GratingMOD

COMPONENT DESIGN
Passive Device

GratingMOD is a general design tool for analyzing and synthesizing complicated grating profiles in optical fibers and integrated waveguide circuits for a wide variety of photonic applications. The software is based on the Coupled Mode Theory (CMT) algorithm for fast simulation as well as sophisticated multiple mode algorithms for advanced applications. GratingMOD also provides a general platform for simulation of various coupling mechanisms.

Benefits

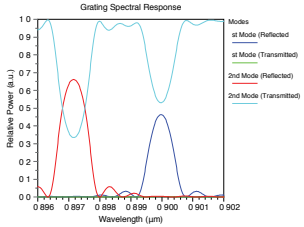
- Incorporates advanced algorithms to improve its robustness, efficiency, and user-friendliness
- Fully integrated into the RSoft CAD Environment *(Page 6)*.

Applications

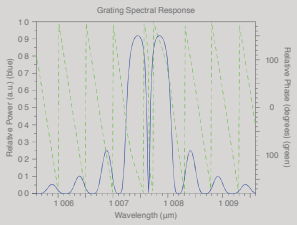
GratingMOD can handle various grating structures for both fiber and integrated waveguides. It has applications to a wide range of integrated and fiber-optic devices including, but not limited to:

- Dispersion compensation Fiber Bragg Grating
- Multiplexing/Demultiplexing
- Add/Drop filtering
- Gain equalization in optical amplifiers
- Grating assisted couplers
- Long period grating sensors

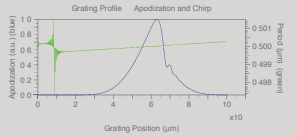
Featured *Application*

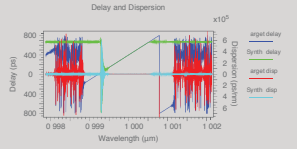


Results for multimode simulation of a grating assisted coupler. Spectra are shown for both forward & backward propagation for both modes in the structure.



Simulation results showing the phase and amplitude.





Synthesis results of a grating with constant dispersion compensation.

FEATURES

- Bragg condition searching to find both the period from the specified modes and the modes from a specified period.
- Sophisticated orthogonality relations for both lossless and lossy waveguide are included.
- Optimal modes are used to reduce error.
- Analytical mode calculations can be used when applicable.
- An arbitrary number of gratings at arbitrary positions in both 2D and 3D structures can be used to study coupling mechanisms. Coupling mechanism includes fiber core coupling, fiber core to cladding coupling, long period fibers, as well as side coupling and vertical coupling for integrated circuits.
- Multi-mode grating systems can be analyzed via a multi-mode CMT implementation.
- An advanced synthesis tool utilizes a state-of-the-art synthesis technique to solve the 'inverse' problem.
- Both waveguide and material dispersion can be included.
- Transmitted and reflected spectra for each mode can be determined.
- Calculation of phase, dispersion, and time delay.
- Generation of mode, apodization, chirp, and grating profiles.
- Automated calculation of band width for primary order reflection.
- Spectrum analysis and Bragg condition analysis.

SEE **PAGE 41** FOR SYSTEM REQUIREMENTS