README

The readme covers the flow of using TCAD, what files are (to some extent), where files were generated, what commands to run.

The server running TCAD is `precision.cqct.unsw.edu.au`.

Files

Initially 1. mosQD4.7.par - parameter file (supplied) for all relevant materials. 2. structure.scm - structrue/doping/refinement(grid size)/contacts are defined. 3. settings_des.cmd - gate voltages/temperature/equations to be solved. other input files for DESSIS are specified here

Added (note that I define quad as the basename in sturcture.scm and settings_des.cmd): 1. Run DEVISE: quad.cmd, quad.bnd, quad.sat, quad.scm, devise.jrl 2. Run MESH: quad_msh.grd, quad_msh.dat, quad_msh.log 3. Run DESSIS: quad_des.plt, quad_des.dat, quad_des.log

TCAD Flow

Henry's thesis also describes the flow of TCAD. Fahd is the resisdent expert.

1. Create structure as a DEVISE scheme script
   - (ise:save-model "NAME") determines output
2. Generate boundary and mesh command file in DEVISE (and view if you want):
   - `devise -l -e structure.scm`
   - Output: NAME.bnd, NAME.cmd, NAME.sat, NAME.scm, devise.jrl
3. Create mesh file
   - `mesh NAME`
   - Input: NAME.bnd, NAME.cmd
   - Output: grid file (NAME_msh.grd), doping file (NAME_msh.dat), log for grid generation (NAME_msh.log)
4. Solve equations:
   - DESSIS
   - Main input: command file (settings_des.cmd)
   - Other inputs: grid (.grd), doping (.dat), parameter file (.par)
   - Output: plot (.plt), data (.dat)
5. View results
   - TECPLOT

Notes on File Types

See the manuals for more information. This is a list of output files from the different programs.

DESSIS: * `scm` - Scheme script file. Used by Devise. * `sat` - ASCII version of complete model. * `cmd` - MESH command file. Doping and refinement file. * `bnd` - DF-ISE boundary representation.

MESH: In general mesh files should have 'msh' somewhere in their name. * `grd`: output device geometry file * `dat`: output impurity concentration file

DESSIS: In general mesh files should have 'des' somewhere in their name. * `_des.dat`: output data for TECPLOT * `_des.plt`: output for current, voltages, charges, and temperature * `_ac_des.plt`: output for small signal AC analysis * `_des.log`: general output. plain text compilation of all output.

TECPLOT: * `grd` - input mixed-element grid from MESH * `dat` - input mixed-element data from DESSIS * `plt` - XY plots from desis from DESSIS

Note from Fahd

Right now the work function of aluminium is set at 4.7 in the parameter file, to take into account charges indirectly at the Si/SiO2 interface of our devices. But ideally, it is ~4.28. If you change the work function in the parameter file, you also have to add interface charges manually in the potential file (SD201_pot.cmd). I can help you with that later on.

Also note that the line commenting character in "SD201_mod.cmd" is ";" and "SD201_pot.cmd" is "#".