Errata for
The Feynman Lectures on Physics Volume II
New Millennium (2nd printing)

The errors in this list appear in the 2nd printing of *The Feynman Lectures on Physics: New Millennium Edition* (2011) and earlier printings and editions; these errors have been corrected in the 3rd hardback printing (and in the 2ndt paperback printing) of the *New Millennium Edition* (2011).

Errors are listed in the order of their appearance in the book. Each listing consists of the errant text followed by a brief description of the error, followed by corrected text.

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Global change: ev -> eV, Mev -> MeV

The abbreviation for electron volt has been changed from ‘ev’ to ‘eV’ throughout this volume; it has been changed on the following pages (for the following number of occurrences, if more than one):

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 ev: 8-5(3), 8-6(4)
Mev: 8-7(7), 8-8(3), 8-9(5), 25-5, 28-11(6), 28-12, 28-14, index
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II:7-2, par 2, unnumbered Eq

$$F(\mathfrak{z}) = \mathfrak{z} \log \mathfrak{z},$$

Here ‘$\mathfrak{z}$’ is a complex number and $\log \mathfrak{z}$ is the principal value of its natural logarithm. However, “log” has not been introduced or defined, so for clarity, we change it to ‘ln’ which is used throughout FLP for the natural logarithm.

$$F(\mathfrak{z}) = \mathfrak{z} \ln \mathfrak{z},$$

II:7-5, Eq 7.14

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$$F(\mathfrak{z}) = \ln \mathfrak{z},$$

II:18-11, par 3

What a beautiful set of equations! They are beautiful, first, because they are nicely separated—with the charge density, goes ϕ; with the current, goes $\boldsymbol{A}$. Furthermore, although the left side looks a little funny—a Laplacian together with a $(\partial/\partial t)^2$ —

For notational consistency with equations (18.24) and (18.25), to which this sentence refers, $(\partial/\partial t)^2$ should be changed to $\partial^2/\partial t^2$.

What a beautiful set of equations! They are beautiful, first, because they are nicely separated—with the charge density, goes ϕ; with the current, goes $\boldsymbol{A}$. Furthermore, although the left side looks a little funny—a Laplacian together with a $\partial^2/\partial t^2$ —

II:25-10, par 3

—the “mismatch,” of mechanics.

Superfluous comma.

—the “mismatch” of mechanics.

II:28-14, par 1

… mass comes out to 3×10^{-25} gm, …

Incorrect abbreviation for gram (‘gm’ vs. ‘g’).

… mass comes out to 3×10^{-25} g, …

II:31-14, unnumbered equation

$$S_{\mu\nu} = \frac{\varepsilon_0}{2}\left(\sum_{\alpha} F_{\mu\alpha}F_{\nu\alpha} - \frac{1}{4}\delta_{\mu\nu}\sum_{\alpha,\beta} F_{\beta\alpha}F_{\beta\alpha}\right)$$

Incorrect factor on right-hand side. (‘$\varepsilon_0/2$’ vs. ‘$-\varepsilon_0$’). See, for example, *Gravitation* (MTW), Section 5.6 *Electromagnetic Stress-Energy*, or, as described in the text below the equation, try using it to calculate S_{tt}; When $\mu = \nu = t$, the first sum on the right equals $-E^2$, the second sum equals $2\left(B^2 - E^2\right)$, and $\delta_{tt} = 1$, so the expression in parentheses equals $-\left(E^2 + B^2\right)/2$. In order to get $S_{tt} = \left(\varepsilon_0/2\right)\left(E^2 + B^2\right)$, the factor on the right-hand side of the equation has to be changed to $-\varepsilon_0$.

$$S_{\mu\nu} = -\varepsilon_0\left(\sum_{\alpha} F_{\mu\alpha}F_{\nu\alpha} - \frac{1}{4}\delta_{\mu\nu}\sum_{\alpha,\beta} F_{\beta\alpha}F_{\beta\alpha}\right)$$

II:32-9, Table 32-2

… density … (gm/cm^3)	… $N_0\alpha_2$ … (gm/liter)

Incorrect abbreviation for gram (‘gm’ vs. ‘g’, 2 occurrences).

… density … (g/cm^3)	… $N_0\alpha_2$ … (g/liter)

II:32-9, par 3

… column B is the measured density (gm/cm^3), …

Incorrect abbreviation for gram ('gm' vs. 'g').

… column B is the measured density (g/cm^3), …

II:32-12, par 1, unnumbered Eq

$m = 9.11 \times 10^{-31}$ kgm,

Incorrect abbreviation for kilogram ('kgm' vs. 'kg').

$m = 9.11 \times 10^{-31}$ kg,

II:34-3, par 3

… because for the electrons involved v/c is generally of the order of $e^2/\hbar c = 1/137$, or about 1 percent.

Somewhat inaccurate and misleading. $e^2/\hbar c$ is actually about $1/137.036$, so we recommend replacing '$=$' with '$\approx$'.

… because for the electrons involved v/c is generally of the order of $e^2/\hbar c \approx 1/137$, or about 1 percent.

II:34-4, par 3

For a proton, g = 2(2.79). Surprisingly enough, the neutron also has a spin magnetic moment, and its magnetic moment relative to its angular momentum is 2(−1.93).

The given neutron g-factor 2·(−1.93) = -3.86 is too large; the correct value is about -3.826, which is close to 2·(−1.91). For clarity we recommend adding "·" (\cdot) between '2' and '(' (two occurrences).

For a proton, g = 2·(2.79). Surprisingly enough, the neutron also has a spin magnetic moment, and its magnetic moment relative to its angular momentum is 2·(−1.91).

II:36-10, par 1

If the yoke has a uniform cross-sectional area—

The cross-sectional area of the yoke must be specified as 'A' for the following correction to make sense.

If the yoke has a uniform cross-sectional area *A*—

II:36-10, par 2 and Fig 36-11(b)

Imagine the closed surface *S*, shown in Fig. 36-11(b), which has one face in the gap and the other in the iron. The total flux of ***B*** out of this surface must be zero. Calling B_1 the field in the gap and B_2 the field in the iron, we have that

$$B_1A_1 - B_2A_2 = 0.$$

Since $A_1 = A_2$ (to our approximation), it follows that $B_1 = B_2$.

A_1 and A_2 are not defined. In Feynman's original lecture, he did not draw a surface as shown in Fig 36-11(b); there was no "A_1" and no "A_2," only "A," in Feynman's figure, which was the cross-sectional area of the iron yoke and of the gap (the same as A defined in section 36-4). So he wrote down B_1*A - B_2*A = 0, from which B_1=B_2 followed directly. However, it is hard to draw such a surface in the given view - that, I think, is why the text was changed. For clarity and to conform better to the original lecture we recommend moving the top and bottom of surface S in Fig 36-11(b) so that they are closer to the yoke, and changing the above text to

Imagine the closed surface *S*, shown in Fig. 36-11(b), which has one face in the gap and the other in the iron. The total flux of ***B*** out of this surface must be zero. Calling B_1 the field in the gap and B_2 the field in the iron, we have (to our approximation) that

$$B_1A - B_2A = 0.$$

It follows that $B_1 = B_2$.

II:37-9, par 3

These currents loose energy in heating the metal.

Wrong word ('loose' vs. 'lose').

These currents lose energy in heating the metal.

II:39-4, Eq 39.14

$$W = \int \tfrac{1}{2} \sum_{ijkl} C_{ijkl} e_{ij} e_{kl} \; d\mathrm{Vol} \tag{39.14}$$

"*d*Vol" is inconsistent "*dV*" in Eq. (39.23) and following equations.

$$W = \int \tfrac{1}{2} \sum_{ijkl} C_{ijkl} e_{ij} e_{kl} \; dV \tag{39.14}$$

II:40-11, par 3

If the diameter has changed, however, the length will have increased to keep the volume constant …

Inaccurate statement; the length increases only if the diameter has *decreased*, as shown in Fig. 40-13.

If, however, the diameter has decreased as shown in figure 40-13, the length will have increased to keep the volume constant …

II:40-11, Fig 4-13

The labels in this figure A, Ω and A', Ω' are inconsistent with the variables in Eq. (40.21) and the following unnumbered equation, which use A_1, Ω_1 and A_2, Ω_2. The figure should be made consistent with the variables in the equations.