1

## For proceedings contributors: Using World Scientific's WS-procs9X6 document class in IAT<sub>E</sub>X2e

A.B. Author,  $^1$  C.D. Author,  $^{1,2},$  and E.F. Author  $^2$ 

<sup>1</sup> University Department, University Name, City, State ZIP/Zone, Country

> <sup>2</sup> Group, Laboratory, City, State ZIP/Zone, Country

On behalf of the LLG Collaboration

This article explains how to use World Scientific's ws-procs9x6 document class written in IAT<sub>E</sub>X2e. This article was typeset using ws-procs9x6-cpt25.cls and may be used as a template for your contribution. Your abstract goes here, and it should consist of one paragraph giving a concise summary of the material in your article. Replace the title, authors, and addresses within the curly brackets with your own title, authors, and addresses. For these headings, please follow the capitalizations, spacings, and punctuation used in the sample latex file. Do not use footnotes in the abstract or the title. The acknowledgments for funding bodies, etc., are to be placed in a separate section at the end of the text.

## 1. Files

You should have four files:

- ws-cpt25.tex the main latex file, containing the instructions for contributors and sample text. To prepare your Proceedings contribution, you can delete the sample text and replace it with your own material. However, we recommend that you keep an initial version of the file for reference.
- (2) ws-procs9x6-cpt25.cls the class file that provides the higher level latex commands for these Proceedings. Don't change these parameters.
- (3) ws-procs-fig1.eps a sample eps figure file.
- (4) ws-cpt25.pdf a pdf output of the above.

These files will work with standard LATEX2e. Note that the final pagi-

nation of the volume will be implemented after you submit the paper.

## 2. Using other packages

The class file loads the packages amsfonts, amsmath, amssymb, chapterbib, natbib, graphicx, rotating, and url at startup. Please try to limit your use of additional packages as they often introduce incompatibilities. If you do need additional packages, send them along with the paper. In general, please use standard LATEX commands as much as possible.

#### 3. Layout

 $\mathbf{2}$ 

To facilitate our processing of your article, please give easily identifiable structure to the various parts of the text by making use of the usual  $LAT_EX$  commands or by using your own commands defined in the preamble, rather than by using explicit layout commands, such as  $\, \$  page-layout parameters. For more information on layout and font specifications, please refer to our Layout and Font Specification Guide.

#### 4. User defined macros

User defined macros should be placed where indicated in the preamble of the article, and not at any other place in the document. Please do not use large macro packages and definitions. Please do not change the existing environments, commands, and other standard parts of  $I_{\rm e}X$ .

## 5. Sectional units

Sectional units are obtained with the IATEX commands \section, \subsection, and \subsubsection. Each section header should have the first letter of the first word capitalized but otherwise be capitalized as in standard text, but ending without a period. Please limit the length of section headers to one line. All sections except the Acknowledgments should be numbered. If you don't use section headings, please add the command \phantom{}\vskip10pt\noindent immediately before the body of your main text following the abstract to obtain correct spacing and avoid an initial paragraph indent, and also note that the Acknowledgments should still be a separate unnumbered section.

## 6. Comments on text usage

In the body of your text, please adopt the following standard usages in these Proceedings: (1) the transformation CPT is in Roman letters, not italic, (2) spacetime is one word, (3) General Relativity (GR), Standard Model (SM), and Standard-Model Extension (SME) are capitalized, (4) e.g., i.e., etc., appear with periods and commas as shown, e.g., here.

## 7. Mathematical formulas

Please note that equations are part of the text even when displayed, so they should be punctuated accordingly. They should be typset to avoid overflow outside the text area and should appear in the latex file without blank lines before or after them.

**Inline:** For in-line formulas use  $\ldots$  . Avoid built-up constructions, for example fractions and matrices, in in-line formulas. Fractions in inline formulas can be typed with a solidus, e.g., (x+y)/z=0.

**Display:** For numbered display formulas, use the displaymath environment:

```
\begin{equation}
...
\label{aba:eqno}
\end{equation}
```

All displayed equations should be numbered. For example, the input for:

$$\mu(n,t) = \frac{\sum_{i=1}^{\infty} 1(d_i < t, N(d_i) = n)}{\int_{\sigma=0}^{t} 1(N(\sigma) = n)d\sigma}.$$
(1)

is:

```
\begin{equation}
\mu(n,t) =
\frac{\sum\limits^\infty_{i=1}1 (d_i < t, N(d_i) = n)}
{\int\limits^t_{\sigma=0}1 (N(\sigma)=n)d\sigma}.
\label{aba:eq1}</pre>
```

4

 $\end{equation}$ 

For displayed multiline formulas, use the **eqnarray** environment. For example,

\begin{eqnarray}
\zeta\mapsto\hat{\zeta}&=&a\zeta+b\eta\label{aba:appeq2}
\nonumber \\
\eta\mapsto\hat{\eta}&=&c\zeta+d\eta\label{aba:appeq3}
\end{eqnarray}

produces:

$$\begin{aligned} \zeta \mapsto \tilde{\zeta} &= a\zeta + b\eta \\ \eta \mapsto \hat{\eta} &= c\zeta + d\eta \end{aligned} \tag{2}$$

Superscripts and subscripts that are words or abbreviations, as in  $\sigma_{low}$ , should be typed as roman letters, with  $(\langle sigma_{low} \rangle)$  instead of  $\sigma_{low}$  done with  $\langle sigma_{low} \rangle$ .

For geometric functions, e.g., exp, sin, cos, tan, etc., please use the macros \sin, \cos, \tan. These macros give proper spacing in mathematical formulas.

#### 8. Tables and figures

Put tables and figures in text using the table and figure environments, and position them near the first reference of the table or figure in the text. Please use only short captions in figures and tables. Please avoid large tables and figures insofar as possible.

## 8.1. Tables

The following commands produce Table 1:

```
\begin{table}
```

```
\tbl{Comparison of acoustic for frequencies for piston-cylinder problem.}
{\begin{tabular}{@{}cccc@{}}\toprule
Piston mass & Analytical frequency & TRIA6-$S_1$ model & ...\\
& (Rad/s) & (Rad/s) \\\colrule
1.0\hphantom{00}&\hphantom{0}281.0&\hphantom{0}280.81&0.07 \\
0.1\hphantom{00}&\hphantom{0}876.0&\hphantom{0}875.74&0.03 \\
0.01\hphantom{0}&2441.0&2441.0\hphantom{0}&0.0\hphantom{0} \\
```

5

```
0.001 & 4130.0 & 4129.3\hphantom{0}& 0.16\\\botrule
\end{tabular}}
\begin{tabnote}
$^{\text a}$ Sample table footnote.\\
\end{tabnote}\label{aba:tbl1}
\end{table}
```

Piston mass	Analytical frequency (Rad/s)	$\begin{array}{c} \text{TRIA6-}S_1 \text{ model} \\ \text{(Rad/s)} \end{array}$	% Error <sup>a</sup>
1.0	281.0	280.81	0.07
0.1	876.0	875.74	0.03
0.01	2441.0	2441.0	0.0
0.001	4130.0	4129.3	0.16

Table 1. Acoustic frequencies for piston-cylinder problem.

Please put the table caption above the table. By using the \tbl command in table environment, long captions will be justified to the table width while the short or single line captions are centered.

Tables should have a uniform style. It does not matter how you place the inner lines of the table, but we would prefer the border lines to be of the style as shown in our sample table. Please keep the inner lines of the table to a minimum.

For most ta	ables, the horizontal rules are obtained by:
$\mathbf{toprule}$	one rule at the top
colrule	one rule separating column heads from
	data cells
botrule	one bottom rule
Hline	one thick rule at the top and bottom of

the tables with multiple column heads

To avoid the rules sticking out at either end of the table, add  $@{}$  before the first and after the last descriptors, e.g. @llll@. Please avoid vertical rules in tables.

Headings which span more than one column should be set using \multicolumn{#1}{#2}{#3} where #1 is the number of columns to be spanned, #2 is the argument for the alignment of the column head (which in general may be either c for center alignment, l for left alignment, or r for right alignment; but please use c for column heads as this is the WS style), and #3 is the heading.

## 8.2. Figures

All images should be in Encapsulated PostScript (.eps) format. Other graphics formats are unsuitable. Even if we can read such files, there is no guarantee that they will look the same on our systems as on yours.

Color figures cannot be reproduced in these Proceedings, and we have found that color figures fail to display properly when reproduced directly in grayscale format. Please prepare all figures in black and white or grayscale. Please prepare the figures in high resolution (at least 300 dpi) for halftone illustrations or images. Half-tone pictures must be sharp enough for reproduction. Please ensure that all labels in the figures are legible.



Fig. 1. The bifurcating response curves of system  $\alpha = 0.5, \beta = 1.8; \delta = 0.2, \gamma = 0$ : (a)  $\mu = -1.3$ ; and (b)  $\mu = 0.3$ .

The following commands produce Figure 1:

```
\begin{figure}
\includegraphics[width=4in]{ws-procs-fig1.eps}
\caption{The bifurcating response curves of system
$\alpha=0.5, \beta=1.8; \delta=0.2, \gamma=0$: (a)
$\mu=-1.3$; and (b) $\mu=0.3$.}
```

\label{aba:fig1}
\end{figure}

Adjust the scaling of the figure until it is correctly positioned within the left and right margins of the text. The figure caption should appear below the figure. All figures should be mentioned in the main text.

## 9. Cross references

Please do not use plain numbers for cross references in the text. Every quantity to which you wish to refer should be labeled with \label.

Use **\label** and **\ref** for cross references to figures, tables, sections, and subsections. Use **\label** and **\refeq** for cross references to equations (this will ensure the equation number appears in parentheses, following the style of the Proceedings).

For example:

```
\begin{equation}
\mu(n, t) =
\frac{\sum\limits^\infty_{i=1}1 (d_i < t, N(d_i) = n)}
{\int\limits^t_{\sigma=0}1 (N(\sigma)=n)d\sigma}.
\label{aba:eq1}
\end{equation}</pre>
```

With the instruction **\refeq** one can refer to a numbered equation that has been labeled:

#### ..., see also Eq.\ \refeq{aba:eq1}.

The \label instruction should be typed immediately after but not inside the argument of a number-generating instruction such as \section or \caption. For example, \caption{Caption here.}\label{aba:fig1}. It should also be roughly in the position where the number appears, in environments such as an equation. Labels must be unique.

Please use abbreviations for Equation, Section, Figure, and Table according to the following list.

latex command	output		
In the middle of a sentence:			
Eq.\ \refeq{aba:eq1}	Eq. (1)		
Sec.\ \ref{aba:sec1}	Sec. 2		
Fig. $\ fig.$	Fig. 1		
Table \ref{aba:tbl1}	Table 1		
At the starting of a sentence:			
Equation \refeq{aba:eq1}	Equation $(1)$		
Section \ref{aba:sec1}	Section 2		
<pre>Figure \ref{aba:fig1}</pre>	Figure 1		
Table \ref{aba:tbl1}	Table 1		

## 10. Footnotes

8

Footnotes are denoted by a Roman letter superscript in the text,<sup>a</sup> whereas references are denoted by a number superscript (see below). The footnote is created by typing:

```
... in the text, \footnote{Just like this one.}
```

Note there is no spacing between the comma and the footnote command. Footnotes should appear numbered sequentially in superscript lowercase Roman letters.<sup>b</sup>

## 11. Citations

Citations are generated as superscripts for these Proceedings. They should appear numbered consecutively in Arabic numerals in the order of first appearance.

If you normally use the method of square brackets for citations, please check that the citation command appears *after* the punctuation mark in the pdf output (this should be automatic). Please don't leave a blank space between the punctuation mark or word and the citation command. For example,

(1) "... in the statement.<sup>1</sup>"

(2) "... have proven<sup>1-3</sup> that this equation ..."

Citations are introduced using the command '\cite{citationlabel}.' Citation labels must be unique. For multiple citations, use the form \cite{cite1,cite2} instead of \cite{cite1}, \cite{cite2}.

<sup>&</sup>lt;sup>a</sup>Just like this one.

<sup>&</sup>lt;sup>b</sup>Footnotes should appear as 8 pt Times Roman at the bottom of the page.

When the citation forms part of the sentence it should not be superscripted. For example,

(1) "One can deduce from Ref. 2 that ..."

(2) "See Refs. 1, 2, 3, 4 for more details."

This is done using the special command 'Ref.  $\ \$ 

The bibliography at the end of this file is produced with the commands

```
\begin{thebibliography}{xx}
\bibitem{datatables}
{\it Data Tables for Lorentz and CPT Violation,}
V.A.\ Kosteleck\'y and N.\ Russell,
2022 edition,
arXiv:0801.0287v15.
\bibitem{randomphoton}
J.\ Lipa, J.A.\ Nissen, S.\ Wang, D.A.\ Stricker, and D.\ Avaloff,
Phys.\ Rev.\ Lett.\ {\bf 90}, 060403 (2003);
H.\ M\"uller, S.\ Herrmann, C.\ Braxmaier,
S.\ Schiller, and A.\ Peters,
Phys.\ Rev.\ Lett.\ {\bf 91}, 020401 (2003);
P.\ Wolf, M.E.\ Tobar, S.\ Bize, A.\ Clairon,
A.N.\ Luiten, and G.\ Santarelli,
Gen.\ Rel.\ Grav.\ {\bf 36}, 2351 (2004).
\bibitem{randomnu}
MINOS Collaboration,
P.\setminus Adamson \etal,
Phys.\ Rev.\ Lett.\ {\bf 101}, 151601 (2008);
LSND Collaboration,
L.B.\ Auerbach \etal,
Phys.\ Rev.\ D {\bf 72}, 076004 (2005);
J.S.\ D\'\i az \etal,
Phys.\ Rev.\ D {\bf 80}, 076007 (2009).
\bibitem{randombook}
{\it Physics of Massive Neutrinos},
F.\setminus Boehm and P.\setminus Vogel,
Cambridge University Press, Cambridge, 1987.
\end{thebibliography}
```

Please note the following points: (1) no spacing between initials, (2) all periods within citations are followed by a backslash and space, and all citations end with a period, (3) the command '\etal,' should be used for

large numbers of authors in a citation, (4) citations to books have the form shown, (5) citations to articles on the arXiv have the form shown, (6) the journal name should appear for every citation, even when two articles in the same journal are being cited sequentially, (7) no footnotes should appear in the citations.

## Acknowledgments

Acknowledgments to funding bodies, etc., may be placed in a separate section at the end of the text, before the Appendices. This should not be numbered, so use \section\*{Acknowledgments}. Please note the correct U.S. spelling of the word 'Acknowledgments.'

## Appendix A. About the appendix

It is preferable to have no appendix in your Proceedings article, but if it is necessary, then please use the format

# \appendix{About the appendix}

It is preferable...

If more appendices are used, they should appear numbered alphabetically. Note that all appendices should appear after the acknowledgments but before the bibliography.

## References

- Data Tables for Lorentz and CPT Violation, V.A. Kostelecký and N. Russell, 2025 edition, arXiv:0801.0287v18.
- J. Lipa, J.A. Nissen, S. Wang, D.A. Stricker, and D. Avaloff, Phys. Rev. Lett. 90, 060403 (2003); H. Müller, S. Herrmann, C. Braxmaier, S. Schiller, and A. Peters, Phys. Rev. Lett. 91, 020401 (2003); P. Wolf, M.E. Tobar, S. Bize, A. Clairon, A.N. Luiten, and G. Santarelli, Gen. Rel. Grav. 36, 2351 (2004).
- MINOS Collaboration, P. Adamson *et al.*, Phys. Rev. Lett. **101**, 151601 (2008); LSND Collaboration, L.B. Auerbach *et al.*, Phys. Rev. D **72**, 076004 (2005); J.S. Díaz *et al.*, Phys. Rev. D **80**, 076007 (2009).
- 4. F. Boehm and P. Vogel, *Physics of Massive Neutrinos*, Cambridge University Press, Cambridge, 1987.