FARADAY

3D Electromagnetic Eddy Current Design Software

FARADAY is **INTEGRATED's** powerful 3D electromagnetic eddy current solver and analysis tool.

Our proprietary Boundary Element Method (BEM) solver technology provides extremely precise numerical field solutions and is the method of choice for problems involving the modeling of space around a device. The Finite Element Method (FEM) solver is included in the program as well to provide users with the choice of both methods.

Engineers and scientists can depend on **FARADAY** for the design and analysis of magnetic equipment and components, including:

- MRI
- non-destructive testing systems
- bus bars, charging fixtures
- induction heating coils

- induction motors
- magnetic recording heads
- magnetic shielding
- coils and transformers

Choose your design environment

**INTEGRATED as a part of your software ecosystem**

Whether your favorite design environment is Excel, MATLAB® or VisualStudio, our Application Programming Interface (API) allows you to seamlessly develop your own specialized analysis tools or develop tools for others.

Users or developers can call our electromagnetic, thermal or particle trajectory functions to create customized applications with relative ease. These customized software programs may also call other APIs to combine their power.

Customize your application and bring your design to an even higher level of sophistication.
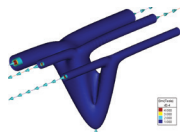
Isosurfaces of B-field around transmission lines
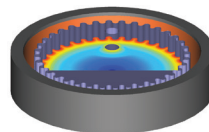
Power density distribution in gear under heat treatment by induction

Hybrid Simulation Tools for Electromagnetic and Particle Trajectory Design Analysis

SOFTWARE THAT LIVES UP TO THE POWER OF YOUR IDEAS

MATLAB
Enabled

MathWorks Partner

WE GO BEYOND TRADITIONAL MULTIPHYSICS:

- Search-based 3D electromagnetic eddy current solver **[NEW]**

- Metaheuristic approach for optimizing simulation based electromagnetic designs. **[NEW]**

- INTEGRATED's latest innovation **"Coils and Windings Editor"** to facilitate AC motor design. **[NEW]**

- Precise calculation of electromagnetic parameters using our proprietary **Boundary Element Method (BEM) solvers**.

- **Finite Element Method (FEM) in addition to BEM**. This hybrid approach uses the strength of each method while designing an electromagnetic system.

- Built-in API, Parametric and/or Scripting capabilities

The **INTEGRATED API** enables the direct control of program functions by utility scripts or macros created in tools such as EXCEL or Visual Studio. Scripting can control the entire process of model creation and testing.

- Direct import of models from CAD partners including: Autodesk, PTC, Solid Edge and SolidWorks.

MORE BENEFITS:

- Coupling to Celsius for **thermal analysis**.

- Easy-to-use and intuitive interface.

- High resolution 3D graphic representations that can show enhanced tracing of points on model.

- Automatic meshing and removal of intersecting geometries.

- World class support team ready to unlock your ideas.

For many systems, it is important for multiple solvers to be combined. INTEGRATED develops comprehensive solutions for scientists modeling prototypes that require multiphysics analysis.

"**F**ARADAY is ideally suited for the analysis of magnetic fields around complex power line configurations because it can easily cope with large scale differences and open boundaries. We have obtained excellent results using **FARADAY** and it still is our main tool for this type of application where a full 3D solution is required because of the absence of exploitable symmetry."

— Sylvain Gravel,
Senior Research Scientist,
Hydro-Québec Research Institute (IREQ)

PUT OUR SOFTWARE TO THE TEST

Don't take our word for it.

Contact us for a free 30 day evaluation and start improving productivity today. Ask for a live demo.

Visualize, Analyze, Optimize

FARADAY provides outstanding visualization features for detailed analysis of magnetic systems. Automated model creation using built-in **API** and **Parametric Utilities** combined with Self-Adaptive **BEM** and **FEM** solvers enable rapid optimization of designs.
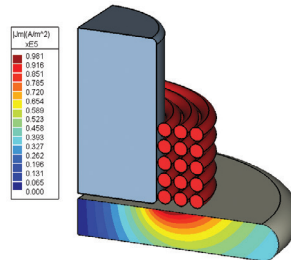
3D model of an eddy current sensor showing current density contours induced in target
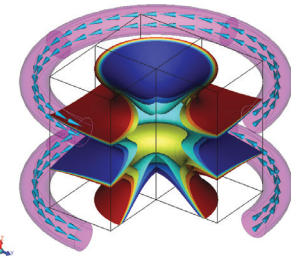
3D model of Helmholtz coils showing isosurface plots of axial component of B field

FARADAY comes complete and ready to use. Purchase of additional modules or options is not needed; **FARADAY** is a fully functional CAE tool. A partial list of standard features includes:

- Intuitive and structured interface maximizes productivity for experts and beginners
- Intuitive Coils and Windings editor
- Simulation of impressed currents and assigned voltage conditions
- Transient, phasor and static analysis modes
- Periodic and symmetry features to minimize modeling and solution time
- Analysis of force, torque, flux linkage, power and impedance parameters
- Analysis of current density in conductors due to skin effects
- A variety of display forms for plotting scalar and vector field quantities including: graphs, profile plots, arrow plots, color maps and vector loci plots
- High quality 3D graphics and text utility for preparation of reports and presentations
- Data exportable to formatted files for integration with spreadsheets and other software packages
- Batch processing that allows unattended solution of multiple files
- Powerful parametric feature which allows definition of variable parameters to be stepped through allowing the analysis of multiple "what-if" scenarios and facilitating design optimization
- A wide array of post-processing options for design evaluation and optimization
- Self-adaptative meshing or optional user refinement
- CAD healing utilities for automatic correction of drafting errors
- Large library of permanent magnet and ferromagnetic materials to which additional materials can be easily added

COMPLETE SOLUTIONS FOR ENGINEERING AND SCIENTIFIC DESIGN