

L^AT_EX Class for *The Israel Journal of Mathematics**

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Abstract

This package provides a class for typesetting articles for *The Israel Journal of Mathematics*

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1 Introduction

The Israel Journal of Mathematics is published by *The Hebrew University Magnes Press*. This class provides L^AT_EX support for its authors and editors. It strives to achieve the distinct “look and feel” of the journal, while having the interface similar to the one of the `amsart` document class [1]. This will help the authors already familiar with `amsart` to easily submit manuscripts for *The Israel Journal of Mathematics* or to put the preprints in <http://www.arxiv.org> with minimal changes in the L^AT_EX source.

This goal determined the implementation approach. We load the `amsart` class and redefine some of its internals on the fly. There are some additional commands added to support the features specific to the journal, but we aimed to keep their number minimal.

An author well acquainted with AMSL^AT_EX should find this package easy to use and configurable. The User Manual below illustrates the basic use of the class and discusses the differences with `amsart`. For an in-depth tutorial of AMSL^AT_EX I could recommend the excellent book [2].

2 User’s Guide

2.1 Installation

The installation of the class follows the usual practice [3] for L^AT_EX packages:

1. Run `latex` on `ijmart.ins`. This will produce the file `ijmart.cls`.
2. Put the files `ijmart.cls` and `ijmart.bst` to the places where L^AT_EX and BibT_EX can find them (see [3] or the documentation for your T_EX system).
3. Update the database of file names. Again, see [3] or the documentation for your T_EX system for the system-specific details.
4. The file `ijmart.pdf` provides the documentation for the package (this is the file you are probably reading now).

As an alternative to items 2 and 3 you can just put the files in the working directory where your `.tex` file is.

The class uses some other L^AT_EX classes or packages. Most probably, they are already installed on your system. If not (or if their versions are very old), you need to download and install them. Here is the list:

1. `amsart` class and related packages [1],
2. `ifpdf` package [4],
3. `fancyhdr` package [5],
4. `lastpage` package [6].

2.2 Invocation

To use the class, put in the preamble of your document

```
\documentclass[options]{ijmart}
```

The class internally loads `amsart`, so all facilities of `amsart` [2, 7] can be used in the source.

option Most of the options are just passed to `amsart` (see [2, 7] for their description).
french The class `ijmart` adds one new option `french`. If it is chosen, some words in the top matter will be typeset in French. Note that this option does *not* change the names of the table of contents and references. An author should also include a call, for example, to the Babel package [8], which takes care of these and other details of international typesetting.

If the author indeed chooses `babel`, then the option `french` is passed to the package. Therefore the following works:

```
\documentclass[french]{ijmart}  
\usepackage{babel} % the french option is passed to the package
```

Please note that `babel` scans the global options first, but the main language of the document must be the last one. Therefore if the paper is written in French, but uses English quotations, the proper way to call `babel` is the following:

```
\documentclass[french]{ijmart}  
\usepackage[english,french]{babel}
```

By default `babel` redefines French captions for figures and tables to use `FIG.` and `TAB.` correspondingly. If this is not acceptable, the authors should add to the preamble *after* the call to `babel` the following:

```
\addto\captionsfrench{%  
  \renewcommand{\figurename}{Figure}%  
  \renewcommand{\tablename}{Table}}%
```

options The options `draft` and `final` work in the same way as for `amsart` and standard
draft \LaTeX . If the option `draft` is chosen, the overfull lines are marked by black
final boxes on the margins *and* the `\includegraphics` prints blank placeholders for the images. The option `final` (default) switches off the marking of overfull lines and restores the behavior of `\includegraphics`. To switch on just the overfull marks, without changing the behavior of `\includegraphics`, one can either explicitly pass the option `final` to `graphics` package:

```
\documentclass[draft]{ijmart}  
\usepackage[final]{graphics}
```

or add in the beginning of the document

```
\overfullrule=5pt
```

options The size-changing options of `amsart` class (`8pt`, `9pt`, ..., `12pt`) have no effect other than producing a warning in the log since the journal is designed for only one type size (roughly corresponding to `10pt` of `amsart`).

`8pt` The journal uses a special paper size. If you process the manuscript with `pdflatex` to produce PDF output, the paper dimensions will be automatically set up by the class. However, if you use `latex` and `dvips`, you need to tell `dvips` what paper size to choose. One way to do this is to add to the `dvips` options the following:

`9pt`

`10pt`

`11pt`

`12pt`

```
-T 5.964in,8.844in -0 -0in,0.1in
```

2.3 Top Matter

Top matter contains the information about the paper: authors, title, affiliations, etc. The interface for `ijmart` top matter is very close to the one used by `amsart`. We added a couple of commands to deal with the information specific to the *The Israel Journal of Mathematics* and changed the behavior of several other commands to suit the style of the journal. These changes are documented below.

There are two kinds of top matter commands: the ones used primarily for authors and the ones used primarily for editors. We describe them separately.

2.3.1 Commands for Authors

`\title` The command `\title`, as in `amsart` class, has two arguments: one optional, and one mandatory:

```
\title[ShortTitle]{FullTitle}
```

The mandatory argument is the full title of the article. The optional argument, if present, defines the shorter version of the title for running heads. If the optional argument is absent, the full title is used instead. Note that the titles are typeset in upper case, but you do not need to input them in capital letters: the class does the conversion automatically.

The optional argument should be used in two cases: when the full title is too long to fit in the running head, *and* when the author wants to add a footnote or linebreaks to the title. Unlike `amsart`, `ijmart` allows the command `\thanks` inside `\title` and `\author` commands. However, the footnote belongs to the title typeset in the top matter, not to the running head version. The optional argument in this case helps, as in the following example:

```
\title[Some properties of  $\sigma$ -algebras]{%  
  Some properties of  $\sigma$ -algebras\thanks{%  
    The work was supported by grant from NSF No.~123456789-MMMM}}}
```

The line breaks in the title, if necessary, are introduced by the command `\linebreak` in the second (mandatory) argument of `\title`:

```
\title[Title with line breaks]{Title \linebreak with line breaks}
```

`\author` The interface for specifying the authors and their affiliations is close to the one of `amsart` [9] (and different from the standard L^AT_EX). For each author a separate command `\author` should be used, followed by `\address` and (optionally) `\curraddr`, `\email` and `\urladdr`. The lines in the address should be divided by `\\`. Like the newer versions of `amsart`, `ijmart` does *not* require the doubling of the `@` symbols in the e-mail addresses. The macro `\author` has two arguments, similarly to `\title`:

```
\author[⟨AbbrevName⟩]{⟨FullName⟩}
```

The optional argument defines the shorter form of the author's name to be included in the running head. Similarly to `\title`, the command `\author` allows the use of `\thanks`. Again, to show that the footnote does not belong to the running head, the optional argument is used.

`\shortauthors` In some cases the authors list may be too long for the running head, even if the abbreviated forms are used for each author. In this case it is possible to change the running head by a *redefinition* of the command `\shortauthors`. This redefinition must be done after all `\author` commands, but before `\maketitle`:

```
\renewcommand{\shortauthors}{A.~Smith et al}
```

`\thanks` As discussed above, the behavior of the `\thanks` command in `ijmart` is different from the one in `amsart`. This command is allowed within the scope of the top matter commands. If it is used in the scope of the main argument of the commands `\author` and `\title`, the optional argument should be used to correctly typeset the running heads.

Sometimes it is necessary to have a `\thanks` footnote referring to more than one author. In this case the usual L^AT_EX command `\footnotemark[⟨number⟩]` can help:

```
\author{A.~Uthor\thanks{The first and the third author were
supported by NSA grant~123456789}}
\author{W.~Riter\thanks{The second author was supported by NSF
grant~987654321}}
\author{C.~Orrespondent\footnotemark[1]}
\address{Noname University\\ Nowhere, RI\\ USA}
\email{author@nowhere.edu, writer@nowhere.edu and
correspondent@nowhere.edu}
```

The command `\title` might have no more than one `\thanks` command in its scope.

`abstract` The abstract of the paper must be put between `\begin{abstract}` and

`\end{abstract}`. Note that to change the abstract name to *Résumé*, the authors should use *Babel*. Similarly to *amsart* class, `abstract` must precede `\maketitle`.

`\maketitle` The macro `\maketitle` typesets the top matter. All top matter information should be specified before this command.

`\tableofcontents` The authors are encouraged to include `\tableofcontents` for long papers. By default only the sections are included in the table. If the authors wish to have a more detailed table of contents, they could change the counter `tocdepth`, for example:

```
\setcounter{tocdepth}{1} % The default: only sections are included
\setcounter{tocdepth}{2} % Sections and subsections
\setcounter{tocdepth}{3} % Sections, subsections and subsubsections
...
```

If `tocdepth` is greater than the default value of 1, the formatting of the table of contents changes: the section entries then are typeset bold.

2.3.2 Commands for Editors

The commands described in this section should be used by the editors to insert the information about the published paper. They must be put before the `\maketitle` command.

`\issueinfo` The command `\issueinfo` has the same format as in the *amsart* document class:

```
\issueinfo{<volume>}{<number>}{<month>}{<year>}
```

Note that at present the class uses only the first and the last arguments of this command (volume and year) for the actual typesetting. However, we keep the original format of this command, first, for compatibility reasons, and second, to facilitate a possible automatic processing of journal issues in the future.

Example of this command:

```
\issueinfo{159}{1}{January}{2007}
```

`\pagespan` The command `\pagespan` has two arguments, setting the first and the last page numbers of the article. If the last argument is empty, the last page number is calculated automatically. If the first argument is negative, the page numbering is done in Roman numerals, for example, for editorial materials. Here are examples of this command:

```
\pagespan{5}{15} % Explicit page span
\pagespan{5}{} % The last page is calculated automatically
\pagespan{-5}{} % Page numbers are Roman numerals v, vi, ...
\pagespan{-5}{xx} % Page numbers are Roman numerals v, vi, ..., xx
```

`\date` The command `\date` is used to put the editorial information about the manuscript, usually the date when the manuscript was received. For example:

```
\date{Received March 12, 2006 and in revised form December 6, 2006.}
```

`\doiinfo` The command `\doiinfo` is used to specify the DOI number of the article, for example

```
\doiinfo{10.1007/s11856-007-0037-3}
```

2.4 Theorems, Lemmas, etc.

The class `amsart` defines three theorem styles: `plain`, `remark` and `definition`. They are redefined by `ijmart` to conform to the style of *The Israel Journal of Mathematics*. Otherwise the usage of the theorem-like environments is the same as for `amsart`. Note that *The Israel Journal of Mathematics* usually recommends `definition` style for remarks, while `remark` style is used for steps, facts, cases, etc.

`\qedhere` The environment `proof` has the same syntax and meaning as for `amsart` package. According to the journal style, the QED symbol in proofs is not flushed left, like in `amsart`, but is typeset at the last line of the proof at some distance from the text. If a proof ends by a nested environment, this might lead to an ugly position of the QED symbol. The command `\qedhere` inside a proof can be used to improve the situation¹. It causes the immediate typesetting of the QED symbol and deletes the QED symbol at the end of the current proof. For example

```
\begin{proof}
  This proof ends by an enumerated list:
  \begin{enumerate}
    \item Item
    \item Item \qedhere
  \end{enumerate}
\end{proof}
```

Compare this to the similar code without `\qedhere`.

The command `\qedhere` should be used if a proof ends by a math display:

```
\begin{proof}
  This proof ends by a displayed math:
  \begin{gather}
    a = b \\
    c = d \qedhere
  \end{gather}
\end{proof}
```

`\mqedhere` The exception is the `multline` environment, where the special version `\mqedhere` should be used:

```
\begin{proof}
  This proof ends with a multline:
  \begin{multline}
    a = b + c + d + e + f + g + h + i + \\
      j + k + l + m + n + o + p + q + \\
      r + s + t + u + v + w + x + y + z\mqedhere
  \end{multline}
\end{proof}
```

`namedprop` Sometimes authors use non-standard names for their theorem-like propositions.
`namedprop*` The documentation [10] recommends the use of `\newtheorem*`:

```
\newtheorem*{KL}{Klein's Lemma}
```

However, if the number of such special environments is large enough, this might be too cumbersome. The package `progrnameijmart` provides two environments, `namedprop` and `namedprop*` to define such these propositions on the fly.

The environment `namedprop` is used for numbered named propositions (admittedly such propositions are less frequent than unnumbered ones). It has the following syntax:

```
\begin{namedprop}{style}{numbered-as}{name}[note]
...
\end{namedprop}
```

where `style` is the style of the proposition (`plain`, `remark`, etc.), `numbered-as` is the name of (already defined) theorem-like environment, that shares the numbering with this proposition, `name` is the name to use instead of “Theorem”, “Lemma”, and `note` is the note after the heading. For example,

```
\begin{namedprop}{plain}{thm}{Klein's Lemma}[as restated in~\cite{a-1}]
...
\end{namedprop}
```

The nevironment `\namedprop*` is used for *unnumbered* named propositions:

```
\begin{namedprop*}{style}{name}[note]
...
\end{namedprop*}
```

For example,

```
\begin{namedprop*}{plain}{Klein's Lemma}[as restated in~\cite{a-1}]
...
\end{namedprop*}
```

¹It is actually defined in `amsart` too, but is not documented in the user's documentation there.

2.5 Bibliography

The sample paper in the distribution shows the journal style for the list of references. For those authors who wish to use Bib \TeX , the style `ijmart.bst` is included in the distribution. It should be noted that the journal style requires full journal titles in references. Following MathSciNet (<http://www.ams.org/mathscinet/> conventions, the style correctly processes article entries with both `journal` and `fjournal` fields, for example

```
@article {MR2663320,
  AUTHOR = {Farkas, J. Z. and Green, D. M. and Hinow, P.},
  TITLE = {Semigroup analysis of structured parasite populations},
  JOURNAL = {Math. Model. Nat. Phenom.},
  FJOURNAL = {Mathematical Modelling of Natural Phenomena},
  VOLUME = {5},
  YEAR = {2010},
  NUMBER = {3},
  PAGES = {94--114},
  ISSN = {0973-5348},
  MRCLASS = {92D25 (35B35 35Q92 47D06 47N60)},
  MRNUMBER = {2663320},
  DOI = {10.1051/mmnp/20105307},
  URL = {http://dx.doi.org/10.1051/mmnp/20105307},
}
```

If an entry has only the `journal` field, it is used for the journal title. However, if the entry has also the `fjournal` field, the style assumes that this field contains the full (unabbreviated) title, and uses it for formatting bibliography.

2.6 Illustrations

The authors can use the `graphics`, `graphicx`, `PSTricks`, `pgf/tikz`, `Metapost` or other tools to include illustrations (see [11] for a comprehensive discussion of \LaTeX graphics possibilities).

Note that the journal uses `dvips` for internal processing. If the authors submit their illustrations in the PNG, JPEG or PDF formats, they are converted to the EPS format by the technical editors. Sometimes this conversion may lead to the loss of quality and resolution. Therefore the authors are advised to submit the illustrations in the EPS format.

3 Implementation

3.1 Identification

We start with the declaration who we are. Most `.dtx` files put driver code in a separate driver file `.drv`. We roll this code into the main file, and use the pseudo-guard `<gobble>` for it.

```
1 <class>\NeedsTeXFormat{LaTeX2e}
2 <*gobble>
3 \ProvidesFile{ijmart.dtx}
4 </gobble>
5 <class>\ProvidesClass{ijmart}
6 [2010/10/18 v1.6 Typesetting articles for The Israel Journal of Mathematics]
```

`\@classname` We also store the current class name in `\@classname`:

```
7 <class>\def\@classname{ijmart}%
```

And the driver code:

```
8 <*gobble>
9 \documentclass{ltxdoc}
10 \usepackage{array}
11 \usepackage{url,amsfonts}
12 \usepackage[breaklinks,colorlinks,linkcolor=black,citecolor=black,
13             pagecolor=black,urlcolor=black,hyperindex=false]{hyperref}
14 \PageIndex
15 \CodelineIndex
16 \RecordChanges
17 \EnableCrossrefs
18 \begin{document}
19   \DocInput{ijmart.dtx}
20 \end{document}
21 </gobble>
22 <*class>
```

3.2 Options

`\ifijm@french` First, the language option. We do not know whether the author chooses to use `babel`, so we define it in the way, which is compatible with `babel`, but works without it too.

```
23 \newif\ifijm@french
24 \ijm@frenchfalse
25 \DeclareOption{french}{\ijm@frenchtrue}
```

The size-changing options produce a warning:

```
26 \long\def\ijm@size@warning#1{%
27   \ClassWarning{\@classname}{Size-changing option #1 will not be
28     honored}}%
29 \DeclareOption{8pt}{\ijm@size@warning{\CurrentOption}}%
```

```

30 \DeclareOption{9pt}{\ijm@size@warning{\CurrentOption}}%
31 \DeclareOption{10pt}{\ijm@size@warning{\CurrentOption}}%
32 \DeclareOption{11pt}{\ijm@size@warning{\CurrentOption}}%
33 \DeclareOption{12pt}{\ijm@size@warning{\CurrentOption}}%
    All other options are passed to amsart:
34 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{amsart}}
    Now we read the configuration file
35 \InputIfFileExists{ijmart.cfg}{%
36   \ClassInfo{ijmart}{%
37     Loading configuration file ijmart.cfg}}{%
38   \ClassInfo{ijmart}{%
39     Configuration file ijmart.cfg is not found}}
And process the options:
40 \ProcessOptions\relax

```

3.3 Loading Class and Packages

We start with the base class

```

41 \PassOptionsToClass{10pt}{amsart}
42 \LoadClass{amsart}
    A bunch of packages:
43 \RequirePackage{ifpdf, fancyhdr, lastpage}

```

3.4 Fonts

The `amsart` class defines several options for different font sizes (10pt, 11pt, etc). We have just one design size for the articles corresponding to the 10pt option of `amsart`, but with larger `\baselineskip`.

`\@typesizes` The font information in `amsart` is stored in `\@typesizes` macro. It has 11 type-sizes: 5 below and 5 above `\normalsize`.

```

44 \def\@typesizes{%
45   \or{5}{7}\or{6}{8}\or{7}{9}\or{8}{11.2}\or{9}{12.6}%
46   \or{10}{14}% normalsize
47   \or{\@xipt}{15}\or{\@xiipt}{16.8}\or{\@xivpt}{19.8}%
48   \or{\@xviipt}{23.3}\or{\@xxpt}{28}}%
49 \normalsize \linespacing=\baselineskip

```

3.5 Page Dimensions and Paragraphing

`\paperheight` The journal has rather narrow pages:
`\paperwidth`

```

50 \setlength{\paperheight}{636.77bp}
51 \setlength{\paperwidth}{429.41bp}

```

```

\pdfpaperheight If we deal with pdftex, we can use this information more creatively. This was
\pdfpaperwidth inspired by memoir [12].
\pdfvorigin 52 \ifpdf\relax
\pdfhorigin 53 \pdfpageheight=\paperheight
54 \pdfpagewidth=\paperwidth
55 \pdfvorigin=0.9in
56 \pdfhorigin=1in
57 \fi

\headheight We leave generous header space:
58 \setlength{\headheight}{32pt}

\footskip The footer is slightly larger than in amsart
59 \setlength{\footskip}{42pt}%

\topmargin The top margin is 50 bp:
60 \setlength\topmargin{50bp}
61 \addtolength\topmargin{-0.9in}
62 \addtolength\topmargin{-\topskip}
63 \addtolength\topmargin{-\headsep}
64 \@settopoint\topmargin

\textheight This code is similar to the one in [13]. \textheight is the height of the text includ-
ing footnotes, but excluding running head and foot. We start with \paperheight
and subtract margins, running heads and foots:
65 \setlength\@tempdima{\paperheight}
66 \addtolength\@tempdima{-\topmargin}
67 \addtolength\@tempdima{-26bp} % Bottom margin
68 \addtolength\@tempdima{-\headheight}
69 \addtolength\@tempdima{-\headsep}
70 \addtolength\@tempdima{-\footskip}
71 \addtolength\@tempdima{-1in}
We want this length to contain an integer number of lines:
72 \divide\@tempdima\baselineskip
73 \@tempcnta=\@tempdima
74 \setlength\textheight{\@tempcnta\baselineskip}
Now we take care of the first line height:
75 \addtolength\textheight{\topskip}

\evensidemargin The margins on even and odd pages are 43 bp:
\oddsidemargin 76 \setlength\evensidemargin{43bp}
77 \addtolength{\evensidemargin}{-1in}
78 \setlength\oddsidemargin{43bp}
79 \addtolength{\oddsidemargin}{-1in}

\textwidth The way to set up the right margin is slightly different:
80 \setlength\textwidth{\paperwidth}

```

```

81 \addtolength{\textwidth}{-1in}
82 \addtolength\textwidth{-\evensidemargin}
83 \addtolength\textwidth{-43bp} % right margin
84 \@settopoint\textwidth

```

`\parindent` The paragraph indentation is 1em:
85 `\setlength\parindent{1em}`

3.6 Headers

`\headrulewidth` We do not want decorative rules in the journal:
`\footrulewidth` 86 `\renewcommand{\headrulewidth}{0pt}`
87 `\renewcommand{\footrulewidth}{0pt}`

It is easy to set up headers with `fancyhdr`:

```

88 \pagestyle{fancy}
89 \fancyhead[LO]{\footnotesize Vol.~\currentvolume, \currentyear}
90 \fancyhead[CO]{\footnotesize\shorttitle}
91 \fancyhead[RO]{\footnotesize\thepage}
92 \fancyhead[LE]{\footnotesize\thepage}
93 \fancyhead[CE]{\footnotesize\shortauthors}
94 \fancyhead[RE]{\footnotesize Isr. J. Math.}
95 \fancyfoot{}

```

The first page has the special headers. The style `firstpage` is invoked by `amsart`; here we just redefine it.

```

96 \fancypagestyle{firstpage}{%
97   \fancyhf{}%
98   \chead{\tiny%
99     ISRAEL JOURNAL OF MATHEMATICS \textbf{\currentvolume}
100     (\currentyear),
101     \start@page--\end@page\ [0.5ex]
102     DOI: \doiinfo}%
103   \cfoot{\thepage}}%

```

3.7 Top Matter Macros

Most top matter macros are defined in `amsart`. Here we just add some new macros and redefine some.

`\author` The macro `\author` provided by `amsart` is almost what we need. “Almost” because we want to add author’s name(s) to the address list to typeset them together.

Another note: `amsart` stores the list of all authors in the macro `\authors`. We need it now only to check whether the list is empty

```

104 \renewcommand{\author}[2] [] {%
105   \ifx@empty\authors
106     \gdef\authors{#2}%
107     \gdef\addresses{\author{#2}}%
108   \else

```

```

109     \g@addto@macro\authors{\and#2}%
110     \g@addto@macro\addresses{\and\author{#2}}%
111 \fi
112 \def\@tempa{#1}%
113 \ifx\@tempa\@empty\relax
114     \ifx\@empty\shortauthors
115         \gdef\shortauthors{#2}%
116     \else
117         \g@addto@macro\shortauthors{\and#2}%
118     \fi
119 \else
120 \ifx\@empty\shortauthors
121     \gdef\shortauthors{#1}%
122 \else
123     \g@addto@macro\shortauthors{\and#1}%
124 \fi
125 \fi
126 }%

```

abstract The following code is mostly from [1] with the changes due to our style. The comments are mostly from the same source.

In AMS-derived document classes, the abstract should be placed before `\maketitle` (otherwise the desired ordering of frontmatter elements cannot be ensured in all cases).

```

127 \newbox\abstractbox

We start by checking whether \maketitle has already been used (in which case it
was reset to \relax); if so, we give a warning that the abstract should be placed
before \maketitle.

128 \renewenvironment{abstract}{%
129     \ifx\maketitle\relax
130         \ClassWarning{\@classname}{Abstract should precede
131             \protect\maketitle\space in AMS-derived document classes; reported}%
132     \fi
133     \global\setbox\abstractbox=\vtop \bgroup
134     \vglue 10pt plus 6pt minus 6pt%
135     \normalfont\tiny
136     \centering\MakeUppercase{\abstractname}\par%
137     \Small
138     \list{ }\labelwidth\z@
139     \leftmargin3pc \rightmargin\leftmargin
140     \listparindent\normalparindent \itemindent\z@
141     \parsep\z@ \@plus\p@

In order to get equation numbers indented with the rest of the abstract, we have to
do this:

142     \let\fullwidthdisplay\relax
143     }%
144 \item[]%
145 }{%

```

```

146     \vspace*{-10pt}
147 \endlist\egroup
    If the abstract was supposed to be typeset earlier, then \@setabstract is now equal
    to \relax, and we had better drop the contents of the abstract box onto the page
    immediately, to salvage the situation as best we can.
148 \ifx\@setabstract\relax \@setabstracta \fi
149 }%

```

`\pagespan` This macro is different from the one provided by `amsart` because we want to have the option of automatic calculation of the last page number.

```

150 \def\pagespan#1#2{\pagenumbering{arabic}\setcounter{page}{#1}%
151 \def\start@page{#1}%
152 \ifnum\c@page<\z@ \pagenumbering{roman}\setcounter{page}{-#1}%
153 \def\start@page{\romannumeral#1}%
154 \fi%
155 \def\@tempa{#2}%
156 \ifx\@tempa\@empty\def\end@page{\pageref{LastPage}}%
157 \else\def\end@page{#2}\fi}
158 \pagespan{1}{}

```

`\doiinfo` This is the doi number of the article:

```

159 \def\doiinfo#1{\gdef\@doiinfo{#1}}
160 \doiinfo{10.1007/s000000000000000000000000}

```

`\thanks` The macro `\thanks` is redefined in `amsart`. Here is the adapted original definition from the L^AT_EX kernel. Note that the footnotes on the title page are typeset in `\small` size, rather than in `\footnotesize`.

```

161 \def\thanks#1{\footnotemark
162 \protected@xdef\thankses{\thankses
163 \protect\footnotetext[\the\c@footnote]{\small#1}}%
164 }
165 \let\@thanks\@empty

```

3.8 Typesetting Top Matter

`\@maketitle@hook` The `\@maketitle@hook` is called by `\maketitle` in `amsart`. We use it to a number of redefinitions.

```

166 \def\@maketitle@hook{%

```

At this point we collected all authors in `\shortauthors`, so we can uppercase it:

```

167 \uppercase\nonmath\shortauthors

```

The footnote numbering on the title page is rather interesting. It is `*`, then `**`, then `†`, then `††`, etc.

```

168 \renewcommand\thefootnote{\ifcase\c@footnote\relax
169 \or\@fnsymbol{1}%
170 \or\@fnsymbol{1}\@fnsymbol{1}%
171 \or\@fnsymbol{2}%

```

```

172 \or\@fnsymbol{2}\@fnsymbol{2}%
173 \or\@fnsymbol{3}%
174 \or\@fnsymbol{3}\@fnsymbol{3}%
175 \or\@fnsymbol{4}%
176 \or\@fnsymbol{4}\@fnsymbol{4}%
177 \or\@fnsymbol{5}%
178 \or\@fnsymbol{5}\@fnsymbol{5}%
179 \or\@fnsymbol{6}%
180 \or\@fnsymbol{6}\@fnsymbol{6}%
181 \fi}%
182 \def\@makefnmark{\@textsuperscript{\normalfont\@thefnmark}}%
183 \long\def\@makefntext##1{\noindent\hangindent=2em\hangafter=1
184 \hb@xt@2em{%
185 \hss\@textsuperscript{\normalfont\footnotesize\@thefnmark\space}}##1}%
186 \def\footnoterule{\kern-3pt\hrule width 2in\kern 2.6pt}
187 \setcounter{footnote}{0}%
188 }%

```

`\@adminfootnotes` amsart typesets the footnotes *before* typesetting the authors and title. Since we form the footnotes later, we must delay this till the end of the top matter:

```
189 \def\@adminfootnotes{}%
```

`\andify` In the US the common style for lists is “Tom, Dick, and Harry”. It is hard-coded into amsart. However, our journal style is “Tom, Dick and Harry” (is it the British usage?). Therefore we need to redefine the function `\andify`:

```
190 \renewcommand{\andify}{%
191 \xandlist{\unskip, }\{\unskip} \@and~}\{\unskip} \@and~}}
```

`\@@and` Normally the macro `\@@and` is expanded just to ‘and’. However, if `french` option is selected, we want the french version:

```
192 \def\@@and{AND}
193 \ifijm@french\def\@@and{ET}\fi
```

`\@@by` Same with `\@@by`:

```
194 \def\@@by{BY}
195 \ifijm@french\def\@@by{PAR}\fi
```

`\curraddrname` The keywords for the specific parts of the address (e-mail, current address, etc.)
`\emailaddrname` depend on the language chosen.

```

\urladdrname 196 \def\curraddrname{Current address:}%
197 \def\emailaddrname{e-mail:}%
198 \def\urladdrname{URL:}%
199 \ifijm@french
200 \def\curraddrname{Adresse actuelle:}%
201 \def\emailaddrname{courriel:}%
202 \fi

```

`\settitle` The title is set in large font uppercase. There is a problem, however: uppercasing title means uppercasing *everything*, including thanks! We solve this problem in

the following way: we typeset the title twice, once invisibly in the lowercase, and again in uppercase, but without typesetting the footnote text.

```

203 \def\@settitle{%
204     \begin{center}%
205     \makebox[Opt]{\hphantom{\@title}}%
206     \def\thanks##1{\addtocounter{footnote}{-1}\footnotemark}%
207     \uppercase\onmath\@title
208     \Large\baselineskip=14pt\lineskiplimit=2pt\lineskip=2pt\@title%
209     \end{center}}%

```

`\@setauthors` While we call this macro `\@setauthors`, in fact it is setting the names *and* addresses of the authors.

The authors' block is centered:

```

210 \def\@setauthors{\vglue 21pt plus 6pt minus 3pt%
211     \begin{center}%

```

We need to properly treat the current address, e-mail and URL of the authors. Note that `amsart` uses an optional first argument to these macros; we silently drop it.

```

212 \def\curraddr##1##2{\begingroup
213     \@ifnotempty{##2}{\par\curraddrname{}}\par
214     ##2\par}\endgroup}%
215 \def\email##1##2{\begingroup
216     \@ifnotempty{##2}{\par\emailaddrname{}}~%
217     ##2\par}\endgroup}%
218 \def\urladdr##1##2{\begingroup
219     \@ifnotempty{##2}{\par\urladdrname{}}~%
220     ##2\par}\endgroup}%

```

We print the word “by” only if there is at least one author. I am not sure how it can be that a manuscript has no authors, but has addresses defined. Maybe official editorial?

```

221     \if\authors\@empty\relax\else{\normalfont\tiny\@by}\par\medskip

```

The authors are typeset in small caps:

```

222     \def\author##1{\normalsize\scshape##1}\par\medskip}

```

The keyword “and” is typeset like “by” with large skip:

```

223     \def\and{\par\bigskip{\normalfont\tiny\@and}\par\medskip}

```

And everything else is typeset in italics:

```

224     \small\itshape\addresses
225     \end{center}}%

```

`\@maketitle` We typeset footnotes at the end of the top matter typesetting. Note the larger type size for the `\@date` footnote.

```

226 \let\@origmaketitle=\@maketitle
227 \def\@maketitle{\@origmaketitle
228     \thankses
229     \ifx\@date\@empty\else

```

```

230 \def\thefootnote{}%
231 \footnotetext{\small\@date}\fi%
232 \gdef\thefootnote{\@arabic\c@footnote}

```

`\enddoc@text` In `amsart` the macro `\enddoc@text` typesets addresses at the end of the document. We do not need it:

```

233 \def\enddoc@text{}

```

3.9 Table of Contents

By default we include in the table of contents only sections:

```

234 \setcounter{tocdepth}{1}

```

`\contentsnamefont` The table of contents is typeset smaller than in `amsart`:

```

235 \renewcommand\contentsnamefont{\scshape\footnotesize}

```

`\starttoc` We also rewrite `\starttoc` to make the type smaller. The comments are again from `amsart`:

```

236 \def\starttoc#1#2{\begingroup
237 \setTrue{#1}%

```

Remove the skip after the abstract so that we can substitute another.

```

238 \par\removelastskip\vskip\z@skip

```

The first two arguments of `\startsection` here are special values that cause different internal branches to be taken.

```

Arguments: {} = name = empty
\@M = no number should be used and no table of contents entry
\z@ = indent amount
12pt + 12pt = vskip before
6pt = vskip after
\centering\contentsnamefont = format

```

```

239 \@startsection{}\@M\z@{\linespacing\@plus\linespacing}%
240 {.5\linespacing}\centering\contentsnamefont}{#2}%

```

If we have a list of figures or list of tables we want to put them in the main table of contents, but we don't want to put an entry there for the main table of contents itself. So we check to see if argument 2 is `\contentsname` and if it is then we refrain from doing `\addcontentsline`.

```

241 \ifx\contentsname#2%
242 \else \addcontentsline{toc}{section}{#2}\fi

```

We want the table of contents to have the same width as the abstract

```

243 \list{}{\labelwidth\z@
244 \leftmargin2.4pc \rightmargin\leftmargin
245 \listparindent\z@ \itemindent\z@
246 \parsep\z@ \@plus\p@}%
247 \item[]\makeatletter%
248 \small\@input{\jobname.#1}\endlist%

```

```

249 \if@filesw
250 \exp\newwrite\csname tf@#1\endcsname
251 \immediate\exp\openout\csname tf@#1\endcsname \jobname.#1\relax
252 \fi
253 \global\@nobreakfalse \endgroup
254 \addvspace{32\p@\@plus14\p@}%
255 \let\tableofcontents\relax
256 }%

```

`\@dotsep` Separation between the dots for table of contents:

```
257 \newcommand\@dotsep{4.5}
```

`\@tocline` We want dots in the table of contents...

```

258 \def\@tocline#1#2#3#4#5#6#7{\relax
259 \ifnum #1>\c@tocdepth % then omit
260 \else
261 \par \addpenalty\@secpenalty\addvspace{#2}%
262 \begingroup \hyphenpenalty\@M
263 \@ifempty{#4}{%
264 \@tempdima\csname r@tocindent\number#1\endcsname\relax
265 }{%
266 \@tempdima#4\relax
267 }%
268 \parindent\z@ \leftskip#3\relax \advance\leftskip\@tempdima\relax
269 \rightskip\@pnumwidth plus4em \parfillskip-\@pnumwidth
270 #5\leavevmode\hskip-\@tempdima #6\nobreak\relax
271 \leaders\hbox{$\m@th
272 \mkern \@dotsep mu\hbox{.}\mkern \@dotsep
273 mu$}\hfill
274 \hbox to\@pnumwidth{\@tocpagenum{#7}}\par
275 \nobreak
276 \endgroup
277 \fi}%

```

`\l@section` The actual formatting of section entries depend whether subsections are included in toc. If yes, the sections are bold.

```

278 \def\l@section{%
279 \@tocline{1}{0pt}{1pc}{-}{%
280 \ifnum\c@tocdepth>1\bfseries\fi}}

```

`\l@subsection` These entries are indented.

```

\l@subsection 281 \def\l@subsection{\@tocline{2}{0pt}{2.8pc}{-}{-}}
\l@subsection 282 \def\l@subsection{\@tocline{3}{0pt}{4.6pc}{-}{-}}

```

3.10 Captions

`\@captionheadfont` The captions in amsart are in small caps. In this journal they are not:

```
283 \def\@captionheadfont{\normalfont}
```

3.11 Sectioning

`\@secnumfont` It is possible in `amsart` to have section numbers in the font different from the title font. We do not want this:

```
284 \let\@secnumfont\@empty
```

Now we redefine sections. The arguments of the `\@startsection` commands are

```
      #1      #2      #3      #4      #5      #6
\@startsection{NAME}{LEVEL}{INDENT}{BEFORESKIP}{AFTERSKIP}{STYLE}
```

`\section` Most sections are not centered, unlike `amsart` ones:

```
285 \def\section{\@startsection{section}{1}%
286   \z@{20pt plus 4pt minus 4pt}{0.5\linespacing}%
287   {\normalfont\bfseries}}%
```

`\centeredsection` However, there are special centered sections, for example, “References”:

```
288 \def\centeredsection{\@startsection{section}{1}%
289   \z@{20pt plus 4pt minus 4pt}{0.5\linespacing}%
290   {\normalfont\bfseries\centering}}%
```

`\subsection` Subsections are in small caps on the line with text.

```
291 \def\subsection{\@startsection{subsection}{2}%
292   \z@{.5\linespacing\@plus.7\linespacing}{-0.5em}%
293   {\normalfont\scshape}}%
```

`\subsubsection` Subsubsection heads are in italics

```
294 \def\subsubsection{\@startsection{subsubsection}{3}%
295   \z@{.5\linespacing\@plus.7\linespacing}{-0.5em}%
296   {\normalfont\itshape}}%
```

`\paragraph` Paragraphs and subparagraphs are in normal font:

```
\subparagraph 297 \def\paragraph{\@startsection{paragraph}{4}%
298   \z@\z@{-0.5em}%
299   {\normalfont}}%
300 \def\subparagraph{\@startsection{subparagraph}{5}%
301   \z@\z@{-0.5em}%
302   {\normalfont}}%
```

`\if@afterindent` The first paragraph after section head is *not* indented, like in standard L^AT_EX— but *unlike* `amsart`. The code below is inspired by David Carlisle’s package `indentfirst` [14] (of course David wanted to *have* the first indent, and we want the opposite):

```
303 \let\@afterindenttrue\@afterindentfalse
304 \@afterindentfalse
```

`\appendix` The standard `amsart` macro `\@tochangmeasure` measures the width of the TOC label for the hanging indentation of TOC entries. However, for appendices this label includes the word “Appendix”, which leads to an ugly indent of TOC entries. Therefore we stop measuring in appendices:

```

305 \def\appendix{\par\c@section\z@ \c@subsection\z@
306   \let\sectionname\appendixname
307   \def\thesection{\@Alph\c@section}%
308   \def\@tochangmeasure##1{}}

```

3.12 Theorem Styles

Here we redefine three main style of `amsart`. Here are the arguments of `\newtheoremstyle` from [1]:

```

#1
\newtheoremstyle{NAME}%
#2 #3 #4
{ABOVESPACE}{BELOWSPACE}{BODYFONT}%
#5 #6 #7 #8
{INDENT}{HEADFONT}{HEADPUNCT}{HEADSPACE}%
#9
{CUSTOM-HEAD-SPEC}

```

In the `plain` style the name (“theorem”) and number are printed in small caps, the optional note is in upright, and the text is slanted.

```

309 \newtheoremstyle{plain}{0.5\linespacing}{0.5\linespacing}{\slshape}{0pt}%
310   {\scshape}{:}{0.5em}{\thmname{#1}\thmnumber{ #2}\thmnote{\upshape{ } (#3)}}

```

In the `definition` style the name, the number is slanted, and the text and the note are upright.

```

311 \newtheoremstyle{definition}{0.5\linespacing}{0.5\linespacing}%
312   {\upshape}{0pt}%
313   {\slshape}{:}{0.5em}{\thmname{#1}\thmnumber{ #2}\thmnote{\upshape{ } (#3)}}

```

In the `remark` style the name and the number are in small caps, the note and the text text is upright.

```

314 \newtheoremstyle{remark}{0.5\linespacing}{0.5\linespacing}%
315   {\upshape}{0pt}%
316   {\scshape}{:}{0.5em}{\thmname{#1}\thmnumber{ #2}\thmnote{\upshape{ } (#3)}}

```

`proof` We want to have the word “proof” slanted rather than italicized:

```

317 \renewenvironment{proof}[1][\proofname]{\par
318   \pushQED{\qed}%
319   \normalfont \topsep6\p@\@plus6\p@\relax
320   \trivlist
321   \item[\hskip\labelsep
322     \slshape
323     #1\@addpunct{.}]\ignorespaces
324 }{%
325   \popQED\endtrivlist\@endpefalse
326 }

```

`\qed` Unlike `amsart`, we do not want the QED symbol to be flushed right:

```

327 \DeclareRobustCommand{\qed}{%
328   \leavevmode\unskip\penalty9999 \hbox{} \nobreak
329   \ifmmode
330     \makebox[0pt][l]{\quad\hbox{\qedsymbol}}%
331   \else
332     \quad\hbox{\qedsymbol}\fi}%

```

`\mqedhere` Normally `\qedhere` is typeset with zero effective width in math mode to present centering alignment in equations. This presents problems in `multline` environment, where the last line is flushed right, so `\qedhere` would be typeset on the margin. The following command switches to text mode:

```

333 \def\mqedhere{\ensuremath{\text{\qedhere}}}%

```

`\qedsymbol` The QED symbol itself is a small closed box:

```

334 \def\qedsymbol{\rule[0.47pt]{4pt}{6pt}}%

```

`\namedprop` This is the unstarred version of the macro. It calls the command and then closes the group opened by `\namedprop@`

```

335 \newenvironment{namedprop}{%
336   \namedprop@}%
337 \end{namedprop@thm}%
338 \egroup}

```

`\namedprop*` The starred version is similar:

```

339 \newenvironment{namedprop*}{%
340   \namedprop@star@}%
341 \end{namedprop@thm}%
342 \egroup}

```

`\namedprop@star@` The starred version has two mandatory arguments: style and name, and one optional argument: note.

```

343 \def\namedprop@star@#1#2{%
344   \ifnextchar[{\namedprop@star@@{#1}{#2}}{\namedprop@star@@{#1}{#2} []}}%

```

`\namedprop@star@@` This is the command that does the real work:

```

345 \def\namedprop@star@@#1#2[#3]{%
346   \bgroup
347   \let\namedprop@thm\relax
348   \theoremstyle{#1}
349   \newtheorem*{namedprop@thm}{#2}
350   \begin{namedprop@thm}[#3]}

```

`\namedprop@` This is the unstarred version of the macro. It has three mandatory arguments: style, counter and the name, and one optional argument: the note.

```

351 \def\namedprop@#1#2#3{%
352   \ifnextchar[{\namedprop@@{#1}{#2}{#3}}{\namedprop@@{#1}{#2}{#3} []}}%

```

```
\namedprop@@ And the real macro:
353 \def\namedprop@@#1#2#3[#4]{%
354   \bgroup
355   \let\namedprop@thm\relax
356   \theoremstyle{#1}
357   \newtheorem{namedprop@thm}[#2]{#3}
358   \begin{namedprop@thm}[#4]}
```

3.13 Bibliography

```
\@bibtitlestyle Unlike other section heads, the word “References” in the journal is centered:
359 \renewcommand{\@bibtitlestyle}{%
360   \@xp\centeredsection\@xp*\@xp{\refname}%
361 }%
```

3.14 End of Class

```
362 </class>
```

4 Acknowledgements

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As a result of their efforts, the Journal was not only saved from extinction, but it has expanded and is considered a leader in its field. With the recent change in the production procedure to a more global format, we have moved to another program, building on the sturdy basis which they created.

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Change History

v0.2	General: First fully functional version	3	General: Documentation update	3
v0.3	<code>\@bibtitlestyle</code> : Redefined to have centered heading	24	v1.1	General: Updated documentation for theorems
	<code>\@captionheadfont</code> : Redefined	20		<code>\namedprop</code> : Introduced macro
	<code>\@classname</code> : Introduced macro	11		<code>\namedprop*</code> : Introduced macro
	<code>\@maketitle</code> : Changed size for date	18		<code>\namedprop@</code> : Introduced macro
	<code>\@maketitle@hook</code> : Changed footnotes formatting	16		<code>\namedprop@@</code> : Introduced macro
	<code>\@typesizes</code> : Redefined amsart defaults	12		<code>\namedprop@star@</code> : Introduced macro
	General: Documentation update	3		<code>\namedprop@star@@</code> : Introduced macro
	<code>abstract</code> : Changed spacing	15	v1.1a	General: Documentation update
	<code>\centeredsection</code> : Added macro	21	v1.2	<code>\@starttoc</code> : Redefined
	<code>\footskip</code> : Redefined	13		General: Added documentation for table of contents formatting
	<code>\if@afterindent</code> : Deleted first indent after the section head	21		<code>\l@section</code> : Redefined to check whether subsections are present
	<code>\pdfhorigin</code> : Changed offsets	13		<code>\l@subsubsection</code> : Added indentation
	<code>\qed</code> : Redefined amsart default	23	v1.3	General: Documented the use of <code>qedhere</code> and <code>mqedhere</code>
	<code>\qedsymbol</code> : Redefined amsart default	23		<code>\l@subsubsection</code> : Changed indentation
	<code>proof</code> : Redefined amsart defaults	22		<code>\mqedhere</code> : Introduced the command
	<code>\thanks</code> : Changed size	16		<code>\qed</code> : Changed math mode branch
v0.4	General: Redefined remark and definition styles: the note is now upright.	22	v1.4	<code>\appendix</code> : Redefined the macro to delete ugly indent in TOC
	<code>\footskip</code> : Changed	13	v1.6	General: Documentation updates: illustrations and bibliography
	<code>\pdfhorigin</code> : Changed offsets	13		
	<code>\textheight</code> : Changed	13		
	<code>\topmargin</code> : Changed offsets	13		
v1.0	<code>\@maketitle@hook</code> : Deleted <code>rlap</code> from footnotemark	16		

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