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TCAD Products

Aurora

Device Characterization and Parameter Extraction System

Aurora is a complete semiconductor device characterization and parameter extraction system, providing capabilities to measure device characteristics, extract circuit level model parameters from measured or simulated data, and analyze results graphically. [...more](#)

DFM WorkBench

Design for Manufacturability Solution

DFM WorkBench bridges the gap between process development and circuit design by allowing semiconductor engineers to account for statistical variations in the process to improve circuit performance, maximize wafer yield and reduce time to volume production. Statistical modeling through factory emulation using TCAD simulators makes it possible to take design for manufacturability into consideration even before running real silicon wafers. By using Monte Carlo sampling, a virtual pilot line is generated in the computer. DFM WorkBench provides a simulation environment to obtain early SPICE models for circuit designers and statistical information for yield enhancement. [...more](#)

Davinci

Semiconductor Device Simulation in 3D

Davinci predicts the electrical characteristics of arbitrary three-dimensional structures under user-specified operating conditions. It is applicable to a broad variety of technologies, ranging from deep submicron devices to large power structures. Typical device applications include diodes, BJT MOSFETs, JFETs and MESFETs. [...more](#)

Medici

Semiconductor Simulation in 2D

Medici predicts the electrical characteristics of arbitrary two-dimensional structures under user specified operating conditions. It is applicable to a broad variety of technologies, ranging from deep submicron devices to large power structures. Typical device applications include diodes, BJTs, MOSFETs, JFETs, MESFETs, HBTs, HEMTs, IGBTs, CCDs and GTOs. [...more](#)

Raphael

Interconnect Analysis Software Product

Raphael is a collection of 2D and 3D field solvers and interfaces that provide the ability to obtain accurate interconnect models for different engineering needs. Given today's deep submicron process technologies, and increasing clock rates, interconnects fundamentally control the overall operating performance of high-speed systems. Interconnect structures must be fully and accurately characterized to ensure on-chip signal integrity. Raphael satisfies this critical industry need by rigorously simulating the resistance, inductance and capacitance with its industry-standard field solvers and interfaces. [...more](#)

Raphael-NES

Net Extraction System

Raphael-NES is a net extraction system that reads GDSII files and computes VLSI parasitic capacitances with the highest accuracy possible. With minimal memory requirement and ultra-fast runtime, its numerical engine QuickCAPTM from Random Logic Corporation, is the only rigorous field solver that can directly compute 3D capacitances of large IC layouts containing more than one million transistors. [...more](#)

TSUPREM-4

Semiconductor Process Simulation Software

TSUPREM-4 is the industry-standard 1D/2D process simulation tool that is widely used by semiconductor companies to optimize IC fabrication processes. With the most advanced models commercially available, TSUPREM-4 simulates the physical effects (e.g. transient enhanced

diffusion and stress-dependent oxidation) found in leading-edge semiconductor processing. The result is the generation of precise device structures that allow inexpensive what-if experiments through simulation, minimizing the need for processing test wafers. Thus, TSUPREM-4 can help optimize device geometry to reduce product development cycles and shorten product time to market. [...more](#)

Taurus-Device

Multidimensional Device Simulation

Taurus-Device is a complete program for semiconductor device simulation. Taurus-Device simulates electrical and thermal characteristics of any semiconductor device in 1, 2 or 3 dimensions. [...more](#)

Taurus-Lithography

Photolithography Simulation

Taurus-Lithography performs complete photolithography process simulation, covering all aspects of stepper setup, resist processing and mask layout optimization to maximize the capabilities of the photolithographic process. With Taurus-Lithography you can analyze the printability of any very large region of an integrated circuit by simulating its aerial image and comparing it to the original mask design. Taurus-Lithography can also be used to analyze stacks of photoresists and dielectric layers to calculate complex layout patterns by simulating the critical exposure, post-exposure bake (PEB), and development steps. The Optical Proximity Correction Advanced Application Module (OPC-AA) automatically modifies layouts to improve their printability characteristics by using an optimization algorithm and a selection of models to calculate the printed contour. [...more](#)

Taurus-OPC

Optical Proximity Correction

The Taurus-OPC system is a comprehensive environment for performing full-chip proximity correction, building behavior models for correction and analyzing proximity effects on corrected and uncorrected IC layout patterns. The high level of programmability and flexibility built into Taurus-OPC ensures an optimal match to your processing objectives and constraints. [...more](#)

Taurus-Process

Multidimensional Process Simulation

Taurus-Process is a complete program for semiconductor process simulation. Taurus-Process simulates all important fabrication steps used to manufacture semiconductor devices. Processes and devices can be simulated for a full 3-dimensional structure, or in 1 or 2 dimensions. Typical processes simulated are deposition, etching, ion implantation, diffusion and oxidation. Taurus-Process has a direct interface to Taurus-Device™ for electrical and thermal device characterization. [...more](#)

Taurus-Topography

Topography Modeling for IC Technology

Taurus-Topography simulates topography modification processes such as deposition, etch, spin on glass, reflow and chemical-mechanical polishing, in 2D or 3D cross-sections of arbitrarily shaped semiconductor devices composed of multiple layers. One of Taurus-Topography's most important features is the physically based topography models for accurate characterization of deposition and etch of different materials. Taurus-Topography, capable of multiprocess simulation, lets you tackle issues ranging from the most complex three-dimensional local interconnect problems in DRAM cell technology to reliability issues associated with void formation during deposition. [...more](#)

Taurus-Visual

Integrated Circuit Technology Visualization

Taurus-Visual lets you visualize data from physical simulation software tools or other sources in one, two, and three dimensions. It is an interactive visualization tool for analyzing physical simulation results and manipulating the resulting plots to gain a new perspective. Taurus-Visual provides an environment with common operations that are simple, direct and easy to use, as well as advanced controls for expert users. [...more](#)

Taurus-WorkBench

Virtual IC Fabrication

Taurus-WorkBench satisfies a long-identified need in IC design, technology development and semiconductor fabrication: the availability of physical simulation tools in a natural, graphically based environment, facilitating their use in the evaluation of design alternatives, yield optimization and failure analysis. Growing industry acceptance of TCAD (technology computer-aided design) and other physical simulation tools has broadened their use from the R&D scientist to the front-line engineer. These new users have a single motivation: to solve real technology problems in the shortest time possible and at the lowest cost. This has long been the promise of physical simulation and through Taurus-WorkBench it is further realized. [...more](#)