OptiOmega 2.0 Release Notes

IMPORTANT – PLEASE READ ME

Windows Installation Notes:

- Installer requires administrator privileges. The software can be run as a regular user.
- After the installation, documentation can be found at,

  C:\Program Files\Optiwave Software\OptiOmega 2\documentation\index.html

- Python and all the required libraries are installed under

  C:\Users\user_name\OptiOmega2Python3.12.7

Linux Installation Notes:

- Installer requires administrator privileges. The software can be run as a regular user.
- For Ubuntu 22.04, 24.04, and Rocky Linux 9.7, please run the installation scripts using the commands in the following order,

  - sudo bash install_dependencies.sh
  - sudo bash install_licensing_drivers.sh
  - bash install install_optiomega.sh

- After the installation, documentation can be found at,

  $USER_HOME/Optiwave/OptiOmega2/documentation/index.html

- Python and all the required libraries are installed under,

  $USER_HOME/Optiwave/OptiOmega2.

Minimum Hardware and Software Requirements:

OptiOmega requires the following minimum/recommended system configuration:

- Operating Systems: Windows 11 or a recent version of Linux compatible with Python 3.12.
- Graphics Card: NVIDIA Graphics card with at least Cuda 12.0 support. A minimum 16 GB of GPU RAM is recommended. AMD graphics cards are not supported.
- Please make sure CUDA 12 drivers are installed before running OptiOmega

Application Execution

- OptiOmega is compatible with Python capable IDE's. Microsoft VSCode is recommended.

OptiOmega 2.0 Features

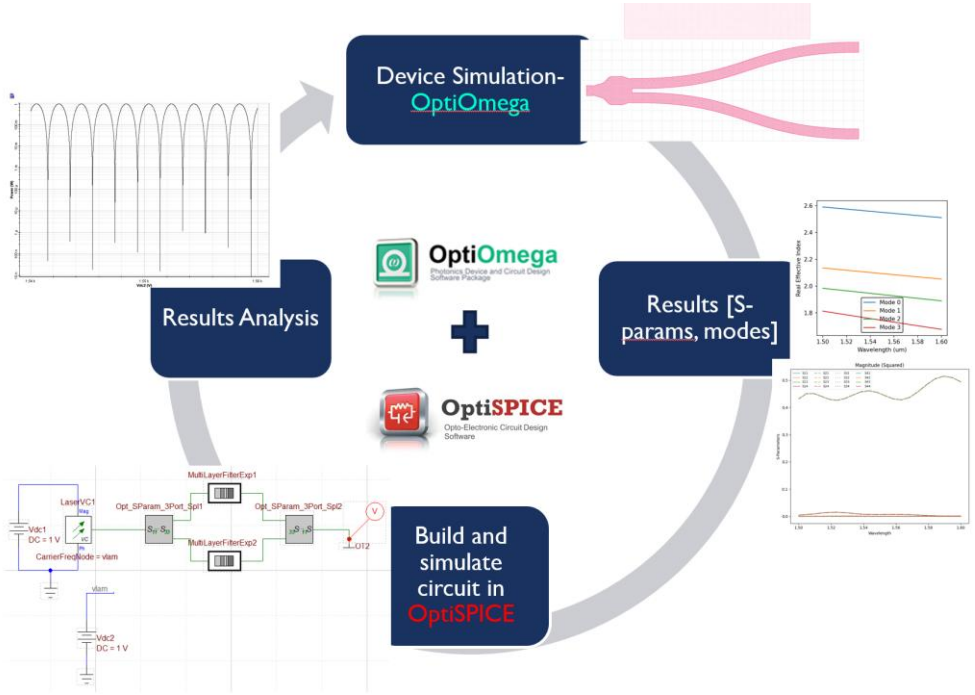
A new finite element frequency domain simulation engine supporting Python scripting is introduced. FDTD engine is enhanced with CPU fallback capability. The capability to find bend modes is added to the Mode Solver combined with PML boundary support. Documentation and the application examples are updated to show newly added features.

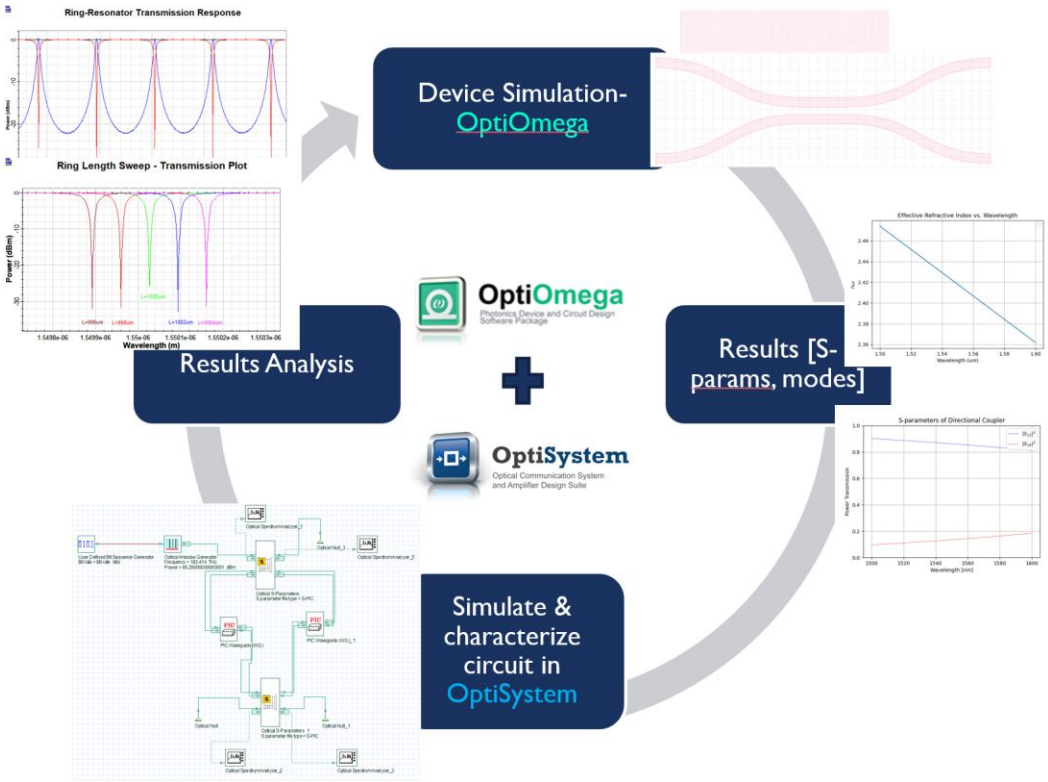
FEFD: This solver implements the Finite-Element Frequency-Domain (FEFD) method for solving Maxwell's equations in 2D space and frequency domain, specifically optimized for the simulation of integrated photonic devices.

It supports **linear, isotropic, dispersive** materials and provides advanced features tailored to photonic circuit design, such as **automatic mode injection**, **port detection**, and **S-parameter extraction**

- **Frequency-domain Maxwell solver** using triangular discretization in 2D space.
- **Perfectly Matched Layer (PML)** boundary conditions for accurate open-region simulations.
- **GDSII Import**: Reads standard GDSII layout files to define device geometry.
- **Automatic Matching Mesh Generation**: Automatically generates a triangular mesh that precisely matches the passed geometry.
- **First and Second Order Element** Support: Choose between linear and quadratic elements for improved accuracy.
- **2D and 2.5D simulation**: Simulate 2D geometries and collapse 3D ones into 2D with acceptable accuracy.
- **Port Identification & Mode Matching**: - Automatic port detection and classification. - Single-mode excitation using computed eigenmodes. - Mode solver integration for accurate injection and extraction.
- **S-Parameter Computation**: - Computes scattering parameters (S-matrix) from frequency-domain data. - Automatically exports results in standard. snp format.
- **HDF5 Output**: - All simulation data, field snapshots, and metadata are stored in *.h5* format for efficient post-processing.

Software interworking with OptiSPICE and OptiSystem and other PIC simulation tools with S-Parameter and effective index compact model data files is also supported with the new FEFD engine.





Examples Library

Windows examples library can be found under,

C:\Users\user_name\Documents\OptiOmega 2.0 Samples

Linux examples library can be found under,

$USER_HOME/Optiwave/OptiOmega2/examples