

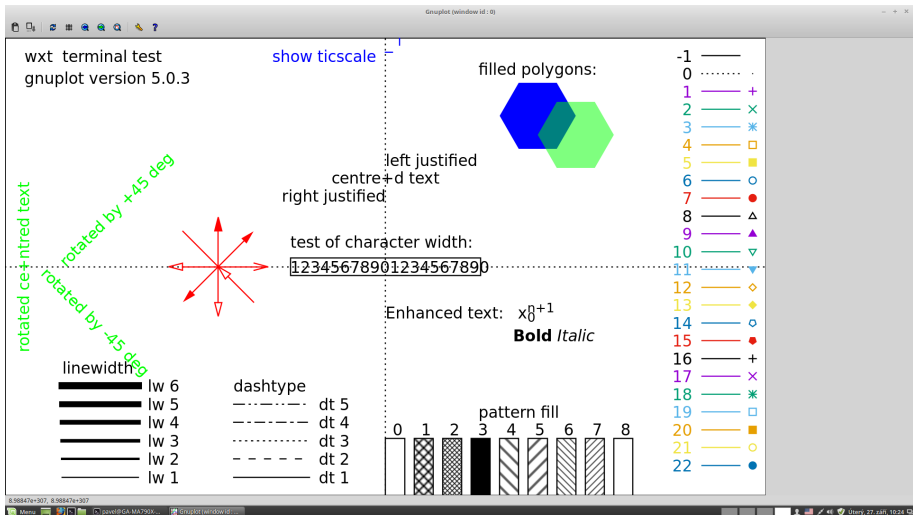
Programy

- Gnuplot
- \LaTeX
- \LaTeX -TikZ

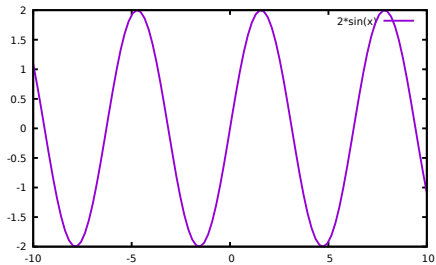
Gnuplot

- hlavní stránka: www.gnuplot.info
- dokumentace: www.gnuplot.info/documentation.html
- příklady: gnuplot.sourceforge.net/demo_5.4/
- matematické funkce
- experimentální data

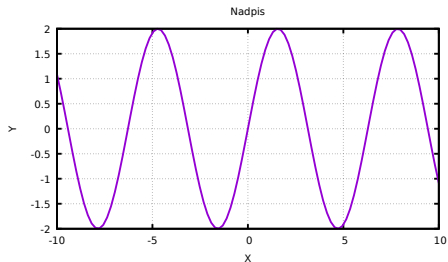
Příkaz - test



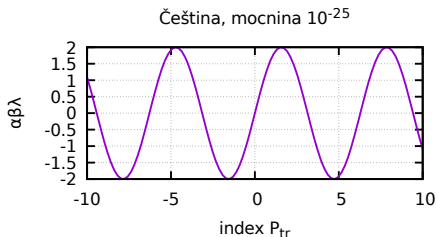
```
#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,12"
set terminal pdfcairo linewidth 3
set output "test.pdf"
plot 2*sin(x)
```



```
#!/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)
```



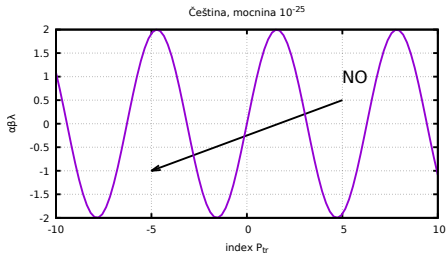
```
#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,20"
set terminal pdfcairo linewidth 3
set output "test.pdf"
unset key
set grid
set title "Čeština, mocnina 10^{-25}"
set xlabel "index P_{tr}"
set ylabel "{ /Symbol abl }"
plot 2*sin(x)
```



```

#!/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)

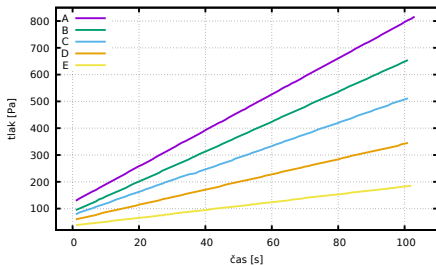
```



```

#!/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

```

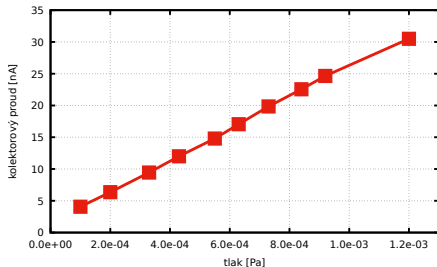



```

#!/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

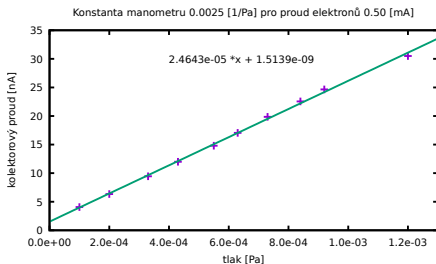
```



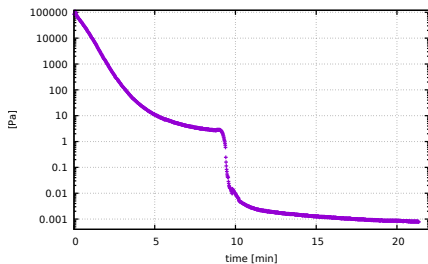
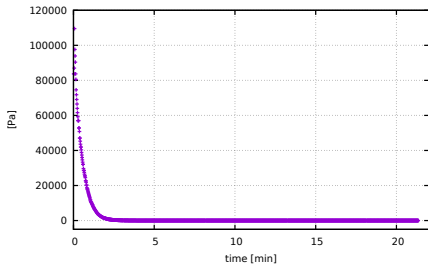
```

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 named 'praktikum-02a-programy.tex'. The code includes a preamble with `\input{hlavicka.tex}`, followed by a `\begin{document}` block. Inside, there are three `\frame` commands. The first frame contains a `\begin{itemize}` list with items `\item Gnuplot`, `\item LaTeX`, and `\item LaTeX-TikZ`. The second frame contains a `\begin{itemize}` list with items `\item hlavní stránka: www.gnuplot.info`, `\item dokumentace: www.gnuplot.info/documentation.html`, and `\item příklady: gnuplot.sourceforge.net/demo\ 5.0/`. The third frame contains a `\begin{columns}` environment with two `\begin{column}` blocks, each containing the text 'test'. The right pane shows the rendered PDF document. The title 'Programy' is centered at the top. Below it is a bulleted list:

- Gnuplot
- LaTeX
- LaTeX-TikZ

The footer of the PDF contains the text 'PRAKTIKUM Z VAKUOVÉ FYZIKY' and '1 / 5'. The status bar at the bottom of the window indicates 'Pages 1 to 3 of 5', '185%' zoom, and 'cs_CZ UTF-8 Ready Automatic' encoding.

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.

At the bottom left, a Messages window displays the following text:

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

The status bar at the bottom right indicates "Page 1 of 1" and "349%". The system tray at the very bottom shows the date and time as "Pátek, 30. září, 12:41".

The screenshot shows the TeXstudio interface. The left pane contains the LaTeX source code for a document. The right pane shows the rendered output. A status bar at the bottom indicates the current page and zoom level.

```
\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}
```

Test češtiny.
Test λ ; T^P ; T_{mn}

Line: 19 Column: 0 INSERT

Messages Log Preview Search Results

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

Process exited normally

Page 1 of 1 349%

cs_CZ UTF-8 Ready Automatic

Menu

Test λ ; T^P ; T_{mn}

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

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

```

\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}

```

Line: 1 Column: 0 INSERT

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

16 / 29

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

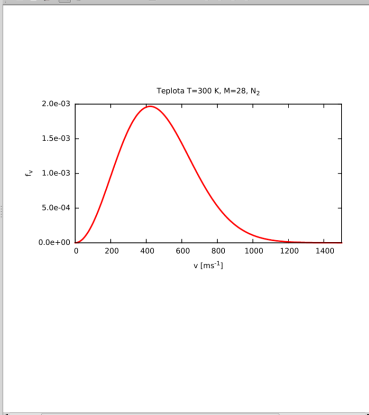
Messages Log Preview Search Results

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



načítání souboru:

```
\input{../hlavicka.tex}
```

nové příkazy:

```
\newcommand{\obr}[2]{\begin{center}  
    \includegraphics[width= #1\textwidth]{#2}  
    \end{center}}
```

```
\obr{1}{p-latex-5.png}
```

`\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.

Teplota $T=300\text{ K}$, $M=28, \text{ N}_2$

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, 13:54

`\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}`

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*

Line: 17 Column: 30 INSERT

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}-\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 Režim: Vložit

Zprávy Zknam Náhled Výsledky hledání

Proces spuštěn: pdflatex -synctex=1 -interaction=nonstopmode "texstudio_PsAprC".tex
 Proces ukončen jako obvykle

Strana 1 z 1 169%

cs_CZ UTF-8 Pípraven Automaticky

Streda, 10. zari, 0:55

The screenshot shows the TeXstudio interface with a LaTeX source file named 'test.tex' open. The source code defines page margins and uses various font size and color commands to display the word 'Test' in different styles. The rendered output on the right shows the word 'Test' in various sizes and colors, including a red 'Test' at the bottom.

```
\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}
```

Line: 12 Column: 0 INSERT

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

2023.10.27 16:07

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 PDF output, which contains:

- Test A
- Test B
- 1. Test A
- 2. Test B

At the bottom of the TeXstudio window, a status bar shows "Page 1 of 1 400%". A messages window at the bottom left displays the following text:

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

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. A status bar at the bottom indicates the current page is 1 of 1 at 165% zoom.

```
\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.

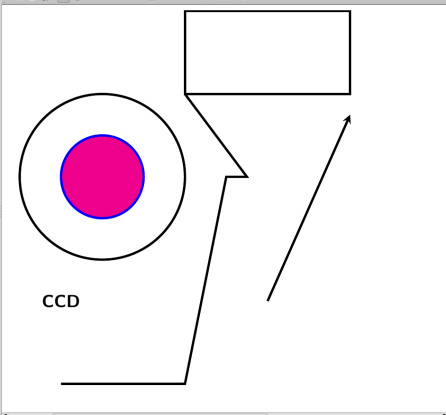
The source code in the left pane is:

```
\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}
```

The rendered output in the right pane shows a diagram with a magenta circle inside a blue circle, a rectangle, and a path of arrows. The text "CCD" is positioned below the circles.



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

