Using and Testing Tabs

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1. INTRODUCTION

The *tabs* program (see manual page: technology abstraction tool) is used to generate 2D capacitance data for the *space* technology file.

Tabs uses the more accurate 3D capacitance extraction method with a large number of basic cells to calculate these 2D capacitance data. Thus, the specified technology file needs to contain 3D technology data (the vdimension list and dielectric structure).

Tabs is a tcl-script and must be started in a project directory. The ICDPATH environment variable is used to find the system technology directory (if needed). Thus, the following command line can be used:

```
% tabs
```

In this case the default technology file "space.def.s" is used, of which the place is specified in the project ".dmrc" file. When this file is in a system directory, it can possible not be changed.
Thus, more likely, you specify a technology file on the command line (for example "tech.s"):

```
% tabs -s tech.s
```

Tabs uses a nominal_spacing to work with. The default nominal_spacing is equal to your project lambda value. If you want to use another nominal_spacing, you must specify the **-S** option, like this:

```
% tabs -S 0.5 -s tech.s
```

The value must be specified in microns.

Use option **-i** when there are already capacitance 2D rules in the technology file. In that case, they are ignored (not removed).

Normally, *tabs* is calculating all capacitances between all conductors found in the vdimensions. The **-L** option can be used to reduce this behaviour.

Note that *tabs* uses a cache, it remembers what is calculated.

Note that the new version of *tabs* can handle more than 3 dielectric layers.

precision	be_window_factor	max_be_area_factor	be_mode	max_complexity
low	1.0	4.0	0c	100
medium	2.0	4.0	0g	500
high	2.0	4.0	0g	1000
veryhigh	5.0	4.0	1g	1500

The default precision, which *tabs* is using, is "medium" (see option **-p**). The "cap3d.be_window" is equal to the max. feature size multiplied by be_window_factor.

2. NEW VERSION OF TABS

The new version of *tabs* does its work more secure for edge capacitance calculations. It uses another (larger) default edge ratio. And it does more iteration steps to find the best last value going to the infinity case.

2.1 Other changes are:

The directory structure in /tmp is changed. There is now only used one project directory for all cap3d test cells. All cells use now the same technology file. Which only needs to be compiled ones. The technology compiler *tecc* is used two times. The first time, to get the tcl-table with technology data to be used. The *tabs* program generates another technology file to be used. The second time, *tecc* is used to compile this generated technology file. When there are more than 3 dielectric interfaces, *tecc* is requested to used the unigreen method (using the option **-u**). Note that the new version of *tecc* uses a cache for the unigreen technology files. Thus, if this is a known case, not much needs to be done. However, if it is the first time, it can cost more than 3 hours to generate the unigreen technology files. Note, don't edit your technology file to skip some vdimensions. This is important information for the technology compiler to use some fixed points in the z-direction. There is a new *tabs* option (**--skip-vdim**) to skip some vdimension names.

2.2 Other new options are:

Option **-V** (or **--verboser**) to put on *space3d* verbosity. Note that the normal verbosity mode is become less verbose.

Option **-R** (or **--edge-ratio**) to specify another edge ratio for the calculation of edge capacitances.

A number of **--skip** options, to skip for example the lateral capacitance generation part.

2.3 TESTING TABS

The changes are made to *tabs* after trying out some test cases. This tests are not incorporated in this report yet.

You can run your own tests to compare the results of a cap3d extraction with a cap2d extraction. There is a *tabs-verify* program (tcl-script) which can be used to do that.