

The old-arrows package

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Version 1.2, released on October 11, 2015

Abstract

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

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1 Introduction

In 1992, Donald E. Knuth made some important corrections to Computer Modern fonts¹. As a consequence, the characters corresponding to arrows have been modified. Just to

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

make things clearer,

$$A \rightarrow B$$

became

$$A \rightarrow B$$

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

The `old-arrows` package with Old Arrows font family allows to use the old-style arrows (\rightarrow , \leftarrow , \dots) with the traditional commands (`\rightarrow`, `\leftarrow`, \dots). Furthermore, the option `new` allows to obtain simultaneously the new-style arrows (\rightarrow , \leftarrow , \dots) just placing `\var` before the corresponding commands (`\varrightarrow`, `\varleftarrow`, \dots).

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

3.1 Copying the files in the local texmf tree

The Old Arrows fonts files are:

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

These files were derived from Computer Modern fonts `cmsy5`, `cmsy7`, `cmsy10`, `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 $\text{MiK}\TeX$, it can be set up on any directory, by the Roots tab of “ $\text{MiK}\TeX$ Options”.

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

```
mktxlsr
```

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 L^AT_EX document

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

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

\leftarrow	<code>\leftarrow</code> or <code>\gets</code>	\longleftarrow	<code>\longleftarrow</code>	\uparrow	<code>\uparrow</code>
\rightarrow	<code>\rightarrow</code> or <code>\to</code>	\longrightarrow	<code>\longrightarrow</code>	\downarrow	<code>\downarrow</code>
\leftrightarrow	<code>\leftrightarrow</code>	\longleftrightarrow	<code>\longleftrightarrow</code>	\updownarrow	<code>\updownarrow</code>
\mapsto	<code>\mapsto</code>	\longmapsto	<code>\longmapsto</code>	\nearrow	<code>\nearrow</code>
\hookrightarrow	<code>\hookrightarrow</code>	\hookrightarrow	<code>\hookrightarrow</code>	\searrow	<code>\searrow</code>
\leftharpoonup	<code>\leftharpoonup</code>	\rightharpoonup	<code>\rightharpoonup</code>	\swarrow	<code>\swarrow</code>
\leftharpoondown	<code>\leftharpoondown</code>	\rightharpoondown	<code>\rightharpoondown</code>	\nwarrow	<code>\nwarrow</code>

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 makes additional over, under (table 2), extensible (table 3) arrows and operator names (table 4) available. 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

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

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

```
\boldsymbol{A \to B} \quad \text{and} \quad \boldsymbol{\overrightarrow{AB}}
```

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

\overleftarrow{AB}	<code>\overleftarrow{AB}</code>	$\underline{\leftarrow{AB}}$	<code>\underleftarrow{AB}</code>
\overrightarrow{AB}	<code>\overrightarrow{AB}</code>	$\underline{\rightarrow{AB}}$	<code>\underrightarrow{AB}</code>
\overleftrightarrow{AB}	<code>\overleftrightharrow{AB}</code>	$\underline{\overleftrightarrow{AB}}$	<code>\underleftrightharrow{AB}</code>

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

\overleftarrow{ABCDEF}	<code>\xleftarrow{ABCDEF}</code>	\overrightarrow{ABCDEF}	<code>\xrightarrow{ABCDEF}</code>
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Table 3: Old-style extensible arrows provided by `amsmath`.

\varinjlim	<code>\varinjlim</code>	\varprojlim	<code>\varprojlim</code>
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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 `\nrightarrow` (\nearrow). However, without `old-arrows`, the commands `\mapsfrom` and `\longmapsfrom` produce the new-style arrows \leftrightarrow and \longleftrightarrow . Instead, the `old-arrows` package allows to obtain the old-style version of these arrows, as shown in table 5.

\leftrightarrow	<code>\mapsfrom</code>	\longleftrightarrow	<code>\longmapsfrom</code>
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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}
```

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

\overleftarrow{ABCDEF}	<code>\xleftrightharrow{ABCDEF}</code>	\overmapsto{ABCDEF}	<code>\xmapsto{ABCDEF}</code>
$\overhookleftarrow{ABCDEF}$	<code>\xhookleftarrow{ABCDEF}</code>	$\overhookrightarrow{ABCDEF}$	<code>\xhookrightarrow{ABCDEF}</code>

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

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

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

produce

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

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 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	<code>\varleftarrow</code> or <code>\vargets</code>	\longleftarrow	<code>\varlongleftarrow</code>	\uparrow	<code>\varuparrow</code>
\rightarrow	<code>\varrightarrow</code> or <code>\varto</code>	\longrightarrow	<code>\varlongrightarrow</code>	\downarrow	<code>\vardownarrow</code>
\leftrightarrow	<code>\varleftrightharrow</code>	\longleftrightarrow	<code>\varlongleftrightharrow</code>	\updownarrow	<code>\varupdownarrow</code>
\mapsto	<code>\varmapsto</code>	\longmapsto	<code>\varlongmapsto</code>	\nearrow	<code>\varnearrow</code>
\hookrightarrow	<code>\varhookrightarrow</code>	\hookrightarrow	<code>\varhookrightarrow</code>	\searrow	<code>\varsearrow</code>
\leftharpoonup	<code>\leftharpoonup</code>	\rightharpoonup	<code>\rightharpoonup</code>	\swarrow	<code>\varswarrow</code>
\leftharpoondown	<code>\leftharpoondown</code>	\rightharpoondown	<code>\rightharpoondown</code>	\nwarrow	<code>\varnwarrow</code>

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

\overleftarrow{AB}	<code>\varoverleftarrow{AB}</code>	\overleftarrow{AB}	<code>\varunderleftarrow{AB}</code>
\overrightarrow{AB}	<code>\varoverrightarrow{AB}</code>	\overrightarrow{AB}	<code>\varunderrightarrow{AB}</code>
\overleftrightarrow{AB}	<code>\varoverleftrightharrow{AB}</code>	\overleftrightarrow{AB}	<code>\varunderleftrightharrow{AB}</code>

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

\overleftarrow{ABCDEF}	<code>\varxleftarrow{ABCDEF}</code>	\overrightarrow{ABCDEF}	<code>\varxrightarrow{ABCDEF}</code>
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Table 9: New-style extensible arrows provided by `amsmath` and the option `new` of `old-arrows`.

\varinjlim	<code>\varvarinjlim</code>	\varprojlim	<code>\varvarprojlim</code>
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Table 10: New-style operator names provided by `amsmath` and the option `new` of `old-arrows`.

\mapsto	<code>\varmapsfrom</code>	\longmapsto	<code>\varlongmapsfrom</code>
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Table 11: New-style arrows provided by `stmaryrd` and the option `new` of `old-arrows`.

\overleftarrow{ABCDEF}	<code>\varxleftrightharrow{ABCDEF}</code>	\overmapsto{ABCDEF}	<code>\varxmapsto{ABCDEF}</code>
\overleftarrow{ABCDEF}	<code>\varxhookrightarrow{ABCDEF}</code>	\overrightarrow{ABCDEF}	<code>\varxhookrightarrow{ABCDEF}</code>

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 \leftarrow , \rightarrow , \longleftarrow , \longrightarrow 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: $\xrightarrow{\hspace{10em}}$

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 \mapsto and \varmapsto will be defined by `stmaryrd`.

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

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

produce $A \rightarrow B$ and \overrightarrow{AB} respectively.

4.4 Additional arrow commands provided by `old-arrows`

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

\longleftrightarrow	<code>\longhookrightarrow</code>	\longleftarrow	<code>\longhookleftarrow</code>
\varlongleftrightarrow	<code>\varlonghookrightarrow</code> ^a	\varlongleftarrow	<code>\varlonghookleftarrow</code> ^a
\longleftarrow	<code>\longleftarrow</code>	\longleftarrow	<code>\longleftarrow</code>
\longrightarrow	<code>\longrightarrow</code>	\longrightarrow	<code>\longrightarrow</code>

^aAvailable with the option `new`.

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

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).

\xleftarrow{ABCDEF} `\xmapsfrom{ABCDEF}` \xleftarrow{ABCDEF} `\varxmapsfrom{ABCDEF}`^a

^aAvailable with the option `new`.

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