

NWplot – A Plotting Framework for Matlab

This document will demonstrate the capabilities of the nwplot framework. Its main purpose is to generate plots for further use in pdf_latex documents. The default dimensions were chosen to fit two *HUGE* plots in a figure environment including a 10pt caption and an additional \tiny line on one DIN-A4 sheet with 25mm page margins.

These default values can be modified in the `initPlotFramework.m` file, however, due to extensive use of hardcoded scaling values it cannot be guaranteed to work properly using different configurations.

Usage

- configure `initPlotFramework.m` according to your needs
- run `initPlotFramework.m` after every `clear`-command
- specify `figure_dir` e.g. directly to your L^AT_EX-figure directory
- set figure type to one of the presets
- plot your figure
- set `plotname`
- run `saveplot.m`

Existing preset classes:

Size		
HUGE	full text width, 50% text height	
REGULAR	75% text width, 38 % text height	for use in continuous text
SLIM	47% text width, 27 % text height	for use in subfigures
FLAT	full text width, 25% text height	
ULTRAFLAT	full text width, 17.5% text height	

Table 1: Plot-Styles

All multiplot-presets come in two configurations, `withXLabel` and `withoutXLabel`. The `withXLabel`-option lets you define individual x-labels for each subplot. However, as subplots are often used to visualize measured data over a time, thus the x-axis being the same for all subplots the `withoutXLabel`-option omits all but the last abscissa, the subplots are scaled accordingly.

In `withoutXLabel`-config environments the framework will automatically scale the subplots depending on the largest y-axis-tick, as the scientific notation (1×10^x) takes significantly more vertical space.

Bugs & Limitations

- centering of ylabel labels messed up (matlab- or alignx_ylabel-bug(?))
- no multiline labels
- values for aligning hardcoded via trial & error
- even though the image & font sizes are adjustable changing them will result in crappy results (bigger font does not scale the images accordingly)

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`max_y_val.m` and `align_Ylabels.m` : BSD by Denis Gilbert

Examples

Some examples of the possible plot-types. Let's first assume that we want to insert a picture in the text to show something. We will use the style `regular_single_plot` for this. This is just some sample text to show how this image will look when there is more than a few lines text around. Lorem ipsum dolor sit amet etc.pp. Just ignore my chatter through the whole document. And this should be enough.

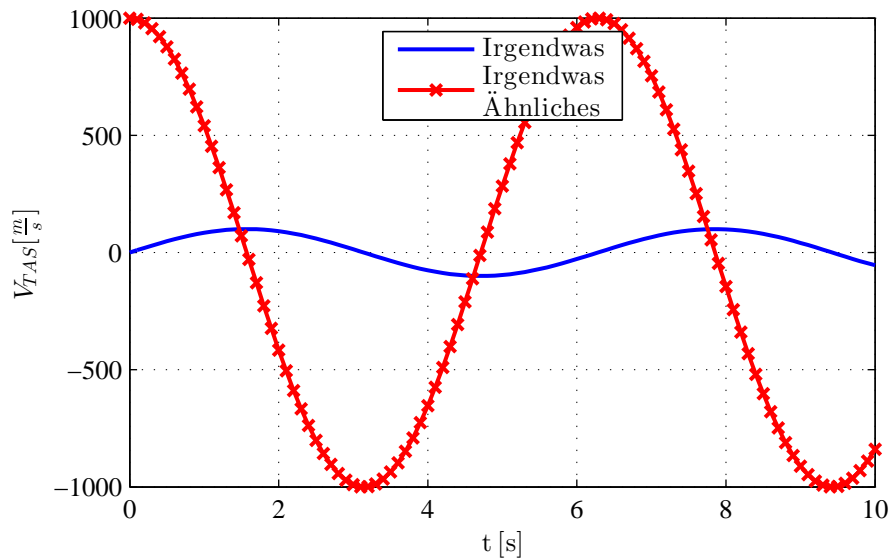


Figure 1: Regular Single Plot

and a tiny subdescription

What a lovely size for images that are integrated in the text. I guess you are interested what a regular plot with two or three subplots looks like. Okay, here we go:

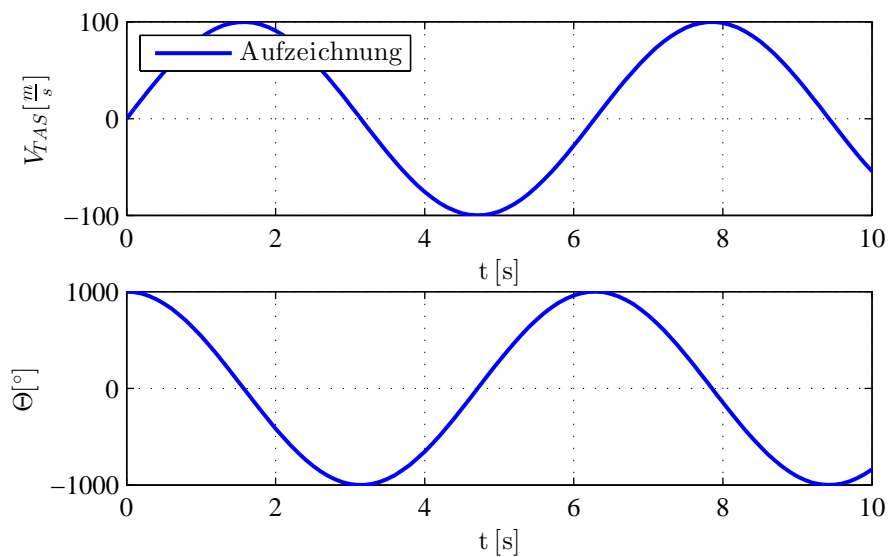


Figure 2: Regular Double Plot

with multiple axes

Well, that looks good. So let's get to final **regular**-sized example, three subplots:

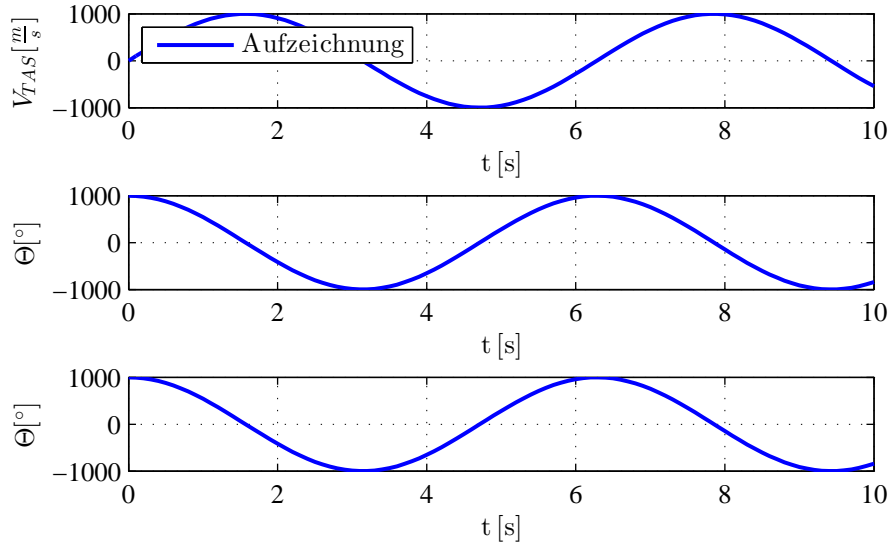


Figure 3: Regular Triple Plot

with only one axis

Not too bad. However, we should not try to fit four subplots, as they would become way too small – that or I was just too lazy to implement yet another size. But hey, most of the axes are the same? That's some waste of precious space. Why not try the fancy-schmancy one x-axis solution?

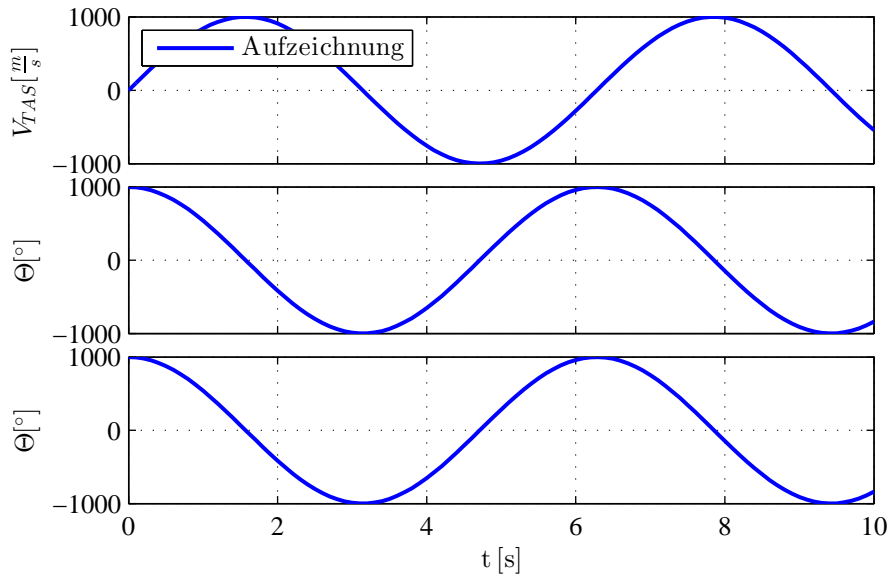


Figure 4: Regular Triple Plot

only one x-axis

Now that's nice plot, isn't it? Works like a charm. And while we're on it, compare fig. 4 to fig. 5.

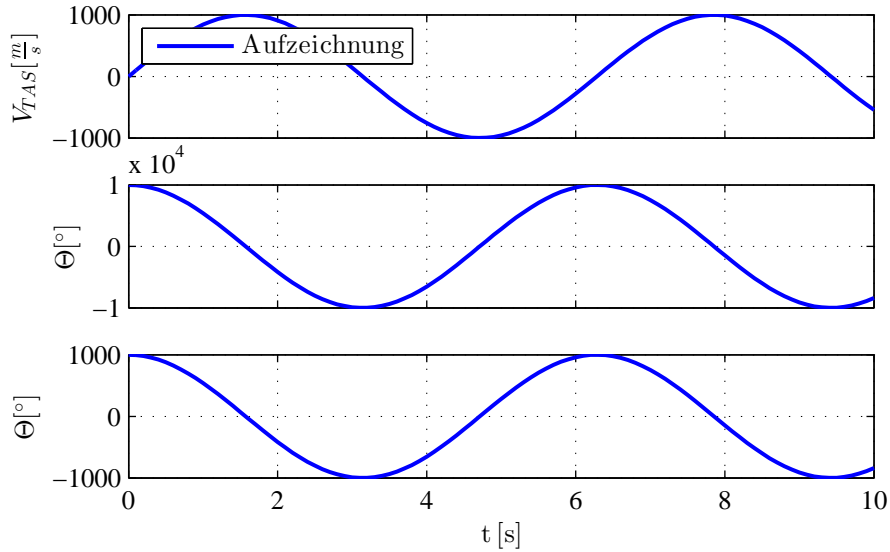


Figure 5: Regular Triple Plot

with scientific notation

Please mind the gap between the train and the platfo..uh... between the subplots. It gets bigger to make room for the $\times 10^4$. Your plots will shrink. Protip: use meters instead of feet and replace knots by $\frac{m}{s}$. That won't help you for altitudes larger than 9999 m , but it's still a good idea to use SI-units.

How about trying some subfigures?

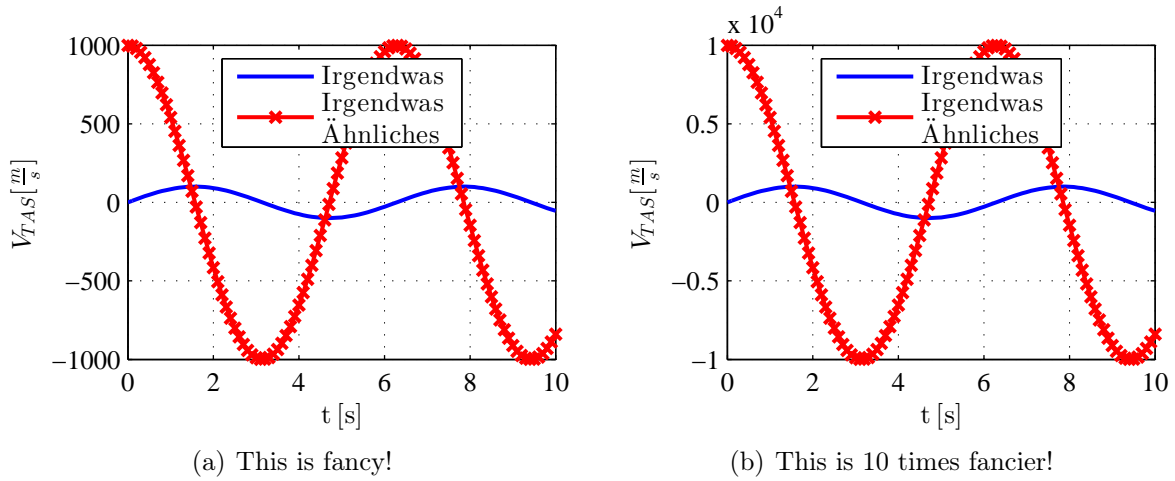


Figure 6: Two Slim Single Plots

Sweet. Maybe generating Matlab-Plots for \LaTeX use isn't that horrible after all. And I got the chance to use the \LaTeX -command in a real document – that has to count for something.

REGULAR and SLIM plots seem to work. Next topic: ULTRAFLAT and FLAT. If you measured a single value for a looooooong time, maybe ULTRAFLAT is just what you are looking for:

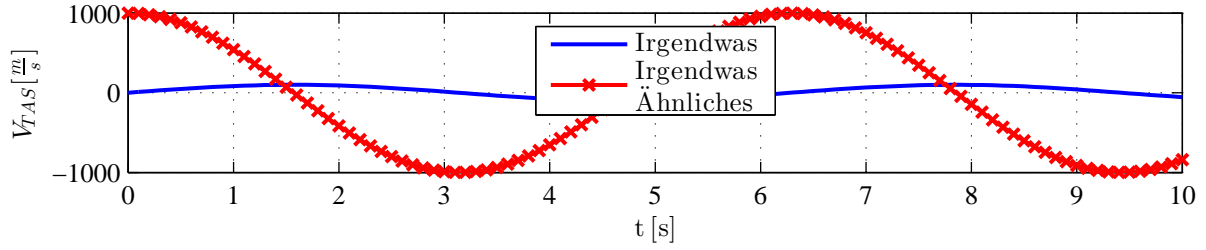


Figure 7: Ultraflat Plot

A bit too flat for your taste? Here we go, a FLAT single plot. And as FLAT plots are a prime example of figures that can be arranged at the top (or the bottom) of a page I'll throw in another example, a FLAT double plot (fig. 9).

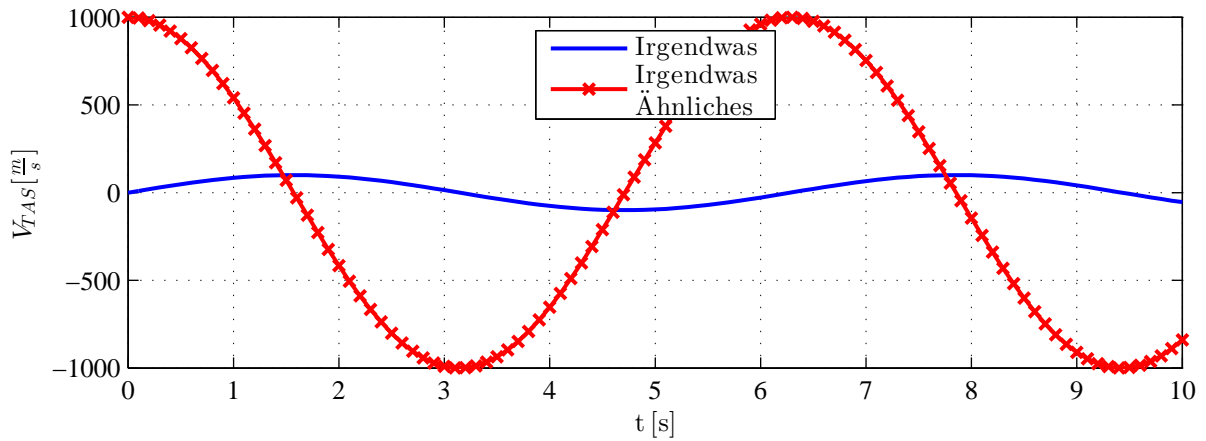


Figure 8: Flat Single Plot

Let us just pretend that I describe the plot with a lot of words. A huge lot, so that I fill up this page and the other plot will be on top of the next page. The quick brown fox jumps over something something... Let us just pretend that I describe the plot with a lot of words. A huge lot, so that I fill up this page and the other plot will be on top of the next page. The quick brown fox jumps over something something... Let us just pretend that I describe the plot with a lot of words. A huge lot, so that I fill up this page and the other plot will be on top of the next page. The quick brown fox jumps over something something... Let us just pretend that I describe the plot with a lot of words. A huge lot, so that I fill up this page and the other plot will be on top of the next page. The quick brown fox jumps over something something... Let us just pretend that I describe the plot with a lot of words. A huge lot,

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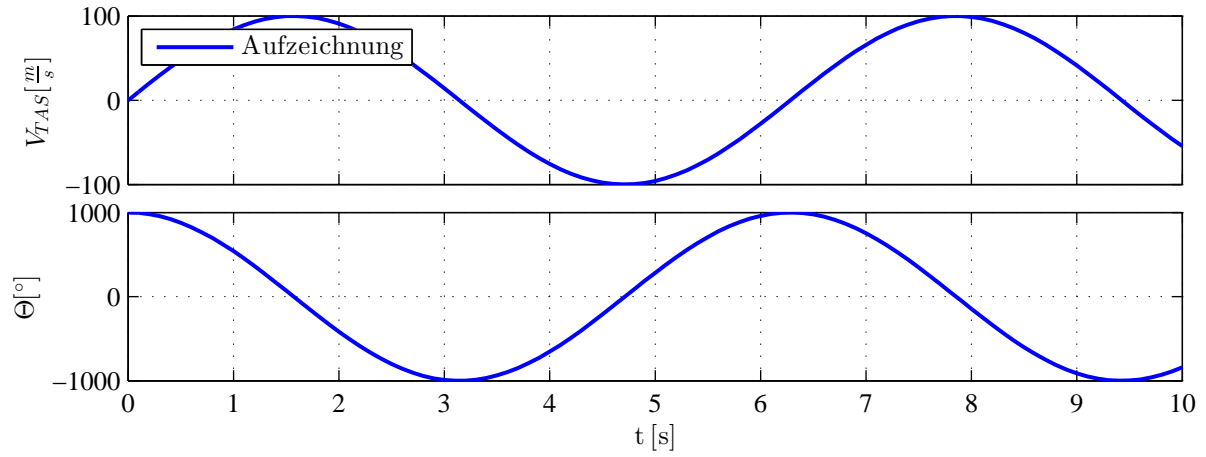


Figure 9: Flat Double Plot

huge lot, so that I fill up this page and the other plot will be on top of the next page. The quick brown fox jumps over something something...

Okay, looks good. Moving on to the last group, the **HUGE** figures. As mentioned before, two of them should fit on an A4-page, including a two-line caption each. Let's give it a try:

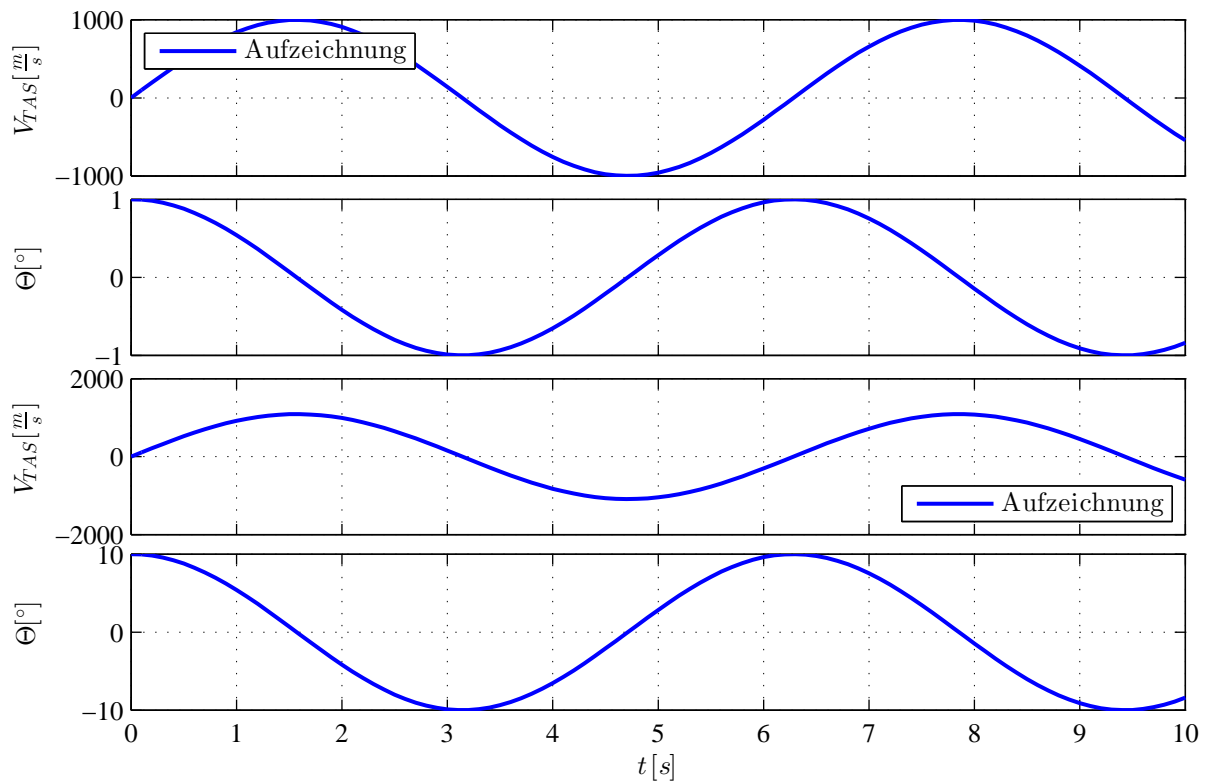


Figure 10: Huge Quadruple Plot

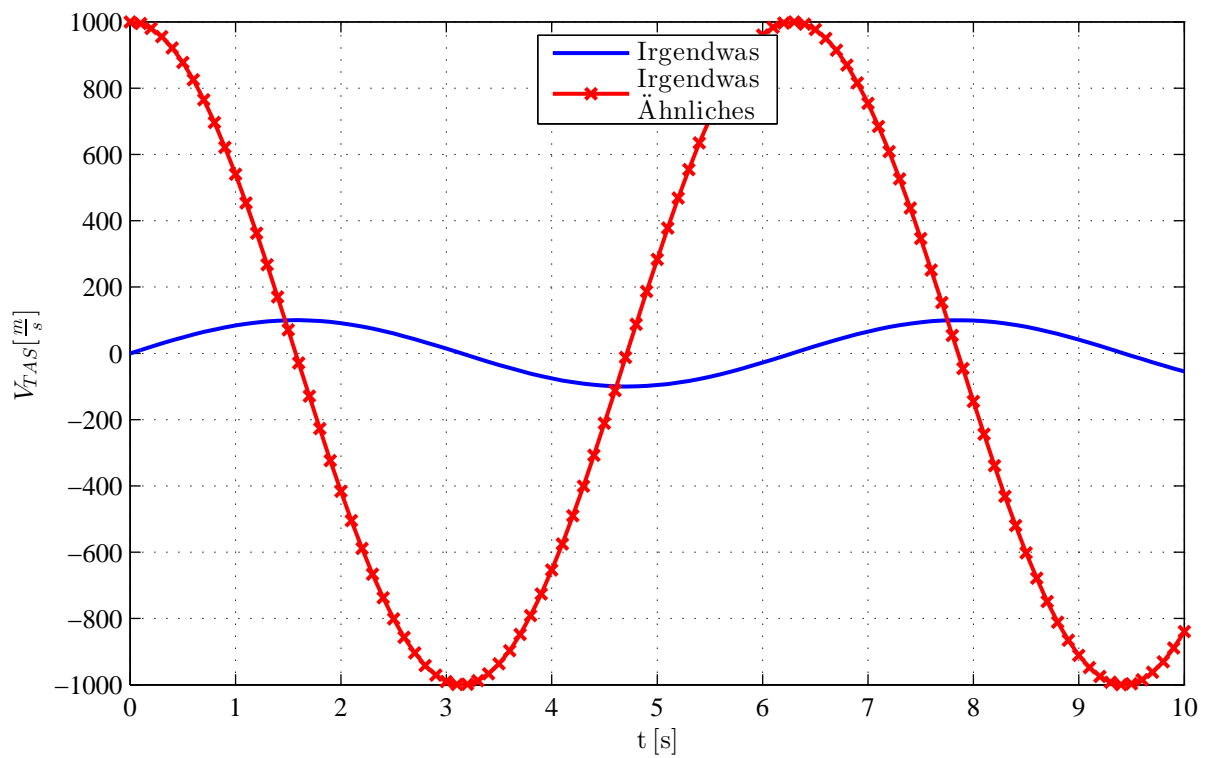


Figure 11: Huge Single Plot

Second Line Included

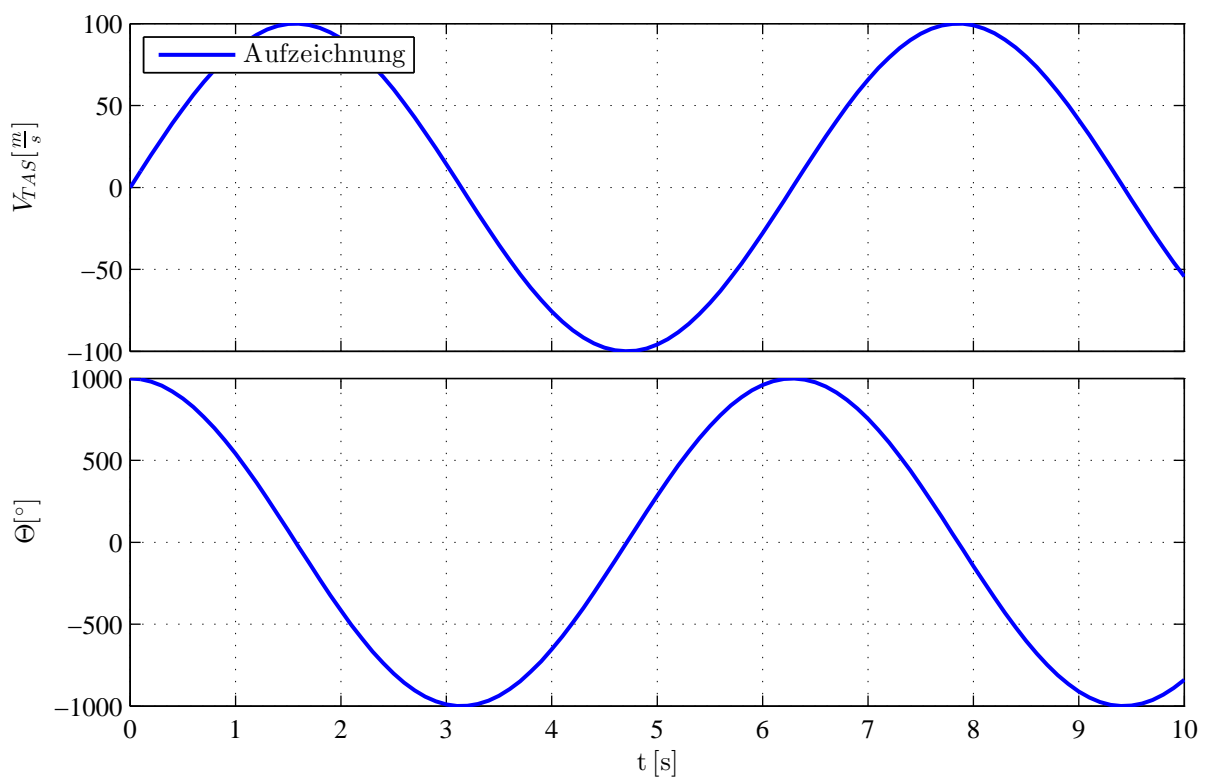


Figure 12: Huge Double Plot
Second Line Included

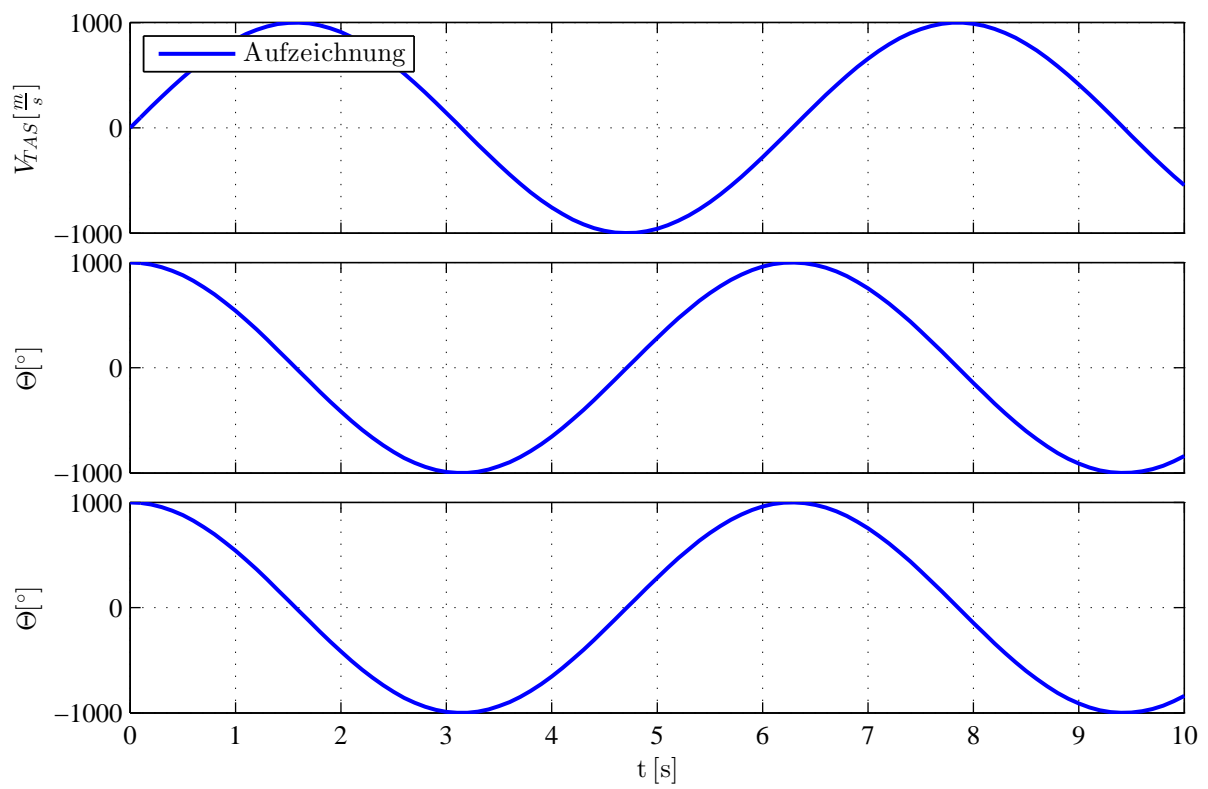


Figure 13: Huge Triple Plot