

BeamPROP

BeamPROP is the industry-leading design tool based on the Beam Propagation Method (BPM) for the design and simulation of integrated and fiber-optic waveguide devices and circuits. The software has been commercially available since 1994, and is in use by leading researchers and development engineers in both university and industrial environments worldwide.

Benefits

- ⇔⇔ Industry-proven BPM algorithm for fast and accurate device design
- ⇔⇔ Built-in advanced Arrayed Waveguide Grating (AWG) utility for simplifying router and demultiplexer design
- ⇔⇔ Advanced capabilities allow for the simulation of complicated devices
- ⇔⇔ Fully integrated into the RSoft CAD Environment (page 5)

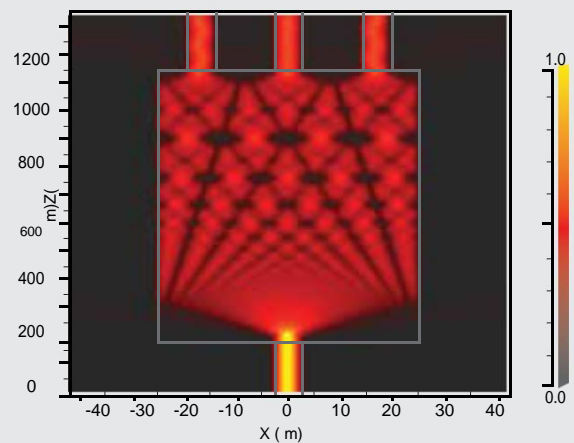
Applications

BeamPROP has applications in a wide range of integrated and fiber-optic devices including, but not limited to:

- ⇔⇔ WDM devices such as AWG routers
- ⇔⇔ Switches, such as directional coupler-based or digital-y type
- ⇔⇔ Modulators, such as Mach-Zehnder type
- ⇔⇔ Multimode interference devices
- ⇔⇔ Passive 1 x N or N x N splitters
- ⇔⇔ Laser-structure transverse mode analysis
- ⇔⇔ Standard and specialty fiber design
- ⇔⇔ Gratings
- ⇔⇔ Sensor structures

Featured Application

BeamPROP simulation of a 1 x 3 MMI device. The length of the MMI was optimized so that the three output waveguides contained equal power.



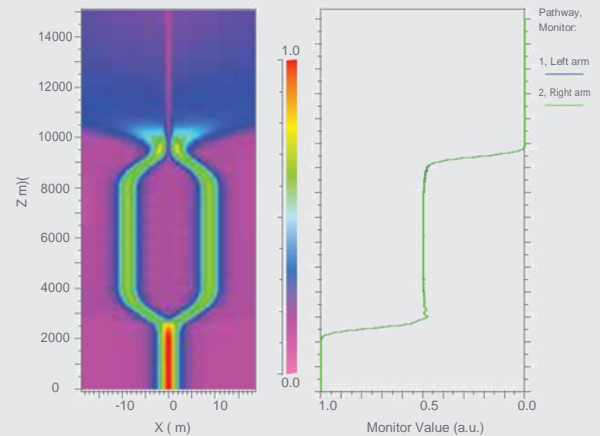
Features

- ↔↔ Superior, robust and efficient results via an implementation of the Beam Propagation Method (BPM) based on an implicit finite-difference scheme
- ↔↔ 2D and 3D simulation capabilities
- ↔↔ Increased performance through multi-threading on computers with multiple cores/CPU's
- ↔↔ Non-uniform mesh
- ↔↔ Anisotropic and non-linear materials
- ↔↔ Fully integrated with Multi-Physics Utility (page 30)
- ↔↔ Polarization effects and coupling via a full-vectorial

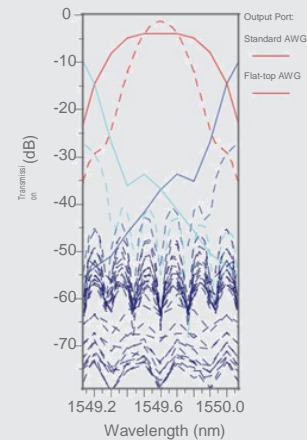
BPM

implementation

- ↔↔ Wide-angle propagation can be improved by multistep Padé approximation techniques, a dynamic reference wave number, and conformal index mapping of bends to allow for accurate and efficient off-axis propagation
- ↔↔ Several boundary condition types including PML ↔↔ Bidirectional BPM formulation for considering reflection along the propagation direction to be considered
- ↔↔ Two BPM-based mode-solvers for the computation of modal propagation constants and profiles for both guided and radiation modes for 2D and 3D geometries
- ↔↔ Comprehensive measurement tools to compute fields, power distribution, loss, etc.
- ↔↔ Automated parametric studies and design optimization using MOST (page 24)



BeamPROP simulation of a Mach-Zehnder modulator operating completely out of phase. The power in each arm is shown on the right



BeamPROP simulation of a flat-top AWG. The taper on the input port was designed to produce the flat-top response shown. The standard AWG output is also shown as reference

