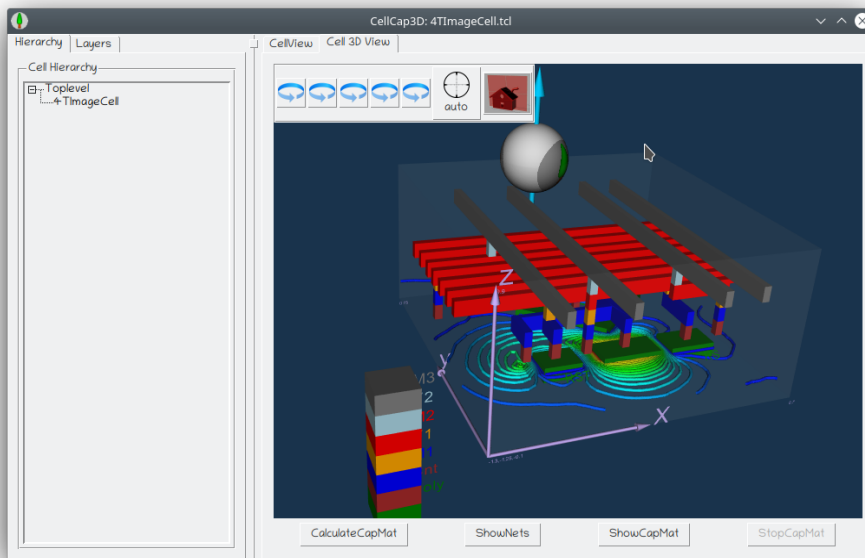# SEQUOIA Design Systems, Inc.

www.sequoiadesignsystems.com

CellCap3D Datasheet

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Product Overview

CellCap3D is SEQUOIA's tool for fully integrated accurate gds-to-spice calculation of capacitance matrices for image sensor cells, memory cells and similar. CellCap3D includes mesh generation, numerical solvers and graphical interfaces for viewing the 3D cell model, connected nets, capmatrix values and internal potential distributions. Overall input to the tool is provided through Tcl - a powerful extension language with full programming capabilities.

CellCap3D Workflow

Capacitance matrices are calculated from two orthogonal input data sets: a gds database with the cell layout and vertical layer information such as layer thicknesses dielectric permittivity of insulators. A 3D cell model is constructed from these inputs and an efficient and high quality simulation mesh is generated automatically. Calculation of the cap
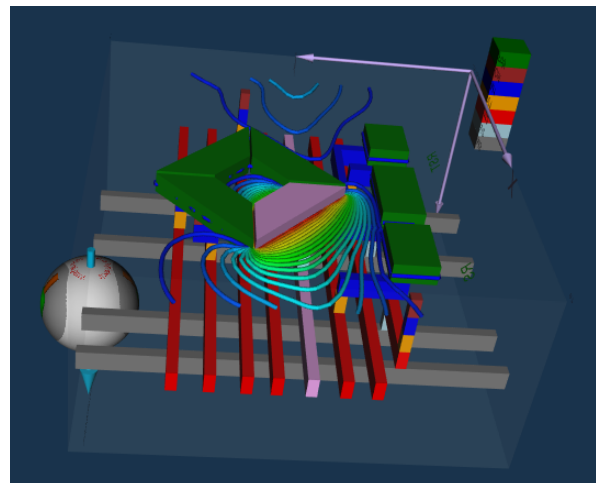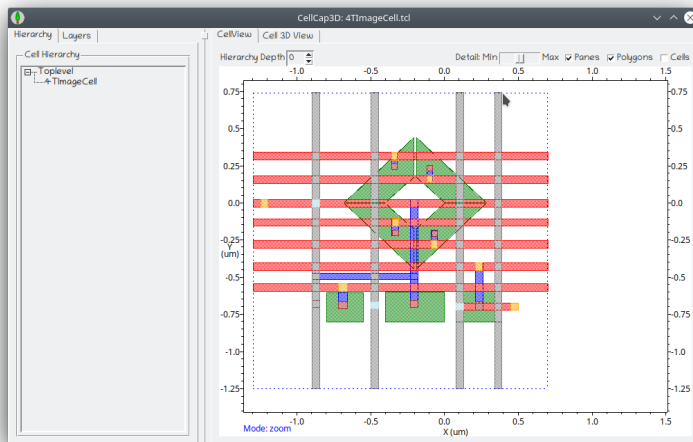
matrix for a complex modern image sensor cell is typically completed in a few minutes. A state-of-the-art numerical solver is built-in and enables viewing of internal potential distributions for detailed analysis.

Electrical Connectivity

Electrically connected conductive portions of the structure are traced automatically and biased together during capacitance calculation.
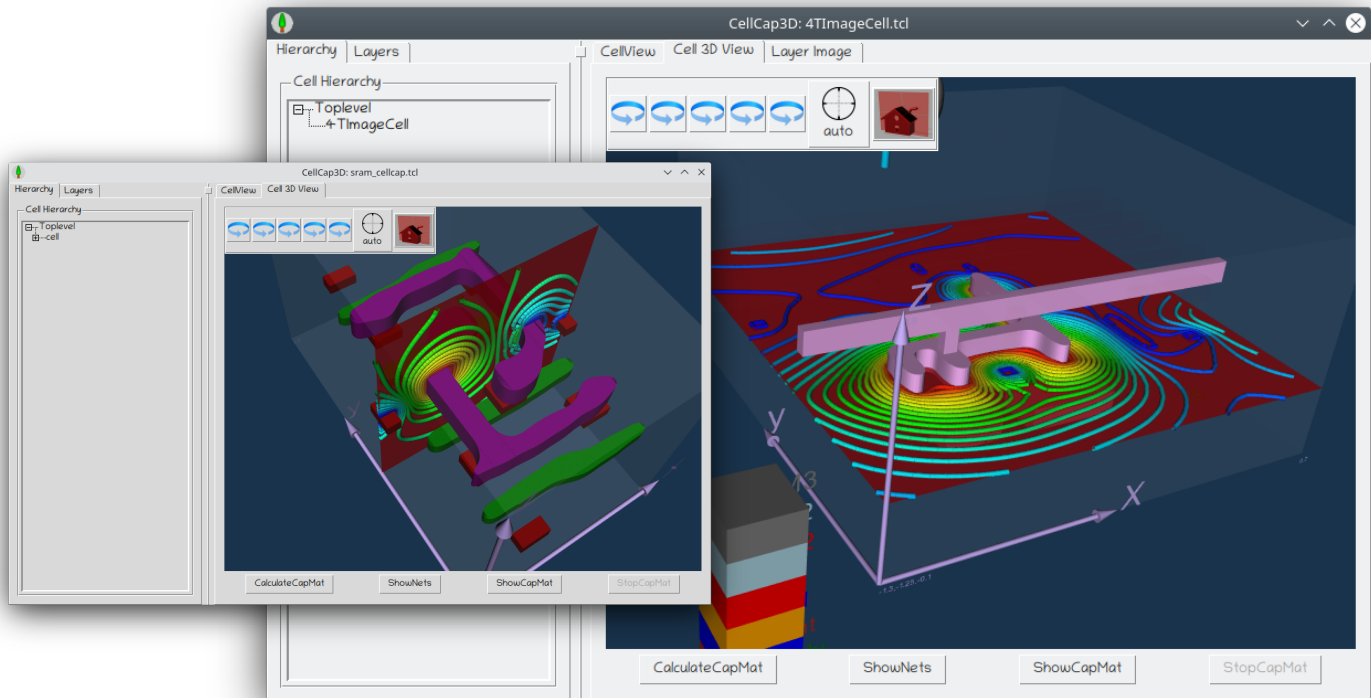

Boundary Conditions

Periodic boundary conditions (PBC) are available in addition to reflective BC and can significantly improve accuracy and reduce calculation time for typical image or memory cell analysis.

Capacitance Matrix

Capmatrix values are calculated automatically and viewed through CellCap3D GUI. Clicking a capmat cell highlights related nets in the 3D model.

Considering Lithographic Distortions and Corner Rounding

CellCap3D can handle complex layouts (gds) including layers subject to lithographic distortion. Such layer polygons may be extracted from SEM images, produced by lithography simulators including SEQUOIA Cell Designer (as in the sram cell shown above), or approximated by directly introducing corner rounding in CellCap3D as shown in the example below of an image sensor cell.

Availability

CellCap3D is available under Linux (Redhat and Ubuntu). Please contact SEQUOIA Design Systems, Inc. for further details at info@sequoiadesignsystems.com