# The mdframed package <sup>1</sup>

auto-split frame environment

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The standard methods for framing text (\fbox or \fcolorbox) require you to handle page breaks by hand, meaning that you have to split the \fbox into two. The present package defines the environment mdframed which automatically deals with pagebreaks in framed text.

By defining new environments the user may choose between several individual designs.

Linked files: mdframed-example-default.pdf mdframed-example-tikz.pdf mdframed-example-pstricks.pdf mdframed-example-texsx.pdf

FYI: I create a repository for mdframed on github where you can download the current development status.

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## 1. Motivation

Many users wish to (further) emphasize lemmata, definitions, proofs, etc. The package mdframed allows you to create environments with breakable frames. I think an example is the best way to

<sup>&</sup>lt;sup>1</sup>Extending the package framed.sty

demonstrate its properties.

**Theorem 1.1 (Pythagorean theorem)** In any right triangle, the area of the square whose side is the hypotenuse is equal to the sum of the areas of the squares whose sides are the two legs.

$$a^2 + b^2 = c^2$$

The frame was defined with the following settings.

```
\new mdtheorem env [\%]
   outerlinewidth
                                          ,%
                     = 2
                      = 10 \, \mathrm{pt}
   roundcorner
   leftmargin
                      = 40
                                          ,%
   rightmargin
                      = 40
   backgroundcolor = yellow!40
   outerlinecolor = blue!70!black
                                          ,%
                                          ,%
   innertopmargin = \backslash topskip
                                          ,%
   splittopskip
                      = \setminus topskip
   ntheorem
                      = true
  [{ theorem } { Theorem } [ section ]
\begin{theorem} [Pythagorean theorem]
\end{theorem}
```

## 2. Syntax

#### Required packages by mdframed

The package itself loads the packages

```
kvoptions xparse etoolbox color.
```

Depending on the option framemthod mdframed will load

```
xcolor tikz pstricks.
```

Load the package as usual:

Only the option framemethod should be loaded by the optional argument of \usepackage. All other options should be loaded with \mdfsetup or related environments. The package should be loaded after amsthm if you need the package.

#### Provided environment

The package defines only one environment with the following syntax:

```
<CONTENT>
\setminusend\{mdframed\}
```

To create own environments with mdframed see section 4.

#### **Autodetecting floats**

mdframed detects whether the environment is used inside float or minipage environments. If you use mdframed in such an environment mdframed will use the option nobreak automatically.

## 3. The frames

Normally you can say mdframed draws only some lines. To allow page breaks the following designs are supported. If you load the package with framemethod=default you can only draw a single line. Inside the gray boxes of the images below the text will be printed.

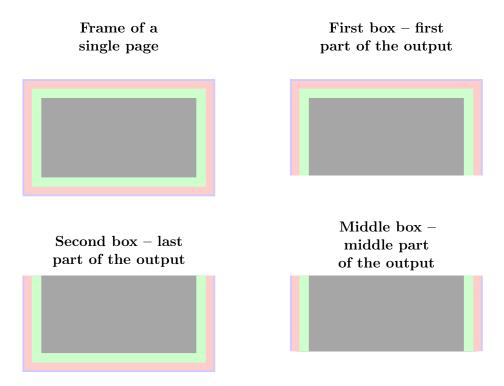


Figure 1: The basic frames

### 4. Commands

The following commands should countenance your by the handling with mdframed.

#### \newmdenv[options]{env-name}

The command allows the definition of a new environment which is surrounded by mdframed. The command has the following syntax:

\newmdenv[<MDFRAMED OPTIONS>]{Name of the environment}

In this way you can say:

```
\newmdenv[linecolor=red,frametitle=Infobox]{infobox}
\begin{infobox}[backgroundcolor=yellow]
Some Infos\ldots
\end{infobox}
```

#### \renewmdenv[options]{env-name}

By using this command you can redefine environments which are created by \newmdenv.

#### \surroundwithmdframed[options]{environment}

Sometimes you have predefined environments. This commands allows you to surround an predefined environment with mdframed without changing the original name. To set a mdframed around the environment verbatim you can simple say.

```
\sl variound with mdframed [linewidth=2pt] \{verbatim\}
```

#### \mdflength{options}

If you want to work with length defined by mdframed (for example innerleftmargin) you can use the command \mdflength.

```
The distance is \hspace{\mdflength{innerleftmargin}}\ \the\mdflength{innerleftmargin}
```

The result will be:

The distance is 10.0pt

## \mdfsetup{options}

To set the options you can use the optional argument of \usepackage or you can use the command \undersetup which is not limited to the preamble. Inside a group the settings work only local.

At this point I want to recommend the usage of the command \mdfsetup instead of setting package option via the optional argument of \usepackage. So you are avoiding breaking of non robust commands.<sup>2</sup> The sole exception is the option framemethod which must given as an optional argument of \usepackage.

## 5. Defining your own style

In the next section all options are introduced. However instead of passing them global or as an optional argument of the environment you can define your own styles. The method is as follows

#### \mdfdefinestyle{style name}{options}

\mdfdefinestyle allows the user to define different styles which can be used as an option of mdframed via style.

### \mdfapptodefinestyle{style name}{options}

This commands add options to a defined style.<sup>3</sup>

http://tex.stackexchange.com/questions/34684/argument-of-setkeys

<sup>&</sup>lt;sup>2</sup>Thanks to Heiko Oberdiek and Philipp Stephani kvoptions-Declaration von Optionen schlägt fehl

<sup>&</sup>lt;sup>3</sup>Thanks to Martin Scharrer and Enrico Gregorio:

#### style

If you define a special style with \mdfdefinestyle you can use the key style to load the style. mdframed has no predefined styles yet.

Here a small example:

```
\mdfdefinestyle{mystyle}{leftmargin=1cm,linecolor=blue}
\begin{mdframed}[style=mystyle]
foo
\end{mdframed}
```

## 6. Options

The package provides various options to manipulate frames. In the following section all options are listed. Some internal macros which can be manipulated are not shown in this documentation. The listed options are divided in global and local options. The global options can not be used inside \mdfsetup.

## 6.1. Global Options

The following options are only global options.

 ${f xcolor}$ 

By setting this key, the package xcolor will be loaded with the given value(s). Without any value mdframed loads the package color without any options. If the package xcolor is already loaded the given option will be ignored. I recommend to load xcolor before mdframed.

With this key you can change the way frames are drawn. You can decide whether the frame is drawn with

- 1. LATEX-commands \hrule, \vrule, \rule,
- 2. TikZ (the package TikZ will be loaded) or
- 3. PSTricks (the package pstricks will be loaded).

The option framemethod requires a string. Allowed combinations are listed in the following table.

Table 1: Allowed keys for framemethod

| Method         | Allowed keys                 |
|----------------|------------------------------|
| LATEX-commands | default, tex, latex, none, 0 |
| TikZ           | tikz, pgf, 1                 |
| PSTricks       | pstricks, ps, postscript, 2  |

If you are lazy you can also work with the following short forms: tikz, TikZ, pstricks, PSTricks or ps. Of course for the default method exists no key.

#### FYI

It is independently whether the method is written with no, one or more capital letter.

All other options listed below can be set globally or locally and they are not limited to the preamble. I was trying to define self explained names.

## 6.2. Restoring the settings

Sometimes it's useful to remove all done settings. Every default value is saved in a style wich can be called by the option default or a more suitable name style=defaultoptions. Both do the same. Here a small example:

```
\mdfsetup{%
middlelinecolor=red,
middlelinewidth=2pt,
backgroundcolor=red!10,
roundcorner=10pt}
\begin{mdframed}
Text\par Text
\end{mdframed}
\ldotsepin{mdframed}
[default]
Text\par Text
\end{mdframed}
```

```
Text
Text
Text
Text
```

## 6.3. Options with lengths

In figure (2) you can see the adjustable lengths (compare also figure (1)).

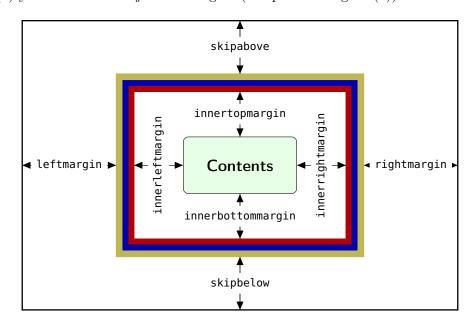


Figure 2: adjustable lengths of mdframed

 ${\tt default=pt}$ 

All lengths accept two kinds of input. The first one is a length (e.g. 2pt) and the second one is a number (e.g. 2) which will be multiplied by 1 defaultunit. To get a better overview, all length options with their default value are listet in a table. I think the names are self explained so that don't describe it anymore. Although special hints and length are described below

The first table lists the length for the geometry of the frame.

Before the next options are introduced here an example where the described length are used.

```
\mdfdefinestyle{mdfexample1}{leftmargin=1cm,rightmargin=2cm,% innerleftmargin=1cm,innerrightmargin=1cm,roundcorner=10pt}
\begin{mdframed}[style=mdfexample1]
In any right triangle, the area of the square whose side is the hypotenuse is equal to the sum of the areas of the squares whose sides are the two legs.
\end{mdframed}
```

In any right triangle, the area of the square whose side is the hypotenuse is equal to the sum of the areas of the squares whose sides are the two legs.

The next table lists the options to manipulate the lines of mdframed. If you are working with framemethod=default you have only one line for framing.

```
linewidth = 0.4pt innerlinewidth = 0pt middlelinewidth = 0.4pt outerlinewidth = 0pt roundcorner = 0pt
```

If you are working width framemethod=tikz or framemethod=pstricks the option linewidth is an alias for the option middlelinewidth.

#### 6.4. Colored Options

Now we want to bring some color on your frames. The limitation is equal the the length options. For framemethod=default you have only one line.

```
\begin{array}{ll} \mbox{linecolor} & = \mbox{black} & \mbox{innerlinecolor} = \mbox{black} \\ \mbox{middlelinecolor} & = \mbox{black} & \mbox{outerlinecolor} = \mbox{black} \\ \mbox{backgroundcolor} & = \mbox{white} & \mbox{fontcolor} & = \mbox{black} \\ \end{array}
```

font default={}

Although it's no really a color options you can also specify the font of the contents. Therefor the option font can be used.

Ok after we have some lengths and some colors we can improve our example.

6.5. Shadows 6. Options

```
\mdfapptodefinestyle{example1}{backgroundcolor=brown!20,%
    linecolor=red!40!black,linewidth=4pt}
\begin{mdframed}[style=mdfexample1]
    In any right triangle, the area of the square whose side is the hypotenuse is equal to the sum of the areas of the squares whose sides are the two legs.
\end{mdframed}
```

In any right triangle, the area of the square whose side is the hypotenuse is equal to the sum of the areas of the squares whose sides are the two legs.

#### 6.5. Shadows

Another possibility to highlight a frame can be a shadow. The package mdframed supports some elementary options to add a shadow. For framemethod=tikz the library shadows is needed which must be loaded by the user by \usetikzlibrary{shadows}.

 ${\bf shadowsize} \\ {\bf default = 8\,pt}$ 

 ${f shadowcolor}$ 

If a shadow is used depends on the option shadow which can be either true or false. The option shadows enables two new options shadowsize and shadowcolor.

```
\begin{mdframed}[backgroundcolor=gray!40,shadow=true,roundcorner=8pt]
In any right triangle, the area of the square whose side is the hypotenuse
is equal to the sum of the areas of the squares whose sides are the two
legs.
\end{mdframed}
```

In any right triangle, the area of the square whose side is the hypotenuse is equal to the sum of the areas of the squares whose sides are the two legs.

#### 6.6. Hidden Lines

The default behavior of the output was shown in a previous picture. mdframed offers the possibility to print only requested lines. If you don't want any right line you can say rightline=false. The table below listed all keys to this topic and shows their default setting.

If you want to disable all lines you can use the short from hidealllines.

## 6.7. Working in twoside-mode

Many books are written in twoside mode. In those cases it's better to set the margins related to the site. Instead of the explained options leftmargin and rightmargin you can work with the options outermargin and innermargin. Of course if you working in oneside mode the options have no effect. If you don't want to work with outermargin and innermargin whether the document is done in twoside mode you can disable the behaviour by the option usetwoside. Allowed values for this key are true or false.

#### 6.8. Footnotes

Inside the environment you can use the command \footnote as usual. mdframed uses the syntax of environment minipage with the same counter.

Every footnote text will be collected inside a box and will be displayed at the end of the environment mdframed.

 $\textbf{footnotedistance} \hspace{1.5cm} default = \texttt{\bigskipamount}$ 

The length is the distance between the end of the environment mdframed and the displaying of the \footnoterule.

footnoteinside default=true

The position of the footnotes can be changed with the option footnoteinside. The footnotes will be displayed at the end of the environment but you can decide whether the output is inside mdframed or after.

#### Note

The output of the footnotes with the option footnoteinside=false are not in a splitted frame. I think it isn't useful because the first line of a new page shouldn't be a footnote.

## 6.9. Page breaks

The package mdframed splits its content if neccessary. In figure 1 the default style for splitting is presented. However there a sevaral situations where no page preak should occur.

 $\operatorname{nobreak}$   $\operatorname{default}$ =false

For this case you can use the option nobreak which is either true or false. As you can see in figure 1 the different elements have different ways of drawing. E.g. the middle part of mdframed has only a left and a right line.

 ${f everyline}$  default=false

If you want that all parts of mdframed get a whole frame you can work with the option everyline. Then all parts are displayed as a single frame.

In a previous section the options innertopmargin and innerbottommaring were introduced. However if a page break occurs you have two new length options which influence the space at the breaking point.

splittopskip default=0 pt

Sets the length of the skip above the split part of the environment.

 ${\bf splitbottomskip} \\ {\bf default=0\,pt}$ 

Sets the length of the skip below the split part of the environment.

6.10. Frametitle 6. Options

#### 6.10. Frametitle

In this section all relevant options of the frame title will be presented. They are not divided in their properties.

 ${f frametitle}$   ${f default=}{f none}$ 

The environment gets a title. To set a title use frametitle={The Title of the frame} as an option of the environment.

Sets the format of the frametitle.

frametitlealignment default=\raggedleft

Align the frametitle. This option must be set via \mdfsetup.

 $\begin{array}{ll} \textbf{frametitlerule} & \textbf{default=false} \end{array}$ 

Set this key to true to get a line between the frame title and the text.

frametitlerulewidth  ${
m default}{=}.2\,{
m pt}$ 

Sets the width of the line between the text and the title of mdframed.

frametitleaboveskip  $default = 5 \, pt$ 

Sets the skip of the frame title to the margin above of mdframed.

 ${\it frametitle belowskip} \\ {\it default=5\,pt}$ 

Sets the skip of the frame title to the rule of the frame title.

frametitlebackgroundcolor default=backroundcolor

Sets the color of the background of the frametitle

 ${\tt repeatframetitle} \\ {\tt default=false}$ 

Repeat the frame title on every frame.

The following picture demonstrates the behaviour of the lengths if the option frametitle is used.

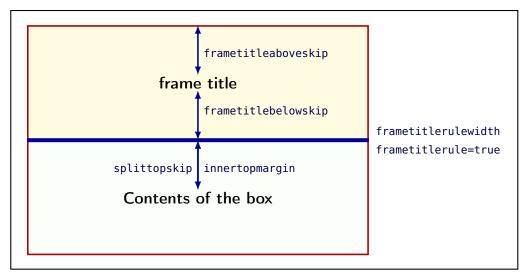


Figure 3: Behavior of the lengths if frametitle is used

#### FYI and Note

The splitting of the frame title is really a fiddly issue. If you want to use the option repeatframetitle a splitting is more than wrong. On the other hand if you use the option repeatframetitle the user must prepare the contents well.

#### 6.11. Title commands inside the environment

To provide titles inside the environment mdframed you can use \mdfsubtitle. The relavant options are listed below.

#### **\mdfsubtitle**

Set a title inside mdframed of the internal level 1.

The command accepts one optional and one mandatory argument. The optional argument sets the option of mdframed whereby everything will be local. The second argument of subtitle also allows paragraph breaking.

Breaks inside the \mdfsubtitle are not supported.

 $\mbox{\bf mdfsubtitle}[<\mbox{options}>]\{\mbox{the subtitle}\}$ 

### 6.11.1. Options related to the title of level 1

 ${\bf subtitle above line} \\ {\bf default=false}$ 

Decide to draw a line above the subtile.

Decide to draw a line below the subtitle.

**subtitlefont** default=\normalfont\bfseries

Sets the font for subtitles.

 ${\bf subtitle background color} \\ {\bf default = white}$ 

Sets the background color of the subtitle between the above and below line.

Sets the line color of the line above.

subtitlebelowlinecolor default=black

Sets the line color of the line below.

 ${f subtitle above linewidth}$   ${f default = 0.8\,pt}$ 

Sets the line width of the line above.

 ${
m subtitle}$ belowlinewidth  ${
m default}$ =0.6pt

Sets the line width of the line below.

 $\operatorname{subtitleaboveskip}$   $\operatorname{default}=\setminus\operatorname{baselineskip}$ 

Sets the skip before the subtitle line above will be drawn.

 ${f subtitle belowskip}$   ${f default=1.2 f baselineskip}$ 

Sets the skip after the subtitle line below is drawn.

subtitleinneraboveskip default=0.5\baselineskip

Sets the skip after the line above and the subtitle itself.

 ${f subtitleinnerbelowskip}$   ${f default=0.5 f baselineskip}$ 

Sets the skip after the subtitle and the line below.

Here an example to demonstrate the behaviour:

```
Theorem
Some Text ...

Notes

Some Text ...
```

```
newmdenv[%
roundcorner=5pt,
subtitlebelowline=true,subtitleaboveline=true,
subtitlebackgroundcolor=yellow!70!white,
backgroundcolor=blue!20!white,
frametitle={Theorem},frametitlerule=true,
frametitlebackgroundcolor=yellow!70!white,
]{subtitleenv}
begin{subtitleenv}
Some Text \ldots
\mdfsubtitle{Notes}
Some Text \ldots
\end{subtitleenv}
```

## 6.12. General options

Some options can't be classified. Such options are listed in this section.

 $egin{align*} \mathsf{ntheorem} & \operatorname{default} = \mathsf{false} \ \end{aligned}$ 

Before setting this boolean key, you have to load the package ntheorem. With this option you set the values \theorempreskipamount and \theorempostskipamount to 0 pt to avoid extra vertical skip.

needspace default=0 p

Sometimes it is useful to set a minimum height before a frame should be splitted. For such cases you can use needspace. The option requires a length which sets the minimum height before a frame will be splitted.

### ignorelastdescenders default=false

Try to ignore the last descenders of the environment mdframed. The complete idea was inspired by Tobias Weh and the solution was provided by Stefan Lemke. See How to make mdframed ignore descenders in last line Of course you have some more length which can be manipulate.

 ${f userdefinedwidth}$   ${f default} = {f Vinewidth}$ 

Sets the width of the whole mdframed environment. The width represent the width including the line width and the inner margins. The outer margins will be ignored.

align  ${
m default}{=}$ left

Sometimes it is useful to align the environment itself. For this you have the option align which can be set to the following strings:

- left,
- right and
- center.

6.13. TikZ options 6. Options

The alignments left or right depend on the given lengths leftmargin and rightmargin. Later I will present an example to demonstrate my bad English explanation.

Be aware of using this option please.

## 6.13. TikZ options

With this key you can pass several options to \tikzset. Some examples are listed in the next section. It is very important to put the options of tikzsetting in brackets.

apptotikzsetting default={}

With this key you can add several options to tikzsetting. This key based on the idea of manipulation of predefined keys of mdframed. The package mdframed defines via \tikzset the following keys to draw frames.

- \tikzset{mdfbox/.style}
- \tikzset{mdfcorners/.style}
- \tikzset{mdfbackground/.style}
- \tikzset{mdfinnerline/.style}
- \tikzset{mdfouterline/.style}
- \tikzset{mdfmiddleline/.style}
- \tikzset{mdfframetitlerule/.style}
- \tikzset{mdfframetitlebackground/.style}
- \tikzset{mdfshadow/.style}

Before you change one please have a look at the file md-frame-1.mdf to see the settings.

#### 6.14. PSTricks options

 $\operatorname{default}=\{\}$ 

With this key you can pass several options to \psset. For example if you want all lines dashed you will have to set pstrickssetting={linestyle=dashed}. It is very important to put the options of pstrickssetting in brackets.

pstricksappsetting  $default=\{\}$ 

mdframed works with defined styles for the different elements. By using \addtopsstyle in combination with this option you can expand the definition. The predefined styles are

- mdfbackgroundstyle
- mdfframetitlebackgroundstyle
- mdfouterlinestyle
- mdfinnerlinestyle
- mdfmiddlelinestyle

Before you change one please have a look at the file md-frame-2.mdf to see the settings.

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## 7. Hooks and Bools

The following options and bool flags can be used by the any user. Of course some needs more experience than other.

 $\mathbf{default} \! = \! \{\}$ 

This option allows the user to commit some macros at the beginning of mdframed. The given material is executed before the savebox starts.

extra  $ext{default}=\{\}$ 

Add material to every drawn frame.

 $\mathbf{default} \! = \! \{\}$ 

With this key you can put extra material to the drawing environment of mdframed only for a non splitted frame.

With this key you can put extra material to the drawing environment of mdframed only for the first part of the splitted frame.

 $ext{middleextra} ext{default={}}$ 

With this key you can put extra material to the drawing environment of mdframed only for the middle part of the splitted frame.

This works only with framemethod=TikZ and PSTricks.

With this key you can put extra material to the drawing environment of mdframed only for the second part of the splitted frame.

After you can add material to any part of the frame you can also detect which part of the frame is drawn. Therefor the bool flags are defined which can be test by \ifbool{boolflag}. All flags are set to true before the output of the content occurs.

 ${f mdfsingleframe}$   ${f default=false}$ 

This bool is only true for a non splitting frame.

 ${\tt mdffirstframe} \\ {\tt default=false}$ 

This bool is only for the first part of the frame true.

 ${f mdfmiddleframe}$   ${f default=false}$ 

see above.

 ${\tt mdflastframe} \\ {\tt default=false}$ 

see above.

For the advanced users there are also some other hooks which can be used to manipulate the output:

 $beforesingleframe \\ default= \{\}$ 

Every given code to this option is executed before a single frame is is printed.

 ${\bf default}{=}\{\}$ 

Every given code to this option is executed after a single frame is is printed.

 $ext{beforebreak} ext{default={}}$ 

The value of this option is only executed at breakable frames. Related to the introduction the first and middle frame can be manipulated.

 $\mathbf{default} \! = \! \{\}$ 

The value of this option is only executed at breakable frames. Related to the introduction the first and middle frame can be manipulated.

The option is executed only for the last frame of a splitted frame.

 $\mathbf{afterlastframe} \qquad \qquad \mathbf{default} = \{\}$ 

The option is executed only for the last frame of a splitted frame.

 $\mathbf{startcode} \\ \\ \mathbf{default} = \{\}$ 

Every code given to this option is executed at the beginning of the environment.

This option is executed at the beginning of the save box.

This option is executed at the end of the save box.

 $\mathbf{default} \! = \! \{\}$ 

The code is executed at the end of the environment.

#### 8. Theorems

In this section is described which commands can help you to define theorem environments with mdframed.

#### \newmdtheoremenv

Since the package is often used to highlight theorem environments, the package provides acommand to simplify this process. The command has the following syntax:

The last four arguments are equivalent to the command \newtheorem. Only the first optional argument is able to pass mdframed-options. A simple example is:

```
\theoremstyle{<some style>}
\newmdtheoremenv[linecolor=blue]{lemma}{Lemma}[section]
...
\begin{lemma}[Some title]
foo foo foo foo foo foo
\end{lemma}
```

So far there is no \renewmdtheoremenv!

#### \mdtheorem

This is a special kind of \newtheorem. The command has the following syntax.

As you can see the arguments are equal to \newtheorem but the command ignores every \theoremstyle. This is based on the following behavior.

The command \mdtheorem creates two environments based on the given first mandatory argument. The first environment is named like the given argument and creates a numbered theorem. The second environment is named like the first mandatory argument with a star. This environment has the same formating but isn't numbered.

The syntax of the new defined environments is equal to the normal theorem environments.

```
\begin{environment}[optional title]
...
\end{environment}
```

What happened? The caption of the command will be set as the frame title. In this way all options of the frame title are available. Furthermore mdframed provides additional options explained below.

 $\textbf{theoremseparator} \\ \\ \text{default=}\{:\}$ 

Sets the separator of the caption and the title of the theorem. The theoremseparator will be printed only if an theorem title is given.

theoremtitlefont default={}

Via the option frametitlefont you can manipulate the font of the frame title. The option theorem:theorem allows to set a different font to the title of the theorem.

theoremspace default=\space

Sets the space after theoremseparator.

Examples can be found in the attached files.

# 9. complexe example - Matlab Terminal

The following example was inspiered by a question on TeX.SX.

The code for this result is:

```
\definecolor{DarkBlue}{rgb}{.11,.23,.60}
\mdfdefinestyle{commandline}%
{leftmargin=5pt, rightmargin=10pt,innerleftmargin=15pt,
middlelinecolor=DarkBlue,
middlelinewidth=2pt,
frametitlerule=false,
```

```
backgroundcolor=black!10!white,
      frametitle={Command Window},
      \mathbf{frametitle font} = \{ \\ \\ \mathbf{sffamily} \\ \\ \mathbf{color} \\ \\ \mathbf{white} \\ \\ \mathbf{hspace} \\ \\ \mathbf{-1em} \\ \\ \}, \\ \mathbf{mormal font} \\ \\ \mathbf{sffamily} \\ \\ \mathbf{color} \\ \\ \mathbf{white} \\ \\ \mathbf{hspace} \\ \\ \mathbf{-1em} \\ \\ \}, \\ \mathbf{mormal font} \\ \\ \mathbf{sffamily} \\ \\ \\ 
      frametitlebackgroundcolor=DarkBlue,
      singleextra={\draw[black!20,line width=12pt]
                                        (\$(O)+(7pt,1pt)\$) --
                                        (\$(O|-P)+(7pt,-\mdfframetitleboxtotalheight)-(0,1pt)\$);
                                        \node[inner sep=0pt, color=black]at (\$(O)+(7pt,9pt)\$)\%
                                        \{ \text{scriptstyle } f \mid x \}; \},
      nobreak,
}
 \ \lambda lstnewenvironment { script } { \%
             \lstset{language=Matlab,basicstyle=\tiny\ttfamily,breaklines=true, %
                                                                  aboveskip=0pt,belowskip=0pt}}{}}
 \surroundwithmdframed[style=commandline]{script}
 \begin{script}
>> help sin
      sin Sine of argument in radians.
                          \sin(X) is the sine of the elements of X.
                          See also asin, sind.
                          Overloaded methods:
                                              sdpvar/sin
                                              codistributed/sin
                                              gpuArray/sin
                          Reference page in Help browser
                                              doc sin
    \mathbf{end}\{\mathbf{script}\}
```

## 10. Examples

I outsource the examples in four files documentation. The files are

#### mdframed-example-default

Demonstration of examples created with framemethod=default.

#### mdframed-example-tikz

Demonstration of examples created with framemethod=TikZ.

#### mdframed-example-pstricks

Demonstration of examples created with framemethod=pstricks.

### mdframed-example-texsx

Demonstration of examples like interaction with listings

The examples are often not equivalent but normally they can be adapted to another method. So I really recommend to have a look to all example files.

The Korean TeXGroup created a very nice presentation. I want to show the link because it's really a great work: kts 2012 mdframed.

## The mdframed package

Examples for framemethod=default

Marco Daniel 1.9b 2013/07/01

In this document I collect various examples for framemethod=default. Some presented examples are more or less exorbitant.

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# 1 Loading

In the preamble only the package mdframed with the option framemethod=default is loaded. All other modifications will be done by \mdfdefinestyle or \mdfsetup.

#### Note

Every \global inside the examples is necessary to work with my own created environment tltxmdfexample\*.

# 2 Examples

All examples have the following settings:

```
\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%

An \textit{inhomogeneous linear} differential equation has the form
\begin{align}

L[v] = f,
\end{align}

where $L$ is a linear differential operator, $v$ is the dependent
variable, and $f$ is a given non-zero function of the independent
variables alone.
}
```

## Example 1 – very simple

An inhomogeneous linear differential equation has the form

$$L[v] = f, (1)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## Example 2 - hidden line + frame title

```
\label{lem:continuous_series} $$ \begin{array}{ll} \mathbf{global} & \mathbf
```

#### Inhomogeneous linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (2)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## Example 3 - colored frame title

```
\label{eq:end_model} $$ \end{mdframed}
```

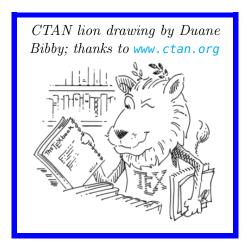
## Inhomogeneous linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (3)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## Example 4 - framed picture which is centered



## Example 5 - Theorem environments

```
\mdfdefinestyle{theoremstyle}{%
    linecolor=red,linewidth=2pt,%
    frametitlerule=true,%
    frametitlebackgroundcolor=gray!20,
    innertopmargin=\topskip,
    }
\mdtheorem[style=theoremstyle]{definition}{Definition}
\begin{definition}
```

```
\ExampleText
\end{\definition}
\begin{\definition}[Inhomogeneous linear]
\ExampleText
\end{\definition}
\begin{\definition*}[Inhomogeneous linear]
\ExampleText
\end{\definition*}
```

#### Definition 1

An inhomogeneous linear differential equation has the form

$$L[v] = f, (4)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

### Definition 2: Inhomogeneous linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (5)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

#### Definition: Inhomogeneous linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (6)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

### Example 6 – theorem with separate header and the help of TikZ (complex)

```
\node[anchor=east,rectangle,fill=blue!20]
              {\strut Theorem~\thetheo};}}
   }%
   {\bf mdfsetup}
        frametitle={%
            \tikz[baseline=(current bounding box.east),outer sep=0pt]
              \node[anchor=east,rectangle,fill=blue!20]
              {\strut Theorem~\thetheo:~#1};}}%
     }%
     \mathbf{mdfsetup}\{\mathbf{innertopmargin}=10\,\mathbf{pt},\mathbf{linecolor}=\mathbf{blue}!20,\%
                      linewidth=2pt,topline=true,
                      frametitleaboveskip = \langle dimexpr - \langle ht \rangle relax, \}
     \begin{matrix} \mathbf{mdframed} \end{bmatrix} \ \mathbf{mdframed} \ 
     \{ \mathbf{M} \}
\begin{theo} [Inhomogeneous Linear]
Example Text
\ensuremath{\mbox{end}\{\ensuremath{\mbox{theo}}\}}
\begin{theo}
Example Text
\ensuremath{\ensuremath{\mathsf{end}}}
```

## Theorem 1: Inhomogeneous Linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (7)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

#### Theorem 2

An inhomogeneous linear differential equation has the form

$$L[v] = f, (8)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

### Example 7 - hide only a part of a line

The example below is inspired by the following post on StackExchange Theorem decorations that stay with theorem environment

```
\setminus \mathbf{color}\{\#1\}\%
      \hfill 
                                                                           \mdf@innerrightmargin@length\relax\}%
      \mathbf{rule}[\mathbf{dimexpr}-\mathbf{mdfboundingboxdepth}+
                                                                                       #2\interruptlength\relax\right|\%
                                  {\mdf@middlelinewidth@length}%
                                  {\displaystyle \{ \cdot \}_{interruptlength \in \mathbb{Z}} } 
\newrobustcmd\overlaplines[2][white]{%
      \mdfsetup{everyline=false}%
      \mathbf{setlength}\{\mathbf{vinterruptlength}\}\{\#2\}
      \arrowvert appto\mdf@frame@leftline@single{\llap}{\interruptrule}{\#1}{1}{2}}
      \arrowvert appto\mdf@frame@rightline@single{\rlap{\rlap{\interruptrule{#1}{1}{2}}}}
      \arrowvert appto \mbox{mdf@frame@leftline@first} \label{lap} \mbox{interruptrule} \mbox{$\#1$} \mbox{$\{1\}$} \
      \arrowvert appto\mdf@frame@rightline@first{\rlap{\interruptrule{#1}{0}{1}}}
      \begin{tabular}{llll} \hline \aligned appto \end{mdf@frame@leftline@second} & \label{llap} & \label
      \appto\mdf@frame@rightline@second{\rlap{\interruptrule{#1}{1}{1}}}}
      \arrowvert appto\mdf@frame@rightline@middle{\rlap}{\interruptrule}{\#1}{0}{0}}
 \makeatother
\mathbf{overlaplines} \{2.5ex\}
\begin{mdframed}[linecolor=blue,linewidth=8pt]
Example Text
\end{mdframed}
\overlaplines[blue!70!black!20]{2.5ex}
\begin{mdframed}[linecolor=blue,linewidth=8pt]
\ExampleText
 \mathbf{end}
```

An inhomogeneous linear differential equation has the form

$$L[v] = f, (9)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

An inhomogeneous linear differential equation has the form

$$L[v] = f, (10)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## The mdframed package

Examples for framemethod=TikZ

Marco Daniel 1.9b 2013/07/01

In this document I collect various examples for framemethod=TikZ. Some presented examples are more or less exorbitant.

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## 1 Loading

In the preamble only the package mdframed width the option framemethod=TikZ is loaded. All other modifications will be done by \mdfdefinestyle or \mdfsetup.

#### Note

Every \global inside the examples is necessary to work with my own created environment tltxmdfexample\*.

# 2 Examples

All examples have the following settings:

```
\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%

An \textit{inhomogeneous linear} differential equation has the form
\begin{align}

L[v] = f,
\end{align}

where $L$ is a linear differential operator, $v$ is the dependent
variable, and $f$ is a given non-zero function of the independent
variables alone.
}
```

## Example 1 - round corner

```
\square \square \left\{ \text{global\mdfdefinestyle} \{exampledefault\} \{ \text{%} \\ outerlinewidth=5pt,innerlinewidth=0pt, \\ outerlinecolor=red,roundcorner=5pt \\ \text{begin} \{mdframed\} [style=exampledefault] \\ ExampleText \\ end \{mdframed\} \\ \end \{
```

An inhomogeneous linear differential equation has the form

$$L[v] = f, (1)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## Example 2 - hidden line + frame title

```
\begin{tabular}{l} $$ \textbf{global} \mdfapptodefinestyle{exampledefault}{\%} $$ topline=false,leftline=false,} $$ \begin{mdframed}[style=exampledefault,frametitle={Inhomogeneous linear}] $$ ExampleText $$ end{mdframed}$$
```

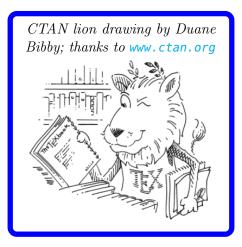
## Inhomogeneous linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (2)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

### Example 3 – framed picture which is centered



## Example 4 - Gimmick

An inhomogeneous linear differential equation has the form

$$L[v] = f, (3)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## Example 5 – complex example with TikZ

```
\mathbf{tikzset}\{\mathbf{titregris}/.\mathbf{style} =
       {draw=gray, thick, fill=white, shading = exersicetitle, %
        text=gray, rectangle, rounded corners, right,minimum height=.7cm}
\pgfdeclarehorizontalshading{exersicebackground}{100bp}
              \{color(0bp)=(green!40); color(100bp)=(black!5)\}
\pgfdeclarehorizontalshading{exersicetitle}{100bp}
              \{\mathbf{color}(0\mathrm{bp}) = (\mathrm{red}!40); \mathbf{color}(100\mathrm{bp}) = (\mathbf{black}!5)\}
\newcounter{exercise}
\renewcommand*\theexercise{Exercise^n\arabic{exercise}}}
\makeatletter
\def \def \end{f@exercise} \new mdframed key:
\define@key{mdf}{exercisepoints}{%
     \def \def \end{mdf@exercise} 1
\mdfdefinestyle{exercisestyle}{%
  outerlinewidth=1em,outerlinecolor=white,%
  leftmargin=-1em,rightmargin=-1em,%
  middlelinewidth=1.2pt,roundcorner=5pt,linecolor=gray,
  apptotikzsetting=\{\text{tikzset}\} mdfbackground/.append style =\{\%
                                 shading = exersicebackground}}},
  innertopmargin=1.2\baselineskip,
  skipabove = { \langle dimexpr0.5 \rangle baselineskip + \langle topskip \rangle relax },
  skipbelow = \{-1em\},\
  needspace=3\baselineskip,
  frametitlefont=\sffamily\bfseries,
  settings={\global\stepcounter{exercise}},
  singleextra={\%}
        \node[titregris,xshift=1cm] at (P-|O) \%
             {~\mdf@frametitlefont{\theexercise}\hbox{~}};
        \left\langle \mathbf{Mdf@@exercisepoints}\right\rangle 
        {\node[titregris,left,xshift=-1cm] at (P)\%}
             {\bf T}_{\bf mdf@frametitlefont} {\bf Mdf@@exercise points points} \hbox{\it Theorem};} \%
  firstextra={%
        \node[titregris,xshift=1cm] at (P-|O) %
             {~\mdf@frametitlefont{\theexercise}\hbox{~}};
        \ifdefempty{\mdf@@exercisepoints}%
        {}%
        {\node[titregris, left, xshift = -1cm] at (P)\%}
             \mbox{mdf@frametitlefont}\\\mbox{mdf@exercisepoints points}\\\mbox{^~}}; \mbox{\%}
    },
\makeatother
\begin{mdframed}[style=exercisestyle]
Example Text
\ensuremath{\backslash end\{mdframed\}}
\begin{mdframed}[style=exercisestyle,exercisepoints=10]
\ExampleText
 end{mdframed}
```

### Exercise n1

An inhomogeneous linear differential equation has the form

$$L[v] = f, (4)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## Exercise n2

10points

An inhomogeneous linear differential equation has the form

$$L[v] = f, (5)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## Example 6 - Theorem environments

```
| mdfdefinestyle{theoremstyle}{% | linecolor=red,middlelinewidth=2pt,% | frametitlerule=true,% | apptotikzsetting={\tikzset{mdfframetitlebackground/.append style={% | shade,left color=white, right color=blue!20}}} | frametitlerulecolor=green!60, | frametitlerulewidth=1pt, | innertopmargin=\topskip, | } | mdtheorem[style=theoremstyle]{definition}{Definition} | begin{definition}[Inhomogeneous linear] | ExampleText | end{definition*}[Inhomogeneous linear] | begin{definition*}[Inhomogeneous linear] | ExampleText | end{definition*} | linhomogeneous linear] | begin{definition*}[Inhomogeneous linear] | begin{definition*}[Inhomogeneous linear] | linhomogeneous linear] |
```

#### Definition 1: Inhomogeneous linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (6)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

#### Definition: Inhomogeneous linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (7)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## The mdframed package

Examples for framemethod=tikz

Marco Daniel 1.9b 2013/07/01

In this document I collect various examples for framemethod=tikz. Some presented examples are more or less exorbitant.

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|   | $\operatorname{mode}$            | 4 | background                             | 7 |

# 1 Loading

In the preamble only the package mdframed width the option framemethod=tikz is loaded. All other modifications will be done by \mdfdefinestyle or \mdfsetup.

#### Note

Every \global inside the examples is necessary to work with my own created environment tltxmdfexample\*.

# 2 Examples

All examples have the following settings:

```
\mdfsetup{skipabove=\topskip,skipbelow=\topskip}\
\newrobustcmd\ExampleText{%}
An \textit{inhomogeneous linear} differential equation has the form \begin{align}
L[v] = f, \end{align}
where $L$ is a linear differential operator, $v$ is the dependent variable, and $f$ is a given non-zero function of the independent variables alone.
}
```

## Example 1 – Package listings

The example below is inspired by the following post on StackExchange Background overflows when using rounded corners for listings (package: 'listings')

Here the solution which can be decorate as usual.

```
\label{eq:beginEnvironment} $$ \BeforeBeginEnvironment{stlisting}{\%$ $$ \begin{mdframed}[<modification>]\%$ $$ \vspace{-0.7em}} $$ \AfterEndEnvironment{lstlisting}{\%$ $$ \vspace{-0.5em}\%$ $$ \end{mdframed}$$} $$
```

With the new command \surroundwithmdframed you can use

```
\boxed{ \\ \\ | surround with mdframed \{listings\} }
```

## Example 2 - Package multicol

How I wrote in "Known Problems" you can't combine multicol with mdframed. In a simple way without any breaks you can use:

```
\begin{multicols}{2}
\lipsum[1]
\begin{mdframed}
\ExampleText
\end{mdframed}
\lipsum[2]
\end{multicols}
```

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

An *inhomogeneous linear* differential equation has the form

$$L[v] = f, (1)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

## Example 3 - Working in twocolumn mode

```
\lipsum[1]\lipsum[2]
\begin{mdframed}[%
leftmargin=10pt,%
rightmargin=10pt,%
linecolor=red,
backgroundcolor=yellow]
\ExampleText
\end{mdframed}
\lipsum[2]
```

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

An *inhomogeneous linear* differential equation has the form

$$L[v] = f, (2)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

## Example 4 – Working inside enumerate

```
Text Text Text Text Text Text Text

| begin{enumerate}
| item in the following \ldots
| begin{mdframed}[linecolor=blue,middlelinewidth=2]
| ExampleText
| end{mdframed}
| item \lipsum[2]
| end{enumerate}

Text Text Text Text Text Text
```

Text Text Text Text Text Text Text Text

1. in the following ...

An inhomogeneous linear differential equation has the form

$$L[v] = f, (3)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

2. Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Text Text Text Text Text Text

## Example 5 - Position a specific symbol at a line

```
\tikzset{
    warningsymbol/.style={
        rectangle,draw=red,
        fill=white,scale=1,
        overlay}}

\mdfdefinestyle{\text{warning}}{\%}
    hidealllines=true,leftline=true,
    skipabove=12,skipbelow=12pt,
    innertopmargin=0.4em,%
    innerbottommargin=0.4em,%
    innerrightmargin=0.7em,%
    rightmargin=0.7em,%
    innerleftmargin=1.7em,%
    leftmargin=0.7em,%
```

```
\label{eq:middlelinewidth} \begin{tabular}{ll} \begin{middlelinewidth} = .2em, \% \\ linecolor = red, \% \\ fontcolor = red, \% \\ firstextra = {\path let \p1 = (P), \p2 = (O) in (\$(\x2,0) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\x2,0) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\x2,0) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\x2,0) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\x2,0) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\x2,0) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\x2,0) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O) in (\$(\xspace A) + 0.5*(0,\y1)\$) \\ node[warningsymbol] \xspace {\path let \p1 = (P), \p2 = (O), \p3 = (P), \p3 = (P
```

An inhomogeneous linear differential equation has the form

$$L[v] = f, (4)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## Example 6 – digression-environement inspired by Tobias Weh

```
\usetikzlibrary{calc,arrows}
\text{\tikzset}\{
    excursus arrow/.style={%
        line width=2pt,
        draw=gray!40,
        rounded corners=2ex,
    excursus head/.style={
        fill=white,
        font=\bfseries\sffamily,
        text = gray!80,
        anchor=base west,
    },
\mdfdefinestyle{digressionarrows}{%
 singleextra={\%}
        \mathbf{path} let p1=(P), p2=(O) in (x2,y1) coordinate (Q);
        \mathbf{path} let p1=(Q), p2=(O) in (x1,\{(y1-y2)/2\}) coordinate (M);
        \path [excursus arrow, round cap-to]
            (\$(O)+(5em,0ex)\$) - | (M) | - \%
            (\$(Q)+(12em,0ex)\$) .. controls +(0:16em) and +(185:6em) .. %
            ++(23em,2ex);
        \node [excursus head] at (\$(Q)+(2.5em,-0.75pt)\$) {Digression};},
 firstextra = \{\%
        \path let \p1=(P), \p2=(O) in (\x2,\y1) coordinate (Q);
```

```
\path [excursus arrow,-to]
             (O) |-\%
             (\$(Q)+(12em,0ex)\$) .. controls +(0:16em) and +(185:6em) .. %
             ++(23em,2ex);
         \node [excursus head] at ((Q)+(2.5em,-2pt)) {Digression};},
 secondextra = \{\%
         \mathbf{path} let p1=(P), p2=(O) in (x2,y1) coordinate (Q);
        \path [excursus arrow,round cap-]
            (\$(O)+(5em,0ex)\$) - | (Q);
 middleextra={%
         \mathbf{path} \ \mathbf{let} \ \mathbf{p1}=(P), \ \mathbf{p2}=(O) \ \mathbf{in} \ (\mathbf{x2},\mathbf{y1}) \ \mathbf{coordinate} \ (Q);
         \path [excursus arrow]
            (O) -- (Q);
    middlelinewidth=2.5em,middlelinecolor=white,
    hidealllines=true,topline=true,
    innertopmargin=0.5ex,
    innerbottommargin=2.5ex,
    innerrightmargin = 2pt,
    innerleftmargin=2ex,
    skipabove=0.87\baselineskip,
    skipbelow=0.62\baselineskip,
\begin{mdframed}[style=digressionarrows]
             Example Text
end{mdframed}
```

Digression \_

An inhomogeneous linear differential equation has the form

$$L[v] = f, (5)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## Example 7 - Theorem style shading background

```
\begin{tabular}{ll} $| \mathbf{m} \\ \textbf{dtheorem}[\%] \\ \textbf{apptotikzsetting} = & \{\% \\ \textbf{top color} = & \{yellow!40! \\ \textbf{white}, \\ \textbf{bottom color} = & \{yellow!80! \\ \textbf{black}\}, \\ \textbf{mdfframetitlebackground}/. \\ \textbf{append style} = & \{ \\ \textbf{top color} = & \{purple!40! \\ \textbf{white}, \\ \textbf{bottom color} = & \{purple!80! \\ \textbf{black}\}, \\ \end{tabular}
```

```
shadow=true,frametitlerule=true,frametitlerulewidth=4pt,
innertopmargin=10pt,%
    ]{alternativtheorem}{Theorem}
    \begin{alternativtheorem}[Inhomogeneous linear]
    \ExampleText
    \end{alternativtheorem}
```

## Theorem 1: Inhomogeneous linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (6)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

# The mdframed package

Examples for framemethod=PSTricks

Marco Daniel 1.9b 2013/07/01

In this document I collect various examples for framemethod=PSTricks. Some presented examples are more or less exorbitant.

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## 1 Loading

In the preamble only the package mdframed width the option framemethod=PSTricks is loaded. All other modifications will be done by \mdfdefinestyle or \mdfsetup.

#### Note

Every \global inside the examples is necessary to work with my own created environment tltxmdfexample\*.

## 2 Examples

All examples have the following settings:

```
\mdfsetup{skipabove=\topskip,skipbelow=\topskip}
\newrobustcmd\ExampleText{%

An \textit{inhomogeneous linear} differential equation has the form
\begin{align}

L[v] = f,
\end{align}

where $L$ is a linear differential operator, $v$ is the dependent
variable, and $f$ is a given non-zero function of the independent
variables alone.
}
```

## Example 1 – very simple

```
pstrickssetting = \{linestyle = dashed,\}, \\ linecolor = red, \\ middle linewidth = 2pt\} \\ \\ \begin{matrix} begin{matrix} begin{m
```

## Inhomogeneous linear

An inhomogeneous linear differential equation has the form

$$L[v] = f, (5)$$

where L is a linear differential operator, v is the dependent variable, and f is a given non-zero function of the independent variables alone.

## 11. Errors, Warnings and Messages

The package mdframed provides different errors, warnings and messages in the log-file. Some LATEX-editors like TEXMaker or TEXStudio have a special tab for errors and warnings but not for messages. So you should look in the log-File itself.

The following errors and warnings are generated by mdframed.

```
The package ... does not exist but needed by mdframed
```

To avoid this problem you should install the required packages which are listed in section 2.

```
package option style is depreciated use framemethod instead style
```

With version 0.9d mdframed changed the meaning of the option style. The option is used to load a defined style by \mdfdefinestyle. Instead use framemethod (see section 6.1).

```
Unknown framemethod .... mdframed
```

The input string for the option framemethod is unknwn. See section 6.1.

```
You have not loaded ntheorem yet
```

To use the option ntheorem you have to load the package ntheorem.

```
You have only a width of 3cm
```

The package mdframed calculates the width of the contents based on the given options. If the width of the contents is smaller than 3 cm you will get this warnings. You should change the settings to get a greater width.

```
You got a bad break
you have to change it manually
by changing the text, the space
or something else
```

Sometimes you have enough vertical space for the rules and the space between the rules and the contents but not for the contents itself. In this situation you will get this warning because the contents of this box is empty. You have the possibility to change the settings or include a \clearpage in front of the environment mdframed. So far I have no idea how to avoid such things.

```
You got a bad break
because the split box is empty
You have to change the page settings
like enlargethispage or something else
```

```
You got a bad break
```

See the explanation above.

```
You got a bad break
because the last split box is empty
You have to change the settings
```

The same reason as above but only in the last box.

```
Option ... is already consumed and has no effect on input line ...
```

If you set a global option inside the document body you will get this warning.

## 12. Known Limitations

In this section I will collect known issues. In case you encounter any further problems, please drop me an email, marco.daniel at mada-nada.de.

Do you have any ideas / wishes on further extensions to this package? Please let me know!

- 1. So far the environment isn't compatible with the package gmverb.
- 2. If you load the package picins the frame will no be splitted. That based on a problem of the package 'picins' which defines \@captype global. To work with the package picins you can use the following hack.

```
\label{lem:continuous} $$ \makeatletter $$ \left( \end{captype} \end{captype} \right) $$ \makeatletter $$ \left( \end{captype} \end{captype} \right) $$ \makeatletter $$ \makea
```

- 3. mdframed can't handle the option allowframebreaks of the class beamer.
- 4. A nested mdframed environment can't be splitted.

## 13. ToDo

### It is important to update the documentation

- 1. see "Known Problems".
- 2. So far it isn't possible to combine the environment \begin{multicols} of the package multicol with mdframed with the whole option list.

- 3. Create new styles.
- 4. Improve page breaks.
- 5. Improve footnotes.
- 6. Improve documentation and examples.
- 7. Create styles for frametitle.
- 8. Create an inline version of mdframed that's works like \fbox
- 9. Add \ht\strutbox to file md-frame-1.mdf

# 14. Acknowledgements

Dick Nickalls; Dietrich Grau; Piazza Luca; Jobst Hoffmann; Martin Scharrer; Enrico Gregorio; Heiko Oberdiek; Philipp Stephani.

Thanks for proofreading
Alan Munn and Nahid Shajari
I hope I forgot nobody.

## A. More information

In the following section I want to present how to create your own frame.

#### A.1. How does mdframed work?

With the environment \begin{mdframed} ... \end{mdframed} the whole contents will be saved in a \savebox called \mdf@splitbox@one. After the calculation of the width and the height of the \mdf@splitbox@one (done by mdframed.sty) the box will be set sequently (done by md-frame-X.mdf). The following figure demonstrates this.



Figure 4: Setting the contents of mdframed

The width of the contents is the result of the settings of leftmargin, rightmargin, linewidth, innerleftmargin and innerrightmargin (see figure (2)).

#### A.2. The Framecommands

The package mdframed knows four kinds of "Framecommand". These commands tell LATEX how to set the contents of mdframed.

\mdf@putbox@single This command sets the contents of a single unsplit frame.

\mdf@putbox@first This command sets the contents of the first frame of a split frame.

\mdf@putbox@middle This command sets the contents of the middle frame of a split frame.

\mdf@putbox@second This command sets the contents of the last frame of a split frame.

Using the explained commands we give an example. The command **\box** uses the contents of the savebox and types them out.

First we want to type out the single box without any settings (but with the calculated width).

I am using the command \leftline to start the "Framecommands" at the left.

```
\label{lem:makeatletter} $$ \def\mdf@putbox@single{\left\lceil \frac{\mathbf{\box}\mdf@splitbox@one}\right\rceil} $$ \\ \mbox{makeatother} $$
```

Now you have to know how the lengths are named. Every length which can be modified by the options has the following syntax:

```
\mdf@<Name of the Length>@length
```

For example the leftmargin is:

```
igg \setminus \mathbf{mdf@leftmargin@length}
```

To create only a line at the left with the correct  $leftmargin\ you\ can\ set\ \mbox{mdf@putboxsingle}\ as$  follows

In this way you can do what you want. If you create your own style you can save the file as md-frame-X.mdf. X must be an integer. In this way you can use the option framemethod to load the file by setting framemethod=X.