

**Instruction for Making L<sup>A</sup>T<sub>E</sub>X Compuscripts Using  $\mathcal{PTP}$ T<sub>E</sub>X**— *L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> Version* —Shin-Ichiro TOMONAGA<sup>1,\*</sup> and Hideki YUKAWA<sup>2,\*\*</sup>)<sup>1</sup>*Physics Department, Tokyo Bunrika University, Tokyo 113-1234, Japan*<sup>2</sup>*Yukawa Institute for Theoretical Physics, Kyoto University,  
Kyoto 606-8502, Japan*

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This is a manual for making L<sup>A</sup>T<sub>E</sub>X compuscripts for *Progress of Theoretical Physics* using the  $\mathcal{PTP}$ T<sub>E</sub>X class file “ptptex.cls.” In particular, we explain some useful options, macros and environments that are specially prepared with ptptex.cls. The source file for this manual itself is designed to provide a template that can be used for writing compuscripts.

**§1. Introduction**

We started printing some articles in *Progress of Theoretical Physics* (PTP) directly from L<sup>A</sup>T<sub>E</sub>X<sup>1)</sup> manuscripts in April, 1996. The Editorial Office of PTP has prepared two versions of the Style setting file for L<sup>A</sup>T<sub>E</sub>X. When you prepare a L<sup>A</sup>T<sub>E</sub>X manuscript (compuscript) to submit to PTP using L<sup>A</sup>T<sub>E</sub>X Ver.2.09, please use ptptex.sty. When you prepare a manuscript using L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>, please use ptptex.cls.<sup>\*\*\*</sup>) In this text, we explain how to use ptptex.cls. In  $\mathcal{PTP}$ T<sub>E</sub>X, all the usual L<sup>A</sup>T<sub>E</sub>X commands can be used, and there are some additional options, macros and environments that are specially prepared. This manual explains the commands specific to  $\mathcal{PTP}$ T<sub>E</sub>X from §2 on.

**1.1. Submission**

When submitting a L<sup>A</sup>T<sub>E</sub>X compuscript written using  $\mathcal{PTP}$ T<sub>E</sub>X, please use **E-mail** if possible. The E-mail address to which compuscripts should be sent is that for the Editorial Office of PTP:

ptp@yukawa.kyoto-u.ac.jp

If the compuscript consists of two or more files, e.g. ps/eps figure files, other than the L<sup>A</sup>T<sub>E</sub>X source file itself, please first combine them into a single compacted file in one of the following ways: <sup>†)</sup>

- 1) Use (P. Ginsparg’s) **uufiles** command on UNIX, or,

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<sup>\*)</sup> A friend of Schwinger, because they both have ‘swing’ in their names.

<sup>\*\*)</sup> A friend of Fermi and Bose. E-mail: yukawa@yukawa.kyoto-u.ac.jp

<sup>\*\*\*)</sup> L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> is the later version. One improvement in L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> is a new font selection scheme.

<sup>†)</sup> If you prepare your document in this manner, you can send your file as the “text” of the E-mail. If you send your document as an “attachment file,” however, you do not have to use “uuencode” or “ish.” These programs convert a binary file into plain text format. You can send .gz files and .lzh files as attachments.

manually carry out `tar+gzip(compress)+uuencode`.

2) Use `lha+ish`.

You can use these methods even if you are sending a single file, and, in fact, we recommend it.)\*

In your E-mail correspondence, please include your name, institution, address, and telephone and facsimile numbers. If you are in Japan, your institution name and address should be written in Japanese (as this may be needed when we correspond by postal mail). In general, when you send an E-mail message to the PTP Editorial Office, please complete the subject line of the mail header as follows: <type of message> <manuscript Ref. Number> <first author's last name>. For example, this would be something like one the following:

“submit PTP Kobayashi” : for the submission of a new manuscript

“final 5Z03L Suzuki” : for the final version of a manuscript accepted for publication

“status 5X31 Sato” : for a status query

“report 6425 Yamada” : for a Referee Report

When sending Referee Reports and other such correspondence to authors, the Editorial Office sends them by E-mail. Authors may send revised manuscripts with replies to referees by postal mail or by E-mail.

Submission of papers can also be accomplished by simply communicating to PTP the e-print arXiv ID by E-mail. In this case, the pdf file representing the latest version of the arXiv.org e-Print archive at the time of submission will be passed on for refereeing. After the refereeing process, the revised version of the manuscript should be submitted, along with replies to referees, in the form of .tex and eps files to PTP by E-mail.

In the case that E-mail is not available, we also accept hard copies of contributed manuscripts. In this case, the word processing environment used in producing the manuscript, such as  $\mathcal{PTP}\text{T}_{\text{E}}\text{X}$ ,  $\text{\LaTeX}$ , Word, etc., should be specified.

In any case, when a paper is accepted for publication, the PTP Editorial Office makes corrections/additions to the **hard copy** of the manuscript and returns this to the author. The author is asked to examine the suggested corrections/additions and make the necessary changes to the source file. The corrected source file should then be sent as the final manuscript to the PTP office either by E-mail or on CD-R or floppy disk by postal mail. (In the latter case, please use a **3.5 inch** DOS/V or NEC formatted floppy disk.) Please return the hard copy of the manuscript corrected by the Editorial Office, along with the order form for reprints, etc., by postal mail.

## 1.2. How to obtain the $\mathcal{PTP}\text{T}_{\text{E}}\text{X}$ style file

The  $\mathcal{PTP}\text{T}_{\text{E}}\text{X}$  class file can be obtained from the WWW home page of Progress of Theoretical Physics:

PTP Home Page: <http://www2.yukawa.kyoto-u.ac.jp/~ptpwww/>

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\*) We have discovered that often extraneous “>” characters (which read “ $\angle$ ” when compiled) appear in some manuscripts when they are sent as the main text of an E-mail. To avoid this problem, the file should be compressed before it is sent, just as in the case of sending multiple files, or the manuscript should be sent as an attachment file.

Please check this site occasionally to obtain the most recent version, as it is revised from time to time.

The file `ptptexXX.uu` that can be downloaded from there is a ‘uuencoded-gzipped-tar’ file, which is automatically unpacked when the command

```
% csh ptptexXX.uu
```

is executed on a UNIX machine. (Here “XX” represents the version number of the class file. For example, XX is 09 for version 0.9.) The same directory also contains the ‘lha+ish’-ed file `ptptexXX.ish` and the ‘gzipped-tar’ file `ptptexXX.tar.gz`, which have the same content as the `ptptexXX.uu` file in alternative compacted forms, as well as the un-packed files themselves. Please choose the form appropriate for your system environment. When any of these compacted files is unpacked, the following will be obtained:

1. `manptp.tex`    Source file for this manual.
2. `template.tex`    Template for making a P<sup>T</sup>P<sup>T</sup>E<sub>X</sub> compuscript.
3. `ptptex.cls`    Main class file of P<sup>T</sup>P<sup>T</sup>E<sub>X</sub>.
4. `ptp-prep.clo`    Class option file for preprint style output.
5. `wrapft.sty`    Macro for wrapfigure and wraptable environments.
6. `wrapfig.sty`    (Macro called by `wrapft.sty`)
7. `overcite.sty`    (Macro called by `ptptex.cls`)

The macros 6 and 7 are style files attached to the standard L<sup>A</sup>T<sub>E</sub>X systems. We include them here because using different versions together may cause unexpected output.

The P<sup>T</sup>P<sup>T</sup>E<sub>X</sub> class file takes as inputs the style files `amsmath.sty` and `amssymb.sty`, which are included in the AMS-L<sup>A</sup>T<sub>E</sub>X package.<sup>\*)</sup> With these files input, AMS-L<sup>A</sup>T<sub>E</sub>X commands, such as `\boldsymbol` (and including commands that produce special mathematical symbols) can be used. In the case that these style files are not found, an error message appears and compilation is suspended. Also, in the case that the L<sup>A</sup>T<sub>E</sub>X 2.09 version of `amsmath.sty` is input, an error results.<sup>\*\*)</sup> For the correct versions of these files, the L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> version of the AMS-L<sup>A</sup>T<sub>E</sub>X package is necessary.

## §2. Style and preamble

When creating a compuscript using `ptptex.cls`, please make use of the **template.tex** file, which is prepared for users’ convenience as a separate file. With this, it is easy to make your compuscript in `ptptex.cls` format. The default style of `ptptex.cls` is that for Regular Articles in *Progress of Theoretical Physics*.

You can start your L<sup>A</sup>T<sub>E</sub>X source file with the line

```
\documentclass{ptptex}
```

or

```
\documentclass[seceq]{ptptex}
```

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<sup>\*)</sup> The `amsmath.sty` style file, in turn, reads in several other AMS-L<sup>A</sup>T<sub>E</sub>X files.

<sup>\*\*)</sup> The error message displayed in this case is ‘‘Package `amsfonts` Warning: Obsolete command `\newsymbol`; `\DeclareMathSymbol` should be used instead ...’’.

Generally, a  $\text{\LaTeX}$  command appearing in square brackets [ ] is an “optional argument” and can be omitted. The optional argument [seceq] in the second of the above command lines is a declaration to create equation numbers that include section numbers, like (2.15). If this optional command is omitted, then the equation numbers will appear as a single sequence from the beginning to the end of the paper, like (1), (2),  $\dots$ .

In a usual  $\text{\LaTeX}$  `article.cls`, this first line is something like

```
\documentclass[12pt]{article}
```

If such a command line is replaced by one of those given above, then the output automatically becomes of the Article form for *Progress of Theoretical Physics*. Since `ptptex.cls` is designed to be as compatible with the usual  $\text{\LaTeX}$  `article.cls` as possible, a source file using  $\text{\LaTeX}$  `article.cls` can (probably) also be compiled with `ptptex.cls`.

In case you wish for the output to be in “preprint” form for private distribution, the file should begin with the line

```
\documentclass[seceq,preprint]{ptptex}
```

If you are writing a Letter article, Supplement article, Addenda or Errata instead of a regular PTP article, please start with the appropriate one of the following:

```
\documentclass[letter]{ptptex}
\documentclass[seceq,supplement]{ptptex}
\documentclass[seceq,addenda]{ptptex}
\documentclass[seceq,errata]{ptptex}
```

The part of the source file from the first `\documentclass` line to the declaration line

```
\begin{document}
```

is called the *preamble*. In the preamble there usually appear definitions of personal macros and style specifications. However, because style specifications are quite unnecessary (and even harmful) in  $\text{\LaTeX}$ , please do not include them. In  $\text{\LaTeX}$ , you should enter the appropriate information in the following items (within the brackets) in the preamble. You do not have to enter in “`\reccdate{ }`”.

```
\markboth{ }{ } : Running head [in the left { } appears the
                  author's name (or authors'names), and in
                  the right { } appears the paper's title]
\title{ }       : Title of paper
\author{ }      : Author's name (or authors' names)
\inst{ }       : Institution (address)
\reccdate{ }    : Date received
\abst{ }       : Abstract
```

An example of the above is given in `template.tex`. (Please beware of the fact that the commands appearing from `\inst` to `\abst` are macros particular to `ptptex.cls`. For this reason, if you compile a file containing these commands using  $\text{\LaTeX}$  `article.cls`, you will get the error message ‘!Undefined control sequence’.)

In the preamble of `template.tex`, the following commands also appear, but each

is “commented out” by the symbol % appearing in front:

- `\notypesetlogo` : Prevents appearance of “typeset using  $\mathcal{PTP}$ T<sub>E</sub>X.cls” in output file.
- `\publishedin{ }` : Vol/Year/Page of the paper about which Addenda or Errata is written.
- `\preprintnumber[width]{ }` : To include preprint numbers when manuscript is printed. Here *[width]* stipulates the width of the preprint number column.

Use these commands (by deleting the preceding “%”) when necessary. Their usage is made clear in the `template.tex`.

In general, any packages to be used in compiling the manuscript are called in the preamble using the `\usepackage` command. However, such files as `amsbsy.sty` (which is necessary for a number of commands, including `\boldsymbol`) are automatically input when `ptptex.cls` is used, and therefore there is no need for them to be called explicitly.

### §3. Equations

With the L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> version of  $\mathcal{PTP}$ T<sub>E</sub>X, the `amsmath.sty` style file is input automatically, and therefore all of the basic mathematical commands contained in AMS-L<sup>A</sup>T<sub>E</sub>X can be used. Here we briefly explain two particularly useful such commands.

#### 3.1. *Mathematical italic bold*

The `\boldsymbol` command is used to make math-bold (mathematical italic bold) fonts. Its use is demonstrated below:

$$\boldsymbol{\alpha \, kx}$$

#### 3.2. *Subequations*

To number equations in a form like (3.2a), (3.2b), ... in an array of equations, you can use the `\subequations` environment. Its usage is clear from the following simple example:

| Input   |                        | Output  |
|---|------------------------|---|
| <pre> \begin{subequations} \label{eq:1} An example of subequations: \begin{equation} \alpha + 2\beta + \gamma = 2 \label{eq:1a} \end{equation} Here is a sentence, which can be of any length. \begin{eqnarray} \gamma &amp;=&amp; \nu(2-\eta) \\ \delta &amp;=&amp; \mu(1+\rho) \end{eqnarray} \end{subequations} </pre> | $\Rightarrow$<br>gives | <div style="border: 1px solid black; padding: 10px;"> <p>An example of subequations:</p> <math display="block">\alpha + 2\beta + \gamma = 2 \quad (3.1a)</math> <p>Here is a sentence, which can be of any length.</p> <math display="block">\gamma = \nu(2 - \eta) \quad (3.1b)</math> <math display="block">\delta = \mu(1 + \rho) \quad (3.1c)</math> </div> |

Here note that the command `\label{eq:1}` just after `\begin{subequations}` defines the label for the entire array, so that `(\ref{eq:1})` gives “(3.1)”, while `\label{eq:1a}` refers to the first equation in the array, (3.1a).

#### §4. References

References are cited using the `\cite` command. All references to be cited at the same point in the paper should be listed in a single series and separated by commas inside the curly brackets, as `\cite{rf:1,rf:3,rf:4,rf:5}`. (There should be no space after any commas here. Such a space will be interpreted by L<sup>A</sup>T<sub>E</sub>X as being part of the reference label.) When three or more consecutive reference numbers appear, as in this example, the numbers are automatically printed in a compressed format, like that at the end of this sentence.<sup>1),3)-5)</sup> In the case that all the references to be cited have consecutively numbered reference numbers, the following type of command can be used: `\cite{rf:3}\tocite{rf:5}`. In this way, only the first and last reference numbers need to be included. The output obtained from this command is that appearing at the end of this sentence.<sup>3)-5)</sup> The `\citen` command can be used to obtain citation numbers: e.g., `Ref.\citen{rf:3}` gives the output “Ref. 3)”.

When you use the `\cite` command at the end of a sentence, it should always appear *after a period, comma, colon or semicolon*, as follows: `...some text.\cite{rf:5}` Then, between such a command and the next sentence (if the paragraph is continued), the command `\quad` (where `\quad` represents a space) should be included to give an appropriate space between sentences. For instance, typing

This is `\cdots` something.`\cite{rf:5}` \ Therefore we can `\cdots` the output becomes the following: This is `\cdots` something.<sup>5)</sup> Therefore we can `\cdots`

The references are included at the end of the file by using the `\thebibliography` environment and `\bibitem` command, as usual. For example, the references at the end of this manual are input as follows:

```

\begin{thebibliography}{99}
\bbitem{rf:1}
  Leslie Lamport, \textit{LaTeX: A Document Preparation System}
  (Addison-Wesley, New York, 1986).
\bbitem{rf:2}
  S.~Weinberg, Phys.\ Rev.\ Lett.\ \textbf{19} (1967), 1264.
\bbitem{rf:3}
  M.~Kobayashi and T.~Maskawa, \PTP{49,1973,652}.
\bbitem{rf:4}
  D.~Gross and F.~Wilczek, \PRL{30,1973,1343}.\
  H.~D.~Politzer, \PRL{30,1973,1346}.
\bbitem{rf:5}
  Y.~Nambu, Phys.\ Rev.\ \textbf{117} (1960), 648; \PRL{4,1960,380}.\
  G.~'t~Hooft, \NPB{33,1971,173}; ibid. \andvol{35,1971,167}.
\bbitem{rf:6}
  E.~Witten, \JL{Adv.\ Theor.\ Math.\ Phys.,2,1998,253},
  hep-th/9802150; hep-th/0112258.
\bbitem{rf:7}
  M.~Harada, Y.~Kikukawa, T.~Kugo and H.~Nakano, \PTP{92,1994,1161}
  [Errata; \textbf{95} (1996), 835].
\end{thebibliography}

```

Please input your bibitems following these examples in the PTP format. In particular, the volume numbers should be in boldface, (*year*) should be followed by a comma, and each item should end with a period. When two or more references by different authors are cited in a single item, as in **rf:4**, each reference should end with a period, and the next reference should be preceded by a line return, facilitated by the command `\`. When two or more references by the same author are cited in a single item, as in **rf:5**, each should be separated by a semi-colon without a line return. When consecutive references appear in the same journal, the word “ibid” should replace the journal name in the second reference. For the proper format to be used in citing references from “e-print arXiv,” see **rf:6** as an example. In the case that a preprint reference of this type corresponds to a paper already published in a journal, whose reference appears before it, the two should be separated by a comma. In the case that such a preprint has not yet been published, if its reference appears after a reference for a paper published by the same author, the two references should be separated by a semi-colon. To make it easier to input bibitems following this PTP format, we prepared the macros `\JL`, `\andvol`, `\PRL`,  $\dots$ , which are used in **rf:3** – **rf:7**. When referring to an errata, please follow the example of **rf:7**.

Personal, custom-made macros cannot be used in the bibliography section. This is because in PTP Online (the online version of Progress of Theoretical Physics), we provide a hyperlink function that allows one to link from PTP papers to the online versions of the references listed in their bibliographies. Custom-made macros in the bibliography section may cause errors to arise in this process and make such linking impossible. If you wish to use macros in writing your bibliography, please use only the following macros, which are designed specifically for PTP:

- for general use

`\JL` : general journals                      `\andvol` : Vol. (Year), Page

- for individual journal

|   |  |
|---|--|
| <code>\AJ</code> : Astrophys. J.          | <code>\NC</code> : Nuovo Cim.                  |
| <code>\ANN</code> : Ann. of Phys.         | <code>\NPA, \NPB</code> : Nucl. Phys. [A, B]   |
| <code>\CMP</code> : Commun. Math. Phys.   | <code>\PLA, \PLB</code> : Phys. Lett. [A, B]   |
| <code>\IJMP</code> : Int. J. Mod. Phys.   | <code>\PRA – \PRE</code> : Phys. Rev. [A–E]    |
| <code>\JHEP</code> : J. High Energy Phys. | <code>\PRL</code> : Phys. Rev. Lett.           |
| <code>\JMP</code> : J. Math. Phys.        | <code>\PRP</code> : Phys. Rep.                 |
| <code>\JP</code> : J. of Phys.            | <code>\PTP</code> : Prog. Theor. Phys.         |
| <code>\JPSJ</code> : J. Phys. Soc. Jpn.   | <code>\PTPS</code> : Prog. Theor. Phys. Suppl. |

The above macros are defined such that the output of each line on the left below is that given to its right (with those macros not appearing below defined similarly):

|                                       |               |  |
|---------------------------------------|---------------|--|
| <code>\PRD{45,1990,34}</code>         | $\Rightarrow$ | <code>Phys.\ Rev.\ D \textbf{45}</code> (1990), 34 |
| <code>\JL{Nature,418,2002,123}</code> | $\Rightarrow$ | <code>Nature \textbf{418}</code> (2002), 123       |
| <code>\andvol{123,1995,1020}</code>   | $\Rightarrow$ | <code>\textbf{123}</code> (1995), 1020             |

Note that here again, no space should appear after commas separating volume, year and page numbers in the argument.

## §5. Figures

### 5.1. PostScript (*ps/eps*) figure files

Figure files in the form of epsf (encapsulated PostScript files) are best suited for *PT<sup>T</sup>EX* manuscripts. To insert an epsf figure into the text, the file `graphicx.sty`<sup>\*)</sup> must be input. This can be accomplished by including the following line in the preamble of the manuscript source file:

```
\usepackage{graphicx}
```

Then, at the point in the manuscript where you wish for the figure to begin, command lines like the following should be input:

```
\begin{figure}
  \centerline{\includegraphics[width=WIDTH cm,height=HEIGHT cm]
               {FILENAME.eps}}
  \caption{Explanation of the figure.}
  \label{fig:1}
\end{figure}
```

Here, `width=WIDTH cm` specifies the horizontal size and `height=HEIGHT cm` the vertical size. If one of these is omitted, the size is automatically set by making the ratio of the height and width of the figure the same as that of the original epsf figure. If both of them are omitted, the size defined in the epsf file is used. However, it is best not to omit both, because in this case an unexpected result can occur for some epsf files.

If you wish to incorporate figures for which there only exist hard copies, the

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<sup>\*)</sup> `graphicx.sty` is included in standard *L<sup>A</sup>T<sub>E</sub>X* distributions



original figures should be mailed to the PTP editorial office separately. (They can be sent with other such correspondence, for example orders for reprints.) In this case, space for the figures in the L<sup>A</sup>T<sub>E</sub>X source file should be created using the `\figurebox` command. The following demonstrates how this is done:

```
\begin{figure}
\figurebox{WIDTH}{HEIGHT}
\caption{This is the caption.}
\label{fig:1}
\end{figure}
```

To delete the frame demarking this `figurebox`, the command `\nofigureboxrule` should be added to the preamble. In `template.tex`, this command can be enabled by deleting the % appearing before it.

## 5.2. *Wrapfigure environment*

Narrow figures should be displayed with half text width. (The size used here is 6.6cm, which is actually 4mm smaller than the true half text size, as it is necessary to include a space.) The `wrapfigure` environment can be used for this purpose. We give an example of the `wrapfigure` in Fig. 1. It should be noted that the `wrapfigure` environment is not a floating environment; that is, the position of the figure in the manuscript corresponds to the place in the source file at which the `\begin{wrapfigure}` command appears, whether there is sufficient space for the figure or not. Please take care, therefore, when this environment is used near the beginning or end of a section, subsection or page. Also, it is best to incorporate figures using `wrapfigure` only when creating the final form of the source file, after no further changes in the text are to be made.



Fig. 1. A figure created using the `wrapfigure` environment.

The use of the `wrapfigure` environment is demonstrated by the following commands, which create Fig. 1 and appear at the beginning of the previous paragraph in the source file of this manuscript:

```
\begin{wrapfigure}{r}{6.6cm} % r: RIGHT, 6.6cm: WIDTH
\figurebox{60mm}{3cm}
\caption{A figure created using the {\ttfamily wrapfigure}
environment.}
\label{fig:2}
\end{wrapfigure}
```

Narrow figures should be displayed with half text width....

Also, note that `\centerline{\includegraphics{FILENAME.eps}}` can be used here in place of `\figurebox`.

To use the `wrapfigure` environment, `wrapft.sty` must be input. This can be

done by including the following command in the preamble:

```
\usepackage{wrapft}
```

The basic format of the `wrapfigure` environment is

```
\begin{wrapfigure}[number]{position}{width}
  <figure> etc.
  \caption{ <caption> }
\end{wrapfigure}
```

Here the optional argument `[number]` specifies the number of text lines corresponding to the height of the figure. Since this is almost always calculated automatically with no problem, it is usually best to omit it. It should be explicitly included only when there is a special need to enforce a certain value for this number. (For instance, when a figure is placed at the bottom of a page, the text lines at the beginning of the next page can sometimes become narrow. This can be avoided by explicitly specifying the `[number]`.) The argument `{width}` specifies the width of the space allocated for the figure (and the figure caption). PTP allows only half the text width for this size (7cm), for aesthetic reasons. For this reason, the argument input here must be `{6.6cm}` or `{\halfwidth}`, which allots the proper space between the figure and the text. (The quantity `\halfwidth` is defined to be 0.471 times `\textwidth`. This is 6.6cm for PTP text style.) The argument `{position}` is `{r}`, which positions the figure on the right, or `{l}`, which positions the figure on the left. (In PTP, half-size figures are placed on the right for odd pages and on the left for even pages.)

If you are inserting a full-size figure and wish to specify its position exactly, instead of using the floating positioning of the usual `figure` environment, you can employ the `wrapfigure` environment and set the position as `{c}` (center). In this case, the command line beginning the figure would be `\begin{wrapfigure}{c}{width}`. With this command line, the figure is treated just as if the `figure` environment were used, except that it is positioned at the point in the manuscript corresponding to the position of this command line in the source file. The item `{width}` specifies the caption width in this case. In the place where “<figure> etc.” appears here, an epsf figure can be input (as in the example used to create Fig. 1) or a picture environment can be used, among other options.

To position a figure at the beginning of a paragraph, as in the case of Fig. 1, place the commands for the `wrapfigure` environment before the beginning of the paragraph. If you wish to position a figure within a paragraph, this can be done manually. First, comment out the entire `wrapfigure` environment and compile the source file. Then, preview the manuscript and note the word that appears at the end of the line below which you wish to place the figure. Insert the entire `wrapfigure` environment directly after this word.

If you would like to avoid all such complications, please simply include all the figures with the ordinary `figure` environment. The Editorial Office will make the appropriate changes.

### 5.3. Putting figures side by side

Using either the `figure` or `wrapfigure` environment, it is easy to position two or more figures in immediate succession vertically. To do this, simply repeat the `<figure>` part of the environment, making reference to the each of the figure files to be displayed. To include a separate caption for each such figure, the `\caption` part must also be repeated accordingly.

It is not so simple to place two figures side by side. In fact there are several ways to do this. Below we demonstrate one, in which the `\parbox` command is used:

```
\begin{figure}[htb]
  \parbox{\halftext}{%   %\def\halftext{.471\textwidth}
    \figurebox{6cm}{2cm}
    \caption{The first figure on the left.}}
  \hfill
  \parbox{\halftext}{
    \figurebox{6cm}{2cm}
    \caption{The second figure on the right.}}
\end{figure}
```

This gives the following output:



Fig. 2. The first figure on the left.



Fig. 3. The second figure on the right.

## §6. Tables

To make tables in P<sup>T</sup>P<sub>T</sub>E<sub>X</sub>, the standard L<sup>A</sup>T<sub>E</sub>X `table` environment can be used. Here we give an example of a small table using the `\wraptable` environment in Table I. This environment is also supported by the `wrapft.sty` file, discussed above, and the format for this environment is quite similar to that for the `wrapfigure` environment. For tables in PTP the conventions are, as in this example, to put the caption above the table and to use a double line only at the top with the repeated commands `\hline \hline`. Please follow these conventions. Table I was created with the following:

```
\begin{wraptable}{r}{\halftext}
  \caption{An example of small table created with
    {\ttfamily \BS begin\{wraptable\}\{r\}\{\BS halftext\}}.}
  \label{table:1}
```

Table I. An example of a small table created with `\begin{wraptable}{r}{\halftext}`.

| temperature | energy | specific heat |
|-------------|--------|---------------|
| 0.1         | 0.24   | 2.46          |
| 0.2         | 0.80   | 4.62          |
| 0.3         | 1.11   | 3.27          |

```

\begin{center}
\begin{tabular}{ccc} \hline \hline
temperature & energy & specific heat \\ \hline
0.1 & 0.24 & 2.46 \\
0.2 & 0.80 & 4.62 \\
0.3 & 1.11 & 3.27 \\ \hline
\end{tabular}
\end{center}
\end{wraptable}
To make tables in \PTPTeX, the standard \LaTeX\ .....

```

The original `tabular` environment is rewritten in  $\mathcal{PTP}\mathrm{TeX}$  so as to make the font used in the table footnote size. If, however, you wish to use the usual text font in a table, please add the line

```
\let\tabularsize\normalsize
```

after the `\begin{wraptable}` command to obtain normal size output. However, care must be taken to make sure that the size change only acts *locally*.

## §7. Comments

If you discover any bugs in `ptptex.cls` when using  $\mathcal{PTP}\mathrm{TeX}$ , we would appreciate it if you would inform us. Please send any such correspondence to the following E-mail address:

`ptp@yukawa.kyoto-u.ac.jp`

It would help us if you could make the title of the E-mail something like `ptptex.cls` bug.

## Acknowledgements

Acknowledgements in  $\mathcal{PTP}\mathrm{TeX}$  can be written using the  $\mathrm{\LaTeX}$  standard command `\section*{Acknowledgements}`.

Class files and manuals for JJAP and JPSJ were of great help to us in creating the  $\mathcal{PTP}\mathrm{TeX}$  class file and writing this manual. We acknowledge the staff of JJAP and JPSJ for this help. At the end of our class file `ptptex.cls`, we have included the free-ware package files `subeqn.sty` (created by Stephen Gildea) and `overcite.sty` (created by Donald Arseneau). Also, the file `wrapft.sty` is a modified version of the `wrapfig.sty` created by Donald Arseneau. We express our sincere thanks to these authors.

## Appendix A

### —— How to Make an Appendix ——

Appendices can be made using the standard L<sup>A</sup>T<sub>E</sub>X commands as follows:

```
\appendix
\section{How to Make an Appendix}
...
\section{Second Appendix}
...
```

If you make two or more appendices, the appendix numbers automatically become **A**, **B**, etc. In an appendix, equations become numbered as

$$S_q^z = \frac{1}{L} \sum_{j=1}^L S_j^z e^{iqj}. \quad (\text{A}\cdot 1)$$

## Appendix B

### —— Notes on Preparing Figures ——

When you make graphics files for figures to be used in  $\mathcal{PTP}$ T<sub>E</sub>X, please do so according to the following directions.

- Graphics files should be prepared in EPS (encapsulated PostScript) format. Files should be made using graphics software supporting the EPS format. The types of software we recommend include Adobe Illustrator, xfig, tgif, Mathematica and Maple. We do not accept files made with a “printer driver.”
- Fonts used in figures should be common PostScript fonts. Times-Roman, Helvetica, Courier and Symbol fonts can be used.
- Lines (solid, dotted, etc.) in figures must be thick and clear. Because the printer we use for publishing has very fine resolution, lines in original figures that are very pale or fine are reproduced faithfully (i.e. very pale or fine), and for this reason, they may be undetectable. Specifically, be sure that line widths are 1pt or thicker.
- If a manuscript is to be published in monochrome (i.e. black and white only), the graphics files must also be prepared as monochrome files. The reason for this is that when a colored graphics file is printed in monochrome, sometimes parts that are colored differently cannot be distinguished and sometimes colored lines become too faint. (Note that papers can be published in color, but in this case there is an additional fee.)
- When preparing graphics files by scanning original figures, the scan setting should be “monochrome (2bit),” with a resolution of 1200dpi if the original size is being used. If a scanned figure is being enlarged or reduced, the resolution used should be [magnification ratio]  $\times$  1200dpi. If a figure is to be printed as half the size (in a single dimension) of the original, the scanning resolution  $1/2 \times 1200 = 600$ dpi can be used.

## Appendix

If you wish to make an appendix without a title, like this appendix, simply begin it with the command `\section{}`, leaving the argument empty or blank. Even in this case, the appendix section counter is active, and equation numbers will reflect this, as seen in the following:

$$A = B. \tag{C.1}$$

Making an appendix without a title is not recommended, except when there is only a single appendix.

## References

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