Medical Imaging Signals and Systems

Jerry L. Prince and Jonathan M. Links
Upper Saddle River, NJ: Pearson Prentice Hall, 2006

Errata, Version 1.0, September 2, 2005

This errata applies to the first printing of the book. The first printing can identified by looking on the copyright page (on the back of the title page) and finding the following text:

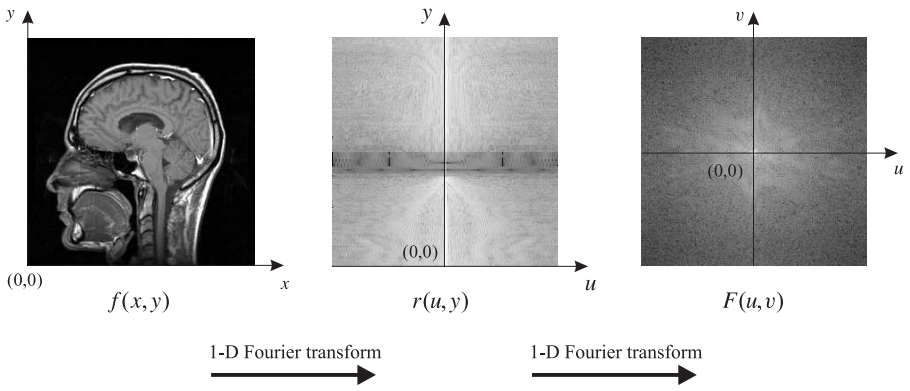
Printed in the United States of America
10 9 8 7 6 5 4 3 2 1
ISBN 0-13-065353-5

The last number of the sequence 10 9, …, 1 is the printing — in this case, 1, the first.

In the bulleted items below, entries starting with an asterisk are errors that should be corrected. Entries without an asterisk are either typographical corrections or corrections related to clarity.

Chapter 2: Signals and Systems

* **Page 43:** Figure 2.11 should look like this:



Chapter 4: Physics of Radiography

- **Page 114:** Table 4.3 should be modified as shown.
- **Page 133:** On the fourth line from the top, Kg should be kg (not capitalized).
- **Page 133:** In Problem 4.7, Kg should be kg (not capitalized) in three places.

Chapter 5: Projection Radiography

- **Page 138:** In Figure 5.5, Bremsstrahlung is misspelled
- **Page 164:** Figure 5.22 should be modified as shown.

Table 4.3 Radiation Concepts

	Imaging	Dose
Particulate	Bremsstrahlung Characteristic radiation *Positron annihilation** *Range*	Linear energy transfer Specific ionization
Electromagnetic	Attenuation Photoelectric effect Compton scatter Characteristic radiation Polyenergetic	Air kerma Dose Dose equivalent Effective dose f-factor

*Italicized entries are discussed in Chapter 7.

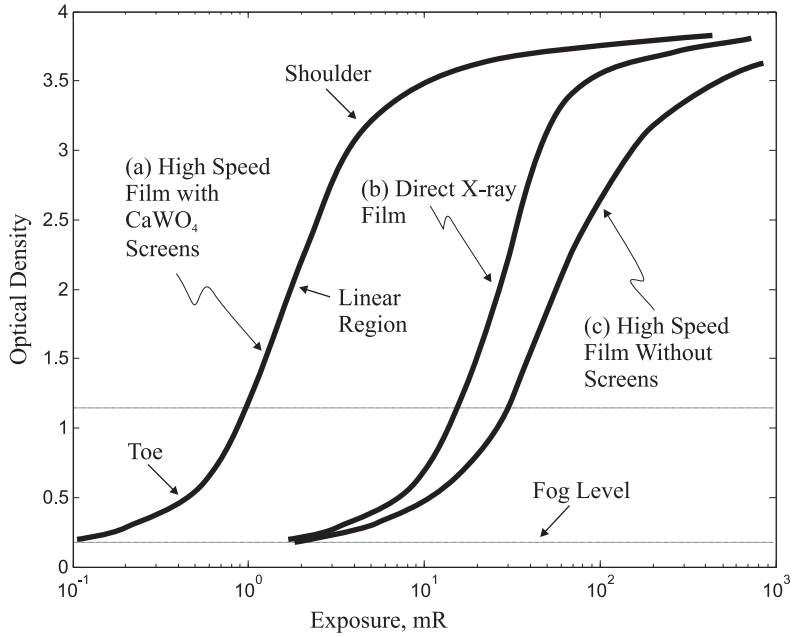


Figure 5.22 An H&D curve.

* **Page 160:** Equation (5.26) should read

$$k \propto \frac{1}{m^2(z)} \,. \tag{5.26}$$

* **Page 160:** Equation (5.27) should read

$$\frac{s(x/m, y/m)}{m^2} \to S(0,0)\delta(x, y) \,. \tag{5.27}$$

Chapter 7: The Physics of Nuclear Medicine

- **Page 249:**
  The second line of the Early reference should be indented.

Chapter 8: Planar Scintigraphy

* **Page 280:** The fourth line of Problem 8.4 should read: A is at a distance of r from the camera, directly below the hole.

* **Page 283:** The fourth line of the page (within problem Problem 8.10) should read: ratio in the last image?

Chapter 9: Emission Computed Tomography

- **Page 297:** The arrow next to θ in Figure 9.7 should point in the other direction.

Chapter 10: The Physics of Ultrasound

* **Page 324:** The numbers in the answer to Example 10.3 (at the top of the page) are wrong. It should read as follows:

Answer: $\theta_r = \theta_i = 45°$. Since $c_1 = 1450$ m/s and $c_2 = 1570$ m/s,

$$\sin\theta_t = \frac{1570 \sin 45°}{1450} = 0.7656\,.$$

Solving this yields $\theta_t = 49.96°$. It makes intuitive sense that the transmission angle should be larger than the incidence or reflection angle, since $c_2 > c_1$.

* **Page 325, Example 10.4:** The computed value for R_I should be 0.0106, (the square of 0.103). Accordingly, the sentence after should read: "Only about 1 percent of the incident power is reflected back from the interface; about 99 percent is transmitted through."

* **Page 327, Example 10.5:** Because of the above error in Example 10.4, there is an error in this example as well. The last part of the example should read:

From the previous example, we know that the intensity reflectivity is 0.0106. The amplitude reflectivity is therefore $\sqrt{0.0106} = 0.103$. Putting these facts together yields

$$\text{dB loss} = 20\log_{10}\frac{A_z}{A_0} = 20\log_{10}(0.234 \times 0.103) = -32.4\text{ dB}\,.$$

Chapter 13: Magnetic Resonance Imaging

* **Page 442:** In equation (13.48), there should be a space between the square root symbol and symbol t, as follows:

$$\varrho = \sqrt{G_x^2 + G_y^2}\; t\,. \tag{13.48}$$

* **Page 443:** Equation (13.52) should read

$$G(\varrho, \theta) = s_0 \left(\frac{\varrho}{\gamma \sqrt{G_x^2 + G_y^2}}, \theta \right) . \tag{13.52}$$

* **Page 459:** The duration of the gradient pulse in Figure P13.5 should be NT.

• **Page 459:** In problem 13.12, part (a), there should be a circle around the number 2 (as in Figure 13.20).