Errata

Engineering Electrodynamics: A collection of theorems, principles and field representations

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The following list of symbols was missing in the electronic and print versions:

**Symbols**

\( \equiv \) A quantity on the right side of equation is defined by the left side

\( \vdash \) A quantity on the left side of equation is defined by the right side

\( \sim \) Asymptotically equal to; similar to

RHS := Right-hand-side

LHS := Left-hand-side

w.r.t := With respect to

\( \mathbf{a}_i \) Unitary vectors in 3D curvilinear coordinates

\( \mathbf{a}_i^\dagger \) Reciprocal unitary vectors in 3D curvilinear coordinates

\( \alpha_{\mu\nu} \) Metric tensor of 3D space in curvilinear coordinates

\( \mathcal{E} \) Electric field strength \([\text{V-m}^{-1}]\)

\( \mathcal{D} \) Electric flux density \([\text{C-m}^{-2}]\)

\( \mathcal{B} \) Magnetic flux density \([\text{T}]\) or \([\text{Wb-m}^{-2}]\)

\( \mathcal{H} \) Magnetic field strength \([\text{A-m}^{-1}]\)

\( \varepsilon_0 \) Permittivity of vacuum \(= 8.854 \times 10^{-12} \text{[F-m]} \)

\( \mu_0 \) Permeability of vacuum \(= 4\pi \times 10^{-7} \text{[H-m]} \)

\( ^*, \tau \) Complex conjugation

\( \Re \) Real part of

\( \Im \) Imaginary part of

\( \mathbb{C} \) Field of complex numbers

\( f \) Frequency \([\text{Hz}]\)

\( t \) Time \([\text{s}]\)

\( \omega \) Time-harmonic radian frequency \([\text{Rad-s}^{-1}]\); member of a random set

\( i, j \) \(\sqrt{-1}\)

\( W_e \) Electric Energy \([\text{J}]\)

\( W_m \) Magnetic Energy \([\text{J}]\)

\( \text{a.s, a.e, a.a} \) Almost surely, almost everywhere, almost all

\( \mathbb{R} \) The real axis

\( t \wedge \tau \) \(\min(t, \tau)\)

\( t \vee \tau \) \(\max(t, \tau)\)

\( \mathbb{I}_A \) Indicator function of the set \(A\)

\( \Omega \) Set of possible outcomes, with typical element \(\omega \in \Omega\); Solid angle

\( k \) Wavenumber \(\omega \sqrt{\mu \varepsilon} \text{ at frequency } \omega \)

\( \eta \) Intrinsic impedance \(\sqrt{\mu / \varepsilon} \text{ at frequency } \omega \)

\( \varnothing \) Null set

\( \mathcal{F} \) \(\sigma\)-algebra: the set of all observable (measurable) events for a single trial.

Includes \(\Omega, \varnothing\), and for \(A_n \in \Omega\), the complement \(\bar{A}_n\), unions \(\bigcup_{n=1}^{\infty} A_n\)

\( \mathbb{P} \) Probability measure

\((\Omega, \mathcal{F}, \mathbb{P})\) Probability space

\( \mathbb{E} X \) Expected value of a random variable \(X\)

\( \mathbb{R}^n \) Euclidean \(n\)-dimensional space

\((X_1, \ldots, X_n)\) \(n\)-dimensional random variable
$X_t$ or $X(t, \omega)$ Stochastic Process

$F_n(x_1, \ldots, x_n)$ $n$-dimensional distribution function $= \mathbb{P}(X_1 < x_1, \ldots, X_n < x_n)$

$\nabla^2$ Laplacian operator

$\square^2$ d’Alembertian operator

Class $C^2$ Functions with continuous first and second derivatives
Table 1: Following are corrections within various chapters

<table>
<thead>
<tr>
<th>Location</th>
<th>Correction</th>
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</thead>
<tbody>
<tr>
<td>Pg 1-18, line 10</td>
<td>Replace (D.127) with (D.126)</td>
</tr>
<tr>
<td>Pg 1-29, line 4 after Eq (1.133)</td>
<td>Replace $DY^m_n = -n(n+1)\sin \theta Y^m_n$ with $DY^m_n = -n(n+1)Y^m_n$</td>
</tr>
<tr>
<td>Pg 10-9, Eq (10.23)</td>
<td>Replace $H'$ with $H^r$</td>
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<tr>
<td>Pg 10-22, line 9</td>
<td>Replace [3] with [8]</td>
</tr>
<tr>
<td>Pg 13-15, line 4</td>
<td>Replace $of$ with $if$</td>
</tr>
<tr>
<td>Pg 13-15, line 13</td>
<td>Replace the denominator of $G(R)$ with $|F_1|^2 + |F_{-1}|^2$</td>
</tr>
<tr>
<td>Pg C-16, Eq (C.145)</td>
<td>Replace $\frac{\nu}{z} \hat{H}_V^{(1)}(z)$ with $\frac{\nu}{z} \hat{H}_V^{(2)}(z)$</td>
</tr>
<tr>
<td>Pg D-15, Eq (D.123)</td>
<td>Replace right hand side with $-\frac{\sin \theta}{2\nu+1} \left[ \frac{\partial \hat{\Theta}_V}{\partial \nu} \frac{\partial \hat{\Theta}_V}{\partial \nu} + \Theta_V \frac{\partial^2 \hat{\Theta}_V}{\partial \nu^2} \right] \theta_2$</td>
</tr>
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