

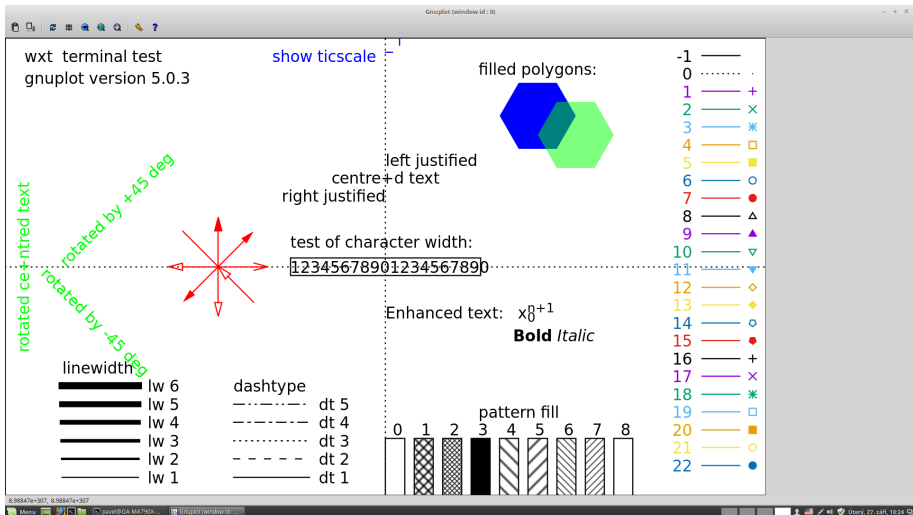
Programy

- Gnuplot
- \LaTeX
- \LaTeX -TikZ

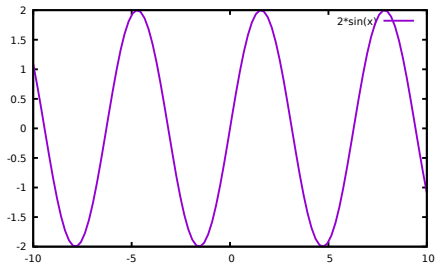
Gnuplot

- hlavní stránka: www.gnuplot.info
- dokumentace: www.gnuplot.info/documentation.html
- příklady: gnuplot.sourceforge.net/demo_5.2/
- matematické funkce
- experimentální data

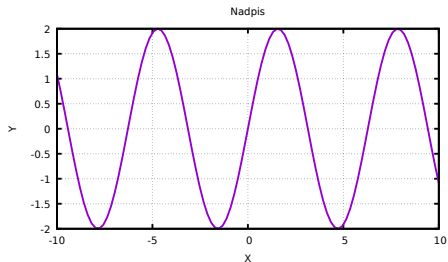
Příkaz - test



```
#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,12"
set terminal pdfcairo linewidth 3
set output "test.pdf"
plot 2*sin(x)
```



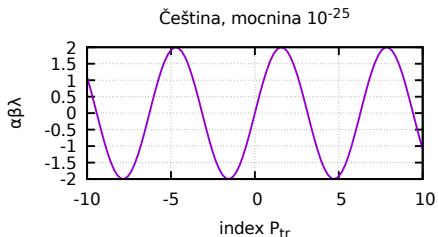
```
#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,12"
set terminal pdfcairo linewidth 3
set output "test.pdf"
unset key
set grid
set title "Nadpis"
set xlabel "X"
set ylabel "Y"
plot 2*sin(x)
```



```

#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,20"
set terminal pdfcairo linewidth 3
set output "test.pdf"
unset key
set grid
set title "Čeština, mocnina 10^{-25}"
set xlabel "index P_{tr}"
set ylabel "{ /Symbol abl }"
plot 2*sin(x)

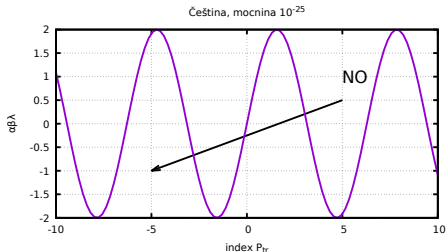
```



```

#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,12"
set terminal pdfcairo linewidth 3
set output "test.pdf"
unset key
set grid
set label "NO" at 5,1 font "Helvetica,20"
set arrow from 5,0.5 to -5,-1
set title "Čeština, mocnina 10-25"
set xlabel "index Ptr"
set ylabel "{ /Symbol abl }"
plot 2*sin(x)

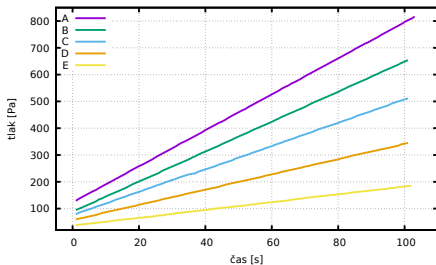
```



```

#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,12"
set terminal pdfcairo linewidth 3
set output "test.pdf"
set grid
set xlabel "čas [s]"
set ylabel "tlak [Pa]"
set key left
set xrange [-5:110]
set yrange [20:850]
plot "VAKP5-01.DAT" using ($1):($2*133.2) title "A" with lines,/
"VAKP5-02.DAT" using ($1):($2*133.2) title "B" with lines,/
"VAKP5-03.DAT" using ($1):($2*133.2) title "C" with lines,/
"VAKP5-04.DAT" using ($1):($2*133.2) title "D" with lines,/
"VAKP5-05.DAT" u ($1):($2*133.2) t "E" w l

```

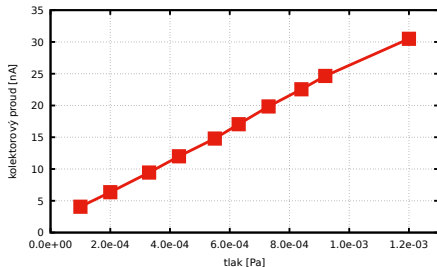



```

#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,20"
set terminal pdfcairo linewidth 3
set output "test.pdf"
unset key
set xlabel "tlak [Pa]"
set ylabel "kolektorový proud [nA]"
set format x "%.1e"
le = 0.5e-3 #proud elektronu [A]

plot 'ion1.dat' using ($1*100):($2*le*1000000000) w lp pt 5 ps
1.5 lt 7 lw 1.5

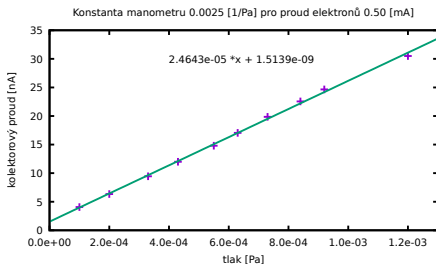
```



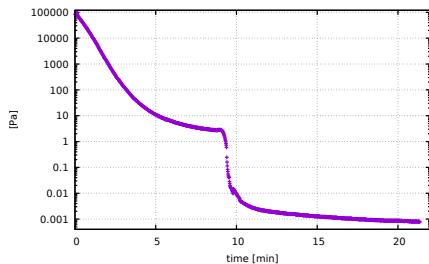
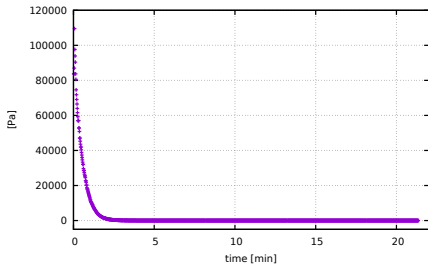
```

set xlabel "tlak [Pa]"
set ylabel "kolektorový proud [nA]"
unset key
set xrange [0:0.0013]
set format x "%.1e"
le = 0.5e-3
lin1(x) = a1*x+b1
a1=1
b1=1
fit lin1(x) 'ion1.dat' using ($1*100):($2*le) via a1,b1
set title sprintf("Konstanta manometru %.4f [1/Pa] pro proud
elektronů %.2f [mA]", a1*100, le*1000)
set label sprintf("%.4e *x + %.4e", K, b1) at 0.0004, 30
plot 'ion1.dat' using ($1*100):($2*le*1000000000) w p,
lin1(x)*1000000000

```



set logscale y



- hlavní stránka: www.latex-project.org/
- dokumentace: www.latex-project.org/help/documentation/
J. Rybička: L^AT_EX pro začátečníky, Konvoj 1995
- příklady: internet, dokumentace, ...
- článek, kniha, DP, BP, skripta, poster, přednáška, protokoly, ...
- integrovaná prostředí - TeXstudio, TeXmaker,...
- formát obrázků - png, jpg, eps, pdf

Texstudio

The screenshot displays the Texstudio application window. The left pane shows the LaTeX source code for a document titled 'praktikum-02a-programy.tex'. The code includes an `\input` command for 'hlavicka.tex', a `\begin{document}` block, and three `\frame` sections. The first frame contains a `\nabdis` command and a list of items: Gnuplot, L^AT_EX, and L^AT_EX-TikZ. The second frame contains another `\nabdis` command and a list of URLs: 'www.gnuplot.info', 'www.gnuplot.info/documentation.html', and 'gnuplot.sourceforge.net/demo\ 5.0/'. The third frame contains a `\begin{columns}` environment with two `\begin{column}` blocks, each containing the word 'test'. The right pane shows the rendered PDF output. The title is 'Programy'. Below it is a bulleted list: Gnuplot, L^AT_EX, and L^AT_EX-TikZ. At the bottom of the page, there is a footer with 'PRAKTIKUM Z VAKUOVÉ FYZIKY' and 'Gnuplot'. The status bar at the bottom of the window indicates 'Pages 1 to 3 of 5', '185%', and 'cs_CZ UTF-8 Ready Automatic'. The system tray shows the date 'Uterý 27. září 10:12'.

```
\input{hlavicka.tex}

\begin{document}
-----
\frame{
  \nabdis{Programy}

  \begin{itemize}
    \item Gnuplot
    \item LATEX
    \item LATEX-TikZ
  \end{itemize}
-----
\frame{
  \nabdis{Gnuplot}

  \begin{itemize}
    \item hlavní stránka: www.gnuplot.info
    \item dokumentace: www.gnuplot.info/documentation.html
    \item příklady: gnuplot.sourceforge.net/demo\ 5.0/
  \end{itemize}
}
-----
\frame{
  \begin{columns}
    \begin{column}{0.5\textwidth}
      test
    \end{column}
    \begin{column}{0.5\textwidth}
      test
    \end{column}
  \end{columns}
}
-----
\frameof
-----
Line: 64 Column: 0 INSERT
```

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "praktikum-02a-programy".tex
Process exited normally

Pages 1 to 3 of 5 185%

cs_CZ UTF-8 Ready Automatic

Uterý 27. září 10:12

The screenshot displays the TeXstudio interface. The main editor window shows the following LaTeX source code:

```
\documentclass[12pt]{article}
\begin{document}
Test
\end{document}
```

The right-hand pane shows the rendered PDF output, which contains the word "Test" centered on the page. The status bar at the bottom indicates "Page 1 of 1" and "349%". A Messages window at the bottom left shows the following text:

```
Process started: pdflatex -synctex=1 -interaction=nonstopmode "test".tex
Process exited normally
```

The system tray at the bottom of the window shows the date and time: "Pátek, 30. září, 12:41".

The screenshot shows the TeXstudio interface. The main editor window contains the following LaTeX code:

```
\documentclass[12pt]{article}
\usepackage[utf8]{inputenc}
\usepackage[czech]{babel}

\pagestyle{empty}
\topmargin -1cm
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\begin{document}

Test češtiny.

Test  $\lambda$ ;  $T^P$ ;  $T_{mn}$ 

\end{document}
```

The preview window on the right displays the rendered output:

Test češtiny.
Test λ ; T^P ; T_{mn}

At the bottom, a Messages window shows the following text:

```
Process started: pdflatex -synctex=1 -interaction=nonstopmode "test.tex"
Process exited normally
```

The status bar at the bottom of the TeXstudio window indicates "Page 1 of 1 349%", "cs_CZ", "UTF-8", "Ready", "Automatic", and the system tray shows the date and time: "Pátek, 30. září, 12:45".

TeXstudio interface showing LaTeX source code and a preview window.

Source Code (test.tex):

```

\documentclass[12pt]{article}
\usepackage[utf8]{inputenc}
\usepackage[czech]{babel}

\pagestyle{empty}
\topmargin -1cm
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\begin{document}
\begin{center}
Test  $\lambda$ ;  $T^P$ ;  $T_{mn}$ 
\end{center}


$$v_a = \sqrt{\frac{4}{\pi}} v_p = \sqrt{\frac{8kT}{\pi m_0}}$$


\begin{equation}
v_a = \sqrt{\frac{4}{\pi}} v_p = \sqrt{\frac{8kT}{\pi m_0}}
\end{equation}

\end{document}

```

Preview Window:

Test λ ; T^P ; T_{mn}

$$v_a = \sqrt{\frac{4}{\pi}} v_p = \sqrt{\frac{8kT}{\pi m_0}}$$

$$v_a = \sqrt{\frac{4}{\pi}} v_p = \sqrt{\frac{8kT}{\pi m_0}} \quad (1)$$

Messages: Process started: pdflatex -synctex=1 -interaction=nonstopmode "test".tex
Process exited normally

Page 1 of 1 200%

TeXstudio interface showing LaTeX code and a plot.

```
\documentclass[12pt]{article}
\usepackage[utf8]{inputenc}
\usepackage[czech]{babel}

\usepackage{graphicx}

\pagestyle{empty}
\topmargin -1cm
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\begin{document}

\includegraphics[width=0.8\textwidth]{v-boltz-01.pdf}

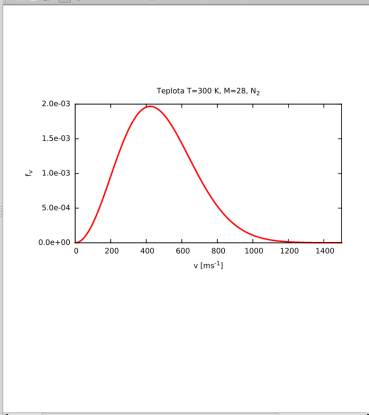
\end{document}
```

Line: 17 Column: 0 INSERT

Messages Log Preview Search Results X
Process started: pdflatex -synctex=1 -interaction=nonstopmode 'test'.tex
Process exited normally

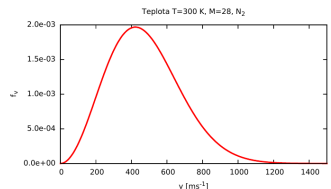
Page 1 of 1 141%

cs_CZ UTF-8 Ready Automatic Pátek, 30. září, 13:52



`\usepackage{graphicx}`
`\pagestyle{empty}`
`\topmargin -1cm`
`\oddsidemargin -0.6cm`
`\textheight 24cm`
`\textwidth 16.5cm`
`\begin{document}`
 Text Obr.\ref{m1} text pokračuje.
`\begin{figure}[!htb]`
`\begin{center}`
`\includegraphics[width= 0.8\textwidth]{v-boltz-01.pdf}`
`\end{center}`
`\caption{\em Maxwellovo rozdělení rychlostí pro dusík a`
`teplotu 300 K }`
`\label{m1}`
`\end{figure}`
`\end{document}`

Text Obr.1 text pokračuje.



Obrázek 1: Maxwellovo rozdělení rychlostí pro dusík a teplotu 300 K

Messages Log Preview Search Results
 Process started: pdflatex -synctex=1 -interaction=nonstopmode "test.tex"
 Process exited normally

Page 1 of 1 141%
 cs_CZ UTF-8 Ready Automatic Pátek, 30. září, 12:54

TeXstudio interface showing a LaTeX document and its rendered output.

Left Panel (Source Code):

```

\begin{document}
\begin{table}[!ht]
\begin{center}
\begin{tabular}{|c|cccc|}
\hline
Plyn & $He$ & $Ne$ & $Ar$ & $Kr$ \\ \hline
$d [10^{-10} m]$ & 2,20 & 2,55 & 3,69 & 4,27 \\ \hline
\end{tabular}
\end{center}
\caption{\em Efektivní průměr některých atomů a molekul}
\label{prumer}
\end{table}
\end{document}

```

Right Panel (Rendered Output):

Plyn	<i>He</i>	<i>Ne</i>	<i>Ar</i>	<i>Kr</i>
$d [10^{-10} m]$	2,20	2,55	3,69	4,27

Tabulka 1: *Efektivní průměr některých atomů a molekul*

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test.tex"

Process exited normally

Page 1 of 1 200%

cs_CZ UTF-8 Ready Automatic

Pátek, 30. září, 13:59

Bez názvu - TeXstudio

Soubor Úpravy Jazyk Nástroje LaTeX Matematika Průvodce Bibliografie Mapa Dohled Volby Nápověda

Střek Label (GRC) Drobně - Jiny

```

\documentclass[12pt]{article}
\begin{document}
\renewcommand{\arraystretch}{1.5}
\begin{tabular}{|c|c|c|c|c|}
\hline
\bf plyn & He & Ne & Ar & Kr \\
\hline
\boldmath $ d-[10^{\{-10\}}\text{-}\rm m]$ & 2,20 & 2,55 & 3,69 & 4,27 \\
\hline
\end{tabular}
\renewcommand{\arraystretch}{1}
\end{document}

```

plyn	He	Ne	Ar	Kr
$d [10^{-10} \text{ m}]$	2,20	2,55	3,69	4,27

Rádek: 11 Sloupec: 0 Peřim: Vnoit

Zprávy Zřnam Náhled Výsledky hledání

Proces spuřten: pdflatex -synctex=1 -interaction=nonstopmode "texstudio_P4prC".tex

Proces ukončen jako obvykle

Strana 1 z 1 169%

cs_CZ UTF-8 Připraven Automaticky

Streda, 10. zari, 9:55

The screenshot displays the TeXstudio interface. The main editor window shows the following LaTeX source code:

```
\topmargin -1cm
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\usepackage{color}

\begin{document}
\begin{center}
{\tiny Test}\\
{\scriptsize Test}\\
{\footnotesize Test}\\
{\small Test}\\
{\normalsize Test}\\
{\large Test}\\
{\Large Test}\\
{\huge Test}\\
{\Huge Test}\\

{\color{red} Test}
\end{center}
\end{document}
```

The right-hand pane shows the rendered output of this code, featuring the word "Test" in various sizes and a red "Test" at the bottom. The status bar at the bottom of the window indicates "Page 1 of 1 400%".

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test".tex

Process exited normally

Page 1 of 1 400%

cs_CZ UTF-8 Ready Automatic

Menu

The screenshot shows the TeXstudio interface. The left pane displays the LaTeX source code for a document. The code is as follows:

```
\textwidth 16.5cm
\usepackage{color}
\begin{document}
\begin{itemize}
\item Test A
\item Test B
\end{itemize}
%-----
\begin{enumerate}
\item Test A
\item Test B
\end{enumerate}
\end{document}
```

The right pane shows the rendered output of the document, which is a white page with the following content:

- Test A
- Test B

Below the rendered output, there is an ordered list:

1. Test A
2. Test B

The status bar at the bottom of the TeXstudio window indicates "Page 1 of 1" and "400%". The system tray at the bottom of the screen shows the date and time as "Pátek, 30. září, 16:59".

The screenshot displays the TeXstudio interface. The left pane shows the LaTeX source code for a document. The right pane shows the rendered PDF output. At the bottom, a status bar indicates the current page and zoom level, and a system tray shows the date and time.

```
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\begin{document}

Text \cite{test1}, text text \cite{test2}.

\begin{thebibliography}{99}
\bibitem{test1} J. Groszkowski: Technika
vysokého vakua, SNTL, Praha 1981
\bibitem{test2} L. Pátý: Fyzika nízkých tlaků,
Academia, Praha 1968
\end{thebibliography}
\end{document}
```

Text [1], text text [2].

Reference

- [1] J. Groszkowski: Technika vysokého vakua, SNTL, Praha 1981
- [2] L. Pátý: Fyzika nízkých tlaků, Academia, Praha 1968

Line: 13 Column: 0 INSERT

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test.tex"

Process exited normally

Page 1 of 1 165%

cs_CZ UTF-8 Ready Automatic Pátek, 30. září, 16:29

L^AT_EX- TikZ

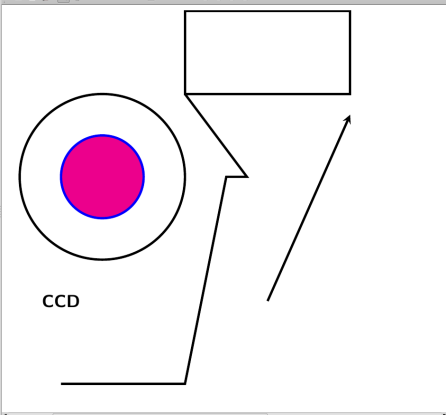
- hlavní stránka: www.ctan.org/pkg/pgf
- dokumentace: www.ctan.org/pkg/pgf
- příklady: www.texample.net/tikz/examples/
- schémata

TeXstudio interface showing a LaTeX document titled "test.tex" and its rendered output.

```
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\usepackage{tikz}
\begin{document}

\begin{tikzpicture}[ultra thick]
\draw (2,4) rectangle (6,2);
\draw (0,0) circle (2);
\draw [fill = magenta, draw = blue] (0,0) circle (1);
\node at (-1,-3) {\bf \textsf{CCD}};
\draw [->, > = stealth] (4,-3)--(6,1.5);
\draw (-1,-5)--(2,-5)--(3,0)--(3.5,0)--(2,2);
\end{tikzpicture}
```



Line: 21 Column: 43 INSERT

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test".tex

Process exited normally

Page 1 of 1 231%

cs_CZ UTF-8 Ready Automatic

