INTEGRATED ENGINEERING SOFTWARE

www.integratedsoft.com

# OERSTED

## 2D/RS Electromagnetic Eddy Current Design Software

**OERSTED** is a 2D/RS electromagnetic eddy current field solver from **INTEGRATED** Engineering Software, which delivers the power to solve transient modes.

Our proprietary Boundary Element Method (BEM) solver technology provides the 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 depend on **OERSTED** for the design and analysis of electrical/electronic equipment and components such as:

- MRI
- non-destructive testing systems
- bus bars, charging fixtures
- induction heating coils
- magnetic recording heads
- magnetic shielding
- coils and transformers
- induction motors

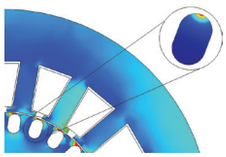
## Choose your design environment

**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.



*Field magnitude plot in the rotor and stator of an induction motor; current density induced in one rotor bar (inset)*

**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 electromagnetic eddy current, 2D and rotationally symmetric field 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
- **Transient and phasor eddy current analysis as well as static analysis modes**
- Precise calculation of electrical 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.

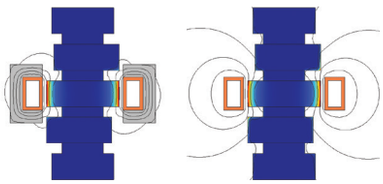
## MORE BENEFITS:

- 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.**

"I truly enjoy using **OERSTED**. Its combination of speed, accuracy and extraordinary user-friendliness make my work much more productive. I would like to thank the **INTEGRATED** team for an excellent numerical code."

— Dr. Valery Rudnev, FASM
Director, Science & Technology
Inductoheat Group



*One of the major challenges in the induction hardening of steel camshafts relates to the avoidance of undesirable heating in adjacent areas that have previously been hardened (temper back effect).*

*This model shows an evaluation of power density and magnetic field distributions using a single-turn inductor without (left) and with (right) magnetic flux concentrator. Image courtesy of Inductoheat Inc.*

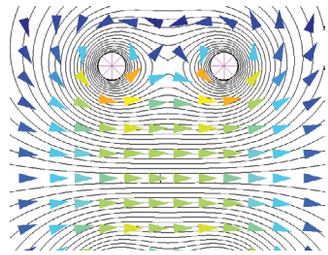
# PUT OUR SOFTWARE TO THE TEST

**Don't take our word for it.**

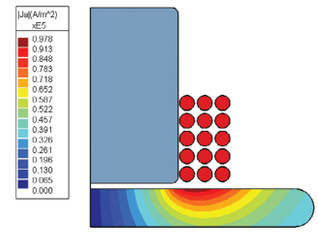
**Contact us** for a free 30 day evaluation and start improving productivity today. Ask for a live demo.

## Visualize, Analyze, Optimize

**OERSTED** 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.



*Rotational Symmetric model of Helmholtz coils showing vector potential contours and B field arrow plots*




*Rotational Symmetric model of an eddy current sensor showing current density contours induced in target*

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

- Intuitive and structured interface which maximizes productivity for experts or beginners
- Intuitive Coils and Windings editor
- Ability to model voltage excitation and back EMF effects of coils and windings
- Calculation of true AC resistance due to skin and proximity effects
- Transient, phasor and static analysis modes
- Simulation of lossy magnetic materials
- Variety of refine wave forms available, such as sinusodial sources with the DC offset and various square wave and triangular pulses
- Periodic and symmetry features to minimize modeling and solution time
- Solution of current induced and skin effect current impressed in conductors
- Calculation of Force, torque, flux linkage, induced voltage, power and impedance parameters
- A variety of display forms for plotting scalar and vector field quantities include: graphs, contour plots, arrow plots, profile plots and vector loci plots
- 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
- Large library of permanent magnet and ferromagnetic materials to which additional materials can be easily added



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