

Grating Assisted Coupler

Designing and simulating a grating assisted coupler

Introduction

Tool used: GratingMOD

Grating assisted couplers are widely used in many areas of photonics, such as filters, optical switches, and wavelength division multiplexing (WDM) systems. They also serve as feedback mirrors for several laser types. This example is based on discussions by N. Izhaky et. al. [1], and uses computer-aided design (CAD) software and GratingMOD, a design tool that simulates various coupling mechanisms.

Creating the Structure

The coupler used in this example consists of three sections: two waveguides separated by an index-modulated grating. This structure is shown in the CAD of Figure 1.

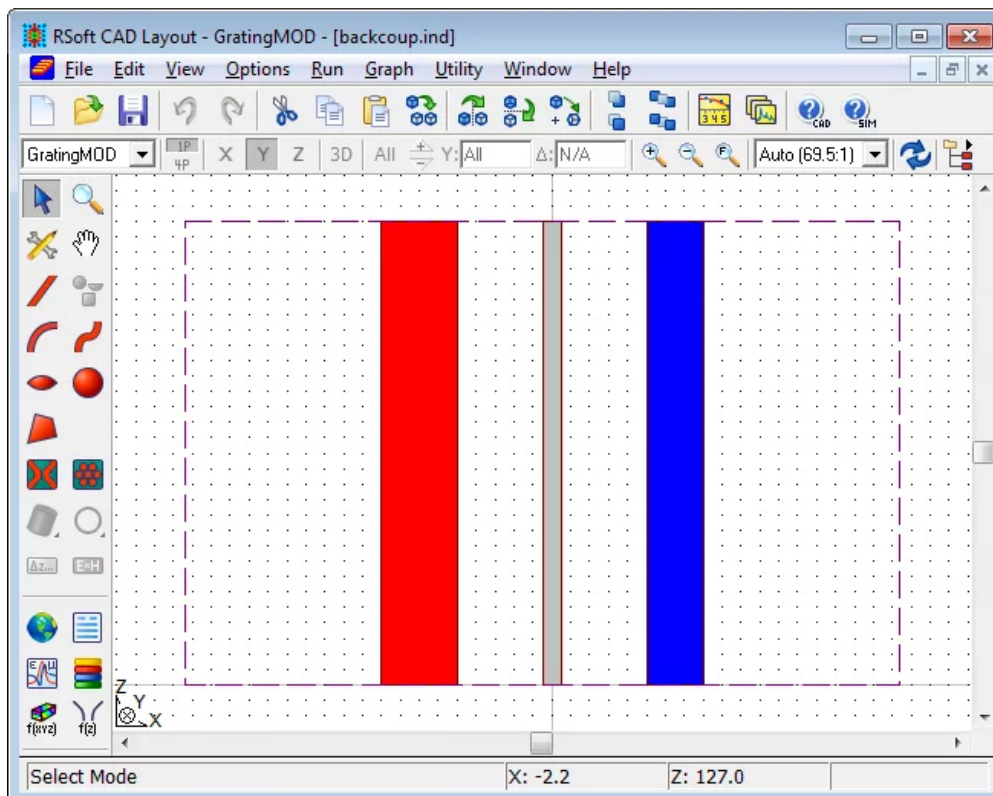


Figure 1. The structure as it appears in RSoft CAD

Simulation Results

This simulation computes the modes of both waveguides and uses them for analysis. The computed spectral response for this structure is shown in Figure 2.

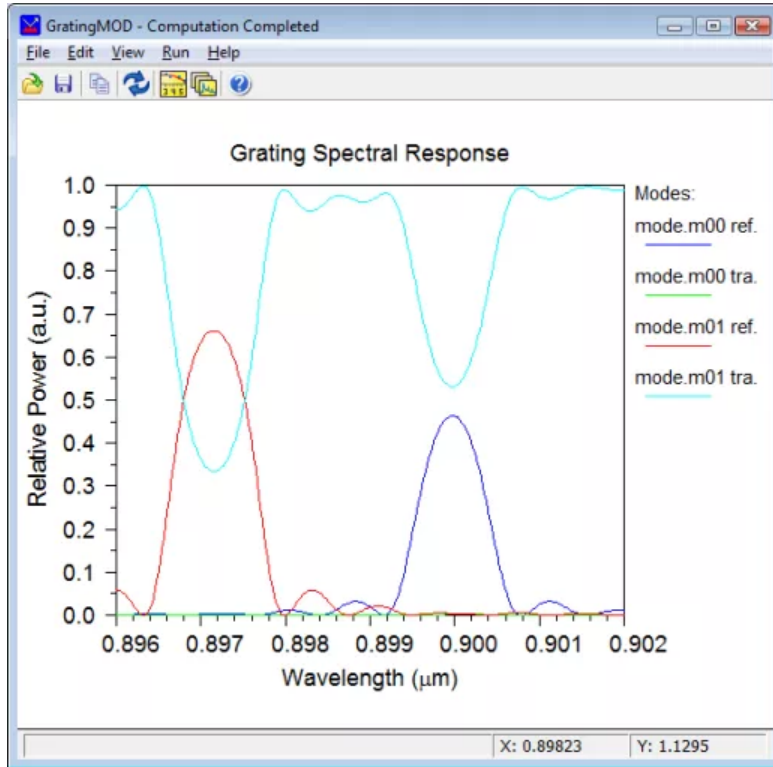


Figure 2. The simulation is produced with GratingMOD software, which is fully integrated into the RSoft CAD Environment

This result shows both the forward and backward reflection spectrum for the modes in both waveguides.

References

- [1] N. Izhaky and A. Hardy, Analysis of grating-assisted backward coupling employing the unified coupled-mode formalism, J. Opt. Soc. Am., 16, 1303 (1999).