

Preparing a paper using L^AT_EX for publication in the proceedings of *Inverse Problems – from Theory to Applications* (IPTA2014)

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Abstract: All articles *must* contain an abstract. This document describes the preparation of a conference paper using L^AT_EX and the IPproc stylefile. The abstract follows the addresses and should give readers concise information about the content of the article and indicate the main results obtained and conclusions drawn. As the abstract is not part of the text it should be complete in itself; no table numbers, figure numbers, references or displayed mathematical expressions should be included. It should be suitable for direct inclusion in abstracting services and should not normally exceed 200 words. The abstract should generally be restricted to a single paragraph. Since contemporary information-retrieval systems rely heavily on the content of titles and abstracts to identify relevant articles in literature searches, great care should be taken in constructing both.

Keywords: Instructions, L^AT_EX, IPTA2014.

1 Introduction

These guidelines show how to prepare articles for publication the proceedings of *Inverse Problems – from Theory to Applications* so they can be published quickly and accurately. Articles will not be refereed and the accepted manuscripts will be published with no editing or proofreading. It is, therefore, the author's responsibility to ensure that the content is correct. This document has been prepared using IPproc stylefile so serves as a sample document. The stylefile and accompanying documentation are available from the IPTA2014 conference website <http://ipta2014.iopconfs.org/home>.

2 Preparing your paper

Authors are encouraged to use L^AT_EX when preparing their contribution and should use IPproc stylefile to assist them. You can call in additional packages such as AMS extensions as needed. Please try to avoid defining or redefining any latex commands or macros when preparing your article, and use standard latex longhand instead.

Start your document with

```
\documentclass[10pt,openany]{book}
\usepackage{IPproc}
\pagestyle{plain}
```

2.1 Headers, footers and page numbers

Authors should *not* add headers or footers to the pages of their article—they will be added by IOP Publishing as part of the production process.

2.2 The title, authors, addresses, abstract and keywords

The code for setting the title page information is slightly different from the normal default in L^AT_EX but please follow these instructions as carefully as possible so all articles have the same style to the title page. The title is created using the `\chapter{}` command, . The first letter of the title should be capitalized with the rest in lower case, unless it is a proper noun. The command `\maketitle` is not required.

The next information required is the list of all authors' names followed by the affiliations. These are created using `\contributor{#1}`, where where `#1` is the list of all authors' names. The style for the names is initials then surname, with a comma after all but the last two names, which are separated by 'and'. Initials should *not* have full stops. First names may be used if desired.

The addresses of the authors' affiliations follow the list of authors. Each address should be set by using `\address{#1}` with the address as the single parameter in braces. If there is more than one address then a superscripted number, followed by a space, should come at the start of each address. In this case each author should also have a superscripted number or numbers following their name to indicate which address is the appropriate one for them.

Please also provide e-mail addresses for any or all of the authors using an `\email{#1}` command after the contributors `\email{#1}` provides the text Email: so `#1` is just the e-mail address or a list of emails.

The abstract follows the addresses and should give readers concise information about the content of the article and should not normally exceed 200 words. **All articles must include an abstract.** Abstracts are created with `\abstract{#1}`, where `#1` is the abstract text. Similarly keywords are included using `\keywords{#1}` following the abstract.

2.3 Sample coding for the start of an article

The code for the start of a title page of a typical paper might read:

```
\chapter{The anomalous magnetic moment of the
neutrino and its relation to the solar neutrino problem}

\contributor{P J Smith1, T M Collins2,
R J Jones3, and J Williams3}

\address{1 Mathematics Faculty, Open University,
Milton Keynes MK7~6AA, UK}
\address{2 Department of Mathematics,
Imperial College, Prince Consort Road, London SW7~2BZ, UK}
\address{3 Department of Computer Science,
University College London, Gower Street, London WC1E~6BT, UK}

\email{williams@ucl.ac.uk}

\abstract{The abstract goes here.}

\keywords{keywords go here.}
```

2.4 The text

The text of the article should be produced using standard L^AT_EX formatting. Articles may be divided into numbered sections and subsections, but the **length limit of 5 pages** should be strictly adhered to.

2.5 Acknowledgments

Authors wishing to acknowledge assistance or encouragement from colleagues, special work by technical staff or financial support from organizations should do so in an unnumbered Acknowledgments section (such as `\section*{Acknowledgments}`) immediately following the last numbered section of the paper.

3 References

Two different styles of referencing are in common use: the Harvard alphabetical system and the Vancouver numerical system. The Vancouver numerical system is preferred but authors should use the Harvard alphabetical system if they wish to do so. In the numerical system references are numbered sequentially throughout the text within square brackets, like this [2], and one number can be used to designate several references.

3.1 Using Bibtex

Bibtex can be used to create references.

3.2 Reference lists

A complete reference should provide the reader with enough information to locate the article concerned, whether published in print or electronic form, and should, depending on the type of reference, consist of:

- name(s) and initials;
- date published;
- title of journal, book or other publication;
- titles of journal articles may also be included (optional);
- volume number;
- editors, if any;
- town of publication and publisher in parentheses for *books*;
- the page numbers.

Up to ten authors may be given in a particular reference; where there are more than ten only the first should be given followed by ‘*et al.*’. If an author is unsure of a particular journal’s abbreviated title it is best to leave the title in full. The terms *loc. cit.* and *ibid.* should not be used. Unpublished conferences and reports should generally not be included in the reference list and articles in the course of publication should be entered only if the journal of publication is known. A thesis submitted for a higher degree may be included in the reference list if it has not been superseded by a published paper and is available through a library; sufficient information should be given for it to be traced readily.

3.3 Formatting reference lists

Numeric reference lists should contain the references within an unnumbered section (such as `\section*{References}`).

The reference list itself is started by the code `\begin{thebibliography}{<num>}`, where `<num>` is the largest number in the reference list and is completed by `\end{thebibliography}`. Each reference starts with `\bibitem{<label>}`, where ‘label’ is the label used for cross-referencing. Each `\bibitem` should only contain a reference to a single article (or a single article and a preprint reference to the same article). When one number actually covers a group of two or more references to different articles, `\nonum` should replace `\bibitem{<label>}` at the start of each reference in the group after the first.

For an alphabetic reference list use `\begin{thereferences} ... \end{thereferences}` instead of the ‘thebibliography’ environment and each reference should start with `\item` instead of `\bibitem{label}` as cross referencing is less useful for alphabetic references.

3.4 References to printed journal articles

A normal reference to a journal article contains three changes of font (see table 1) and is constructed as follows:

- the authors should be in the form surname (with only the first letter capitalized) followed by the initials with no periods after the initials. Authors should be separated by a comma except for the last two which should be separated by ‘and’ with no comma preceding it;
- the article title (if given) should be in lower case letters, except for an initial capital, and should follow the date;
- the journal title is in italic and is abbreviated. If a journal has several parts denoted by different letters the part letter should be inserted after the journal in Roman type, e.g. *Phys. Rev. A*;
- the volume number should be in bold type;
- both the initial and final page numbers should be given where possible. The final page number should be in the shortest possible form and separated from the initial page number by an en rule ‘-’, e.g. 1203–14, i.e. the numbers ‘12’ are not repeated.

A typical (numerical) reference list might begin

- [1] Strite S and Morkoc H 1992 *J. Vac. Sci. Technol.* B **10** 1237
- [2] Jain S C, Willander M, Narayan J and van Overstraeten R 2000 *J. Appl. Phys.* **87** 965
- [3] Nakamura S, Senoh M, Nagahama S, Iwase N, Yamada T, Matsushita T, Kiyoku H and Sugimoto Y 1996 *Japan. J. Appl. Phys.* **35** L74
- [4] Akasaki I, Sota S, Sakai H, Tanaka T, Koike M and Amano H 1996 *Electron. Lett.* **32** 1105
- [5] O’Leary S K, Foutz B E, Shur M S, Bhapkar U V and Eastman L F 1998 *J. Appl. Phys.* **83** 826
- [6] Jenkins D W and Dow J D 1989 *Phys. Rev. B* **39** 3317

which would be obtained by typing

```
\begin{thebibliography}{6}
\bibitem{Strite1992} Strite S and Morkoc H 1992 {\it J. Vac. Sci. Technol.} B
{\bf 10} 1237
\bibitem{Jain2000} Jain S C, Willander M, Narayan J and van Overstraeten R 2000
{\it J. Appl. Phys.} {\bf 87} 965
\bibitem{Nakamura1996} Nakamura S, Senoh M, Nagahama S, Iwase N, Yamada T,
Matsushita T, Kiyoku H and Sugimoto Y 1996 {\it Japan. J. Appl. Phys.}
{\bf 35} L74
\bibitem{Akasaki1996} Akasaki I, Sota S, Sakai H, Tanaka T, Koike M and Amano H 1996
{\it Electron. Lett.} {\bf 32} 1105
\bibitem{O’Leary1998} O’Leary S K, Foutz B E, Shur M S, Bhapkar U V and Eastman L F
```

1998 *J. Appl. Phys.* **83** 826
 \bibitem{Jenkins1989} Jenkins D W and Dow J D 1989 *Phys. Rev.* B **39** 3317
 \end{thebibliography}

Table 1. *Font styles for a reference to a journal article.*

Element	Style
Authors	Roman type
Date	Roman type
Article title (optional)	Roman type
Journal title	Italic type
Volume number	Bold type
Page numbers	Roman type

3.5 References to preprints

For preprints there are two distinct cases:

1. Where the article has been published in a journal and the preprint is supplementary reference information. In this case it should be presented as:

[1] Kunze K 2003 T-duality and Penrose limits of spatially homogeneous and inhomogeneous cosmologies *Phys. Rev. D* **68** 063517 (*Preprint* gr-qc/0303038)

2. Where the only reference available is the preprint. In this case it should be presented as

[1] Milson R, Coley A, Pravda V and Pravdova A 2004 Alignment and algebraically special tensors *Preprint* gr-qc/0401010

3.6 References to electronic-only journals

In general article numbers are given, and no page ranges, as most electronic-only journals start each article on page 1.

- For *New Journal of Physics* (article number may have from one to three digits)

[1] Fischer R 2004 Bayesian group analysis of plasma-enhanced chemical vapour deposition data *New. J. Phys.* **6** 25
- For SISSA journals the volume is divided into monthly issues and these form part of the article number

[1] Horowitz G T and Maldacena J 2004 The black hole final state *J. High Energy Phys.* JHEP02(2004)008
 [2] Bentivegna E, Bonanno A and Reuter M 2004 Confronting the IR fixed point cosmology with high-redshift observations *J. Cosmol. Astropart. Phys.* JCAP01(2004)001

3.7 References to books, conference proceedings and reports

References to books, proceedings and reports are similar to journal references, but have only two changes of font (see table 2).

Points to note are:

- Book titles are in italic and should be spelt out in full with initial capital letters for all except minor words. Words such as Proceedings, Symposium, International, Conference, Second, etc should be abbreviated to *Proc.*, *Symp.*, *Int.*, *Conf.*, *2nd*, respectively, but the rest of the title should be given in full, followed by the date of the conference and the town or city where the conference was held. For Laboratory Reports the Laboratory should be spelt out wherever possible, e.g. *Argonne National Laboratory Report*.

Table 2. *Font styles for references to books, conference proceedings and reports.*

Element	Style
Authors	Roman type
Date	Roman type
Book title (optional)	Italic type
Editors	Roman type
Place (city, town etc) of publication	Roman type
Publisher	Roman type
Volume	Roman type
Page numbers	Roman type

- The volume number, for example vol 2, should be followed by the editors, if any, in a form such as ‘ed A J Smith and P R Jones’. Use *et al* if there are more than two editors. Next comes the town of publication and publisher, within brackets and separated by a colon, and finally the page numbers preceded by p if only one number is given or pp if both the initial and final numbers are given.

Examples taken from published papers:

- [1] Kurata M 1982 *Numerical Analysis for Semiconductor Devices* (Lexington, MA: Heath)
- [2] Selberherr S 1984 *Analysis and Simulation of Semiconductor Devices* (Berlin: Springer)
- [3] Sze S M 1969 *Physics of Semiconductor Devices* (New York: Wiley-Interscience)
- [4] Dorman L I 1975 *Variations of Galactic Cosmic Rays* (Moscow: Moscow State University Press) p 103
- [5] Caplar R and Kulisic P 1973 *Proc. Int. Conf. on Nuclear Physics (Munich)* vol 1 (Amsterdam: North-Holland/American Elsevier) p 517
- [6] Cheng G X 2001 *Raman and Brillouin Scattering-Principles and Applications* (Beijing: Scientific)
- [7] Szytula A and Leciejewicz J 1989 *Handbook on the Physics and Chemistry of Rare Earths* vol 12, ed K A Gschneidner Jr and L Erwin (Amsterdam: Elsevier) p 133
- [8] Kuhn T 1998 *Density matrix theory of coherent ultrafast dynamics Theory of Transport Properties of Semiconductor Nanostructures* (Electronic Materials vol 4) ed E Schöll (London: Chapman and Hall) chapter 6 pp 173–214

4 Tables and table captions

Tables should be numbered serially and referred to in the text by number (table 1, etc, **rather than** tab. 1). Each table should be a float and be positioned within the text at the most convenient place near to where it is first mentioned in the text. It should have an explanatory caption which should be as concise as possible.

4.1 The basic table format

The standard form for a table is:

```
\begin{table}
\caption{\label{tablelabel}Table caption.}
\begin{center}
\begin{tabular}{llll}
\hline
Head 1&Head 2&Head 3&Head 4\\
\hline
1.1&1.2&1.3&1.4\\
2.1&2.2&2.3&2.4\\
\hline
\end{tabular}
\end{center}
\end{table}
```

Table 3. *Table caption.*

Head 1	Head 2	Head 3	Head 4
1.1	1.2	1.3	1.4
2.1	2.2	2.3	2.4

The above code produces table 3.

Points to note are:

1. The caption comes before the table.
2. The normal style is for tables to be centred in the same way as equations. This is accomplished by using `\begin{center} ... \end{center}`.
3. The default alignment of columns should be aligned left.
4. Tables should have only horizontal rules and no vertical ones.
5. Numbers in columns should be aligned as appropriate, usually on the decimal point;

5 Figures and figure captions

Figures must be included in the source code of an article at the appropriate place in the text not grouped together at the end.

Each figure should have a brief caption describing it and, if necessary, interpreting the various lines and symbols on the figure. As much lettering as possible should be removed from the figure itself and included in the caption. If a figure has parts, these should be labelled *(a)*, *(b)*, *(c)*, etc.

Authors should try and use the space allocated to them as economically as possible. At times it may be convenient to put two figures side by side or the caption at the side of a figure. To put figures side by side, within a figure environment, put each figure and its caption into a minipage with an appropriate width (e.g. 3in or 18pc if the figures are of equal size) and then separate the figures slightly by adding some horizontal space between the two minipages (e.g. `\hspace{.2in}` or `\hspace{1.5pc}`). To get the caption at the side of the figure add the small horizontal space after the `\includegraphics` command and then put the `\caption` within a minipage of the appropriate width aligned bottom, i.e. `\begin{minipage}[b]{3in}` etc (see code in this file used to generate figures 1–3).

Note that it may be necessary to adjust the size of the figures (using optional arguments to `\includegraphics`, for instance `[width=3in]`) to get you article to fit within your page allowance or to obtain good page breaks.

Packages such as `wrapfig` and `multifig` may be useful for wrapping text around figures or creating multipart figures.

Using the `graphicx` package figures can be included using code such as:

```
\begin{figure}
\begin{center}
\includegraphics{file.eps}
\end{center}
\caption{\label{figlabel4}Figure caption}
\end{figure}
```

6 Mathematics

Some key points to bear in mind when composing mathematical manuscripts:

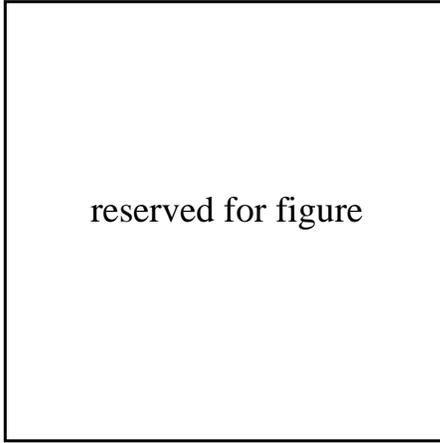


Figure 1. *Figure caption for first of two sided figures.*

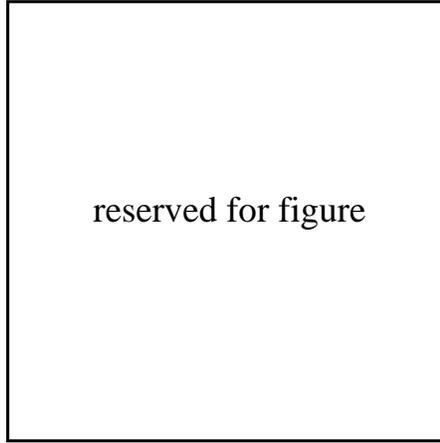


Figure 2. *Figure caption for second of two sided figures.*

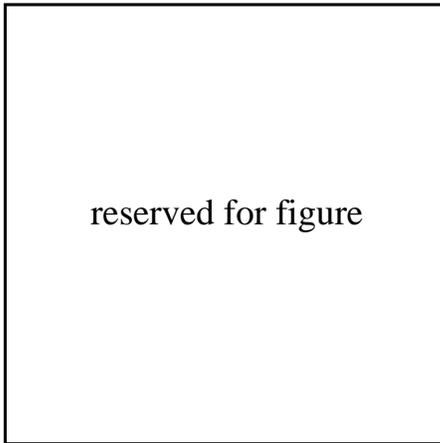


Figure 3. *Figure caption for a narrow figure where the caption is put at the side of the figure.*

- It is very important to distinguish between constants/labels (Roman text) and variables (italic text).
 - Roman (upright) characters are used for constants or for labels attached to variables, e.g. M_e for the mass of an electron.
 - Roman characters are used for the differential ‘d’, the exponential ‘e’ and ‘i’ where $i = \pm\sqrt{-1}$.
To help, this stylefile defines the commands
 - ◊ `\e` or `\rme` to produce `\mathrm{e}` (e),
 - ◊ `\rmi` to produce `\mathrm{i}` (i), and
 - ◊ `\rmd` to produce `\mathrm{d}` (d).
 - When letters are used as labels they are set in Roman type (for example x -axis but x -ray). Hence, operators such as differential, div, grad, curl etc, are set in roman as they act merely as labels, but the variable on which the operator acts is set in italic, hence $dx = dy$, etc.
 - Sub and superscripts must be set in italics when they represent physical quantities or mathematical variables otherwise they should be set in Roman type; for example: C_T , where T represents “temperature”; M_i , where i is a summation index; but R_E where ‘E’ distinguishes an object such as the “emitter”.

- Care should also be taken with exponential expressions and with subscripts; the principle to bear in mind is simply that matter above or below the level of the normal type involves special treatment which leads both to less elegant work and to greater expense. It is better to use $\exp(n^3 - 1)$ than e^{n^3-1} .
- Full formulae or equations should be displayed, i.e. written on a separate line as shown in the following examples:

$$e^{i\pi} + 1 = 0$$

$$\tilde{T}_{\mu\nu}(x) = -\frac{2}{\sqrt{-g(x)}} \frac{\delta S_m}{\delta g^{\mu\nu}(x)} \quad (1)$$

$$\frac{dN}{dt} = -C\sigma \oint_{\partial M} \kappa_g(s) ds$$

and only numbered if referred to in the text, eg equation (1).

- Where an equation is longer than the line width, it should be broken at an appropriate point, e.g. before a complete term, immediately before =, + or – signs or between terms multiplied together. The connecting signs are not repeated and appear only at the beginning of the turned-over line with the new line beginning with +, – or ×:

$$\begin{aligned} \int d^3v' \mathbf{v}' \left(\frac{\partial f_\alpha}{\partial f} \right)_c &= \frac{\partial}{\partial t} \int d^3v' \mathbf{v}' f_\alpha(\mathbf{x}, \mathbf{v}', t) + \nabla \cdot \int d^3v' \mathbf{v}' \mathbf{v}' f_\alpha \\ &+ \left(\frac{e_\alpha}{m_\alpha} \right) \int d^3v' \nabla_v \cdot \left[\left(\mathbf{E} + \frac{\mathbf{v}'}{c} \times \mathbf{B} \right) \mathbf{v}' f_\alpha \right] \\ &- \int d^3v' \left(\mathbf{E} + \frac{\mathbf{v}'}{c} \times \mathbf{B} \right) f_\alpha \end{aligned}$$

$$\begin{aligned} C(12) &= \left[\vec{\pi} \cdot \vec{\phi}(x+r) \right] \\ &\approx 1 - \text{const} \frac{r^2}{L^2} \int_r^L \frac{xdx}{x^2} + \dots \\ &\approx 1 - \text{const} \frac{r^2}{L^2} \ln \frac{xdx}{x^2} + \dots \end{aligned} \quad (2)$$

However, if equations will fit on one line, do so; for example, (2) may also be formatted as:

$$C(12) = \left[\vec{\pi} \cdot \vec{\phi}(x+r) \right] \approx 1 - \text{const} \frac{r^2}{L^2} \int_r^L \frac{xdx}{x^2} + \dots \approx 1 - \text{const} \frac{r^2}{L^2} \ln \frac{xdx}{x^2} + \dots$$

- Bold italic characters is our preferred style for vectors but you may use any standard notation.
- Matrices should be sans serif bold (e.g. **G**, **d**, **W**).
- Braces, brackets and parentheses are used in the order $\{[()]\}$, except where mathematical convention dictates otherwise (e.g. square brackets for commutators and anti-commutators).
- Decimal fractions should always be preceded by a zero: for example 0.123 not .123.
- Commas are not inserted between figures: e.g. use 4000, 60 000, 0.123 45 not 4, 000, 60, 000, 0.123, 45.
- Mathematical expressions are not punctuated except by use of the full stop.

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Locating copyright owners of works can be a time-consuming operation, but with some forward planning should not be difficult.

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Please submit your article as a zipped file containing the .tex and all image files by email to ip@iop.org before the deadline of **Monday 14th July 2014**.

Please also include copies of any permission statements at the same time.

Before submitting your article do check for spelling and typing errors, the section numbering is correct and consistent, all figures and tables have a call out in the text, and the reference list is complete with each reference being cited.