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13 years later, FEI still appreciates the advantages of the Boundary Element Method for particle trajectory

About the company and its products

FEI is a leading diversified scientific instruments company, featuring electron and ion-beam microscopes and other instruments for nanoscale applications across many industries: industrial and academic materials research, life sciences, semiconductors, data storage, natural resources and more. With a 60-year history of technological innovation and leadership, FEI has set the performance standard in transmission electron microscopes (TEM), scanning electron microscopes (SEM) and DualBeams (tm), which combine a SEM with a focused ion beam (FIB). FEI's imaging systems provide 3D characterization, analysis and modification/prototyping with resolutions down to the sub-Angstrom (one-tenth of a nanometer) level. FEI's standard line of products and custom-designed instruments can be found in laboratories around the world.

Jim McGinn, a Staff Scientist with FEI, has dedicated over three decades of work in the electron optics field, and he joined FEI 22 years ago. It was in 1999 that FEI bought the first package of LORENTZ, INTEGRATED's beam optics and charge particle trajectory design analysis tool. Today, FEI still relies on LORENTZ for testing and modeling during the design process.

Why does FEI prefer the Boundary Element Method?

The FEI Beam Technology team appreciates many of the technical capabilities in the software package. One key feature McGinn enjoys is the Boundary Element Method (BEM), a solver developed by INTEGRATED. "The Boundary Element Method is more computationally efficient than the Finite Element Method and it also enables us to better define complex surfaces than the Finite Element Method (FEM). From our viewpoint, the Boundary Element Method makes it very quick and easy to set up a problem," says McGinn.

Another highlight for McGinn is the CAD import capability of LORENTZ, because it "makes it very quick and easy to create a model. Of the various electromagnetic codes that we have, and we have many, LORENTZ is the only one that offers a full CAD import, and that makes it very useful."

Read more —>

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> RF, Microwave & Antennas

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Cont'd

Particle trajectory analysis in the magnetic field

FEI was able to use the magnetics portion of LORENTZ to get very good results. McGinn finds the magnetic analysis tools in LORENTZ are relatively easier and more straightforward to use than the other code they use for magnetics. The magnetics work that McGinn is able to do in LORENTZ, because of the way that the user interface is created for defining magnetic sources, is very useful. He adds, "The way that the electric boundary conditions are defined inside of Lorentz in the user interface is extremely useful, quick and easy."

One last note about technical support

"I just wanted to make sure that everybody understands how much we appreciate the work that Bruce (Klimpke, INTEGRATED's Technical Director) and his group have been doing on the improvements to the code," McGinn concludes, "and we are excited about the new steps that are happening in the upcoming version of LORENTZ. We're very much looking forward in continuing to work with INTEGRATED in the development of future releases."

"It's my pleasure to get to work with INTEGRATED. We all here at FEI are really excited about the good new movement that you are making with the software, and we are appreciative of that."

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