

Glasgow Mathematical Journal: L^AT_EX Guidelines for authors

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Abstract

This guide is for authors who are preparing papers for the *Glasgow Mathematical Journal* journal using the L^AT_EX document preparation system and the CUP GMJ style file.

1. Introduction

The layout design for the *Glasgow Mathematical Journal* journal has been implemented as a L^AT_EX style file. The GMJ style file is based on the ARTICLE style as discussed in the L^AT_EX manual. Commands which differ from the standard L^AT_EX interface, or which are provided in addition to the standard interface, are explained in this guide. This guide is not a substitute for the L^AT_EX manual itself.

1.1. Introduction to L^AT_EX

The L^AT_EX¹ document preparation system is a special version of the T_EX typesetting program. L^AT_EX adds to T_EX a collection of commands which simplify typesetting by allowing the author to concentrate on the logical structure of the document rather than its visual layout.

L^AT_EX provides a consistent and comprehensive document preparation interface. There are simple-to-use commands for generating a table of contents, lists of figures and/or tables, and indexes. L^AT_EX can automatically number list entries, equations, figures, tables, and footnotes, as well as parts, chapters, sections and subsections. Using this numbering system, bibliographic citations, page references and cross references to any other numbered entity (*e.g.* chapter, section, equation, figure, list entry) are quite straightforward.

1.2. The GMJ document class

The use of document class allows a simple change of style (or style option like if DTMCOLOR is removed from `\documentclass` then the layout will be in B/W) to transform the appearance of your document. The CUP GMJ class file preserves the standard L^AT_EX interface such that any document which can be produced using the standard L^AT_EX ARTICLE style can also be produced with the GMJ style. However, the fonts (sizes) and measure of text is slightly different from that for ARTICLE, therefore line breaks will change and it is possible that equations may need re-setting.

¹To know more information about L^AT_EX and its packages, try <https://ctan.org/?lang=en>

2. Additional facilities

In addition to all the standard \LaTeX design elements, the GMJ style includes the following feature:

- Extended commands for specifying a short version of the title and author(s) for the running headlines.

Once you have used this additional facility in your document, do not process it with a standard \LaTeX style file.

2.1. *Titles authors' names and affiliation*

In the GMJ style, 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). Although the main heading can run to several lines of text, the running head line must be a single line.

Moreover, the main heading can also 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 author's name, the standard `\righttitle` and `\lefttitle` commands have been used to print the running headline. If more authors has to be used in `\author` command then each authors should be captured in separate `\author` command. `\affil` command is used to call the affiliation, if more affiliations has to be used in `\affil` command then each affiliations should be captured in separate `\affil` command.

```
\lefttitle{LaTeX\ Supplement}
\righttitle{Journal of Functional Programming}
  \title{The full title which can be as long
    as necessary}
\begin{authgrp}
  \author{Author's name}
  \affil{the affiliation if necessary}
\end{authgrp}
```

2.2. *Abstract*

The GMJ style provides for an abstract which is produced by the following commands

```
\begin{abstract} ... \end{abstract}
```

2.3. *Lists*

The GMJ style provides the three standard list environments.

- Bulleted lists, created using the `itemize` environment.
- Numbered lists, created using the `enumerate` environment.
- Labelled lists, created using the `description` environment.

3. Some guidelines for using standard facilities

The following notes may help you achieve the best effects with the GMJ style file.

3.1. Sections

L^AT_EX provides five levels of section headings and they are all defined in the GMJ style file:

- \section.
- \subsection.
- \subsubsection.
- \paragraph.
- \subparagraph.

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

3.2. Running headlines

As described above, the author's name (or author's names) should be used as running headline at the top of every page. The journal 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.

3.3. Tables

The figure and table environments are implemented as described in the L^AT_EX Manual to provide consecutively numbered floating inserts for illustrations and tables respectively. The standard inserts and their captions are formatted centred. Line breaks in captions can be inserted as required using \\.

The GMJ style 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. Normal journal style sets the table caption first, 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:

```
\begin{table}
\caption{{Results of Overloading for 3 Experimental Setups.
This sample table caption to show how it will display
\label{sample-table}}}
{\begin{tabular}{@{\extracolsep{\fill}}lcrrrrr}
\toprule
Program& Expt.&CPU&RelCPU&GC& Mem&RelMem\\
\midrule
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\\
\botrule
```

```
\end{tabular}}
\end{table}
```

Notice the use of the `mc` macro to obtain the centered decimal points, inside the body of the table.

Table 1. Results of Overloading for 3 Experimental Setups. This sample table caption to show how it will display.

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

The `tabular` environment should be used to produce ruled tables; it has been modified for the GMJ style in the following ways:

- (1) Additional vertical space is inserted above and below a horizontal rule (produced by `\hline`);

Because of this reformatting, vertical rules should not be used; furthermore, commands to redefine quantities such as `\arraystretch` should be omitted. If the old `tabular` facilities are needed, there is a new environment, `oldtabular`, which has none of the reformatting; it should be used in exactly the same way.

3.4. Illustrations (or figures)

The GMJ style 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 figure or space left for an illustration.

Figure 1 shows an example onw working with LaTeX code to load art files. `\includegraphics` commnad is to load art files `scale` option used in `\includegraphics` is to reduce the art. EPS format will be compiled using LaTeX. PNG, PDF and JPG format art files are loaded in the same command but the TeX file should be compiled using PDFLaTeX:

```
\begin{figure}
\includegraphics[scale=.4]{sample.eps}
\caption{An example figure with space for artwork.}
\label{sample-figure}
\end{figure}
```

The vertical depth should correspond roughly to the artwork you will submit; it will be adjusted to fit the final artwork exactly.

Figure 1. An example figure with space for artwork..

3.5. Creating new theorem-like environments

You can create your own environments in \LaTeX , and although you may already be familiar with `\newtheorem`, you will not have seen the other two commands explained below.

`\newtheorem` is a standard command used for creating new theorem-like environments, such as theorems, corollaries, lemmas, conjectures and propositions, with the body of the text (automatically) in italic.

4. Mathematics

The GMJ class file will centre displayed mathematics, and will insert the correct space above and below if standard \LaTeX commands are used; for example use `\[\dots \]` and *not* `$$ \dots $$`. Do not leave blank lines above and below displayed equations unless a new paragraph is really intended.

`amsmath.sty` is common package to handle various type math equations. The `amsmath` descriptions are available in the document can be find in the web link <https://ctan.org/pkg/amsmath?lang=en>

4.1. Numbering of equations

The `subequations` and `subeqnarray` environments have been incorporated into the GMJ class file (see Section 4.1.1 regarding the `subequations` environment). Using these two environments, you can number your equations (1a), (1b) etc. automatically. For example, you can typeset

$$a_1 \equiv (2\Omega M^2/x)^{\frac{1}{4}} y^{\frac{1}{2}} \quad (1a)$$

and

$$a_2 \equiv (x/2\Omega)^{\frac{1}{2}} k_y/M. \quad (1b)$$

by using the `subequations` environment as follows:

```
\begin{subequations}
\begin{equation}
a_1 \equiv (2\Omega M^2/x)^{\textstyle\frac{1}{4}} y^{\textstyle\frac{1}{2}} \label{a1}
\end{equation}
and
\begin{equation}
a_2 \equiv (x/2\Omega)^{\textstyle\frac{1}{2}} k_y/M. \label{a2}
\end{equation}
\end{subequations}
```

4.1.1. The subequations environment and the AMSTEX package

The `amstex` (and the `amsmath`) packages also define a `subequations` environment. The environment in `GMJ.cls` is used by default, as the environments in the AMS packages don't produce the correct style of output.

Note that the `subequations` environment from the `amstex` package takes an argument – you should use an 'a' to give α style subequations. e.g.

```
\begin{subequations}{a} ... \end{subequations}
```

4.2. Bibliography

As with standard L^AT_EX, there are two ways of producing a bibliography; either by compiling a list of references by hand (using a `thebibliography` environment) and contributors are encouraged to format their list of references style outlined in section 4.2.2 below.

As with standard L^AT_EX, there are two ways of producing a bibliography; either by compiling a list of references by hand (using a `thebibliography` environment), or by using BibT_EX with a suitable bibliographic database with the `bibliography` style provided with the `GMJ-UserGuide.tex` like `\bibliographystyle{gmjlike}`. The `gmjlike.bst` will produce the bibliography which is similar to GMJ style but not exactly. If any modification has to be made with `gmjlike.bst` can be adjusted during manuscript preparation but the updated `bst` file should be given along with source files. However, contributors are encouraged to format their list of references style outlined in section 4.2.2 below.

Run the `bibtex` to output the sample bibliography from given `sample.bib` file using the command the `\bibliographystyle{gmjlike}\bibliography{Sample}`

4.2.1. References in the text

References in the text are given by reference number. 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 reference number. Thus, [1] is produced by

```
\cite{D18}.
```

`natbib.sty` is common package to handle various reference and its cross citations. The `natbib` descriptions are available in the document can be find in the web link <https://ctan.org/pkg/natbib?lang=en>

4.2.2. List of references

The following listing shows some references prepared in the style of the journal.

```
\begin{thebibliography}{99}
\bibitem{D18} X. Du, L. Guth, Y. Ou, H. Wang, B. Wilson and R. Zhang,
\emph{Weighted restriction estimates and application to Falconer
distance set problem}, preprint, arXiv:1802.10186, to appear in
Amer. J. Math., (2018).
\bibitem{DZ19} X. Du and R. Zhang, \emph{Sharp  $L^2$  estimates of
the Schrödinger maximal function in higher dimensions}, Ann.
of Math.(2), \textbf{189}, (2019), 837--861.
\bibitem{ES10} G. Elekes and M. Sharir, \emph{Incidences in three
dimensions and distinct distances in the plane}, Proceedings 26th
ACM Symposium on Computational Geometry, (2010), 413--422.
```

```

\bibitem{E} B. Erdogan, \emph{A bilinear Fourier extension problem
and applications to the distance set problem}, Int. Math. Res. Not.,
\textbf{23}, (2005), 1411--1425.
\bibitem{Fa} K. Falconer, \emph{Fractal geometry: Mathematical
foundations and applications}, Wiley, (2004).
\end{thebibliography}

```

4.3. Catchline and date commands

To be placed in the preamble; for example:

- \jnlPage{2021}
- \doival{10.1017/xxxxx}
- \jnlPage{1}{8}

5. Conclusion

Some Conclusions here.

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Competing interests. A statement about any financial, professional, contractual or personal relationships or situations that could be perceived to impact the presentation of the work- or 'None' if none exist

Data availability statement. A statement about how to access data, code and other materials allowing users to understand, verify and replicate findings.

Ethical standards. The research meets all ethical guidelines, including adherence to the legal requirements of the study country

Author contributions. A.A. and A.B.C. designed the study, abstracted the data wrote the first draft, and approved the final version of the manuscript. A.R.E.J., M.R.L., K.L.S., and A.D.P. revised the manuscript and approved the final version.

Supplementary material. State whether any supplementary material intended for publication has been provided with the submission.

References

- [1] X. Du, L. Guth, Y. Ou, H. Wang, B. Wilson and R. Zhang, *Weighted restriction estimates and application to Falconer distance set problem*, preprint, arXiv:1802.10186, to appear in Amer. J. Math., (2018).
- [2] X. Du and R. Zhang, *Sharp L^2 estimates of the Schrödinger maximal function in higher dimensions*, Ann. of Math.(2), **189**, (2019), 837–861.
- [3] G. Elekes and M. Sharir, *Incidences in three dimensions and distinct distances in the plane*, Proceedings 26th ACM Symposium on Computational Geometry, (2010), 413–422.
- [4] B. Erdogan, *A bilinear Fourier extension problem and applications to the distance set problem*, Int. Math. Res. Not., **23**, (2005), 1411–1425.
- [5] K. Falconer, *Fractal geometry: Mathematical foundations and applications*, Wiley, (2004).