The old-arrows package

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Abstract

This package provides Computer Modern old-style arrows (→) with smaller arrowheads, associated with ordinary LaTeX commands. It can be used in a document that contains other `amssymb` arrow characters, like ↠, which also have small arrowheads. It is possible to use the usual new-style Computer Modern arrows (→) together with the old-style ones.

Contents

1 Introduction

In 1992, Donald E. Knuth made some important corrections to Computer Modern fonts[1]. As a consequence, the characters corresponding to arrows have been modified. Just to make things clearer,

$$A \to B$$

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[1] See http://www-cs-faculty.stanford.edu/~uno/cm.html

became

$$A \to B$$

that is, the character → was replaced by →, which has a larger arrowhead. The same happened to other arrow characters. However, many arrow characters defined by `amssymb`, like ↛, ↣, ↠ and others, maintained a small arrowhead and seem too different from →.

The `old-arrows` package with Old Arrows font family allows the user to use the old-style arrows (→, ←, . . .) with the traditional commands (`\rightarrow`, `\leftarrow`, . . .). Furthermore, the options `new` and `old` allow the user to obtain the new-style arrows (→, ←, . . .) together with the old-style ones by putting `\var` before the corresponding commands (`\varrightarrow`, `\varleftarrow`, . . .)[2].

Old Arrows font family was derived from an old version of Blue Sky Computer Modern Math Symbols (1991–1992, released by AMS) by deleting many characters with FontForge.

2 Licenses

The LaTeX code in this package is licensed under the LaTeX Project Public License, v1.3.

The fonts in this package are licensed under the SIL Open Font License, v1.1.

3 Installation

The `old-arrows` package is included in the latest MiKTeX and TeX Live distributions. However, if you want to install it manually, follow the instructions below.

3.1 Copying the files in the local `texmf` tree

The Old Arrows fonts files are:

oasy5.afm	oasy5.pfm	oasy5.tfm	oasy5.pfb
oasy6.afm	oasy6.pfm	oasy6.tfm	oasy6.pfb
oasy7.afm	oasy7.pfm	oasy7.tfm	oasy7.pfb
oasy8.afm	oasy8.pfm	oasy8.tfm	oasy8.pfb
oasy9.afm	oasy9.pfm	oasy9.tfm	oasy9.pfb
oasy10.afm	oasy10.pfm	oasy10.tfm	oasy10.pfb
oabsy5.afm	oabsy5.pfm	oabsy5.tfm	oabsy5.pfb
		oabsy6.tfm	
oabsy7.afm	oabsy7.pfm	oabsy7.tfm	oabsy7.pfb
		oabsy8.tfm	
		oabsy9.tfm	
oabsy10.afm	oabsy10.pfm	oabsy10.tfm	oabsy10.pfb

These files were derived from Computer Modern fonts `cmbsy5`, `cmbsy7`, `cmbsy10`, `cmsy5`, `cmsy7`, `cmsy8`, `cmsy9` and `cmsy10`.

Call `<localtexmf>` the path of your local `texmf` tree. For TeX Live, the local tree is usually placed in `/usr/local/texlive/texmf-local`; for MiKTeX, it can be set up on any directory, by the Roots tab of "MiKTeX Options".

[2] See sections 4.3 and 4.4.

1. Copy the `*.afm` and `*.tfm` font files into the corresponding `old-arrows` directories (you have to create them, as shown below):

   ```
   <localtexmf>/fonts/afm/old-arrows
   <localtexmf>/fonts/tfm/old-arrows
   ```

2. Copy the `*.pfb` and `*.pfm` font files into the directory

   ```
   <localtexmf>/fonts/type1/old-arrows
   ```

3. Copy the `oasy.enc` and `oasy.map` files, respectively, into the directories

   ```
   <localtexmf>/fonts/enc/dvips/old-arrows
   <localtexmf>/fonts/map/dvips/old-arrows
   ```

4. Copy the `old-arrows.sty` file into the directory

   ```
   <localtexmf>/tex/latex/old-arrows
   ```

3.2 Updating the filename database

MiKTeX On the General tab of "MiKTeX Options (Admin)" click the Refresh FNDB button. Alternatively, in a DOS command prompt window run

```
initexmf --update-fndb
```

TeX Live Start the "TeX Live Manager". From Actions menu, select Update filename database. Alternatively, run in a terminal command line

```
mktexlsr
```

3.3 Updating the font map files

MiKTeX To update the configuration file `updmap.cfg`, execute in a DOS command prompt

```
initexmf --edit-config-file updmap
```

add to `updmap.cfg` (that will be opened) the following line

```
Map oasy.map
```

save, close and execute (always in the DOS command prompt)

```
initexmf --mkmaps
```

TeX Live Execute in a terminal command line

```
updmap-sys --enable Map=oasy.map
```

Finally, it is better to make another update of the filename database (see 3.2).

4 Usage

4.1 Basic usage

Simply type in the preamble of your LaTeX document

```
\usepackage{old-arrows}
```

and every arrow command will be associated to the "old-style", as indicated in table 1.

$\leftarrow$	`\leftarrow` or `\gets`	$\longleftarrow$	`\longleftarrow`	$\uparrow$	`\uparrow`
$\rightarrow$	`\rightarrow` or `\to`	$\longrightarrow$	`\longrightarrow`	$\downarrow$	`\downarrow`
$\leftrightarrow$	`\leftrightarrow`	$\longleftrightarrow$	`\longleftrightarrow`	$\updownarrow$	`\updownarrow`
$\mapsto$	`\mapsto`	$\longmapsto$	`\longmapsto`	$\nearrow$	`\nearrow`
$\hookleftarrow$	`\hookleftarrow`	$\hookrightarrow$	`\hookrightarrow`	$\searrow$	`\searrow`
$\leftharpoonup$	`\leftharpoonup`	$\rightharpoonup$	`\rightharpoonup`	$\swarrow$	`\swarrow`
$\leftharpoondown$	`\leftharpoondown`	$\rightharpoondown$	`\rightharpoondown`	$\nwarrow$	`\nwarrow`

Table 1: Old-style arrows provided by `old-arrows`.

The commands `\rightarrowfill` and `\leftarrowfill` allow to fill empty spaces with extensible arrows. For example, the first command written at the end of this paragraph gives the following result: $\longrightarrow$

4.2 Usage together with other packages

4.2.1 `amsmath`

The `old-arrows` package does not require `amsmath`. However, if you want to use the `amsmath` package, you must load it *before* `old-arrows`:

```
\usepackage{amsmath}
\usepackage{old-arrows}
```

The `amsmath` package provides over, under (table 2), extensible (table 3) arrows and operator names (table 4). Note that `amsmath` adds more space between the arrow above and the characters below, with a better typographical result. The commands `\overrightarrow{AB}` and `\overleftarrow{AB}`, without `amsmath`, produce respectively

$\overrightarrow{AB}$ rather than $\overrightarrow{AB}$ and $\overleftarrow{AB}$ rather than $\overleftarrow{AB}$.

The `amsmath` package also provides the command `\boldsymbol` for obtaining bold mathematical symbols, which can be used together with `old-arrows`. For example, the commands

```
$\boldsymbol{A \to B}$   and   $\boldsymbol{\overrightarrow{AB}}$
```

produce $\boldsymbol{A \to B}$ and $\boldsymbol{\overrightarrow{AB}}$, respectively.

$\overleftarrow{AB}$	`\overleftarrow{AB}`	$\underleftarrow{AB}$	`\underleftarrow{AB}`
$\overrightarrow{AB}$	`\overrightarrow{AB}`	$\underrightarrow{AB}$	`\underrightarrow{AB}`
$\overleftrightarrow{AB}$	`\overleftrightarrow{AB}`	$\underleftrightarrow{AB}$	`\underleftrightarrow{AB}`

Table 2: Old-style over and under arrows provided by `amsmath`.

$\xleftarrow{ABCDEF}$	`\xleftarrow{ABCDEF}`	$\xrightarrow{ABCDEF}$	`\xrightarrow{ABCDEF}`

Table 3: Old-style extensible arrows provided by `amsmath`.

$\varinjlim$	`\varinjlim`	$\varprojlim$	`\varprojlim`

Table 4: Old-style operator names provided by `amsmath`.

4.2.2 `lmodern`

The `old-arrows` package is fully compatible with the Latin Modern fonts, provided that you load the `lmodern` package *before* `old-arrows`.

```
\usepackage{lmodern}
\usepackage{old-arrows}
```

4.2.3 `stmaryrd`

The `old-arrows` package is also fully compatible with the St Mary's Road symbol font, always provided that you load the `stmaryrd` package *before* `old-arrows`.

```
\usepackage{stmaryrd}
\usepackage{old-arrows}
```

The `stmaryrd` package provides several arrow characters with small arrowheads, like `\shortrightarrow` ($\rightarrow$) and `\nnearrow` ($\nearrow$). However, without `old-arrows`, the commands `\mapsfrom` and `\longmapsfrom` produce the new-style arrows $\leftarrow\!\shortmid$ and $\longleftarrow\!\shortmid$. Instead, the `old-arrows` package allows you to obtain the old-style version of these arrows, as shown in table 5.

$\mapsfrom$	`\mapsfrom`	$\longmapsfrom$	`\longmapsfrom`

Table 5: Old-style arrows provided by `stmaryrd`.

4.2.4 `mathtools`

The `old-arrows` package can be used together with the `mathtools` package, always on condition that you load it *before* `old-arrows`.

```
\usepackage{mathtools}
\usepackage{old-arrows}
```

$\xleftrightarrow{ABCDEF}$	`\xleftrightarrow{ABCDEF}`	$\xmapsto{ABCDEF}$	`\xmapsto{ABCDEF}`
$\xhookleftarrow{ABCDEF}$	`\xhookleftarrow{ABCDEF}`	$\xhookrightarrow{ABCDEF}$	`\xhookrightarrow{ABCDEF}`

Table 6: Old-style extensible arrows provided by `mathtools`.

The `mathtools` package makes additional extensible arrows available (table 6).

Every extensible arrow can take an optional argument that produces a subscript. For example, the commands

`\xrightarrow[G]{ABCDEF}` and `\xmapsto[G]{ABCDEF}`

produce

$\xrightarrow[G]{ABCDEF}$ and $\xmapsto[G]{ABCDEF}$

Remark. It is very important that you load `old-arrows` *after* `amsmath`, `stmaryrd`, `lmodern` and `mathtools`, because many commands of these packages must be redefined by `old-arrows`. Otherwise, `old-arrows` won't work properly.

```
\usepackage{lmodern}
\usepackage{amsmath}
\usepackage{stmaryrd}
\usepackage{mathtools}
\usepackage{old-arrows}
```

4.3 The option new

Loading `old-arrows` with the option `new`

```
\usepackage[new]{old-arrows}
```

allows you to use the new-style and the old-style arrows simultaneously. In order to obtain new-style arrows, just put `\var` before every ordinary command, as shown in tables 7, 8, 9, 10, 11 and 12.

$\leftarrow$	`\varleftarrow` or `\vargets`	$\longleftarrow$	`\varlongleftarrow`	$\uparrow$	`\varuparrow`
$\rightarrow$	`\varrightarrow` or `\varto`	$\longrightarrow$	`\varlongrightarrow`	$\downarrow$	`\vardownarrow`
$\leftrightarrow$	`\varleftrightarrow`	$\longleftrightarrow$	`\varlongleftrightarrow`	$\updownarrow$	`\varupdownarrow`
$\mapsto$	`\varmapsto`	$\longmapsto$	`\varlongmapsto`	$\nearrow$	`\varnearrow`
$\hookleftarrow$	`\varhookleftarrow`	$\hookrightarrow$	`\varhookrightarrow`	$\searrow$	`\varsearrow`
$\leftharpoonup$	`\leftharpoonup`	$\rightharpoonup$	`\rightharpoonup`	$\swarrow$	`\varswarrow`
$\leftharpoondown$	`\leftharpoondown`	$\rightharpoondown$	`\rightharpoondown`	$\nwarrow$	`\varnwarrow`

Table 7: New-style arrows provided by option `new`.

$\overleftarrow{AB}$	`\varoverleftarrow{AB}`	$\underleftarrow{AB}$	`\varunderleftarrow{AB}`
$\overrightarrow{AB}$	`\varoverrightarrow{AB}`	$\underrightarrow{AB}$	`\varunderrightarrow{AB}`
$\overleftrightarrow{AB}$	`\varoverleftrightarrow{AB}`	$\underleftrightarrow{AB}$	`\varunderleftrightarrow{AB}`

Table 8: New-style over and under arrows provided by `amsmath` and the option `new` of `old-arrows`.

$\xleftarrow{ABCDEF}$	`\varxleftarrow{ABCDEF}`	$\xrightarrow{ABCDEF}$	`\varxrightarrow{ABCDEF}`

Table 9: New-style extensible arrows provided by `amsmath` and the option `new` of `old-arrows`.

$\varinjlim$	`\varvarinjlim`	$\varprojlim$	`\varvarprojlim`

Table 10: New-style operator names provided by `amsmath` and the option `new` of `old-arrows`.

$\mapsfrom$	`\varmapsfrom`	$\longmapsfrom$	`\varlongmapsfrom`

Table 11: New-style arrows provided by `stmaryrd` and the option `new` of `old-arrows`.

$\xleftrightarrow{ABCDEF}$	`\varxleftrightarrow{ABCDEF}`	$\xmapsto{ABCDEF}$	`\varxmapsto{ABCDEF}`
$\xhookleftarrow{ABCDEF}$	`\varxhookleftarrow{ABCDEF}`	$\xhookrightarrow{ABCDEF}$	`\varxhookrightarrow{ABCDEF}`

Table 12: New-style extensible arrows provided by `mathtools` and the option `new` of `old-arrows`.

Note that the commands

`\leftharpoonup`, `\rightharpoonup`, `\leftharpoondown`, `\rightharpoondown`

have not been redefined by `old-arrows`, because the corresponding characters $\leftharpoonup$, $\rightharpoonup$, $\leftharpoondown$, $\rightharpoondown$ have not been modified by the introduction of the new-style arrows.

The commands `\varrightarrowfill` and `\varleftarrowfill` allow to fill empty spaces with extensible arrows. For example, the first command written at the end of this paragraph gives the following result: $\longrightarrow$

If you want to use the option `new` and the option `only` provided by the `stmaryrd` package, you must write the command you wish to define in both ordinary and `\var` versions in the option list. For example:

```
\usepackage[only,mapsfrom,varmapsfrom]{stmaryrd}
\usepackage[new]{old-arrows}
```

says that only the symbols $\mapsfrom$ and $\varmapsfrom$ will be defined by `stmaryrd`.

Furthermore, with the option `new` it is also possibile to use the command `\boldsymbol` provided by `amsmath`. The following commands

`$\boldsymbol{A \varto B}$` and `$\boldsymbol{\varoverrightarrow{AB}}$`

produce $\boldsymbol{A \varto B}$ and $\boldsymbol{\varoverrightarrow{AB}}$ respectively.

4.4 The option old

If you want to use the old-style arrows only in a few cases, and maintain the new-style by default, then it is available the option `old`

```
\usepackage[old]{old-arrows}
```

that associates all of the commands with prefix `\var` to the old-style rather than the new one, which remains associated to the ordinary commands. For example, with the option `old` the commands

`$A \varleftarrow B$` and `$A \varto B$`

produce $A \varleftarrow B$ and $A \varto B$ respectively, while

`$A \leftarrow B$` and `$A \to B$`

produce $A \leftarrow B$ and $A \to B$, respectively.

It is not possible to load the options `new` and `old` simultaneously (if so, you will get an error message).

4.5 Additional arrow commands provided by `old-arrows`

The `old-arrows` package provides additional arrow commands that are listed in table 13.

Finally, there are extensible "mapsfrom" arrows (table 14) that are available only if both `mathtools` and `stmaryrd` are loaded together with `old-arrows` (as they depend on commands defined by these two packages).

$\hookrightarrow$	`\longhookrightarrow`	$\hookleftarrow$	`\longhookleftarrow`
$\hookrightarrow$	`\varlonghookrightarrow` [a]	$\hookleftarrow$	`\varlonghookleftarrow` [a]
$\leftharpoonup$	`\longleftharpoonup`	$\leftharpoondown$	`\longleftharpoondown`
$\rightharpoonup$	`\longrightharpoonup`	$\rightharpoondown$	`\longrightharpoondown`

[a] Available with the option `new`.

Table 13: Arrow commands provided by `old-arrows`.

$\xmapsfrom{ABCDEF}$	`\xmapsfrom{ABCDEF}`	$\varxmapsfrom{ABCDEF}$	`\varxmapsfrom{ABCDEF}` [a]

[a] Available with the option `new`.

Table 14: Extensible arrows provided by `old-arrows` together with `mathtools` and `stmaryrd`.