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# 1 General Guidance

## 1.1 Figure numbering

Tables, Figures and Captions (see Sec. 4 for formatting properly in L<sup>A</sup>T<sub>E</sub>X).

In Eq. (13), (14), and (16)

In Fig. 4(a)

In Ref. 5

Place the caption under figures and images and above tables.

## 1.2 Dates and numbers

02 February 2016 (no commas)

four or fewer numbers closed up:

1200

24.0032 cm

Five or more digits, spaces instead of commas:

12 000

24.077 89 cm

one through ten

11,12 and above

2x2 matrix (numerals)

0.03 and 106.0 (no “naked” decimal points)

6 V (number before units are always numerals)

1D, 2D, 3D

## 1.3 Punctuation

en-dash: Paris–London train, (1950–), University of Wisconsin–Madison

serial commas (a, b, and c)

hyphenate multi-word modifiers: macro-time

parenthesis:

inserted into another sentence, no period (such as this).

isolated, period inside. (Such as this.)

pairs surrounded letters in innumeration list (a) and (b)

possessives: Smith and Green’s theory

plurals:

1950s

x’s, K’s

quotation marks after commas and periods, before colons and semi-colons

in general, place “e.g.” and “i.e.” in parenthesis, not commas and include a comma after (e.g., like this).

## 1.4 Abbreviations

Plural add ’s: LCAO’s

## 1.5 Names & proper nouns

Book titles should be italicized.

Article titles should be in quotation marks.

## 2 Specific words and terms

### A

$\alpha$  particle

angular-flux (adj)

*ad hoc*

*à la*

anti-compounds closed (antilogarithm)

### B

burnup (n)

### C

Cartesian

collision-flux estimator

cross-section (n)

cross term

### D

delta-tracking

Doppler

downscatter

### E

eigenfunction

eigenvalue

### F

Fourier transform/analysis/spectra

### G

Gauss-Seidel (adj)

### H

half-compound hyphenated:

half-life

halfway

### I

indexes (to book)

indices (to variable)

*in situ*

### J

### K

### L

Laplacian

l.h.s.

lifetime

### M

Maxwell(ian)

midpoint

modeling

multigroup

multivariant

### N

non-compound closed:

nonelastic

nonradioactive

*but* proper noun, symbol, numeral:

non-Fermi

12-fold

### O

### P

path length

### Q

### R

radioactive

ray tracing

r.h.s.

runtime

**S**

scalar-flux (adj)

setup

self-compound hyphenated:

self-shielded (adj)

semiempirical

semi-infinite

**T**

track length

track-length estimator

**U**

upscatter

uranium

**V****W**

waveheight

wavelength

**X**

x ray (n)

x-ray (adj)

**Y****Z**

## 3 Math and notation

### 3.1 Cross-sections

Macroscopic cross-sections are used so infrequently in neutronics that reserving the use of capital sigma,  $\Sigma$ , is inefficient. Use the following notation to differentiate between the two:

macroscopic:  $\tilde{\sigma}$

microscopic:  $\sigma$

### 3.2 Integrals

To ease reading, for single-integration integrals, place the differential on the right side, with a space between the last variable and the  $d$ ,

```
\begin{equation*}
\int f(x)\,dx
\end{equation*}
```

$$\int f(x) dx$$

For multiple-integration integrals place the differential immediately after its corresponding integral symbol, place a space after the last differential:

```
\int_{0}^{1}dx \int_{0}^{1} dy\,f(x,y)
```

$$\int_0^1 dx \int_0^1 dy f(x, y)$$

The space helps emphasize that the differential is a single variable.

Use parenthesis or brackets for any integral with multiple terms, the extra space is not required if the `\left` and `\right` commands are used, but are required otherwise; see examples:

```
\int \left[f(x) + g(x)\right]dx
```

$$\int [f(x) + g(x)] dx$$

```
\int [f(x) + g(x)]\,dx
```

$$\int [f(x) + g(x)] dx$$

```
\int_{0}^{1}dx \int_{0}^{1} dy\left[f(x,y)
+ g(x,y)\right]
```

$$\int_0^1 dx \int_0^1 dy [f(x, y) + g(x, y)]$$

```
\int_{0}^{1}dx \int_{0}^{1} dy\,[f(x,y)
+ g(x,y)]
```

$$\int_0^1 dx \int_0^1 dy [f(x, y) + g(x, y)]$$

### 3.3 Matrices

Bold capital letters, **A**.

Use brackets (`\bmatrix`) for normal matrix, pipes (`\vmatrix`) for determinants, and double pipes (`\Vmatrix`) for a matrix norm.

### 3.4 Vectors

Topped with an arrow,  $\vec{\phi}$ . Vector superscripts must be shifted slightly using `\vec{\phi}^{\ell}`. For comparison:

$$\begin{array}{ll} \vec{\phi}^{\ell} & : \vec{\phi}^{\ell} \\ \vec{\phi}^{\ell} & : \vec{\phi}^{\ell} \end{array}$$

Use hats to denote unit vectors,  $\hat{\Omega}$ .

In general, if a vector is made up of other vectors, use a capital letter for the larger vector, and lowercase for the smaller vectors.

$$\vec{\Phi} = \begin{bmatrix} \vec{\phi}_0 \\ \vec{\phi}_1 \end{bmatrix}$$

## 4 Other L<sup>A</sup>T<sub>E</sub>X specific items

### 4.1 Figures

Place the `\label{}` for figures inside the caption to ensure correct references:

```
\caption{This is the caption.\label{fig:ref}}
```

### 4.2 Labels

Use the following formats for labels:

Chapters	<code>\label{sec:chapter_name}</code>
Sections	<code>\label{sec:chapter_name:section_name}</code>

### 4.3 Package settings

Always hide boxes from hyperref package:

```
\usepackage[hidelinks]{hyperref}
```

### 4.4 Programming language names

For the C++ programming language use:

```
\newcommand{\Cpp}[1][\textrm{C\nolinebreak[4]\hspace{-.05em}\raisebox{.4ex}{\tiny\bf ++}\#1}]
```

This greatly improves the look of the name:

C++17	C++
<code>\Cpp{17}</code>	C++17

### 4.5 References and citations

For equations, use the `amsmath \eqref{label}` function.

$$E = mc^2 \tag{1}$$

This correctly formats `Eq.~\eqref{eq:relativity}` as Eq. (1).

Use `Sec.~\ref{sec:latex}` for sections, which correctly formats as Sec. 4.

For figures, use `Fig.~\ref{fig:image}`, which correctly formats as Fig. 1.

For subfigures, include the packages and commands:

```
\usepackage{caption, subcaption}
\renewcommand\thesubfigure{(\alph{subfigure})}
\captionsetup[sub]{labelformat=simple}
```

and reference the subfigure itself, which will format correctly as Fig. 1(a). See documentation for these packages if needed.

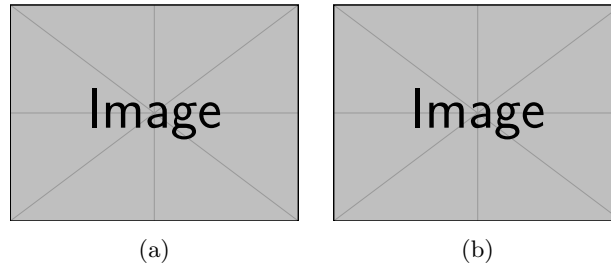


Figure 1: Subfigure with parts (a) and (b).

## 4.6 Spacing

For abbreviations use `.\` or `.\~` if a tie is needed (titles or other words that should not be separated).

Normal	e.g. this example; seen in Fig. 1
Proper	e.g. this example; seen in Fig. 1

Note: the bibliography handles this correctly already.

Specify interspace spacing, `\@.` if a capital letter ends a sentence:

Normal	The code is called BART. As you can see.
Proper	The code is called BART. As you can see.