BeamPROP

COMPONENT DESIGN
Passive Device

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

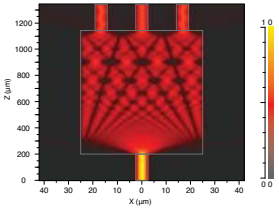
- Industry-proven BPM algorithm for fast and accurate device design.
- Built-in advanced AWG utility for simplifying router and demultiplexer design.
- Advanced capabilities allow for the simulation of complicated devices.
- Fully integrated into the RSoft CAD Environment *(Page 6)*.

Applications

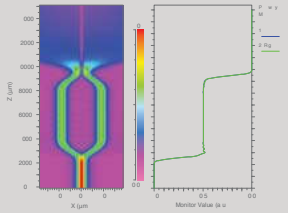
BeamPROP has applications in a wide range of integrated and fiber-optic devices including, but not limited to:

- WDM devices such as arrayed waveguide grating (AWG) routers
- Switches, e.g. directional coupler-based or digital-y type
- Modulators, e.g. 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

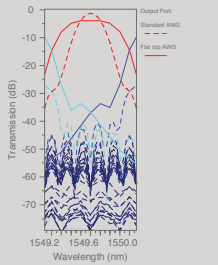
Featured *Application*



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.



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 at-top AWG. The taper on the input port was designed to produce the at-top response shown. The standard AWG output is also shown as reference.

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.
- Non-uniform mesh.
- Anisotropic and non-linear materials.
- Fully intergrated with Multi-Physics Utility *(Page 28)*.
- Polarization effects and coupling via a full-vectorial BPM implementation.
- techniques, a variable reference wave number, and conformal index mapping of bends to allow for accurate and efficient off-axis propagation.
- 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)*.

SEE **PAGE 41** FOR SYSTEM REQUIREMENTS