

Using the `compositio` class file

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A dedication can be included here.

ABSTRACT

The `compositio` L^AT_EX document class is designed to give the page layout, front matter and formatting required for articles published in *Compositio Mathematica*. The published version of your article will display the *Compositio Mathematica logo* and bibliographic information in the upper left-hand corner of the title page (see one of the sample files `cmguide1.pdf` or `cmguide1.ps` available at <http://www.compositio.nl/cmauthor.html>).

An English abstract of less than 200 words is required and should contain at least two sentences. Please do not include citations, footnotes or references to numbered equations, theorems, figures or tables in your abstract. Avoid complicated formulae or displayed equations, if possible.

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2010 *Mathematics Subject Classification* 35J25 (primary), 28C15, 28D10 (secondary). At least one subject code is required. Please refer to <http://www.ams.org/msc/> for a list of codes.

Keywords: Please provide keywords here.

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1. Introduction

The `compositio` L^AT_EX document class is based on the standard `article` class that you already know and love. While `compositio` performs most of its work behind the scenes, it does provide some user-visible features:

- Author “front matter” commands are available to provide authors’ email and spatial addresses, dedications, keywords and MSC classifications (see Section 3).
- Where available, the `amsthm` and `amssymb` packages are loaded to provide rich support for **theorem**-like environments and access to the AMS fonts such as blackboard bold and fraktur (see Subsection 4.1).
- Extra environments for proofs (with optional end-of-proof boxes) and acknowledgements are available.

This document describes these additional features and outlines the structure your electronic manuscript should have.

2. Getting started

First things first: your document should load the `compositio` class and so begin:

```
\documentclass{compositio}
```

Thereafter, have a look at the sample shown in Figure 1 on page 3. This tells most of the story. You will find the details in the subsequent sections.

3. Front matter

Front matter commands follow `\begin{document}` and precede `\maketitle`. They come in two flavours: those that give the coordinates of authors and those that provide extra information about the text (keywords and MSC subject classification).

Each author is named in a separate `\author` command (the `\and` mechanism of the `article` class is not available here – see Appendix A). After this, use `\email` (optional), `\address` and `\curraddr` (also optional) *in this order* to indicate the author’s email address, permanent address and, if necessary, temporary address. Look at Figure 1 for examples. For compatibility with the `amsart` class, these commands accept an optional argument but this is silently ignored.

The list of authors is combined to make the running header on the top of even-numbered pages. If there are too many authors to fit, provide a short alternative with `\shortauthors`:

```
\shortauthors{F.E. Burstall et al.}
```

This will only effect running headers, not the title page.

Use `\classification` or `\subjclass` to record the MSC subject classification, `\keywords` for (guess what?) listing keywords describing your text and `\thanks` to acknowledge financial and institutional support. Thus:

```
\classification{58E20}
\keywords{harmonic map, projective geometry}
\thanks{The first author is supported by EPSRC.}
```

USING THE COMPOSITIO CLASS FILE

```

\documentclass{compositio}      % 'we are using the compositio class'

%% packages
\usepackage{amsmath}           % 'not essential, but very useful'

\begin{document}

\title
  [Short Title]                % 'optional short form; for the running head'
  {A longish title like this goes here} % 'Main title'

% 'Each author has his or her own set of coordinates.'
\author{F. Author}
\email{f.author@some.where.ac.uk} % 'optional'
\address{Mathematics Department\\Some University\\Where Road\\%
  Here\\MT55 9XX}
\curraddr{Mathematics Institute\\Another University\\
  There\\BA1 1HZ} % 'also optional'
% 'Another author'
\author{A. Author}
\email{another.author@other.edu}
\address{Physics Department\\Other University\\There\\USA}
%
\shortauthors{F. Author et al.}
% 'optional short form; for the running head'

% 'MSC classification, keywords and grant acknowledgements'
\classification{58E20}
\keywords{harmonic map, projective geometry}
\thanks{The first author is supported by EPSRC.}

% 'Abstract comes before maketitle, as in the AMS classes'
\begin{abstract}
% 'Abstract text'
\end{abstract}

\maketitle

% 'Main text starts here.'

```

FIGURE 1. Document example

You may also insert a dedication with the `\dedication` command.

Of the front-matter commands, only `\author`, `\address`, `\classification` are considered to be compulsory. A warning will be generated on the screen if `\address` or `\classification` is missing (unless the **draft** option is set; see Section 5).

4. Environments

4.1 Mathematics

`compositio` uses the `amsthm` package to provide enhanced support for theorem-like environments. This introduces three new features: the `\theoremstyle` command for making different kinds of theorem-like environment, a starred form `\newtheorem*` for un-numbered environments of this kind and a `proof` environment.

`amsthm` defines three styles:

plain The “usual” style for a THEOREM, LEMMA, COROLLARY or PROPOSITION. *This is the default, with the body typeset in italic font.*

definition For an ASSERTION, a CONJECTURE, DEFINITION or HYPOTHESIS: the body of the statement is in normal, upright font.

remark For a *Remark*, *Note*, *Notation*, an *Observation*, a *Problem*, *Question*, *Algorithm* or *Example*: here the caption is set in italics and the body in an upright font.

See Figure 2 for the sort of thing you should put in the preamble. You can find more details in the `amsthm` documentation¹.

```
% \theoremstyle{plain} % 'this is the initial setting and can be omitted here'
\newtheorem{thm}{Theorem}[section] % number like 3.1, 3.2, 3.3, etc.
\newtheorem*{FLT}{Fermat's Last Theorem} % not numbered
\theoremstyle{definition} % 'here we change the style'
\newtheorem{defn}[thm]{Definition} % numbered with thm
\theoremstyle{remark} % 'style changed again'
\newtheorem{rem}{Remark}
\newtheorem{conj}{Conjecture}
```

FIGURE 2. Defining theorem-like environments.

The environments defined by `\newtheorem` take an optional argument often used to indicate an attribution. Please note that, in contrast to the `article` and `amsart` classes, `compositio` does *not* surround the argument with parentheses: this is to facilitate attributions consisting of a single reference to the bibliography. If you want the parentheses, you must include them in the argument yourself as shown here:

```
\begin{thm}[(Burstall, 2002)]
```

If your site does not have the AMS \LaTeX distribution, you should follow these steps:

- (i) Complain to your System Administrator! The AMS \LaTeX distribution is a required component of a well-founded \LaTeX installation.
- (ii) Use the `noams` option to work around the missing files; see Subsection 5.1 for details.

4.2 Proofs

`compositio` also provides a `proof` environment adapted from that of `amsthm`. This takes an optional argument that *replaces* the label. Thus

```
\begin{proof}[Proof of Main Theorem]
```

¹At <ftp://ftp.tex.ac.uk/tex-archive/macros/latex/required/amslatex/classes/amsthdoc.tex>, for example.

begins a proof headed *Proof of Main Theorem* rather than *Proof*.

By default, the proofs are ended with “Halmos tombstones” – open-face boxes. The generation of these boxes can be turned off everywhere by use of the `noboxes` option; see Section 5.1.

4.3 Acknowledgements

Use the `acknowledgements` environment to wrap your thanks to colleagues for their inspirational conversations.

5. Options

5.1 Document class options

`compositio` is designed especially for *Compositio Mathematica* and most font-size and layout decisions have already been made. Therefore, most of the options of the `article` class are inappropriate. To help transfer documents from `article` to `compositio`, the following document class options are accepted (perhaps with a warning), but do not affect the document.

10pt 11pt 12pt
 oneside twoside
 onecolumn twocolumn
 a4paper
 letterpaper

That said, `compositio` has a few options of its own:

draft This suppresses warnings about elements of front matter. It also marks over-long lines with ugly black boxes.

noboxes Suppresses the placement of boxes at the end of proofs.

noams If you have not got the AMS packages installed, then you can use this option. It suppresses the loading of the packages and defines `\theoremstyle` and `\newtheorem*` to be silently accepted without error. Although the theorem commands will not work as intended in this case, authors should still use them, so that the final form of the document generated by *Compositio Mathematica* will use the AMS definitions where appropriate. Similarly, authors should still use `\mathbb` to specify blackboard bold, although the `noams` option defines this command to produce normal bold.

5.2 The `compositio.cfg` configuration file

If a file with the name `compositio.cfg` is present in the \LaTeX search path, it will be input by `compositio` before it processes the options. In this case, *all options specified in the document will be ignored*.

6. Graphics and tables

`compositio` pre-loads the standard `graphicx` package, which allows easy loading of PostScript images generated by external programs. Figure 3 gives the idea: here the image is scaled to have a width of 3 inches. Note the use of `\centering` rather than a `center` environment; this prevents the appearance of extraneous white space.

```

\begin{figure}
\centering
\includegraphics[width=3in]{image.ps}
\caption{A Klein bottle}
\end{figure}

```

FIGURE 3. Including an image

The `compositio` house style prescribes that the caption for a figure should follow the image while the caption for a table should precede it. To achieve this effect, simply place the `\caption` command after the `\includegraphics` command in a figure but *before* the `tabular` environment in a `table` environment.

7. Bibliography

A bibliography suitable for *Compositio Mathematica* can be created with `BIBTEX` using the AMS bibliography style `amsalpha`. The REFERENCES section is then generated with the commands

```

\bibliographystyle{amsalpha}
\bibliography{bibname}

```

where *bibname* is the first part of the name of a `BIBTEX` file with extension `.bib`.

If the REFERENCES section is entered by hand, please use the first [optional] argument of the `\bibitem` command to provide acronyms formed by the first letters of the authors' surnames and the last two digits of the publication year (followed by "a", "b", etc. when needed). The bibliography for this guide was generated using the following lines of code:

```

\begin{thebibliography}{PTW02} % '2nd argument contains the widest acronym'
\bibitem[Lam94]{Lamport}
  L. Lamport, \emph{\LaTeX: A document preparation system \textup{({}%
    updated for \LaTeXe\textup{)}}} (Addison--Wesley, New York, 1994).
\bibitem[PTW02]{PRL}
  T.~Prokopec, O.~T\"ornkvist and R.~P.~Woodard, \emph{Photon mass
    from inflation}, Phys.\ Rev.\ Lett.\ \textbf{89} (2002), 101301.
\end{thebibliography}

```

The publications are cited using the second argument of `\bibitem`, *e.g.* `\cite{Lamport}` [Lam94].

Appendix A. Converting from other document classes

The `compositio` class has been designed to make conversion from other popular document classes as easy as possible. The first thing to do is to change the documentclass. Thus, replace `article` or `amsart` in the `\documentclass` command to give `\documentclass{compositio}`.

A.1 Converting from article

The main differences between `article` and `compositio` lie in the treatment of front matter. With `article`, the `\author` command had to do all the work of displaying authors' names, addresses and acknowledgements, whereas `compositio` has separate commands for all these. Moreover, the `compositio` class does not support the `\and` method of fitting several authors into a single `\author` command. This is because addresses are provided for each author individually. Thus you must replace

```
\author{H.~Jones \and J.~Smith} % wrong!
```

with

```
\author{H.~Jones}
\author{J.~Smith}
```

Furthermore, you need to remove all address lines from `\author` and place them in `\address` commands, one for each author. Similarly, `\thanks` should be taken out of `\author` and placed by itself. To summarise: if your document has something like this

```
\author{F.E. Burstall\thanks{Supported by EPSRC.}\\
University Of Bath\\ Bath BA1 1HZ\\ UK}
```

you should edit to achieve this:

```
\author{F.E. Burstall}
\address{University Of Bath\\ Bath BA1 1HZ\\ UK}
\thanks{The first author is supported by EPSRC.}
```

The `compositio` version of `\thanks` does not decorate the authors with footnote symbols to indicate the mapping between different authors and their support. Thus, with multiple authors, you should use one `\thanks` of the form `\thanks{The first author...The second author...}`.

Having successfully converted `\author`, you may want to add email addresses with `\email` (as well as MSC subject classifications and keywords). To see how to do this, see Section 3.

A.2 Converting from `amsart`

The `compositio` class supports the same address commands as the `amsart` class, but stylistic considerations force a few differences:

- (i) The `\email` command comes between `\author` and `\address` rather than after `\address`;
- (ii) each `\author` *must* have his or her own `\address` even if two authors share an address;
- (iii) all acknowledgements of support should be collected into a single `\thanks`.

As a consequence of the second item, any optional arguments to the AMS versions of `\email`, `\address` and `\curraddr` are silently ignored.

The only other issue is that `amsart` automatically loads the `amsmath` package. Consequently, you should place a `\usepackage{amsmath}` in the preamble of your converted document.

A.3 Converting from `LATEX 2.09`

If your document begins `\documentstyle`, then you are using a dialect of `LATEX` that has been obsolete since 1994 and you are in trouble. In the case that your `LATEX` installation really is that old, you can do nothing but complain to your Systems Administrator; `compositio` will not work for you. Otherwise, first replace `\documentstyle` with `\documentclass`, then follow the instructions in Section A.1 and try running `LATEX` on the converted document.

If you run into errors, try removing any optional arguments to `\documentclass` and then seek the advice of your local `LATEX` guru.

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REFERENCES

- Lam94 L. Lamport, *L^AT_EX: A document preparation system (updated for L^AT_EX 2_ε)* (Addison–Wesley, New York, 1994).
- PTW02 T. Prokopec, O. Törnkvist and R. P. Woodard, *Photon mass from inflation*, Phys. Rev. Lett. **89** (2002), 101301.

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