CST EM STUDIO(tm)

Technical Specification

1 January 2011

Frontend Module

- For functionality and CAD/EDA import filter, see technical specifications of the CST STUDIO SUITE(tm)

Electrostatics Field Solver Module

- Automatic mesh generation and adaptive mesh refinement
- Isotropic and (coordinate-dependent) anisotropic material properties
- Perfect conducting sheets and wires
- Electric / magnetic / tangential / normal / open / fixed-potential boundary conditions
- Source types: fixed and floating potentials, charges on PEC solids and piecewise constant charge distributions
- Automated capacitance calculation
- Force calculation
- Network distributed computing for optimizations and parameter sweeps (option)
- Coupled simulations with Mechanical Solver from CST MPHYSICS STUDIO®

Magnetostatics Field Solver Module

- Automatic mesh generation and adaptive mesh refinement
- Isotropic and (coordinate-dependent) anisotropic material properties
- Nonlinear materials
- Laminated material properties
- Electric / magnetic / tangential / normal / open boundary-conditions
- Source types: coils, permanent magnets, DC current distribution, current paths, external homogeneous field
- Automated inductance and flux linkages calculation
- Force and torque calculation
- Flux linkages
- Network distributed computing for optimizations and parameter sweeps (option)
- Coupled simulations with Mechanical Solver from CST MPHYSICS STUDIO®

Stationary Current Field Solver Module (DC)

- Isotropic and (coordinate-dependent) anisotropic material properties
- Perfect conducting sheets and wires
- Choice of hexahedral or tetrahedral meshing
- Automatic mesh generation and adaptive mesh refinement
- Source types: current ports, current paths, potentials
- Electric / magnetic / tangential / normal / open boundary-conditions
- Automated conductance calculation
- Network distributed computing for optimizations and parameter sweeps (option)
- Coupled simulations with Mechanical Solver from CST MPHYSICS STUDIO®

LF Frequency Domain Field Solver Module

- Fullwave solver
- Magnetoquasistatics solver
- Electroquasistatics solver
- Automatic mesh generation and adaptive mesh refinement
- Isotropic and anisotropic material properties
- Perfect conducting sheets and wires
- Surface impedance model for good conducting metalls
- Boundary conditions: electric, magnetic
- Sources for full wave and magnetoquasistatic analysis:

  coils, current paths, voltage paths
- Sources for electroquasistatic analysis: potentials
- Force and torque calculation
- Loss- and energy density monitors
- Network distributed computing for optimizations and parameter sweeps (option)
- Coupled simulations with Thermal Solver from CST MPHYSICS STUDIO®

LF Time Domain Field Solver Module

- Magnetoquasistatics solver
- Automatic mesh generation
- Adaptive time stepping
- Network distributed computing for optimizations and parameter sweeps (option)
- Isotropic and (coordinate-dependent) anisotropic material properties
- Perfect conducting sheets and wires
- Boundary conditions: electric, magnetic
- Sources: coils, current paths, permanent magnets

- User defined excitation signals and signal database
- Network distributed computing remote calculations
- Transient EM/circuit co-simulation with CST DESIGN STUDIO™ network elements

Post Processing

- 2D and 3D field vizualisation
- Integration and vizualisation of fields along arbitrary paths
- Flux integration
- Force and torque calculation
- Capacitance- / inductance / conductance calculation
- Export of electromagnetic field data
- Advanced reporting facilities

Automation

- Fully parametric 3D modelling
- VBA macro language
- OLE automation server
- Template based postprocessing
- Automatic, multi-dimensional parameter sweeps
- Automatic structure optimization for arbitrary goals using built-in optimizer

Documentation

- CST STUDIO SUITE™ - Getting Started
- CST EM STUDIO® - Workflow and Solver Overview
- Online Help System, including step-by-step tutorials

Minimum Hardware Requirements

- Intel® Xeon® based PC, 4GB RAM, DVD- Drive, at least 20GB of free hard disc space.
- Fully OpenGL compliant graphic card
- Windows XP Professional, Vista and Windows 7
- All solvers support RedHat Enterprise Linux (RHEL) 4.x und 5.x.
- Hardware recommendation depends on your application. If in doubt, please contact your local sales office for further information.

General

- CST EM STUDIO® is a configurable tool with a choice of 5 solver modules. The standard configuration is one full process with the static solver bundle and one additional frontend. Floating and node-locked licenses are available. Please contact your local sales office for further information.