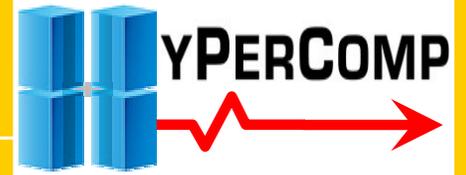


High quality meshes lead to faster turnaround time



# HyPerComp Inc.

Defense, Energy and Commercial Product Design

United States of America

[www.hypercomp.net](http://www.hypercomp.net)



## ANSYS Meshing Solution

### Overview

HyPerComp Inc. develops user-friendly, high-performance computing technologies combining advances in physics-based numerical algorithms and parallel computing hardware for cost-effective simulations of complex, multidisciplinary physical processes in support of defense, energy and commercial product design.

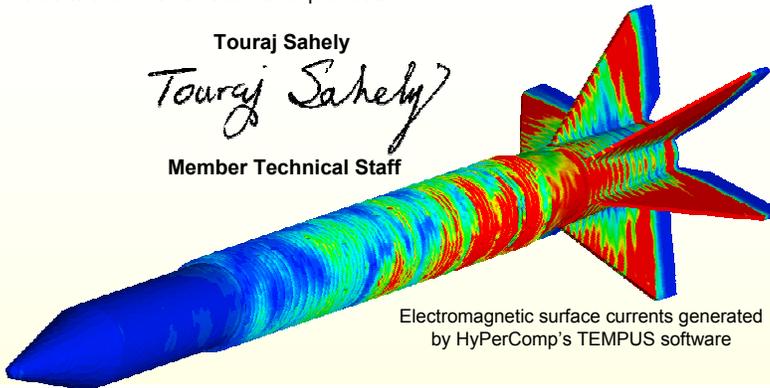
### Testimonial

The pre-processing phase, which includes the setting up of higher order geometry representation and the subsequent generation of surface and volume grids, is a critical and time-consuming component of the start-to-finish computational simulation process. Even for higher order discretization algorithms, the quality and smoothness of grids control the accuracy and efficiency of the simulation.

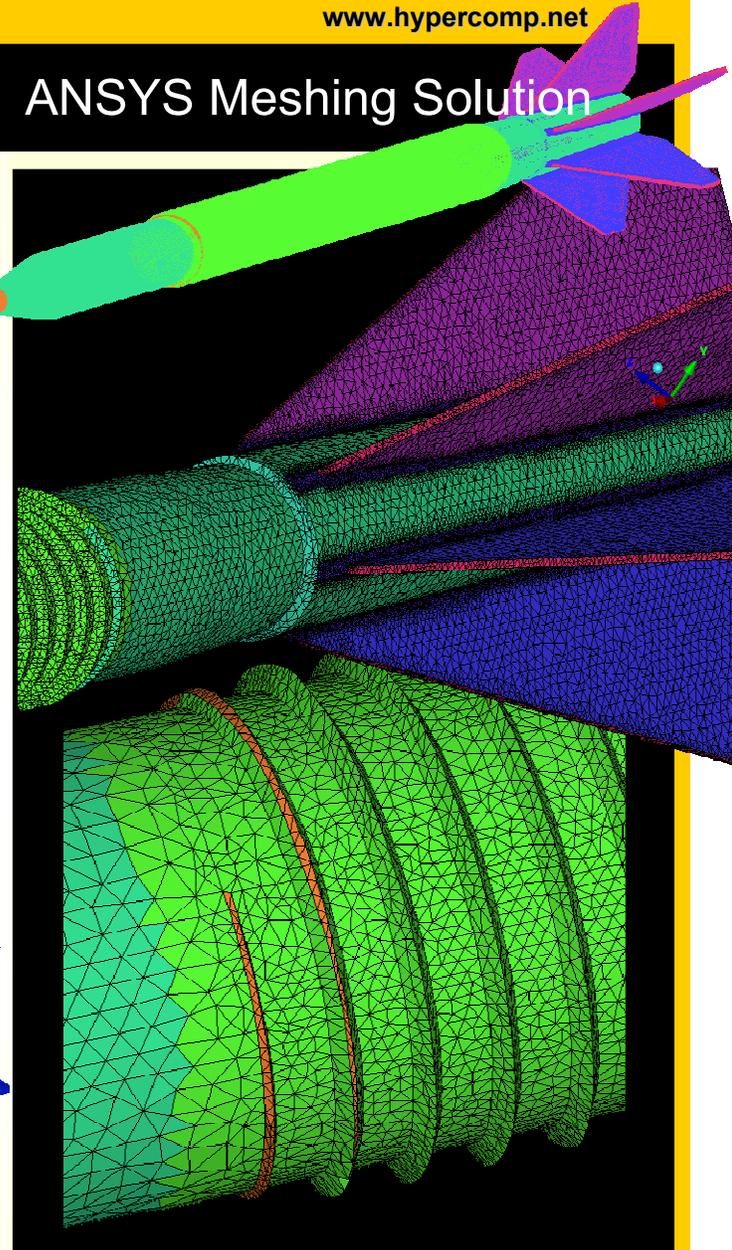
HyPerComp uses ANSYS® ICEM CFD™ tools for generating meshes for a range of applications in Computational ElectroMagnetics (CEM), Computational Fluid Dynamics (CFD) and Magnetohydrodynamics (MHD) simulations. ICEM CFD grid generation products are extremely efficient and accurate, and by far the most advanced and user friendly tools currently available. Our unique applications in CEM truly benefit from the versatility of ANSYS ICEM CFD Hexa and Tetra tools in producing accurate solutions and in reducing the cycle time. The timely response of the ANSYS customer support staff also adds significant value to the ANSYS ICEM CFD products.

Touraj Sahely

Member Technical Staff



Electromagnetic surface currents generated by HyPerComp's TEMPUS software



### Process

Utilizing ANSYS ICEM CFD tools, we generate tetrahedral, hexahedral and hybrid unstructured grids that are, in turn, used by our higher order CEM, CFD and MHD solvers. Usually, geometries are received in IGES format and are then imported into ANSYS ICEM CFD. We also use ANSYS ICEM CFD geometry generation tools to create a variety of CAD models for subsequent analysis. Both Tetra and Hexa produce very high quality meshes that are suitable for the most demanding higher order solvers. ANSYS ICEM CFD domain format is then converted into HyPerComp solvers format and used by domain decomposition tools for subsequent parallel runs.

### Benefits

It is a formidable challenge to be able to accurately simulate the various linear and/or nonlinear processes that govern a physical phenomenon. A high quality mesh is in fact a critical necessity for these simulations. We rely on ANSYS ICEM CFD meshes to satisfy this critical requirement.

Furthermore, other salient benefits include:

- Fast and efficient mesh parameter set up
- Extremely effective and versatile mesh repair capabilities
- Intuitive mesh editor GUI design
- Robust geometry generation tools

The minimum pre-processing and set up effort combined with high quality meshes lead to faster turnaround time for our multidisciplinary scientific simulations.