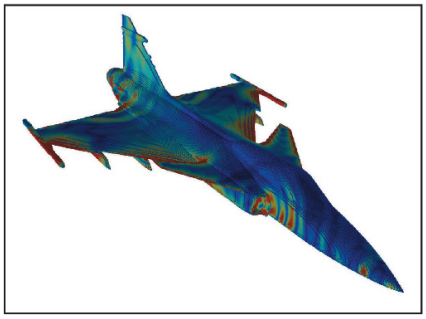
CADfix Fosters EM Progress

"CADfix is at the heart of this technology."

- Jonas Gustafsson
CEM specialist at Ericsson Saab Avionics

CADfix

CADfix removes barriers preventing the reuse of solid models. By providing an extensive set of geometry manipulation tools for importing, repairing and exporting data, CADfix maximizes the reuse of CAD data in downstream applications.



More and more modern technologies depend on electromagnetic (EM) waves. EM-based systems are now truly ubiquitous. The accurate prediction of how EM systems interact with each other, the world around them and natural EM phenomena like lightning is now more important than ever if such systems are to continue to work effectively and safely.

"Prediction of EM behavior is becoming vital in more and more civil and commercial engineering situations," says Jonas Gustafsson, a computational electromagnetics (CEM) specialist at Ericsson Saab Avionics. "Not knowing what to expect when lightning strikes a passenger aircraft, for instance, is simply not an option. We are constantly developing innovative techniques to help us with these analysis scenarios."

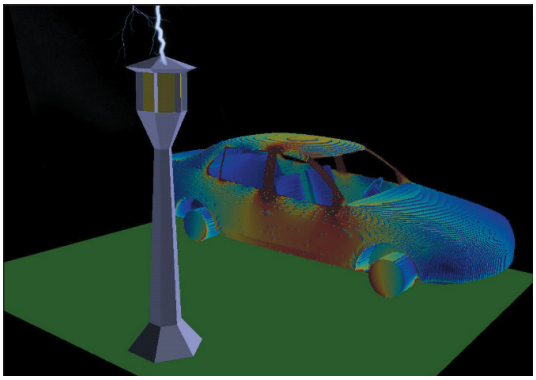
Ericsson Saab Avionics consults on CEM projects for clients throughout the industry. Applications include efficient positioning of antennae within complex environments and predicting radar cross-section (RCS) profiles for different aircraft, as well as the more extreme lightning strike situations.

"We rely on CADfix throughout our analysis projects," explains Jonas. "First we need to bring in and repair incoming geometry, often from more than one CAD system. Next we use CADfix to build the complex meshes required for EM analysis. Finally we use it to display the results of our analysis."

"Unlike traditional FEA, where scope is quite limited, there are many solvers and algorithms in CEM, each suitable for a particular physical situation," he explains. "Each of these requires a particular kind of mesh to be built – some of which mix surface boundary elements and body elements in the same mesh – and we would not be able to achieve some of the necessary effects without CADfix."

Jonas has worked closely with ITI to push the limits of CADfix functionality, providing valuable input to move from finite difference methods to the next logical level of accuracy and complexity: a hybrid meshing algorithm that combines the finite difference method with triangular surface and solid tetrahedral elements.

"We are working toward GEMS, the general electromagnetic solver, which we hope will be the most accurate and versatile CEM solution available," says Jonas. "CADfix is at the heart of this technology."



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www.iti-global.com
info@iti-global.com
1-800-783-9199 US
+44-1954-234-300 UK

European Headquarters:
4 Carisbrooke Court, Anderson Road
Buckingway Business Park, Swavesey
Cambridge, CB24 4UQ, England

World Headquarters:
5303 DuPont Circle
Milford, OH 45150 USA

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International TechneGroup