OptiFDTD

What's New in 8.1

Created to address the needs of research scientists, professors, and students, OptiFDTD satisfies the demand of users who are searching for a powerful and flexible Finite-Difference Time-Domain simulation design suite.

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What's new in OptiFDTD 8.1 (April 2009)

Three-Dimensional Layout Designer

The OptiFDTD design experience is now enhanced with a full three-dimensional layout designer. Rotate, move, and view your structures in a versatile 3D environment with zoom in/out capabilities from any angle or position. Users no longer have to rely on the analysis of two-dimensional cross-sections to deduct spatial shape.

Multiprocessor Support for 2D Simulations

We have improved our 64-bit 2D simulators with added support for multi-processor (multi-core) systems. This feature will speed up the simulation of large projects.

Notes on performance of 64-bit 2D Simulator on multi-processor (multi-core) systems

The performance of the 64-bit 2D Simulator has been dramatically improved due to its support for parallel processing on multi-processor (multi-core) systems. In our tests, the performance has been almost linearly proportional to the number of processors (processor cores) installed on the computer.

In order to achieve the highest performance (speed) of the simulation, it is recommended that no other applications are running while the simulation is in progress:

The calculations are performed on all available processors in so called true-parallel algorithm. As a result the overall performance (speed) of the simulations depends on the processing speed of the slowest processor, since all other processors have to wait until the last processor completes its simulation sequence.

Anisotropic 3D Mode Solver

OptiFDTD 8.1 features a powerful anisotropic 3D Mode Solver included with the modal analysis toolset. The anisotropic mode solver provides a more accurate simulation and analysis of high-contrast material structures.

User Defined Waveguide Profiles

This feature allows the user to define a custom pattern of the material distribution within the Waveguide Profile cross-section. Using simple parser functions, or their DLL equivalents, the user may design cross-sectional patterns of great complexity.

Such defined cross-sections may be easily parameterized with usage of custom defined parameters. The designed cross-sections behave the same way as the built-in Fiber Profiles – they automatically scale to match the waveguide width, can be placed on an arbitrary depth, associated with any waveguide and may use any material.

This feature gives the user additional degree of flexibility when designing specialty shapes or cross-sections, which cannot be easily created using the previously available constructs.

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See also our *Optiwave Community Forum* portal (http://forum.optiwave.us/) for new additions. You can download a number of advanced examples and VB Script usage.

System requirements

OptiFDTD requires the following system configuration:

- Microsoft Windows 2000/XP/Vista 32-bit or 64-bit

  Note:

  In order to utilize 64-bit simulators a 64-bit Windows operating system is required. The menu options related to 64-bit simulations are disabled when the software is installed under a 32-bit operating system.

  A 64-bit operating system is required as well when planning to use of the multi-processor (or multi-core) supported calculations, since this support has been implemented in 64-bit simulators.

- Personal computer with a minimum Pentium Processor 1GHz.

  A higher clock and/or multi-core processor are recommended, since FDTD algorithms are highly CPU intensive and simulations take long time to complete.

  For 64-bit operating systems, Intel or AMD processors supporting EM64T architecture are required (processors providing hardware support for 32-bit and 64-bit applications). For example Intel's Core 2 based processors.

- Minimum 1 GB of RAM

  The FDTD algorithms require high volumes of RAM. A higher RAM amounts are recommended:

  - 3-4GB of RAM under 32-bit operating systems
  - Over 4GB of RAM for 64-bit operating system. The practical determination of how much RAM would be required depends on the dimensions of the simulated problems and computer's CPU power. For larger problems, the 8-16GB (or more) of RAM is suitable, especially when accompanied by fast multi-core CPU's.

- Minimum 5-10 GB of free hard disk space

  This requirement depends on the simulated problems. However, in most of the cases simulations generate high volumes of the simulation results. Much higher amounts of hard disk space is recommended to accommodate for the storage space needs. Availability of a fast-access hard disk will speed up the simulations as well.

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