Simfit

Tutorials and worked examples for simulation,
curve fitting, statistical analysis, and plotting.
*https://simfit.org.uk*

Sometimes it is required to import one SVG file into another SVG file, for example to create overlays, insets, or collages. This document describes how to do this using program **EditSVG** when fitting one then two exponential functions to a data set and plotting the best–fit curves to evaluate the improvement in fit.

Fitting exponential functions

Using SimFiT program **exfit** in the default mode to analyze data in the test file `exfit.tf4` for models of orders 1 and 2 fits the following exponential functions sequentially.

$$f_1(t) = Ae^{-Bt}$$
$$f_2(t) = \alpha_1 e^{-k_1 t} + \alpha_2 e^{-k_2 t}$$

Program **exfit** then outputs goodness of fit criteria and statistical tests to see if there is sufficient statistical evidence to accept the need to fit the additional parameters required by the two exponential model. In addition the following graph is plotted to illustrate the goodness of fit for both models.

Data fitted by One and Two Exponentials
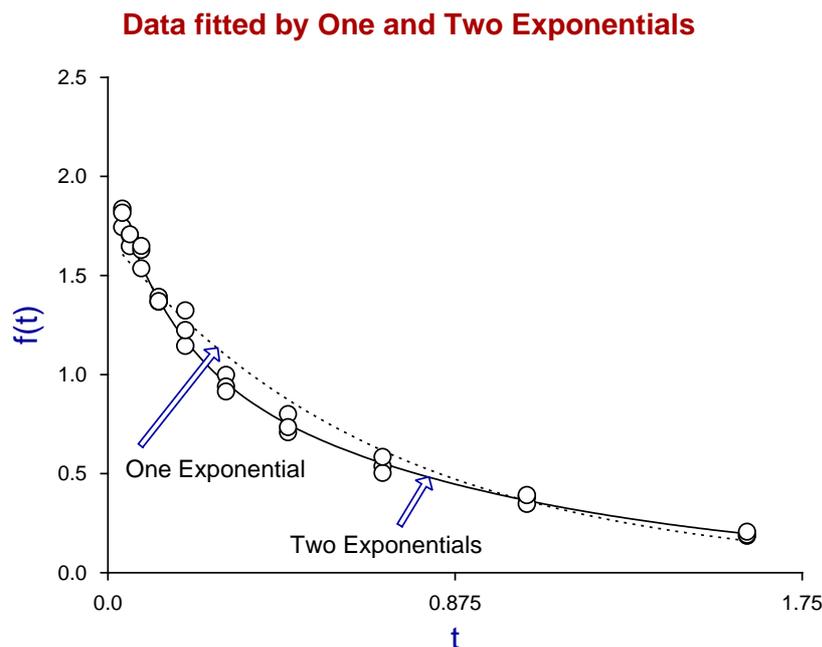
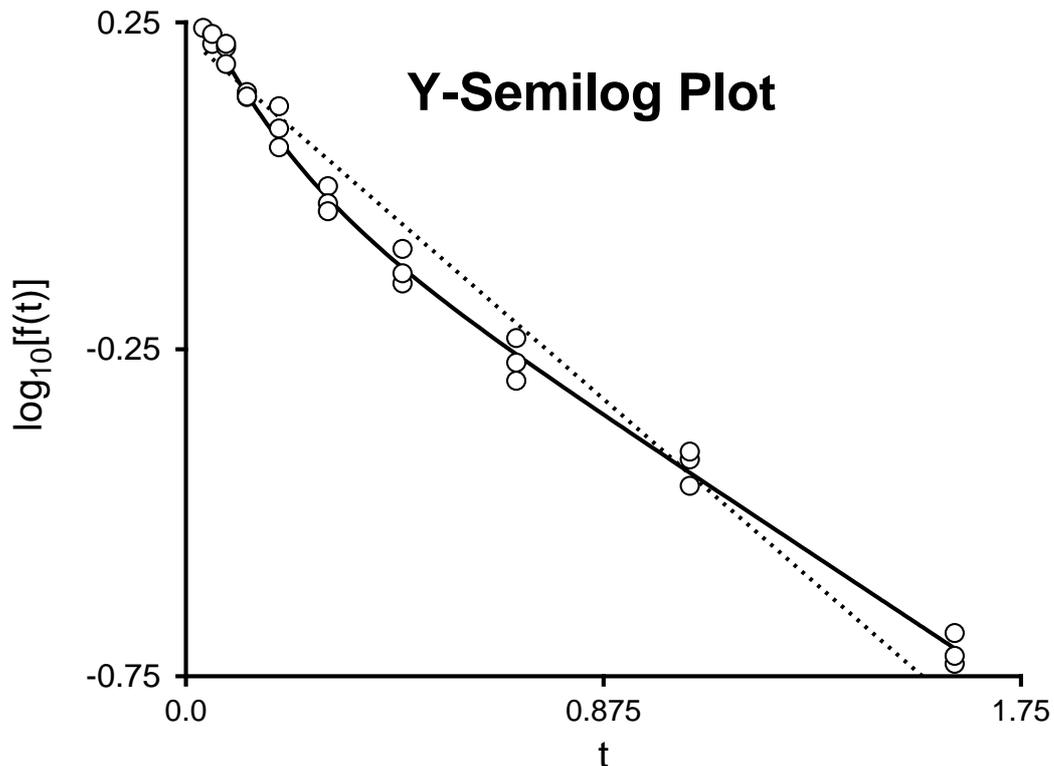The following SimFiT test files are provided to reproduce this fit.

- `exfit.t4f`, the data for input into program **exfit**

- `exfit_normalplot.eps`, the above plot in EPS format for input into program **editps**

- `exfit_normalplot.svg`, the above plot in SVG format for input into program **EditSVG**

- `exfit_normalplot.metafile`, a metafile to create this plot in SimFiT program **simplot** or SimDEM program **simdem70**

The file `exfit_normalplot.svg` was also created at this stage to archive this plot.

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Creating the log transform

Of course the previous plot was created from within program **exfit** by simply transferring the plot into SimFıT advanced graphics mode then editing. Now one technique that can be used to check the relative fit for two exponentials as opposed to one is to plot a semilogarithm plot, which results in linearizing the single exponential function but not the double exponential model.

Within the advanced graphics environment this transformation was selected to produce the next plot.

As the intention was to insert this graph into the previous one the graph was edited as follows

- Suppressing the title

- Changing the legends

- Adding a subsidiary title within the graph

- Making the lines thicker so they do not look too narrow when the plot is reduced in size. As the figure is to be reduced by a factor of two, the line thicknesses were doubled. Sometimes it is useful to enlarge the legends or to replace using a bold font, and even the numbers can be enlarged if required.

The following SimFıT test files are provided to reproduce this fit.

- `exfit_logplot.eps`, the above plot in EPS format for input into program **editps**

- `exfit_logplot.svg`, the above plot in SVG format for input into program **EditSVG**

- `exfit_logplot.metafile`, a metafile to create this plot in SimFıT program **simplot** or SimDEM program **simdem70**

The file `exfit.svg` was also created at this stage to archive the compound plot, as described next.

Joining the SVG files using EditSVG

Open program **EditSVG** then input the test file `exfit_normalplot.svg`.

Now input the file `exfit_logplot.svg` then just use the mouse to move the equation into position and alter the scaling as required to obtain the final plot saved as `exfit.svg` and shown next.
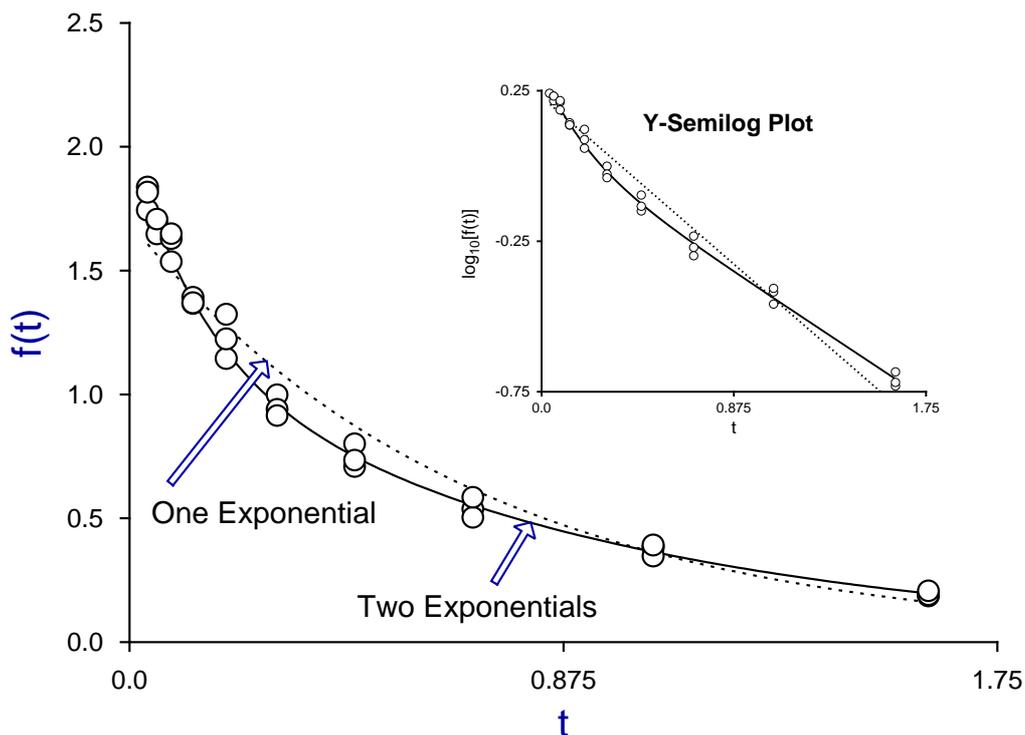
Summary

Finally, the SIMF$_I$T test files described in this document that can be used to create this plot are now listed.

File name	Data included
`exfit_normalplot.metafile`	SIMF$_I$T or SIMD$_E$M metafile to create the normal plot
`exfit_logplot.metafile`	SIMF$_I$T or SIMD$_E$M metafile to create the log plot
`exfit_normal.svg`	SVG file containing the normal plot
`exfit_logplot.svg`	SVG file containing the log plot
`exfit.svg`	SVG file containing both the final compound plot
`exfit_normalplot.eps`	EPS file containing the normal plot
`exfit_logplot.eps`	EPS file containing the log plot
`exfit.eps`	EPS file containing the final compound plot
`exfit.tf4`	Test file containing the data for fitting