

Simulation Cheatsheet

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This cheat sheet compiles basic simulation and measurement commands, as well as a collection of useful code snippets for Ngspice and Xyce. In addition, bind keys and a summary of the mouse operations for Xschem are provided as well. This compilation relates to Ngspice 42, Xyce 7.8 and Xschem 3.4.5, see:

<https://ngspice.sourceforge.io/>
<https://xyce.sandia.gov/>
<http://repo.hu/projects/xschem/index.html>

A comprehensive documentation and description of Ngspice, Xyce and Xschem can be found at:

<https://ngspice.sourceforge.io/docs/ngspice-42-manual.pdf>
https://xyce.sandia.gov/files/xyce/Xyce_Users_Guide_7.8.pdf
http://repo.hu/projects/xschem/xschem_man/xschem_man.html

Introductory notes on Ngspice

Simulation based on the typical SPICE commands, which are preceded by a dot, is known in Ngspice as batch mode. In addition to this basic mode of operation, Ngspice does also offer a so called interactive mode with control file or control section, which allows to either process the results from batch mode, or use all the known simulation commands, measurement statements for scripting. Note that commands in the interactive mode are not preceded by a dot! Lastly, it should be noted, that Ngspice creates a so called *plot* for every simulation run, e.g. *op1*, *ac1*, *tran2*. These contain all the respective vectors. In case of a small-signal noise analysis, two plots are generated, the second *plot* contains the integrated results. The initial plot is called *const*. Vectors may be accessed across plots by adding <plotname>. in front of the vector.

Simulation options:

Simulation commands:

Measurement snippets (ngspice):

General commands (ngspice):

display	print all vectors of the current plot
set	print all plots and set variables
show	print all dc operating point model parameters for all device instances
show [<i><devicename></i>]	print dc operating point model parameters of <device-name>

Bind keys (Xschem):

Mouse operations (Xschem):
