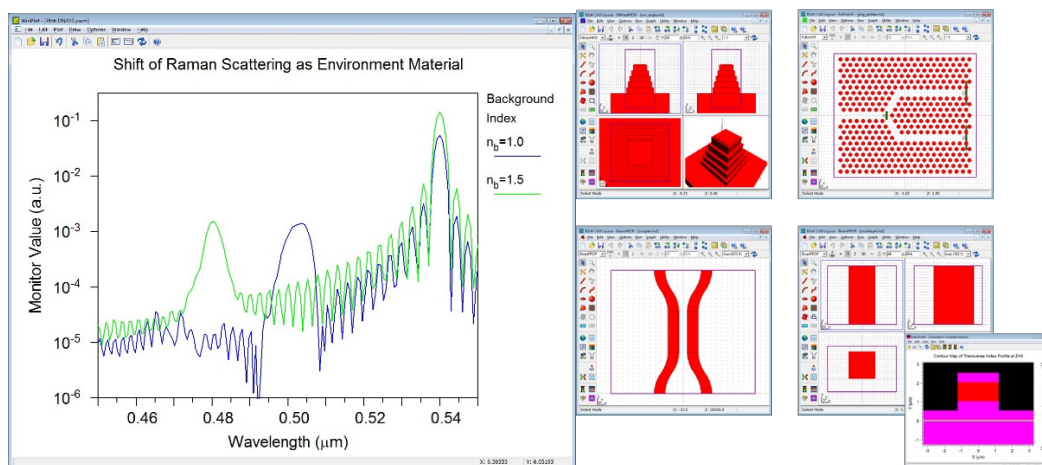


RSoft Photonic Device Tools

Overview

The **RSoft Photonic Device Tools** provide the industry's widest portfolio of simulators and optimizers for passive and active photonic and optoelectronic devices, including DFB lasers and VCSELs. RSoft Photonic Device Tools integrate with Keysight optical design software to enable streamlined multi-domain workflows that connect photonic device simulation with optical system analysis. Interoperability with **CODE V** and **LightTools** supports rigorous modeling of diffractive optics, nano-structured surfaces, optical coupling, and system-level optical performance.



Features at a Glance

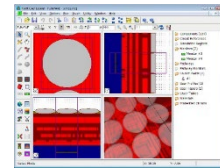
- Rapid virtual prototyping of passive and active photonic devices
- Discovery of new products with "what if" product scenarios
- Common CAD interface for all passive device tools
- Automatic scanning and parameter optimization
- Scripting in any programming language

Key Features

- Highly accurate algorithms allow for rapid virtual prototyping reducing the need for costly and lengthy physical prototyping increasing productivity and decreasing time-to-market.
- Assists in the discovery of new products by creating "what if" product scenarios.
- Each algorithm engine shares a common **CAD interface**; the software can utilize multiple RSoft packages without having to import designs from one software to the next.
- Scripting can be done with any programming language.
- Includes automated parameter scanning and optimization via **RSoft MOST**.
- Each simulation engine is licensed and sold separately, allowing users to choose only those that are suitable to their work.

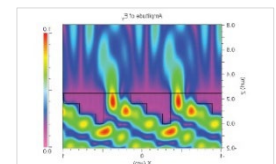
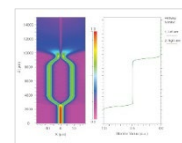
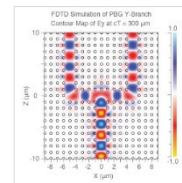
RSoft Photonic Device Tools

- **RSoft CAD Environment**: The RSoft CAD Environment is the core program of the RSoft Passive Device Suite and allows researchers and engineers to layout the physical structure of photonic devices.

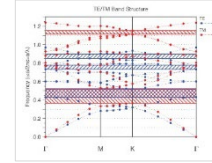


Passive Device Tools

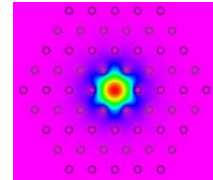
- **FullWAVE FDTD**: This most rigorous numerical simulation tool is based on the Finite-Difference Time-Domain (FDTD) method for studying the propagation of light in a wide variety of photonic structures.
- **BeamPROP BPM**: The unique tool based on the highly efficient Beam Propagation Method (BPM) for the design and simulation of integrated and fiber-optic waveguide devices and circuits.
- **DiffractionMOD RCWA**: This design and simulation tool is ideal for diffractive optical structures such as diffractive optical elements, subwavelength periodic structures, and photonic bandgap crystals.



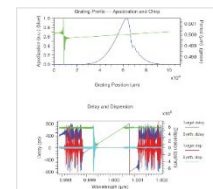
- **BandSOLVE PWE:** This tool is based on the Plane Wave Expansion (PWE) algorithm and is the first commercially available design tool to automate and simplify the modeling and calculation of photonic band structures for all photonic crystal devices.



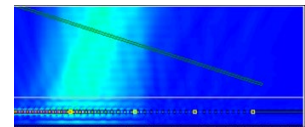
- **FemSIM FEM:** This generalized mode solver is based on the Finite Element Method (FEM) and can be used to calculate any number of transverse or cavity modes of an arbitrary structure on non-uniform mesh.



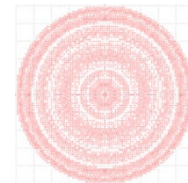
- **GratingMOD CMT:** This general design tool based on Coupled Mode Theory (CMT) can be used to analyze and synthesize complicated grating profiles in optical fibers and integrated waveguide circuits for a wide variety of photonic applications.



- **ModePROP EME:** This Eigenmode Expansion Propagation (EME) tool can be used to account for both forward and backward propagation and radiation modes. It provides a rigorous steady-state solution to Maxwell's equations that is based on the highly-stable Modal Transmission Line Theory. A full array of analysis and simulation features make this tool flexible and easy to use.

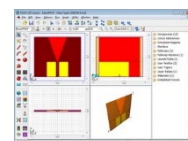
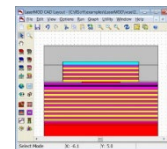


- **MetaOptic Designer:** MetaOptic Designer inversely designs metalenses and metasurfaces for optimal design performance. Designers at all levels of expertise can create novel metalens designs quickly and easily.



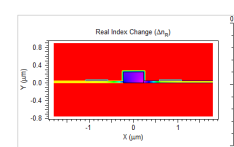
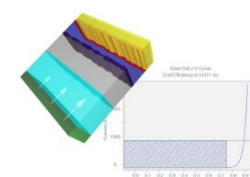
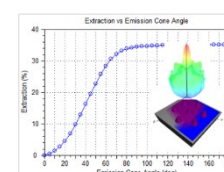
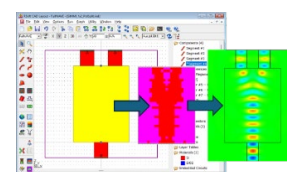
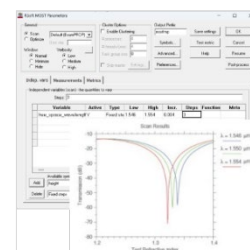
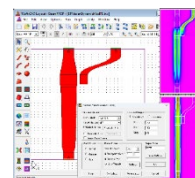
Active Device Tools

- **LaserMOD:** This tool is designed to simulate the optical, electronic, and thermal properties of semiconductor lasers and similar active devices.
- **Tapered Laser Utility:** This utility provides an efficient and accurate design tool for analyzing and optimizing tapered semiconductor laser diodes.



Other Options & Utilities

- Photonic Device Compiler:** A bundle of device tools to create foundry-specific building blocks and augment existing PDKs with custom photonic components. Automate the generation of symbols, analytical models, and parametric layouts for PIC design, simulation, layout, and verification.
- MOST:** The Multi-Variable Optimization and Scanning Tool (MOST), is an exciting solution to the critical problem of design optimization for photonic devices. During the research or design cycle, it is crucial to understand the full parameter space of the system. Acting as an automated driver for the RSoft physics-based simulators, MOST takes the drudgery out of these important operations by streamlining the definition, calculation, and analysis of scans and optimizations. If you own multiple RSoft product.
- Topology Optimizer:** A freeform inverse design utility integrated into the RSoft CAD Environment that uses FullWAVE FDTD solvers to generate photonic structures directly from performance targets. Built-in binarization and Design Rule Checking (DRC) help ensure manufacturable designs by enforcing fabrication constraints.
- LED Utility:** Use this tool to accurately simulate next generation LED structures and all materials involved in their design. This utility simplifies common tasks and assists in the rigorous computation of extraction ratios and radiation patterns.
- Solar Cell Utility:** This utility provides an optical and electronic simulation solution for solar cell devices. Use this utility to aid in the computation of J-V curves, quantum efficiency spectra, and overall cell efficiency.
- Multi-Physics Utility:** This utility can be used in conjunction with any of the RSoft passive device simulation tools. It provides a convenient interface for including disturbances of the refractive index profile of a structure in a simulation.

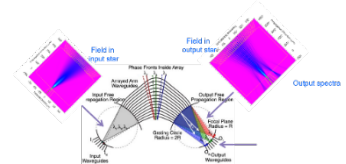


- **BSDF Generation Utility:** This utility automates generation of Bi-directional Scattering Distribution Function (BSDF) of a periodic structure by scanning wavelength and incident angles, as well as design variables. The generated BSDF file can be used in system tools, such as MetaOptic Designer, LightTools, and CODE V.



- **Custom PDK Generation Utility:** This utility automates generation of custom PDK following foundry design rule. The generated PDKs, including both device performance and layout, can be exported to a Photonic Integrated Circuit (PIC) design tool, such as ADS Photonic Designer and the designed PICs can be sent to a chosen foundry to fabricate.

- **AWG Utility:** This utility automates the design and simulation of Arrayed Waveguide Grating (AWG) for Wavelength Division Multiplexer (WDM). User simply provides channel number, channel spacing and material platform, this utility will create device layout automatically and provides simulation results.



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