# Zemax Diode Collimator

15th Czech-Polish-Slovak Conference on Wave and Quantum Aspects of Contemporary Optics
Gradient Index, Miniature, and Diffractive Optical Systems
A Practical Guide to Handling Laser Diode Beams
Wavefront Shaping for Biomedical Imaging
OFC/NFOEC: Thursday, March 10, 2005
Optical Engineering
Realistic Ray Tracing, Second Edition
OPTICAL SYSTEM DESIGN
Digital Optical Measurement Techniques and Applications
Recent Advances in Computer Science and Information Engineering
Light-emitting Diodes
Optical Coherence Tomography and Its Non-medical Applications
Design, simulation, and construction of an illumination unit for non-contact dermatoscopy
High Power Diode Lasers
Introduction to Lens Design
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Laser Beam Shaping
Optical Refrigeration
Laser Focus World
Advances in Optical Data Storage Technology
Lasers & Optronics

Tailoring the Emission of Stripe-array Diode Lasers with External Cavities to Enable Nonlinear Frequency Conversion
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Adaptive Optics Progress
Optical Modeling and Performance Predictions
Handbook of Optoelectronic Device Modeling and Simulation



**KAYLEY**

**ELLISON**

15th Czech-Polish-Slovak Conference on Wave and Quantum Aspects of Contemporary Optics John

Wiley & Sons This book summarizes a five year research project, as well as subsequent results regarding high power diode laser systems and their application in materials processing. The text explores the entire chain of technology, from the semiconductor technology, through cooling mounting and assembly, beam shaping and system technology, to applications in the processing of such materials as metals and polymers. Includes theoretical models, a range of important parameters and practical tips. *Gradient Index, Miniature, and Diffractive Optical Systems* Cambridge University Press This book offers the reader a practical guide to the control and characterizati on of laser diode beams. Laser diodes are the most widely used lasers, accounting for 50% of the global laser market. Correct handling of laser diode beams is the key to the successful use of laser diodes, and this requires an in-depth understanding of their unique properties. Following a short introduction to the working principles of laser diodes, the book describes the basics of laser diode beams and beam propagation, including

Zemax modeling of a Gaussian beam propagating through a lens. The core of the book is concerned with laser diode beam manipulations: collimating and focusing, circularization and astigmatism correction, coupling into a single mode optical fiber, diffractive optics and beam shaping, and manipulation of multi transverse mode beams. The final chapter of the book covers beam characterization methods, describing the measurement of spatial and spectral properties, including wavelength and linewidth measurement techniques. The book is a significantly revised and expanded version of the title Laser Diode Beam Basics, Manipulations and Characterizations by the same author. New topics introduced in this volume include: laser diode types and working principles, non-paraxial Gaussian beam, Zemax modeling, numerical analysis of a laser diode beam, spectral property characterization methods, and power and energy characterization techniques. The book approaches the subject in a practical way with mathematical content kept to the minimum level required, making the book a convenient reference for laser diode

users. *A Practical Guide to Handling Laser Diode Beams* SPIE-International Society for Optical Engineering This book provides a comprehensive overview of the fundamental principles and applications of semiconductor diode laser arrays. All of the major types of arrays are discussed in detail, including coherent, incoherent, edge- and surface-emitting, horizontal- and vertical-cavity, individually addressed, lattice-matched and strained-layer systems. The initial chapters cover such topics as lasers, amplifiers, external-cavity control, theoretical modeling, and operational dynamics. Spatially incoherent arrays are then described in detail, and the uses of vertical-cavity surface emitter and edge-emitting arrays in parallel optical-signal processing and multi-channel optical recording are discussed. Researchers and graduate students in solid state physics and electrical engineering studying the properties and applications of such arrays will find this book invaluable. **Wavefront Shaping for Biomedical Imaging** Cambridge University Press This new resource explains the

principles and applications of today's digital optical measurement techniques. From start to finish, each chapter provides a concise introduction to the concepts and principles of digital optical metrology, followed by a detailed presentation of their applications. The development of all these topics, including their numerous methods, principles, and applications, has been illustrated using a large number of easy-to-understand figures. This book aims to not only help the reader identify the appropriate techniques in function of the measurement requirements, but also assess modern digital measurement systems. OFC/NFOEC: Thursday, March 10, 2005 Springer Publishes papers reporting on research and development in optical science and engineering and the practical applications of known optical science, engineering, and technology. **Optical Engineering** A K Peters, Ltd. Proceedings of SPIE present the original research papers presented at SPIE conferences and other high-quality conferences in the broad-ranging fields of optics and photonics. These books provide prompt access to the latest innovations in

research and technology in their respective fields. Proceedings of SPIE are among the most cited references in patent literature.

*Realistic Ray Tracing, Second Edition*

Springer

Proceedings of SPIE present the original research papers presented at SPIE conferences and other high-quality conferences in the broad-ranging fields of optics and photonics. These books provide prompt access to the latest innovations in research and technology in their respective fields. Proceedings of SPIE are among the most cited references in patent literature.

*OPTICAL SYSTEM DESIGN*

McGraw Hill Professional

For over four decades there has been continuous progress in adaptive optics technology, theory, and systems development. Recently there also has been an explosion of applications of adaptive optics throughout the fields of communications and medicine in addition to its original uses in astronomy and beam propagation. This volume is a compilation of research and tutorials from a variety of international authors with expertise in theory, engineering, and technology. Eight chapters include

discussion of retinal imaging, solar astronomy, wavefront-sensorless adaptive optics systems, liquid crystal wavefront correctors, membrane deformable mirrors, digital adaptive optics, optical vortices, and coupled anisoplanatism.

*Digital Optical Measurement Techniques and Applications* BoD – Books on Demand

Laser Beam Shaping: Theory and Techniques addresses the theory and practice of every important technique for lossless beam shaping. Complete with experimental results as well as guidance on when beam shaping is practical and when each technique is appropriate, the Second Edition is updated to reflect significant developments in the field. This authoritative text: Features new chapters on axicon light ring generation systems, laser-beam-splitting (fan-out) gratings, vortex beams, and microlens diffusers Describes the latest advances in beam profile measurement technology and laser beam shaping using diffractive diffusers Contains new material on wavelength dependence, channel integrators, geometrical optics, and optical software Laser Beam Shaping: Theory and Techniques,

Second Edition not only provides a working understanding of the fundamentals, but also offers insight into the potential application of laser-beam-profile shaping in laser system design.

*Recent Advances in Computer Science and Information Engineering*

CRC Press

This thirteenth volume in the PUILS series covers a broad range of topics from this interdisciplinary research field, focusing on atoms, molecules, and clusters interacting in intense laser field and high-order harmonics generation and their applications. The series delivers up-to-date reviews of progress in ultrafast intense laser science, the interdisciplinary research field spanning atomic and molecular physics, molecular science, and optical science, which has been stimulated by the developments in ultrafast laser technologies. Each volume compiles peer-reviewed articles authored by researchers at the forefront of each their own subfields of UILS. Typically, each chapter opens with an overview of the topics to be discussed, so that researchers unfamiliar to the subfield, as well as graduate students, can grasp the importance and attractions of the research

topic at hand; these are followed by reports of cutting-edge discoveries.

**Light-emitting Diodes**

Springer

Concentrating on the "nuts and bolts" of writing ray tracing programs, this new and revised edition emphasizes practical and implementation issues and takes the reader through all the details needed to write a modern rendering system. Most importantly, the book adds many C++ code segments, and adds new details to provide the reader with a better intuitive understanding of ray tracing algorithms.

**Optical Coherence Tomography and Its Non-medical Applications**

SPIE-International Society for Optical Engineering

In dieser Arbeit wird die Entwicklung und Charakterisierung eines Wellenfrontmesssystems für Gleitsichtbrillengläser beschrieben. Es ermöglicht eine quantitative Messung der Wellenfront bis zu 65 mm Durchmesser mit einer lateralen Auflösung von besser als die erforderlichen 1mm für die Inline-Qualitätskontrolle in der Produktion. Das realisierte Low-Cost System ist für Wellenfrontsteigungen mit einer sphärischen Abweichung von ± 2 Grad konzipiert und eröffnet eine flexible funktionale

Prüfung von optischen Systemen und Freiformoptiken.

**Design, simulation, and construction of an illumination unit for non-contact dermatoscopy** CRC Press This new edition details the important features of beam shaping and exposes the subtleties of the theory and techniques that are best demonstrated through proven applications. New chapters cover illumination light shaping in optical lithography; optical micro-manipulation of live mammalian cells through trapping, sorting, and transfection; and laser beam shaping through fiber optic beam delivery. The book discusses applications in lithography, laser printing, optical data storage, stable isotope separation, and spatially dispersive lasers. It also provides a history of the field and includes extensive references.

**High Power Diode Lasers** Springer This book introduces double-prism multi-mode scanning theory and technology, focusing on double Risley-prism, multi-mode scanning models, methods and key techniques applied in multi-mode optical scanning and target tracking fields. It is first book to systematically and

comprehensively describe basic multi-mode scanning theory and practical implementation techniques utilizing double Risley prisms. It includes rigorous modeling of double Risley-prism multi-mode scanning systems and high-efficiency solution algorithms for inverse problems with abundant illustrative examples and scanning error analyses, along with design guidance and performance test on specific scanning devices. Further, it presents the latest research results for forward scanning models and inverse tracking algorithms, sub-microradian fine scanning modeling with tilting double Risley prisms, nonlinear control strategy for double prism motion, calibration and experiment techniques for various double-prism layouts, as well as opto-mechanical system design and analysis. Featuring rigorous theoretical derivations illustrated with corresponding examples and original scanning apparatus, the book is a valuable reference resource for those developing and applying multi-mode scanning techniques in photoelectric scanning and tracking areas.

Introduction to Lens Design Springer Starting from the basics of semiconductor lasers with emphasis on the generation of high optical output power the reader is introduced in a tutorial way to all key technologies required to fabricate high-power diode-laser sources. Various applications are exemplified. DN to [lambda] BoD – Books on Demand CSIE 2011 is an international scientific Congress for distinguished scholars engaged in scientific, engineering and technological research, dedicated to build a platform for exploring and discussing the future of Computer Science and Information Engineering with existing and potential application scenarios. The congress has been held twice, in Los Angeles, USA for the first and in Changchun, China for the second time, each of which attracted a large number of researchers from all over the world. The congress turns out to develop a spirit of cooperation that leads to new friendship for addressing a wide variety of ongoing problems in this vibrant area of technology and fostering more collaboration over the world. The congress, CSIE 2011, received 2483 full paper and abstract submissions from 27 countries and

regions over the world. Through a rigorous peer review process, all submissions were refereed based on their quality of content, level of innovation, significance, originality and legibility. 688 papers have been accepted for the international congress proceedings ultimately.

**Laser Beam Shaping**

Apprimus Wissenschafts verlag

A huge number of applications require coherent radiation in the visible spectral range. Since diode lasers are very compact and efficient light sources, there exists a great interest to cover these applications with diode laser emission. Despite modern band gap engineering not all wavelengths can be accessed with diode laser radiation. Especially in the visible spectral range between 480 nm and 630 nm no emission from diode lasers is available, yet. Nonlinear frequency conversion of near-infrared radiation is a common way to generate coherent emission in the visible spectral range. However, radiation with extraordinary spatial temporal and spectral quality is required to pump frequency conversion. Broad area (BA) diode lasers are reliable high power light sources in the

near-infrared spectral range. They belong to the most efficient coherent light sources with electro-optical efficiencies of more than 70%. Standard BA lasers are not suitable as pump lasers for frequency conversion because of their poor beam quality and spectral properties. For this purpose, tapered lasers and diode lasers with Bragg gratings are utilized. However, these new diode laser structures demand for additional manufacturing and assembling steps that makes their processing challenging and expensive. An alternative to BA diode lasers is the stripe-array architecture. The emitting area of a stripe-array diode laser is comparable to a BA device and the manufacturing of these arrays requires only one additional process step. Such a stripe-array consists of several narrow striped emitters realized with close proximity. Due to the overlap of the fields of neighboring emitters or the presence of leaky waves, a strong coupling between the emitters exists. As a consequence, the emission of such an array is characterized by a so called supermode. However, for the free running stripe-array mode competition between several supermodes occurs

because of the lack of wavelength stabilization. This leads to power fluctuations, spectral instabilities and poor beam quality. Thus, it was necessary to study the emission properties of those stripe-arrays to find new concepts to realize an external synchronizatio n of the emitters. The aim was to achieve stable longitudinal and transversal single mode operation with high output powers giving a brightness sufficient for efficient nonlinear frequency conversion. For this purpose a comprehensiv e analysis of the stripe-array devices was done here. The physical effects that are the origin of the emission characteristics were investigated theoretically and experimentall y. In this context numerical models could be verified and extended. A good agreement between simulation and experiment was observed. One way to stabilize a specific supermode of an array is to operate it in an external cavity. Based on mathematical simulations and experimental work, it was possible to design novel external cavities to select a specific supermode and stabilize all emitters of the array at the same wavelength.

This resulted in stable emission with 1 W output power, a narrow bandwidth in the range of 2 MHz and a very good beam quality with $M^2<1.5$. This is a new level of brightness and brilliance compared to other BA and stripe-array diode laser systems. The emission from this external cavity diode laser (ECDL) satisfied the requirements for nonlinear frequency conversion. Furthermore, a huge improvement to existing concepts was made. In the next step newly available periodically poled crystals were used for second harmonic generation (SHG) in single pass setups. With the stripe-array ECDL as pump source, more than 140 mW of coherent radiation at 488 nm could be generated with a very high opto-optical conversion efficiency. The generated blue light had very good transversal and longitudinal properties and could be used to generate biphotons by parametric down-conversion. This was feasible because of the improvement made with the infrared stripe-array diode lasers due to the development of new physical concepts.

*Optical Refrigeration*

SPIE-International Society for Optical Engineering Proceedings of

SPIE present the original research papers presented at SPIE conferences and other high-quality conferences in the broad-ranging fields of optics and photonics. These books provide prompt access to the latest innovations in research and technology in their respective fields. Proceedings of SPIE are among the most cited references in patent literature. *Laser Focus World* GRIN Verlag Learn about the theory, techniques and applications of wavefront shaping in biomedical imaging using this unique text. With authoritative contributions from researchers who are defining the field, cutting-edge theory is combined with real-world practical examples, experimental data and the latest research trends to provide the first book-level treatment of the subject. It is suitable for both background reading and use in a course, with coverage of essential topics such as adaptive optical microscopy, deep tissue microscopy, time reversal and optical phase conjugation, and tomography. The latest images from the forefront of biomedical imaging are included, and full-colour versions are available in

the eBook version. Researchers, practitioners and graduate students in optics, biophotonics, biomedical engineering, and biology who use biomedical imaging tools and are looking to advance their knowledge of the subject will find this an indispensable resource.

**Advances in Optical Data Storage Technology**

Springer Science & Business Media

This classic resource provides a clear, well-illustrated introduction to the essentials of optical design-from basic principles to cutting-edge design methods.

• Stop Overthinking: 23 Techniques To Relieve Stress, Stop Negative Spirals, Declutter Your Mind, And Focus On The Present (the Path To Calm) By Nick Trenton