# gnuplot in LaTeX, without gnuplottex

Asked 6 years, 8 months ago Active 3 years, 4 months ago Viewed 4k times

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I'm using the `cairolatex` terminal in `gnuplot` to create some surface plots ( `pgfplots` is failing the task because of its hunger for memory). As the number of plots increase, I would like to include the `gnuplot` compilation into my `tex` compilation to ensure the plots are up-to-date. I came across the `gnuplottex` package, which seems to handle the task, though it's slow.

I have a large, nested document. Tex root is `thesis.tex` where I include, amongst others, `theory.tex` . In `theory.tex` I have put

```
\begin{figure}[htbp]
    \centering
    \input{gnuplot/cascade}
    \input{figures/cascade}
\end{figure}
```

where `gnuplot/cascade.tex` contains the `gnuplot` code

```
\begin{gnuplot}[terminal=cairolatex]
    set samp 100;
    set iso 40;
    set xrange [0:1];
    set yrange [0:1];
    set zrange [0.8:2];
    unset key;
    unset colorbox;
    set hidden3d front;
    a = 1;
    set xyplane at a;
    f(x,y) = (x+y)/(2*sqrt(x*y));
    set xlabel "$\\tau_I$";
    set ylabel "$\\tau_D$";
    set zlabel "$\\zeta$";
    set output "figures/cascade.tex"
    splot f(x,y) with pm3d at b, f(x,y) with lines;
    unset output
\end{gnuplot}
```

The output of this setup is awesome. But whenever I change something in `theory.tex` , the entire `gnuplottex` routine recompiles. This takes quite some time, and is very annoying.

How come `latexmk` doesn't recognise that the `gnuplot` code hasn't changed and leave it? Could this dependency be specified, and in that case, how?

EDIT: `gnuplottex` is fairly slow on my system, although `gnuplot` is really quick. How can I avoid using `gnuplottex`, it's long compilation time and thus avoid having `gnuplottex` recompiling every time?

gnuplot latexmk

edited May 16 '13 at 8:14

asked Apr 2 '13 at 10:32

Holene
**6,040** 4 30 60

Because the `gnuplot` command is being executed by the `gnuplottex` package, `latexmk` doesn't control whether `gnuplot` is invoked. You can change things so that `latexmk` is in control of `gnuplot` by turning off `-shell-escape` and defining a custom dependency for `latexmk` to invoke `gnuplot`. Could you try this on your present document? (One would need a modification to `gnuplottex` to make this solution fully general.) – John Collins Apr 3 '13 at 15:37

I thought maybe `latexmk` would control whether or not `gnuplottex` would be invoked. But yeah, this could be a solution. I don't have the skills to make such a dependency though, could you please help me out? – Holene Apr 4 '13 at 6:47

Come to think of it, what i *really* would like is to avoid using `gnuplottex` at all, and have `latexmk` invoke `gnuplot` when needed. Something like this maybe (though is doesn't work, of course): `add_cus_dep('gnu','eps', 0, 'makegnu2eps'); sub makegnu2eps { system("gnuplot \"$_[0].gnu\"") ; }` – Holene Apr 4 '13 at 7:26

What doesn't work about the custom dependency you tried? If you put your `gnuplot` code in a file with extension .gnu, e.g., `figure.gnu`, and have a corresponding `\includegraphics{figure}` in your LaTeX file, then it should work. This assumes you are using `latex`, not `pdflatex`, to compile your LaTeX file, since you are generating an `.eps` file. When you run `latexmk`, there will be a missing-file error the first time it uses `latex`; `latexmk` should detect that and use `gnuplot`. Then there should be a successful second use of `latex`. – John Collins Apr 4 '13 at 13:50

I made a mistake, it's actually working! I changed the dependency to yield: `add_cus_dep('gnu','tex', 0, 'makegnu2tex'); sub makegnu2tex { system("gnuplot \"$_[0].gnu\"") ; }`. The `gnuplot` code now outputs `gnuplot/cascade.tex` and my LaTeX file requests `\include{gnuplot/cascade.tex}`. The `gnuplot` code is compiled (as fast as you would expect `gnuplot` to compile, way faster than `gnuplottex`), the `.eps` and `.tex` files from `cairolatex` is produced, and everything is fine! – Holene Apr 5 '13 at 11:45

## 2 Answers

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I have avoided using `gnuplottex` at all by adding the following custom dependency to `.latexmkrc`:

```
add_cus_dep('gnu','tex', 0, 'makegnu2tex');
    sub makegnu2tex {
    system("gnuplot \"$_[0].gnu\"") ;
    }
```

My `gnuplot` file uses the `cairolatex` terminal (or any other terminal who produce a `.tex` file). My `latex` document contains `\input{gnuplot_output.tex}` which, because of the newly defined dependency, causes a system call to `gnuplot` upon `tex` compilation. The `.gnu` file

and `.tex` files are now a normal dependency, and `gnuplot` will not recompile unless the time stamp is changed.

It's important to notice that the path specified in `set output "path/gnuplot_output.tex"` in the `.gnu` file is relative to the `tex root` file as long as the `gnuplot` system call is induced by `latexmk .`

edited Apr 6 '13 at 7:40

answered Apr 5 '13 at 11:52

Holene

**6,040** 4 30 60

Should one worry about a possible missing dependency between eps/pdf figure and the gnuplot file? Two files are generated by one command ( `$ gnuplot file.gnu -> file.tex & file.eps` ). – Hotschke Apr 5 '13 at 14:23

I don't know if a non-one-to-one dependency in general should be avoided, but unless your `.eps` / `.pdf` file somehow should update without its corresponding `.gnu` file being updated, it shouldn't pose a problem. – Holene Apr 6 '13 at 7:45

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My current solution without using `gnuplottex` is a modification of one I found a while ago (How to include an SVG image in LaTeX) for the inclusion of SVGs (with an automatic call to Inkscape if necessary).

```
\newcommand{\executeiffilenewer}[3]{%
    \ifnum\pdfstrcmp{\pdffilemoddate{#1}}%
    {\pdffilemoddate{#2}}>0%
    {\immediate\write18{#3}}\fi%
}
\newcommand{\includegp}[2]{%
    \executeiffilenewer{#1#2.gp}{tmp/img/#2.tex}%
    {gnuplot #1#2.gp}%
    \import{tmp/img/}{#2.tex}%
}
```

I have my gnuplot files in a subfolder, e.g. `img/ch01/foo.gp` , and I like to have all temporary files in `tmp/` and all temporary image files in `tmp/img/` (since I use `git` to track my tex files, but do not want do track any derived files, i.e. the ones in `tmp/` ). The gnuplot file can then be embedded in a document like this:

```
\begin{figure}
    \centering
    \includegp{img/ch01/}{foo}
\end{figure}
```

I call `miktex-pdftex.exe` from `TeXworks` with the `-aux-directory=tmp` and `-shell-escape` options for this to work. Addionally, the folder containing the gnuplot binary must be in the PATH variable or in my case set in the TeXworks settings (e.g. `D:/gnuplot/bin` ).

answered Jul 7 '16 at 17:29

Cornelius Sicker

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