

# Document class pja00.cls: User guide

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## Overview

This document outlines the usage of the LaTeX document class pja00.cls, which can be used to prepare manuscripts for the Proceedings of the Japan Academy, Series A. The primary purpose of this document is to illustrate the difference between pja00.cls and standard class files such as article.cls. For information on the general usage of LaTeX, please consult instructive books or manuals.

In this document, readers will find some text in italics surrounded by angular brackets, for example, “ *<options>* ”. Such descriptions represent the input provided by a user, and they can be omitted in some cases.

**Note:** Even if pja00.cls is used to prepare the manuscript, the appearance of the resulting document is only a sample and is not necessarily identical to the printed/published manuscript. This is because of instructions by editors or corrections according to general rules in typesetting. In order to keep within the page limit (6 pages), redefining the `\baselinestretch` command and the excessive use of the `\vspace` command are strongly discouraged.

## 1. Document structure

In the case of pja00.cls, each document has the following structure. The meaning and usage of commands provided by pja00.cls will be described later.

```
\documentclass{pja00}
  <preamble>
\runninghead{ <running head> }
\title{ <title> }
\Author{ <id1> }{ <first name1> }{ <surname1> }
\Author{ <id2> }{ <first name2> }{ <surname2> }
...
\Author{ <idn> }{ <first namen> }{ <surnamen> }
\affiliation{1}{ <affiliation1> }
\affiliation{2}{ <affiliation2> }
...
\affiliation{N}{ <affiliationN> }
\KeyWords{{ <keyword1> }{ <keyword2> }...
  { <keywordm> } }
```

```
\Subject [ <def-year> ]{ <subject_codes> }
\begin{document}
\maketitle
\begin{abstract}
  <abstract>
\end{abstract}

  <contents>
...
\begin{thebibliography}{ <longest-label> }
\bibitem{ <key1> } <bib_entry1>
\bibitem{ <key2> } <bib_entry2>
...
\end{thebibliography}
\end{document}
```

The definitions of *<preamble>* and other such text in the above description are as follows.

- *<preamble>* : preamble (for example, descriptions for calling some packages)
- *<running head>* : running head (title in a pagehead)  
In general, the document title itself is used as the running head. If the title is too long for a pagehead, a shortened form of the title can be used for the running head.
- *<title>* : title of the article
- *<id<sub>k</sub>>* : ( $1 \leq j \leq n$ ): identification number of the *k*th author (see below)
- *<first name<sub>k</sub>>* ( $1 \leq k \leq n$ ): *k*th author's first name  
If middle names exist, they can be included in *<first name<sub>k</sub>>* .
- *<surname<sub>k</sub>>* ( $1 \leq k \leq n$ ): *k*th author's surname
- *<affiliation<sub>k</sub>>* ( $1 \leq k \leq N$ ): the affiliation described as the *k*th footnote among all the affiliations of each author (excluding the case where there is only one affiliation, in which case, the affiliation will not be a footnote)
- *<keyword<sub>k</sub>>* ( $1 \leq k \leq m$ ): a keyword

If there are two keywords or more, each keyword is surrounded by a pair of curly braces, as follows.

`\Keywords{{keyword}}{keyword}}`

Note that in the case of only one keyword, it is surrounded by (seemingly redundant) curly braces, as follows.

`\Keywords{{keyword}}`

- `<def-year>` : If the manuscript does not use 2010 Mathematics Subject Classification (MSC) (for example, 2000 MSC), the version (year of definition) is given as `<def-year>` (for example, `\Subject[2000]{. . .}`). If “[ `<def-year>` ]” is omitted, the default version is 2010 MSC.
- `<subject_codes>` : comma-separated list of MSC classification codes; primary and secondary codes are separated by a semicolon, and primary codes are followed by secondary ones.

Examples:

– `\Subject{12F12,11R32,12F10}`: There are three primary codes: 12F12, 11R32, and 12F10 (appearing in footnote as “2010 Mathematics Subject Classification. Primary 12F12, 11R32, 12F10.”).

– `\Subject{12F12,11R32;12F10,12F15}`: There are two primary codes: 12F12 and 11R32, and two secondary codes: 12F10 and 12F15 (appearing in footnote as “2010 Mathematics Subject Classification. Primary 12F12, 11R32; Secondary 12F10, 12F15.”).

For showing only classification codes without declaring the rank of codes (that is, omitting “primary” or “secondary”), please insert an asterisk immediately after the `\Subject` command: `\Subject*{. . .}`.

- `<abstract>` : abstract of the article
- `<contents>` : main body of the article

Note that `\chapter` is not provided, and it cannot be used in the manuscript.

- `<longest-label>` , `<keyk>` , and `<bib_entryk>` : the longest label (number) of bibliography entries, reference key for a bibliography entry, and bibliography entry, respectively (they have the same meaning as in the case of standard classes)

If necessary, the subtitle can be added in the preamble by using the `\subtitle` command, as follows.

`\subtitle{ <subtitle> }`

In the above command, `<subtitle>` is the text for the subtitle.

**Note:** Although each article in the Proceedings of the Japan Academy is classified as “(Communicated . . .)” or “(Contributed . . .)”, authors need not provide this description.

## 2. How to describe authors and their affiliations

In the example provided in the previous section, since the use of `\Author` and `\affiliation` might have appeared to be complicated, it is summarized as follows:

- All `\Author` commands are arranged in the same order as the order of authors.
- Affiliations are numbered according to the order of their occurrence, and the number is used as the first argument of each `\affiliation` command.
- If an author is affiliated to the  $k$ th affiliation (the affiliation described by the `\affiliation` command with number  $k$  as its first argument), the `\Author` command corresponding to that author has number  $k$  in its first argument.

As the first example, we illustrate the simplest case, that is, a one-to-one correspondence between authors and their affiliations. For example, assume that there are two authors “Foo Bar” and “Foo’ Bar’”, and Foo Bar is affiliated to “Somewhere” and Foo’ Bar’ to “Somewhere’”. In this case, authors and affiliations are described as follows.

```
\Author{1}{Foo}{Bar}
\Author{2}{Foo’}{Bar’}
\affiliation{1}{Somewhere}
\affiliation{2}{Somewhere’}
```

If both Foo Bar and Foo’ Bar’ are affiliated to the same organization Somewhere, then one may use only one `\affiliation` command corresponding to Somewhere, that is, only the command

```
\affiliation{1}{Somewhere}
```

is sufficient to describe the affiliation. In this case, the two authors are affiliated to Somewhere with number 1, and the `\Author` commands for the two authors have the same first argument “1”, as follows.

```
\Author{1}{Foo}{Bar}
\Author{1}{Foo’}{Bar’}
```

In addition, if there are authors with multiple affiliations, then the first argument of the `\Author` command corresponding to each of those authors will be a comma-separated list of the number of affiliations. As an example, consider the following description.

```
\Author{1,2}{Foo}{Bar}
\affiliation{1}{Somewhere}
\affiliation{2}{Somewhere’}
```

In this case, Foo Bar is regarded to be affiliated to both Somewhere and Somewhere’.

In the list of authors in a pagehead, each author’s first name appears in the abbreviated form. If the abbreviated forms generated automatically are not appropriate, then the user may provide the correct abbreviations through an optional argument after the second argument of the `\Author` command, as follows.

```
\Author{ <id> }{ <first name> }
      [ <shorten first name> ]{ <surname> }
```

### 3. Use of packages

The class file `pja00.cls` calls the packages `amsmath` and `amsthm` automatically, and the user need not call them. If the manuscript should be processed without using one or both of these packages for some reason, then the class options (options for the `\documentclass` command) listed below can be used.

- `noamsmath`: `amsmath` is not required
- `noamsthm`: `amsthm` is not required

In general, one may use other packages if necessary, but `pja00.cls` ignores some packages that can change the appearance of a document (for example, the package `ftnright`) or packages that override the commands provided by `pja00.cls` (for example, the package `theorem`).

### 4. Definitions of commands and environments by a user

If the user needs to define his/her own commands or environments, only the following commands should be used.

- `\newcommand` to define new commands
- `\DeclareMathOperator` to define new commands for math operator names
- `\newenvironment` to define new environments
- `\newtheorem` to define new theorem-type environments

In particular, directly redefining existing commands by using `\renewcommand` (or commands such as `\def`, `\edef`, `\gdef`, and `\xdef`) is highly discouraged.

For theorem-type environments, some functions of the package `amsthm` are available and the following operations are always supported.

- The style of each environment can be specified through the `\theoremstyle` command.
- The environment can be defined without numbering through the `\newtheorem*` command.

Note that in the case of `pja00.cls`, the “remark” style (for `\theoremstyle`) is the same as the “definition” style.

For example, one may define some environments as exemplified below.

```
\theoremstyle{plain}
\newtheorem*{MThm}{Main Theorem}
\newtheorem{Thm}{Theorem}[section]
\newtheorem{Lem}{Thm}{Lemma}
\theoremstyle{definition}
\newtheorem{Dfn}{Definition}
```

For the usage of the `\theoremstyle` command or details of each style, please consult documentation on the package `amsthm`.

### 5. Figures and tables

Captions for figures or tables can be provided through the `\caption` command, but the meaning of an optional argument of this command should be noted. In the case of `pja00.cls`, an optional argument of the `\caption` command is the number of a figure or table, and it does not refer to a caption used in a list of figures or tables. For example, a caption with the number “1” may be specified as follows<sup>1</sup>.

```
\caption[1$’$]{... }
```

To generate a thick horizontal rule with a thickness of 0.8pt, shown as the topmost rule in the table below, one can add an optional argument to the `\hline` command as “`\hline[0.8pt]`”, and this optional argument indicates the thickness of a horizontal rule. Owing to this change, it might be necessary to add additional curly braces “`{}`” immediately after the `\hline` command if an open bracket “[” follows this command.

AAA	BBB	CCC
x	y	z

### 6. Miscellaneous remarks

In general, manuscripts for the Proceedings of the Japan Academy, Series A, should be prepared in English

to specify the number of a figure or table through an optional argument of the `\caption` command.

<sup>1</sup> This function is introduced for the purpose of conversion of manuscripts by a non-LaTeX user. Therefore, it is strongly discouraged

or French (English is recommended). If the language is French, please add the description

```
\DocumentLanguage{French}
```

in the preamble of the manuscript. This specification through the `\DocumentLanguage` command changes some words in text such as the title (for example, the word “By” before the list of authors is replaced with “Par”), but this command is not associated with packages for processing French documents, such as `babel`. Such packages may be called by a user, if necessary.