SYNOPSYS®
Silicon to Software™

RSoft Application: Reconfigurable Optical Add/Drop Multiplexer (ROADM)

Technology Selection for Efficient Traffic Management in Agile Optical Networks

Overview

A leading North American ROADM manufacturer wanted to demonstrate to a network operator that installing multiple ROADMs would boost network performance and meet dynamic network demands.

The Challenge

ROADM is a complex optical network element made up of a number of electrical, optical and photonic components using a wide array of technologies (Figure 1). Detailed physical models of ROADM components may not be available, making ROADM technology selection and deployment testing a challenge. The RSoft™ Photonic Component Design Suite and OptSim™ provide ROADM component design, optimization and simulation capabilities to meet this challenge.
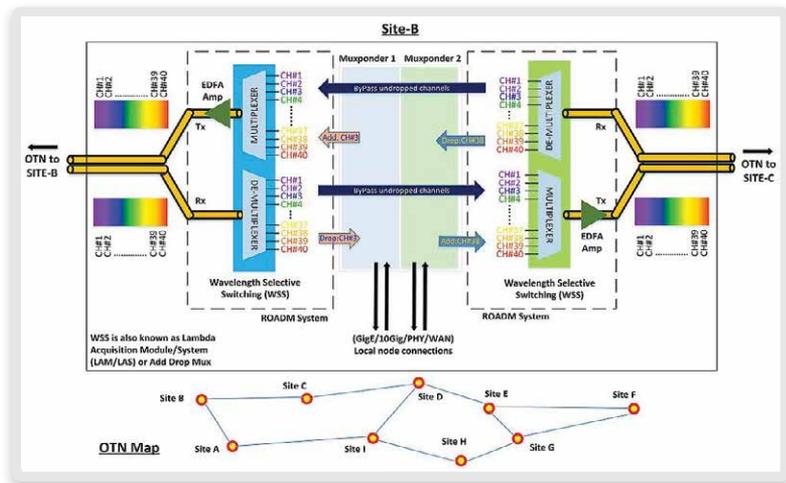

Figure 1. Functional details of a ROADM at an optical transport network (OTN) node

The Solution

The RSoft device modeling tools in the Photonic Component Design Suite can be used to design and optimize ROADM device characteristics. In OptSim, users can load measured ROADM characteristics (such as a transfer function, Figure 2) and verify specification compliance using system-level modeling and analysis capabilities.
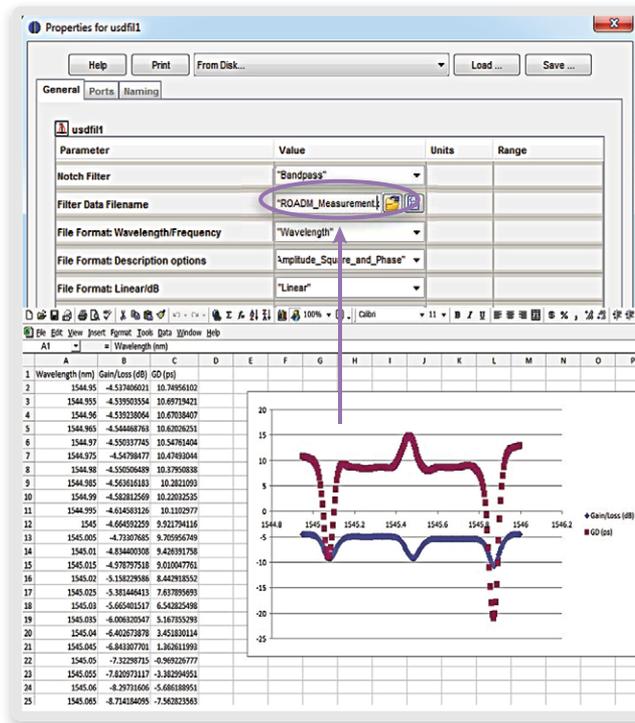
Figure 2. Using ROADM measurement data (lower) to model it in OptSim (upper)

The Result

OptSim analysis of the optical network with multiple ROADMs yielded the following results:

▸ Spectral response for multi-stage ROADM showed bandwidth narrowing and crosstalk that were within compliance specifications

▸ Corresponding impact on performance was estimated from bit-error-rate plots

▸ Analysis helped select the right ROADM technology for network deployment

For more information, please contact Synopsys' Optical Solutions Group at (626) 795-9101, visit http://optics.synopsys.com/rsoft/, or send an e-mail to rsoft_sales@synopsys.com.