For proceedings contributors: Using World Scientific's ws-procs11x85 document class with LaTeX2e*

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This article explains how to use World Scientific's ws-procs11x85 document class written in LaTeX2e. This article was typeset using ws-procs11x85.cls and may be used as a template for your contribution.

Keywords: Style file; LaTeX; Proceedings; World Scientific Publishing.

1. Using Other Packages

The class file loads the packages `amsfonts, amsmath, amssymb, chapterbib, cite, dcolumn, rotating` and `url` at startup. Please try to limit your use of additional packages as they often introduce incompatibilities. This problem is not specific to the WSPC styles; it is a general LaTeX problem. Check this article to see whether the required functionality is already provided by the WSPC class file. If you do need additional packages, send them along with the paper. In general, you should use standard LaTeX commands as much as possible.

2. Layout

In order 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 LaTeX commands or by using your own commands defined in the preamble, rather than by using explicit layout commands, such as `\hspace, \vspace, \large, \centering`, etc. Also, do not redefine the page-layout parameters.

3. User Defined Macros

User defined macros should be placed in the preamble of the article, and not at any other place in the document. Such private definitions, i.e. definitions made using the commands

*Type the title of the paper, authors' names with the first letter of important words capitalized.

`\newcommand, \renewcommand, \newenvironment` or `\renewenvironment`, should be used with great care. Sensible, restricted usage of private definitions is encouraged. Large macro packages and definitions that are not used in this example article should be avoided. Please do not change the existing environments, commands and other standard parts of LaTeX.

4. Using WS-procs11x85

4.1. *Input used to produce this paper*

```
\documentclass{ws-procs11x85}

\usepackage{ws-procs-thm}
\begin{document}
\title{For proceedings ...}
\author{First Author$^*$ ...}
\address{University ...}
\author{Second Author}
\address{Group, Laboratory, ...}
\begin{abstract}
This article...
\end{abstract}
\keywords{Style file; ...}
\copyrightinfo{\copyright...}

\section{Using Other Packages}
The class file has...

\appendix{About the Appendix}
Appendices should be...
\bibliographystyle{ws-procs11x85}
\bibliography{ws-pro-sample}

\end{document}
```

5. Sectional Units

Sectional units are obtained in the usual way, i.e. with the LaTeX commands `\section`, `\subsection`, `\subsubsection` and `\paragraph`.

6. Section

This is just an example.

6.1. *Subsection*

This is just an example.

6.1.1. *Subsubsection*

This is just an example.

Paragraph This is just an example.

Unnumbered Section

Unnumbered sections can be obtained by using `\section*`.

7. Lists of Items

Lists are broadly classified into four major categories that can randomly be used as desired by the author:

(a) Numbered list.
(b) Lettered list.
(c) Unnumbered list.
(d) Bulleted list.

7.1. *Numbered and lettered list*

(1) The `\begin{arabiclist}[]` command is used for the arabic number list (arabic numbers appearing within parenthesis), e.g., (1), (2), etc.
(2) The `\begin{romanlist}[]` command is used for the roman number list (roman numbers appearing within parenthesis), e.g., (i), (ii), etc.
(3) The `\begin{Romanlist}[]` command is used for the cap roman number list (cap roman numbers appearing within parenthesis), e.g., (I), (II), etc.
(4) The `\begin{alphlist}[]` command is used for the alphabetic list (alphabets appearing within parenthesis), e.g., (a), (b), etc.
(5) The `\begin{Alphlist}[]` command is used for the cap alphabetic list (cap alphabets appearing within parenthesis), e.g., (A), (B), etc.

Note: For all the above mentioned lists (with the exception of alphabetic list), it is obligatory to enter the last entry's number in the list within the square bracket, to enable unit alignment.

7.2. *Bulleted and unnumbered list*

The `\begin{itemlist}` command is used for the bulleted list. The `\begin{unnumlist}` command is used for creating the unnumbered list with the turnovers hangindent by 1 pica.

Lists may be laid out with each item marked by a dot:

- item one
- item two
- item three
- item four.

Items may also be numbered with lowercase Roman numerals:

(i) item one
(ii) item two
    (a) lists within lists can be numbered with lowercase alphabets
    (b) second item.
(iii) item three.

8. Theorems and Definitions

The following environments are available by default with `ws-procs-thm`:

Environment	Heading
`algorithm`	Algorithm
`answer`	Answer
`assertion`	Assertion
`assumption`	Assumption
`case`	Case
`claim`	Claim
`comment`	Comment
`condition`	Condition
`conjecture`	Conjecture
`convention`	Convention
`corollary`	Corollary
`criterion`	Criterion
`definition`	Definition
`example`	Example
`lemma`	Lemma
`notation`	Notation
`note`	Note
`observation`	Observation
`problem`	Problem
`proposition`	Proposition
`question`	Question
`remark`	Remark
`solution`	Solution
`step`	Step
`summary`	Summary
`theorem`	Theorem

Input:

```
\begin{theorem}
We have $\# H^2 (M \supset N) < ...
\label{aba:the1}
\end{theorem}
```

Output:

Theorem 1. *We have* $\#H^2(M \supset N) < \infty$ *for an inclusion* $M \supset N$ *of factors of finite index.*

Input:

```
\begin{theorem}[Longo, 1998]
For a given $Q$-system ...
\[ N = \{x \in N; ... \}\,, \]
and $E_\Xi (\cdot) = T^* ...\label{aba:the2}
\end{theorem}
```

Output:

Theorem 2 (Longo, 1998). *For a given Q-system...*

$$N = \{x \in N; Tx = \gamma(x)T, Tx^* = \gamma(x^*)T\}\,,$$

and $E_\Xi(\cdot) = T^*\gamma(\cdot)T$ *gives a conditional expectation onto* N*.*

LaTeX provides `\newtheorem` to create new theorem environments. To add theorem-type environments to an article, use

```
\newtheorem{example}{Example}[section]
\let\Examplefont\upshape
\def\Exampleheadfont{\bfseries}
\begin{example}
We have $\# H^2 (M \supset N) < ...
\end{example}
```

For details see the LaTeX user manual.[1,2]

8.1. *Proofs*

The WSPC document styles also provide a predefined proof environment for proofs. The proof environment produces the heading 'Proof' with appropriate spacing and punctuation. It also appends a 'Q.E.D.' symbol, □, at the end of a proof, e.g.

```
\begin{proof}
This is just an example.
\end{proof}
```

to produce

Proof. This is just an example. □

The proof environment takes an argument in curly braces, which allows you to substitute a different name for the standard 'Proof'. If you want to display, 'Proof of Lemma', then write e.g.

```
\begin{proof}[Proof of Lemma]
This is just an example.
\end{proof}
```

produces

Proof of Lemma. This is just an example. □

9. Programs and Algorithms

Fragments of computer programs and descriptions of algorithms should be prepared as if they were normal text. Use the same fonts for keywords, variables, etc., as in the text; do not use small typeface sizes to make program fragments and algorithms fit within the margins set by the document style. An example with only the tabbing environment and one new definition:

```
\newcommand{\keyw}[1]{{\bf #1}}
\begin{tabbing}
\quad \=\quad \=\quad \kill
\keyw{for} each $x$ \keyw{do} \\
\> \keyw{if} extension$(p, x)$ \\
\> \> \keyw{then} $E:=E\cup\{x\}$\\
\keyw{return} $E$
\end{tabbing}
```

for each x **do**
  if extension(p, x)
    then $E := E \cup \{x\}$
return E

10. Mathematical Formulas

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

Display: For numbered display formulas, use the displaymath environment:
`\begin{equation}...\end{equation}`.

And for unnumbered display formulas, use `\[ ... \]`. For numbered displayed, one-line formulas always use the equation environment. Do not use `$$ ... $$`.

For example, the input for:

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

is:

```
\begin{equation}
\mu(n, t) = \frac{\sum ...}{\int ...}.
\label{aba:eq1}
\end{equation}
```

For displayed multi-line formulas, use the `eqnarray` environment. For example,

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

produces:

$$\zeta \mapsto \hat{\zeta} = a\zeta + b\eta \tag{2}$$
$$\eta \mapsto \hat{\eta} = c\zeta + d\eta \tag{3}$$

LaTeX does not break long equations to make them fit within the margins as it does with normal text. It is therefore up to you to format the equation appropriately (if they overrun the margin.) This typically requires some creative use of an eqnarray to get elements shifted to a new line and to align nicely, e.g.,

$$\begin{aligned}(1+x)^n = 1 &+ nx + \frac{n\,(n-1)}{2!}x^2 \\ &+ \frac{n\,(n-1)\,(n-2)}{3!}x^3 \\ &+ \frac{n\,(n-1)\,(n-2)\,(n-3)}{4!}x^4 \\ &+ \ldots n\text{th.}\end{aligned} \tag{4}$$

Superscripts and subscripts that are words or abbreviations, as in σ_{low}, should be typed as roman letters; this is done as `\( \sigma_{\mathrm{low}} \)` instead of σ_{low} done with `\( \sigma_{low} \)`.

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.

It is also possible to use the $\mathcal{AMS}$-LaTeX package,[2] which can be obtained from the $\mathcal{AMS}$ and various TeX archives.

11. Floats

11.1. *Tables*

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 avoid long captions in figures and tables.

Input:

```
\begin{table}[h]
\tbl{... table caption ...}
{\begin{tabular}{@{}lcccr@{}}\toprule
ID & $m$ & $R^2$ & $x_2$ & Times\\ \colrule
11 & 100 & 3135 & 1138 & $<98$ sec\\
11 & 100 & 3135 & 1138 & $<98$ sec\\
12 & 100 & 3135 & 1138 & $<99$ sec\\
13 & 100 & 3135 & 1138 & $<100$ sec\\
14 & 100 & 3135 & 1138 & $<101$ sec\\
15 & 100 & 3135 & 1138 & $<102$ sec\\ \botrule
\end{tabular}}\label{aba:tbl1}
\end{table}
```

Output:

Table 1. ... table caption ...

ID	m	R^2	x_2	Times
11	100	3135	1138	< 98 sec
12	100	3135	1138	< 99 sec
13	100	3135	1138	< 100 sec
14	100	3135	1138	< 101 sec
15	100	3135	1138	< 102 sec

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

```
\begin{table}[h]
\tbl{table caption}
{tabular environment}
\label{tblabel}
\end{table}
```

For most tables, the horizontal rules are obtained by:

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. But if you think the vertical rule is a must, you can use the standard LaTeX `tabular` environment.

Headings which span for 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 may be either c — for center alignment; l — for left alignment; or r — for right alignment, as desired by the users. Use c for column heads as this is the WS style and `#3` is the heading.

For the footnotes in the table environment the command is `\begin{tabnote}<text>\end{tabnote}`.

Tables should have a uniform style throughout the proceedings volume. 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 tables. For the inner lines of the table, it looks better if they are kept to a minimum.

11.2. *Figures*

A figure is obtained with the following commands

```
\begin{figure}[h]
\centerline{
\includegraphics[width=4.5cm]{procs-fig1}
}
\caption{...caption here...}
\label{aba:fig1}
\end{figure}
```

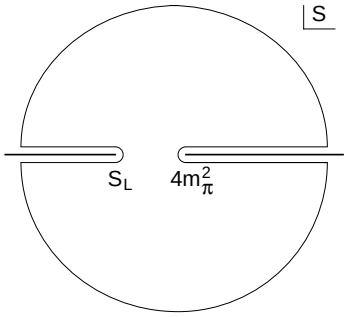

Fig. 1. ... caption here ...

The preferred graphics formats are TIF and Encapsulated PostScript (EPS) for any type of image. Our TeX installation requires EPS, but we can easily convert TIF to EPS. Many other formats, e.g. PICT (Macintosh), WMF (Windows) and various proprietary formats, are not suitable. Even if we can read such files, there is no guarantee that they will look the same on our systems as on yours.

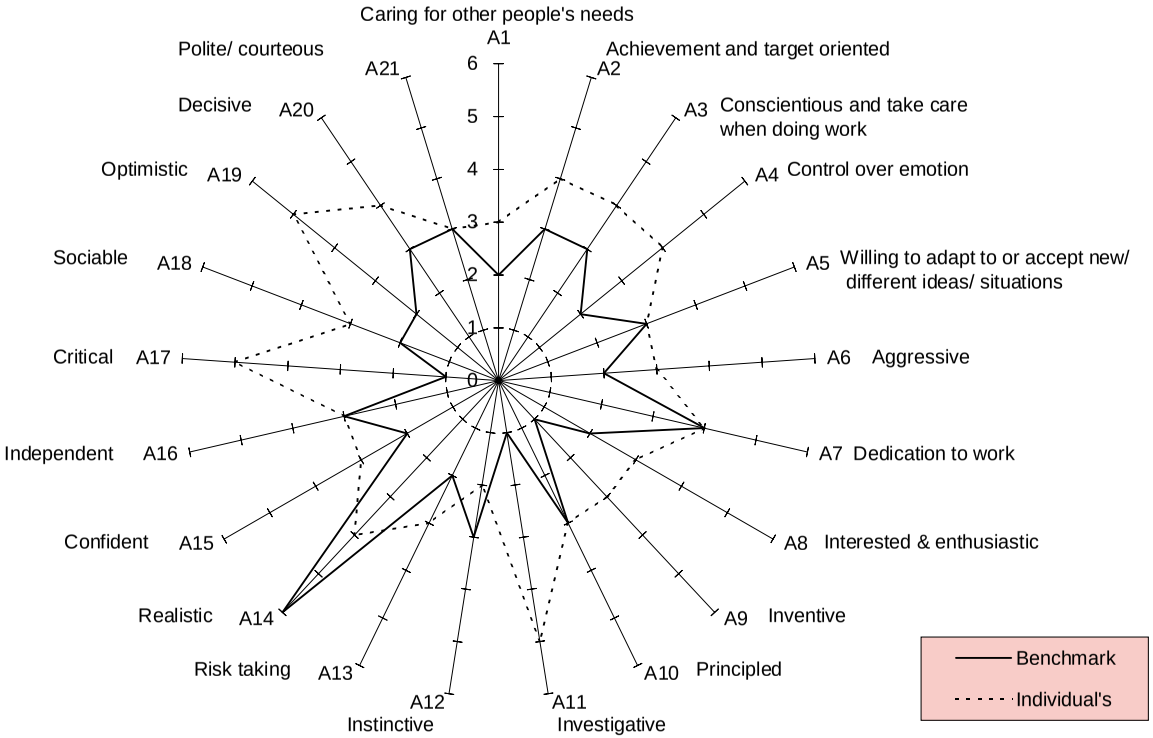

Fig. 2. The bifurcating response curves of system $\alpha = 0.5$, $\beta = 1.8$; $\delta = 0.2$, $\gamma = 0$: (a) $\mu = -1.3$; and(b) $\mu = 0.3$.

Table 2. Positive values of X_0 by eliminating Q_0 from Eqs. (15) and (16) for different values of the parameters f_0, λ_0 and α_0 in various dimension.

f_0	λ_0	α_0	Positive roots (X_0)							
			4D	5D	6D	7D	8D	10D	12D	16D
−0.033	0.034	0.1	6.75507, 1.14476	4.32936, 1.16321	3.15991, 1.1879	2.44524, 1.22434	1.92883, 1.29065	0.669541, 0.415056	—	—
−0.1	0.333	0.2	3.15662, 1.24003	1.72737, 1.48602	—	—	—	—	—	—
−0.301	0.302	0.001	2.07773, 1.65625	—	—	—	—	—	—	—
−0.5	0.51	0.001	—	—	—	—	—	—	—	—
0.1	0.1	2	1.667, 0.806578	1.1946 0.858211	—	—	—	—	—	—
0.1	0.1	10	0.463679	0.465426	0.466489	0.466499	0.464947	0.45438	0.429651	0.35278
0.1	1	0.2	—	—	—	—	—	—	—	—
0.1	5	5	—	—	—	—	—	—	—	—
1	0.001	2	0.996033, 0.414324	0.968869, 0.41436	0.91379, 0.414412	0.848544, 0.414489	0.783787, 0.414605	0.669541, 0.415056	0.577489, 0.416214	—
	0.001	0.2	0.316014, 0.275327	0.309739, 0.275856	—	—	—	—	—	—
	0.1	5	0.089435	0.089441	0.089435	0.089409	0.08935	0.089061	0.088347	0.084352
	1	3	0.128192	0.128966	0.19718, 0.41436	0.169063, 0.414412	0.142103, 0.414489	—	—	—

Adjust the scaling of the figure until it is correctly positioned, and remove the declarations of the lines and any anomalous spacing.

Very large figures and tables should be placed on a separate page by themselves. Landscape tables and figures can be typeset with the following environments:

- `sidewaystable` and
- `sidewaysfigure`.

Example:

```
\begin{sidewaysfigure}
\begin{center}
\includegraphics[width=6in]{procs-fig2}
\end{center}
\caption{Caption ...}
\label{aba:fig2}
\end{sidewaysfigure}
```

```
\begin{sidewaystable}
\tbl{Positive values of ...}
{\begin{tabular}{@{}ccccccccccc@{}}
...
\end{tabular}}
\label{aba:tbl3}
\end{sidewaystable}
```

12. Cross-references

Use `\label` and `\ref` for cross-references to equations, figures, tables, sections, subsections, etc., instead of plain numbers. Every numbered part to which one wants to refer, should be labeled with the instruction `\label`. For example:

```
\begin{equation}
\mu(n, t) = \frac{\sum ...}{\int ...}.
\label{aba:eq1}
\end{equation}
```

With the instruction `\ref` one can refer to a numbered part that has been labeled:

```
..., see also Eq. (\ref{aba:eq1})
```

The `\label` instruction should be typed

- immediately after (or one line below), but not inside the argument of a number-generating instruction such as `\section` or `\caption`, e.g.: `\caption{Caption}\label{aba:fig1}`.
- roughly in the position where the number appears, in environments such as an equation,
- labels should be unique, e.g., equation 1 can be labeled as `\label{aba:eq1}`, where '`aba`' is author's initial and '`eq1`' the equation number.

13. Citations

We have used `\bibitem` to produce the bibliography. Citations in the text use the labels defined in the bibitem declaration, e.g., the first paper by Jarlskog[3] is cited using the command `\cite{jarl88}`. Bibitem labels should be unique.

For multiple citations, do not use `\cite{1}`, `\cite{2}`, but use `\cite{1,2}` instead.

When the reference forms part of the sentence, it should not be typed in superscripts, e.g.: "One can show from Ref. 1 that ...", "See Refs. 2 and 3 for more details." This is done using the LaTeX command: "`Ref.~\citen{name}`".

14. Footnotes

Footnotes are denoted by a Roman letter superscript in the text. Footnotes can be used as

Input:

```
... total.\footnote{Sample footnote.}
```

Output: ... in total.[a]

15. Acknowledgments and Appendices

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}`.

It is preferable to have no appendices in a short article, but if it is necessary, then simply use as

```
\appendix{About the Appendix}
Appendices should be...
\begin{equation}
\mu(n, t) = ... \label{app:a1}
\end{equation}
\subappendix{Appendix Sectional Units}
Sectional units are...
```

16. References

References can be typed in your preferred bibliography style.

```
\begin{thebibliography}{9}

\bibitem{jarl88} C. Jarlskog, in {\it CP Violation} (World Scientific,
   Singapore, 1988).
```

[a]Sample footnote text.

```
\bibitem{lamp94} L. Lamport, {\it \LaTeX, A Document Preparation System},
   2nd edition (Addison-Wesley, Reading, Massachusetts, 1994).

\bibitem{ams04} \AmS-\LaTeX{} Version 2 User's Guide (American Mathematical
   Society, Providence, 2004).

\bibitem{best03} B.~W. Bestbury, {$R$}-matrices and the magic square,
   {\em J. Phys. A} {\bf 36}, 1947 (2003).

\end{thebibliography}
```

16.1. *BIBTEXing*

BIBTEX users can use their preferred BIBTEX style file, e.g.,

```
\bibliographystyle{ws-procs11x85}
\bibliography{ws-pro-sample}
```

where `ws-procs11x85` refers to a file `ws-procs11x85.bst`, which defines how your references will look. The argument to `\bibliography` refers to the file `ws-pro-sample.bib`, which should contain your database in BIBTEX format. Only the entries referred to via `\cite` will be listed in the bibliography. Sample output using `ws-procs11x85` bibliography style file:

BIBTEX entry type	Sample citation
article	... text.[4–6]
proceedings	... text.[7]
inproceedings	... text.[8]
book	... text.[3,9]
edition	... text.[10]
editor	... text.[11]
series	... text.[12]
tech report	See Refs. 13 and 14 for more details
unpublished	... text.[15]
phd thesis	... text.[16]
masters thesis	... text.[17]
incollection	... text.[18]
misc	... text.[19]

The numbered citations can appear in two ways:

(1) Superscript[1] (default) - `\usepackage{ws-procs11x85}`
(2) Bracketed [1] - `\usepackage[square]{ws-procs11x85}`

The contributors are advised to consult the proceedings editor before choosing the citation style `square`.

Appendix A. About the Appendix

Appendices should be used only when absolutely necessary. They should come before the References.

Table A1. Macros available for use.

Macro name	Purpose
\title{#1}	Article Title
\author{#1}	List of all Authors
\address{#1}	Address of Author
\maketitle	Formats title page
\begin{abstract}	Start Abstract
\end{abstract}	End Abstract
\keywords{#1}	Keywords
\bodymatter	Start body text
\section{#1}	Section heading
\subsection{#1}	Subsection heading
\subsubsection{#1}	Subsubsection heading
\section*{#1}	Unnumbered Section head
\begin{itemlist}	Start unnumbered lists
\end{itemlist}	End unnumbered lists
\begin{romanlist}	Start roman lists
\end{romanlist}	End roman lists
\begin{alphlist}	Start alpha lists
\end{alphlist}	End alpha lists
\begin{proof}	Start of Proof
\end{proof}	End of Proof
\begin{theorem}	Start of Theorem
\end{theorem}	End of Theorem
	See Page for detailed list
\appendix{#1}	Appendix heading
\begin{thebibliography}	Start of numbered reference list
\end{thebibliography}	End of numbered reference list
Macros available for Table/Figures	
figure	Single column figures
sidewaysfigure	landscape figures
table	Single column tables
sidewaystable	landscape tables
Horizontal rules for tables	
\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

Unnumbered appendix sections can be obtained using `\section*`.

$$\zeta \mapsto \hat{\zeta} = a\zeta + b\eta \tag{A.1}$$

$$\eta \mapsto \hat{\eta} = c\zeta + d\eta \tag{A.2}$$

Number displayed equations occurring in the appendix in this way, e.g. (A.1), (A.2), etc.

References

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