Errata

Fundamentals of Carrier Transport, 2nd Edition

Mark Lundstrom
Cambridge University Press, 2000
ISBN 0 521 63134 3

December 8, 2004

Chapter 1:

page 10:   in the second line below eq. (1.31), change "solutions for a periodic are called…." to "solutions for a periodic potential are called…"

page 11:   in Fig. 1.4, on the horizontal axis, replace 'k_I' by "0" and place "k_I" below the tic mark to the right.

page 20:   in the last line, change "the x-z plane" to "the x-y plane".

page 21:   in the caption of Fig. 1.12, change "3π/2" to "2π/3" and in the fourth line below Fig. 1.13 make the same substitution.

page 23:   in Fig. 1.14, change $\Delta E_{C0} = 0.15$ eV to $\Delta E_{V0} = 0.15$ eV.

page 23:   in the first line of the caption for Fig. 1.15, change "Al/GaAs/GaAs/AlGaAs" to "AlGaAs/GaAs/AlGaAs".

page 24:   in the third line below eq. (1.46b), change "force of an electron" to "force on an electron."

page 26:   in the line above eq. (1.52), change "so only discrete values of k are given by" to "so only discrete values of k given by".

page 29:   in the line just above the last equation of the example, change $x = k^2$ to $x' = k'^2$.

page 37   in Fig. 1.24b, all states below the Fermi level in subband 1 should be shown as occupied, since $T = 0$K.

page 38   in eq. (1.89), replace "$\overline{h}^2$" with "$\hbar^2$".

page 44:   in the line before eq. (1.114), replace "$\delta(x)$" with "$\pi\,\delta(x)$".

page 46:   in eq. (1.125), insert a comma between "a" and "e" in the superscript.

page 46:   in the line below eq. (1.129), change "The scattered momentum…" to "The scattered <u>electron</u>…".

Chapter 2:

page 57:   to be consistent with the derivations, reverse the direction of the vector "β" in Fig. 2.2c.

page 58:   change "$E' - E$" to "$E' = E$" on line 2 of the paragraph above section 2.2.

page 58:   change "In following sections, …" to "In <u>the</u> following sections, …" on line 4 of the first paragraph of sec. 2.2.

page 60:   change "$A = q^2 / ...$" to "$A = q / ...$" in the equation on line 4 of text.

page 60:   change "Four" to "For" in the last line.

page 63:   change "i" to "$= -$" in the equation on line 5 of text.

page 67:   change "… density of state …" to "… density of <u>states</u> …" on line 5 of sec. 2.3.4.

page 67:   change "various mechanism; …" to "various mechanisms, …" on line 2 of last paragraph of sec. 2.3.4.

page 68:   change "e^{r/L_D}" to "e^{-r/L_D}" inside the integrand of eq. (2.34).

page 68:   change "N_1" to "N_I" in eqs. (2.36a), (2.36b), and (2.36c).

page 69:   change "[…]" to "[…]^2" in the denominator of the integrand in eq. (2.38). Also change "N_1" to "N_I".

page 75:   change "… must be a positive number, …" to "… must be a positive <u>real</u> number, …" on first line after eq. (2.57).

page 76:   change "… eq. (1.127)…" to "… eq. (1.126) …" on the line just above eq. (2.60).

page 77:   change "magnitude" to "amplitude" on line 3 from the bottom of the page.

page 80:   change "β'" to "$\boldsymbol{\beta}'$" to show that it is a vector, on the line just above eq. (2.78).

page 90:   change "… that carrier" to "… that carriers" on the second line of the second paragraph.

page 95:   change "expects" to "expect" on line 7.

page 96:   change "… band energy versus position versus distance" to "… band energy versus distance" on line 3 in caption of Fig. 2.20.

page 98:   change " p_z " to " p_z' " in eq. (2.123b)

page 102:   change "h" to " $\ddot{}$ " in the y tick labels of Fig. 2.22a.

page 106:   change "…)$_{E'=E}$" to "…|$_{E'=E}$" in the RHS of eq. (2.155).

page 114:   the GaAs lattice constant in line 2 of Table 2.1 should be 5.65 Angstroms.

page 117:   change "… expression for $1/\tau(p)$ terms of the …" to "… expression for $1/\tau(p)$ in terms of the …" on the first line of prob. 2.2(b).

Chapter 3:

page 120:   change "$f_0(\boldsymbol{p})$=…" to "$f_0(\boldsymbol{r}, \boldsymbol{p})$=…" in eq. (3.3).

page 120:   change "$E_{C0}(\boldsymbol{r}, t)$" to "$E_{C0}(\boldsymbol{r})$" in eq. (3.4) and in the first line after this equation.

page 122:   change "$\upsilon(\mathbf{p}$=…)" to "$\upsilon(\mathbf{p})$ =…" and "f_0(-$\mathbf{p}$=…" to "f_0(-$\mathbf{p}$) =…" in the last 2 lines of the text.

page 123:   change "$F_n(\boldsymbol{r}, p)$" to "$F_n(\boldsymbol{r}, t)$" in eq. (3.16).

page 125:   change "… = (F_n-E_{C0}/$k_B T_C$) where …" to "… = (F_n-E_{C0})/$k_B T_C$ where …" just below Table 3.1.

page 125:   change "solve f(…" to "solve for f(…" on line 13 of text.

page 127:   change "f_x", "f_y" and "f_z" to "f" in the RHS of eqs. (3.23a) and (3.23b).

page 129:   change "Carrier's" to "Carriers" in the caption of Fig. 3.4.

page 129:   in Fig. 3.4, the streamlines should not cross.

page 135:   in Fig. 3.5 "$\mathcal{E}_z$" in italics is very faint.

page 140:   change "$g(p^2)$" to "$g(p)$" in eq. (3.70).

page 140:   change "… eq. (3.59)…" to "…eq. (3.68)…" on the line just above eq. (3.71).

page 155:   change "$\langle u_z \rangle$" to "$\langle v_z \rangle$" in prob. 3.9.

page 156:   insert a "-" before the delta function in the RHS of prob. 3.14.

Chapter 4:

page 160:   change "… (4.4.)" to "…(4.4)." in the third line below eq. (4.8).

page 161:   change "where F_n the …" to "where F_n, the …" on the first line after eq. (4.12)

page 161:   change "$E_{C0}(\mathbf{p})$" to "$E_{C0}(\mathbf{r})$" in eq. (4.14).

page 162:   change "… (or $j=x,y$, or z)." to "…(or $x_j = x, y$, or z)." in eq. (4.20).

page 164:   change "f_s" to "∂f_S" in RHS of eq. (4.31).

page 166:   insert the "x" axis label in Fig. 4.1.

page 171:   insert the subscript "f" for τ in equation (4.62a) and (4.62b).

page 173:   change "J_{Qi}" to "J_{Qj}" in eq. (4.70b).

page 176:   change "The phenomena is known as…" to "The <u>phenomenon</u> is known as …" on line 3 from the bottom of the page.

page 178:   change "$\Delta J_{Qi} = 0$" to "$\Delta J_{Qi} > 0$" on line immediately below eq. (4.88b).

page 185:   change "… contacts M and P …" to "… contacts M and N …" on the second line above eq. (4.112).

page 187:   change "… contacts, a, b, c, and d." to "… contacts, a, b, and c." on line second line below eq. (4.118).

page 193:   in the first row of Table 4.2, below the heading "Electrons", change "1.19 X 10^6 cm^{2}K^2/Vs" to "1.19 X 10^8 cm^{2}K^2/Vs".

page 208:   insert the subscript "f" for τ in prob. 4.8.

Chapter 5:

page 214:   insert "*f*" right after the summation symbol in RHS of eq. (5.8).

page 217:   change "$<< \tau_E >>$" to "$<< 1/\tau_E >>$" on the third line below eq. (5.17).

page 219:   change "$1\tau_m(p)$" to "$1/\tau_m(p)$" on line 4 of text.

page 222:   change "$G\ldots=\ldots=(-q)\boldsymbol{\mathcal{E}} \bullet \boldsymbol{v}_d =$" to "$G\ldots=\ldots=(-q)n\boldsymbol{\mathcal{E}} \bullet \boldsymbol{v}_d =\ldots$" in eq. (5.35).

page 224:   change "$W_{ii} = \Sigma\ldots = \ldots$" to "$W_{ii} = 1/2 \; \Sigma=\ldots$" in eq. (5.42).

page 228:   change "(5.56) and (5.27b)" to "(5.56) into (5.27b)" in the third line after eq. (5.57).

page 241:   change "eq. (4.141b)" to "eq. (4.141b)**.**" on the line immediately above Summary.

page 244:   change "dt" to "$\partial t =$" in the denominators on LHS of eqs. (P5.4) and (P5.5).

page 244:   change "*IEEE … Electronic …*" to "*IEEE … Electron…*" in prob. 5.7. Similar change needs to be made in several other places.

page 244:   change "E_l" to "E_i" in the numerator of third term in the RHS of eq. (P5.4)

Chapter 6:

page 255:   change "… with $E(p) = 0.5$eV…" to "… with $E(p) = 0.15$eV" on line 10 of the text.

page 255:   show a scattering event, "X", at $t = t_2$ in Fig. 6.6a.

page 274:   change "… the time, $TJ_L(p_i)AT\ldots$" to "… the time $T, J_L(p_i)AT\ldots$" on the second line below eq. (6.41).

Chapter 7:

page 283:   remove "*q*" from the last term in eq. (7.1).

page 288:   square root should be only on the numerator in the RHS of eq. (7.12).

page 292:   change "dominants" to "dominates" on the last line of the paragraph below the shaded example box.

page 303:   change "eq. (7.36)" to "eq. (7.34)" on the first line of page.

page 307:   in the caption of Fig. 7.15, change "*Physics Review*" to "*Physical Review*" in line 2 and "American Institute of Physics" to "American Physical Society" in line 3.

page 309:   change the line properties for doping 10^{15} and 10^{17} in Fig. 7.17(b) so that they can be distinguished.

Chapter 8:

page 324:   change "*Journal of Applied Physics*" to "*Applied Physics Letters*" in line 4 from the bottom of the text.

page 327:   change "fund" to "find" on line 3 from bottom of text.

page 335:   in the fifth line below the figure, change "the average electron is still low" to "the average electron <u>energy</u> is still low".

page 340:   change the dashed part of the line for $<n>$ in Fig. 8.13 (c) to solid.

page 344:   change "can not" to "cannot" in line 7 of the text.

page 348:   change μ_p to μ_n in eq. (8.42a) and D_n to D_p in eq. (8.42b).

page 354:   in the last line, change "eq. (8.34b)" to "eq. (8.43b)"

Chapter 9:

page 390:   change "…= $te^{ik_z z}$ " to "…=$te^{ik_2 z}$ " in eq. (9.78b).