VizEM

SOLUTIONS FOR HIGH-FIDELITY ELECTROMAGNETICS SIMULATIONS

VizEM

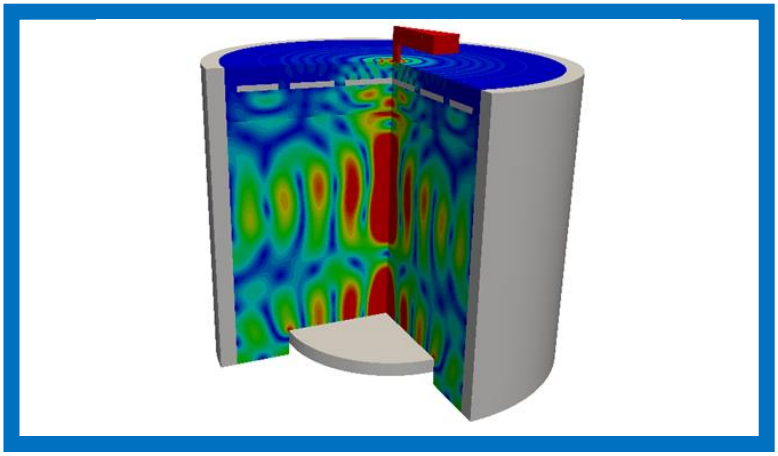
VizEM software tool is used for large-scale multi-dimensional electromagnetics (EM) modeling and simulation. It can be used either as standalone or in coupled to other simulation tools such as VizGlow and VizSpark. Features of VizEM include:

- Both Time-Domain (TD) and Frequency-Domain (FD) allows great flexibility in modeling (e.g. TD for capacitive plasmas and FD for inductive, microwave plasmas, etc.)
- Different types of wave excitation mechanisms available, e.g. Waveguides, inductive coils, capacitive circuits, striplines and microstrips
- Transverse Electric (TE), Transverse Magnetic (TM) or combined (TE + TM) as well as full 3D (non-polarized) solutions can be obtained
- Robust representation of complex EM Wave + Plasma phenomena such as surface waves, resonances etc.
- Robust numerical Solvers that allows modelling of very wide range of frequencies (from mHz to THz)
- Variety of Boundary Condition Types for general and specialized modeling needs
- Seamless integration with VizGlow and VizSpark

Applications

VizEM principally deals with the electromagnetic wave aspects of all VizGlow related plasma applications. It has been provably successful in the following:

- Microwave Plasmas
- VHF and UHF CCP (where both inductive and capacitive effects are present)
- ICP Plasmas
- Reservoir imaging using magnetic and dielectric contrast materials
- Laser heating of micro and nano- sized spheres
- Investigations of Fundamental Wave Plasma Interactions



SOLUTIONS FOR YOUR MULTI-PHYSICS SIMULATION NEEDS

VizEM is one of several simulation packages that are part of the OverViz multiphysics simulation suite. List of simulation packages in OverViz include:

- **VizGlow** Non-equilibrium Plasma simulator
- **VizSpark** Thermal (arc) Plasma simulator
- **VizEM** Electromagnetics simulator
- **VizFlow** Fluid flow simulator
- **VizGrain** Particle simulator
- **VizMesh** Geometry and unstructured meshing
- **ChemZone** Zero-dimensional reactor simulator

We also provide the following services:

- Modeling and simulation services: work with customers to define problem and setup model
- Calibration of models for customer-specific problems
- Training and support to clients using software tools

EsgeeTechnologies Inc.
Analysis and Design through High-Fidelity Simulations

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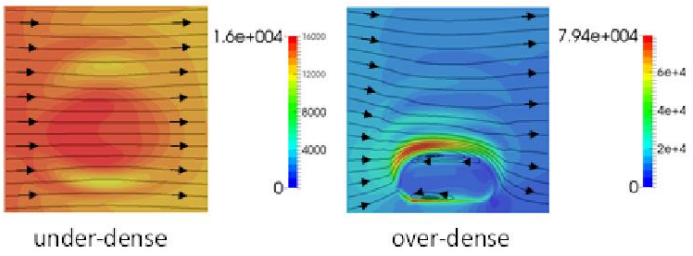

Fig. 1. Poynting Vector Field for EM Wave Microdischarge Plasma Interactions. Left (Underdense), Right (Overdense) cases.

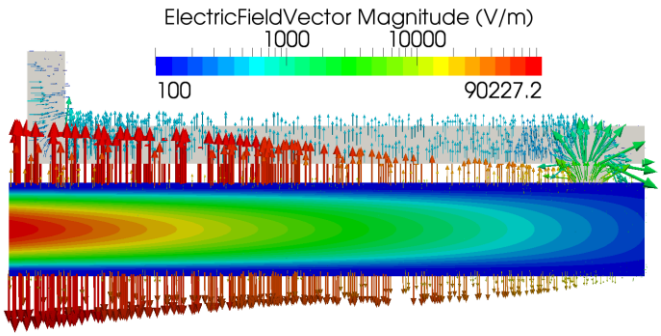

Fig. 3. Electric Field Vector in a Very High Frequency (VHF) CCP showing a standing wave pattern in the plasma sheath.

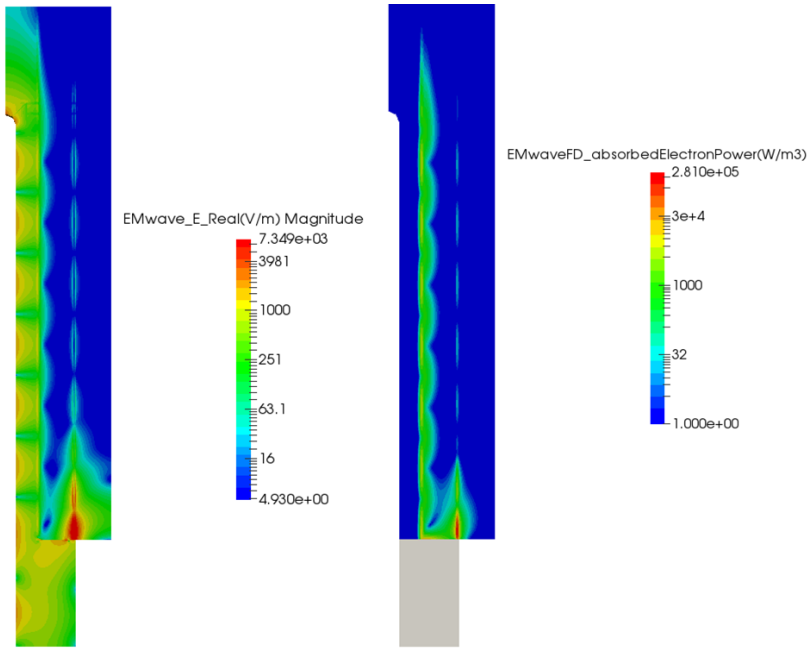

Fig. 2. Magnitude of Real Component of Electric Field Phasor (Left) and EM Wave Absorbed Electron Power (Right) for Microwave Propagation in an Annular Plasma Reactor with DC Bias

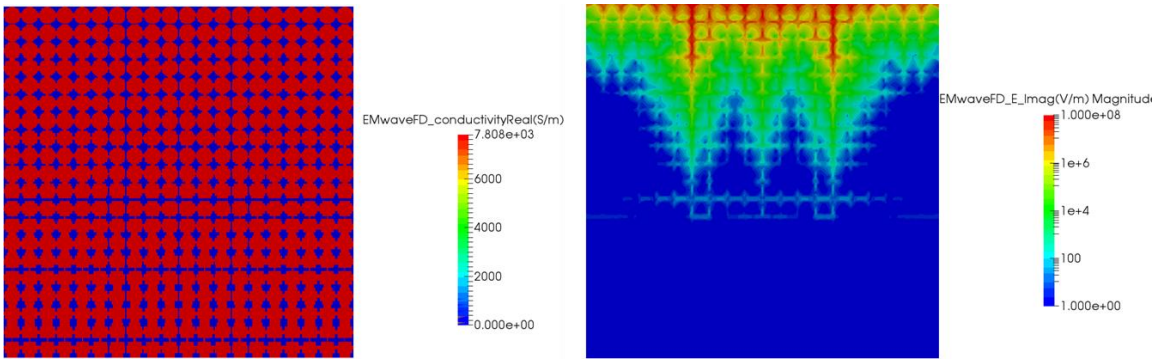

Fig. 4. Real Part of Electrical Conductivity (Left) and Imaginary component of Electric Field Vector Phasor in a Packed Nanoparticle Bed that is irradiated by a Laser.

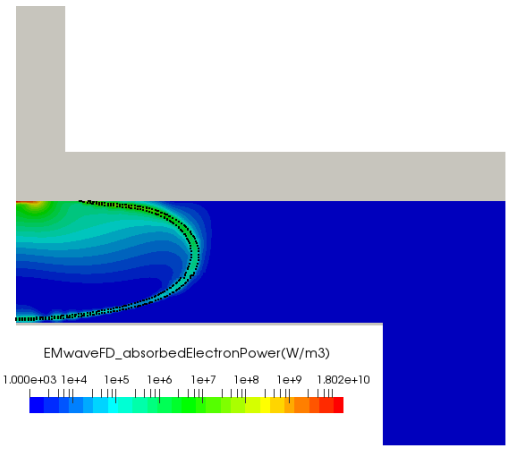

Fig. 5. EM Wave Power Absorbed by Electrons in a microwave Plasma Reactor.

For more information, please contact us:

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