LaTeX 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*

Contents

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1 Introduction

The Israel Journal of Mathematics is published by *The Hebrew University Magnes Press*. This class provides LaTeX 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 LaTeX 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 AMSLaTeX 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 AMSLaTeX 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 LaTeX 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 LaTeX and BibTeX can find them (see [3] or the documentation for your TeX system).
3. Update the database of file names. Again, see [3] or the documentation for your TeX 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 LaTeX 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 `french`

Most of the options are just passed to amsart (see [2, 7] for their description). 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 `draft` `final`

The options `draft` and `final` work in the same way as for amsart and standard LaTeX. If the option `draft` is chosen, the overfull lines are marked by black 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
8pt
9pt
10pt
11pt
12pt

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).

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:

```
-T 5.964in,8.844in -O -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 neccessary, are introduced by the command `\linebreak` in the second (mandatory) argument of `\title`:

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

`\author` `\address` `\curraddr` `\email` `\urladdr`

The interface for specifying the authors and their affiliations is close the the one of amsart [9] (and different from the standard LaTeX). 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 LaTeX 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 Jorunal 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 situaiton[1]. 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
namedprop* Sometimes authors use non-standard names for their theorem-like propositions. 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 prognameijmart 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.), `nmubered-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-l}]
  ...
\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-l}]
  ...
\end{namedprop*}
```

[1] It 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 BibTEX, 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 of 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.

```
⟨class⟩\NeedsTeXFormat{LaTeX2e}
⟨*gobble⟩
\ProvidesFile{ijmart.dtx}
⟨/gobble⟩
⟨class⟩\ProvidesClass{ijmart}
[2013/06/23 v1.7 Typesetting articles for The Israel Journal of Mathematics]
```

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

```
⟨class⟩\def\@classname{ijmart}%
```

And the driver code:

```
⟨*gobble⟩
\documentclass{ltxdoc}
\usepackage{array}
\usepackage{url,amsfonts}
\usepackage[breaklinks,colorlinks,linkcolor=black,citecolor=black,
            pagecolor=black,urlcolor=black,hyperindex=false]{hyperref}
\PageIndex
\CodelineIndex
\RecordChanges
\EnableCrossrefs
\begin{document}
  \DocInput{ijmart.dtx}
\end{document}
⟨/gobble⟩
⟨*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.

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

The size-changing options produce a warning:

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

```
\DeclareOption{9pt}{\ijm@size@warning{\CurrentOption}}%
\DeclareOption{10pt}{\ijm@size@warning{\CurrentOption}}%
\DeclareOption{11pt}{\ijm@size@warning{\CurrentOption}}%
\DeclareOption{12pt}{\ijm@size@warning{\CurrentOption}}%
```

All other options are passed to amsart:

```
\DeclareOption*{\PassOptionsToClass{\CurrentOption}{amsart}}
```

Now we read the configuration file

```
\InputIfFileExists{ijmart.cfg}{%
  \ClassInfo{ijmart}{%
    Loading configuration file ijmart.cfg}}{%
  \ClassInfo{ijmart}{%
    Configuration file ijmart.cfg is not found}}
```

And process the options:

```
\ProcessOptions\relax
```

3.3 Loading Class and Packages

We start with the base class

```
\PassOptionsToClass{10pt}{amsart}
\LoadClass{amsart}
```

A bunch of packages:

```
\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 typesizes: 5 below and 5 above \normalsize .

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

3.5 Page Dimensions and Paragraphing

\paperheight
\paperwidth

The journal has rather narrow pages:

```
\setlength{\paperheight}{636.77bp}
\setlength{\paperwidth}{429.41bp}
```

\pdfpaperheight
\pdfpaperwidth
\pdfvorigin
\pdfhorigin

If we deal with pdftex, we can use this information more creatively. This was inspired by memoir [12].

```
\ifpdf\relax
  \pdfpageheight=\paperheight
  \pdfpagewidth=\paperwidth
  \pdfvorigin=0.9in
  \pdfhorigin=1in
\fi
```

\headheight

We leave generous header space:

```
\setlength{\headheight}{32pt}
```

\footskip

The footer is slightly larger than in amsart

```
\setlength{\footskip}{42pt}%
```

\topmargin

The top margin is 50 bp:

```
\setlength\topmargin{50bp}
\addtolength\topmargin{-0.9in}
\addtolength\topmargin{-\topskip}
\addtolength\topmargin{-\headsep}
\@settopoint\topmargin
```

\textheight

This code is similar to the one in [13]. `\textheight` is the height of the text including footnotes, but excluding running head and foot. We start with `\paperheight` and subtract margins, running heads and foots:

```
\setlength\@tempdima{\paperheight}
\addtolength\@tempdima{-\topmargin}
\addtolength\@tempdima{-26bp} % Bottom margin
\addtolength\@tempdima{-\headheight}
\addtolength\@tempdima{-\headsep}
\addtolength\@tempdima{-\footskip}
\addtolength\@tempdima{-1in}
```

We want this length to contain an integer number of lines:

```
\divide\@tempdima\baselineskip
\@tempcnta=\@tempdima
\setlength\textheight{\@tempcnta\baselineskip}
```

Now we take care of the first line height:

```
\addtolength\textheight{\topskip}
```

\evensidemargin
\oddsidemargin

The margins on even and odd pages are 43 bp:

```
\setlength\evensidemargin{43bp}
\addtolength{\evensidemargin}{-1in}
\setlength\oddsidemargin{43bp}
\addtolength{\oddsidemargin}{-1in}
```

\textwidth

The way to set up the right margin is slightly different:

```
\setlength\textwidth{\paperwidth}
```

```
\addtolength{\textwidth}{-1in}
\addtolength\textwidth{-\evensidemargin}
\addtolength\textwidth{-43bp} % right margin
\@settopoint\textwidth
```

\parindent The paragraph indentation is 1em:

```
\setlength\parindent{1em}
```

3.6 Headers

\headrulewidth We do not want decorative rules in the journal:

\footrulewidth

```
\renewcommand{\headrulewidth}{0pt}
\renewcommand{\footrulewidth}{0pt}
```

It is easy to set up headers with fancyhdr:

```
\pagestyle{fancy}
\fancyhead[LO]{\footnotesize Vol.~\currentvolume, \currentyear}
\fancyhead[CO]{\footnotesize\shorttitle}
\fancyhead[RO]{\footnotesize\thepage}
\fancyhead[LE]{\footnotesize\thepage}
\fancyhead[CE]{\footnotesize\shortauthors}
\fancyhead[RE]{\footnotesize Isr. J. Math.}
\fancyfoot{}
```

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

```
\fancypagestyle{firstpage}{%
  \fancyhf{}%
  \chead{\tiny%
    ISRAEL JOURNAL OF MATHEMATICS \textbf{\currentvolume}
    (\currentyear),
    \start@page--\end@page\\[0.5ex]
  DOI: \@doiinfo}%
   \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

```
\renewcommand{\author}[2][]{%
  \ifx\@empty\authors
    \gdef\authors{#2}%
    \gdef\addresses{\author{#2}}%
  \else
```

```
    \g@addto@macro\authors{\and#2}%
    \g@addto@macro\addresses{\and\author{#2}}%
  \fi
  \def\@tempa{#1}%
  \ifx\@tempa\@empty\relax
   \ifx\@empty\shortauthors
     \gdef\shortauthors{#2}%
   \else
     \g@addto@macro\shortauthors{\and#2}%
   \fi
  \else
  \ifx\@empty\shortauthors
     \gdef\shortauthors{#1}%
   \else
     \g@addto@macro\shortauthors{\and#1}%
   \fi
 \fi
}%
```

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).*

```
\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`*.*

```
\renewenvironment{abstract}{%
  \ifx\maketitle\relax
    \ClassWarning{\@classname}{Abstract should precede
      \protect\maketitle\space in AMS-derived document classes; reported}%
  \fi
  \global\setbox\abstractbox=\vtop \bgroup
  \vglue 10pt plus 6pt minus 6pt%
    \normalfont\tiny
    \centering\MakeUppercase{\abstractname}\par%
    \Small
    \list{}{\labelwidth\z@
      \leftmargin3pc \rightmargin\leftmargin
      \listparindent\normalparindent \itemindent\z@
      \parsep\z@ \@plus\p@
```

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

```
      \let\fullwidthdisplay\relax
    }%
  \item[]%
}{%
```

```
    \vspace*{-10pt}
  \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.*

```
  \ifx\@setabstract\relax \@setabstracta \fi
}%
```

`\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.

```
\def\pagespan#1#2{\pagenumbering{arabic}\setcounter{page}{#1}%
  \def\start@page{#1}%
  \ifnum\c@page<\z@ \pagenumbering{roman}\setcounter{page}{-#1}%
    \def\start@page{\romannumeral#1}%
  \fi%
  \def\@tempa{#2}%
  \ifx\@tempa\@empty\def\end@page{\pageref{LastPage}}%
  \else\def\end@page{#2}\fi}
\pagespan{1}{}
```

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

```
\def\doiinfo#1{\gdef\@doiinfo{#1}}
\doiinfo{10.1007/s00000000000000000000000}
```

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

```
\def\thanks#1{\footnotemark
    \protected@xdef\thankses{\thankses
        \protect\footnotetext[\the\c@footnote]{\small#1}}%
}
\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.

```
\def\@maketitle@hook{%
```

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

```
  \uppercasenonmath\shortauthors
```

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

```
  \renewcommand\thefootnote{\ifcase\c@footnote\relax
    \or\@fnsymbol{1}%
    \or\@fnsymbol{1}\@fnsymbol{1}%
    \or\@fnsymbol{2}%
```

```
    \or\@fnsymbol{2}\@fnsymbol{2}%
    \or\@fnsymbol{3}%
    \or\@fnsymbol{3}\@fnsymbol{3}%
    \or\@fnsymbol{4}%
    \or\@fnsymbol{4}\@fnsymbol{4}%
    \or\@fnsymbol{5}%
    \or\@fnsymbol{5}\@fnsymbol{5}%
    \or\@fnsymbol{6}%
    \or\@fnsymbol{6}\@fnsymbol{6}%
  \fi}%
  \def\@makefnmark{\@textsuperscript{\normalfont\@thefnmark}}%
  \long\def\@makefntext##1{\noindent\hangindent=2em\hangafter=1
    \hb@xt@2em{%
      \hss\@textsuperscript{\normalfont\footnotesize\@thefnmark\space}}##1}%
  \def\footnoterule{\kern-3pt\hrule width 2in\kern 2.6pt}
  \setcounter{footnote}{0}%
}%
```

`\@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:

```
\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`:

```
\renewcommand{\andify}{%
  \nxandlist{\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:

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

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

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

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

```
\def\curraddrname{Current address:}%
\def\emailaddrname{e-mail:}%
\def\urladdrname{URL:}%
\ifijm@french
  \def\curraddrname{Adresse actuelle:}%
  \def\emailaddrname{courriel:}%
\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.

```
\def\@settitle{%
    \begin{center}%
    \makebox[0pt]{\hphantom{\@title}}%
    \def\thanks##1{\addtocounter{footnote}{-1}\footnotemark}%
    \uppercasenonmath\@title
      \Large\baselineskip=14pt\lineskiplimit=2pt\lineskip=2pt\@title%
    \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:

```
\def\@setauthors{\vglue 21pt plus 6pt minus 3pt%
  \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.

```
  \def\curraddr##1##2{\begingroup
    \@ifnotempty{##2}{\par\curraddrname{}\par
      ##2\par}\endgroup}%
  \def\email##1##2{\begingroup
    \@ifnotempty{##2}{\par\emailaddrname{}~%
      ##2\par}\endgroup}%
  \def\urladdr##1##2{\begingroup
    \@ifnotempty{##2}{\par\urladdrname{}~%
      ##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?

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

The authors are typeset in small caps:

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

The keyword "and" is typeset like "by" with large skip:

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

And everything else is typeset in italics:

```
     \small\itshape\addresses
  \end{center}}%
```

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

```
\let\@origmaketitle=\@maketitle
\def\@maketitle{\@origmaketitle
  \thankses
  \ifx\@date\@empty\else
```

```
    \def\thefootnote{}%
    \footnotetext{\small\@date}\fi%
  \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:

```
\def\enddoc@text{}
```

3.9 Table of Contents

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

```
\setcounter{tocdepth}{1}
```

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

```
\renewcommand\contentsnamefont{\scshape\footnotesize}
```

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

```
\def\@starttoc#1#2{\begingroup
  \setTrue{#1}%
```

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

```
  \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
```

```
  \@startsection{}\@M\z@{\linespacing\@plus\linespacing}%
    {.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`*.*

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

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

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

```
  \if@filesw
    \@xp\newwrite\csname tf@#1\endcsname
    \immediate\@xp\openout\csname tf@#1\endcsname \jobname.#1\relax
  \fi
  \global\@nobreakfalse \endgroup
  \addvspace{32\p@\@plus14\p@}%
  \let\tableofcontents\relax
}%
```

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

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

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

```
\def\@tocline#1#2#3#4#5#6#7{\relax
  \ifnum #1>\c@tocdepth % then omit
  \else
    \par \addpenalty\@secpenalty\addvspace{#2}%
    \begingroup \hyphenpenalty\@M
    \@ifempty{#4}{%
      \@tempdima\csname r@tocindent\number#1\endcsname\relax
    }{%
      \@tempdima#4\relax
    }%
    \parindent\z@ \leftskip#3\relax \advance\leftskip\@tempdima\relax
    \rightskip\@pnumwidth plus4em \parfillskip-\@pnumwidth
    #5\leavevmode\hskip-\@tempdima #6\nobreak\relax
    \leaders\hbox{$\m@th
        \mkern \@dotsep mu\hbox{.}\mkern \@dotsep
        mu$}\hfill
    \hbox to\@pnumwidth{\@tocpagenum{#7}}\par
    \nobreak
    \endgroup
  \fi}%
```

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

```
\def\l@section{%
  \@tocline{1}{0pt}{1pc}{}{%
    \ifnum\c@tocdepth>1\bfseries\fi}}
```

`\l@subsection` `\l@subsubsection` These entries are indented.

```
\def\l@subsection{\@tocline{2}{0pt}{2.8pc}{}{}}
\def\l@subsubsection{\@tocline{3}{0pt}{4.6pc}{}{}}
```

3.10 Captions

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

```
\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:

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

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

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

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

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

\centeredsection However, there are special centered sections, for example, "References":

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

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

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

\subsubsection Subsubsection heads are in italics

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

\paragraph Paragraphs and subparagraphs are in normal font:

\subparagraph

```
\def\paragraph{\@startsection{paragraph}{4}%
  \z@\z@{-0.5em}%
 {\normalfont}}%
\def\subparagraph{\@startsection{subparagraph}{5}%
  \z@\z@{-0.5em}%
 {\normalfont}}%
```

\if@afterindent The first paragraph after section head is *not* indented, like in standard LaTeX—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):

```
\let\@afterindenttrue\@afterindentfalse
\@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:

```
\def\appendix{\par\c@section\z@ \c@subsection\z@
   \let\sectionname\appendixname
   \def\thesection{\@Alph\c@section}%
   \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.

```
\newtheoremstyle{plain}{0.5\linespacing}{0.5\linespacing}{\slshape}{0pt}%
   {\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.

```
\newtheoremstyle{definition}{0.5\linespacing}{0.5\linespacing}%
   {\upshape}{0pt}%
   {\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.

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

proof We want to have the word "proof" slanted rather than italicized:

```
\renewenvironment{proof}[1][\proofname]{\par
  \pushQED{\qed}%
  \normalfont \topsep6\p@\@plus6\p@\relax
  \trivlist
  \item[\hskip\labelsep
    \slshape
    #1\@addpunct{.}]\ignorespaces
}{%
  \popQED\endtrivlist\@endpefalse
}
```

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

```
\DeclareRobustCommand{\qed}{%
  \leavevmode\unskip\penalty9999 \hbox{}\nobreak
  \ifmmode
     \makebox[0pt][l]{\qquad\hbox{\qedsymbol}}%
  \else
     \qquad\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:

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

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

```
\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@`

```
\newenvironment{namedprop}{%
  \namedprop@}{%
  \end{namedprop@thm}%
  \egroup}
```

`\namedprop*` The starred version is similar:

```
\newenvironment{namedprop*}{%
  \namedprop@star@}{%
  \end{namedprop@thm}%
  \egroup}
```

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

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

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

```
\def\namedprop@star@@#1#2[#3]{%
  \bgroup
  \let\namedprop@thm\relax
  \theoremstyle{#1}
  \newtheorem*{namedprop@thm}{#2}
  \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.

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

\namedprop@@ And the real macro:

```
\def\namedprop@@#1#2#3[#4]{%
  \bgroup
  \let\namedprop@thm\relax
  \theoremstyle{#1}
  \newtheorem{namedprop@thm}[#2]{#3}
  \begin{namedprop@thm}[#4]}
```

3.13 Bibliography

\@bibtitlestyle Unlike other section heads, the word "References" in the journal is centered:

```
\renewcommand{\@bibtitlestyle}{%
  \@xp\centeredsection\@xp*\@xp{\refname}%
}%
```

3.14 End of Class

⟨/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

Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

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Z