FETD (Finite Element Time Domain) Engine for OmniSim

With this new addition to OmniSim and CrystalWave, Photon Design offers **the world's first integrated FDTD and FETD simulation suite**.

You can now **choose** the most **efficient** calculation method for your structure, and you can also to model your design with two independent engines - **ideal to check the accuracy** of your simulations!

The world's first integrated FDTD and FETD simulation suite

Finite element time domain (FETD) simulations are an alternative to the popular finite difference time domain (FDTD) method. Incorporating new state-of-the-art techniques, Photon Design presents an efficient, fully-functional FETD calculation engine, which will **complement FDTD** for simulations of photonic devices.
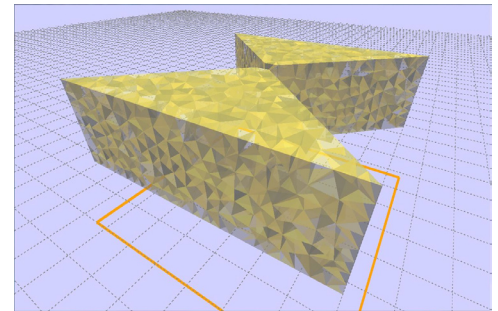
This new engine is designed to **address some of the specific shortcomings of FDTD**, in particular for **metallic structures** and **plasmonic devices** for which FDTD can be very slow. In these areas, it delivers major steps forward in terms of capability and efficiency.

Features

☑ **Finite element time domain** calculation engine based on a new super-efficient method - **much faster than conventional finite element** time domain methods!

☑ **Finite element orders** from 1 to 5, allowing large efficient elements.

☑ **2D and 3D** versions.

☑ Automatic conformal tetrahedral (3D) or triangular (2D) meshing: **no staircasing or averaging of surfaces**.

☑ PML, PEC and PMC boundary conditions (periodic soon).

☑ **Dispersive material** handling by Drude model (Lorentz model coming soon).

☑ Full **multi-core** processor and **64-bit support.**

☑ **Variable mesh refinement** according to local refractive index – automatically uses a finer mesh where required.

☑ **Integrated with OmniSim and CrystalWave**'s user interface.

☑ Plane wave, Gaussian, waveguide-mode and dipole electromagnetic sources.

☑ A variety of sensors for measuring spatial, time-evolving and spectral responses.

☑ Intuitive **real-time field visualization** during simulations.
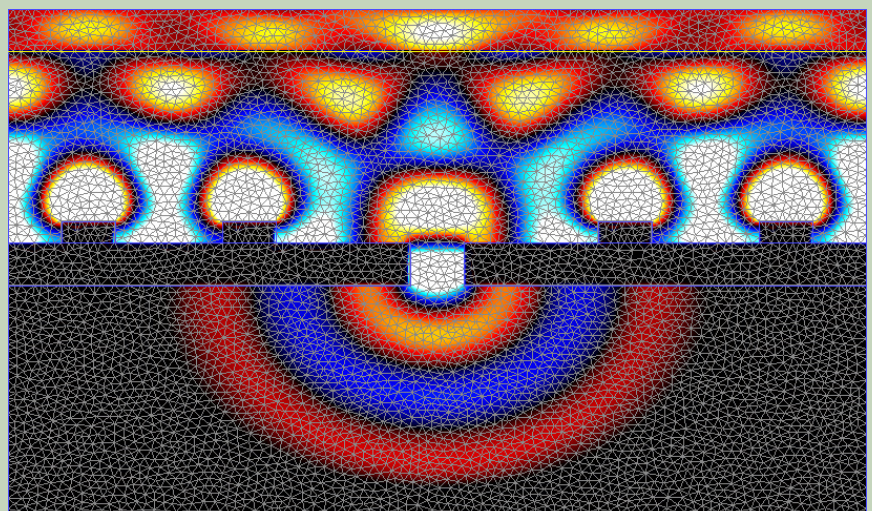
Modelling plasmonics: a metal grating used as a light harvester simulated with OmniSim's FETD engine.