

TEM3P

TEM3P is a 3D parallel finite-element code that performs integrated electromagnetic, thermal, and mechanical analysis.

Thermal simulations of superconducting cavities are highly nonlinear due to temperature dependent thermal conductivity, surface resistance and Kapitza conductance. Solving nonlinear thermal equations requires efficient and robust nonlinear solvers. TEM3P addresses both challenges through parallel implementation of an inexact Newton method. TEM3P uses shell elements for FEM modeling of very thin layers. Electromagnetic analysis is done using Omega3P for the vacuum region.