

# Errata Pages for Introduction to Perturbation Methods by Mark H. Holmes

## Preface

pg (vii), 3d line from bottom: replace 3.2.1(d) with 3.4.1(d)

page (viii), 16th line from top: replace "principle objective" with "principal objective"

pg (ix), last 2 sentences of first paragraph: replace "Solutions to some of ... reach the author at holmes@rpi.edu." with "Solutions to some of the exercises are available from the author's home page located at <http://www.math.rpi.edu/~holmes>. Also located there is an errata list. Those who may want to make a contribution to one of these files, or have suggestions about the text, can reach the author at holmes@rpi.edu."

## Chapter 1

pg 13 (first line): replace 1964 with 1972

pg 17, third line: replace  $2a_1b_1$  with  $a_1b_1$

pg 19, 11th line from bottom of page: replace  $x_1 = 1$  with  $x_1 = -1$

pg 19, 7th line from bottom of page: replace  $x \sim \pm 1 +$  with  $x \sim \pm 1 -$

pg 21, last line: replace "some" with "a"

pg 29, 6th line from bottom: replace "Deybe" with "Debye"

pg 43, last line: remove comma following "3"

## Chapter 2

pg 55, end of the expression in (2.17): replace  $\frac{1}{2} e^{1+(1+x^2)}$  with  $\frac{1}{2} e^{1+\frac{1}{2}x^2} e^{\frac{1}{2}x^2}$

pg 55, last line: replace  $O(\cdot)$  with  $O(\cdot^2)$

pg 64, 9th line from bottom: replace  $\bar{x} = x/$  with  $\bar{x} = x/\sqrt{\cdot}$

pg 65, 3d line: replace  $B - Y_0$  with  $B - 2Y_0$

pg 65, in equation (2.33): replace  $B - s$  with  $B - 2s$

pg 71, 8 lines from top: replace  $Y_0(\cdot)$  with  $Y_0(\cdot)$  and replace  $Y_0(\cdot)$  with  $Y_0(\cdot)$

pg 72, in equation (2.47): within the  $\tanh(\cdot)$  expression replace  $x$  with  $\bar{x}$

pg 99, 17th line from top: the equation for  $y_n$  should be replaced with...

$$y_n = m_2^n + (1 - \cdot) m_1^n$$

where

$$= \frac{1 - m_1^N}{m_2^N - m_1^N}$$

pg 101, in first line of equation (2.106): replace the exponent  $N - k$  with  $N - n$

pg 104, first line in exercise 4(a): replace "the difference" with "the solution of the difference"

### Chapter 3

pg 125, line above equation (3.40b): indent "where" so it's aligned with "The" in the lines above and below it.

pg 130, third line in Exercise 6: replace  $\frac{2}{3}$  with  $\frac{2}{3}$  and replace  $\frac{2}{3}$  with  $\frac{2}{3}$

pg 143, line after equation (3.73): replace "problem" with "problems"

pg 144, in equation (3.79) and in formula for  $v_{ph}$  two lines below: replace "8" with "16"

pg 153, third line after (3.95): replace  $y + y = y^3$  with  $y + y + y^3 = 0$

pg 154, 2nd line: the line should be left justified

pg 192, 10 lines from top: replace  $-x u_0^2$  with  $-G x u_0^2$

### Chapter 4

pg 210, equation (4.119): within the parenthesis replace "1" with " $1 + 2 \mu_1$ "

pg 211: On 4th line of Exercise 1 replace  $(r^*/h^*, z^*/h^*)$  with  $(\sqrt{r^*/h}, z^*/h)$

pg 214, line above Example: replace 1995 with 1996

### Chapter 5

pg 229, last line in caption to Fig 5.2: replace  $g(x) = 0$  with  $g(x) = 1$

pg 241, 2 lines above (5.44): remove comma after "condition"

## Chapter 6

pg 273, 5th line: replace  $u_1 = 0$  with " $u_1$  is not identically zero"

pg 273, 5th line from bottom: replace Section 5.5 with Section 4.5

pg 275, 6th line after equation (6.48): replace  $r_+ < 0$  with  $\text{Re}(r_+) < 0$

pg 275, 7th line after equation (6.48): replace  $m < 0$  with " $m < 0$  for all values of  $m$ "

pg 277, first line: replace " $= [$ " with " $= - [$ "

pg 282, 10th line: replace 1988 with 1983

pg 288, first line: replace  $y_0$  with  $y_s$

pg 290, sixth line: replace  $= -y_1$  with  $= -y_2$

pg 292, Exercise 4(a): replace  $> (\epsilon - \mu)/(1 + \epsilon + \mu)$  with the following

$$> \frac{(\epsilon - \mu)(1 - \epsilon + \mu)}{(1 - \epsilon + \mu)}$$

## References

Costin, O. and Costin, R. (1996). "Rigorous WKB for finite-order linear recurrence relations with smooth coefficients." *SIAM J Math Anal* **27**, 110-134.

Lin, C.-C. and Segel, L.A. (1989). *Mathematics Applied to Deterministic Problems in the Natural Sciences*, SIAM Classics in Applied Mathematics, SIAM Publications, Philadelphia, PA.

pg 326: in Rudin reference replace 1964 with 1976