A guide for authors preparing their accepted manuscript for AlCo

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ABSTRACT Here is the abstract, which is short but nevertheless useful.

The aim of this document is to be at the same time a manual and a sample of a `.tex` file prepared in the class `cedram-alco.cls` for submissions accepted for publication. The class `cedram-ALCO` is just a wrapper around `amsart.cls` (version 2) implementing the layout of the journal, therefore all authors already at ease with the classes of the AMS should find it easy to adapt their source to `cedram-alco.cls`. As a corollary, all packages whose name starts with `ams` (like `amsmath` or `amsfonts`) are already automatically loaded and you don't need to call them explicitly in the preamble[(1)].

1. THE BEGINNING

1.1. METADATA. As you can see in the source file of this document, all "metadata" like keywords, subject numbers, authors, affiliations, email (and url) should be in the relevant field separated by comma–space if needed. Beware the special rôle played by `\\` in the `address` field: it is rendered as a comma, so you should not separate, e.g. your institution and the city by a comma, but by `\\`: have a look at this document's `address` field for more details.

A special treatement is reserved to acknowledgement and thanks. The class provides a field `\thanks`, whose use you can see at the bottom of this page (in a footnote). It is intended for a short acknowledgement of funding, hospitality, grants, etc. If you have longer and more wordy thanks that you wish to address to someone, there is a command `\longthanks` which creates a non-numbered subsection in which you can enter your wordy thanks. It is *not* like `\thanks`, so it will appear where you type it (unlike the other command, which needs to be filled before `\begin{document}`). The journal style requires that you insert it right before the bibliography, as it is in this very same file.

Concerning the title, apart from being of course in the field `\title{}`, all English common nouns should be lower-case, and upper-case letters should be used only for proper names (but see the §4 for a discussion about capitalization of adjectives). There is an optional field, to be entered in square brackets, for a shorter version of the title to be used in running headers; this, again, you see by looking at the source

[(1)]There is one exception: the package `amscd` is not loaded by default.

code of this very document and at the top of every odd page but the first. The same applies for authors.

2. Pre-loaded commands

In order to maintain uniformity about labelling and numbering of theorems and theorem-like environments, many environments are already defined by the class. This means that, unlike what you might be used to doing, you *should not* insert a list of commands like

```
\theoremstyle{plain}
\newtheorem{theorem}{Theorem}
\newtheorem{lemma}{Lemma}

...
...

\theoremstyle{remark}
\newtheorem{remark}{Remark}
```

at the beginning of the file. But most probably in your document you have already a bunch of occurrences of

```
\begin{thm}
If $xyz=0$ and $x\neq 0$ and $y\neq 0$ then $z=0$.
\end{thm}
```

and we are going to discuss how you can adapt your source file. The list of all environments which are defined in the class is in the appendix.

(1) If in the class the kind of environment (say, Theorem) already exists and has the same name as in your file (as in the above example, since this is the case for `thm`), then you don't have to do anything.

(2) If, for instance, you called your Theorem environment `satz`, so that a typical command in your source file is

```
\begin{satz}
  This template will prove useful.
\end{satz}
```

then you will receive an error. In this case you should replace the line in your preamble which reads

```
\newtheorem{satz}{Theorem}
or
\newtheorem{satz}{Theorem}[section]
or
\newtheorem{satz}[lemma]{Theorem}
```

simply by the line

```
\equalenv{satz}{thm}
```

where the first argument is the name *you* gave to the environment, and the second is the name of the environment in the class (see next subsection).

(3) Finally, if you want to use an environment which does not belong to the list below (say, for instance, that you want an environment `Subsublemma`, called by the command `\begin{sslmma}`) you need to modify the definition so that it reads

```
\newtheorem{sslmma}[cdrthm]{Subsublemma}
```

and place it *after* `\begin{document}`.

Finally, of course, it is necessary that you either delete or at least comment out all of your definitions which fall into categories (1) and (2).

2.1. Two useful packages.

2.1.1. *enumitem.* The `enumitem` package is already loaded and its main point is to enhance the original capacities of LaTeX for creating lists. It mainly allows you to take care of labels properly (and, in the background, offers a better layout when things get hard). If you want to create a list like

   (1) $3 = 2^2 - 1$ is a prime number;
   (2) $7 = 2^3 - 1$ is a prime number;
   (3) $31 = 2^5 - 1$ is a prime number.

you can simply use `\begin{enumerate}` and then let each line start with `\item`, finishing with `\end{enumerate}`. Please avoid using the `itemize` environment if you want increasing labels (as above). `enumitem` allows for great flexibility in the choice of labels; it suffices to add the command `[label=...]` right after the `\begin{enumerate}` command (beware, it is `label` and not `\label`). The three dots can be basically whatever you want: the important thing is that you add a *counter* at a certain point, namely either of the six[2]

`\roman* \Roman* \alph* \Alph* \arabic*`

which offer, respectively, small/capital roman numbering, then small/capital (latin) alphabetic numbering, or numbering in Arabic numerals $1, 2, 3, \ldots$ For instance, we can modify the above list to the following

Mers **Prim** 1) $3 = 2^2 - 1$ is a prime number;
Mers **Prim** 2) $7 = 2^3 - 1$ is a prime number;
Mers **Prim** 3) $31 = 2^5 - 1$ is a prime number.

2.1.2. *mathtools.* Another very useful package which is automatically loaded is `mathtools`. It provides many commands, among others extensible arrows, fine-tuned matrices and very nice treatments of *paired delimiters*, for instance in order to define a `abs` command such that

$$\text{\texttt{\textbackslash abs\textbackslash frac\{a\}\{b\}}} \qquad \text{gives} \qquad |\frac{a}{b}|$$

but

$$\text{\texttt{\textbackslash abs*\textbackslash frac\{a\}\{b\}}} \qquad \text{gives} \qquad \left|\frac{a}{b}\right|.$$

We refer to the well-written documentation available at

      `http://mirrors.ircam.fr/pub/CTAN/macros/latex/contrib/`
      `mathtools/mathtools.pdf`

for all instructions for this package.

2.2. Abbreviations.
A list of common abbreviations which are a typical source of misunderstanding or typos is provided: for instance, there is a command resp. , a command i.e. and a command e.g. (which are, respectively, `\resp`, `\ie` and `\eg`). The full list is in the appendix, but what is important is that you notice that they already contain a period at the end, so you need not (and should not!) insert it again.

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[2]A bit more is allowed; see the package's website.

3. The bibliography

The bibliography style used for AlCo is `amsplain-ac` and it is to `amsplain` what the class `cedram-alco.cls` is to `amsart`, namely a minor modification of the AMS "plain bibliographical style". All authors are asked to prepare their bibliography in a *separate* `.bib` file. If your file is called `mynicebibliography.bib` then you should put this file in the same folder as the `.tex` file and finish your document with the lines

```
\bibliographystyle{amsplain-ac}
\bibliography{mynicebibliography}
\end{document}
```

which is precisely the way this very sample file finishes. Of course, you will need to upload the `.bib` file along with the `.tex` for our production. Please try to keep your `.bib` file as simple as possible. You can clean it using programs such as bibtool in order to remove unused entries.

Creating the `.bib` file is quite standard; one easy way of doing so is by choosing your favourite database (MathSciNet or Zentralblatt or GoogleScholar) and find the `bibtex` string corresponding to the work you want to quote: then, copy-paste it. Here, some remarks are in order. First of all, the `\note{}` field is sometimes abusively used by these databases. For instance, the `bibtex` entry for Eisenbud's *Commutative algebra* reads

```
@book {EisWrong,
     AUTHOR = {Eisenbud, David},
      TITLE = {Commutative algebra},
     SERIES = {Graduate Texts in Mathematics},
     VOLUME = {150},
       NOTE = {With a view toward algebraic geometry},
  PUBLISHER = {Springer-Verlag, New York},
       YEAR = {1995},
      PAGES = {xvi+785},
       ISBN = {0-387-94268-8; 0-387-94269-6},
    MRCLASS = {13-01 (14A05)},
   MRNUMBER = {1322960},
 MRREVIEWER = {Matthew Miller},
}
```

and you can easily find what went wrong by looking at the entry [2] in the bibliography of this file. The entry [3] is correct, and it is typeset from

```
@book {EisRight,
     AUTHOR = {Eisenbud, David},
      TITLE = {Commutative algebra. {W}ith a view toward algebraic
               geometry},
     SERIES = {Graduate Texts in Mathematics},
     VOLUME = {150},
  PUBLISHER = {Springer-Verlag, New York},
       YEAR = {1995},
      PAGES = {xvi+785},
   MRNUMBER = {1322960},
}
```

Speaking about bibliography, you could look at how the entry [6] is typeset in the `sample.bib` file; it gives instruction on how to obtain upper-case and accents, because if you simply write in a bibliographical entry

```
title={On a theorem by Atiyah, Patodi and Singer},
```

the result will be

> On a theorem by atiyah, patodi and singer.

We stress here that our policy is that, as in the title, we prefer all common English nouns to be lower-case even if in the original title the publisher followed a different style (but see §4 for a discussion about capitalization of adjectives).

Another useful command is the field `eprint`: you can see it in action in reference [8]. The entry, which is "only" an `arXiv` submission, was typeset (in the `.bib` file, as usual!) as

```
@Unpublished{Per02,
  author =  {Perelman, Grisha},
  title =  {The entropy formula for the {R}icci flow and its geometric
 applications},
  year =  2002,
  eprint = {math/0211159}
}
```

(you can check it by yourself in the `sample.bib` file) so that you see what `eprint` does. On a one hand, it prepends `https://arxiv.org/abs/` to the reference number (which was the only typeset argument) and, on the other, it creates a clickable link. In case the repository hosting the preprint is not the arXiv, you need to specify the prefix of the repository with `archiveprefix = {}` (this will replace the url of the arXiv with that of the repository). You can also use `archive = {}` for providing a repository name, but this is not displayed in the reference list. For instance, reference [1] was typeset as

```
@article{Con07,
  TITLE = {{Yang-Mills and some related algebras}},
  AUTHOR = {Connes, Alain and Dubois-Violette, Michel},
  year = {2007},
  eprint = {hal-00003314},
  archiveprefix = {HAL},
  archive = {https://hal.archives-ouvertes.fr}
}
```

For all electronic resources that have a url but don't belong to any "repository" like the arXiv or HAL (for which the previous paragraph applies), two useful fields `url` and `urldate` are available, whose aim should be self-explanatory: for instance, the entry [7] referring to a paper available on his author's homepage was typeset as

```
@Unpublished{Maz13,
  author         = {Mazur, Barry},
  title          = {A brief introduction to the work of {H}aruzo {H}ida},
  url = {http://www.math.harvard.edu/~mazur/papers/Hida.August11.pdf},
  urldate = {2019-09-04},
  year           = {2013}
}
```

Finally, there is a trend in electronic publishing to endow papers with a unique ID rather than continuous page numbering to precisely locate papers within a journal. This is handled in amsplain-ac through the field `eid`, which you can complete with an optional `pagetotal` field. The field `pages` should not be used for these papers. See entry `infrank` in `sample.bib` and [9].

4. En-dashes and capitals

We have already discussed that all nouns should be lower-case, like in the title, and upper-case should be used only for proper names. Accordingly, we insist that all adjectives coming from a proper name be spelt with a capital letter except from extremely common ones. Therefore we expect to find Riemannian, Euclidean, non-Archimedean, Gaussian but abelian instead of Abelian.

Another typographical remark which often leads to difficulties is the difference between a hyphen (typeset -) and a en-dash (typeset --) or em-dash (typeset ---). In particular, it is a en-dash and not a hyphen that needs to be used to separate proper names (as in Gauß–Bonnet, instead of *Gauß-Bonnet) and in intervals, so pp. 123–125 instead of *pp. 123-125. On the other hand, a proper name like Swinnerton-Dyer is correctly written with a hyphen.

4.1. TEX hints. We gather here some hints which might be useful when preparing your source file.

- the package `amsmath`, which is automatically loaded, provides the command `\eqref{}` which has the advantage of automatically inserting parenthesis around the number generated by `\ref{}`. So, don't use (`\ref{navier.stokes}`) but rather `\eqref{navier.stokes}`
- In general, parenthesis in italicized text look *odd (not to say: bad)*. Since statements of theorems, propositions, etc. are automatically italicized, you can use the command `\textup{}` to repair the problem, as in

  ```
  Let $V$ be a finite-dimensional $\mathbb{C}$-vector space of
  \textup{(}even\textup{)} real dimension $n$.
  ```

  Let V be a finite-dimensional ℂ-vector space of (even) real dimension n.

  This holds in particular for lists: if you have a list of conditions in a theorem and (wisely!) take full benefit of the `enumitem` package described in Section 2.1.1, you want to begin your list by `\begin{enumerate}[label=\alph*)]` so that your conditions will look like
  - *a)* The first,
  - *b)* the second,
  - *c)* and the last.

  which is bad! Indeed, parenthesis are again in italics. Rather, start with `\begin{enumerate}[label=\alph*\textup{)}]`
- As a last hint, let us stress once more that TEX does an excellent job in placing spaces and organizing layout, so each time you use a spacing-command like `\;` or `\!` please double-check that this is a good idea. This applies in particular to figures, cf. Section 5.2. On the other hand, since it is allowed to go at the line when it considers it useful, it is good practice to use ~ before a digit or a single mathematical symbol, in order to avoid having the symbol go on a line all alone: so, write `we let~$k$ be the unique even prime number`.

5. Final remarks

5.1. Avoid overwriting. Since many commands are defined in our class file, and since it is important that the result of compiling each article is uniform, we ask all authors to refrain from using `\let` and `\renewcommand` in the preamble. Likewise, every command which might modify the general layout, like `\setlength` or `\leftmargin` or the like should be avoided. Analogously, we ask authors *not to load* the package `geometry` which normally alters the layout of pages.

5.2. FIGURES. If you want to insert figures, you should resize them in a way that they don't creep into the margins (and this, after having checked that `geometry` is disabled and that you are not using a smaller font or larger margins, otherwise they won't creep into *your* margins but will in AlCo's). If this is not possible, you should rotate them so that they appear in landscape mode. It is important to insert figures in a figure environment, by using `\begin{figure}` and `\end{figure}`. This allows you, on a one hand, to add a caption and to get the figure numbers, so that you can insert a `\label{fig:mynicefigure}` and refer to it. What is more important, it allows the figure to *float*, so to move around for best typographical results. It is not a good practice, in general, to force LATEX to insert figures *precisely* where you want, so please refrain from adding the option `[H]` which forces LATEX to do so: some fine-tuning of figures placement can be discussed at a later stage of production.

APPENDIX A. LIST OF PRE-LOADED COMMANDS

Here we list all pre-loaded commands. Since it is an appendix, we also recall here how to create an appendix: you should first add a line `\appendix`, which instructs LATEX to switch from Arabic numbering to alphabetic (plus other minor changes), and then you can keep on using the usual `\section,\subsection` pattern you are used to.

A.1. ABBREVIATIONS. The abbreviations that are preloaded are
- loc. cit. *produced by* `\loccit`
- cf. *produced by* `\cf`
- e.g. *produced by* `\eg`
- i.e. *produced by* `\ie`
- resp. *produced by* `\resp`
- vs. *produced by* `\vs`
- etc. *produced by* `\etc` or by `\ecc`

It is a typographical choice to *avoid all double punctuation*, so we don't expect to find commas or other punctuation after these abbreviations, including in particular i.e. instead of *i.e.,

A.2. THEOREM-LIKE ENVIRONMENTS. All theorems share a single counter, which is relative to the section number (so that the first theorem of § 5 would be Theorem 5.1). The rationale of the naming scheme is to use the 4 first letters of the English label.

Theorem: `theo`, *aliases:* `thm`, `theorem`, *unnumbered version:* `theo*`, *alias:* `thm*`
Conjecture: `conj`, *alias:* `conjecture`
Proposition: `prop`, *unnumbered version:* `prop*`
Lemma: `lemm`, *alias:* `lemma`, *unnumbered version:* `lemm*`
Question: `ques`
Corollary: `coro`, *unnumbered version:* `coro*`
Definition: `defi`
Notation: `nota`, *unnumbered version:* `nota*`
Notations: `notas`, *unnumbered version:* `notas*`
Remark: `rema`, *unnumbered version:* `rema*`
Remarks: `remas`, *unnumbered version:* `remas*`
Example: `exam`, *unnumbered version:* `exam*`
Examples: `exams`, *unnumbered version:* `exams*`

References

[1] Alain Connes and Michel Dubois-Violette, *Yang-Mills and some related algebras*, (2007), `https://hal.archives-ouvertes.fr/hal-00003314` .

[2] David Eisenbud, *Commutative algebra*, Graduate Texts in Mathematics, vol. 150, Springer-Verlag, New York, 1995, With a view toward algebraic geometry.

[3] ———, *Commutative algebra. With a view toward algebraic geometry*, Graduate Texts in Mathematics, vol. 150, Springer-Verlag, New York, 1995.

[4] C. King and C.-L. Terng, *Submanifolds in path space*, in Global Analysis in Modern Mathematics (K. Uhlenbeck, ed.), Publish or Perish, Inc., Houston, 1993, pp. 253–282.

[5] Donald E. Knuth, *The T_EXbook*, Addison Wesley Professional, Massachusetts, 1984.

[6] J. Leray and J-L. Lions, *Quelques résultats de Višik sur les problèmes elliptiques nonlinéaires par les méthodes de Minty-Browder*, Bull. Soc. Math. France **93** (1965), 97–107, `http://www.numdam.org/item?id=BSMF_1965__93__97_0`.

[7] Barry Mazur, *A brief introduction to the work of Haruzo Hida*, 2013, `http://www.math.harvard.edu/~mazur/papers/Hida.August11.pdf` (accessed 4th September 2019).

[8] Grisha Perelman, *The entropy formula for the Ricci flow and its geometric applications*, 2002, `https://arxiv.org/abs/math/0211159`.

[9] Steven V Sam and Andrew Snowden, *Stability patterns in representation theory*, Forum Math. Sigma **3** (2015), e11 (108 pages).

[10] M. Vajiac, *Gauge theory techniques in quantum cohomology*, Ph.D. thesis, Boston University, 2000.

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