Latex Environment to Produce High Quality Figures

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Contents

1 EPS Figure

The detail procedure to include a SVG image produced by Inkscape into LaTeX is available online in [1].

```
\usepackage{calc}
```

```
\begin{figure}[h!]
\centering
\def\svgscale{1.5}
\input{figures/fig-ideal-dc-collector-grids.pdf_tex}
\caption{Ideal dc network}
\label{fig:ideal-dc-network}
\end{figure}
```

figures/fig–ideal–dc–collector–grids.tex

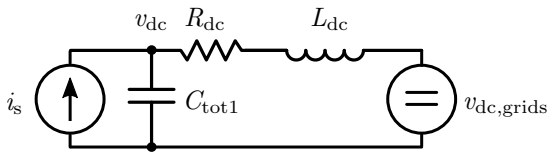

Fig. 1: Ideal dc network

2 Tikz Plot

```
\usepackage{tikz}
\usetikzlibrary{arrows}
\usepackage{pgfplots}
\pgfplotsset{compat=1.9}
```

```
length  overshoot w   zeta
1 5379.14   243.0641456 0.138522557
2 5612.62   151.1361325 0.170548865
3 5793.3    116.1782662 0.239915914
```

figures/length–80Hz.dat

2.1 Coordinate Plot

```
\definecolor{mycolor1}{rgb}{1,0,0}%
\definecolor{mycolor2}{rgb}{0,1,0}%
\definecolor{mycolor3}{rgb}{0,0,1}%
\definecolor{mycolor4}{rgb}{0,0,0}%
\definecolor{mycolor5}{rgb}{0.9,0.5,0.1}%

\begin{figure}[h!]
\centering
\begin{tikzpicture}
\begin{axis}[%
%width=4.521in,
```

```
%height=3.566in,
%at={(0.758in,0.481in)},
%scale only axis,
xmin=0.45,
xmax=0.75,
xlabel style={font=\color{white!15!black}},
xlabel={Time (s)},
%ymin=3000,
%ymax=7000,
ylabel style={font=\color{white!15!black}},
ylabel={Voltage (V)},
axis background/.style={fill=white},
legend style={legend cell align=left,anchor=north},
legend pos=north east,
]

\addplot [color=mycolor1] table [x=time,
   y=simple]{comparation-n-section-cable.dat};
\addlegendentry{$N=1$}

\addplot [color=mycolor3] table [x=time,
   y=10-section]{comparation-n-section-cable.dat};
\addlegendentry{$N=10$}

\end{axis}
\end{tikzpicture}
\caption{Validation of the number of sections of pi-cable-model in the time
   domain}
\label{fig:validation-section-cable}
\end{figure}
```

figures/coordinate–plot.tex

2.2 3D Plot

```
\begin{figure}[h!]
\centering
\begin{tikzpicture}
\begin{axis}[
xlabel=cable length (km),ylabel=output capacitor (mF),zlabel=voltage (V),
ymin=1,
ymax=3,
]
\addplot3[surf] file{plot/threeD-plot.dat};
\end{axis}
\end{tikzpicture}
\caption{3D Plot}
\label{fig-threeD-plot}
\end{figure}
```

plot/threeD–plot.tex

```
% x = cable length (km)
% y = output capacitor (mF)
% z = magnitude (v)



% 1 mF
1 1 5500
2 1 5400
3 1 5300

% 2 mF
1 2 5400
2 2 5300
3 2 5200

% 3 mF
1 3 5300
2 3 5200
3 3 5100
```

plot/threeD–plot.dat

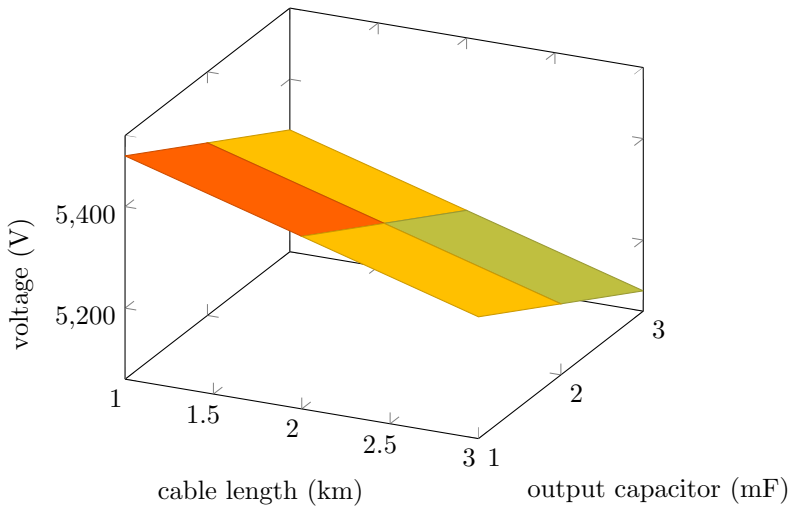

Fig. 2: 3D Plot

2.3 Bar Plot

```
\begin{figure}[h!]
\centering
\begin{tikzpicture}
\begin{axis}[
ybar,
xlabel=Cable Length (km),
enlargelimits=0.15,
ylabel=Voltage (V),
legend pos=north west,
]
```

```
\addplot table [x=length, y=overshoot]{figures/length-80Hz.dat};
\addplot table [x=length, y=overshoot]{figures/length-100Hz.dat};
\addplot table [x=length, y=overshoot]{figures/length-200Hz.dat};

\legend{$\textit{f}_{\rm b}=80$ Hz,$\textit{f}_{\rm b}=100$ Hz,$\textit{f}_{\rm b}=200$ Hz}
\end{axis}
\end{tikzpicture}
\caption{Overshoot voltage at different cable length and control bandwidth}
\label{fig:overshoot-voltage}
\end{figure}
```

figures/bar–plot.tex

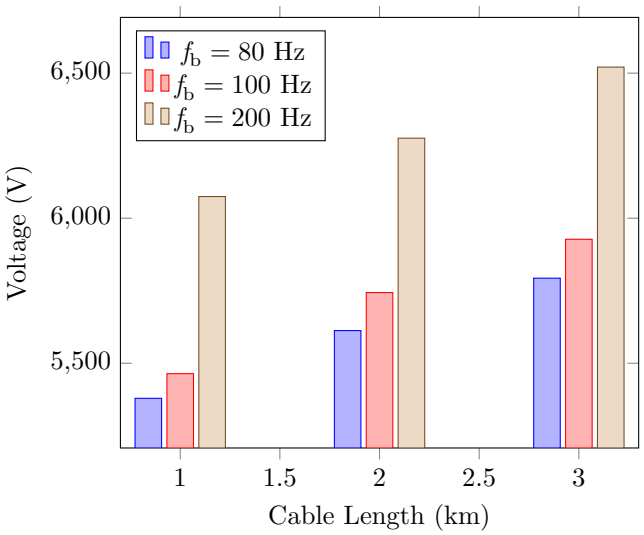

Fig. 3: Overshoot voltage at different cable length and control bandwidth

2.4 Bode Plot

```
\definecolor{mycolor1}{rgb}{1,0,0}%
\definecolor{mycolor2}{rgb}{0,1,0}%
\definecolor{mycolor3}{rgb}{0,0,1}%
\definecolor{mycolor4}{rgb}{0,0,0}%
\definecolor{mycolor5}{rgb}{0.9,0.5,0.1}%

\begin{figure}[h!]
\centering
\begin{tikzpicture}

\begin{axis}[%
width=3in,
height=1.4in,
at={(2.4in,4.765in)},
scale only axis,
separate axis lines,
every outer x axis line/.append style={white!0!black},
```

```
every x tick label/.append style={font=\color{white!0!black}},
every x tick/.append style={white!0!black},
xmode=log,
xmin=1,
xmax=10000,
xtick={0.1,1,10,100,1000,10000},
xticklabels={\empty},
xminorticks=true,
every outer y axis line/.append style={white!0!black},
every y tick label/.append style={font=\color{white!0!black}},
every y tick/.append style={white!0!black},
ymin=-50,
ymax=35,
ylabel={Magnitude (dB)},
axis background/.style={fill=white},
xmajorgrids,
xminorgrids,
ymajorgrids,
]

\addplot [color=mycolor1] table [x=frequency, y=magnitude]{figures/plecs.dat};
\addplot [color=mycolor3] table [x=frequency,
   y=magnitude]{figures/analytical.dat};

\end{axis}

\begin{axis}[%
width=3in,
height=1.4in,
at={(2.4in,3.2in)},
scale only axis,
separate axis lines,
every outer x axis line/.append style={white!0!black},
every x tick label/.append style={font=\color{white!0!black}},
every x tick/.append style={white!0!black},
xmode=log,
xmin=1,
xmax=10000,
xminorticks=true,
every outer y axis line/.append style={white!0!black},
every y tick label/.append style={font=\color{white!0!black}},
every y tick/.append style={white!0!black},
ymin=-91.8,
ymax=90,
ytick={-90,  0, 90, 180, 270},
ylabel={Phase (deg)},
axis background/.style={fill=white},
xmajorgrids,
xminorgrids,
```

```
ymajorgrids,
%legend style={legend cell align=left, align=left, draw=white!15!black},
%legend style={at={(1.2,1)},legend cell align=left,anchor=north}
legend style={legend cell align=left,anchor=north},
legend pos=north east,
]

\addplot [color=mycolor1] table [x=frequency, y=phase]{figures/plecs.dat};
\addlegendentry{plecs}

\addplot [color=mycolor3] table [x=frequency, y=phase]{figures/analytical.dat};
\addlegendentry{analytical}

\end{axis}

\begin{axis}[%
width=3in,
height=3.1in,
at={(2.275in,3in)},
scale only axis,
xmin=0,
xmax=1,
xtick={\empty},
xlabel={Frequency  (Hz)},
ymin=0,
ymax=1,
ytick={\empty},
axis line style={draw=none},
ticks=none,
title style={font=\bfseries},
%title={$Z_\textrm{in}$ compared to $Z_\textrm{o}$ },
axis x line*=bottom,
axis y line*=left,
]
\end{axis}
\end{tikzpicture}
\caption{Validation of the circuit without the output impedance of the current source}
\label{fig:validation-without-parallel-damping}
\end{figure}
```

figures/bode–plot.tex

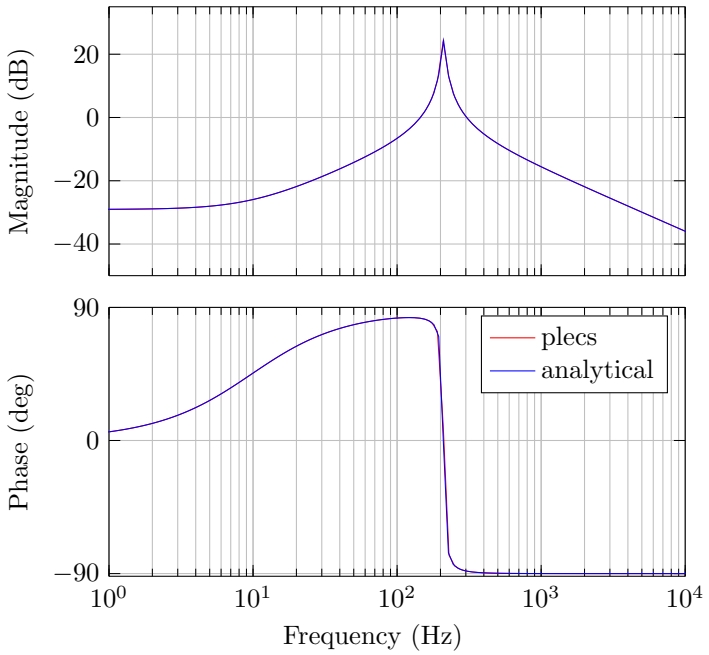

Fig. 4: Validation of the circuit without the output impedance of the current source

References

[1] J. B. C. Engelen, "How to include an svg image in latex," Available at http://tug.ctan.org/info/svg-inkscape/InkscapePDFLaTeX.pdf(2018/04/07).