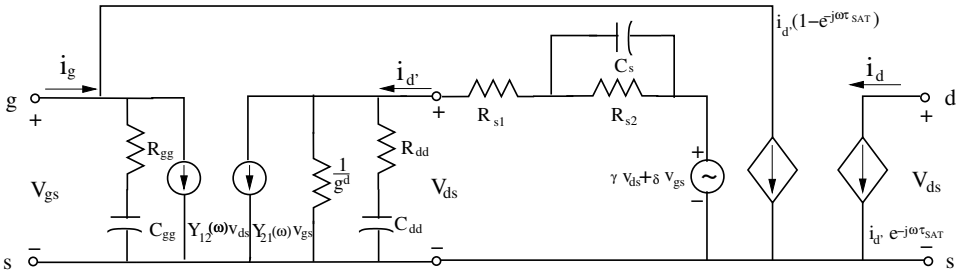
$$\frac{d}{dt}(m_1^* v_1) = qF - \frac{m_1^* v_1}{\tau_{M1}}$$

Chapter 11

P. 364 Replace $\exp(j\omega\tau_s)$ by $\exp(-j\omega\tau_s)$.

Chapter 12

P. 391 in Fig 12.1 replace i_d by $i_{d'}$ on 3 occurrences (i_d, $i_{d'}(1-e^{-j\omega\tau_{SAT}})$, and $i_{d'}e^{-j\omega\tau_{SAT}}$), (see Fig 1.1 below) to differentiate between the internal node current $i_{d'}$ and the external node current i_d:



$$Y_{12}(\omega) = \frac{j\omega C_{gd}}{1 + j\omega R_{gd} C_{gd}}$$

$$Y_{21}(\omega) = g_m + \frac{j\omega C_{dg}}{1 + j\omega R_{dg} C_{dg}}$$

Figure 1.1: Modified Fig 12.1

Chapter 18

In Problem 18.7, "abrupt-junction" should be replaced by "graded-emitter".

In the caption to Fig. 18.16, ", abrupt-junction" should be omitted.