

# CUSPICE (NGSPICE on CUDA Platforms) User Guide

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April 28, 2014

## 1 Introduction

CUSPICE ports Model Evaluation step to NVIDIA GPUs using CUDA programming language and it's structured to be an extension of some NGSPICE libraries.

Only some models are supported right now by CUSPICE; in particular they are (in order of NGSPICE folders):

1. BSIM4v7 (bsim4 folder)
2. Capacitor (cap folder)
3. Inductor and Mutual Inductor (ind folder)
4. Current Source (isrc folder)
5. Resistor (res folder)
6. Voltage Source (vsrc folder)

Note that only some Current and Voltage Sources are supported in CUSPICE.

**Please pay attention to not mix supported models with non supported models in a single circuit in CUSPICE environment**, since the sparse matrix which contains the circuit lives inside the GPU!

## 2 Compilation Steps

The user that wants to compile CUSPICE can do the following:

1. Clone the GIT repository by typing 'git clone git://git.code.sf.net/p/ngspice/ngspice'
2. Switch to the CUSPICE branch by typing 'git checkout CUSPICE'
3. ./autogen.sh
4. ./configure --enable-cuspice (and maybe other switches, like --disable-debug or --prefix)
5. make (or make V=1 to see the compilation recipes)
6. make install

### 3 Dependencies

CUSPICE depends on KLU and CUSPARSE. The first one is automatically enabled during the compilation process, while the second one is an external library, which is provided by the CUDA environment installation. For this purpose, a `'-with-cuda'` switch is provided in `'configure'` script to let the user specify a non-default path.