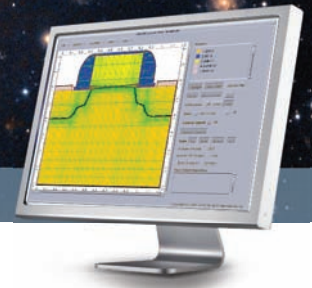


DevEdit

Structure and Mesh Editor



DevEdit can be used to either create a device from scratch or to remesh or edit an existing device. DevEdit creates standard Silvaco structures that are easily integrated into Silvaco 2D or 3D simulators and other support tools.

Through a powerful command driven batch mode, DevEdit can be used directly within DeckBuild. In command mode DevEdit structures can be parameterized and varied automatically by DeckBuild or VWF. Simulating these structures allows device engineers to examine spread and corner characteristics of devices. DevEdit batch mode allows semi-automatic remeshing of existing structures. DevEdit significantly reduces simulation by remeshing process simulation structures prior to device simulation. Similarly, DevEdit saves process simulation time by mirroring, stretching or cloning a partial structure or by joining several structures to form a complete device.

DevEdit can also be driven by a fully interactive GUI allowing designers to directly draw or edit devices. Creating devices directly allows their simulation without the need to optimize process details or even without knowing the process. This improves productivity by avoiding unnecessary and time consuming optimizations of fictitious processes. DevEdit allows device engineers to experiment with devices to optimize performance. The modified devices can then be fed back to process engineers to determine if they can be manufactured. DevEdit incorporates many powerful tools to assist in editing, such as the ability to load 1D doping profiles as a basis for doping information. [NOTE: GUI mode is available on Linux]

In both interactive and batch mode DevEdit provides extensive remesh functionality. During meshing, any number of solution quantities may be independently weighed and used for mesh adaptation. The mesh may also be directly modified using the relax and refine boxes.

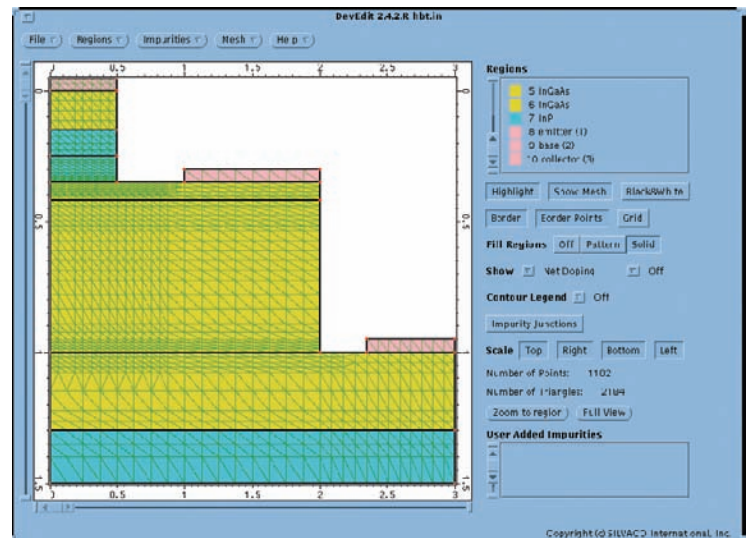
Features

Region Editing

- Specify regions of arbitrary materials and polygonal shapes
- Modify existing regions, altering material, shape, or base impurity
- Add new regions to existing devices, automatically etching away parts of regions or leaving the regions unchanged
- Define electrode location, name, and work function

Doping Editing

- Add analytical doping profiles such as Gaussian or complementary error function
- Combine multiple 2D devices to create new 2D doping profiles
- Import 1D doping profiles
- Combine 1D doping profiles with analytical doping profiles to create quick yet realistic doping concentrations



A nonplanar HBT structure can be created by DevEdit for simulation in Atlas Blaze/Blaze 3D.

Meshing 2D

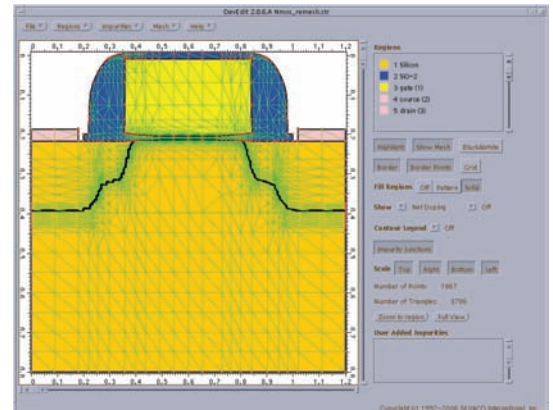
- Creates high quality triangle meshes with minimal obtuse triangles
- Maintain mesh details using refinement criteria while reducing the elements in areas that do not have useful detail
- Allows user control over detail retention through multiple criteria, include material type, quality change, location, or relative location

Meshing 3D

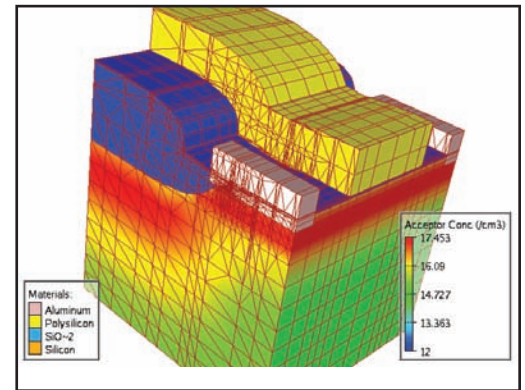
- Creates high quality prisms or tetrahedra based on the same algorithm used for 2D meshes
- Allows understandable 1 plane refinement criteria to be expanded to the third dimension using a simple but flexible plane creation algorithm

Interface

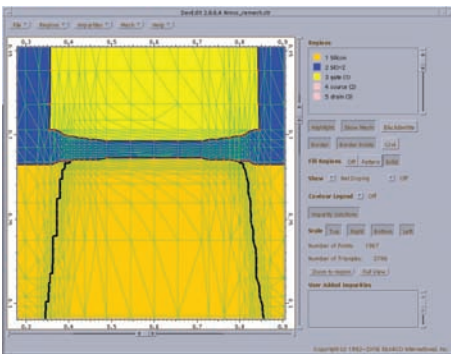
- Reads in 2D structures created by process and device simulators like Athena and Atlas
- Reads in 1D Doping profiles from Athena
- Writes out 2D structures for process and device simulators like Athena and Atlas
- Writes out 3D structures for device simulators like Atlas-3D and Victory Device



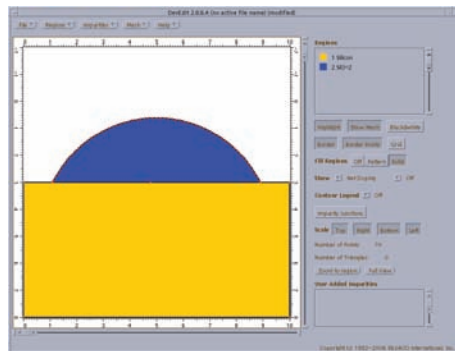
This NMOS device illustrates DevEdit's advanced mesh refinement around the junction locations (Black Line)



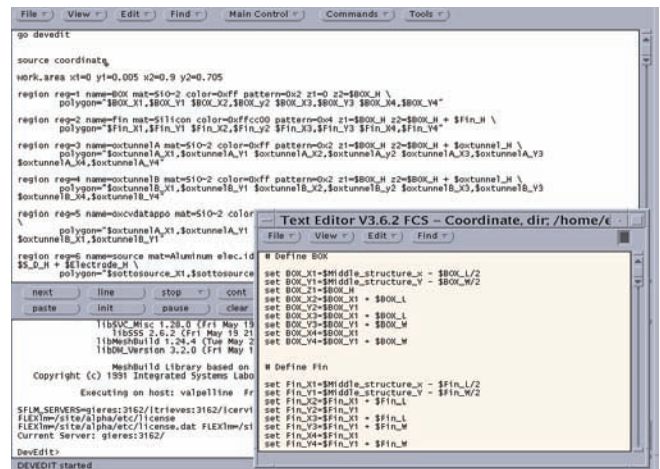
Use of DevEdit to remesh a 3D structure got 3D Atlas simulation.



To get a high level of accuracy in subsequent Atlas simulation DevEdit constraint mesh box feature is used to increase the mesh density in the gate oxide channel.



DevEdit contains many tools to simplify creation of devices. Here the Circle tool is used to lay down a CCD lens over a base oxide.



DevEdit's powerful batch mode also functions like a simulator, allowing parameterization (geometry, doping and meshing) to be performed.

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