Errata for
The Feynman Lectures on Physics Volume II
Definitive Edition (final printing)

The errors in this list appear in the final printing of *The Feynman Lectures on Physics: Definitive Edition* (2010) and earlier printings and editions; these errors have been corrected in the 1st 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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Michael A. Gottlieb
Playa Tamarindo, Guanacaste
Costa Rica
mg@feynmanlectures.info

II:vii, par 1

... Sin-Itero Tomanaga ...

Misspelled name. (“Sin-Itero Tomanaga” vs. “Sin-Itiro Tomonaga”. See, for example, http://nobelprize.org/nobel_prizes/physics/laureates/1965/tomonaga-bio.html)

... Sin-Itiro Tomonaga ...

II:xiii, par 4

The supernova of 1987 has just been discovered, and Feynman was very excited about it.

Incorrect word (‘has’ instead of ‘had’).

The supernova of 1987 had just been discovered, and Feynman was very excited about it.

II:xiv, par 6

... Sin-Itero Tomanaga ...

Misspelled name. (“Sin-Itero Tomanaga” vs. “Sin-Itiro Tomonaga”. See, for example, http://nobelprize.org/nobel_prizes/physics/laureates/1965/tomonaga-bio.html)

... Sin-Itiro Tomonaga ...

II:9, Table of Contents

5-1 Electrostatics is Gauss’s law plus … 5-1

Typographic error (Gauss’s vs. Gauss’)

5-1 Electrostatics is Gauss’ law plus … 5-1

II:11, Table of Contents

30-9 The Bragg-Nye crystal model 30-10

Incorrect page number.

30-9 The Bragg-Nye crystal model 30-9

II:10, Table of Contents

13-4 The magnetic field of steady currents; Ampere's law 13-3

Incorrect spelling of proper name ('Ampere' vs. 'Ampère')

13-4 The magnetic field of steady currents; Ampère's law 13-3

II:1-1, par 4

The Empire State Building, for example, swings only 8 feet in the wind…

According to the FAQ on the official ESB website, the movements are in the inch order of magnitude. See: http://www.esbnyc.com/tourism/tourism_facts_2.cfm.

The Empire State Building, for example, swings less than one inch in the wind…

II:1-2, last line of par 2

We will entertain overselves by discussing this subject some more in later chapters.

Incorrect spelling ('overselves' vs. 'ourselves')

We will entertain ourselves by discussing this subject some more in later chapters.

II:1-3, last par

Since a vector is specified by its components, each of the fields $\boldsymbol{E}(x, y, z, t)$ and $\boldsymbol{B}(x, y, z, t)$ represent three mathematical functions of x, y, z, and t.

Plural vs. singular ('represent' vs. 'represents')

Since a vector is specified by its components, each of the fields $\boldsymbol{E}(x, y, z, t)$ and $\boldsymbol{B}(x, y, z, t)$ represents three mathematical functions of x, y, z, and t.

II:1-7, Fig 1-8

The labels "+" and "–" indicating charge should be exchanged in this figure, so that the indicated current direction is shown flowing from "+" to "–", as shown in Fig. 1-6, Fig.1-7 and Fig. 1-9.

II:1-8, last par

– the electrons in the wire feel the force $\boldsymbol{F} = qv \times \boldsymbol{B}$.

Vectors should be bold ('v' vs '$\boldsymbol{v}$').

– the electrons in the wire feel the force $\boldsymbol{F} = q\boldsymbol{v} \times \boldsymbol{B}$.

II:1-8, last par

This *v* with a vertical ***B*** from the magnet results in a force …

Vectors should be bold ('*v*' vs '***v***').

This ***v*** with a vertical ***B*** from the magnet results in a force …

II:1-9, last par

It is interesting that the correct equations for the behavior of light in crystals were worked out by McCullough in 1843.

Three errors: proper name misspelled ('McCullough' vs. 'MacCullagh'), wrong publication (MacCullagh'a Hamiltonian formulation of wave optics produces the correct equations for the behavior of light, not his earlier work on reflection and refraction in crystals) and wrong date ('1843' vs. '1839') – see, http://www.maths.tcd.ie/pub/official/400Hist/14.html and http://maxwell.byu.edu/~spencerr/phys442/node4.html, and most particularly, http://www.apriorijournal.org/volume1/chalmers.pdf)

It is interesting that the correct equations for the behavior of light were worked out by MacCullagh in 1839.

II:1-10, par 2

—they may disappear completely in certain coordinate frames

Incorrect punctuation (missing '.' at end of sentence)

—they may disappear completely in certain coordinate frames.

II:1-10, par 5

…uncovered one new phenomena after another…

Pluralization error ('phenomena' vs 'phenomenon')

…uncovered one new phenomenon after another…

II:2-2, par 1

You can also fill in what we must leave out by reading the Encyclopedia Brittanica,

Incorrect spelling of proper name ('Brittanica' vs. 'Britannica')

You can also fill in what we must leave out by reading the Encyclopedia Britannica,

II:2-4, par 5

Similarly, if we *know* that $\boldsymbol{A}$ is a vector, and we have three number B_1, B_2, and B_3, and we find out that

$$A_x B_1 + A_y B_2 + A_z B_3 = S, \tag{2.12}$$

where S is the same for any coordinate system, then it *must* be that the three numbers B_1, B_2, and B_3 are the components B_x, B_y, B_z of some vector $\boldsymbol{B}$.

Untrue statement.

Similarly, if we have three numbers B_1, B_2, and B_3 and we find out that for *every* vector $\boldsymbol{A}$

$$A_x B_1 + A_y B_2 + A_z B_3 = S, \tag{2.12}$$

where S is the same for any coordinate system, then it *must* be that the three numbers B_1, B_2, and B_3 are the components B_x, B_y, B_z of some vector $\boldsymbol{B}$.

II:2-6, par 1

since Δy is negative when Δx is positive.

Missing prime on 'Δy'.

since $\Delta y'$ is negative when Δx is positive.

II:3-1, caption of section 3-1

3-1 Vector integrals; the line integral of $\nabla\Psi$

For consistency with the rest of the chapter, the upper-case Ψ should be a lower-case ψ.

3-1 Vector integrals; the line integral of $\nabla\psi$

II:3-1, par 3

If Γ(gamma) is any curve joining (1) and (2),

Typographical error: missing space after Γ.

If Γ (gamma) is any curve joining (1) and (2),

II:3-1, Fig 3-2

The subscript on the tangential component, $(\Delta\psi)_{\dagger}$ looks more like a dagger '†' than a 't'. It should be $(\Delta\psi)_{t}$.

II:3-2, par 1

we mean the limit of the sum

$$\sum f_i \Delta s_i \,,$$

Summation index 'i' missing.

we mean the limit of the sum

$$\sum_i f_i \Delta s_i \,,$$

II:3-2, par 3

In Chapter 1, we showed that the component of $\nabla\psi$ along a small …

Incorrect reference.

In Chapter 2, we showed that the component of $\nabla\psi$ along a small …

II:3-2, par 3

… the rate of change of ψ in the direction of ΔR

Typographical error; vectors should be bold ('R' vs. '$\boldsymbol{R}$').

… the rate of change of ψ in the direction of $\Delta \boldsymbol{R}$

II:3-2, Eq 3.6

$$\psi(2)-\psi(1)=\sum(\nabla\psi)_i\cdot\Delta\boldsymbol{s}_i\,. \tag{3.6}$$

Summation index 'i' missing.

$$\psi(2)-\psi(1)=\sum_i(\nabla\psi)_i\cdot\Delta\boldsymbol{s}_i\,. \tag{3.6}$$

II:3-3, par 7

Imagine that we have a closed surface ***S*** that encloses the volume *V*.

Typographical error; only vectors should be bold ('***S***' vs. '*S*').

Imagine that we have a closed surface *S* that encloses the volume *V*.

II:3-4, Fig 3-4

Vectors $\mathbf{n}_1$ and $\mathbf{n}_2$ should have the same length since they are both unit normal vectors along the same line.

II:3-4, Fig 3-5

Vectors **n** and **n**' should have the same length since they are both unit normal vectors along the same line.

II:3-5, par 1

There are, of course, more terms, but they will involve $(\Delta_x)^2$ and higher powers…

Typographical error ('*x*' should not be a subscript.).

There are, of course, more terms, but they will involve $(\Delta x)^2$ and higher powers…

II:3-6, Eq 3.20

$$-\frac{d}{dt}\left(q\Delta V\right) = -\frac{dq}{dt}\Delta V. \tag{3.20}$$

Wrong kind of derivative. In going from Eq 3.19 to Eq 3.20 the total derivative in front of the volume integral is (implicitly) put under the integral sign, thus making it a partial deriviative.

$$-\frac{\partial}{\partial t}\left(q\Delta V\right) = -\frac{\partial q}{\partial t}\Delta V. \tag{3.20}$$

II:3-6, Eq 3.21

$$-\frac{dq}{dt}=\nabla\cdot\boldsymbol{h}. \qquad (3.21)$$

Wrong kind of derivative. (see error II:3-6, Eq 20).

$$-\frac{\partial q}{\partial t}=\nabla\cdot\boldsymbol{h}. \qquad (3.21)$$

II:3-6, Eq 3.22

$$\int_S \boldsymbol{h}\cdot\boldsymbol{n}\,da=\int \nabla\cdot\boldsymbol{h}\,dV \qquad (3.22)$$

Integral on right-hand side is missing subscript V for volume (as per Eq. 3.18).

$$\int_S \boldsymbol{h}\cdot\boldsymbol{n}\,da=\int_V \nabla\cdot\boldsymbol{h}\,dV \qquad (3.22)$$

II:3-7, par 3, unnumbered Eq

$$-\frac{dq}{dt}=\nabla\cdot\boldsymbol{h}=-\nabla\cdot\left(\kappa\nabla T\right),$$

Wrong kind of derivative. (see error II:3-6, Eq 20).

$$-\frac{\partial q}{\partial t}=\nabla\cdot\boldsymbol{h}=-\nabla\cdot\left(\kappa\nabla T\right),$$

II:3-7, Eq 3.26

$$\frac{dq}{dt} = \kappa\nabla\cdot\nabla T = \kappa\nabla^2 T, \qquad (3.26)$$

Wrong kind of derivative. (see error II:3-6, Eq 20).

$$\frac{\partial q}{\partial t} = \kappa\nabla\cdot\nabla T = \kappa\nabla^2 T, \qquad (3.26)$$

II:3-7, Eq 3.27

$$\frac{dq}{dt} = c_v \frac{dT}{dt}. \qquad (3.27)$$

Wrong kind of derivative. (see error II:3-6, Eq 20).

$$\frac{\partial q}{\partial t} = c_v \frac{\partial T}{\partial t}. \qquad (3.27)$$

II:3-7, Eq 3.28

$$\frac{dT}{dt} = \frac{\kappa}{c_v}\nabla^2 T. \qquad (3.28)$$

Wrong kind of derivative. (see error II:3-6, Eq 20).

$$\frac{\partial T}{\partial t} = \frac{\kappa}{c_v}\nabla^2 T. \qquad (3.28)$$

II:3-7, Eq 3.29

$$\frac{dT}{dt} = D\,\nabla^2 T, \qquad (3.29)$$

Wrong kind of derivative. (see error II:3-6, Eq 20).

$$\frac{\partial T}{\partial t} = D\,\nabla^2 T, \qquad (3.29)$$

II:3-7, par 4

The constant or proportionality c_v is …

Typographical error (‘or’ vs. ‘of’).

The constant of proportionality c_v is …

II:3-9, Eq 3.34

$$\left[C_x(1) - C_x(3)\right]\Delta y = -\frac{\partial C_x}{\partial y}\Delta x\,\Delta y \qquad (3.34)$$

Left-hand side is incorrect ('Δy' vs. 'Δx')

$$\left[C_x(1) - C_x(3)\right]\Delta x = -\frac{\partial C_x}{\partial y}\Delta x\,\Delta y \qquad (3.34)$$

II:3-11, 2nd unnumbered Eq

$$\int \nabla\times(\nabla\phi)\,da = 0$$

According to Stokes' theorem, the normal component of the curl has to be integrated over the surface.

$$\int (\nabla\times(\nabla\phi))_n\,da = 0$$

II:4-5, last sentence

Each of the integrals is the potential from one of the charges.

Sign error.

Each of the integrals is the negative of the potential from one of the charges.

II:4-4, par 6

Let point a be at the distance r_1 from q, and point b at r_2.

Subscripts inconsistent with following discussion ('r_1' and 'r_2' vs. 'r_a' and 'r_b'. See Eq 4.20).

Let point a be at the distance r_a from q, and point b at r_b.

II:4-6, par 3

Consider two points, one at x and one at $(x + dx)$,

Inconsistent with following (two) unnumbered Eqs ('dx' vs. 'Δx').

Consider two points, one at x and one at $(x + \Delta x)$,

II:4-6, par 3

The path is along the horizontal line from x to $x + dx$.

Inconsistent with following (two) unnumbered Eqs (‘dx’ vs. ‘Δx’).

The path is along the horizontal line from x to $x + \Delta x$.

II:4-6, Eq 4.25

$$\phi(1) = \frac{1}{4\pi\varepsilon_0} \int \frac{\rho(2)\, dV_2}{r_{12}}. \qquad (4.25)$$

For consistency with Eq. (4.16) the integral should be taken over “all space.”

$$\phi(1) = \frac{1}{4\pi\varepsilon_0} \int_{\substack{\text{all} \\ \text{space}}} \frac{\rho(2)\, dV_2}{r_{12}}. \qquad (4.25)$$

II:4-7, par 1

…gives an $\boldsymbol{E}$ field that staisfies that condition.

Incorrect spelling (‘staisfies’ vs. ‘satisfies’)

…gives an $\boldsymbol{E}$ field that satisfies that condition.

II:4-7, par 4

Because of this, Eq. (4−28)—or (4.29)—can contain only part of the laws of electricity.

Punctuation error in equation number (‘−’ vs. ‘.’).

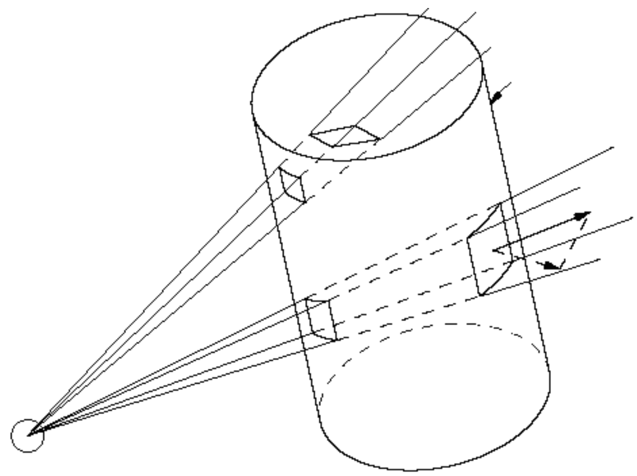
Because of this, Eq. (4.28)—or (4.29)—can contain only part of the laws of electricity.

II:4-8, Fig 4-5

In Fig. 4-5 the Point Charge is twice as far from point b as it is from point a, yet the electric field vector at point b (E_b) is drawn four times longer than the electric field vector at point a (E_a); it should be the other way around: E_a has four times the magnitude of E_b. The lengths (but not the positions) of vectors E_a and E_b should be exchanged in this figure.

II:4-8, Fig 4-7

There are geometrical errors in this figure. In particular, vector component E_n does not appear to be normal to the surface. Also, for clarity, the topmost three rays should extend beyond the top of the cylinder. It should look more like:



II:4-8, Fig 4-8

$\mathbf{E}_a$ should be longer than $\mathbf{E}_b$ because it is closer to the charge.

II:4-9, Eq 4.31

Flux through the suface *S'* = … (4.31)

Spelling error ('suface' vs. 'surface')

Flux through the surface *S'* = … (4.31)

II:4-10, par 2

The two are quite equivalent so long as we keep in mind the rule that the forces between charges is radial.

Singular vs. plural ('is' vs. 'are')

The two are quite equivalent so long as we keep in mind the rule that the forces between charges are radial.

II:4-12, last par

If we calculate the fields from Eq. (4.13) and the potentials from (4.23), ...

Incorrect reference.

If we calculate the fields from Eq. (4.13) and the potentials from (4.24), ...

II:5-3, Fig 5-3, caption

The Thompson model of an atom.

Incorrect spelling of proper name (Thompson' vs. 'Thomson').

The Thomson model of an atom.

II:5-3, par 2

This was the first atomic model, proposed by Thompson.

Incorrect spelling of proper name (Thompson' vs. 'Thomson').

This was the first atomic model, proposed by Thomson.

II:5-3, par 2

Thompson's static model had to be abandoned.

Incorrect spelling of proper name (Thompson' vs. 'Thomson').

Thomson's static model had to be abandoned.

II:5-3, par 3

The net result is an electrical equilibrium not too different from the idea of Thompson …

Incorrect spelling of proper name (Thompson' vs. 'Thomson').

The net result is an electrical equilibrium not too different from the idea of Thomson …

II:5-3, Fig 5-5

The "G" of "GAUSSIAN" is hardly discernable

II:5-5, par 4, unnumbered Eq

$$\frac{E_2}{E_1} = \frac{q_2/r_2^2}{q_1/r_1^2} = 1\,.$$

Missing 'Δ's (two of them. See preceding unnumbered Eq).

$$\frac{E_2}{E_1} = \frac{\Delta q_2/r_2^2}{\Delta q_1/r_1^2} = 1\,.$$

II:5-6, par 5

… by Plimpton and Laughton.

Incorrect spelling of proper name ('Laughton vs. 'Lawton')

… by Plimpton and Lawton.

II:5-6, last par

... expected to have almost indentical energies *only* if the potential varies exactly as...

Incorrect spelling ('indentical' vs. 'identical')

... expected to have almost identical energies *only* if the potential varies exactly as...

II:5-7, par 4

The inverse square law is valid at distances like one meter and also at 10^{-10}m;

Missing space before 'm'.

The inverse square law is valid at distances like one meter and also at 10^{-10} m;

II:5-7, par 5

… Plimpton and Laughton …

Incorrect spelling of proper name ('Laughton vs. 'Lawton')

… Plimpton and Lawton …

II:5-9, par 4

… van de Graaff …

Incorrect spelling of proper name ('van de Graaff' vs. 'Van de Graaff')

… Van de Graaff …

II:6-2, par 6, final unnumbered Eq

$$\frac{1}{\sqrt{\left[z-(d/2)\right]^2+x^2+y^2}} \approx \frac{1}{\sqrt{r^2\left[1-(zd/r^2)\right]}} \approx \frac{1}{r}\left(1-\frac{zd}{r^2}\right)^{-1/2}.$$

The second approximately equal sign should be an equal sign ('≈' vs. '=').

$$\frac{1}{\sqrt{\left[z-(d/2)\right]^2+x^2+y^2}} \approx \frac{1}{\sqrt{r^2\left[1-(zd/r^2)\right]}} = \frac{1}{r}\left(1-\frac{zd}{r^2}\right)^{-1/2}.$$

II:6-3, par 1

—and throwing away terms with higher powers than the square of d—

Incorrect statement.

—and throwing away terms with the square or higher powers of d—

II:6-3, par 3

…, pointing from q_- toward q_+.

The charges are denoted by $-q$ and $+q$ (see par 1 of Sec. 6-2)

…, pointing from $-q$ toward $+q$.

II:6-3, Eq 6.13

$$\phi(r) = \frac{1}{4\pi\varepsilon_0}\frac{\boldsymbol{p}\cdot\boldsymbol{e}_r}{r^2} = \frac{1}{4\pi\varepsilon_0}\frac{\boldsymbol{p}\cdot\boldsymbol{r}}{r^3} \qquad (6.13)$$

The dipole potential does not only depend on the distance r but also on the direction (relative to $\boldsymbol{p}$) and thus the argument of ϕ has to be the vector $\boldsymbol{r}$

$$\phi(\boldsymbol{r}) = \frac{1}{4\pi\varepsilon_0}\frac{\boldsymbol{p}\cdot\boldsymbol{e}_r}{r^2} = \frac{1}{4\pi\varepsilon_0}\frac{\boldsymbol{p}\cdot\boldsymbol{r}}{r^3} \qquad (6.13)$$

II:6-4, par 1

The transverse component $E_\perp$ is in the x-y plane …

Punctuation error. [See correction III:17-14, par 3 in Commemorative Issue errata.]

The transverse component $E_\perp$ is in the xy-plane …

II:6-6, Fig 6-6(a)

To indicate equal volume charge densities, there should also be a "+" in the center of the positively charged sphere

II:6-7, Eq 6.22

$$\phi = \frac{1}{4\pi\varepsilon_0}\frac{1}{R}\sum q_i = \frac{Q}{4\pi\varepsilon_0}, \qquad (6.22)$$

Summation index 'i' missing.

$$\phi = \frac{1}{4\pi\varepsilon_0}\frac{1}{R}\sum_i q_i = \frac{Q}{4\pi\varepsilon_0}, \qquad (6.22)$$

II:6-7, par 2

In other words if $\boldsymbol{e}_r$ is the unit vector in the direction of $\boldsymbol{R}$,

Inconsistent notation ('$\boldsymbol{e}_r$' vs. '$\boldsymbol{e}_R$'). See Eqs. II:14.28 and II:14.34.

In other words if $\boldsymbol{e}_R$ is the unit vector in the direction of $\boldsymbol{R}$,

II:6-7, par 2

The three dots indicate the terms of higher order in d/R that we have neglected.

Missing subscript ('d' vs 'd_i').

The three dots indicate the terms of higher order in d_i/R that we have neglected.

II:6-7, Eq 6.23

$$r_i \approx R - \boldsymbol{d}_i \cdot \boldsymbol{e}_r \,. \tag{6.23}$$

Inconsistent notation ('$\boldsymbol{e}_r$' vs. '$\boldsymbol{e}_R$'). See error II:6-7, par 2, *above*.

$$r_i \approx R - \boldsymbol{d}_i \cdot \boldsymbol{e}_R \,. \tag{6.23}$$

II:6-7, Eq 6.24

$$\frac{1}{r_i} \approx \frac{1}{R}\left(1 + \frac{\boldsymbol{d}_i \cdot \boldsymbol{e}_r}{R}\right). \tag{6.24}$$

Inconsistent notation ('$\boldsymbol{e}_r$' vs. '$\boldsymbol{e}_R$'). See errors II:6-7, par 2, Eq. (6.23) and (6.25), in *FLP_Definitive_Edition_Caltech_Approved_Vol_II_Errata.pdf*.

$$\frac{1}{r_i} \approx \frac{1}{R}\left(1 + \frac{\boldsymbol{d}_i \cdot \boldsymbol{e}_R}{R}\right). \tag{6.24}$$

II:6-7, Eq 6.25

$$\phi = \frac{1}{4\pi\varepsilon_0}\left(\frac{Q}{R} + \sum_i q_i \frac{\boldsymbol{d}_i \cdot \boldsymbol{e}_r}{R^2} + \cdots\right). \tag{6.25}$$

Inconsistent notation ('$\boldsymbol{e}_r$' vs. '$\boldsymbol{e}_R$'). See error II:6-7, par 2, *above*.

$$\phi = \frac{1}{4\pi\varepsilon_0}\left(\frac{Q}{R} + \sum_i q_i \frac{\boldsymbol{d}_i \cdot \boldsymbol{e}_R}{R^2} + \cdots\right). \tag{6.25}$$

II:6-7, Eq 6.26

$$p = \sum q_i \boldsymbol{d}_i \tag{6.26}$$

Summation index '*i*' missing.

$$p = \sum_i q_i \boldsymbol{d}_i , \tag{6.26}$$

II:6-7, Eq 6.27

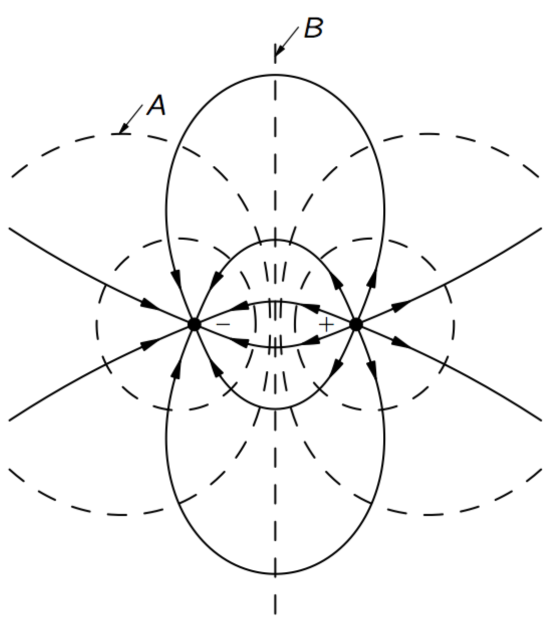
$$\phi = \frac{1}{4\pi\varepsilon_0}\frac{\boldsymbol{p}\cdot\boldsymbol{e}_r}{R^2}. \tag{6.27}$$

Inconsistent notation ('$\boldsymbol{e}_r$' vs. '$\boldsymbol{e}_R$'). See error II:6-7, par 2, *above*.

$$\phi = \frac{1}{4\pi\varepsilon_0}\frac{\boldsymbol{p}\cdot\boldsymbol{e}_R}{R^2}. \tag{6.27}$$

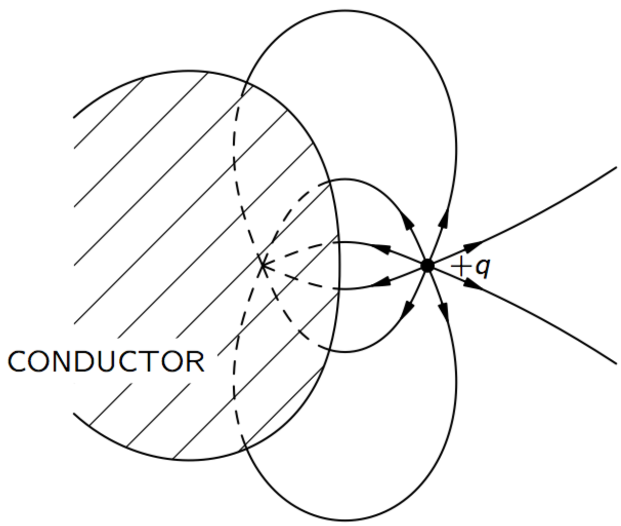
II:6-8, Fig. 6-8

The field lines in this figure are not accurately drawn; it should look more like:



II:6-8, Fig. 6-9

The field lines in this figure are not accurately drawn; it should look more like:



II:6-8, par 6

Figure 6-8 shows some of the field lines and equipotential surfaces we obtained by the computations in chapter 5.

Incorrect reference ('chapter 5' vs. 'chapter 4').

Figure 6-8 shows some of the field lines and equipotential surfaces we obtained by the computations in chapter 4.

II:6-9, par 5

You can find the surface charge density by using the result we worked out in Section 5-6 with Gauss' theorem.

Two errors: (1) it's Gauss' *law* not Gauss' theorem, (2) incorrect reference ('5-6' vs '5-9') [Gauss' law is used in both sections 5-6 and 5-9, but here Feynman is discussing the fields near a conductor, which is the subject of 5-9, not the fields of sheets of charge, which is the subject of 5-6.]

You can find the surface charge density by using the result we worked out in Section 5-9 with Gauss' law.

II:6-10, par 5

Let's find the fields around a metal sphere …

Incomplete statement (see Fig 6-11).

Let's find the fields around a grounded metal sphere …

II:6-12, par 4

[A very good approximation for the capacity is obtained if we use Eq. (6.34) but take for *A* the area one *would* get if the plates were extended artifcially by a distance 3/8 of the separation between the plates.]

Inexact or inaccurate statement. (See *Form and Capacitance of Parallel-Plate Capacitors*. by Nishiyama and Nakamura, IEEE Transactions of Components, Packaging, and Manufacturing Technology - Part A, Vol 17, No3, Sept 1994.) This statement should be struck.

II:6-13, par 2

From the definition of *C*, we see that its unit is one coul/volt.

Incorrect abbreviation of 'coulomb'.

From the definition of *C*, we see that its unit is one $\text{coulomb}/\text{volt}$.

II:6-14, par 2

… is placed at the center of an evacuated glass sphere (Fig. 6−16.)

Punctuation error: the period belongs at the end of the sentence, not in parentheses.

… is placed at the center of an evacuated glass sphere (Fig. 6−16).

II:6-14, par 4

The combination of these two effects limits the resolution to 25 A or so.

Incorrect abbreviation for angstrom ('A' vs. 'Å')

The combination of these two effects limits the resolution to 25 Å or so.

II:6-14, Fig. 6-17 caption

Courtesy of Erwin W. Mueller,

Incorrect spelling of proper name ('Mueller' vs. 'Müller')

Courtesy of Erwin W. Müller,

II:6-14, footnote

See E. W. Mueller:

Incorrect spelling of proper name ('Mueller' vs. 'Müller')

See E. W. Müller:

II:7-4, par 2

This fact is used to make devices (called quadrupole lenses) that are useful for focusing particle beams (see Section 29-9).

Incorrect reference.

This fact is used to make devices (called quadrupole lenses) that are useful for focusing particle beams (see Section 29-7).

II:7-5, Eq 7.13

$$F(\mathfrak{z}) = z^{3/2} \tag{7.13}$$

Two errors: (1) Error in formula: the mapping above can be used to find the field inside a 120 degree corner. The field outside a rectangular corner (= field inside a 270 degree corner) is found using the mapping shown below (and in the original lecture Feynman actually said "Z to the two-thirds"). (2) Typographic error ('z' vs. '$\mathfrak{z}$')

$$F(\mathfrak{z}) = \mathfrak{z}^{2/3} \tag{7.13}$$

II:7-6, par 2

Let n_0 be the density of electrons in the undisturbed equilibrium state. This must also be the density of positive ions, …

Incomplete statement. The density of positive ions is n_0 only if we assume that all positive ions come from molecules that have lost just one electron.

Let n_0 be the density of electrons in the undisturbed equilibrium state. Assuming the molecules are singly ionized, this must also be the density of positive ions, …

II:7-7, par 1

Its time variation will be as cos ωt, or—

The plasma frequency is denoted ω_p not just ω.

Its time variation will be as cos $\omega_p t$, or—

II:7-7, Eq 7.24

$$e^{i\omega\ _p t}. \tag{7.24}$$

Too large of a gap between ω and its subscript *p*.

$$e^{i\omega_p t}. \tag{7.24}$$

II:7-7, par 5

… which are separated by the the energy

Superflous repetition of "the"

… which are separated by the energy

II:7-9, Eq 7.35

$$D^2 = \frac{\varepsilon_0 kT}{2n_0 q^2}. \tag{7.35}$$

Missing subscript ('q' vs. 'q_e', see preceding Eqs).

$$D^2 = \frac{\varepsilon_0 kT}{2n_0 q_e^2}. \tag{7.35}$$

II:7-9, par 3

Equation (7.36) says that the sheath gets thinner with increasing concentration of ions (n_0) or with decreasing temperature.

Incorrect reference.

Equation (7.35) says that the sheath gets thinner with increasing concentration of ions (n_0) or with decreasing temperature.

II:7-9, par 4

… if we know the surface charge σ on the colloidal particle.

Inaccurate statement; σ is the surface charge density. See last sentence of 1st par of pp 7-10, and also Eq. (5.8).

… if we know the surface charge density σ on the colloidal particle.

II:7-9, par 4

But E is also the gradient of ϕ:

E is a vector field and should therefore be bold (only vector fields can be gradients of scalar fields).

But $\boldsymbol{E}$ is also the gradient of ϕ:

II:8-2, Fig. 8-2

The charge being brought to the sphere should be labelled *dQ* instead of *dq*, as per the second unnumbered equation on the page.

II:8-2, par 1

We can also interpret Eq. (8.7) as saying that the average of (1/r_ij) for all pairs of points in the sphere is 3/5a.

The statement is essentially saying that the righthand side of Eq. 8.3 is equal to the righthand side of eqn 8.7. The $4\pi\varepsilon_0$'s drop out from both sides and you end up with $\sum 1/r_{ij} = 3/5a\left(Q^2/q^2\right) = 3/5a\left(N^2\right)$ where N is the number of charges. We can then rewrite this as $\left(\sum 1/r_{ij}\right)/N^2 = 3/5a$. However, the number of *pairs* of charges is not N^2, but $N\left(N-1\right)/2$, which, for large N, is approximately $N^2/2$, so the average of $\left(1/r_{ij}\right)$ is actually closer to $6/5a$, by this analysis.

We can also interpret Eq. (8.7) as saying that the average of $\left(1/r_{ij}\right)$ for all pairs of points in the sphere is $6/5a$.

II:8-5, par 1

The spacing of the ions is 2.81 A …

Wrong symbol for Angstrom ('A' vs. 'Å').

The spacing of the ions is 2.81 Å…

II:8-5, Fig 8-5

2.81 A

Wrong symbol for Angstrom ('A' vs. 'Å').

2.81 Å

II:8-5, par 2

… the energy of vaporization can also be given as…

Wrong word ('vaporization ' vs. 'dissociation').

… the energy of dissociation can also be given as…

II:8-8, par 7

In going from B11 to C11, we replace a neutron by a proton, which has less mass. So part of the energy difference is the difference in the rest energies of a neutron and a proton, which is 0.784 Mev.

The difference between the rest energies of a neutron and a proton is 1.293 MeV, not .784 MeV. Feynman fails to mention the rest energy of the electron that must be added to the atom (to keep it neutral) when transitioning from B11 (Z=5) to C11 (Z=6), though he includes that energy in his calculation.

In going from B11 to C11, we replace a neutron by a proton and an electron, which have less mass. So part of the energy difference is the difference in the rest energies of a neutron and that of a proton plus an electron, which is 0.784 Mev.

II:8-9, unnumbered Eq below Eq 8.26

$r = (1.2 \times 10^{-13})\,(11)^{1/3} = 2.7 \times 10^{-13}$ cm.

Missing unit ("cm"), and the factor $(11)^{1/3}$ should go in front to better match Eq. (8.25).

$r = (11)^{1/3}\,(1.2 \times 10^{-13})$ cm $= 2.7 \times 10^{-13}$ cm.

II:8-9, Eq 8.27 [introduced in the 2nd printing]

$$U = \frac{1}{2}\int_{\text{all}} \frac{\rho(1)\rho(2)}{4\pi\varepsilon_0 r_{12}}\,dV_1 dV_2. \qquad (8.27)$$

The word "space" (which should appear directly below "all") is missing.

$$U = \frac{1}{2}\int_{\substack{\text{all}\\ \text{space}}} \frac{\rho(1)\rho(2)}{4\pi\varepsilon_0 r_{12}}\,dV_1 dV_2. \qquad (8.27)$$

II:9-1, caption of section 9-1

9-1 The electric potential gradient of the amosphere

Incorrect spelling of "atmosphere."

9-1 The electric potential gradient of the atmosphere

II:9-5, par 2

In the figure the little crosses indicate snow and the dots indicate rain, …

Innacurate description of figure ('little crosses' vs. 'little stars').

In the figure the little stars indicate snow and the dots indicate rain, …

II:9-5, par 2

As the warm, moist air at the bottom rises, it cools and condenses.

Inaccurate statement. The air itself does not condense.

As the warm, moist air at the bottom rises, it cools and the water vapor in it condenses.

II:9-11, par 3

It is called a "dark leader" …

Wrong word. ('dark' vs. 'dart') See: http://en.wikipedia.org/wiki/Dart_leader (where this slip is mentioned).

It is called a "dart leader" …

II:9-11, par 4

…it can sometimes happen that the *dark* leader of the second stroke…

Wrong word. ('dark' vs. 'dart') See errata for II:9-11, par 3.

…it can sometimes happen that the *dart* leader of the second stroke…

II:9-11, par 7

…—that you have a greater wisdom in advising kings on military matters than did Artabanus 2300 years ago?

Wrong century. The citations are from Herodotus, Histories, Book VII. Artabanus gave this advice to Xerxes during the preparation of the Second Greco-Persian War,so close to 480 BC. At the time of the lecture that would have been about 2440 years ago..

…—that you have a greater wisdom in advising kings on military matters than did Artabanus 2400 years ago?

II:10-4, par 1, unnumbered Eq

$$\sigma_{\text{pol}} = Nq_e\ \ \delta.$$

Unwanted extra space between q_e and δ.

$$\sigma_{\text{pol}} = Nq_e\delta.$$

II:10-4, Eq 10.8

$$\boldsymbol{P} = \chi\boldsymbol{\varepsilon}_0\boldsymbol{E}. \tag{10.8}$$

Epsilon should not be bold ('$\boldsymbol{\varepsilon}_0$' vs. '$\varepsilon_0$').

$$\boldsymbol{P} = \chi\varepsilon_0\boldsymbol{E}. \tag{10.8}$$

II:10-5, par 6

… so we get again that $\sigma = P$.

Missing subscript on sigma ('σ' vs. 'σ_{pol}').

… so we get again that $\sigma_{\text{pol}} = P$.

II:10-6, par 1

Of course, the curl of E is unchanged:

Vectors should be bold italic ('E' vs. '$\boldsymbol{E}$')

Of course, the curl of $\boldsymbol{E}$ is unchanged:

II:11-1, par 2

As we pointed out in Chapters 6 and 7, there is in the water vapor molecule an average plus charge on the hydrogen atoms and a negative charge on the oxygen.

Incorrect reference (no mention is made of the water vapor molecule in chapter 7).

As we pointed out in Chapter 6, there is in the water vapor molecule an average plus charge on the hydrogen atoms and a negative charge on the oxygen.

II:11-2, par 5

From Eq. (11.9) we would predict...

(incorrect reference)

From Eq. (11.10) we would predict...

II:11-3, par 3

… it takes about 24.5 volts to pull the electron off helium,

Wrong voltage ('24.5' vs. '24.6') and wrong unit ('volts' vs. 'electron volts'). See Table III:19-2, line 2.

… it takes about 24.6 electron volts to pull the electron off helium,

II:11-3, par 3

… compared with the 13.5 volts required to ionize hydrogen.

Wrong voltage ('13.5' vs. '13.6') and wrong unit ('volts' vs. 'electron volts'). See, for example, Vol I, Eq 38.13.

… compared with the 13.6 electron volts required to ionize hydrogen.

II:11-4, par 6, unnumbered Eq

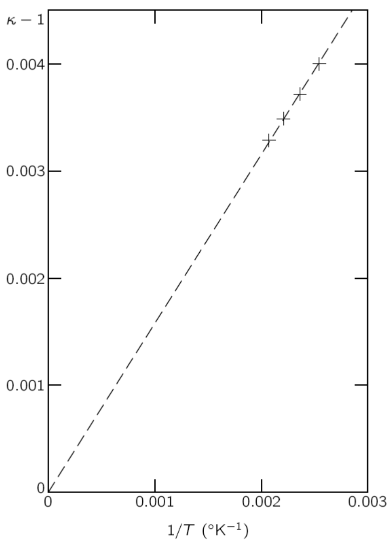
$$P = -\frac{N}{2}\int_0^{\pi}\left(1+\frac{p_0 E}{kT}\cos\theta\right)p_0\cos\theta\, d\left(\cos\theta\right)$$

Incorrect limits of integration. θ goes from 0 to π (see Eq 11.19), so cos θ goes from 1 to −1.

$$P = -\frac{N}{2}\int_1^{-1}\left(1+\frac{p_0 E}{kT}\cos\theta\right)p_0\cos\theta\, d\left(\cos\theta\right)$$

II:11-5, Fig. 11-4

κ - 1 is proportional to 1/*T*and therefore the dashed line should go through the origin. Below the figure is replotted, using data from the cited article (Sänger et al.)



II:11-2, Fig 11-5

The E vector should be the same length in parts (b) and (d) of the figure.

II:11-7, Table 11-1, last line

A 1.000545 0.000545 0.00178 …

Incorrect abbreviation for Argon ('A' vs. 'Ar').

Ar 1.000545 0.000545 0.00178 …

II:11-10, par 3

There are two solutions: E and p both zero, or

$$\alpha = \frac{a^3}{0.383},$$

with E and p both finite.

Missing subscript: 'E' vs. 'E_{chain}' (2 times)

There are two solutions: E_{chain} and p both zero, or

$$\alpha = \frac{a^3}{0.383},$$

with E_{chain} and p both finite.

II:11-11, par 1

So α(average) = 16.3 × 10^{-24}, which is not high enough to give a permanent polarization.

Unit of α missing.

So α(average) = 16.3 × 10^{-24} cm^3, which is not high enough to give a permanent polarization.

II:11-11, par 2

(A more precise computation using alternating atoms shows that actually 11.9 × 10^{-24} is needed.)

Unit missing.

(A more precise computation using alternating atoms shows that actually 11.9 × 10^{-24} cm^3 is needed.)

II:12-1, par 3

There is a potential (ϕ) whose gradient multiplied by a scalar function (κ) has a divergence equal to another scalar function $(-\rho/\varepsilon_0)$.

Missing subscript on rho (‘ ρ ’ vs. ‘ ρ_{free} ’).

There is a potential (ϕ) whose gradient multiplied by a scalar function (κ) has a divergence equal to another scalar function $(-\rho_{\text{free}}/\varepsilon_0)$.

II:12-8, par 5

Then we represent the flow by giving the velocity vector $v(\boldsymbol{r})$ as a function of position $\boldsymbol{r}$.

‘v’ is a vector and so it should be bold (‘ $v(\boldsymbol{r})$ ’ vs. ‘ $\boldsymbol{v}(\boldsymbol{r})$ ’).

Then we represent the flow by giving the velocity vector $\boldsymbol{v}(\boldsymbol{r})$ as a function of position $\boldsymbol{r}$.

II:12-9, par 5

We want to get a quantative description for the velocity field, …

Incorrect spelling ('quantative' vs. 'quantitative').

We want to get a quantitative description for the velocity field, …

II :12-9, par 6

To satisfy (2), we must have $\partial\psi/\partial z = \boldsymbol{v}_0$ at all points where $r >> a$.

Only vectors should be bold ($\boldsymbol{v}$ vs. v)

To satisfy (2), we must have $\partial\psi/\partial z = v_0$ at all points where $r >> a$.

II:12-9, last par

Find a solution of $\boldsymbol{\nabla}^2\phi = 0$ such that …

Consistency error: the Laplace operator should not be bold ($\boldsymbol{\nabla}^2$ vs. ∇^2)

Find a solution of $\nabla^2\phi = 0$ such that …

II:12-11, par 1

… then I, the energy arriving *per unit area* of the surface, is only cos θ as great,

Missing subscript ('I' vs. 'I_n').

… then I_n , the energy arriving *per unit area* of the surface, is only cos θ as great,

II:12-11, par 2

… within one part in a thousand? *Answer;* …

Punctuation error (';' vs. ':') .

… within one part in a thousand? *Answer:* …

II:12-12, par 1

(An exact calculation shows that A_1 is really twice the average field, so the exact answer is $b = 0.8z$.)

Inaccurate statement. $b = 0.8z$ is just the next approximation, which, though it is much better the previous two approximations (0.91 and ¾), is not exact. Using the closed form obtainable for the grid potential in Section 7-5, a more exact calculation yields b = 0.827z.

(An exact calculation shows that A_1 is really twice the average field, so that $b \approx 0.83z$.)

II:13-2, Fig 13-4, caption

The integral of $\boldsymbol{j}\cdot\boldsymbol{n}$ over a closed surface is the rate of change of the total charge Q inside.

Sign error. See Eq 13.6.

The integral of $\boldsymbol{j}\cdot\boldsymbol{n}$ over a closed surface is negative the rate of change of the total charge Q inside.

II:13-3, caption of section 13-4

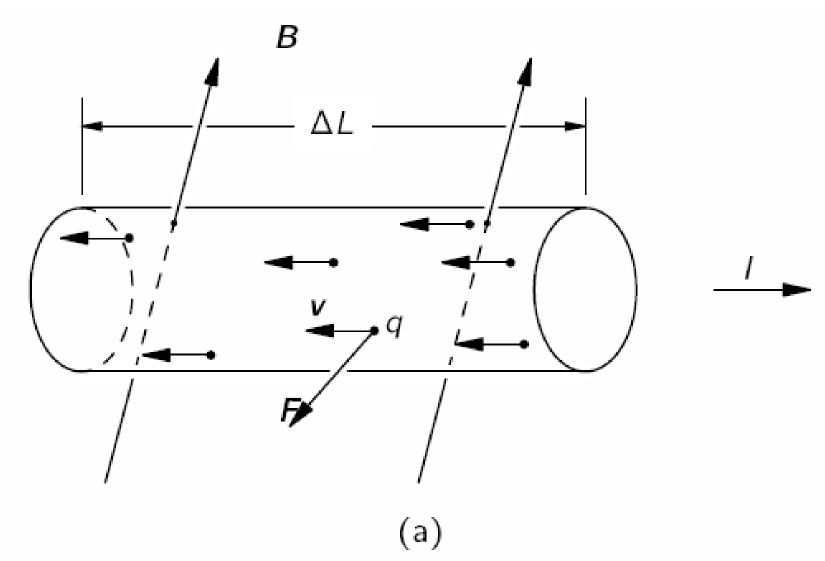
13-4 The magnetic field of steady currents; Ampere's law

Incorrect spelling of proper name ('Ampere' vs. 'Ampère)

13-4 The magnetic field of steady currents; Ampère's law

II:13-3, Fig 13-5(a)

The velocity vectors should point in the opposite direction. The caption speaks of charges in a current-carrying wire, which would be electrons. Also, for clarity, the ***B*** vectors should be tilted downward some, so that it is clearer that they point out of the page and toward the reader. It should look like:



II:13-3, par 3

… brilliant theoretical arguments given by Ampere.

Incorrect spelling of proper name ('Ampere' vs. 'Ampère)

… brilliant theoretical arguments given by Ampère.

II:13-4, last par

This law—called *Ampere's law*—plays … Ampere's law alone …

Incorrect spelling of proper name ('Ampere' vs. 'Ampère)

This law—called *Ampère's law*—plays … Ampère's law alone …

II:13-5, par 1

We can illustrate the use of Ampere's law … , then Ampere's law, …

Incorrect spelling of proper name ('Ampere' vs. 'Ampère)

We can illustrate the use of Ampère's law … , then Ampère's law, …

II:13-5, par 4

… can be analyzed by Ampere's law if we add … , together with Ampere's law, we …

Incorrect spelling of proper name ('Ampere' vs. 'Ampère)

… can be analyzed by Ampère's law if we add … , together with Ampère's law, we …

II:13-5, last par

…, we can use Ampere's law with …

Incorrect spelling of proper name ('Ampere' vs. 'Ampère)

…, we can use Ampère's law with …

II:13-7, par 4

We let the density of the conduction electrons be ρ_- ...

Missing word ('density' vs. 'charge density').

We let the charge density of the conduction electrons be ρ_- ...

II:13-7, par 5

Using Eqs. (13.4) and (13.5), the current I can be written as $\rho_- vA$ ...

Incorrect reference ('13.4' vs. '13.3').

Using Eqs. (13.3) and (13.5), the current I can be written as $\rho_- vA$ ...

II:13-7, last par

… the wire will make some magnetic field *B'* at …

Vectors should be bold ('*B*' vs. '***B***')

… the wire will make some magnetic field ***B'*** at …

II:13-8, par 8

This must also be equal to $\rho_0 L_0 A$, …

Typographic error ('A' vs. 'A_0')

This must also be equal to $\rho_0 L_0 A_0$, …

II:13-8, Fig 13-11(a) and (b)

Two errors: (1) "Area *A*" should be "Area A_0" (two occurences) and (2) vector v should point in the opposite direction

II:13-8, Fig 13-11(b)

L' should be L (see Eq 13.22).

II:13-9, par 3

... because they have the density ρ_-' when ...

Wrong prime.

... because they have the density ρ_- when ...

II:13-10, Fig 13-12

The arrowheads indicating the directions of magnetic fields B and B' should (both) point in the other direction (right-hand rule).

II:13-11, par 4

Now we know that the energy *U* and momentum *p* of …

Vectors should be bold ('*p*' vs. '***p***')

Now we know that the energy *U* and momentum ***p*** of …

II:14-2, par 1

Then *A* and *A'* must have the same curl:

Vectors should be bold ('*A*' vs. '***A***', 2 times)

Then ***A*** and ***A'*** must have the same curl:

II:14-2, par 2

… ***A*** have the same curl, and give the same *B*, …

Vectors should be bold ('*B*' vs. '***B***')

… ***A*** have the same curl, and give the same ***B***, …

II:14-3, Eq 14.9

$$\boldsymbol{A} = ½\boldsymbol{B}\times\boldsymbol{r}'. \quad (14.9)$$

Missing subscript (' $\boldsymbol{B}$ ' vs. ' $\boldsymbol{B}_0$ '). See Eq 14.8.

$$\boldsymbol{A} = ½\boldsymbol{B}_0\times\boldsymbol{r}'. \quad (14.9)$$

II:14-3, par 2

The vector potential $\boldsymbol{A}$ has the magnitude $Br'/2$ …

Missing subscript (' B ' vs. ' B_0 '). See error II:14-3, Eq 14.9.

The vector potential $\boldsymbol{A}$ has the magnitude $B_0r'/2$ …

II:14-5, par 2, unnumbered Eq

$$A_z = -\frac{\pi a\ ^2 j_z}{2\pi\varepsilon_0 c^2}\ln r'$$

Unwanted space between ' a ' and its superscript 2 (' $a\ ^2$ ' vs. ' a^2 ').

$$A_z = -\frac{\pi a^2 j_z}{2\pi\varepsilon_0 c^2}\ln r'$$

II:14-5, par 6

The result is the same as the electrostatic potential outside a cylinder with a surface charge

$$\sigma = \sigma_0 \sin\phi,$$

with $\sigma_0 = J/c^2$.

Wrong sign ('J/c^2' vs. '$-J/c^2$'). See preceding unnumbered equation.

The result is the same as the electrostatic potential outside a cylinder with a surface charge

$$\sigma = \sigma_0 \sin\phi,$$

with $\sigma_0 = -J/c^2$.

II:14-5, last par

The result is the same as the electrostatic potential outside a cylinder with a surface charge

$$\sigma = \sigma_0 \sin\phi,$$

Inaccurate statement; σ is the surface charge density. See 2nd par of Section 14-4.

The result is the same as the electrostatic potential outside a cylinder with a surface charge density

$$\sigma = \sigma_0 \sin\phi,$$

II:14-6, par 4

… should be equal to the flux of B inside the …

Vectors should be bold ('B' vs. '$\boldsymbol{B}$')

… should be equal to the flux of $\boldsymbol{B}$ inside the …

II:14-7, Fig 14-6, caption

$(R >> a,$ or $b.)$

Incorrect punctuation (there should be no comma after '*a*').

$(R >> a$ or $b.)$

II:14-8, par 5

(See Eqs. (6.14) and (6.15); also Fig. 6-5.)

Incorrect reference ('Fig. 6-5' vs. 'Fig. 6-4')

(See Eqs. (6.14) and (6.15); also Fig. 6-4.)

II:14-8, par 6

… $\nabla\cdot E=\rho/\varepsilon_0$ and $\nabla\times B=j/\varepsilon_0c^2$,

Five errors: E, B, and j are supposed to be vectors and $\nabla\cdot$ and $\nabla\times$ are supposed to be vector operators, so they should all be bold. See Eqs. 14.1 and 14.2.

… $\boldsymbol{\nabla\cdot E}=\rho/\varepsilon_0$ and $\boldsymbol{\nabla\times B}=\boldsymbol{j}/\varepsilon_0c^2$,

II:14-8, last line of Eq 14.36

$$=\cdots\left(\frac{1}{r^3}-\frac{3z^2}{r^5}\right)$$

Both *r* in the denominators should be uppercase

$$=\cdots\left(\frac{1}{R^3}-\frac{3z^2}{R^5}\right)$$

II:14-9, par 3

In studying electrostatics we found that the electric field of a known charge distribution could be obtained directly with an integral (Eq. 4-16):

Incorrect punctuation of equation number ('(Eq. 4-16)' vs. 'Eq. (4.16)').

In studying electrostatics we found that the electric field of a known charge distribution could be obtained directly with an integral, Eq. (4.16):

II:15-1, par 1

… where I is the current and A is the area of the loop. The direction of the moment is normal to the plane of the loop, so we can also write

$$\mu = IA\mathbf{n},$$

where **n** is the unit normal to the area A.

Vectors should be bold italic ('**n**' vs. '***n***', 2 times).

… where I is the current and A is the area of the loop. The direction of the moment is normal to the plane of the loop, so we can also write

$$\mu = IA\boldsymbol{n},$$

where ***n*** is the unit normal to the area A.

II:15-1, par 3

You will remember that we found the same kind of relationship for the torque of an electric dipole:

The torque of an electric dipole is not mentioned anywhere else.

The same kind of relationship holds for the torque of an electric dipole in an electric field:

II:15-1, par 4, unnumbered Eq

$$dU = -\tau\, d\theta.$$

Wrong sign. U decreases when θ decreases and $\tau > 0$.

$$dU = \tau\, d\theta.$$

II:15-2, par 1

Setting $\tau = -\mu B \sin\theta,$ and integrating, …

Wrong sign. See unnumbered Eqs on page 15-1 (also, the integral of sin θ is – cos θ).

Setting $\tau = \mu B \sin\theta,$ and integrating, …

II:15-2, par 1

… the energy is lowest when μ and B are parallel.

Vectors μ and B are parallel (not their magnitudes); vectors should be bold.

… the energy is lowest when $\boldsymbol{\mu}$ and $\boldsymbol{B}$ are parallel.

II:15-2, par 3

Again, this corresponds to our result for an electric dipole:

The energy of an electric dipole is given in a different chapter - see Eq. (11.14).

Again, this corresponds to the result for an electric dipole:

II:15-3, Eq 15.9

$$U_{\text{mech}} = W = -Iab\ \ B = -\mu B$$

There should be less space between 'b' and 'B'.

$$U_{\text{mech}} = W = -IabB = -\mu B$$

II:15-5, Fig 15-3

In both parts (a) and (b) of the figure the symbol for the battery cell is reversed. The positive side should be the longer line.

II:15-6, Fig 15-4

In the small box that the vectors **n** and **B** are coming out of, the current arrow at the bottom of the box is reversed.

II:15-7, par 1

So we may if we wish think of $\boldsymbol{A}$ as a kind of potential energy for currents in magnetostatics.

Inaccurate statement – $\boldsymbol{A}$ is not energy (in the original lecture Feynman said "a kind of potential" not "a kind of potential energy").

So we may if we wish think of $\boldsymbol{A}$ as a kind of potential for currents in magnetostatics.

II:15-9, Fig 15-5

Exchange path labels (1) and (2) for consistency with equations.

II:15-11, Fig 15-7

Exchange path labels (1) and (2) for consistency with equations.

II:15-12, par 4

… when Bohm and Aharanov first suggested it …

Misspelled name ("Aharanov" vs. "Aharonov").

… when Bohm and Aharonov first suggested it …

II:15-12, footnote

If the field ***B*** comes out of the plane of the figure, the flux as we have defined it is negative and x_0 is positive.

Incorrect statement.

If the field ***B*** comes out of the plane of the figure, the flux as we have defined it is positive and since q for electrons is negative, x_0 is positive.

II:15-13, Fig 15-8

Delete superfluous '3' at the head of arrow (2). Exchange path labels (1) and (2) for consistency with equations.

II:15-13, par 1

Using Eq. (15.28),

$$\Delta x = \frac{L\lambda\!\!\!^{-}}{d}\Delta\delta = \frac{L\lambda\!\!\!^{-}}{d}\left[\delta - \delta\left(B=0\right)\right]$$

Wrong reference and wrong sign.

Using Eq. (15.35),

$$\Delta x = -\frac{L\lambda\!\!\!^{-}}{d}\Delta\delta = -\frac{L\lambda\!\!\!^{-}}{d}\left[\delta - \delta\left(B=0\right)\right]$$

II:15-13, Eq 15.38

$$\Delta x = L\lambda\!\!\!^{-} \frac{q}{\hbar} Bw. \tag{15.38}$$

Wrong sign. (See error II:15-13, par 1, above). [Note: q for electrons is negative thus the minus sign is needed for Δx to be positive.]

$$\Delta x = -L\lambda\!\!\!^{-} \frac{q}{\hbar} Bw. \tag{15.38}$$

II:15-13, Eq 15.39

$$\alpha = \frac{\Delta x}{L} = \frac{\lambda\!\!\!^{-}}{\hbar} qBw. \tag{15.39}$$

Wrong sign. (See error II:15-13, Eq 15.38, above).

$$\alpha = \frac{\Delta x}{L} = -\frac{\lambda\!\!\!^{-}}{\hbar} qBw. \tag{15.39}$$

II:15-13, Eq 15.40

$$\Delta p_x = qwB. \tag{15.40}$$

Wrong sign. (See error II:15-13, Eq 15.39, above). [Note: We need $\Delta p_x > 0$, towards the top of the page as shown in Fig. 15-8. $\boldsymbol{v}$ goes to the right and $\boldsymbol{B}$ comes out of the page, so $\boldsymbol{v} \times \boldsymbol{B}$ points toward the bottom of the page (as per the footnote on page 15-12). However, since q for electrons is negative, the force $q\boldsymbol{v} \times \boldsymbol{B}$ is directed upward.]

$$\Delta p_x = -qwB. \tag{15.40}$$

II:15-13, Eq 15.41

$$\alpha' = \frac{\Delta p_x}{p} = \frac{qwB}{p}. \tag{15.41}$$

Wrong sign. (See error II:15-13, Eq 15.40, above).

$$\alpha' = \frac{\Delta p_x}{p} = -\frac{qwB}{p}. \tag{15.41}$$

II:15-14, par 2

it always turns out that the effects depend only on how much the field *A changes* from point to point, …

The vector potential is a vector field and therefore 'A' should be bold ('A' vs '$\boldsymbol{A}$').

it always turns out that the effects depend only on how much the field ***A** changes* from point to point, …

II:15-15, Table 15-1, row 5 col 2, middle Eq

$$\boldsymbol{A}(1,t) \pm \frac{1}{4\pi\varepsilon_0 c^2}\int\frac{\boldsymbol{j}(2,t')}{r_{12}}dV_2$$

Typographical error ('$\pm$' vs. '$=$').

$$\boldsymbol{A}(1,t) = \frac{1}{4\pi\varepsilon_0 c^2}\int\frac{\boldsymbol{j}(2,t')}{r_{12}}dV_2$$

II:16-3, Fig 16-3

For the indicated current direction, the ***B*** lines point in the wrong direction.

II:16-5, Fig 16-6

The lead wires to the coil are both coming out on the same side and in front of the bar. It would be more consistent to show the top wire coming out from behind the bar (see, for example Fig.s 16-5 and 16-8).

II:16-5, par 3

... the induced current in the ring is making a downward-point north pole.

Grammatical error ("downward-point" vs. "downward-pointing").

... the induced current in the ring is making a downward-pointing north pole.

II:17-2, Eq 17.3

$$\oint_\Gamma \boldsymbol{E}\cdot d\boldsymbol{s} = -\frac{\partial}{\partial t}\int_S \boldsymbol{B}\cdot\boldsymbol{n}\,da = -\frac{\partial}{\partial t}(\text{flux through } S)$$

The two partial time derivatives should be total derivatives

$$\oint_\Gamma \boldsymbol{E}\cdot d\boldsymbol{s} = -\frac{d}{dt}\int_S \boldsymbol{B}\cdot\boldsymbol{n}\,da = -\frac{d}{dt}(\text{flux through } S)$$

II:17-3, par 3

It is defined as the tangential component of ***E*** integrated around the curve. Faraday's law says that this line integral is equal to the rate of change of the magnetic flux through the closed curve, Eq. (17.3).

Sign error.

It is defined as the tangential component of ***E*** integrated around the curve. Faraday's law says that this line integral is equal to minus the rate of change of the magnetic flux through the closed curve, Eq. (17.3).

II:17-4, Fig 17-4

The velocity vector v and the (4) vectors labelled 'qE' are all drawn in the wrong direction. The direction of v should be reversed and the labels 'qE' should be changed to 'E'.

II:17-4, Fig 17-4, caption

An electron accelerating in an axially symmetric, time-varying magnetic field.

Indefinite statement ("time-varying" vs. "increasing").

An electron accelerating in an axially symmetric, increasing magnetic field.

II:17-4, par 1

If the electron's orbit has the radius *r*, the line integral of ***E*** around the orbit is equal to the rate of change of the magnetic flux through the circle.

Sign error.

If the electron's orbit has the radius *r*, the line integral of ***E*** around the orbit is equal to minus the rate of change of the magnetic flux through the circle.

II:17-4, par 1, unnumbered Eq

$$2\pi rE = \frac{\partial}{\partial t}\left(B_{\text{av}} \cdot \pi r^2\right)$$

Partial derivative should be a full derivative.

$$2\pi rE = \frac{d}{dt}\left(B_{\text{av}} \cdot \pi r^2\right)$$

II:17-5, par 2

… the average magnetic field inside the orbit increase at twice …

Typographical error ('increase' vs. 'increases').

… the average magnetic field inside the orbit increases at twice …

II:17-6, footnote

… for a Surface area.

Typographical error ('Surface' vs. 'surface')

… for a surface area.

II:17-8, par 2

… let's analyze what happens in the setup described in Section 12, and shown in Fig. 17-1.

Incorrect reference.

… let's analyze what happens in the setup described in Section 17-1, and shown in Fig. 17-1.

II:18-2, Table 18-1, line 4

IV. $c^2\nabla\times\boldsymbol{B}=\dfrac{\boldsymbol{j}}{\varepsilon_0}+\dfrac{\partial\boldsymbol{E}}{\partial t}$ $c^2\left(\text{Integral of }\boldsymbol{B}\text{ around a loop}\right)$ = (Current through the loop)$/\varepsilon_0$

$+\dfrac{\partial}{\partial t}\left(\text{Flux of }\boldsymbol{E}\text{ through the loop}\right)$

The partial derivative on $\left(\text{Flux of }\boldsymbol{E}\text{ through the loop}\right)$ should be a total derivative [see chapter II:1].

II. $c^2\nabla\times\boldsymbol{B}=\dfrac{\boldsymbol{j}}{\varepsilon_0}+\dfrac{\partial\boldsymbol{E}}{\partial t}$ $c^2\left(\text{Integral of }\boldsymbol{B}\text{ around a loop}\right)$ = (Current through the loop)$/\varepsilon_0$

$+\dfrac{d}{dt}\left(\text{Flux of }\boldsymbol{E}\text{ through the loop}\right)$

II:18-2, Table 18-1, line 5

$\nabla\cdot\boldsymbol{j}=-\dfrac{\partial\rho}{\partial t}$ $\left(\text{Flux of current through a closed surface}\right)$ =

$-\dfrac{\partial}{\partial t}\left(\text{Charge inside}\right)$

The partial derivative on $\left(\text{Charge inside}\right)$ should be a total derivative.

$\nabla\cdot\boldsymbol{j}=-\dfrac{\partial\rho}{\partial t}$ $\left(\text{Flux of current through a closed surface}\right)$ =

$-\dfrac{d}{dt}\left(\text{Charge inside}\right)$

II:18-4, par 2

... the current close to the wire ...

Incorrect description.

... the current close to the plate ...

II:18-5, par 2

… effects by writing the momentum as $p = m_0 v / \sqrt{1 - v^2 / c^2}$.

Vectors should be bold ('p' vs. '$\boldsymbol{p}$' and 'v' vs. '$\boldsymbol{v}$')

… effects by writing the momentum as $\boldsymbol{p} = m_0 \boldsymbol{v} / \sqrt{1 - v^2 / c^2}$.

II:18-6, Fig 18-4

The width shown at the bottom should be *vT* not just *T*.

II:18-7, last 2 lines before Eq 18.10

... this should equal the line integral of $\boldsymbol{E}$ around Γ_2, which is just EL.

Wrong sign (see Faraday's law in Table 18-1)

... this should equal minus the line integral of $\boldsymbol{E}$ around Γ_2, which is just EL.

II:18-9, par 3

… work of Faraday, Oersted, and Ampere.

Incorrect spelling of proper name ('Ampere' vs. 'Ampère')

… work of Faraday, Oersted, and Ampère.

II:18-10, line above Eq 18.22

$$\boldsymbol{\nabla}(\boldsymbol{\nabla} \cdot \boldsymbol{A}) - \boldsymbol{\nabla}^2 \boldsymbol{A}$$

Consistency error: the Laplace operator should not be bold ($\boldsymbol{\nabla}^2$ vs. ∇^2)

$$\boldsymbol{\nabla}(\boldsymbol{\nabla} \cdot \boldsymbol{A}) - \nabla^2 \boldsymbol{A}$$

II:18-11, footnote

Equation (18.23) is called "the Lorentz gauge."

Wrong physicist. Ludwig Valentin Lorenz wrote down this gauge condition in 1867, when Hendrik Antoon Lorentz was 14 years old. [See the correction for chapter 4 page 79 of "An Introduction to Quantum Field Theory," by Peskin & Schroeder, documented in the errata posted at http://www.slac.stanford.edu/~mpeskin/QFT.html]

Equation (18.23) is called "the Lorenz gauge."

II:19-7, par 5

…, where, you remember, $\boldsymbol{p} = m\boldsymbol{v} / \sqrt{1 - v^2/c^2}$.

Typographical error ('m' vs 'm_0').

…, where, you remember, $\boldsymbol{p} = m_0\boldsymbol{v} / \sqrt{1 - v^2/c^2}$.

II:19-8, 2nd Eq

$$\mathcal{L} = -m_0 c^2 \sqrt{1 - v^2/c^2} - q(\phi + \boldsymbol{v} \cdot \boldsymbol{A})$$

wrong sign in parenthesis (see Eq. on p. 19-7)

$$\mathcal{L} = -m_0 c^2 \sqrt{1 - v^2/c^2} - q(\phi - \boldsymbol{v} \cdot \boldsymbol{A})$$

II:19-10, 9th unnumbered Eq

$$\int \frac{\partial \underline{\phi}}{\partial x} \frac{\partial f}{\partial x} dx = f \frac{\partial \phi}{\partial x} - \int f \frac{\partial^2 \underline{\phi}}{\partial x^2} dx$$

The 1st ϕ on the RHS is missing its underbar

$$\int \frac{\partial \underline{\phi}}{\partial x} \frac{\partial f}{\partial x} dx = f \frac{\partial \underline{\phi}}{\partial x} - \int f \frac{\partial^2 \underline{\phi}}{\partial x^2} dx$$

II:19-11, 1st unnumbered Eq

$$\boldsymbol{\nabla}^2 \underline{\phi} = -\rho / \varepsilon_0$$

Consistency error: the Laplace operator should not be bold ($\boldsymbol{\nabla}^2$ vs. ∇^2)

$$\nabla^2 \underline{\phi} = -\rho / \varepsilon_0$$

II:19-11, 2nd unnumbered Eq

$$\boldsymbol{\nabla} \cdot (f \boldsymbol{\nabla} \underline{\phi}) = \boldsymbol{\nabla} f \cdot \boldsymbol{\nabla} \underline{\phi} + f \boldsymbol{\nabla}^2 \underline{\phi}$$

Consistency error: the Laplace operator should not be bold ($\boldsymbol{\nabla}^2$ vs. ∇^2)

$$\boldsymbol{\nabla} \cdot (f \boldsymbol{\nabla} \underline{\phi}) = \boldsymbol{\nabla} f \cdot \boldsymbol{\nabla} \underline{\phi} + f \nabla^2 \underline{\phi}$$

II:19-11, Text below 2nd unnumbered Eq

we replace $-\boldsymbol{\nabla}\underline{\phi}\cdot\boldsymbol{\nabla}f$ by $f\boldsymbol{\nabla}^2\underline{\phi}-\boldsymbol{\nabla}\cdot(f\boldsymbol{\nabla}\underline{\phi})$, which gets integrated …

Two errors: (1) Irritating sign (see 7th unnumbered Eq on p. 19-10) and (2) Consistency error: the Laplace operator should not be bold ($\boldsymbol{\nabla}^2$ vs. ∇^2)

we replace $\boldsymbol{\nabla}\underline{\phi}\cdot\boldsymbol{\nabla}f$ by $\boldsymbol{\nabla}\cdot(f\boldsymbol{\nabla}\underline{\phi})-f\nabla^2\underline{\phi}$, which gets integrated …

II:19-11, 5th unnumbered Eq

$$\Delta U^* = \int(-\varepsilon_0\nabla^2\underline{\phi}-\rho\underline{\phi})f\,dV$$

The second $\underline{\phi}$ is superfluous (see the following Eq. and the last Eq. on p. 19-10)
(Note: This typo was also posted to sci.physics by "hetware":
http://groups.google.at/group/sci.physics/browse_frm/thread/39476b38bbe7d861/830c74d2ffb456bb?tvc=1&q=Feynman+19#830c74d2ffb456bb)

$$\Delta U^* = \int(-\varepsilon_0\nabla^2\underline{\phi}-\rho)f\,dV$$

II:19-11, 6th unnumbered Eq

$$\boldsymbol{\nabla}^2\underline{\phi} = -\rho/\varepsilon_0$$

Consistency error: the Laplace operator should not be bold ($\boldsymbol{\nabla}^2$ vs. ∇^2)

$$\nabla^2\underline{\phi} = -\rho/\varepsilon_0$$

II:19-11, par 3

… must equal the given potential of the conductors when x, y, z is a point …

Typographical error.

… must equal the given potential of the conductors when (x, y, z) is a point …

II:19-12, table, row b/a = 100, col C_{true}

100 | 0.267 | 0.51

Incorrect number (0.267 vs. 0.217)

100 | 0.217 | 0.51

II:19-12, table, row b/a = 1.1, col C_{true}

1.1 | 10.492070 | 10.500000

Incorrect number (10.492070 vs. 10.492059)

1.1 | 10.492059 | 10.500000

II:19-13, table, row b/a = 100, col C_{true}

100 | 0.267 | 0.346

Incorrect number (0.267 vs. 0.217)

100 | 0.217 | 0.346

II:19-13, table, row b/a = 1.1, col C_{true}

1.1 | 10.492070 | 10.492065

Incorrect number (10.492070 vs. 10.492059)

1.1 | 10.492059 | 10.492065

II:19-13, par below table

I get that *C* is 0.346 instead of 0.267.

Incorrect number (0.267 vs. 0.217)

I get that *C* is 0.346 instead of 0.217.

II:19-13, par below table

… and for a *b/a* of 1.1, the answer comes out 10.492065 instead of 10.492070.

Incorrect number (10.492070 vs. 10.492059)

… and for a *b/a* of 1.1, the answer comes out 10.492065 instead of 10.492059.

II:19-14, par 1

[Chapter 40, Vol. I; Eq. (40.6)] because they are drifting sideways   The …

Typographical errors (‘Vol. I;’ vs. ‘Vol. I,’ and missing point after ‘sideways’).

[Chapter 40, Vol. I, Eq. (40.6)] because they are drifting sideways. The …

II:19-14, par 2

[Feynman, Hellworth, Iddings, and Platzman, "Mobility of Slow Electrons in a Polar Crystal," *Phys Rev*. **127**, 1004 (1962).]

Incorrect spelling of proper name (Hellworth vs. Hellwarth) and abbreviation dot missing after 'Phys'

[Feynman, Hellwarth, Iddings, and Platzman, "Mobility of Slow Electrons in a Polar Crystal," *Phys. Rev*. **127**, 1004 (1962).]

II:20-1, par 1

The magnitude of the field components is given by

$$E_y = cB_z = -\frac{J}{2\varepsilon_0 c}, \tag{20.2}$$

Incorrect term ("magnitude of field component" vs. "field component").

The field components are given by

$$E_y = cB_z = -\frac{J}{2\varepsilon_0 c}, \tag{20.2}$$

II:20-2, Fig 20-3(a)

Between t_1 and t_2 J should be 3 units high (see description in the text)

II:20-2, par 3

If you will look in chapter 31 of Vol. I, you will see that Eq. (31.10) there is just the same as the Eq. (20.3) that we have just written down.

Incorrect reference ('Eq. (31.10)' vs 'Eq. (31.9)').

If you will look in chapter 31 of Vol. I, you will see that Eq. (31.9) there is just the same as the Eq. (20.3) that we have just written down.

II:20-3, Eq 20.5

$$\nabla^2 \boldsymbol{A} = \frac{1}{c^2}\frac{\partial^2 \boldsymbol{A}}{\partial t^2} = -\frac{\boldsymbol{j}}{\varepsilon_0 c^2} \qquad (20.5)$$

Typographical error (first '=' should be "–").

$$\nabla^2 \boldsymbol{A} - \frac{1}{c^2}\frac{\partial^2 \boldsymbol{A}}{\partial t^2} = -\frac{\boldsymbol{j}}{\varepsilon_0 c^2} \qquad (20.5)$$

II:20-3, above Eq 20.11

Similarly, using the fact that $\boldsymbol{E} = -\nabla\phi - d\boldsymbol{A}/dt$, …

The total time derivative of the vector potential should be a partial derivative

Similarly, using the fact that $\boldsymbol{E} = -\nabla\phi - \partial\boldsymbol{A}/\partial t$, …

II:20-4, Eq 20.12

II. $\qquad \nabla\times\boldsymbol{E} = -\frac{\partial \boldsymbol{B}}{\partial t}$

Unnecessary large space between Eq Number and Eq

II. $\nabla\times\boldsymbol{E} = -\frac{\partial \boldsymbol{B}}{\partial t}$

II:20-6, Fig 20-4

Velocity vector **c** is missing it's arrowhead.

II:20-6, par 5

… expecially because we know what the solution is supposed to be,

Typographical error ('expecially' vs 'especially').

… especially because we know what the solution is supposed to be,

II:20-7, 5th Eq of Eqs 20.25

$cB_z = f(x–ct)–g(x + ct)$

Missing spaces around the 2 minus signs

$cB_z = f(x - ct) - g(x + ct)$

II:20-9, last line

… of the ***E***- and ***B*** fields and …

Typographical error (hyphen missing between '***B***' and 'fields').

… of the ***E***- and ***B***-fields and …

II:20-10, par 4

Maxwell, Ampere, Faraday, …

Incorrect spelling of proper name ('Ampere' vs. 'Ampère)

Maxwell, Ampère, Faraday, …

II:21-1, Eq 21.1

E = …

Vectors should be bold ('*E*' vs. '***E***').

E = …

II:21-3, par 2

–the potentials ϕ and *A*, and the fields …

The vector potential should be bold ('*A*' vs. '***A***').

–the potentials ϕ and ***A***, and the fields …

II:21-5, footnote

The formula was worked out by R. P. Feynman, in about 1950, and given in some lectures as a good way of thinking about synchrotron radiation.

Incomplete information. Apparently Feynman (and Leighton) were not aware that this formula (also given in Volume I as Eq. I:28.3) had already been worked out by Oliver Heaviside in 1902 [See J. J. Monoghan, ''The Heaviside–Feynman expression for the fields of an accelerated dipole,'' J. Phys. A 1, 112–117 (1968).]

The formula was first published by Oliver Heaviside in 1902. It was independently discovered by R. P. Feynman, in about 1950, and given in some lectures as a good way of thinking about synchrotron radiation.

II:21-6, par 4

Our result says that the current in a varying dipole produces a vector potential in the form of spherical waves whose source strength is $\dot{\boldsymbol{p}}/4\pi\varepsilon_0 c^2$.

Incorrect statement. See Eqs. (21.12) and (21.13).

Our result says that the current in a varying dipole produces a vector potential in the form of spherical waves whose source strength is $\dot{\boldsymbol{p}}/\varepsilon_0 c^2$.

II:21-6, line below Eq 21.21

which drops off as $1/r^2$ like the fields of a static dipole (…

Inaccurate statement. The electric field of a static electric dipole and the magnetic field of a static magnetic dipole drop off as $1/r^3$ (see Eq. (6.14) and the following unnumbered Eq., and Eqs. (14.35) - (14.36)). However, it is possible Feynman meant the *potential* of a static dipole (see Eqs. (6.9) – (6.11) and Eqs. (14.20)-(14.34)).

which drops off as $1/r^2$ like the potential of a static dipole (…

II:21-7, caption of Fig 21-3

magnitude of $\boldsymbol{A}$

The z-component and not the magnitude of $\boldsymbol{A}$ is plotted here.

z-component of $\boldsymbol{A}$

II:21-7, below Eq 21.23

The direction of $\boldsymbol{B}$ is given by $\boldsymbol{p}\times\boldsymbol{r}$, …

The 2nd derivative of the dipole moment $\boldsymbol{p}$ is missing its two dots

The direction of $\boldsymbol{B}$ is given by $\ddot{\boldsymbol{p}}\times\boldsymbol{r}$, …

II:21-7, par 7

In Section 14-9 we worked out the law of Biot and Savart …

Incorrect reference ('14-9' vs. '14-7').

In Section 14-7 we worked out the law of Biot and Savart …

II:21-8, 2nd unnumbered Eq

$$\dot{\boldsymbol{p}}(t-r/c) = \dot{\boldsymbol{p}}(t) - \frac{r}{c}\ddot{\boldsymbol{p}}(t) + \text{etc.},$$

and to the same order in r/c,

$$\ddot{\boldsymbol{p}}(t-r/c) = \ddot{\boldsymbol{p}}(t).$$

Inaccurate statement.

$$\dot{\boldsymbol{p}}(t-r/c) = \dot{\boldsymbol{p}}(t) - \frac{r}{c}\ddot{\boldsymbol{p}}(t) + \text{etc.},$$

and to the same order in r/c,

$$\frac{r}{c}\ddot{\boldsymbol{p}}(t-r/c) = \frac{r}{c}\ddot{\boldsymbol{p}}(t) + \text{etc.},$$

II:21-8, par 6

Integrating with respect to t just removes one dot from each of the p's, so

Vectors should be bold ('p' vs. '$\boldsymbol{p}$').

Integrating with respect to t just removes one dot from each of the $\boldsymbol{p}$'s, so

II:21-8, Eq 21.25

$$\phi(r,t) = \frac{1}{4\pi\varepsilon_0}\frac{[\boldsymbol{p}+(r/c)\dot{\boldsymbol{p}}]_{t-r/c}\cdot\boldsymbol{r}}{r^3}. \qquad (21.25)$$

The potential does not only depend on the distance to the source but also on the direction relative to $\boldsymbol{p}$. Thus the argument of ϕ should be the vector $\boldsymbol{r}$.

$$\phi(\boldsymbol{r},t) = \frac{1}{4\pi\varepsilon_0}\frac{[\boldsymbol{p}+(r/c)\dot{\boldsymbol{p}}]_{t-r/c}\cdot\boldsymbol{r}}{r^3}. \qquad (21.25)$$

II:21-9, Eq 21.26

$$\boldsymbol{E}(r,t)=\frac{-1}{4\pi\varepsilon_0 r^3}\left[-\boldsymbol{p}^*-3\frac{(\boldsymbol{p}^*\cdot\boldsymbol{r})\boldsymbol{r}}{r^2}+\frac{1}{c^2}\left\{\ddot{\boldsymbol{p}}(t-r/c)\times\boldsymbol{r}\right\}\times\boldsymbol{r}\right] \tag{21.26}$$

(3 errors) The signs of the first and third term in the brackets are wrong. Additionally, it is recommended that the "–" in front of the brackets should be moved inside the brackets so that the first 2 terms inside the brackets would---apart from the *---be equal to the field of an electric dipole as obtained by calculating the gradient of Eq. (6.13). Also, the electric field does not only depend on the distance to the source but also on the direction relative to $\boldsymbol{p}$. Thus the argument of $\boldsymbol{E}$ should be the vector $\boldsymbol{r}$.

$$\boldsymbol{E}(\boldsymbol{r},t)=\frac{1}{4\pi\varepsilon_0 r^3}\left[\frac{3(\boldsymbol{p}^*\cdot\boldsymbol{r})\boldsymbol{r}}{r^2}-\boldsymbol{p}^*+\frac{1}{c^2}\left\{\ddot{\boldsymbol{p}}(t-r/c)\times\boldsymbol{r}\right\}\times\boldsymbol{r}\right] \tag{21.26}$$

II:21-9, line below Eq 21.29

... charge parallel to r'_{12} ...

Vectors should be bold italic (r vs. $\boldsymbol{r}$)

... charge parallel to $\boldsymbol{r}'_{12}$ ...

II:21-10, par 4

Then when we evalute …

Incorrect spelling of 'evaluate'.

Then when we evaluate …

II:21-11, Eq 21.32

$\phi(t) = ...$

The potential is missing its first argument.

$\phi(1, t) = ...$

II:21-11, Eq 21.34

$$\boldsymbol{A}(1,t) = \frac{q\boldsymbol{v}}{4\pi\varepsilon_0 c^2[r - (\boldsymbol{v}\cdot\boldsymbol{r}/c)]_{\text{ret}}}$$

The velocity in the numerator has also to be taken at the retarded time (v vs. v_{ret})

$$\boldsymbol{A}(1,t) = \frac{q\boldsymbol{v}_{\text{ret}}}{4\pi\varepsilon_0 c^2[r - (\boldsymbol{v}\cdot\boldsymbol{r}/c)]_{\text{ret}}}$$

II:22-1, par 5

… we can then represent all voltages and currents by complex numbers, using the exponential notation described in Chapter 22 of Vol. I.

Incorrect chapter number (“22” vs. “23”).

… we can then represent all voltages and currents by complex numbers, using the exponential notation described in Chapter 23 of Vol. I.

II:22-2, par 5

…, the curl of $\boldsymbol{E}$ is equal to $-d\boldsymbol{B}/dt$;

The total time derivative of ***B*** should be a partial derivative.

…, the curl of $\boldsymbol{E}$ is equal to $-\partial\boldsymbol{B}/\partial t$;

II:22-6, Eq 22.12

F/unit charge = …

Vectors should be bold (‘*F*’ vs. ‘***F***’).

F/unit charge = …

II:22-11, par 8

… as the sum of its real and imginary parts.

Incorrect spelling of ‘imaginary’.

… as the sum of its real and imaginary parts.

II:22-15, par 4

… with an impedence equal to the characteristic impedence z_0.

Incorrect spelling of 'impedance' (2x).

… with an impedance equal to the characteristic impedance z_0.

II:22-16, par 3

With a resonant filter, these side-bands are always attentuated somewhat, …

Incorrect spelling of 'attenuated'.

With a resonant filter, these side-bands are always attenuated somewhat, …

II:22-17, Fig 22-27(a)

The top right field line is pointing in the wrong direction (negative to positive) – it should go from positive to negative

II:23-3, Eq 23.3

$$c^2\oint_\Gamma \boldsymbol{B}\cdot d\boldsymbol{s} = \frac{\partial}{\partial t}\int_{\text{inside }\Gamma} \boldsymbol{E}\cdot\boldsymbol{n}\,da. \tag{23.3}$$

Wrong type of derivative (since the integral is fixed in space).

$$c^2\oint_\Gamma \boldsymbol{B}\cdot d\boldsymbol{s} = \frac{d}{dt}\int_{\text{inside }\Gamma} \boldsymbol{E}\cdot\boldsymbol{n}\,da. \tag{23.3}$$

II:23-3, last unnumbered Eq

$$\oint_\Gamma \boldsymbol{E}\cdot d\boldsymbol{s} = -\frac{\partial}{\partial t}(\text{flux of } B)$$

Two errors: (a) wrong type of derivative (since the integral is fixed in space – see error II:23-3, Eq. 23.3), and (b) vectors should be bold ('B' vs. '$\boldsymbol{B}$')

$$\oint_\Gamma \boldsymbol{E}\cdot d\boldsymbol{s} = -\frac{d}{dt}(\text{flux of } \boldsymbol{B})$$

II:23-4, par 1

This is equal to the rate of change of the flux of B, …

Two errors: (a) wrong sign, (b) vectors should be bold ('B' vs. '$\boldsymbol{B}$').

This is equal to minus the rate of change of the flux of $\boldsymbol{B}$, …

II:23-4, last unnumbered Eq

$$c^2 B_2 \cdot 2\pi r = \frac{\partial}{\partial t}(\text{flux of } E_2 \text{ through } \Gamma_1)$$

Wrong type of derivative (since the integral is fixed in space – see error II:23-3, Eq. 23.3)

$$c^2 B_2 \cdot 2\pi r = \frac{d}{dt}(\text{flux of } E_2 \text{ through } \Gamma_1)$$

II:23-6, 2nd unnumbered Eq

$J_0(2.5) = 1 - 1.56 + 0.61 - 0.09 = -0.04.$

Incorrect values for 4th term and the sum.

$J_0(2.5) = 1 - 1.56 + 0.61 - 0.11 = -0.06.$

II:23-7, Fig 23-7(a)

The (up) direction of current ***j*** is inconsistent with the direction of magnetic field ***B*** shown in this figure, as can be seen by applying Maxwell's equations, or by considering the following: At the left wall of the can the ***B***-field is directed out of the paper, in order for there to be no field outside the can (which there should not be!) there must be a current in the wall that produces a magnetic field, of equal magnitude, that is directed into the paper; following the right-hand rule, this implies the current (***j***) in the wall is going *down,* not up as shown in the figure.

II:24-3, par 1

Similary, for the wave going toward minus *x* the relation is

Incorrect spelling of 'Similarly'.

Similarly, for the wave going toward minus *x* the relation is

II:24-4, Eq 24.12

$$E_y = E_0 \sin k_x x e^{i(\omega t - k_z z)} \qquad (24.12)$$

As printed it looks as if the exponential was a part of the argument of the sine.

$$E_y = E_0 e^{i(\omega t - k_z z)} \sin k_x x \qquad (24.12)$$

II:24-6, Eq 24.23

$$E_y = E_0 \sin k_x x e^{i(\omega t \mp ik'z)} \qquad (24.23)$$

As printed it looks as if the exponential was a part of the argument of the sine.

$$E_y = E_0 e^{i(\omega t \mp ik'z)} \sin k_x x \qquad (24.23)$$

II:24-6, Eq 24.24

$$E_y = E_0 \sin k_x x e^{\pm k'z} e^{i\omega t} \qquad (24.24)$$

As printed it looks as if the exponentials were a part of the argument of the sine.

$$E_y = E_0 e^{\pm k'z} e^{i\omega t} \sin k_x x \qquad (24.24)$$

II:25-5, par 4

… for a particle *at rest* $p_\mu = (M, 0)$, so $p_\mu p_\mu = M^2$.

Vectors should be bold italic (‘*0*’ vs. ‘***0***’).

… for a particle *at rest* $p_\mu = (M, \boldsymbol{0})$, so $p_\mu p_\mu = M^2$.

II:25-5, par 5

Now we can also evaluate $p_\mu^a p_\mu^b$ in the laboratory system. The four-vector p_μ^a can be written $(E^a, \boldsymbol{p}^a)$, while $p_\mu^b = (M, \boldsymbol{0})$, since it describes a proton at rest. Thus, $p_\mu^a p_\mu^b$ must be equal to ME^a; ... So we have that

$$E^a = 7M,$$

In Fig. 25-1, the quantities in the laboratory system are primed. Either Fig. 25-1 or par 5 should be adjusted.

Now we can also evaluate $p_\mu^a p_\mu^b = p_\mu^{a\prime} p_\mu^{b\prime}$ in the laboratory system. The four-vector $p_\mu^{a\prime}$ can be written $(E^{a\prime}, p^{a\prime})$, while $p_\mu^{b\prime} = (M, \boldsymbol{0})$, since it describes a proton at rest. Thus, $p_\mu^{a\prime} p_\mu^{b\prime}$ must be equal to $ME^{a\prime}$; ... So we have that

$$E^{a\prime} = 7M\ ,$$

II:25-7, par 3

in Maxwell's equation in the …

Singular vs. Plural (equation vs. equations)

in Maxwell's equations in the …

II:25-9, below 25.23

This condition is called the *Lorentz condition*.

Wrong physicist ('Lorentz' vs. 'Lorenz').

This condition is called the *Lorenz condition*.

II:26-1, par 2

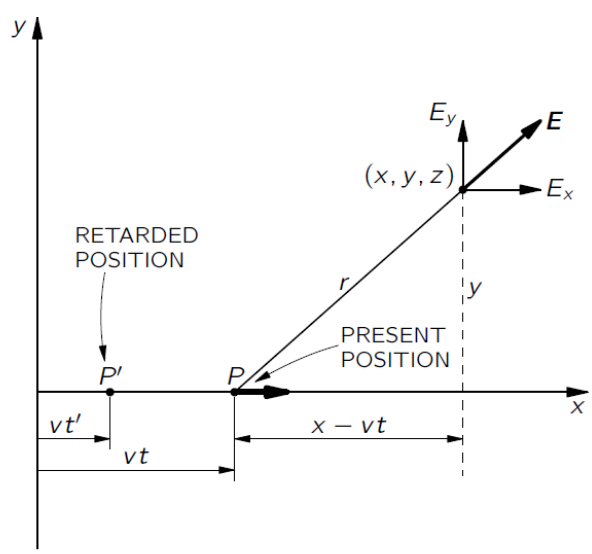
Then you imgaine that the charge …

Incorrect spelling ('imgaine' vs. 'imagine').

Then you imagine that the charge …

II:26-3, Fig 26-3

This figure is *identical* to Fig 26-1, but it *should not be* (see earlier editions). The original looks like this (except in the original '***r***' was written '$\boldsymbol{r_p}$' : we have changed this for consistency with Fig 26-1)



II:26-4, 1st line

... the distance from the charge is (y^2+z^2) .

Square root missing.

... the distance from the charge is $\sqrt{y^2+z^2}$.

II:26-4, Eq 26.13

$$\boldsymbol{B} = \frac{q}{4\pi\varepsilon_0 c^2}\frac{\boldsymbol{v}\times\boldsymbol{r}}{\boldsymbol{r}^3}$$

Only vectors should be bold ($\boldsymbol{r}^3$ vs r^3)

$$\boldsymbol{B} = \frac{q}{4\pi\varepsilon_0 c^2}\frac{\boldsymbol{v}\times\boldsymbol{r}}{r^3}$$

II:26-5, par 1

Imagine two electrons with velocities at right angles, …

Sign error ('electron' vs. 'proton'). For the magnetic field to be pointing into the plane of the paper as shown in the figure, the charges must be positive.

Imagine two protons with velocities at right angles, …

II:26-9, Table 26-4, 1st line

$E'_{||} = E$ $\qquad$ $B'_{||} = B$

The right-hand side of both equations is missing the "parallel" symbol.

$E'_{||} = E_{||}$ $\qquad$ $B'_{||} = B_{||}$

II:26-10, par 2

… $\boldsymbol{B}' = -\boldsymbol{v}\times\boldsymbol{E}'/c^2$. (The $\sqrt{1-v^2}$ doesn't appear in our formula …

Missing c^2.

… $\boldsymbol{B}' = -\boldsymbol{v}\times\boldsymbol{E}'/c^2$. (The $\sqrt{1-v^2/c^2}$ doesn't appear in our formula …

II:26-12, par 4

… is moving with the particle at any particluar instant.

Incorrect spelling ('particluar' vs. 'particular').

… is moving with the particle at any particular instant.

II:27-1, caption of Fig 27-1(b)

$$dQ_1 / dt = \int \boldsymbol{j} \cdot \boldsymbol{n}\, da = -dQ_2 / dt$$

Wrong sign in central term (the current in the figure flows out of the volume of Q_1 and into the volume of Q_2)

$$dQ_1 / dt = -\int \boldsymbol{j} \cdot \boldsymbol{n}\, da = -dQ_2 / dt$$

II:27-2, Eq 27.3

$$-\frac{\partial}{\partial t}\int_V u\, dV = \int_\Sigma \boldsymbol{S} \cdot \boldsymbol{n}\, da + \text{ (work done on matter inside } V). \qquad (27.3)$$

Wrong type of derivative (since the integral is taken over a fixed volume in space)

$$-\frac{d}{dt}\int_V u\, dV = \int_\Sigma \boldsymbol{S} \cdot \boldsymbol{n}\, da + \text{ (work done on matter inside } V). \qquad (27.3)$$

II:27-3, Eq 27.4

$$-\frac{\partial}{\partial t}\int_V u\, dV = \int_\Sigma \boldsymbol{S} \cdot \boldsymbol{n}\, da + \int_V \boldsymbol{E} \cdot \boldsymbol{j}\, dV. \qquad (27.4)$$

Wrong type of derivative (since the integral is taken over a fixed volume in space)

$$-\frac{d}{dt}\int_V u\, dV = \int_\Sigma \boldsymbol{S} \cdot \boldsymbol{n}\, da + \int_V \boldsymbol{E} \cdot \boldsymbol{j}\, dV. \qquad (27.4)$$

II:27-3, 1st unnumbered Eq

$$-\int_V \frac{du}{dt} dV = \int_V \nabla \cdot \boldsymbol{S}\, dV + \int_V \boldsymbol{E} \cdot \boldsymbol{j}\, dV,$$

Wrong type of derivative (because *u* depends on position and time).

$$-\int_V \frac{\partial u}{\partial t} dV = \int_V \nabla \cdot \boldsymbol{S}\, dV + \int_V \boldsymbol{E} \cdot \boldsymbol{j}\, dV,$$

II:27-7, 1st unnumbered Eq

$$u = \frac{\varepsilon_0}{2}E^2 + \frac{\varepsilon_0 c^2}{2}\left(\frac{E^2}{c_2}\right) = \varepsilon_0 E^2.$$

Incorrect subscript ('c_2' vs. 'c^2').

$$u = \frac{\varepsilon_0}{2}E^2 + \frac{\varepsilon_0 c^2}{2}\left(\frac{E^2}{c^2}\right) = \varepsilon_0 E^2.$$

II:27-7, par 2

… we have already derived this result in Section 31–3 of Vol. I, …

Incorrect reference ('Section 31–3' vs. 'Section 31–5').

… we have already derived this result in Section 31–5 of Vol. I, …

II:27-10, par 2

We have, in fact, shown in Chapter 36 of Vol. I that the momentum is $1/c$ times the energy absorbed [Eq. (36.24) of Vol. I].

Two incorrect reference ('Chapter 36' vs. 'Chapter 34' and 'Eq. (36.24)' vs. 'Eq. (34.24)').

We have, in fact, shown in Chapter 34 of Vol. I that the momentum is $1/c$ times the energy absorbed [Eq. (34.24) of Vol. I].

II:28-9, 1st unnumbered Eq

$$A_\mu(1) = \int j_\mu(2) f(r_{12})\, dV_2$$

This equation is incomplete because it does not specify at what times $A_\mu(1)$ and $j_\mu(2)$ are to be taken; it should be equivalent to Eq. (28.13) when $f(r_{12}) = 1/4\pi\varepsilon_0 c^2 r_{12}$, so $A_\mu(1)$ and $j_\mu(2)$ should be taken at the same times as in Eq. (28.13).

$$A_\mu(1,t) = \int j_\mu(2, t - r_{12}/c) f(r_{12})\, dV_2$$

II:28-9, Fig 28-4

The curve is mislabeled $\mathrm{f}(\mathrm{s}^2)$. It should be labeled $F(s^2)$, as per the figure's caption, and the body text.

II:28-10, par 1

If we pick $K = q^2c/4\pi\varepsilon_0 a^2$ we get right back to the retarded potential solution of Maxwell's equations—

Incorrect statement.

If we pick $K = 1/4\pi\varepsilon_0 ca^2$ we get right back to the retarded potential solution of Maxwell's equations—

II:31-7, 2nd line of Eq 31.16

$$L_y = I_{xy}\omega_x + I_{yy}\omega_y + I_{yz}\omega_z,$$

Wrong index in first term on RHS ('I_{xy}' vs. 'I_{yx}').

$$L_y = I_{yx}\omega_x + I_{yy}\omega_y + I_{yz}\omega_z,$$

II:31-8, par 4

an antisymmetric tensor of the second rank has *six* nonezero terms

Incorrect spelling ('nonezero' vs. 'nonzero'), and inexact statement.

an antisymmetric tensor of the second rank has up to *six* nonzero terms

II:31-8, last par

Thus, for the position vector r_i, $r_i r_j$ is a tensor,

Typographic error in position vector ('r_i' vs. '$\boldsymbol{r}$').

Thus, for the position vector $\boldsymbol{r}$, $r_i r_j$ is a tensor,

II:32-2, last par

Representing the three parameters ω, γ, and f by ω_k, γ_k and f_k …

Missing subscript '0' (2 times).

Representing the three parameters ω_0, γ, and f by ω_{0k}, γ_k and f_k …

II:32-4, last par

where ***H*** differs from $\varepsilon_0 c^2 B$ because …

Vectors should be bold ('B' vs. '$\boldsymbol{B}$').

where ***H*** differs from $\varepsilon_0 c^2 \boldsymbol{B}$ because …

II:32-6, par 2

… we can set ***P*** proportional to ***E***, as in Eq. (32.5).

Incorrect reference ('32.5' vs. '32.8'). Here the polarization is discussed and not the dipole moment.

… we can set ***P*** proportional to ***E***, as in Eq. (32.8).

II:32-6, par 3

There we got Eq. (31.29), which is …

Incorrect reference ('31.29' vs. '31.19').

There we got Eq. (31.19), which is …

II:32-7, par 2

This is known as the Clausius-Mosotti equation.

Incorrect spelling ('Mosotti' vs. 'Mossotti').

This is known as the Clausius-Mossotti equation.

II:32-8, 1st unnumbered Eq

$$E_x = E_0 e^{-i\omega(t - nz/c)}.$$

Wrong sign in exponent.

$$E_x = E_0 e^{i\omega(t - nz/c)}.$$

II:32-8, Fig. 32-1

The factor $e^{-\omega n_I z/c}$ is missing for the damped oscillating curve.

II:32-9, par 4

… and solving Eq. (38.27) for α_2.

Incorrect reference ('38.27' vs. '32.37').

… and solving Eq. (32.37) for α_2.

II:32-10, par 2

So the correction we made to Eq. (32.5) by using …

Incorrect reference ('32.5' vs. '32.8'). Here the polarization is discussed and not the dipole moment.

So the correction we made to Eq. (32.8) by using …

II:32-12, par 2

$\delta = 6.7 \times 10^{-4}\,\text{cm}$.

The given δ is too big by a factor of 10.

$\delta = 6.7 \times 10^{-5}\,\text{cm}$

II:33-1, par 1

… Chapter 35 of Volume I.

Incorrect reference ('Chapter 35' vs. 'Chapters 26 and 33').

… Chapters 26 and 33 of Volume I.

II:33-2, Fig 33-2

The wave crests should be perpendicular to vector ***k.***

II:33-2, par 2

… Chapter 36 of Volume I.

Incorrect reference ('36' vs. '34').

… Chapter 34 of Volume I.

II:33-4, par 1

… the frequency is the same and the magnitude of ***k*** is the same …

Prime missing on ***k***.

… the frequency is the same and the magnitude of ***k***' is the same …

II:33-6, end of par 2

… the variation of *P* in the wave …

Vectors should be bold ('*P*' vs. '***P***').

… the variation of ***P*** in the wave …

II:33-6, end of last par

[If it did, there would be a spike on the left of Eq. (33.22a) …

Incorrect reference ('33.22a' vs. '33.22b').

[If it did, there would be a spike on the left of Eq. (33.22b) …

II:33-7, par 3

Equation (33.24a) gives nothing, because there are no *x* derivatives. Equation (33.23b) has one, $-c^2 \dfrac{\partial B_z}{\partial x}$,

Incorrect reference.

Equation (33.24a) gives nothing, because there are no *x* derivatives. Equation (33.24b) has one, $-c^2 \dfrac{\partial B_z}{\partial x}$,

II:33-9, Eq 33.43

$$E_r = E_0' e^{i(\omega t - k_x x + k_y y)}. \tag{33.43}$$

Two wrong signs in exponent.

$$E_r = E_0' e^{i(\omega t + k_x x - k_y y)}. \tag{33.43}$$

II:33-10, par 4

… Chapter 35 of Volume I …

Incorrect reference ('35' vs. '33').

… Chapter 33 of Volume I …

II:33-11, par 1

The numerator and denominator are just the sines of $(\theta_i - \theta_t)$ and $(\theta_i + \theta_t)$;

Wrong sign.

The numerator and denominator are just the sines of $-(\theta_i - \theta_t)$ and $(\theta_i + \theta_t)$;

II:33-11, Eq 33.56

$$\frac{E_0'}{E_0} = \frac{\sin(\theta_i - \theta_t)}{\sin(\theta_i + \theta_t)}. \tag{33.56}$$

Wrong sign.

$$\frac{E_0'}{E_0} = -\frac{\sin(\theta_i - \theta_t)}{\sin(\theta_i + \theta_t)}. \tag{33.56}$$

II:33-12, par 2

Notice that k_I is of the order ω / c—which is λ_0, the free-space wavelength of the light.

Inaccurate statement . $k_I = \omega / c$, but this equals $2\pi / \lambda_0$, and not λ_0.

Notice that k_I is ω / c—which is of the order $1/\lambda_0$, the reciprocal of the free-space wavelength of the light.

II:33-12, Fig 33-9

The label $1/k_I \approx \lambda_0$ should be changed to $1/k_I \sim \lambda_0$, in accordance with the correction given for II:33-12, par 2.

II:33-12, Fig 33-10

The index of refraction of empty space is 1, not 0. Thus “$n_2 = 0$” should be ““$n_2 = 1$”.

II:34-6, par 3

… an axis through the atom parallel to *B*, so if *B* is along …

Vectors should be bold (‘*B*’ vs. ‘***B***’, 2x)

… an axis through the atom parallel to ***B***, so if ***B*** is along …

II:34-7, par 2

This is no longer an inertial system, so we have to put in the proper pseudoforces—

Spelling error ('pseudoforces' vs. 'pseudo forces').

This is no longer an inertial system, so we have to put in the proper pseudo forces—

II:34-8, par 2

… the probability that a system will have any given state of motion is proportional to $e^{-U/kt}$ …

Capitalization error ('$e^{-U/kt}$' vs. '$e^{-U/kT}$').

… the probability that a system will have any given state of motion is proportional to $e^{-U/kT}$ …

II:35-2, Fig 35-1

(a) Every one of the (9) small 'j_z's should be a capital 'J_z', and (b) all (9) values given for J_z need to be multiplied by $\hbar$, as per Figs 34-5 and 34-6. [Note: the (3) 'j's and their given values are okay.]

II:35-5, Fig 35-5

The vertical field labeled **B** in Magnet 2 should be labeled $\mathbf{B_0}$ (see text).

II:35-8, Eq 35.14

$$e^{-\Delta U}/^{kT}. \tag{35.14}$$

Typographical error. The fraction bar '/' is too big – it belongs in the exponent.

$$e^{-\Delta U/kT}. \tag{35.14}$$

II:35-8, Eq 35.15

$$N_{\text{up}} = ae^{-\mu_0 B/kt}, \tag{35.15}$$

Capitilization error ('t' vs. 'T').

$$N_{\text{up}} = ae^{-\mu_0 B/kT}, \tag{35.15}$$

II:35-8, Eq 35.16

$$N_{\text{down}} = ae^{+\mu_0 B/kt}, \qquad (35.16)$$

Capitilization error ('t' vs. 'T').

$$N_{\text{down}} = ae^{+\mu_0 B/kT}, \qquad (35.16)$$

II:35-9, par 1

A plot of M as a function of B is given in Fig. 35.7.

Typographical error ('35.7' vs. '35−7').

A plot of M as a function of B is given in Fig. 35−7.

II:35-9, par 2

In most normal cases—say, for typical moments, room temperatures, and the fields one can normally get (like 10,000 gauss)—the ratio $\mu_0 B/kT$ is about 0.02.

Arithmetic error ('0.02' vs. '0.002'). [With g=2, T=295, the ratio is 0.00227698.]

In most normal cases—say, for typical moments, room temperatures, and the fields one can normally get (like 10,000 gauss)—the ratio $\mu_0 B/kT$ is about 0.002.

II:35-10, 1st line

like praseodynium-ammonium-nitrate

Incorrect spelling of 'praseodymium'

like praseodymium-ammonium-nitrate

II:36-7, par 1

… From Stokes's theorem

Incorrect possessive of proper name ('Stokes's' vs. 'Stokes'').

… From Stokes' theorem

II:36-10 par 3

As before, the right-hand side is *NI,* …

Inaccurate statement. The right-hand side of Eq. (36.19) also involves the factor $1/\varepsilon_0 c^2$.

As before, the integral on the right-hand side is *NI,* …

II:36-11, par 3

… so the component of μ along the z-axis is

Vectors should be bold (‘μ’ vs. ‘$\boldsymbol{\mu}$’).

… so the component of $\boldsymbol{\mu}$ along the z-axis is

II:36-11, Eq 36.29

$$M = N\mu \tanh \frac{\mu B_{\mathrm{a}}}{\mathrm{kT}}. \tag{36.29}$$

Consistency error: the index ‘a’ should be italic.

$$M = N\mu \tanh \frac{\mu B_a}{\mathrm{kT}}. \tag{36.29}$$

II:36-13, Eq 36.36

$$\boldsymbol{B}_{\mathrm{a}} = H + \lambda \frac{\boldsymbol{M}}{\varepsilon_0 c^2}. \tag{36.36}$$

2 errors: (i) consistency error: the index ‘a’ should be italic, and (ii) the *H* vector should be bold

$$\boldsymbol{B}_a = \boldsymbol{H} + \lambda \frac{\boldsymbol{M}}{\varepsilon_0 c^2}. \tag{36.36}$$

II:36-14, last unnumbered Eq

$$B_{\mathrm{a}} = B + \frac{(\lambda - 1)M}{\varepsilon_0 c^2}$$

Consistency error: the index ‘a’ should be italic.

$$B_a = B + \frac{(\lambda - 1)M}{\varepsilon_0 c^2}$$

II:36-14, last par

… by the amount $-\frac{2}{3}M/\varepsilon_0$.

Missing c^2.

… by the amount $-\frac{2}{3}M/\varepsilon_0 c^2$.

II:37-10, Fig 37-12

The coercive force Hc of Alnico V is shown in this figure to be a little under 400 gauss, which does not agree with Table 37-1 where Hc for Alnico V is given to be 550 gauss. Also the value for *Br*, given in the table as 13,000, does not agree with the figure. The table is (more or less) accurate, and therefore the figure should be adjusted accordingly.

II:37-10, par 3

You see that it is about 500 times wider than the hysterisis curve for soft iron…

Inaccurate statement. As per the correction given for II:37-10, Fig 27-12, it should be something like:

You see that it is about 700 times wider than the hysterisis curve for soft iron…

II:39-7, par 3

If you use (39.20) for S_{ij}, and write the e_{ij} as $\frac{1}{2}\partial u_i/\partial x_j +$ $\partial u_j/\partial x_i$, you end up with a vector equation

Missing parentheses.

If you use (39.20) for S_{ij}, and write the e_{ij} as $\frac{1}{2}\left(\partial u_i/\partial x_j +\right.$ $\left.\partial u_j/\partial x_i\right)$, you end up with a vector equation

II:39-7, par 4

But remember that $\nabla\times\nabla\times\boldsymbol{u}$ is the same thing as $\nabla^2\boldsymbol{u}-\nabla(\nabla\cdot\boldsymbol{u})$, …

Wrong sign.

But remember that $\nabla\times\nabla\times\boldsymbol{u}$ is the same thing as $\nabla(\nabla\cdot\boldsymbol{u})-\nabla^2\boldsymbol{u}$, …

II:39-8, par 1

Substituting $u_1 + u_2$ for u in (39.33), we get

… (39.36)

We can eliminate u_1 by taking the divergence of this equation,

Vectors should be bold ('u' vs. '$\boldsymbol{u}$', 4x).

Substituting $\boldsymbol{u}_1 + \boldsymbol{u}_2$ for $\boldsymbol{u}$ in (39.33), we get

… (39.36)

We can eliminate $\boldsymbol{u}_1$ by taking the divergence of this equation,

II:39-10, Eq 39.40

$$U(\theta) = U(0) + U'(0)\theta + \frac{1}{2}U''(0)\theta^2 + \frac{1}{6}U'''(\theta)\theta^3 \cdots \qquad (39.40)$$

The argument of U''' should be '0'.

$$U(\theta) = U(0) + U'(0)\theta + \frac{1}{2}U''(0)\theta^2 + \frac{1}{6}U'''(0)\theta^3 \cdots \qquad (39.40)$$

II:39-10, Eq 39.41

$$t(\theta) = U'(0) + U''(0)\theta + \frac{1}{2}U'''(0)\theta^2 + \cdots \qquad (39.41)$$

Incorrect symbol for the torque ('t' vs. 'τ').

$$\tau(\theta) = U'(0) + U''(0)\theta + \frac{1}{2}U'''(0)\theta^2 + \cdots \qquad (39.41)$$

II:39-12, Table 39-1, last line

9	$a, -a$	$(e_{xx} - e_{xy})a$	$(e_{yx} + e_{yy})a$	k_2

Sign error. ('$e_{yx} + e_{yy}$' vs. '$e_{yx} - e_{yy}$')

9	$a, -a$	$(e_{xx} - e_{xy})a$	$(e_{yx} - e_{yy})a$	k_2

II:40-3, par 3

and writing the force per unit volume as f, we have

$$\rho \times (\text{acceleration}) = f.$$

Vectors should be bold ('f' vs. '$\boldsymbol{f}$', 2x).

and writing the force per unit volume as $\boldsymbol{f}$, we have

$$\rho \times (\text{acceleration}) = \boldsymbol{f}.$$

II:40-4, par 1

The acceleration $\Delta v / \Delta t$ is

Vectors should be bold ('v' vs. '$\boldsymbol{v}$').

The acceleration $\Delta \boldsymbol{v} / \Delta t$ is

II:40-6, unnumbered Eq

$$\nabla \left\{ \frac{p}{\rho} + \frac{1}{2} v^2 + \phi \right\} = 0,$$

Vectors should be bold ('∇' vs. '$\boldsymbol{\nabla}$', as per Eq. (40.12)).

$$\boldsymbol{\nabla} \left\{ \frac{p}{\rho} + \frac{1}{2} v^2 + \phi \right\} = 0,$$

II:40-10, first unnumbered Eq

$$gz + ½mv^2 = \text{const.}$$

Innacurate statement. The factor '*m*' should not be there (as per Eq. 40.14). What Feynman actually said in the original lecture is:

$$gz + ½v^2 = \text{const.}$$

II:41-4, Eq 41.14

$$(f_{\text{visc}})_i = \sum_{j=1}^{3} \frac{\partial S_{ij}}{\partial x_j}$$

$$= \eta \sum_{j=1}^{3} \frac{\partial}{\partial x_j} \left\{ \eta \left(\frac{\partial v_i}{\partial x_j} + \frac{\partial v_j}{\partial x_i} \right) \right\} + \frac{\partial}{\partial x_i} (\eta' \nabla \cdot \boldsymbol{v})$$

The first η in the 2nd line should not be there.

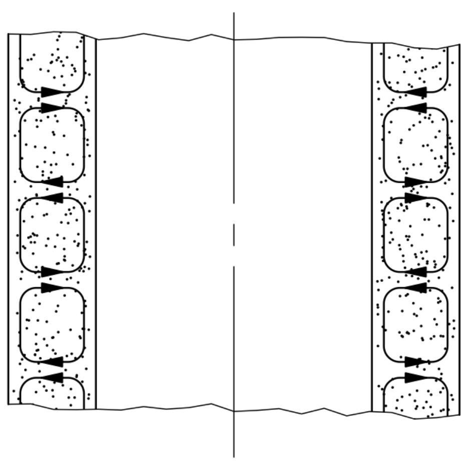
$$(f_{\text{visc}})_i = \sum_{j=1}^{3} \frac{\partial S_{ij}}{\partial x_j}$$

$$= \sum_{j=1}^{3} \frac{\partial}{\partial x_j} \left\{ \eta \left(\frac{\partial v_i}{\partial x_j} + \frac{\partial v_j}{\partial x_i} \right) \right\} + \frac{\partial}{\partial x_i} (\eta' \nabla \cdot \boldsymbol{v})$$

II:41-11, Fig 41-9(b)

There is a slight error in the lower right of this figure: where the bands come close to each other, the arrows should point in the same direction. It should look like this:

(b)



II:42-3, par 2

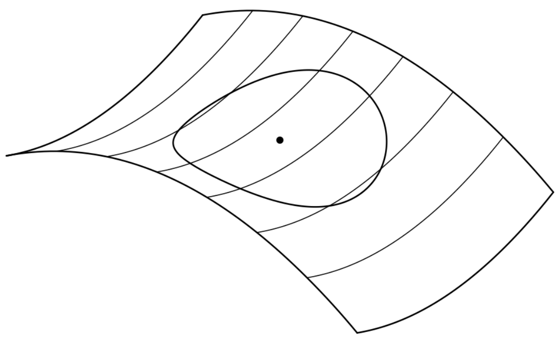
The rules of Euclidian geometry fail.

Incorrect spelling ('Euclidian' vs. 'Euclidean').

The rules of Euclidean geometry fail.

II:42-4, Fig 42-13

The figure is very distorted, and should look more like:



II:42-6, Eq 42.3

$$\text{Radius excess} = \sqrt{\frac{A}{4\pi}} - r_{\text{meas}} = \frac{G}{3c^2}\cdot M. \qquad (42.3)$$

Wrong sign. (See definition of r_{excess} on page 42-5, par 5.)

$$\text{Radius excess} = r_{\text{meas}} - \sqrt{\frac{A}{4\pi}} = \frac{G}{3c^2}\cdot M. \qquad (42.3)$$

II:42-7, par 2

So if you know the average curvature everywhere, you can figure out the details of the curvature at each place. The average curvature above the earth varies with altitude, so the space there is curved. And it is that curvature that we see as a gravitational force.

Incorrect (or, at least, confusing) statement. (Correction supplied by Kip Thorne.)

So if you know the average curvature everywhere, you can figure out the details of the curvature components at each place. The average curvature inside the earth varies with altitude, and this means that some curvature components are nonzero both inside the earth and outside. It is that curvature that we see as a gravitational force.

II:42-7, par 4

There are debates because the atronomical measurements …

Incorrect spelling ('atronomical' vs. 'astronomical').

There are debates because the astronomical measurements …

II:Index-1

Aharanov, II-15-12

Misspelled name ("Aharanov" vs. "Aharonov").

Aharonov, II-15-12

II:Index-3

Laughton, II-5-6

Misspelled name ("Laughton" vs. "Lawton").

Lawton, II-5-6

II:Index-5

Priestly, J.

Incorrect spelling of proper name ('Priestly' vs. 'Priestley').

Priestley, J.