

Instructions for Authors

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1. Introduction

Authors are requested to adhere strictly to these instructions; *the class file must not be changed*.

The text output area is automatically set within an area of 5in horizontally and 7.8in vertically.

If you are already familiar with L^AT_EX, then the GTM class should not give you any major difficulties. The GTM class is an extension of the standard L^AT_EX “article” document class. Therefore you may use all “article” commands for the main body of your paper to prepare your manuscript. It will change the layout to the required GTM style (it will for instance define the layout of \section). We had to invent some extra commands, which are not provided by L^AT_EX (e.g. \institute, see also Sect. 3.)

Furthermore, the documentation provides suggestions about the proper editing and use of the input files (capitalization, abbreviation etc.) (see Sect. 7. How to Edit Your Input File).

For the input of the references at the end of your contribution, please follow our instructions given in Sect. 10. References.

2. How to Invoke the GTM Document Class

GTM class is invoked by replacing “article” by “GTM” in the first line of your document:

```
\documentclass[citeauthoryear]{GTM}

\begin{document}
  <Your paper>
\end{document}
```

Option [citeauthoryear] is necessary to cite properly references in the text (see also Sect. 10. References).

3. The Heading of Your Contribution

The title of a contribution should be coded as follows:

```
\title{<Your contribution title>}
```

All words in titles should be capitalized except for conjunctions, prepositions (e.g. on, of, by, and, or, but, from, with, without, under) and definite and indefinite articles (the, a, an) unless they appear at the beginning. Formula letters must be typeset as in the text. Titles have no end punctuation. If a long \title must be divided please use the code \\ (for new line).

Now the name(s) of the author(s) must be given:

```
\author{<author(s) name(s)>}
```

If there is more than one author, the order is up to you; the \and command provides for the separation:

```
\author{Ivar Ekeland \and Roger Temam \and Alfred Holmes}
```

Numbers referring to different addresses or affiliations are to be attached to each author with the `\inst{<no>}` command. If you have done this correctly, this entry now reads, for example:

```
\author{Ivar Ekeland\inst{1} \and Roger Temam\inst{2}
        \and Alfred Holmes\inst{3}}
```

The first name¹ is followed by the surname.

Next the address(es) of institute(s), company etc. is (are) required. If there is more than one address, the entries are numbered automatically with `\and`, in the order in which you type them. Please make sure that the numbers match those placed next to the authors' names to reflect the affiliation.

```
\institute{<name of an institute>
\and <name of the next institute>
\and <name of the next institute>}
```

In addition, you can use

```
\email{<email address>}
```

to provide your email address within `\institute`. If you need to typeset the tilde character — e.g. for your web page in your unix system's home directory — the `\homedir` command will happily do this.

If footnote like things are needed anywhere in the contribution heading please code (immediately after the word where the footnote indicator should be placed):

```
\thanks{<text>}
```

`\thanks` may only appear in `\title`, `\author` and `\institute` to footnote anything. If there are two or more footnotes or affiliation marks to a specific item separate them with `\fmmsep` (i.e. *footnote mark separator*).

The command

```
\maketitle
```

then formats the complete heading of your article. If you leave it out the work done so far will produce *no* text.

Then the abstract should follow. Simply code

```
\begin{abstract}
<Text of the summary of your article>
\end{abstract}
```

4. How to Code Your Text

All headings, as the contribution title, should be capitalized except for conjunctions, prepositions (e.g. on, of, by, and, or, but, from, with, without, under) and definite and indefinite articles (the, a, an) unless they appear at the beginning. Formula letters must be typeset as in the text.

Headings will be automatically numbered by the following codes.

Sample Input

¹ Other initials are optional and may be inserted if this is the usual way of writing your name, e.g. Alfred J. Holmes, E. Henry Green.

```

\section{This is a First-Order Title}
\subsection{This is a Second-Order Title}
\subsubsection{This is a Third-Order Title.}
\paragraph{This is a Fourth-Order Title.}

```

Note. `\section` and `\subsection` have no end punctuation. `\subsubsection` and `\paragraph` need to be punctuated at the end.

In addition to the above-mentioned headings your text may be structured by subsections indicated by run-in headings (theorem-like environments).

5. Predefined Theorem-like Environments

The following variety of run-in headings are at your disposal:

- **Bold** run-in headings with *italicized text* as built-in environments:

```

\begin{corollary} <text> \end{corollary}
\begin{lemma} <text> \end{lemma}
\begin{proposition} <text> \end{proposition}
\begin{theorem} <text> \end{theorem}
\begin{axiom} <text> \end{axiom}

```

- **Bold** run-in headings with roman text as built-in environments:

```

\begin{definition} <text> \end{definition}
\begin{problem} <text> \end{problem}
\begin{property} <text> \end{property}
\begin{remark} <text> \end{remark}

```

Note. The determined notion in the text of a definition should be *italicized*.

- Further *italic* run-in headings with roman environment body may also occur:

```

\begin{case} <text> \end{case}
\begin{conjecture} <text> \end{conjecture}
\begin{example} <text> \end{example}
\begin{exercise} <text> \end{exercise}
\begin{note} <text> \end{note}
\begin{question} <text> \end{question}
\begin{solution} <text> \end{solution}

```

- The following generally appears as *italic* run-in heading:

```

\begin{proof} <text> \qed \end{proof}

```

It is unnumbered and may contain an eye catching square (call for that with `\qed`) before the environment ends.

All the theorem-like environments are numbered automatically throughout the sections of your document — each with its own counter.

If you want the theorem-like environments to use the same counter just specify the documentclass option `envcountsame`:

```

\documentclass[citeauthoryear, envcountsame]{GTM}

```

If your first call for a theorem-like environment then is e. g. `\begin{lemma}`, it will be numbered 1; if corollary follows, this will be numbered 2; if you then call lemma again, this will be numbered 3.

But in case you want to reset such counters to 1 in each section, please specify the documentclass option `envcountreset`.

Even a numbering on section level (including the section counter) is possible with the documentclass option `envcountsect`.

6. Defining your Own Theorem-like Environments

We have enhanced the standard `\newtheorem` command and slightly changed its syntax to get two new commands `\spnewtheorem` and `\spnewtheorem*` that now can be used to define additional environments. They require two additional arguments namely the type style in which the keyword of the environment appears and second the style for the text of your new environment.

`\spnewtheorem` can be used in two ways.

6.1. Method 1 (*preferred*)

You may want to create an environment that shares its counter with another environment, say *main theorem* to be numbered like the predefined *theorem*. In this case, use the syntax

```
\spnewtheorem{<env_nam>}[<num_like>]{<caption>}
{<cap_font>}{<body_font>}
```

Here the environment with which the new environment should share its counter is specified with the optional argument `[<num_like>]`.

Sample Input

```
\spnewtheorem{mainth}[theorem]{Main Theorem}{\bfseries}{\itshape}
\begin{theorem} The early bird gets the worm. \end{theorem}
\begin{mainth} The early worm gets eaten. \end{mainth}
```

Sample Output

Theorem 3. *The early bird gets the worm.*

Main Theorem 4. *The early worm gets eaten.*

The sharing of the default counter (`[theorem]`) is desired. If you omit the optional second argument of `\spnewtheorem` a separate counter for your new environment is used throughout your document.

6.2. Method 2 (*assumes [envcountsect] documentstyle option*)

```
\spnewtheorem{<env_nam>}{<caption>}[<within>]
{<cap_font>}{<body_font>}
```

This defines a new environment `<env_nam>` which prints the caption `<caption>` in the font `<cap_font>` and the text itself in the font `<body_font>`. The environment is numbered beginning anew with every new sectioning element you specify with the optional parameter `<within>`.

Example

`\spnewtheorem{joke}{Joke}[subsection]{\bfseries}{\rmfamily}`

defines a new environment called `joke` which prints the caption **Joke** in boldface and the text in roman. The jokes are numbered starting from 1 at the beginning of every subsection with the number of the subsection preceding the number of the joke e. g. 7.2.1 for the first joke in subsection 7.2.

6.3. Unnumbered Environments

If you wish to have an unnumbered environment, please use the syntax

`\spnewtheorem*{<env_nam>}{<caption>}{<cap_font>}{<body_font>}`

7. How to Edit Your Input (Source) File

7.1. Capitalization and Non-capitalization

- The following should always be capitalized:
 - Headings (see Sect. 4.)
 - Abbreviations and expressions in the text such as Fig(s)., Table(s), Sect(s)., Chap(s)., Theorem, Corollary, Definition etc. when used with numbers, e. g. Fig. 3, Table 1, Theorem 2.
- The following should *not* be capitalized:
 - The words figure(s), table(s), equation(s), theorem(s) in the text when used without an accompanying number.
 - Figure legends and table captions except for names and abbreviations.

7.2. Abbreviation of Words

- The following *should* be abbreviated when they appear in running text *unless* they come at the beginning of a sentence: Chap., Sect., Fig.; e. g. “The results are depicted in Fig. 5.” “Figure 9 reveals that”
Please note: Equations should usually be referred to solely by their number in parentheses: e. g. (14). However, when the reference comes at the beginning of a sentence, the unabbreviated word “Equation” should be used: e. g. “Equation (14) is very important.” “However, (15) makes it clear that”
- If abbreviations of names or concepts are used throughout the text, they should be defined at first occurrence, e. g. Plurisubharmonic (PSH) Functions, Strong Optimization (SOPT) Problem.

7.3. Signs and Characters

Special Signs. We have created further symbols for math mode (enclosed in `\$`):

<code>\grole</code>	yields	\gtrsim	<code>\getsto</code>	yields	\Leftrightarrow
<code>\lid</code>	yields	\lesssim	<code>\gid</code>	yields	\geq

Gothic (Fraktur). In \LaTeX only the following gothic letters are available: `\Re` yields \Re and `\Im` yields \Im . If gothic letters are *necessary*, please use the `amstex` package of the American Mathematical Society (`amsfonts`, `amssymb`).

For the real and the imaginary parts of a complex number within math mode you should use: `\mathrm{Re}` (which yields \Re) or `\mathrm{Im}` (which yields \Im).

Special Roman. We created the blackboard bold characters listed below.

<code>\bbbc</code>	(complex numbers)	yields \mathbb{C}	<code>\bbbf</code>	(blackboard bold F)	yields \mathbb{F}
<code>\bbbh</code>	(blackboard bold H)	yields \mathbb{H}	<code>\bbbk</code>	(blackboard bold K)	yields \mathbb{K}
<code>\bbbm</code>	(blackboard bold M)	yields \mathbb{M}	<code>\bbbn</code>	(natural numbers N)	yields \mathbb{N}
<code>\bbbp</code>	(blackboard bold P)	yields \mathbb{P}	<code>\bbbq</code>	(rational numbers)	yields \mathbb{Q}
<code>\bbbr</code>	(real numbers)	yields \mathbb{R}	<code>\bbbs</code>	(blackboard bold S)	yields \mathbb{S}
<code>\bbbt</code>	(blackboard bold T)	yields \mathbb{T}	<code>\bbbz</code>	(whole numbers)	yields \mathbb{Z}
<code>\bbbone</code>	(symbol one)	yields $\mathbb{1}$			

$$\mathbb{C}^{\mathbb{C}} \otimes \mathbb{F}_{\mathbb{F}\mathbb{F}} \otimes \mathbb{H}_{\mathbb{H}\mathbb{H}} \otimes \mathbb{K}_{\mathbb{K}\mathbb{K}} \otimes \mathbb{M}^{\mathbb{M}\mathbb{M}} \otimes \mathbb{N}_{\mathbb{N}\mathbb{N}} \otimes \mathbb{P}^{\mathbb{P}\mathbb{P}} \\ \otimes \mathbb{Q}_{\mathbb{Q}\mathbb{Q}} \otimes \mathbb{R}^{\mathbb{R}\mathbb{R}} \otimes \mathbb{S}^{\mathbb{S}\mathbb{S}} \otimes \mathbb{T}^{\mathbb{T}\mathbb{T}} \otimes \mathbb{Z} \otimes \mathbb{1}^{\mathbb{1}\mathbb{1}}$$

Vectors (`\vec{Symbol}`). Vectors may only appear in math mode. The default L^AT_EX vector symbol has been adapted to GTM conventions.

`\vec{A} \times \vec{B} \cdot \vec{C}` yields $\mathbf{A} \times \mathbf{B} \cdot \mathbf{C}$

`\vec{A}^{\hat{T}} \otimes \vec{B} \otimes \vec{\hat{D}}` yields $\mathbf{A}^T \otimes \mathbf{B} \otimes \hat{\mathbf{D}}$

8. Figures

All schemas, graphs, diagrams and photographs are to be referred to as figures. Do not use coloured photographs or figures. A figure environment should be inserted in the text as close as possible to the first reference to the figure. Figures will be numbered automatically.

Sample Input

```
\begin{figure}
\vspace{2.0cm}
\caption{This is the caption of the figure displaying a white
eagle and a white horse on a snow field}
\end{figure}
```

Sample Output

Fig. 1. This is the caption of the figure displaying a white eagle and a white horse on a snow field

9. Tables

Only horizontal lines should be used within a table, to distinguish the column headings from the body of the table. Table captions should be treated in the same way as figure legends, except that the table captions appear *above* the tables and are centred. The tables will be numbered automatically.

Sample Input

```

\begin{table}
\caption{Critical  $N$  values}
\begin{tabular}{llllll}
\hline\noalign{\smallskip}
 $M_{\odot}$  &  $\beta_0$  &  $T_{c6}$  &  $\gamma$  &  $N_{\text{crit}}^L$  &  $N_{\text{crit}}^{\text{Te}}$  \\
\hline
\hline
\hline\noalign{\smallskip}
30 & 0.82 & 38.4 & 35.7 & 154 & 320 \\
60 & 0.67 & 42.1 & 34.7 & 138 & 340 \\
120 & 0.52 & 45.1 & 34.0 & 124 & 370 \\
\hline
\end{tabular}
\end{table}

```

Sample Output

Table 1. Critical N values

M_{\odot}	β_0	T_{c6}	γ	N_{crit}^L	$N_{\text{crit}}^{\text{Te}}$
30	0.82	38.4	35.7	154	320
60	0.67	42.1	34.7	138	340
120	0.52	45.1	34.0	124	370

10. References

A reference list should be included at the end of your paper placing the \LaTeX environment `thebibliography` there. Only essential references, which are directly referred to in the text, should be included in the reference list. At the moment there is no special Bib \TeX style for GTM — sorry. To use the reference system you have to specify the option `[citeauthoryear]` in the `documentclass`, like:

```
\documentclass[citeauthoryear]{GTM}
```

References are cited in the text — using the `\cite` command — by name and year of publication in brackets, e.g. (Backer, 1963), according to your use of the `\bibitem` command in the `thebibliography` environment. The coding is as follows: if you choose your own label for the sources by giving an optional argument to the `\bibitem` command the citations in the text are marked with the label you supplied.

The results in this section are a refined version of (`\cite{clar:eke}`); the minimality result of Proposition~14 was the first of its kind.

The above input produces the citation:

“The results in this section are a refined version of (Clarke and Ekeland, 1982); the minimality ...”.

Then the `\bibitem` entry of the `thebibliography` environment should read:

```
\begin{thebibliography}{} % (do not forget {})
.
\bibitem[Clarke and Ekeland, 1982]{clar:eke}
Clarke, F.\ and I.\ Ekeland (1982).
{\em Nonlinear oscillations and boundary-value problems for
Hamiltonian systems}. Arch.\ Rat.\ Mech.\ Anal., {\bf 78}, 315--333.
.
\end{thebibliography}
```

For one author, use author’s surname and the year (Abell, 1945). For two authors, give both names and the year (Abell and Smith, 1956). For three or more authors, use a surname of the first author, plus “et al.”, and the year (Abell et al., 1954). You may put also the number of section, chapter, theorem, etc., after the year: (Abell, 1945, Theorem 2), (Abell and Smith, 1956, Sect. 2.1), (Backer, 1963, Chap. 3). If giving a list of references, separate them using semi-colons (Jones, 1965; Tarantello, 2001a, b). Put only the year in brackets when referring to the author(s) of the referenced publication (for example, “This work was first developed by Clarke and Ekeland (1982), and later expanded by Subbotina (1986), who demonstrated that ...”)

The reference list should contain all citations occurring in the text, ordered alphabetically by surname (with initials following). If there are several works by the same author(s) the references should be listed in the appropriate order indicated below:

- One author: list works chronologically;
- Author and same co-author(s): list works chronologically;
- Author and different co-author(s): list works alphabetically according to co-author(s).

If there are several works by the same author(s) and in the same year, but which are cited separately, they should be distinguished by the use of “a”, “b”, etc., put after the year.

References should appear *only* in the following three forms: journal reference, reference to book, reference to multi-author work.

Journal reference should include: author’s surname and initials; surnames and initials of remaining authors; year of publication (in brackets); article title (in *italics*); abbreviated journal title; volume number (in **bold**, without “Vol.”, “No.”, etc.); page numbers (without “pp.”); language of publication except for English if relevant (in brackets) .

Reference to book should include: author’s surname and initials; surnames and initials of remaining authors; year of publication (in brackets); the book title (in *italics*); volume (with “Vol.”), chapter (with “Chap.”) or page (with “pp.”) numbers if relevant; the name of the publisher: place of publication; language of publication except for English if relevant (in brackets).

Reference to multi-author work should include after the year of publication: the chapter title (in *italics*); “In:” followed by book title; surname(s) and initials of editor(s) and abbr. “ed” or “eds” (in brackets); “Vol.” and volume number when appropriate; “pp.” and page numbers; the name of the publisher; place of publication; language of publication except for English if relevant (in brackets).

Note. Please, call your attention to punctuation marks in the different forms of references (see *Samplpe* below).

Sample Input

```
\begin{thebibliography}{} % (do not forget {})

\bibitem[Abell, 1945]{ab:45} % Journal reference
Abell, B.\,C.\ (1945). {\em The examination of cell nuclei}.
Biochemical Journal, {\bf 35}, 123--126.

\bibitem[Abell and Smith, 1956]{ab:sm} % Journal reference
Abell, B.\,C.\ and S.\,E.\ Smith (1956). {\em Nucleic acid content
of microsomes}. Nature, {\bf 135(2)}, 7--9.

\bibitem[Abell et al.]{ab:et} % Reference to multi-author work
Abell, B.\,C., R.\,C.\ Tagg and M.\ Push (1954).
{\em Enzyme catalyzed cellular transaminations}.
In: Advanced in Enzymology (Round, A.\,F., ed),
Vol.\,2, pp.\,125--247. Academic Press: New York.

\bibitem[Backer, 1963]{back} % Reference to book
Backer, R.\,C.\ (1963). {\em Microscopic Staining Techniques},
Chap.\,3. Butterworth: London.

\bibitem[(1982)]{clar:eke} % Journal reference
Clarke, F.\ and I.\ Ekeland (1982).
{\em Nonlinear oscillations and boundary-value problems for
Hamiltonian systems}. Arch.\ Rat.\ Mech.\ Anal., {\bf 78}, 315--333.

\bibitem[Subbotina (1986)]{subb} % Reference to multi-author work
Subbotina, N.\,N.\ (1986). {\em Necessary and sufficient optimality
conditions for controls and trajectories}. In: Synthesis of optimal
control to game-theoretical problems (Subbotin, A.\,I.\ and
A.\,F.\ Kleimenov, eds), Vol.\,1, Chap.\,3, pp.\,86--96.
Inst.\ Math.\ Mech.: Sverdlovsk (in Russian).

\bibitem[Tarantello, 2001a]{tar:a} % Journal reference
Tarantello, G.\ (2001a). {\em Subharmonic solutions with prescribed
minimalperiod for nonautonomous Hamiltonian systems}.
J.\ Diff.\ Eq., {\bf 2(3)}, 28--55.

\bibitem[Tarantello (2001b)]{tar:b} % Journal reference
Tarantello, G.\ (2001b). {\em Subharmonic solutions for
```

Hamiltonian systems via a pseudoindex theory}. *Annali di Matematica Pura* (to appear).

\end{thebibliography}

Sample Output

References

- Abell, B. C. (1945). *The examination of cell nuclei*. *Biochemical Journal*, **35**, 123–126.
- Abell, B. C. and S. E. Smith (1956). *Nucleic acid content of microsomes*. *Nature*, **135**(2), 7–9.
- Abell, B. C., R. C. Tagg and M. Push (1954). *Enzyme catalyzed cellular transaminations*. In: *Advanced in Enzymology* (Round, A. F., ed), Vol. 2, pp. 125–247. Academic Press: New York.
- Backer, R. C. (1963). *Microscopic Staining Techniques*, Chap. 3. Butterworth: London.
- Clarke, F. and I. Ekeland (1982). *Nonlinear oscillations and boundary-value problems for Hamiltonian systems*. *Arch. Rat. Mech. Anal.*, **78**, 315–333.
- Subbotina, N. N. (1986). *Necessary and sufficient optimality conditions for controls and trajectories*. In: *Synthesis of optimal control to game-theoretical problems* (Subbotin, A. I. and A. F. Kleimenov, eds), Vol. 1, Chap. 3, pp. 86–96. Inst. Math. Mech.: Sverdlovsk (in Russian).
- Tarantello, G. (2001a). *Subharmonic solutions with prescribed minimal period for nonautonomous Hamiltonian systems*. *J. Diff. Eq.*, **2**(3), 28–55.
- Tarantello, G. (2001b). *Subharmonic solutions for Hamiltonian systems via a pseudoindex theory*. *Annali di Matematica Pura* (to appear).