



## **RSOFT Design Group's LaserMOD 1.1 Simulates The Performance Of Semiconductor Lasers, Partnership With NLCS Incorporates Advanced Gain Modeling**

*RSOFT Is First To Widely Introduce Nonlinear Control Strategies' Advanced Gain Modeling Approach For Semiconductor Quantum Well Structures To The Market*

**March 26, 2003 — Atlanta, GA** — RSOFT Design Group, Inc. (<http://www.rsoftdesign.com>) today announced *LaserMOD*<sup>™</sup> 1.1, a photonic device design tool for simulating the performance of semiconductor lasers. RSOFT also announced a partnership with Nonlinear Control Strategies (NLCS, <http://www.nlcstr.com>) to introduce advanced modeling of gain, carrier induced change of the refractive index, and spontaneous emission to *LaserMOD*. Combined with the rigorous transport models of *Minilase II* from the University of Illinois, upon which *LaserMOD* is based, and the family of passive device design tools from RSOFT, *LaserMOD* 1.1 provides a powerful and user-friendly solution for active component simulation.

As key components in optical telecommunication systems, semiconductor lasers continually have demands for improvements in power dissipation, bandwidth, tunability, temperature stability, and noise figure placed upon them. Many complex physical processes occur in lasers that govern their performance, and sophisticated simulation tools are required to allow designers to bring their devices to market in a timely fashion. Currently, *LaserMOD* focuses on Fabry-Perot and DBR type edge-emitting lasers in multiple dimensions. Future releases of the tool will address VCSELs, DFBs and SOAs, as well as other device geometries. The *LaserMOD* package includes advanced gain calculations, mode solvers, a bias point driven simulation engine, an extended set of carrier transport and recombination models, a nonuniform mesh generator, material libraries, plot generation and visualization utilities, and online documentation, all integrated under a single, user-friendly, parametric graphical CAD interface.

*LaserMOD*'s separate treatment of bound and continuum quantum well states allows for the modeling of the carrier capture process and enables users to accurately simulate device characteristics, such as the frequency response. The internal mode solvers are augmented through the integration of other tools from RSOFT, such as *BeamPROP*<sup>™</sup> and *FullWAVE*<sup>™</sup>. Effects such as transverse and longitudinal mode competition, as well as carrier-dependent index variation are accounted for. *LaserMOD*'s advanced transport and gain models are solved self-consistently with the optical problem, to predict both steady-state and transient device performance. *LaserMOD* — along with the other Component Design products from RSOFT — provide a unique solution for both active and passive device design.

RSoft's partnership with NLCS enhances *LaserMOD* by improving accuracy and predictive capability, while reducing calibration effort with advanced gain modeling. For the photonic device and circuit design process, this enables reduced time-to-market and decreased development cost. NLCS employs a quantum kinetic many-body theory developed at the University of Arizona, Tucson, and at the Philipps University in Marburg, Germany, which microscopically describes carrier-carrier and carrier-phonon scattering. The full treatment of particle interactions allows the detailed prediction of the material gain based solely on material parameters. In order to avoid the involved many-body gain calculation during run time, the gain, induced change of the refractive index, and the spontaneous emission are pre-computed by NLCS and stored as a library. *LaserMOD* Version 1.1 offers a jointly developed database system that interfaces with NLCS' gain spectra. Libraries such as the newly released InGaAs gain library will be distributed through RSoft.

*LaserMOD* 1.1 will be available next month and is being demonstrated at OFC 2003 in RSoft's booth, #2862. RSoft also invites OFC attendees to a demonstration and question and answer session on *LaserMOD* on Wednesday, March 26 at 11 AM in meeting room B315.

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**About RSoft Design Group, Inc.**

Offering a comprehensive suite of design and business analysis software solutions to the telecommunications and photonics industries, RSoft Design Group is the only company that provides a full range of simulation and planning software and services across the entire component to network-level hierarchy. The company's award-winning products are used by researchers, manufacturers, systems integrators, and service providers to address design challenges ranging from the physics of component design to the business implications of planning wired and wireless networks. RSoft Design Group, Inc. is a privately held corporation with software development offices in New York, New Jersey, Illinois and Silicon Valley, and global marketing operations in the Pacific Rim, Europe, and the Middle East. For more information, visit [www.rsoftdesign.com](http://www.rsoftdesign.com).

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