

The package `lpic` allows to put any \LaTeX material on top of included graphics. It can also create white background rectangle under \LaTeX annotations.

It defines an environment `lpic` and two commands `\lbl` and `\lpichelp`. Command `\lpichelp` dumps usage instructions into the document.

USAGE:

The environment

```
\begin{lpic}[OPTIONS] {<FILENAME>DIMENSIONS}
    \lbl[POSITION] {X-COORD,Y-COORD,ANGLE;  $\LaTeX$  MATERIAL}
    \vdots
\end{lpic}
```

produces a \TeX box with included graphics and the \LaTeX material on top of it.

`<FILENAME>` is a name of external graphics in **PS**, **EPS** or **PDF** format. There is no need to give the extension of the file, appropriate format will be chosen, depending whether latex or pdflatex is run on the document. Convention is the same as for `epsfig` package.

`DIMENSIONS` is one of the following:

- (1) empty string
- (2) `()`
- (3) `(,)`
- (4) `(X)`
- (5) `(X,)`
- (6) `(,Y)`
- (7) `(X,Y)`

where each `X` and `Y` is either a positive decimal (with decimal point, not coma!) or length (any length expression understandable to \TeX). Decimal number is interpreted as a scale coefficient and length is interpreted as the desired horizontal or vertical dimension of the figure.

If neither `X` nor `Y` are supplied (cases 1, 2, 3), then the original unscaled picture is included. If only one of `X` and `Y` is given (cases 4, 5, 6), then picture is scaled homotetically. If both are present (case 7), then graphics is scaled vertically and horizontally, according to given parameters.

For example:

`\begin{lpic}{tessalation}` – means include graphics in the file `tessalation` at the original size.

`\begin{lpic}{tessalation(0.5)}` – means include graphics at the half the original size.

`\begin{lpic}{tessalation(0.5,3)}` – means include graphics shrinking twice in the horizontal direction and stretching 3 times in the vertical direction.

`\begin{lpic}{tessalation(,10cm)}` – include graphics homotetically scaled, so that height is equal to 10cm.

`\begin{lpic}{tessalation(150mm)}` – include graphics homotetically scaled, so that width is equal to 150mm.

`\begin{lpic}{tessalation(150mm,0.7)}` – include graphics scaled, so that width is equal to 150mm and height is 0.7 of the original.

`OPTIONS` is a coma separated list of options (no spaces, this is a bug, I will fix it sometimes). Option are processed sequentially, thus options to the right override preceding ones. Parameter in `()` is optional, if omitted then some default value is taken.

Options are:

`l(length)` – the size of the left margin beyond bounding box of graphics (default 0mm).

`r(length)` – right margin

`t(length)` – top margin

`b(length)` – bottom margin

- `grid(step)` – Draw a grid over the picture of step `step*\lpunitlength` and thickness `\lpgridthickness`. Parameter `step` must be an integer and defaults to 5.
- `coords(step)` – write coordinates with the step `step*\lpunitlength`. Parameter `step` must be an integer and defaults to 10.
- `frames(length)` – draw boxes of thickness `length` over \LaTeX material. Default value is 0.01mm
- `frame(length)` – draw a box around the whole thing (margins included). `length` is the thickness of the lines. Default value is 0.7mm.
- `figframe(length)` – draw a box around the included graphics. `length` is the thickness of the lines. Default value is 0.2mm.
- `draft` – draw whatever is convenient for adjusting the positions of \LaTeX material. That includes grid, coordinates, all types of frames.
- `clean` – remove all auxiliary stuff.
- `nolbl` – don't typeset any \LaTeX material.
- `nofigure` – don't include the graphics, just an empty box of appropriate size

Inside of `lpic` environment one can issue `\lbl` command with the following syntax:

```
\lbl[OPTIONS]{COORDINATES; ANY  $\LaTeX$  MATERIAL}
```

\LaTeX material is put in a box, rotated if necessary and printed in appropriate place. White rectangular background, which overshadows part of graphics could also be created.

COORDINATES are either pair or a triple of decimals. The first two numbers are coordinates of the point, where \LaTeX material should be placed and the third is an angle of rotation applied to the box containing the material. Coordinates are measured in the coordinate system in the original, unscaled picture, with the unit equal to `\lpunitlength` (default 1mm). So, if the picture is scaled, all the boxes containing \LaTeX will hopefully stay at their appropriate places.

OPTIONS is optional and consists of at most three letters, one from the set `{t,b}`, one from `{r,l}` and one from `{w,W}` in any order. `[t|b,l|r]` options give a reference point in a box containing \LaTeX text. Coordinates refer to this reference point. Rotation is also centered at this point. Thus, there are total 9 possibilities referring to 9 evenly spaced points in the rectangle. If one of `[w|W]` is given then \LaTeX is put on top of white box. The size of the box is equal to the size of the box containing the material in case of `w` and margins `\lpbgsep`-wide are added in case of `W`. Note that `xdvi` apparently renders postscript after dvi, so any postscript covers dvi material. Thus, if you use background, you will not be able to see your latex in `xdvi`. but once postscript file is created, \LaTeX will show.

ADJUSTABLE PARAMETERS:

- `\lpunitlength` (1mm) Units in the unscaled coordinate system
- `\lpmarginright` (0mm)
- `\lpmarginleft` (0mm)
- `\lpmargintop` (0mm)
- `\lpmarginbottom` (0mm) Default sizes of margins.
- `\lpbgsep` (`\fboxsep`) Margins for the white background.
- `\lpgridthickness` (0.01mm) Thickness of the grid lines.
- `\lpframethickness` (0.7mm) Thickness of the frame around the whole box.
- `\lpblframethickness` (0.01mm) Thickness of the frame around labels.
- `\lpfigframethickness` (0.2mm) Thickness of the frame around included graphics.
- `lpgridstep` (5) Counter containing the step to draw grid lines
- `lpcoordstep` (10) Counter containing the step to draw coordinates

TODO:

- (1) Optimise the whole thing.
- (2) Write legible usage.
- (3) Spaces in the list of options make troubles!
- (4) Angles should be measured in unscaled coordinate system!

- (5) Different steps for the grid and coordinates in vertical and horizontal direction.
- (6) With nofigure frame is not drawn.