LATEX Guide for the Publications of the Astronomical Society of Australia

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Abstract

This guide is for authors who are preparing papers for the *Publications of the Astronomical Society of Australia* using the LaTeX document-preparation system and the PASA class file (pasa.cls).

Keywords: keyword1 – keyword2 – keyword3 – keyword4 – keyword5

1 INTRODUCTION

In addition to the standard submission of hardcopy from authors, the journal now accepts machine-readable forms of papers in LATEX. The layout design for the PASA journal has been implemented as a LATEX class file (pasa.cls), based on the article class as discussed in the LATEX manual (Lamport 1986). We assume that the reader is already familiar with LATEX, but commands which differ from the standard LATEX interface, or which are provided in addition to the standard interface, are explained in this guide (which is not a substitute for the LATEX manual itself).

Note that the final printed version of papers will use the Times typeface rather than the Computer Modern typeface available to authors. For this reason, line and page breaks will change and authors should not insert hard breaks in their text. (Note that this document uses pasa.cls, but is output in Computer Modern.)

Authors planning to submit their papers in LATEX are advised to use pasa.cls as early as possible in the creation of their files.

1.1 Why LATEX?

LATEX is constructed as a series of macros on top of the TEX typesetting program. LATEX adds to TEX a collection of facilities which simplify typesetting for authors by allowing them to concentrate on the logical structure of the document rather than its visual layout. Careful use of the LATEX mark-up philosophy results in uniform layout rather than the *ad hoc* results of some word-processing systems. Authors are advised to let the defaults control font selection etc., rather than tinker themselves.

The LATEX system provides a consistent and comprehensive document preparation interface. Among other things, LATEX can automatically number list entries, equations, figures, tables and footnotes, as well as sections and subsections. Using this numbering system, bibliographic citations, page references and cross references to any other numbered entity (e.g. sections, equations, and figures) are straightforward.

1.2 The PASA document class

The use of document classes allows a simple change of style (or style option) to transform the appearance of your document. The PASA class preserves the standard LATEX interface such that any document which can be produced using the standard LATEX article class can also be produced with the PASA class. However, the measure (or width of text) is different from that for article calss therefore line breaks will change and it is possible that longer equations may need re-setting. Authors are urged to use pasa.cls from the beginning of their document preparation, otherwise it may require re-formatting at a later stage.

1.3 General style issues

Use of LaTeX defaults will result in a pleasing uniformity of layout and font selection. Authors should resist the temptation to make *ad hoc* changes to these. Also avoid use of direct formatting unless really necessary. Papers will be edited as usual, and this process may be obstructed by the use of inserted line breaks, etc.

2 USING THE PASA CLASS FILE

First, copy the file pasa.cls into an appropriate subdirectory on your system. The PASA class is implemented as a complete document class, and *not* as a class option. In order to use the PASA class, replace article by pasa in the \documentclass command at the beginning of your document, that is,

\documentclass{article}

is replaced by

\documentclass{pasa}

Author-defined macros should be inserted before \begin{document}, or in a separate file, and should be included with the submission. Authors must not change any of the macro definitions or parameters in pasa.cls.

2.1 Document class options

In general, the following standard document class options should *not* be used with the PASA class file:

- 10pt, 11pt and 12pt unavailable;
- twoside is the default (oneside is disabled);
- twocolumn is the default (onecolumn is disabled);
- titlepage is not required and is disabled;
- fleqn and leqno should not be used, and are disabled.

3 ADDITIONAL FACILITIES

In addition to all the standard IATEX design elements, the PASA class includes the following features:

- Additional commands for typesetting the title page. Extended commands for specifying a short version of the title and author(s) for the running headlines.
- An abstract environment for typesetting abstracts
- A keywords environment for typesetting keywords
- Control of enumerated lists.

Once you have used these additional facilities in your document, it can be processed only with pasa.cls.

3.1 Titles, authors' names, and running headlines

At the beginning of your article, the title should be generated in the usual way using the \maketitle command. Immediately following the title you may include

an abstract and/or keywords. For example, the titles for this guide were produced by the following source:

\begin{document}
\maketitle

In the PASA class, the title of the article and the author's name (or authors' names) are used both at the beginning of the article for the main title and throughout the article as running headlines at the top of every page. The title is used on odd-numbered pages (rectos) and the author's name appears on even-numbered pages (versos). The \pagestyle and \thispagestyle commands should not be used. Similarly, the commands \markright and \markboth should not be necessary.

Although the article title can run to several lines of text, the running headline must be a single line. Moreover, the title can incorporate new-line commands (e.g. \\), but these are not acceptable in a running headline. To enable you to specify an alternative short title, and an alternative short author's name, the standard \title and \author commands have been extended to take an optional argument to be used as the running headline.

```
\title[Short title]
    {Full title which can be as long
        as necessary}
\author[Author name]
    {Author name \\ \affil{Affiliation}}
```

Notice that the author name in the argument for the running head, as well as for the title, should be in mixed case. The author affiliation is set in the normal way, after a \\ in the argument to the \author command.

Any 'work supported by' or 'authors current address' information should be inserted via \thanks commands, which should be positioned after the appropriate 'Author name' in the \author command.

If there are four (or more) authors for the article, the author running head should contain the first author name followed by 'et al.' only, e.g.

```
\author[Author1 et al.]
{Author1...}
```

The previous examples show an article with one author, the normal LaTeX conventions have been extended

to allow the author names and their affiliations to be typeset in the correct PASA style. The following examples should cover most possibilities:

Case 1. Two authors with the same affiliation:

```
\author[Author1 and Author2]
{Author1 and Author2\\
\affil{Affiliation for both authors}}
```

If the author names are too long to fit onto one line, it should be broken into two or more lines using the \\ command.

Case 2. Two authors with different affiliations:

```
\author[Author1 and Author2]
     {Author1\\
        \affil{Affiliation for Author1}
        \and Author2\\
        \affil{Affiliation for Author2}}
```

Case 3. Three (or more) authors, two with the same affiliation:

Case 4. One author with two affiliations:

3.2 Abstract and keywords

At the beginning of your article, the title should be generated in the usual way using the \maketitle command. The abstract should be enclosed within an abstract environment, followed immediately by the key words enclosed in a keywords environment. These can be produced using the following codes:

```
\begin{abstract}
This guide is for authors...
\end{abstract}
\begin{keywords}
keyword1 -- keyword2 -- ...
\end{keywords}
```

doi:xxxx

The headings 'Abstract' and 'Keywords:' are generated automatically.

3.3 Lists

The PASA class provides the three standard list environments:

- Numbered lists, created using the enumerate environment:
- Bulleted lists, created using the itemize environment:
- Unnumbered lists, created using the unnumlist environment.

The numbered list is provided in the PASA class file using the enumerate environment, for example,

- 1. First numbered item.
- 2. Second numbered item.
- 3. Third numbered item.

The above list was produced by

```
\begin{enumerate}
  \item First numbered item.
  \item Second numbered item.
  \item Third numbered item.
\end{enumerate}
```

The bulletpointed list is produced by using the itemize environment, for example,

- First bulleted item.
- Second bulleted item.
- Third bulleted item.

The above list was produced by

```
\begin{itemize}
  \item First bulleted item.
  \item Second bulleted item.
  \item Third bulleted item.
\end{itemize}
```

The PASA class file provides unnumbered lists using the unnumlist environment, for example,

First unnumbered item.
Second unnumbered item.
Third unnumbered item.

The above list was produced by

\begin{unnumlist}
 \item First unnumbered item...
 \item Second unnumbered item.
 \item Third unnumbered item.
\end{unnumlist}

3.4 Quotation

The PASA class provides the standard quotation environments.

This is a longer quotation. It consists paragraph of text, neither of which are particularly interesting. It is just as dull as the above text.

\begin{quotation}

This is a longer quotation. It consists paragraph of text, neither of which are particularly interesting. It is just as dull as the above text. \end{quotation}

4 USER-DEFINED MACROS

If you define your own macros, you must ensure that their names do not conflict with any existing macros in LATEX. You should also place them in the preamble of your input file, between the \documentclass (but after any \usepackage commands) and before the \begin{document} command.

Apart from scanning the indexes of the relevant manuals, you can check whether a macro name is already used by using \newcommand rather than \def, which will check for the existence of the macro you are trying to define. If the macro exists IATFX will respond with:

! LaTeX Error: Command ... already defined.

In this case you should choose another name, and try again.

Such macros must be in a place where they can easily be found and if necessary correctly modified by the journal's editors or typesetter. They must be gathered together in the preamble of your input file, or in a separate macros.tex file with the command \input{macros} in the preamble. Macro definitions must not be scattered about your document where they are likely to be completely overlooked or overwritten by the typesetter.

The same applies to font definitions that are based on Computer Modern fonts. These must be changed by the typesetter to use the journal's correct typeface. In this case, you should draw attention to these font definitions on the hard copy that you submit for publication and by placing a comment in your input file just before the relevant definitions, for example % replace font!

5 SOME GUIDELINES FOR USING STANDARD FACILITIES

The following notes may help you achieve the best effects with the PASA class file.

5.1 Sections

LATEX provides four levels of section headings and they are all defined in the PASA class file:

Heading A - \section{...}
Heading B - \subsection{...}
Heading C - \subsubsection{...}
Heading D - \paragraph{...}

Section numbers are given for sections, subsection, and subsubsection headings.

5.2 Unnumbered section

Unnumbered sections can be produced by using the command \section*{...}.

5.3 Equations

The equation and equatray environments have been incorporated into the PASA class file regarding the equations environment. Using these two environments, you can number your equations. For example:

$$\dot{X} = \gamma X - \gamma \delta \eta,\tag{1}$$

and

$$\dot{\eta} = \frac{1}{2}\delta + 2X\eta.$$

$$\dot{X} = \gamma X - \gamma \delta \eta,\tag{2}$$

$$\dot{\eta} = \frac{1}{2}\delta + 2X\eta. \tag{3}$$

and

$$\dot{X} = \gamma X - \gamma \delta \eta,$$

$$\dot{\eta} = \frac{1}{2}\delta + 2X\eta.$$

$$(n-1)^{-1} \sum_{i=1}^{n} (X_i - \overline{X})^2.$$
 (4)

Equation (4) gives the formula for sample variance.

The above was typeset by using the equation environment as follows:

\begin{equation}
 \dot{X} = \gamma X - \gamma\delta\eta ,
\end{equation}
and

```
\begin{eqnarray}
 \dot{\det} \&=\& {\text{textstyle} \{1}{2}}
                   \delta + 2X\eta .\nonumber\\
 \dot{X}
             &=& \gamma X - \gamma
                 \delta\eta ,\\
 \displaystyle \det{\det}  \&=\&  \{\text{textstyle} \{1\} \{2\}\} 
                   \delta + 2X\eta .
 \end{eqnarray}
 and
 \begin{eqnarray*}
             &=&\gamma X - \gamma\delta\eta ,\\
 \dot{X}
 \dot{\det} \&=\&{\text{textstyle}frac{1}{2}}
                \delta + 2X\eta .
 \end{eqnarray*}
\begin{equation}
  (n-1)^{-1} \sum_{i=1} (X_i)
              -\overline{X})^2.
  \label{eq:samplevar}
\end{equation}
Equation (\ref{eq:samplevar}) gives the
formula for
sample variance.
```

Note the use of the **\label** command in the final expression of the above example. Using labels is encouraged as it helps to automate cross-referencing.

5.4 Figures and tables

The figure and table environments enable figures and tables to be numbered automatically and aid automatic cross-referencing. Line breaks in captions can be inserted as required using \\.

5.4.1 Figures

The PASA class will cope with most positioning of your illustrations and you should not normally use the optional positional qualifiers on the figure environment which would override these decisions. Figure captions should be below the figure itself; therefore, the \caption command should appear after the illustration itself, and any \label after the \caption.

Figure 1 is produced with the following commands:



Figure 1. This is an example of figure caption text.

5.4.2 Tables

The PASA class file will cope with most positioning of your tables and you should not normally use the optional positional qualifiers on the table environment which would override these decisions. The PASA style is normally to set the table caption first, then the \label, followed by a double rule, the table body and a double rule at the bottom. Single rules and spanner rules (\cline) can be used to separate headings from the columns. For example, Table 1 is produced using the following commands:

The first argument just after \begin{tabular*} specifies the width of table.

```
\begin{table}
\caption{Results of overloading for 3 experimental
          setups.}
\label{sample-table}
\begin{center}
\begin{tabular*}{41.5pc}{@{}}l\x c\x r\x r\x r\x r\x r@{}}
\hline\hline
Program & Expt.&CPU&RelCPU& GC&Mem&RelMem\\
\hline
8 Queens& (a)&
                2.88& 1.00&
                                6&
                                    1.7M& 1.00\\
       & (b)& 32.51& 11.29& 193&
                                   48.9M& 28.76\\
       & (c)&
                7.90% 2.74%
                               42& 11.3M& 6.65\\
\noalign{\vspace {.5cm}}
Primes & (a)&
                4.89& 1.00&
                               19&
                                    5.3M& 1.00\\
       & (b)& 47.54& 9.72&
                             204&
                                   54.5M& 10.28\\
       & (c)& 10.08& 2.06&
                               47&
                                   13.0M& 2.45\\
 \noalign{\vspace {.5cm}}
Nfib
       & (a)& 21.65& 1.00& 161& 40.4M&
                                           1.00\\
       & (b)& 221.65& 10.24& 1382& 349.0M&
       & (c)& 21.30& 0.98& 161&
                                   42.0M&
 \noalign{\vspace {.5cm}}
KWIC
       & (a)&
               7.07& 1.00&
                               15&
                                    6.3M&
                                           1.00\\
       & (b)& 34.55& 4.89& 109& 47.8M&
                                           7.59\\
       & (c)& 31.62& 4.47&
                              53&
                                   45.0M\& 7.14^{a}
\hline\hline
\end{tabular*}
\end{center}
\tabnote{$^a$Memory usage relative to experient.}
\end{table}
```

6 ACKNOWLEDGEMENTS

This should appear at the close of your paper, just before the list of references. Use the acknowledgements environment, e.g.

| Program | Expt. | CPU | RelCPU | GC | Mem | RelMem |
|----------|-------|--------|--------|------|--------|------------|
| 8 Queens | (a) | 2.88 | 1.00 | 6 | 1.7M | 1.00 |
| | (b) | 32.51 | 11.29 | 193 | 48.9M | 28.76 |
| | (c) | 7.90 | 2.74 | 42 | 11.3M | 6.65 |
| Primes | (a) | 4.89 | 1.00 | 19 | 5.3M | 1.00 |
| | (b) | 47.54 | 9.72 | 204 | 54.5M | 10.28 |
| | (c) | 10.08 | 2.06 | 47 | 13.0M | 2.45 |
| Nfib | (a) | 21.65 | 1.00 | 161 | 40.4M | 1.00 |
| | (b) | 221.65 | 10.24 | 1382 | 349.0M | 8.64 |
| | (c) | 21.30 | 0.98 | 161 | 42.0M | 1.03 |
| KWIC | (a) | 7.07 | 1.00 | 15 | 6.3M | 1.00 |
| | (b) | 34.55 | 4.89 | 109 | 47.8M | 7.59 |
| | (c) | 31.62 | 4.47 | 53 | 45.0M | 7.14^{a} |

Table 1 Results of overloading for 3 experimental setups.

\begin{acknowledgements}
The research and writing of this work was
partially carried out...
\end{acknowledgements}

The heading ACKNOWLEDGEMENTS is generated automatically.

7 APPENDICES

You should use the standard IATEX \begin{appendix} command to place any appendices, normally, just before any references. From that point on \section will produce an appendix, which are numbered A, B, etc., and equations as (A1), (B1), etc. Figures and tables also number A1, B1, etc.

\begin{appendix}

\section{PRINCIPAL COMPONENT ANALYSIS}

Consider a data set

\end{appendix}

More than one appendices can also be produced by using appendix environment again as below:

\begin{appendix}
\section{....}
Consider a data set
\end{appendix}

PASA (2013) doi:xxxx

8 REFERENCES

As with standard LaTeX, there are two recommended ways of producing a list of references; either by using BibTeX with the apj bibliography style apj.bst, or by compiling a list of references by hand (using a thebibliography environment).

8.1 Using BibT_FX

If you have BibTeX installed on your system, the following is a brief description on how to automatically generate a bibliography (.bbl file) for your article. Your article should contain at least the following elements:

% sample.tex
\documentclass{pasa}
\bibliographystyle{apj}
\begin{document}
 \cite{citations}
 \bibliography{biblio database files}
\end{document}

Where 'biblio database files' may be one or more filenames of bibliographic database files (without the .bib extension) separated by commas. First, LATEX the file sample.tex. Second, run BibTEX by typing:

bibtex sample

This creates the file sample.bbl. Third, re-LATEX your document, and the newly-created sample.bbl will be read in and typeset. You will then need to LATEX the

^a Memory usage relative to experient.

document once more to resolve any unresolved citation references.

8.2 Typesetting the references by hand

The following listing shows some references prepared in the style of the journal; this code produces the references at the end of this guide.

\begin{thebibliography}{}

BSAO, 32, 51

\bibitem[\protect\citename{Afanas'ev et al. } 1990]{afa} Afanas'ev, V. L., Vlasyuk, V. V., Dodonov, S. N., Lorentz, H., \& Terebizh, V. 1990,

\bibitem[\protect\citename{Arp \& Duhalde } 1985] {arp}

Arp, H., \& Duhalde, O. 1985, PASP, 97, 1149

\bibitem[\protect\citename{Burbidge, Crowne, \& Smith \}1977]{bcs} Burbidge, G. R., Crowne, A. H., \& Smith, H. E. 1977, ApJS, 33, 113

\bibitem[\protect\citename{Campusano \& Pedreros }1978]{cp} Campusano, L. E., & Pedreros, M. 1978, Obs. Astron. Natl. Cerro Calan (Santiago: Dep. Astron. Publ. III), 315

\bibitem[\protect\citename{Flesch } 2010]{fls} Flesch, E. 2010, PASA, 27, 283

\bibitem[\protect\citename{Knuth }1984]{DEK84} Knuth, "D. "E. 1984, Obs. Astron. Natl. Cerro Calan (Santiago: Dep. Astron. Publ. III), 315

\bibitem[\protect\citename{Lamport }1986] {LaTeX}

Lamport,~L. 1986, \LaTeX: A Document Preparation System (2nd edn; New York: Addison-Wesley)

\bibitem[\protect\citename{Lanzetta et al. } 1991]{lwt}

Lanzetta, K. M., Wolfe, A. M., Turnshek, D. A., Lu, L., McMahon, R. G., \& Hazard, C. 1991, ApJS, 77, 1

\bibitem[\protect\citename{Reichert et al. } 1982]{rmt}

\& Bowyer, S. 1982, ApJ, 260, 437

\bibitem[\protect\citename{Remillard }1993]{rem} Remillard, R. A., et al. 1993, AJ, 105, 2079

\bibitem[\protect\citename{Sargent, Boksenberg, \& Steidel \1993]{sbs} Sargent, W. L., Boksenberg, A., & Steidel, C. C. 1988, ApJS, 68, 539

\bibitem[\protect\citename{Wolfe et al. }1986]{wts} Wolfe, A. M., Turnshek, D. A., Smith, H. E., \& Cohen, R. D. 1986, ApJS, 61, 249

\end{thebibliography}

The above list is typeset at the end of this guide. Each entry takes the form

\bibitem[\protect\citename{Author(s), }Date]{tag} Bibliography entry

where Author(s) should be the author names as they are cited in the text (note the space before the closing } of the \citename command is vital), Date is the date to be cited in the text, and tag is the tag that is to be used as an argument for the \cite{} and \shortcite{} commands. Bibliography entry should be the material that is to appear in the bibliography, suitably formatted. This rather unwieldy scheme makes up for the lack of an author-date system in LATEX.

8.2.1 References in the text

References in the text are given by author and date. Whichever method is used to produce the bibliography, the references in the text are done in the same way. Each bibliographical entry has a key, which is assigned by the author and used to refer to that entry in the text. There is one form of citation - \cite{key} - to produce the author and date, and another form - \shortcite{key} - which produces the date only. Thus, Campusano & Pedreros (1978) is produced by

Campusano \& Pedreros \shortcite{cp},

while (Knuth 1984) is produced by

\cite{DEK84}.

8.2.2 Multiple references

References should be listed alphabetically by author name(s) and then by year if the same author has several papers. If some papers by the same author(s) also Reichert, G. A., Mason, K. O., Thorstensen, J. R. fall in the same year, their dates should be in the form (1993a), (1993b), etc.

Formatting for italic etc. should be avoided unless you are sure you understand the style of references; please concentrate on giving full and clear information.

A APPENDIX

A.1 Special commands in pasa.cls

The following is a summary of the new commands, optional arguments and environments which have been added to the standard IPTEX user-interface in creating the PASA class file:

New optional arguments

[<short title>] in the \title command: to define a right running headline that is dif-

ferent from the article title. The \shorttitle command is also pro-

vided.

[<short author>] in the \author command: to define

a left running headline that is different from the authors' names as typeset at the article opening. The \shortauthor command is also pro-

vided.

[<widest label>] in $\operatorname{begin}\{enumerate\}$: to ensure

the correct alignment of numbered

lists.

\shortcite typesets the 'year' part of the bibli-

ographic entry only. e.g. (1987).

\footnote{...} typesets the text footnotes.

\documentclass{pasa}

A.2 Catchline commands

To be placed in the preamble:

- \jid{PASA}
- \doi{10.1017/pas.\the\year.xxx}
- \jyear{2013}

A.3 Additional fonts

 The complete (v1) AMS symbols are available using the normal names:

\boxdot \boxplus \boxtimes $\boxdot \boxplus \boxtimes$

Blackboard bold:

$\Lambda BC}$

• Fraktur/Gothic (bold math version available):

\$\mathfrak{ABC}\$\mathfrak{ABC}

• Bold math italic/symbols are provided by the \boldsymbol macro (from the amsbsy package). The \bmath macro is provided as an alias.

REFERENCES

Afanas'ev, V. L., Vlasyuk, V. V., Dodonov, S. N., Lorentz, H., & Terebizh, V. 1990, BSAO, 32, 51

Arp, H., & Duhalde, O. 1985, PASP, 97, 1149

Burbidge, G. R., Crowne, A. H., & Smith, H. E. 1977, ApJS, 33, 113

Campusano, L. E., & Pedreros, M. 1978, Obs. Astron. Natl. Cerro Calan (Santiago: Dep. Astron. Publ. III), 315

Flesch, E. 2010, PASA, 27, 283

Knuth, D. E. 1984, Obs. Astron. Natl. Cerro Calan (Santiago: Dep. Astron. Publ. III), 315

Lamport, L. 1986, IATEX: A Document Preparation System (2nd edn; New York: Addison-Wesley)

Lanzetta, K. M., Wolfe, A. M., Turnshek, D. A., Lu, L., McMahon, R. G., & Hazard, C. 1991, ApJS, 77, 1

Reichert, G. A., Mason, K. O., Thorstensen, J. R., & Bowyer, S. 1982, ApJ, 260, 437

Remillard, R. A., et al. 1993, AJ, 105, 2079

Sargent, W. L., Boksenberg, A., & Steidel, C. C. 1988, ApJS, 68, 539

Wolfe, A. M., Turnshek, D. A., Smith, H. E., & Cohen, R. D. 1986, ApJS, 61, 249