

FEKO is a leading electromagnetic simulation software that uses multiple frequency and time domain techniques. True hybridization of these methods enables the efficient analysis of a broad spectrum of electromagnetic problems mainly related to antenna design and placement, scattering, radar cross section (RCS) and electromagnetic compatibility (EMC), including electromagnetic pulses (EMP), lightning effects, high intensity radiated fields (HIRF) and radiation hazard.

Product Highlights

- State-of-the art simulation tool for antenna design and placement, and RCS
- EMC analysis, including emissions, immunity, and shielding effectiveness
- Wide set of hybridized methods to solve large and complex problems
- Specialized tools, including windscreen antennas, arrays, cable modeling, and CMA
- HPC-enabled efficient, reliable, and accurate solvers

Benefits

One Product, Multiple Solvers

By offering a selection of different solvers, FEKO users can choose the method that is most suitable to the problem that they are trying to solve, or use more than one solver for cross validation purposes. All FEKO solvers are sold in a single bundle and are also part of the Altair HyperWorks licensing system.

True Hybridization

FEKO offers industry leading hybridization of different solvers to combine the beneficial characteristics and allow more efficient and accurate analysis of multi-scale problems that are both complex and electrically large.

Solver Accuracy and Performance

Extensive validation of the numerical methods and enhancements in FEKO is carried out to ensure the accuracy of our approaches. Solver performance and parallel scaling is continually optimized to achieve leading computational efficiency.

Specialized Solutions

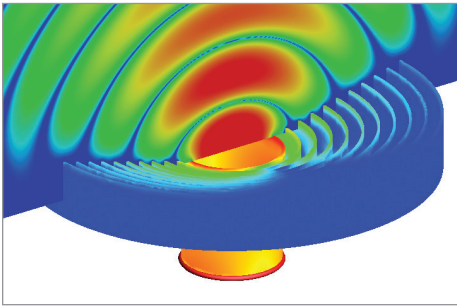
FEKO was the first to commercially offer a characteristic mode analysis (CMA) solver, which is still today the most proven and reliable. FEKO includes specialized solutions for bidirectional cable coupling, windscreen antennas and large finite arrays. Model decomposition workflows for classical antenna placement and EMC problems enable equivalent representation of the transmitting/receiving antennas and other devices.

Capabilities

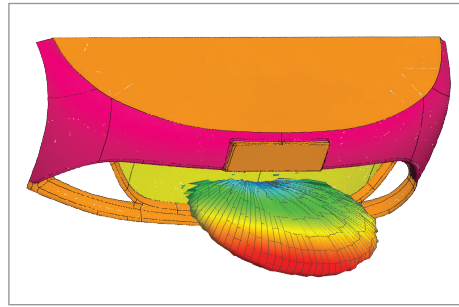
Solver Overview

- Frequency and time domain full wave solvers: MoM, FDTD, FEM and MLFMM
- Asymptotic methods: PO, LE-PO, RL-GO, UTD
- True hybridization of methods to solve complex and large multi-scale problems
- Unique CMA solver calculates modal currents, eigenvalues, modal significance and characteristic angles

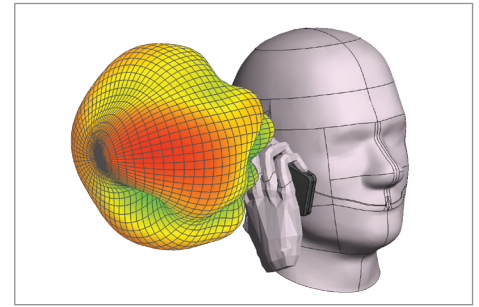
Learn more:
altairhyperworks.com/feko



Corrugated horn antenna analysis



ACC vehicle radar integration



Radiation pattern for mobile phone against head and with hand phantom

Solver Performance Features

- The FEKO solver is fully parallelized and optimized to exploit multi-CPU distributed memory resources
- GPU-based solver acceleration
- Optimized out-of-core solver to deliver solutions when RAM limits are reached

User Interface

- State-of-the-art 3D Parasolid CAD modeling interface, including import/export of CAD and mesh formats
- Integrated mesh engine for generating triangle, tetrahedron and voxel simulation meshes
- Interface to Altair HyperMesh
- Comprehensive post-processing including 1D, 2D, and 3D plots, import of measurement results, report generation, etc.
- Full Lua script automation for modeling, configuration and post-processing, with macro recording support

Optimization

- Automated optimization of multi-variable and multi-goal problems with several algorithms, including GA and particle swarm
- Real-time monitoring of the optimization process
- Interface to Altair HyperStudy

Specialized Solutions

- Bi-direction coupling with complex cable bundles and along arbitrary cable paths

- Special solver for efficient analysis of antennas integrated into layered windscreens
- Efficient methods for finite and infinite arrays and periodic structures
- Metamaterials and composites

Model and Domain Decomposition

- Decomposition of electromagnetic problems to reduce computational cost
- Numerically efficient equivalent sources for complex sources and receivers

Non-Radiating Networks

- Lumped, linear circuit models can be included in a simulation, often used for matching networks
- S-, Z- or Y-parameter files or SPICE circuit file Network definitions

CADFEKO Features

- Set up the entire problem within the CADFEKO GUI, covering all aspects from geometry modelling to mesh generation.
- CAD and mesh import/export of most major formats including Parasolid, AutoCAD DXF, IGES, STEP, Pro/ENGINEER®, Unigraphics, CATIA V4 & V5, ACIS Exchange (SAT)
 - Gerber, ODB++ and 3Di for printed circuit boards
 - CAD healing functions for fixing inconsistencies, gashes, slivers, spikes, and filling holes

- Media library with pre-defined and user-defined materials
- Powerful meshing algorithms for surface or volume, flat or curvilinear mesh generation with manual or adaptive refinement
- Direct link to Optenni Lab for automated matching circuit generation
- EMIT interface for co-site interference analysis
- Imports of results from Cadence Sigrity, FEST3D, GRASP, CST, SEMCAD, Orbit/Satimo measurements and Touchstone files

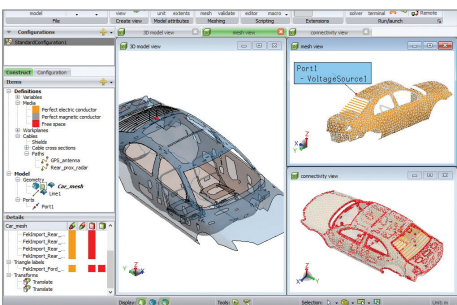
POSTFEKO Features

Visualize and compare simulation and measurement results in the comprehensive POSTFEKO GUI.

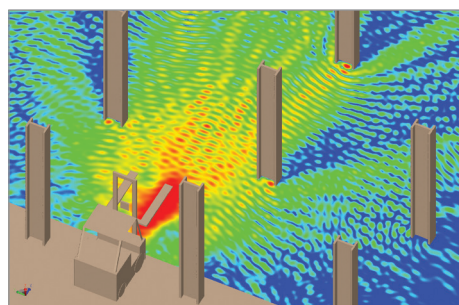
- 2D/3D plots and animations of near and far fields (radiation patterns), currents, SAR
- Impedance, S-parameters
- Contours, iso-surfaces, ortho-slices
- Cartesian graphs, polar graphs, Smith charts
- Multiple models, multiple views
- Mathematical operations
- Imported data and measurements
- Export of various data formats, images, and animations

Report Generation

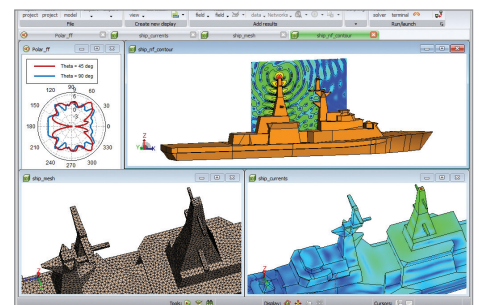
Active POSTFEKO sessions can be exported to a PowerPoint, Word, or PDF report. A quick reporting option requires minimal input from the user, while a template-based report may be generated where the user has full control over the content of the document.



Automotive cable coupling problem setup



Warehouse environment RFID study



Naval antenna placement result visualization