



Tunable Laser Diodes and Related Optical Sources

By Jens Buus, Markus-Christian Amann, Daniel J. Blumenthal

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The phenomenal growth in Internet traffic has led to a huge increase in demand for data transmission capacity on a worldwide level. As a result, wavelength division multiplexing (WDM) technology emerged, which makes it possible to transmit a large number of optical channels on a single optical fiber. An equally significant development occurred in optical networks, where switching and routing of signals takes place in the optical domain. This technology places special demands on the optical sources (lasers) used in the system. This text offers a description of the optical sources (equipment and devices) designed to meet these demands.

Sources for DWDM Systems is intended for the engineers and graduate students working on optical networks. There is currently a nearly explosive interest in optical networks and the components required for such networks, but there is presently no single work which covers the variety of optical sources which may be used. This book will cover a particular component, tunable lasers, which is the next "big thing" in DWDM.

The primary market are engineers developing tuneable lasers for optical networks, as well as graduate students enrolled in the optical engineering curriculum, especially: optical communication, semiconductor lasers, optical networks, and/or components for optical networks.

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Editorial Review

From the Back Cover

An essential introduction to the powerful new developments in optoelectronics

Tunable laser diodes, characterized by their unique ability to "tune in" to different wavelengths, thus significantly improving the efficiency of the switch, are rapidly becoming key components for advanced optical communication. Tunable Laser Diodes and Related Optical Sources, Second Edition is a much-needed single reference covering the range of optical networks and the components they require, with emphasis on tunable lasers. Written by respected experts in this groundbreaking technology, this resource covers fundamentals not only of tunable laser diodes, but also modern laser diodes in general, from theory to applications.

Highlights include:

- Basic properties of semiconductor lasers
- Essential properties for single-mode laser diodes
- Principles, design and practice of tunable laser diodes
- Optical components related to tunable lasers and non-semiconductor tunable lasers
- Application areas like optical communication, radar, environmental sensing, reflectometry, and circuit analysis

Designed for engineers developing tunable lasers for optical networks, as well as graduate students enrolled in the optical engineering curriculum, Tunable Laser Diodes and Related Optical Sources, Second Edition promises to be the definitive resource on this groundbreaking optoelectronics technology.

About the Author

JENS BUUS, PhD, is a fellow of the IEEE whose research has made numerous contributions to the understanding of the properties of semiconductor lasers and optical waveguides. He holds five patents and has written two earlier books. A popular speaker, Dr. Buus has presented tutorials and short courses at major conferences, including: ECOC, OFC, EFOC, and the IEEE International Semiconductor Laser Conference.

MARKUS-CHRISTIAN AMANN, PhD, is Professor of Electrical Engineering at the Walter Schottky Institute of the Technical University of Munich, Germany. In addition to over 200 publications, conference papers and book chapters, he is a frequent tutorial speaker and short-course presenter on semiconductor lasers, and has served on numerous conference committees such as CLEO, IEEE Semiconductor Laser Conference, IEEE LEOS annual meeting, ECIO and APOC. His present research areas are wavelength-tunable laser diodes, long-wavelength surface-emitting lasers, and microwave semiconductors.

DANIEL J. BLUMENTHAL, PhD, is Professor of Electrical Engineering at the University of California at Santa Barbara. In addition to being a Fellow of the IEEE/LEOS and member of the OSA, Professor Blumenthal is also an associate editor for IEEE Photonics Technology Letters and has served as associate and guest editor for several other IEEE publications. Along with publishing several hundred journal articles, conference presentations, magazine articles, and book chapters, he has served as chairman or on the organizing committees of numerous conferences, including OFC, ECOC, OSA Topical Meeting on Photonics in Switching and CLEO. Professor Blumenthal's current research areas include optical wavelength

conversion and regeneration, optical packet switching and photonic integration.

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