

# Including Graphics in L<sup>A</sup>T<sub>E</sub>X

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## 1 Including external graphics

	EPS	PDF	JPG	GIF	PNG
L <sup>A</sup> T <sub>E</sub> X	yes	no	yes*	no	yes*
PDFL <sup>A</sup> T <sub>E</sub> X	no	yes	yes	no	yes

Please note: only EPS and PDF are scalable. Use JPG and PNG for photographs only!

Many programs can generate EPS directly. You can use Micrografx/Corel Designer to export (almost?) everything to EPS format. Just Copy/Paste objects in Designer and export to "EPS no header or preview".

Use EPS2PDF (installed on your Windows desktop) to convert EPS to PDF.

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\* does not work automatically when working with L<sup>A</sup>T<sub>E</sub>X. You should enter the coordinates of the bounding box manually.

Including graphics:

- In preamble:

```
\usepackage{graphicx}
```

- Including the graphic file:

```
\includegraphics [width=0.7\linewidth]{filename}
```

Use the file name **without** extension!  $\LaTeX$  will take the EPS file, PDF $\LaTeX$  will take the PDF file automatically.

## 2 The includegraphics command

```
\includegraphics [options]{filename}
```

When including EPS or PDF files, use the file name **without** extension!  $\LaTeX$  will take the EPS, PDF $\LaTeX$  will take the PDF.

Supported options are:

scale=number      magnifies the figure by *number* over its natural size.  
width=length      specifies the width to which the figure should be scaled  
height=length     specifies the height to which the figure should be scaled  
angle=number      rotates the figure counterclockwise over the specified angle  
                    (in degrees)  
bb=llx lly urx ury enters the coordinates of the bounding box manually.

## 3 Floating Figures

Use a figure environment to create floating figures.  $\LaTeX$  will position the image on the place that you specify, or on the top of the next page if it doesn't fit on the current page anymore. In a figure environment you can use a caption to give a description of the figure, and a label to refer to the image.

```
\begin{figure}[ht]  
\begin{center}  
\includegraphics [width=8cm]{images/rsm}  
\caption{a response surface.}
```

```
\label{fig:surface}  
\end{center}  
\end{figure}
```

Now you can refer to the image:

```
See figure \ref{fig:figure}.
```

Please note:

The external figures will be embedded in the PostScript and PDF file, but not in the DVI file!

## 4 Inline floats

The package `wrapfig` makes it possible to place text next to floats:

```
\begin{wrapfigure}{placement}[overhang]{width}  
\includegraphics[width=\linewidth]{image}  
\end{wrapfigure}
```

`placement` horizontal placement: l (left) or r (right). For two-sided documents: i (inside edge) or o (outside edge).

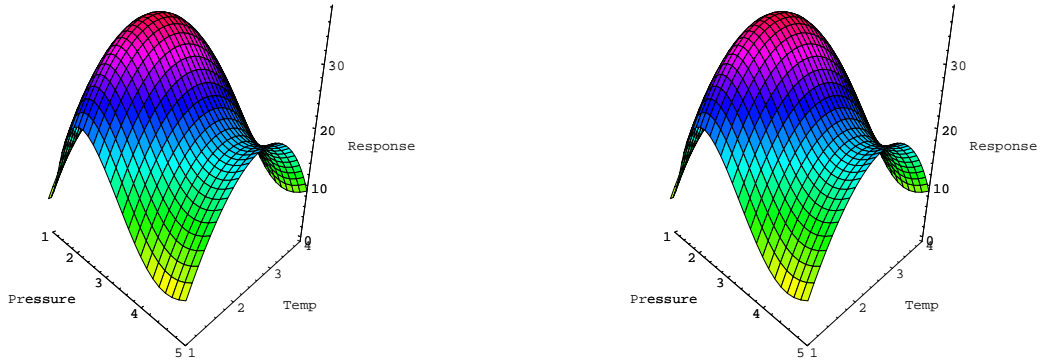
`overhang` overhang of the float into the margin (default: 0pt).

`width` width of the figure or table (use `wratable` for tables).

## 5 Two floats next to each other

### 5.1 No caption

```
\includegraphics[width=0.45\linewidth]{pic1}  
\hfill  
\includegraphics[width=0.45\linewidth]{pic2}
```



## 5.2 One caption

```

\begin{figure}[ht]
\includegraphics[width=0.45\linewidth]{pic1}
\hfill
\includegraphics[width=0.45\linewidth]{pic2}
\caption{a response surface.}
\label{fig:surface}
\end{figure}

```

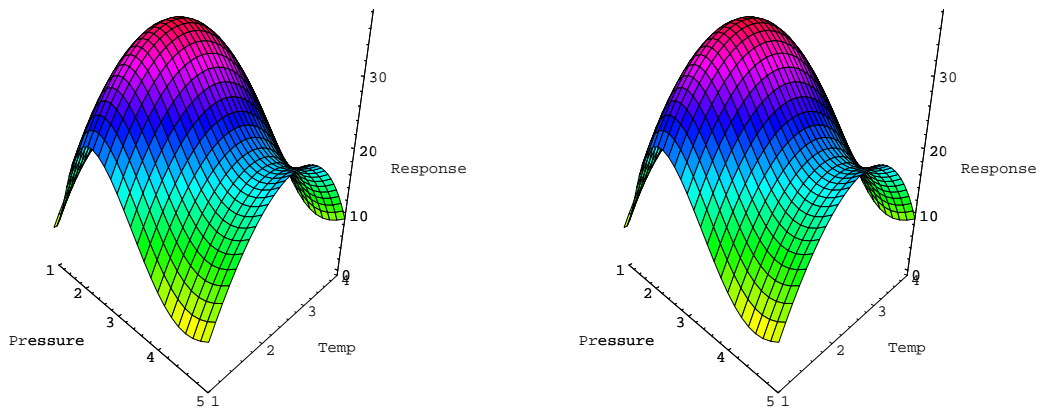


Figure 1: a response surface.

### 5.3 Two captions

Now we need the package `caption`. This package has very extensive functionality to change the appearance of captions. In this case we are only going to use the new command `\captionof`.

```
\parbox[t]{0.45\textwidth}{
  \includegraphics[width=\linewidth]{pic1}
  \captionof{figure}{the first figure}
}
\hfill
\parbox[t]{0.45\textwidth}{
  \includegraphics[width=\linewidth]{pic2}
  \captionof{figure}{the second figure}
}
```

For tables, just replace `figure` by `table`.

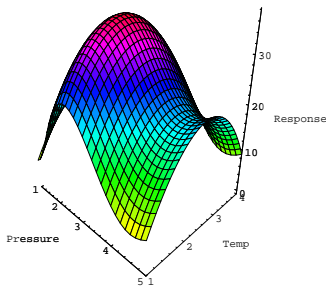


Figure 2: the first figure

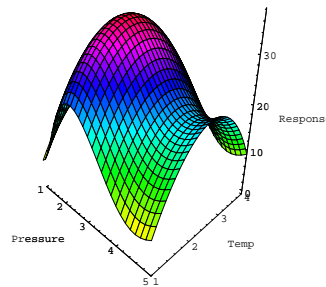


Figure 3: the second figure

### 5.4 Sub-captions

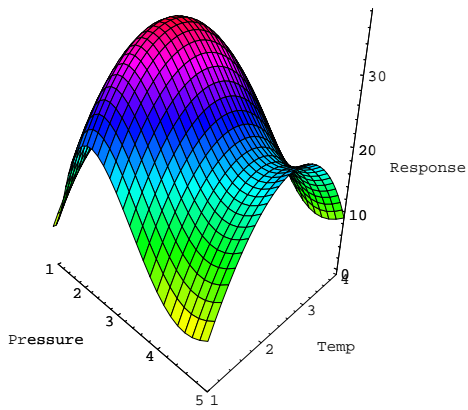
Now we need the package `subfig`:

```
\begin{figure}[ht]
\begin{center}
\subfloat[First figure]{
  \includegraphics[width=0.45\textwidth]{pic1}
}
\subfloat[Second figure]{
```

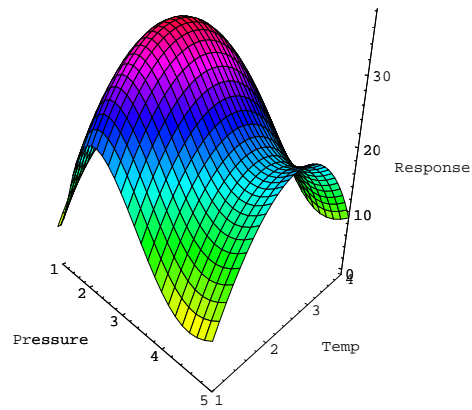
```

\includegraphics[width=0.45\textwidth]{pic2}
}
\caption{Two figures}
\end{center}
\end{figure}

```



(a) First figure



(b) Second figure

Figure 4: Two figures