Package `envmath`*

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Abstract

Documentation for the package `envmath`.

1 Introduction

This package provides some useful math-commands and enviroments, which are simpler to use and prettier then their standard LaTeX counterpart.

In particular some commands are redefined[1], so care should be taken, expecially when including this package in an already existent LaTeX file.
The redefined commands are:
`\(`, `\)`, `\[`, `\]`, `\{` and `\}`
The effect of "`\( ... \)`" can still be achieved by the LaTeX equivalent commands "`\begin{math} ... \end{math}`" or "`$ ... $`".
Similarly, the effect of "`\[ ... \]`" can be achieved by the LaTeX equivalent commands "`\begin{displaymath} ... \end{displaymath}`" or "`$$ ... $$`".
The "`\{`" and "`\}`" commands are the more error-prone, since one may try to use "`\left\{`", which now is incorrect, because the "`\{`" command already contains a "`\left`" declaration. In the rare occasions where a brace of normal size is needed, one can use the LaTeX commands "`\lbrace`" and "`\rbrace`"
Also the "`equation`" environment has been changed, but it is completly compatible with the original definition, so it should be safe,

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[1]See the options in next section if you don't want these comand to be redefined

perhaps except when the first character of the equation is an open square bracket or it is placed in a moving argument: in fact, the new version of this command is fragile, and this is true also for most of the commands defined by this package.

2 Backward compatibility

The package has been renamed from "`mathenv`" to "`envmath`", in order to avoid conflicts with another package with the same name: if you were using the "old" package, you need to change your LaTeX files in order to include the new ones.
Alternatively, you can also rename the package to give it the "old" name (you need to change also the "`\def\FileName{...}`" line inside the "`sty`"-file), but you must take care not to have another package with the same name installed on your system.

3 The options

At now, five options are available with the `envmath` package.
The "`RedefEquation`"/"`StdEquation`" and "`RedefBrackets`"/"`StdBrackets`" options control whether the "`equation`" environment and the brace commands "`\(`", "`\(`", "`\)`", "`\[`", "`\]`", "`\{`" and "`\}` should be redefined or retain their original LaTeX meaning. More precisely, "`RedefEquation`" (default) redefines the "equation" environment to have an optional argument (used as a label), while "`StdEquation`" leaves it unchanged. In the first case, the "equation" environment will be equivalent to the "Equation" environment (capitalized!) described below, whereas in the second case they will be different. Similarly, the "`RedefBrackets`" option (default) makes the brackets command to be redefined, whilst "`StdBrackets`" leave them their original meaning. Also a "`Standard`" option exists, which amounts to specify both the "`StdEquation`" and "`StdBrackets`" options, thus making the package fully standard, which may be useful when sending your LaTeX files to someone else.

4 Math-mode environments

This package provides three math-mode environments, each with a "*-form" which does not generates numbers.

4.1 The `Equation` environment

The "`Equation`" environment has an optional argument which is used as a label to reference it.

```
\begin{Equation}[label]
        ...
\end{Equation}
```

If the "`RedefEquation`" option is in effect (default), then the "`equation`" environment is redefined to have the same optional argument as "`Equation`".

There is also a *-form, which does not generate a number (so this *-form is really a "displaymath" and not an equation, but it has been added for simmetry and for making it easier to add or remove the number to a formula).
The *-form has an optional argument like the non-* form, which is disregarded by the environment and is added only for simmetry reasons.

```
\begin{equation*}[disregarded-label]
        ...
\end{equation*}
```

4.2 The `MultiLine` equation environment

The "`MultiLine`" environment is intended for formulas that don't fit on a single line, and so must be broken across lines.
As for the `Equation` environment above, it has an optional argument which is used as a label.
All the lines but the first are automatically indented by the lenght "`\MultiLineIndent`", which is rougthly what one expects, but can be changed at any time by the user with "`\setlenght{\MultiLineIndent}{...}`".
You can also control the alignment of the continuation rows by placing an optional `&` in the first row: is such a case all the others line will *not* be indented by "`\MultiLineIndent`" but wil behave *as if* there there were an ampersand in front of them (i.e. they will be left-aligned at the right of the & in the first row).
Each line but the last must end with a "`\\`" command (which can have an optional argument to add some vertical space between lines).
When the line is broken in the middle (e.g. after a "+" sign) and not at the end (i.e. after a "=" or similar), the *-form "`\\*`" may

be used to indicate the line-break, the difference being in an extra space added at the beginning of the next line. The width of a thise space defaults to 1em and can be changed by the user with "`\setlenght{\MultiLineStarIndent}{...}`".

```
\begin{MultiLine}[label]
      ... [&]= ... =   \\
             = ... +   \\*
               + ... = \\
             = ...
\end{MultiLine}
```

Also this environment has a *-form which differs only in that it does not generate an equation number.

```
\begin{MultiLine*}[disregarded-label]
      ... [&]= ... =   \\
             = ... +   \\*
               + ... = \\
             = ...
\end{MultiLine*}
```

4.3 The `System` environment

The "`System`" environment is used for grouping a set of equations together inside a left brace, with one only equation number.
Again there is an optional argument to indicate a label and each equation is separated by a "`\\`" or "`\\*`" command, as for the "`MultiLine`" environment.
The rows (except the ones ended with the *-form "`\\*`") may optionally contain one "`&`", which is usually used when some text should be added to the equation.

```
\begin{System}[label]
    ... = ...   [& ...] \\
    ... = ... +         \\*
      + ...     [& ...] \\
    ... = ...   [& ...]
\end{System}
```

A *-form which does not generate any number is also provided.

```
\begin{System*}[disregarded-label]
    ... = ...   [& ...] \\
```

```
    ... = ... +          \\*
      + ...      [& ...] \\
    ... = ...    [& ...]
\end{System*}
```

4.4 The `EqSystem` environment

The "`EqSystem`" environment is used for grouping a set of equations together inside a left brace, each with its own equation number.
Again there is an optional argument to indicate a label and each equation is separated by a "`\\`" or "`\\*`" command.
The rows may optionally contain one "`&`", which is usually used when some text should be added to the equation.

```
\begin{EqSystem}[label]
    ... = ...    [& ...] \\    % (1.1)
    ... = ... +          \\*   % (1.2)
      + ...      [& ...] \\    % (1.3)
    ... = ...    [& ...]       % (1.4)
\end{EqSystem}
```

A *-form is also provided: it differs in that each equation is numbered with the same number but with a lowercase letter added, i.e. like (1.1a), (1.1b), etc. instead of (1.1), (1.2) and so on.

```
\begin{EqSystem*}[label]
    ... = ...    [& ...] \\   % (1.5a)
    ... = ... +          \\*  % (1.5b)
      + ...      [& ...] \\   % (1.5c)
    ... = ...    [& ...]      % (1.5d)
\end{EqSystem*}
```

In both cases, if the optional argument is present, each equation can be referenced by `\ref{<label>:a}`, `\ref{<label>:b}`, ..., where `<label>`, stands for the string used as optional argument. In the case of the *-form, a reference of the kind `\ref{<label>}` will print the equation number without any letter, thus referring to the system as a whole, whereas such a reference is meaningless (and indeed does not exists) when dealing with the non *-form.

5 Math-mode commands

In addition to the previously mentioned environments, the `envmath` package defines also some of math-mode commands which consider-

ably simplify the use of adjustable-size parentheses.
The "`\(`", "`\[`", "`\{`", "`\)`", "`\]`" and "`\}`" generates the corresponding parenthesis but with a "`\left`" or "`\right`" declaration (respectively) added, so they must come in matched pairs or coupled with a "`\left.`" or "`\rigtht.`" or another adjustable-size delimiter.

6 Implementation

```
%%
\NeedsTeXFormat{LaTeX2e}[1995/12/01]
\ProvidesPackage{\FileName}[\filedate\space v\fileversion\space\filedescr]
%%
\newif\if@Redefine@Equation@
\DeclareOption{RedefEquation}{\@Redefine@Equation@true}
\DeclareOption{StdEquation}{\@Redefine@Equation@false}
%%
\newif\if@Redefine@Brackets@
\DeclareOption{RedefBrackets}{\@Redefine@Brackets@true}
\DeclareOption{StdBrackets}{\@Redefine@Brackets@false}
%%
\DeclareOption{Standard}{\@Redefine@Equation@false\@Redefine@Brackets@false}
%%
\ExecuteOptions{RedefEquation,RedefBrackets}
```

The "`\ProcessOptions*`" command was used here instead of "`\ProcessOptions*`" in order to process the options in the "`\usepackage`" order, rather than in the declaration order

```
%%
\ProcessOptions*
```

`\StartMath@Err` The "`\StartMath@Err`" prints an error message if used in math-mode (saying that you can't use the command passed to it as an argument in math-mode); otherwise it just enters math-mode through a `$$`. It is used by the *-form of the math-environments to prevent their use in math-mode.

```
%%
\newcommand*\StartMath@Err[1]{%
\ifmmode\PackageError{\FileName}{%
You can't use environment ``#1'' in math mode}{%
You probably used ``\string\end{#1}'' without a previous ``\string\begin{#1}''.}%
\else$$\fi%
}
```

`Equation` The definition of the original "`equation`" environment is first saved in the "`\@StandardEquation`" command. Then the "`\@LabelledEquation`" command is defined as an `equation` with a label. The `Equation` command simply calls "`\@LabelledEquation`" or "`\@StandardEquation`", depending on the presence or absence of the optional argument (indicated by the square bracket).

```
%%
```

```
\AtBeginDocument{%
\let\@StandardEquation=\equation
}
\def\@LabelledEquation[#1]{\@StandardEquation\label{#1}}
\newenvironment{Equation}{%
\@ifnextchar[{\@LabelledEquation}{\@StandardEquation}%
}{%
\endequation%
}
```

If the "RedefEquation" option is in effect, equation is defined to be the same as Equation. The actual definition of the equation environment is deferred at the "\begin{document}" in order to minimize the possibility of conflicts with other packages.

```
\if@Redefine@Equation@
  \AtBeginDocument{\let\equation=\Equation}
\fi
```

equation* The command "\Equation@Star" simply enters math-mode (via the "\StartMath@Err" command). The definition of "equation*" is deferred at the "\begin{document}" so that this definition takes precedence over the analogue one from the "amsmath" package, if both are included. The command "\global\@ignoretrue" in the definition of "\end{equation*}" prevents spurious spaces at the beginning of next line.

```
%%
\def\Equation@Star[#1]{\StartMath@Err{equation*}}
\AtBeginDocument{%
\@namedef{equation*}{\@ifnextchar[{\Equation@Star}{\Equation@Star[]}}%
\@namedef{endequation*}{$$\global\@ignoretrue}%
}
```

\ARRAY@CR The original definition of "\@arraycr" is saved in the command "\@ArrayCR". Then "\ARRAY@CR" is defined to do the same job of "\@arraycr" and add a "\displaystyle" declation at the beginning of next row.

```
%%
\let\@ArrayCR=\@arraycr
\def\@ArrayCR@quadra[#1]{\@ArrayCR[#1]\displaystyle}
\def\@ArrayCR@star@quadra[#1]{%
\@ArrayCR[#1]\displaystyle\mbox{\hspace{\SystemStarIndent}}%
}
\def\@ArrayCR@star*{%
```

```
\@ifnextchar[{\@ArrayCR@star@quadra}{%
\@ArrayCR\displaystyle\mbox{\hspace{\SystemStarIndent}}}}%
\newcommand*{\ARRAY@CR}{\@ifnextchar*{\@ArrayCR@star}{%
\@ifnextchar[{\@ArrayCR@quadra}{\@ArrayCR\displaystyle}}%
}
```

`\MakeAmper@Active` Makes "&" active (instead of a tab marker), giving it the meaning specified by the argument.

```
%%
\newcommand*\MakeAmper@Active[1]{
\global\def\@AMPERSAND{#1}%
\begingroup%
  \catcode`\~\active  \lccode`\~`\&%
  \lowercase{%
  \global\expandafter\let
     \csname ac\string\&\endcsname~%
  \gdef~{\@AMPERSAND}}%
\endgroup%
\global\catcode`\&\active%
}
```

`\MakeAmper@Tab` Restores "&" to its original meaning (a tab marker).

```
%%
\newcommand*\MakeAmper@Tab{\global\catcode`\&=4}
```

`\OneShot@Amper` Makes "&" active for one occurrence only: when encountered, the code in the first argument is executed, then "&" is restored to its original meaning, a tab marker is inserted, and finally the code in the second argument is executed.

```
%%
\newcommand*\OneShot@Amper[2]{%
\MakeAmper@Active{#1\expandafter\MakeAmper@Tab&#2}%
}
```

`\MultiLineIndent` The length "`\MultiLineIndent`" represents the amount of spece by which each line but the first of a "`MultiLine`" environment is indented. It defaults to 1.7em, which is roughtly equal to the width of a character followed by an equal sign (e.g.: "`A = `").

```
%%
\newlength\MultiLineIndent
\setlength{\MultiLineIndent}{1.7em}
```

`\MultiLineStarIndent` The length "`\MultiLineStarIndent`" represents the amount of spece by which each line following a "`\\*`" in a "`MultiLine`" environment

is indented. It defaults to 1em, which is roughtly equal to the width of a an equal sign (e.g.: "=").

```
%%
\newlength\MultiLineStarIndent
\setlength\MultiLineStarIndent{1em}
```

\@MultiLineCR The "\@MultiLineCR" command does the original job of "\@arrycr" (saved in "\ArrayCR") and then executes the "\ML@EveryRow" command. In the *-form it also adds a space equal to "\MultiLineStarIndent". The splitting in subcommands is required in order to pass the optional argument to "\@ArrayCR" and not to the last executed command.

```
%%
\newcommand*\@MultiLineCR{%
\@ifnextchar*{\MLineCR@star}{%
\@ifnextchar[{\MLineCR@quadra}{\@ArrayCR\ML@EveryRow}}%
}
\def\MLineCR@star*{%
\@ifnextchar[{\MLineCR@star@quadra}{%
\@ArrayCR\ML@EveryRow\hspace{\MultiLineStarIndent}}%
}
\def\MLineCR@star@quadra[#1]{%
\@ArrayCR[#1]%
\ML@EveryRow%
\hspace{\MultiLineStarIndent}%
}
\def\MLineCR@quadra[#1]{\@ArrayCR[#1]\ML@EveryRow}
```

The "MultiLine" environment starts by setting "\ML@EveryRow" to be equivalent to "\@MultiLINEcr", so that this command is executed at the end of the first row. It checks the \catcode of & and redefines "\ML@EveryRow" accordingly: if & is a tab marker (\catcode=4), an ampersand has occurred in the first row, so that each row must begin itself with an ampersand; otherwise (i.e. if the \catcode of & is *active*) no ampersand were found in the first row, so that each line must begin with a space equal to "\MultiLineStarIndent".

```
\newcommand*\@MultiLINEcr{%
\ifnum\catcode`\&=4%
\global\def\ML@EveryRow{&\displaystyle\mbox{}}%
\else%
\MakeAmper@Tab%
\global\def\ML@EveryRow{\displaystyle\mbox{\hspace{\MultiLineIndent}}}%
\fi%
```

```
\ML@EveryRow%
}
```

`\CONTINUE` The command "`\CONTINUE`" is obsolete: you should use "`\\*`" instead.

```
%%
\newcommand*{\CONTINUE}{%
\PackageError{\FileName}{%
Command ``\string\CONTINUE'' is obsolete: use ``\string\\*'' instead}{%
You'd better correct your input file as stated above,\MessageBreak%
but if you press ENTER everything will work for the moment.}%
\MLineCR@star*%
}
```

`MultiLine` The internal commad "`\Start@MultiLine`" is used by the "`MultiLine`" and "`MultiLine*`" environments. It makes & add a "`\displaystyle`" declaration. It also changes the meaning of "`\\`" to "`\@MultiLineCR`", sets "`\ML@EveryRow`" to its default value "`\@MultiLINEcr`" and then starts an "`array`" environment (we already are in math-mode here) with one only column which is left aligned. Finally, if there is an optional argument it is used as a "`\label`" or ignored, depending on the current meaning of "`\@LABEL`" (which is the same as "`\label`" in the standard form and does nothing in the *-form).

```
%%
\newcommand*\Start@MultiLine{%
\@ifnextchar[{\Start@MultiLine@quadra}{\Start@MultiLine@no}%
}
%%
\def\Start@MultiLine@quadra[#1]{\@LABEL{#1}\Start@MultiLine@no}
%%
\newcommand*\Start@MultiLine@no{%
\OneShot@Amper{}{\displaystyle}%
\let\@arraycr=\@MultiLineCR%
\let\ML@EveryRow=\@MultiLINEcr%
\begin{array}{l@{\hspace{0.3em}}l}%
\displaystyle%
}
```

The internal command "`\Stop@MultiLine`" is used by the "`MultiLine`" and "`MultiLine*`" environments. It simply closes the "`array`" environment anr restores "`\@arrycr`" to its original meaning.

```
%%
\newcommand*\Stop@MultiLine{%
\end{array}%
```

```
\let\@arraycr=\@ArrayCR%
\MakeAmper@Tab% % For the case no ``\\'' is used
}
```

The "MultiLine" environment invokes "\Start@MultiLine" and "\Stop@MultiLine" inside an "equation" environment.

```
%%
\newenvironment{MultiLine}{%
\let\@LABEL=\label%
\@StandardEquation%
\Start@MultiLine%
}{%
\Stop@MultiLine%
\endequation%
\global\@ignoretrue%
}
```

MultiLine* The "\MultiLine@Star" command issues an error message if used inside math mode, while when in text mode starts a "displaymath" environment (throught the "$$" command) in which a "\Start@MultiLineEq" command is issued (so it is the same as "\Label@MultiLineEq", but with "\equation" substituted by "$$").

```
%%
\@namedef{MultiLine*}{\ifmmode\Not@MathErr{MultiLine*}\else$$\fi%
\def\@LABEL##1{}%
\Start@MultiLine%
}
\@namedef{endMultiLine*}{\Stop@MultiLine$$\global\@ignoretrue}
```

System The "\@System@Def" command is the kernel of the "System" and "System*" environments. It redefines "\@arraycr" so that "\\" not only ends the line but also adds a "\displaystyle" declaration. Then it draws an adjustable-size left brace, which will be as big as the system requires. Finally, a two-column array environment with a "\qquad" space between the columns is started and a "\displaystyle" declaration is added to the first row.

```
%%
\newcommand*\@System@Def{%
\let\@arraycr=\ARRAY@CR%
\left\lbrace%
\begin{array}{l@{\qquad}l@{}}%
\displaystyle%
}
```

The "\Label@System" commands opens an equation environment, issues a "\label" command for cross-referencing, and then calls the command "\@System@Def" defind above.

```
\def\Label@System[#1]{\@StandardEquation\label{#1}\@System@Def}
```

The "\begin{System}" command does the same things, skipping the "\label" command if there isn't the optional parameter. The "\end{System}" command closes the array, puts an invisible delimiter ("\right.") which pairs with the left brace of the "\@System@Def" command, restores "\@arraycr" to its original meaning, ends the equation, and prevents spurious spaces by issuing the command "\global\@ignoretrue".

```
\newenvironment{System}{%
\@ifnextchar[{\Label@System}{\@StandardEquation\@System@Def}%
}{%
\end{array}%
\right.%
\endequation%
\let\@arraycr=\@ArrayCR%
\global\@ignoretrue%
}
```

System*

The "\System@Star" command generates en error message when used in math-mode, and calls "\@System@Def" inside a "displaymath" environment (the "$$") when used in text-mode.

```
%%
\def\System@Star[#1]{\StartMath@Err{System*}\@System@Def}
```

The "System*" environment is the same as "System", but with "\begin{equation}...\end{equation}" substituted by "$$...$$".

```
\@namedef{System*}{\@ifnextchar[{\System@Star}{\System@Star[]}}
\@namedef{endSystem*}{\end{array}\right. $$\let\@arraycr=\@ArrayCR \global\@ignoretr
```

EQNarray

The EQNarray environment is only for backward compatibility: use the equationarry environment from package eqnarray if you need more control than an eqnarray environment allows.

```
%%
\newenvironment{EQNarray}{%
\PackageError{\FileName}{Environment ``EQNarray'' is obsolete}{%
Use the ``equationarry'' environment from the ``eqnarray'' package instead!}%
\eqnarray%
}{%
\endeqnarray%
}
```

ep,\SystemStarIndent

```
%%
\newlength\SystemColSep
\setlength\SystemColSep{2em}
%%
\newlength\SystemBraceSep
\setlength\SystemBraceSep{3pt}
%%
\newlength\SystemStarIndent
\setlength\SystemStarIndent{2em}
```

EqSystem

```
%%
\newsavebox{\SysRow@Box}
\newlength\ColOne@Width
\newlength\ColTwo@Width
\newlength\SysCol@TmpWidth
%%
\newcommand*\Start@EqSysRow{%
\OneShot@Amper{%
$\end{lrbox}%
\settowidth\SysCol@TmpWidth{\usebox{\SysRow@Box}}%
\ifnum\SysCol@TmpWidth>\ColOne@Width\global\setlength\ColOne@Width\SysCol@TmpWidth\f
\usebox{\SysRow@Box}%
}{%
\begin{lrbox}{\SysRow@Box}$\displaystyle%
}%
\begin{lrbox}{\SysRow@Box}$\displaystyle%
}
%%
\newcommand*\Stop@EqSysRow{%
$\end{lrbox}%
\settowidth\SysCol@TmpWidth{\usebox{\SysRow@Box}}%
\ifnum\catcode`\&=4%
\ifnum\SysCol@TmpWidth>\ColTwo@Width\global\setlength\ColTwo@Width\SysCol@TmpWidth\f
\else%
\MakeAmper@Tab%
\ifnum\SysCol@TmpWidth>\ColOne@Width\global\setlength\ColOne@Width\SysCol@TmpWidth\f
\fi%
\usebox{\SysRow@Box}%
}
%%
\def\@EqSystCR@star@quadra[#1]{%
```

```
\Sys@@eqncr%
\noalign{\penalty\@eqpen\vskip #1\relax}%
\Start@EqSysRow%
\mbox{\hspace{\SystemStarIndent}}%
}
%%
\def\@EqSystCR@star*{%
\global\@eqnswfalse%
\@ifnextchar[{\@EqSystCR@star@quadra}{%
\Sys@@eqncr\Start@EqSysRow\mbox{\hspace{\SystemStarIndent}}}%
}
%%
\def\@EqSystCR@quadra[#1]{%
\Sys@@eqncr%
\noalign{\penalty\@eqpen\vskip #1\relax}%
\Start@EqSysRow%
}
%%
\newcommand*\EqSyst@CR{%
\Stop@EqSysRow%
\@ifnextchar*{\@EqSystCR@star}{%
\@ifnextchar[{\@EqSystCR@quadra}{\Sys@@eqncr\Start@EqSysRow}}%
}
%%
\let\Label@EqSystem=\relax
%%
\newcommand*\Sys@@eqncr{%
\let\reserved@a\relax%
\ifcase\@eqcnt\def\reserved@a{& &}%     %% \@eqcnt = 0
\or\def\reserved@a{&}%                  %% \@eqcnt = 1
\else%                                  %% \@eqcnt > 1
\let\reserved@a\@empty%
\PackageError{\FileName}{Too many columns in EqSystem environment}{%
You can use at most one ``&'' in each row of an ``EqSystem'' environment.}%
\fi%
\reserved@a%
\if@eqnsw\Label@EqSystem\@eqnnum\stepcounter{equation}\fi%
\global\@eqnswtrue%
\global\@eqcnt\z@%
\cr%
}
%%
\newenvironment{EqSystem}[1][\relax]{%
```

```
\setcounter{EqSys@counter}{0}%
\def\Label@EqSystem{#1}%
\def\@tempa{\relax}%
\ifx\Label@EqSystem\@tempa\else%
\def\Label@EqSystem{\stepcounter{EqSys@counter}\label{#1:\alph{EqSys@counter}}}%
\fi%
\BEGIN@EqSystem%
}{%
\Stop@EqSysRow%
%%%-------------------- \endEQNarr@y ----------------------%
\Sys@@eqncr%
\egroup%
\global\advance\c@equation\m@ne%
$$%
%%%-------------------------------------------------------%
\vspace*{-\belowdisplayskip}%
\end{minipage}%
\advance\ColTwo@Width\ColOne@Width%
\advance\ColTwo@Width\SystemColSep%
\setlength\SysCol@TmpWidth\displaywidth%
\global\advance\SysCol@TmpWidth-\ColTwo@Width%
\global\divide\SysCol@TmpWidth\tw@%
\global\advance\SysCol@TmpWidth\ColTwo@Width%
\global\advance\SysCol@TmpWidth\SystemBraceSep% %% Space around left-brace
\global\advance\SysCol@TmpWidth 1em%    %% ~= Left-brace size
\hspace{-\SysCol@TmpWidth}%
\right\lbrace%
\advance\SysCol@TmpWidth-1em%           %% ~= Left-brace size
\hspace*{\SysCol@TmpWidth}%
$$\global\@ignoretrue%
}
%%
\newcommand*\BEGIN@EqSystem{%
\setlength\ColOne@Width\z@%
\setlength\ColTwo@Width\z@%
$$\left.%
\begin{minipage}{\displaywidth}%
\vspace*{-\abovedisplayskip}%
%%%-------------------------- \EQNarr@y --------------------%
\stepcounter{equation}%
\let\@currentlabel=\theequation%
\global\@eqnswtrue%
\global\@eqcnt\z@%
```

```
\tabskip\@centering%
\let\\=\EqSyst@CR%
$$\halign to \displaywidth\bgroup%
\tabskip\z@{##}\hfil%
&\global\@eqcnt\@ne%
\hspace{\SystemColSep}{##}\hfil%
\tabskip\@centering%
&\llap{##}\tabskip\z@\cr%
%%%----------------------------------------------------------%
\Start@EqSysRow%
}
```

EqSystem*

```
%%
\newcounter{EqSys@counter}
%%
\newcommand*\EqSystem@Star[1][\relax]{%
\stepcounter{equation}%
\setcounter{EqSys@counter}{\value{equation}}%
\def\Label@EqSystem{#1}%
\def\@tempa{\relax}%
\ifx\Label@EqSystem\@tempa\else%
\let\@currentlabel=\theequation%
\label{#1}%
\def\Label@EqSystem{\label{#1:\alph{equation}}}%
\fi%
\let\INNER@theEQUATION=\theequation%
\xdef\inner@theEQUATION{\theequation}%
\def\theequation{\inner@theEQUATION\alph{equation}}%
\setcounter{equation}{0}%
\BEGIN@EqSystem%
}
%%
\@namedef{EqSystem*}{\EqSystem@Star}
%%
\@namedef{endEqSystem*}{%
\endEqSystem%
\setcounter{equation}{\value{EqSys@counter}}%
\global\let\theequation=\INNER@theEQUATION%
}
```

The LaTeX environments `math` and `displaymath` are redefined so that they will not be affected by the subsequent redefinition of the brackets commands. The redefinition of the brackets commands is

deferred at the `\begin{document}`, so that other packages may use the original definitions and cannot override the new ones. It only takes place if the "`RedefBrackets`" option is in effect.

```
\if@Redefine@Brackets@
  \AtBeginDocument{%
    \let\math=\(
    \let\endmath=\)
    \let\displaymath=\[
    \let\enddisplaymath=\]
    \renewcommand*{\(}{\left(}%
    \renewcommand*{\)}{\right)}%
    \renewcommand*{\[}{\left[}%
    \renewcommand*{\]}{\right]}%
    \renewcommand*{\{}{\left\lbrace}%
    \renewcommand*{\}}{\right\rbrace}%
  }
\fi
```

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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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Change History

v0.1

General: First release (basic environments) 1

v0.2

General: Added the "*-form" of environments 1

v1.0

General: Documentation added 1

v1.1

General: "EQNarray" and "EqSystem" environments 1

v1.2
General: Options to behave like “Standard” LateX . . 1
v1.3
General: Documentation updated 1
v2.0
General: Separated from package “mathcmd” 1
v2.1
General: “MultiLine” and “EqSystem” environments reimplemented; “EQNarray” environment and “CONTINUE” command made obsolete 1
v2.2
General: “@StandartEquation” deferred “AtBeginDocument”; some “def” replaced by “newcommand*”; documentation updated 1
v2.3
General: Added copyright notice and changed addresses 1
v2.4
General: Usage of the double-quote character (”) avoided 1
v2.5
General: Package renamed from “mathenv” to “envmath” to avoid name conflicts 1