Errata
for

Nuclear Reactor Analysis

A. F. Henry
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ERRATA – Nuclear Reactor Analysis 10/1/91

Page	32	line 11 from bottom; full → fuel
	79	Eq. (3.3.28): add ν
	92	space → spaced: Heading, 3rd paragraph
	105	$n^j(\underline{r},E) \rightarrow n^j(\underline{r})$
	103	(3.3.27) → (3,3.21); (line 1 <u>and</u> line 4)
	✓133	extra bracket] in Eq. (4.7.13)
	✓145	"mean paths" → mean free paths; line 2 from bottom
	315 ✓	it it → it is; line 12 from top
	364✓	$\Sigma_s'(E'\rightarrow E,\mu) \rightarrow \Sigma_s(E'\rightarrow E,\mu_o)$; line 3 from top
	470✓	eq. (11.2.26); k → K

p. 137 cylinder equation

$\frac{\pi}{L_z} \rightarrow \frac{\pi z}{L_z}$

p. 30

4.30 R(r) should be outside bracket

Gloria Kooh

9/88

Errata - Nuclear Reactor Analysis, by Allan F. Henry

page 3 Last word: atomic mass

page 5 3rd paragraph; line 8: two billion → six billion

page 7 5th line: α particle — occasionally an electron → α particle, or an electron

page 8 The paragraph beginning "Now, even in..." change both 10^{-12}'s to 10^{-13}'s.

page 8 The paragraph beginning "If we were..."; change ellipse to ellipsoid.

page 9 Paragraph beginning "Neutrons ..." 9th line: $14 → $35
11th line: an electron → two electrons

page 11 First sentence after Eq(1.4.1) "The curve (1.4.1) etc." "An approximation to the curve (1.4.1) etc."

page 27 8 lines from bottom ∿ 100Kev →∿ 100 ev.

page 30 1st line: the the → the

page 37 References: Physics of Nuclear Kinetics is by G.R. Keepin (not Keeping).

page 41 Paragraph beginning "Finally ..." 3rd line: remove words "of direction"

Page 44 Eq(2.3.6), denominator: $N(\underline{r},\underline{\Omega},E)|_{\alpha=0}$ $N(\underline{r},\underline{\Omega},E)|_{x=0}$

Page 47 Equation (2.4.6): The integral should contain $d\varphi(\sin\theta)/4\pi$

page 48 Equa. 2.4.10 $\sigma_i^j(E\to E'),\underline{\Omega}\cdot\underline{\Omega}') \to \sigma_i^j(E\to E', \underline{\Omega}\cdot\underline{\Omega}')$

Page 51 The paragraph, in the middle of the page, beginning "Since E, E^1, and μ_o are all measured ...." is incorrect. Disregard it.

Also, the paragraph immediately following the above is arranged improperly. It should read:

"Rate at which neutrons in dV are scattered elastically from the beam dΩdE into the conical shell $d\mu_o/2$

$$= \sum_j \Sigma_s^j(E) f_s^j(E,\mu_o) \frac{d\mu_o}{2} v(E) N(\vec{r},\vec{\Omega},E)\, dV\, d\Omega\, dE$$

and the rate at which neutrons are scattered elastically from the beam dΩdE into the energy range dE'

$$= \sum_j \Sigma_s^j(E) f_s^j(E \rightarrow E')\, dE'\, v(E) N(\vec{r},\vec{\Omega},E)\, dV\, d\Omega\, dE."$$

Page 54 Paragraph after Eq(2.5.8), third line: $\cos\phi \rightarrow \cos\theta$

page 55 1st paragraph: Equation 2.5.4 → Equation 2.5.14

Page 56 Delete 1st 3 lines beginning "It should also be noted ..."

page 61 2 lines above (2.6.1): At point r → containing point r

page 62 Equa. 2.6.5: $f_s^j(E,\mu_o)] \rightarrow f_s^j(E,\mu_o)$

Page 64 Problem 2: N is known to be 10^4 neutrons per cm^3 ...

Page 65 Problem 6: The first equation should contain μ_c instead of μ

Page 65 Problem 14 b & c: neutrons/cm^2 ... (not neutrons/cc ...)

Page 66 The word "is" is missing from a sentence in the last paragraph. "The reason for this is that, ..."

Page 73 Statement 2: "All the elements...real and positive." "All the elements...real and have the same sign."

Page 83 Top of page: "... the function has a small value ($\lesssim$ 1.75 MeV). Similarly, the unit "MeV" is missing on the value 0.5 at the end of the first paragraph.

Page 87 Top of page: the division 6.67/6.697 yields 0.996. Hence only about 0.4 percent of the neutrons .... Similarly, the value on the fourth line is 0.4%, and not 4%.

Page 88 Equation (3.4.20): The second integral should contain α_k in the denominator (not α_j).

Page 91 The word "arbitrary" at the end of the first paragraph has been misspelled.

Page 103 First line: (3.3.27) → (3.3.21)

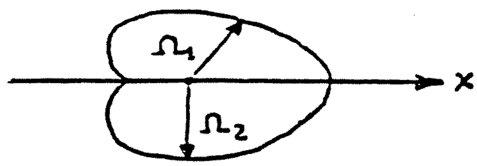
Page 108 The integral at the top of the page is missing a "ν" between dE and Σ_f

Page 110 The integral in the denominator of Eq (3.5.12) should be $\int_{fuel}$, (not $\int_{cell}$). The argument is also slightly wrong here.

Page 118 Line above Eq. (4.2.7): $\underline{J}(\underline{r},E)\cdot i \rightarrow \underline{J}(\underline{r},E)\cdot i\, dE$

Page 122 Last paragraph should read "if $N(\vec{r},\vec{\Omega},E)$ is not to" and not "otherwise $N(r,\Omega,E)$ will " and "$V_z(\vec{r},E)$ should never", and not "can" never.

Page 122 Fig. (4.4b): drawing should look like this:



Page 127 4th and 3rd lines from bottom should read "...for five or more arbitrary directions of reentry generally yields..."

Page 132 The gradient of Eq. (4.7.7) has been improperly taken--terms and constants are missing (very top of page).

Page 133 ℓ.2 (3.2.4) → (3.2.5)

Page 133 Omit the small bracket in Eq. (4.7.13) between the large bracket and ψ_g,

Page 137 Table 4.1: The bottom term under $R(\vec{r})$ should contain the factor $\sin(\frac{\pi z}{L_z})$ (the "z" is missing).

Page 138 Second line of 2nd paragraph should read: "by (4.7.20) is less than about 5 percent, <u>and</u> <u>therefore</u> the accuracy ..."

Page 148 11th line should begin " $\vec{J}(r,E)$ and $\vec{n}\cdot D\nabla\Phi(r,E)$ be ..." (add capital "D").

page 154 The line after Eq. (4.10.22) should end "$C_5 \sinh C_6 \equiv + C_4$ and $C_5 \cosh C_6 \equiv - C_3$

Page 156 Equation (4.10.30) should read, $\frac{1}{\lambda}\nu\Sigma_f^k X(x)$. (add "$\nu$")

Page 160 Equation (4.10.51) should read:

$$\bar{P} = \frac{1}{(3\times10^{10})\pi R_2^2 L_z} \int_0^\infty dE \int_0^{R_2} (2\pi r)\, dr \int_0^{L_z} dz \sum_f (r,z,E)\, \Phi(r,z,E)$$
$$= \frac{(2\pi)}{(3\times10^{10})\pi R_2^2 L_z} \int_0^{L_z} dz \left[\int_0^{R_1} (r) \Sigma_f^{(1)} \Phi(r,z)\, dr + \int_{R_1}^{R_2} (r) \Sigma_f^{(2)} \Phi(r,z)\, dr\right]$$

(corrections circled).

Page 164 Change definitions of v_1 and v_2 to

$$\frac{1}{v_1} = \frac{\int_{E_c}^\infty \frac{\phi_1(\underline{r}E)}{v(E)}\, dE}{\int_{E_c}^\infty \phi(\underline{r}E)\, dE} \quad ; \quad \frac{1}{v_2} = \frac{\int_0^{E_c} \frac{\phi_2(\underline{r}E)}{v(E)}\, dE}{\int_0^{E_c} \phi_2(\underline{r}E)\, dE}$$

Page 164 Also Eq. 4.11.4, last line: $\nu\Sigma_f(E') \to \nu\Sigma_f^k(E')$

Page 165 Eq. 4.11.6, 1st line: $D(E) \to D^k(E)$

Page 167 Eq. (4.11.11) last line $\rightarrow$

$$\int_{x_{i-\frac{1}{2}}}^{x_{i+\frac{1}{2}}} dx \int_{y_{j-\frac{1}{2}}}^{y_{j+\frac{1}{2}}} dy \text{ [etc]}$$

Page 170 line after Eq 4.11.15: $z = Z_1 \rightarrow z = \pm Z_1$

Page 170 Eq 4.11.17, 2nd line: $X_1 \to X_1(x)$

Page 174 5th line of text: $C_2 \to C_2^{(1)}$

Page 177 7th line from bottom: $P_{L_1}f \to P_{L_2}f$

Page 178 Eq 4.12.16, multiply by $\Sigma_{a_2}^{fuel}$

Page 178 line after Eq 4.12.18: $L_2^2 \to L_2$

Page 180 Eq 4.12.27: the (2.3) element $s_2D_1^{(2)}\kappa_2X_2 \to s_2D_1^{(2)}\kappa_2$

Page 181 2nd line: impossible → unlikely

Page 182 3rd paragraph, line 6: (4.7.23) $\longrightarrow$ (4.7.22)

Page 190 Eq 4.13.2: $\psi^k(E) \to \psi_g^k(E)$ and line 4: $E_2 - E_1 \to E_1 - E_2$

Page 191 Eq 4.13.5, 2d line: $\psi_g^k(\underline{r},E') \to \psi_{g'}^k(E')$

Page 191 Eq 4.13.6, last line: $\int_{\Delta E_{g'}} dE \to \int_{\Delta E_g} dE$

Page 191 Eq 4.13.7: $\chi^j \nu^j \Sigma_{fg}^{jk}(\underline{r}) \to \chi_g^j \nu^j \Sigma_{fg'}^{jk}(\underline{r})$

Page 196 Problem 16: replace $\sigma_s = 8b$, $\sigma_f = 4b$, $\sigma_a = 3.85b$ by
by $\sigma_s = 4b$, $\sigma_f = 1.2b$, $\sigma_\gamma = 0.5b$

Page 202 Eq 5.2.3: $\approx \to \sim$; $k = 8.6 \times 10^{-5}$ ev/^{o}K

page 203 Equa. 5.2.5: $\sigma_a(E,T) \to \sigma_c(E,T)$
$\left[\frac{E_o}{E} \cdots\right] \to \left[\frac{1}{E} \cdots\right]$; $\int_o^\infty dE_r \frac{\Gamma^2(\ )}{\cdots}$
$\to \int_o^\infty dE_r \sqrt{\frac{E_r}{\cdots}} \frac{\Gamma^2(\ )}{.}$

Page 205 Eq 5.2.13: $\exp(\frac{1}{4}\xi^2(x - y)^2) \to \exp -(\frac{1}{4}\xi^2(x - y)^2)$

Page 212 Eq 5.4.12: denominator 1st term $\sum_{g'=g+1}^{G} (\Sigma_{gg} + \Sigma_{ag})\Phi_g \to$

$$\left(\sum_{g'=g+1}^{G} \Sigma_{g'g} + \Sigma_{ag}\right) \Phi_g$$

Page 213 last line: notation → notion

page 216 5th line: (5.4.21) → ... (5.4.22)

Page 217 1st line: that → than

Page 218 2nd paragraph: $\Gamma_p >> E_i(1 - 1/\alpha_{res}) \to \Gamma_p >> E_i(1/\alpha_{res} - 1)$

Page 221 Eq 5.5.4: $\overline{\Sigma}_{gg'} \equiv \int \ldots \Sigma_s(\underline{r},E' \to E)\Phi(\underline{r},E')$

Page 222 Eq 5.5.8 numerator $\bar{\phi}^{(f)} \rightarrow \bar{\phi}^{(f)}(E)$

Page 222 Immediately after Eq 5.5.7: (5.5.1) → (5.5.6)

Page 223 Eq 5.5.9: $\Sigma_{t(f)}(E)\bar{\Phi}(\underline{r},E) \rightarrow \Sigma_{t(f)}(E)\Phi(\underline{r},E)$

In integrand $\Phi(\underline{r},E) \rightarrow \Phi(\underline{r},E')$

Page 224 Eq 5.5.13: $\Phi(\underline{r},E)H^{(m)} \rightarrow \Phi(\underline{r},E')H^{(m)}$ dE

Page 225 Paragraph after Eq (5.5.17), 2nd line: "neutrons scattered into the energy interval of E within..." → "neutrons appearing with energy E within..."

Page 227 Eq 5.5.21, 2nd line: $\Sigma_{s(f)} \rightarrow \Sigma^{j}_{s(f)}$;

4th line from bottom of page: $\bar{\Phi}(\underline{r},E) \rightarrow \Phi(\underline{r},E)$;

last paragraph, title: <u>Probabilities</u> → <u>Densities</u>

Page 229 Eq 5.5.26: $\Sigma^{res}_{s(f)} \rightarrow \Sigma^{res}_{s(f)}(E)$

page 231 3rd paragraph: "interval about dE" → "interval about E"

Page 234 Eq 5.6.9, 1st line of Eq: $dV^{(1)}_{m} \rightarrow dV^{(i)}_{m}$;

2nd line of Eq: $dV^{(i)}_{f} \rightarrow dV^{(1)}_{f}$

page 235 2nd line after Equa. (5.6.12): "spatially flat within ... " → "spatially flat and isotropic within ..."

Page 240 line 8: $\underline{n}_i \cdot \underline{\Omega} S\ dE dA(1-G^{(1)}_{f})/\Sigma_{t(f)}(E) \rightarrow$

$\underline{n}_i \cdot \underline{\Omega} S\ dE dA d\Omega(1-G^{(1)}_{f})/\Sigma_{t(f)}(E)$

Page 243 Eq 5.6.36: $P_m(E) \rightarrow P^{o}_{m}(E)$; last line: $P_m(E) \rightarrow P^{o}_{m}(E)$

Page 244 Eq 5.6.37: $P_m(E) \rightarrow P^{o}_{m}(E)$

page 244 2nd line from bottom: "... appearing in dE ..." → : ... appearing at E ..."

Page 245 Point (3), 1st line "...dE is flat within the fuel rod and flat within..." → "...dE is flat and isotropic within the fuel rod and within..."

Page 247 $E_c - E_1 \rightarrow E_c + E_1$; 2 lines after Eq 5.7.1: of a U^{28} atoms → of U^{28} atoms

Page 250 Eq 5.7.16: rhs $\bar{\sigma}_a^{28}(E) \rightarrow \sigma_a^{28}(E)$

Page 251 Eq 5.7.20 denominator: $[\ldots]\Sigma_{t(m)} \rightarrow \Sigma_{t(m)}(E)$

Page 251 4th line from bottom: $P_f(E) \rightarrow P_f^o(E)$

Page 255 Problem 4c: exprected → expected

Page 263 Fig. 6.2 β^- 1.2m; 6.7h missing $Pa^{234} \rightarrow U^{234}$

Page 265 Eq 6.2.6, 4th Eq: $\sigma_\alpha^{28} \rightarrow \sigma_a^{28}$

Page 266 Paragraph beginning "For the highly enriched...": 3rd line: 4.7 → 1.2; 10th line: 14 → 13; 11th line 4.7 → 1.2; 12th line: "...conversion leads to an increase of 0.65 percent in the U^{25}..." → "...conversion is equivalent to an increase of 0.17 percent in the initial U^{25}..."

Page 266 Next paragraph, line 2: 2.3 → 6.05; 5th line 0.015 x 0.023 = 0.000345 → 0.015 x 0.0605 = 0.00091

Page 268 Paragraph (beginning "Not only ...") 3rd line: $\exp(-\sigma_a^{24}\phi_1 t) \rightarrow \exp(-\sigma_a^{24}\phi_1 \Delta t)$; last line: 0.0000092 → 0.0000088

Page 269 Eq 6.2.14, 6.2.15: all σ_a^{28}'s → σ_γ^{28}

Page 269 Eq 6.2.13, 2nd equation $\sigma_\gamma \rightarrow \sigma_\gamma^{28}$

page 271 paragraph beginning "The simplest ... ": last word: $\sigma_a^f \rightarrow \sigma_a^{ff}$

Page 273 Eq 6.3.6, 1st line, last term: $\exp(\sigma_{a1}^{Sm}\phi_1 t) \rightarrow \exp -(\sigma_{a1}^{Sm}\phi_1 t)$

Page 274 Eq 6.3.9: denominator $\sigma_{a1} \rightarrow \sigma_{a1}^{Sm}$

page 274 2 lines after Equa. (6.3.9): 13 years → 32 years

Page 275 Last paragraph: 3rd line: aborption → absorption

page 276 2 lines after Equa. (6.3.11): samaraium → samarium

Page 277 Last paragraph, 1st line: 10 neutrons → 10^8 neutrons

Page 279 Line 6, They → Then

Page 286 Paragraph beginning "Since only..." 1st line: "...emitted in fission..." → "...emitted in thermal fission..."

Page 293 Problem 3, last line: cross sections given → cross sections and other assumptions given ...

Page 293 Problem 5: add $n^{24}(\tau)$ to both $\int$'s on l.h.s.; 2nd eq, last term: $n^4(t_{n+1}) \rightarrow n^{24}(t_{n+1})$

page 294 Problem 10a, Equa. beginning J_2 ... ; $+ \nu\Sigma_{f2} \rightarrow - \nu\Sigma_{f2}$

Page 294 Problem 10a: last line: $\overline{\Phi} = \frac{1}{2}(\Phi_1 + \Phi_2)$

Page 297 Eqs 7.2.2, 7.2.3: $\int_0^\infty (\ldots) dE$ (dE's missing)

Page 298 Eq 7.2.4: $c_i(\underline{r},E) \rightarrow c_i(\underline{r},t)$; Eq 7.2.5: $\chi_p^j \rightarrow \chi_p^j(E)$

Page 299 Eq 7.2.7: $\frac{d}{dt} \rightarrow \frac{\partial}{\partial t}$

Page 310 Eq 7.5.12 exp (-0.068t) → exp (-0.0695t)

Page 310 Eq 7.5.12: 0.0113 → -.113

Page 312 6th line from bottom: 1.5 millisecond → 15 millisecond

page 313 1st line: 1.5 millisecond → 15 millisecond

Page 318 Eq 7.6.4: Denominator: $\chi F(\delta S) \rightarrow \chi F_o(\delta S)$

Page 323 1st paragraph, 2nd line: → If we add at some point $\underline{r}$ a sample η ... 10^6 - all having energy E and an isotropic ... etc.

Page 324 7 lines from bottom: Equation (7.6.16) → Equation (7.6.17)

Page 325 1st line of paragraph below Eq 7.6.21: solution of (7.6.17) → solution of (7.6.18)

Page 326 Second paragraph → "When the reactivities...and $\delta(\chi F)$ are desired,..."

Page 327 Eq 7.7.2, 2nd line $S_{g'}(\underline{r})$'s → $S_{og'}(\underline{r})$'s

Page 327 Eq 7.7.1, Numerator: $-\sum_{g'=1}^{G}[\,] \rightarrow +\sum_{g'=1}^{G}[\,]$;

$\nabla\Phi_g^*(\underline{r}) \rightarrow \nabla\Phi_{og}^*(\underline{r})$; $\delta\Sigma_{tgg'}(\underline{r},t) \rightarrow \delta\Sigma_{sgg'}(\underline{r},t)$

Page 330 Problem 4: Assume $a_1(t)$ and $a_2(t)$ are known

page 331 Problem 7: $C_i(T) \rightarrow C_i(t)$

Page 333 Paragraph 4, line 3: deriving → derive

Page 336 line 14: contaning → containing

page 339 last 3 lines → "all having energies E and being introduced isotropically at point $\underline{r}$ in a critical ... "

Page 340 line 6: ...having energies E, directions of travel $\underline{\Omega}$ and all introduced into the reactor at point $\underline{r}$. These neutrons ...

Page 355 last line: ... if any orthogonal polynomials ...

Page 356 last line Eq 8.4.13: $\Psi_m(E') \rightarrow \Psi_m(z,E')$

Page 357 Figure 8.3: ϕ' measured in wrong sense

Page 357 Eq 8.4.15: $\Psi_m(E') \rightarrow \Psi_m(z,E')$; $\Sigma_{sn}(E'\rightarrow E) \rightarrow \Sigma_{sn}(z,E'\rightarrow E)$;

$\sum_{n=0}^{\infty}[\ ]$ - add brackets line 4 ; $\psi_n(E) \rightarrow \psi_n(zE')$

Page 358 2nd line after 8.4.16: $N \rightarrow N+1$

Page 359 Sentence beginning on 2nd line should be "For slab geometry this procedure...etc."

Page 361 line 1: (usually complex) → either real or pure imaginary

line 21: $\int d\Omega F_{\underline{+}B_m}(\underline{\Omega},E) \rightarrow \int d\Omega F_{\underline{+}L}(\underline{\Omega},E)$

line 25: $\exp(+Z/L) \rightarrow \exp(+z/L)$

Page 362 4th line from bottom: $Y_r^p(\underline{\Omega}) \rightarrow \overline{Y}_r^p(\underline{\Omega})$

Page 363 1st line after 8.4.23: all $l > L$ → all F_l with $l > L$

Page 364 1st line after 8.4.24: $\Sigma_s'(E' \rightarrow E,\mu) \rightarrow \Sigma_s(E' \rightarrow E,\mu)$

Page 365 Eq 8.4.27, 2nd line: $\Sigma_t(E')F_{o(\underline{B})}(E) \rightarrow \Sigma_t(E')F_{o(\underline{B})}(E')$

Page 366 Eq 8.4.33, 2nd line: $d\phi \rightarrow d\phi/2\pi$

page 368 Equa. 8.4.35: $\Sigma_f^j(\underline{\Omega},E')\psi_o^o(\underline{r},E) \rightarrow \Sigma_f^j(\underline{r},E')\psi_o^o(\underline{r},E')$

Page 368 Eq. 8.4.36: 1st term: $(n + 3) \rightarrow (2n + 3)$

Page 370 Eq 8.4.38, 2nd line: $\ldots + \Sigma_{so}(x,y,E'\rightarrow E) \sum_{d'=1}^{4} \frac{1}{4}\Psi(x,y,\underline{\Omega}_{d'},E')\Big]$

$\rightarrow \ldots + \Sigma_{so}(x,y,E'\rightarrow E)\Big] \sum_{d'=1}^{4} \frac{1}{4}\Psi(x,y,\Omega_{d'},E')$

Page 373 line 4: $\alpha E - E$ should be $\alpha E \rightarrow E$

Paragraph 3, line 6: for small Δx becomes $\Sigma_t \Delta x \exp(-\Sigma_t \Delta x) \rightarrow$ for small Δx becomes $\Sigma_t \Delta x \exp(-\Sigma_t x)$

Page 375 2nd paragraph, line 5: tables of ρ versus x → tables of F versus x ;

2nd paragraph, line 6: number ρ is found → number F is found

Page 377 Eq 8.4.49, 2nd line → $<\xi^2>$ being an expected value defined by $<\xi^2>=$ etc.

page 377 2nd paragraph from bottom; last line: "error is $\pm \epsilon$ →" "error is $< |\epsilon|$"

page 382 3rd line: for $0 \leq \mu < 1 \rightarrow$ for $0 < \mu \leq 1$

Page 382 Prob. 10: $\langle \psi_n^{(\lambda)*} | L^{-1} | Q \rangle \rightarrow \langle \psi^{(\lambda)*} | Q \rangle$

Page 383 Prob. 17.a. 2nd line: delete period and add "and $\bar{\Sigma}_{sn} = 0$, $n > 1$."

Page 384 Prob. 19 lines 2 and 3 should have $x = 0$ to $x = x_1$ and ... extends from x_1 to ∞ .

Page 384 Problem 21: Hint: Problem 7 → Problem 11

page 386 last paragraph; line 4: from → form

Page 387 $\Sigma_f^j(E')$ in 1st of Eq 9.2.1 and $\Psi_1(E')$ in 2nd → $\Sigma_f^j(z,E')$ and $\Psi_1(z,E')$

Page 387 Eq 9.2.6: $\frac{\partial}{\partial z}\left[\tilde{D}\frac{\partial}{\partial z}\Phi(z,E)\right] \rightarrow -\frac{\partial}{\partial z}\left[\tilde{D}\frac{\partial}{\partial z}\Phi(z,E)\right]$

Page 389 Paragraph 9.3, 4th line: $\Sigma_s(z,E' \rightarrow E) \rightarrow \Sigma_s(z,\mu_0,E' \rightarrow E)$

Page 395 Eq 9.3.23: $J(\underline{r},E) \rightarrow \underline{J}(\underline{r},E)$

Page 395 Eq 9.3.24: $-\Sigma_t(\underline{r},E)\phi(\underline{r},E) \rightarrow +\Sigma_t(\underline{r},E)\phi(\underline{r},E)$

Page 395 last line: (9.3.23) → (9.3.24); (9.3.26) → (9.3.27)

Page 396 Last of Eq 9.4.3: $A_{1gg',u} \rightarrow A_{1gg',u}(\underline{r})$; $\Sigma_t(\underline{r},E) \rightarrow \Sigma_t(\underline{r},E')$

Page 397 last line in paragraph after (9.4.8): positive → non-negative

Page 397 Eq 9.4.9: $\frac{\partial}{\partial u}\Phi_{g'}(u) \rightarrow \frac{\partial}{\partial u}\Phi_{g'}(r)$

Page 401 Lines 5 and 6: $= 0 \rightarrow = 0$ or ∞

Page 403 Last paragraph, 3rd line should be "...can be approximated by integrals over ΔE_g and $\Delta E_{g'}$ of unnormalized pieces..."

Page 403 Eq 9.4.25: Remove ΔE_n

Page 403 Eq 9.4.26: Remove ΔE_n

Page 403 Eq 9.4.28: Remove ΔE_n

Page 404 Eq 9.4.29: $-\nabla \cdot D_g \nabla \Phi \rightarrow -\nabla \cdot D_g(\underline{r}) \Phi_g(\underline{r})$

Page 405 last line: $[\tilde{D}] \rightarrow [\tilde{D}_u]$

Page 406 Paragraph 4, line 2: $\delta(E' \rightarrow E) \rightarrow \delta(E'-E)$

page 412 Item (3); 1st line: "is taken as $\Sigma_{s1}, \delta(E' - E)$" → "is taken as $\Sigma_{s1}(E')\delta(E' - E)$"

Page 424 Problem 3, part c: $\delta\left(\mu \pm \frac{\pi}{4}\right) \rightarrow \delta\left(\mu \pm \cos\frac{\pi}{4}\right)$

Page 425 Problem 12: r.h.s. of expression for $q_1(u)$ should be negative $\left(-\sum_{n=0}^{\infty}\right)$

last equation: $\Psi_1 \rightarrow F_1$

page 432 2nd line: "between vectors" → "betweem column vectors"

page 435 Equa. 10.3.10; 3rd line; (1,1) element of the matrix: $\frac{1}{4!}\kappa^2\Delta^4 \rightarrow \frac{1}{4!}\kappa^4\Delta^4$

Page 437 Eq (10.3.23):

$$\Omega \equiv \begin{bmatrix} \omega_1 & 0 \\ 0 & \omega_2 \end{bmatrix}$$

Page 440 Eq 10.3.33: $\int_{=1}^{1} \rightarrow \int_{-1}^{1}$

page 441 Equa. (10.3.38) r.h.s. →

$$\int_0^{2\pi}\frac{d\phi'}{2\pi}\int_{-1}^{1}\frac{d\mu'}{2}\int_0^{\infty} dE'\Sigma_s(E',\mu_o) \text{ etc}$$

$$= \int_0^{2\pi}\frac{d\phi'}{2\pi}\int_{-1}^{1}\frac{d\mu'}{2}\,\Sigma_s(E,\mu_o)\,\psi(x_1,\mu',E)$$

Page 443 Line 1: one-speed → one-group

page 447 2nd paragraph from bottom; 4th line: naterial → material

Page 448 In the $\int$'s: $y_i \rightarrow y_j$

Page 452 Last line of text: (10.3.18) → (10.3.13) page 461 Equa. 11.2.4; 2nd line from bottom: $[V_1(E')J_1(z) + V_2(E')J_2(z)] \rightarrow [V_1(E)J_1(z) + V_2(E)J_2(z)]$

Page 462 Eq 11.2.10:... $\frac{d}{dz}\begin{bmatrix}\Phi_1(z)\\ \Phi_2(z)\end{bmatrix} + [A(z)]\begin{bmatrix}\Phi_1(z)\\ \Phi_2(z)\end{bmatrix}$ ...

Page 464 Line 18: $U_1(E), U_2(E) \rightarrow V_1(E), V_2(E)$

Page 467 Eq 11.2.17, first line: $-\Sigma_1\Psi_2^1T_1^1 \rightarrow -\Sigma_1\Psi_1^1T_1^1$

Page 470 Eq 11.2.26: ... $\frac{1}{\lambda}\int [W_j][M]$... etc.

Page 473

$$\Psi_{l,m,n}(x,y,z) = \sin\frac{l\pi x}{L_x}\sin\frac{m\pi y}{L_y}\sin\frac{n\pi z}{L_z}$$

Page 474 Eq 11.3.4, last line: denominator is $\int \nu\Sigma_f(\Phi_0 + \delta\Phi)^2 dV$

Page 475 Eq 11.3.9: $\Sigma_a \rightarrow \Sigma$

Page 476 Eq 11.3.10, numerator: $\int[D\nabla\Phi\cdot\nabla\Phi + \Sigma\Phi^2]dV$

Page 476 #5. should read: "The function Φ that makes $F(\Phi)$ stationary and takes on a minimum value with respect to first-order variation in $F(\Phi)$ is..."

Page 477 Eq 11.3.13, 2nd line:

$$+\Sigma(x)\cos\frac{\pi x}{2l}\sin\frac{\pi x}{l} \rightarrow -\Sigma(x)\cos\frac{\pi x}{2l}\sin\frac{\pi x}{l}$$

Page 479 Eq 11.3.15: $=\{[\int\ldots \rightarrow \{\int\ldots$

Page 480 Eq between 11.3.16 and 11.3.17 should be:

$$\left\{1 - \frac{\int[\delta U^*]^T[\chi\nu\Sigma_f{}^T][U]d\underline{r} + \int[U^*]^T[\chi\nu\Sigma_f{}^T][\delta U]d\underline{r}}{\int[U^*]^T[\chi\nu\Sigma_f{}^T][U]d\underline{r}}\right\}$$

Page 481 Eq 11.3.18, last line: $[\delta U]^T\,\nabla\cdot[\underline{V}^*] - \nabla\cdot([\underline{V}^*]^T[\delta U]) + \ldots$

Page 483	Eq 11.3.23, middle line: $x_N - \frac{h_{N-1}}{2} < x \leq x_N$
Page 488	Eq 11.4.5, 1st term, 2nd line: $\frac{d}{dx} \rightarrow \frac{\partial}{\partial x}$
Page 489	Last paragraph, 1st line [A] → [$\mathfrak{a}$]
Page 493	Eq 11.4.15: $\sum_{n=1}^{N-1} \rightarrow \sum_{n=0}^{N-1}$
Page 494	Eq 11.4.17, 3rd line: $\sum_{k=1}^{K} \rightarrow \sum_{k=1}^{K} \sum_{n=1}^{N-1}$
Page 495	Eq 11.4.18: dz's missing from all integrals over Z-ranges
Page 502	Eq 11.5.7: $\nabla[\delta U^*] \rightarrow \nabla[\delta U^*]^T$
Page 507	Eq 11.5.20: 1st line $h_k[D_{k-1}]^{-1} \rightarrow h_{k-1}[D_{k-1}]^{-1}$
Page 510	First term of equation: $u_j^0(y) \rightarrow u_j^{1+}(y)$; also $\left(\frac{x-x_{k-1}}{h_{k-1}^{(x)}}\right) \rightarrow \left(\frac{x-x_{k-1}}{h_{k-1}^{(x)}}\right)^2$
Page 510	Last term of Eq: $-\left(\frac{y_{j+1} - y}{h_j^{(y)}}\right) \rightarrow -\left(\frac{y_{j+1} - y}{h_j^{(y)}}\right)^3$
Page 514	7 lines from bottom: $T_i(x,y) = 0 \rightarrow T_i(x,y) \neq 0$
Page 516	4th text line from bottom: points 15, 16, 13 → points 15, 16, 18
Page 521	Eq 11.6.1: r.h.s. $\int_{V_n} [\bar{\Phi}(\underline{r})]dV \rightarrow \int_{V_n} [\Phi(\underline{r})]dV$
Page 525	Eq 11.6.4, last term, denominator: $h_i \rightarrow h_i^{(x)}$
Page 528	2nd line, paragraph after Eq. 11.6.15: group-g → group-g'
Page 535	Line 6: $y_j - y_{j+1} \rightarrow y_j \rightarrow y_{j+1}$
Page 536	4th line from bottom: $[J_i^{\pm}(y)] \rightarrow [J_j^{\pm}(y)]$
Page 544	Maxwellian distribution 302 → 202